A SUPPLEMENT

TO

Mr. CHAMBERS's Cyclopædia:

OR,

UNIVERSAL DICTIONARY

OF

ARTS AND SCIENCES.

IN TWO VOLUMES.

VOL. II.

LONDON:

Printed for W. INNYS and J. RICHARDSON, R. WARE, J. and P. KNAPTON, T. OSBORNE, S. BIRT, T. and T. LONGMAN, D. BROWNE, C. HITCH and L. HAWES, J. HODGES, J. SHUCKBURGH, A. MILLAR, J. and J. RIVINGTON, J. WARD, M. SENEX, and the Executors of J. DARBY.

M. DCC. LIII.

SUPPLEMENT

TO THE

CYCLOPÆDIA,

OR,

UNIVERSAL DICTIONARY

OF

ARTS AND SCIENCES.

M.

MABBY, a kind of wine made from potatoes. It is faid to be ufed in Barbadoes. *Boyle*'s Works abridg. vol. 1. p. 71.

MABOUJAS, the *devil lizard*, a fpecies of American lizard, fo called from its uglinefs and difagreeable afpect. It grows to fix or feven inches long, and to the thicknefs of a thumb, and is found in the trunks of rotten trees, and in marfhy places, where the fun beams feldom reach. It is all over of a gloffy black colour, and looks as if fmeared over with oil. *Rochefort*'s Hift. Antill.

MACAM, *Indian apple*, in natural hiftory, the name of a common Eaft-Indian fruit; it is of a round fhape, and about the fize of our common wild crabs which grow in the hedges. Inftead of the feveral fmall feeds which our crabs and apples contain, this fruit has only one hard kernel. It is of an acid tafte, and of a raw and not very agreeable fmell. The tree which produces this fruit, does not grow to any great height It refembles the quince tree in its leaves, except that they have a yellowifh caft. Mem. Acad. Par. 1699.

MACAQUO, in zoology, the name of a large fpecies of monkey, called by Mr. Ray *cercopithecus angolenfis major*, the great Angola monkey. Its hair is all of the colour of that of a wolf, its noftrils are elate, its head like a bear's, and its buttocks are bald, on thefe he frequently fits upright. He always carries his tail bent into a fort of arch, his length from the head to the infertion of the tail is more than a foot; his tail equals his body in length, his legs are confiderably long, and his body remarkably fat and bulky; his teeth are extremely white, and his penis very much refembles that of a man. It is an extremely lively animal, and continually plays a number of antic tricks; its voice is fhrill, and its only note hah! hah! *Ray*'s Syn. Quad. p. 155. See CERCOPITHECUS.

They have another fpecies of this kind alfo about Angola, which may be called the black *Macaquo*. Its only colour is black, but on many parts of the back and fides, there is a greyifh caft among it. This has a tail of remarkable length, being more than two foot long.

MACARON, the name of a fort of vermicelli, a pafte made of flour and water, and formed into the fhape of the barrel of a large quill, or the guts of fmall fowls.

MACAW, or MACAO, in zoology, the name of a large fpecies of parrot, diftinguifhed alfo by the length of its tail. There are three different fpecies of this bird brought over into Europe, which not only differ in fize and other particulars, but alfo in colour. The firft is the largeft, and is finely variegated with blue and yellow. The fecond is fomewhat fmaller than this, and is principally red and yellow, and the third is red and blue. It is not uncommon alfo to fee the *Macaw* perfectly white, and it is to that particular colour we give the name of *cockatoon*; though with fome it is made the fynonymous name of all the *Macaw* tribe.

MACERONE, in botany, a name given by fome authors to the great *hippofelinum*, or herb Alexanders. *J. Bauhine*, vol. 3. p. 126.

MACHÆRION, a word ufed by chirurgical writers as the name of an inftrument of the nature of the incifion knife. It is alfo fometimes ufed to exprefs an incifion, and by the arufpices of old it was applied to fome peculiar part of the liver of animals, from which they prefaged events.

MACHERA *Lapis*, in natural hiftory, the name of a ftone of a ferrugineous colour, frequent on mount Berecynthus in Phrygia. Plutarch, and many other grave writers, relate, that if any perfon found this ftone, and took it up at the time of the celebration of the feafts of Cybele, he inftantly was feized with madnefs.

MACHLIS, in natural hiftory, a name ufed by Pliny and fome of the old authors, for the rein-deer. See the article RANGIFER.

MACKREL, the Englifh name for the fcombrus, or fcomber. See the article SCOMBER.

Horfe MACKREL. See the article HORSE-*Mackrel*.

MACROCELE. See the article FULICA.

MACROCEPHALUS (*Cycl.*)—*Macrofephali*, or *Long heads*, is a name given to a certain people who, according to the accounts of authors, were famous for the unfeemly length of their heads; yet cuftom fo far habituated them to it, that inftead of looking on it as a deformity, they efteemed it a beauty, and as foon as the child was born, moulded and fafhioned its head in their hands to as great a length as poffible, and afterwards ufed all fuch rollers and bandages as might feem moft likely to determine its growing long.

MACROCERCOS *Ovis*, in natural hiftory, the name of a fpecies of fheep fomewhat allied to the *ovis laticauda*, or *platycercos* in the largenefs of its tail; but as that extends fo wonderfully in breadth, this does fo no lefs in length, being defcribed to be three cubits long.

Authors who have treated of this animal obferve, that it is wholly unable to manage this load of tail, fo that in the

natural state it trails upon the ground, and soon becomes sore and ulcerated; for this reason the shepherds are obliged to contrive a sort of support for it, by which the animal is made easy.

MACROCOLUM, or MACROCOLLUM, among the Romans, the largest kind of paper then in use. It measured sixteen inches, and frequently two feet.

MACROLOGY, Μακρολογία, in rhetoric, a redundant, or too copious stile; an example of which we have in Livy, lib. viii. *Legati non impetratâ pace, retro domum, undè venerant abierunt.*

The too copious is equally subject to obscurity with the two concise stile, and consequently ought to be avoided. *Voss.* Rhet. l. 4. c. 1. §. 12. p. 35. See the articles BRACHYLOGY and DICTION.

MACROPEDIUM, the *Long-legs*, a name given by some writers in natural history, to the common tipula. See the article TIPULA.

MACROPIPER, a name given by authors to the *piper longum*, or long pepper.

MACROPNUS, a word used by Hippocrates and other old writers in medicine, to signify a person who fetches his breath at long intervals. It is used in opposition to *brachypnus*, or short-breathed. See the article BRACHYPNÆA.

MACROPTERA, in zoology, the name of a genus of birds of the hawk kind, remarkable for the length of their wings. The word is derived from the Greek μακρὸς, long, and πτερὸν, a wing.

The hawks of this genus have their wings so long, that when closed they reach to the end of the tail, or nearly so. Of this genus are the bald buzzard, the kite, the hen harrier, the honey buzzard, and common buzzard, the sacre, the jersalcon, &c. *Willughby*'s Ornitholog. p. 40.

MACRORYNCHÆ, *long-beaked*, in the Linnæan system of zoology, the character of a large order of the bird kind.

The word is derived from the Greek μακρὸς, long, and ῥύγχος, a beak

The birds of this order have all of them beaks many times longer than their head, with oblong nostrils, and a furrow running from them towards the apex of the beak. *Linnæi* System. Nat. p. 45.

MACROTELOSTYLA, in natural history, the name of a genus of crystals, which are composed of two pyramids joined to the end of a column, both the pyramids, as also the column, being hexangular, and the whole body consequently composed of eighteen planes.

The word is derived from the Greek μακρὸς, long, τέλειος, perfect, and στύλος, a column; expressing a perfect crystal with a long column. See Tab. of Fossils, Class 3.

There are only three known species of this genus: 1. A very bright and colourless one, found in some few places in England, and very common in the mountains of Germany. 2. A blackish very bright kind, with short pyramids, found sometimes in Cornwall, but more frequent in Italy. And, 3. A dull whitish one, with irregular pyramids; this is sometimes found in Yorkshire and in Cornwall, and is very common in Germany. Either of the sorts found with us, are called by the common name of *Cornish diamonds*. *Hill*'s Hist. of Foss.

MACROULE, in zoology, the name given by many to the largest species of coot. It is of a deeper black than the common kind, and has a larger bald spot on its head. It is also called by some *diable de mer*. *Ray*'s Ornithol. p. 289. See the article FULICA.

MACUCAQUA, in zoology, the name of a Brasilian bird of the gallinaceous kind, called also by some the *gallina sylvestris*, or wild hen. It is larger than our common hen, and has a black strong beak somewhat hooked at the end; its body is thick and bulky, and it has no tail; its head and neck are variegated with black and yellow spots, its throat is white, its breast, belly, and back, are of a dusky ash-colour; its wings are of an olive colour, and are variegated with black; the long feathers of them are all black. It is a very well-tasted fowl, and has twice as much flesh as the European hen; its eggs are somewhat larger than the common hen egg, and of a bluish-green colour; it feeds on fruits that fall off the trees, &c. and runs well, but cannot fly high or far, and never is seen in the trees. *Marggrave*'s Hist. Brasil.

MACULA, (*Cycl.*) in the writers of medicine, is used to express all kinds of spots and efflorescences on the skin with different epithets. Thus *Maculæ pestilentiales* are the spots or efflorescences which appear upon the skin in pestilential diseases. *Maculæ hepaticæ* are spots of a brownish red colour appearing on the skin in many places, from an *ichorescence* of the blood, attended with a sort of coagulation. *Maculæ volaticæ*, or vanishing spots, are very common to children, appearing in several parts of their bodies, and very soon disappearing again. *Maculæ maternæ* are the spots or blemishes on children called *nævi*, and marks from the mother's longing; and *maculæ albæ* are white spots which appear in the cornea of the eye, called by other names, albugo, leucoma, nebula, and nubecula.

MACULA *Oculi*, a word used by many authors to signify a cataract or suffusion.

MAD-*Dog*. See the article MADNESS.

MAD-*Apple*. See the article MELONGENA.

MADAROSIS, a word appropriated by the Greek physicians to the falling off of the hair of the eye-lids. This was usually occasioned among them by small but foul ulcers on the verge of the eyelid, and this falling off of the hair about their edges, is said by Hippocrates to have been a very bad symptom.

MADDER (*Cycl.*)—For the botanical characters of *Madder*, See the article RUBIA.

The culture of *Madder* is an article of considerable advantage to the Dutch, and might be prosecuted here with equal success. The method of cultivating it in Holland is this: In autumn they plough the land where the *Madder* is to be planted, laying it up in high ridges, that it may be mellowed by the winter's frosts. In March they plough it again, working it very deep, and laying it in ridges at eighteen inches asunder, and about a foot deep. Then, in the beginning of April, when the *Madder* begins to shoot out of the ground, they open the earth about the old roots, and take off all the side shoots, which extend themselves horizontally just under the surface of the ground, preserving as much of the root as may be with them. These they plant immediately on the tops of the new ridges, at about a foot distance from each other; and this they usually do in showery weather, when the plants immediately take root, and require no more water. In these ridges they let the plants remain two seasons, keeping them clear of weeds; and at Michaelmas time, when the leaves are fallen off, they take up the roots, and dry them for the market.

In England it would not be necessary to lay the ground up in ridges, as our lands are not so subject to over-flowings; the plants also will thrive better, if at greater distances, and if the horizontal roots were to be destroyed at times, the downright root would succeed much the better. *Miller*'s Gardener's Dict.

MADDER-*Root*. Mr. John Belchier shewed to the Royal Society the bones of hogs which were become red, by their feeding on bran that had been boiled with printed calicoes, which had been stained with preparations of iron, alum, sugar of lead, and had had an infusion of *Madder-root*, to fix the colours. By feeding a cock sixteen days on fig-dust, with a little *Madder-root*, all his bones became also red. Phil. Trans. N° 457.

Mr. Hamel du Monçeau verified Mr. Belchier's experiments, and observed, that except the villous coat of the stomach and intestines, the capsula of the crystalline and vitreous humours of the eyes, and some very hard bony tendons, and the bones, no other part had any tincture of the *Madder*. The most solid bones were most tinged, and all the red ones were larger, more spongy, and easily broken; nor did they unite so well, when broken, as white bones. Some young animals had their bones tinged in three days. The red colour went gradually off, when the creatures forbore to take the *Madder* for food, which proved unhealthy, for they began to languish soon, and died with it.—Vegetables did not take the red colour when they were planted in *Madder*; and none of the other dyes, with which he fed animals, had any such effect of tinging their bones, as the *Madder* had. Mr. du Hamel, having mixed *Madder* with the food of a pig for some time, and then kept away the *madder* an equal time, found, upon sawing the bones through, that their interior laminæ were red, while the exterior were white: And having fed another pig six weeks with *Madder*, then kept it out of its food as long, and then mixed it other six weeks; upon sawing the bones, they were composed of three layers, the external and internal were red, the middle one was white. Mem. de L'Acad. des Scienc. 1739. & Phil. Trans. N°. 457, §. 4. Med. Ess. Edinb. Abr. Vol. 2. p. 477.

MADELION, in the materia medica, a word used by Dioscorides for *bdellium*.

MADERAM-*Pulli*, in botany, a name used by some authors for the tree whose fruit is the tamarind of the shops. Hort. Malab. vol. 1. p. 39.

MADIC, a word used by some medical writers for buttermilk.

MADISTERIUM, a name given by the Greeks to an instrument intended to keep the skin smooth, by eradicating the hairs.

MADNESS, *Mania*, in medicine. See the article MANIA, *Cycl.* and *Suppl.*

MADNESS *from the bite of enraged animals, Rabies canina.*—The bites of enraged animals, tho' they were not *mad* at the time they inflicted them, are usually attended with very grievous consequences. If the wound is slight, the discharge of blood from the part is to be encouraged by pressing it with the fingers, sucking it in the mouth, or by the application of cupping-glasses, or enlarging it with a lancet. It is afterwards to be washed with warm spirit of wine, and bolsters dipped in the same liquor, are to be applied to it, repeating the application every three or four hours, till all danger of inflammation is gone off. If the wound be considerably deep, it is always necessary to enlarge it with the knife, unless it have already a very large opening; and, after applying spirit of wine for the first days, to prevent the bad symptoms, it may be easily healed with honey, or some digestive ointment, and afterwards with a vulnerary balsam, as usual in other wounds. *Heister*'s Surg. 97.

To know whether the dog which has bitten a person be or be not *mad*, it is necessary to know the marks by which a dog, in that condition, is to be distinguished from others; these are, that he foams at the mouth, lolls out his tongue, claps his tail between his legs, and runs up and down, without ceasing, as if he was pursued; he makes a hoarse noise when he barks, and is afraid of all animals that come in his way, snapping at every thing he meets, even his master whom he used to fawn upon; and other dogs are afraid of him, and avoid him.

Persons bit by a *mad* dog are usually afflicted with very violent disorders, sometimes sooner, sometimes later, according to the malignity of the poison imbibed by the wound, and other accidents. The most proper thing the surgeon can do on this occasion, is to enlarge the wound with the knife, and promote the flowing out of the blood; then to wash it with salt water, or with Venice-treacle dissolved in vinegar; and when the texture of the part will permit, that is, when only the common integuments, or fleshy parts are wounded, to apply the actual cautery to the wound, and afterwards dress it as other burns. Another method much practised, is to make a tight ligature above the wound, to prevent, as much as may be, the return of the blood by the veins from that part; then to enlarge the wound with a knife, and wash it as before directed; then cauterize it if the part will admit that operation, if not, cleanse the wound, if deep, by means of a syringe, and apply over it a plaster of the mercurial kind; and if the person be plethoric, to open a vein. After the Venice-treacle has been used for a day or two in these cases, the wound is to be dressed with honey, or with the common digestive ointment, mixed with the Ægyptian ointment, or with red precipitate, and be kept open by means of these dressings for some weeks; for wounds of this kind must never be healed too soon, especially when they have not been cauterized. *Heister*'s Surg. 99.

Dr. de Sault argues for the *rabies canina*, depending on small worms, of which, he says, there are a great number found in the heads of those who die of this disease. From the analogy of this terrible disease with others; such as the itch, lues venerea, &c. which, in his opinion, are also contagious, by worms communicated from one person to another, he was led to think that the cure of the *rabies* was only to be performed by mercury, and the success confirmed his theory; for of four men who had all been bit at the same time by the same wolf, two were treated by the common specifics of plunging in the sea, &c. and died some days after of the *rabies*. The other two, having all the signs of an approaching *rabies*, were cured by Mr. de Sault's method, which is this: If he is consulted immediately after the person is bit, he orders him to be bathed in the sea, that the common confidence in this method may calm his mind. As soon as the patient returns, he puts him on the use of Palmarius's powder, composed of Fol. Rut. Verben. Salv. Plantag. Polypod. Absinth. Vulg. Menth. Artemis. Meliss. Betonic. Hyperic. Centaur. Min. ana partes æquales, with some coralline. A dram of this powder is to be taken every morning, in a glass of white wine or warm water. This he gives for twenty or thirty days, as there is more or less presumption of the poison having entered the blood. From the first day of taking the powder, he rubs a dram or two of ung. Neapolit. upon the wound, and skin round it, every other day. After doing this thrice, he applies the ointment every third day; and afterwards every fourth day, till he has made use of two or three ounces of the ointment. If the patient has delayed several days to take his advice, he uses the mercurial friction three or four times a day, for four days, and encreases the dose of Palmarius's powder; then forbears the inunction two days, lest a salivation should be brought on. Our author likewise recommends music as of use to calm the mind, and divert the fear which people, in danger of this disease, generally have. Medic. Ess. Edinb.

Dr. James relates the cure he made of dogs that were *mad*, and how he preserved others from the rabies, who had been bit by *mad* dogs, by giving doses of turbith mineral every day, or every other day. The other dogs of the pack that had been bit, died, notwithstanding the famous pewter medicine, dipping in the sea, and the other common specifics. The Doctor likewise mentions three people who were bit by *mad* dogs, and escaped the *rabies* by the use of the turbith. Phil. Trans. N°. 441. §. 8.

Mr. Fuller relates the good effects of the pulvis antylissus, composed of lichen. ciner. terrest. and piper. nigr. a a. in preventing the *rabies*. Phil. Trans. N°. 448. §. 5.

A person who had been bit by a *mad* dog, and began to have symptoms of the *rabies*, was saved by having one hundred and twenty ounces of blood taken in a week, and being bathed in cold water. Phil. Trans. ibid. §. 6.

Mr. Nourse relates the history of a lad bit in the thumb by a *mad* dog; he took morning and evening a dram of the *pulvis antilyssus* forty days, and bathed in the sea ten days; he was cut for the stone soon after, and recovered very well; nineteen months after which he died, with all the symptoms of the hydrophobia. Phil. Trans. N°. 445. See the article HYDROPHOBIA.

We have an account of a man bit by one of these animals; who was cured by bleeding, nitre, and mithridate. See Phil. Trans. N°. 475. Sect. 4. The *pulvis antilyssus*; and cold bathing, far from alleviating the symptoms in this patient, rather increased them. The cold bath was observed to augment the head-ach. Dr. Mortimer, the editor of the transactions, proposes warm bathing.

The Tonquinese pretend to an infallible remedy for the bite of the *mad* dog. Their method is to take about sixteen grains of the best musk; of the purest native cinnabar, and finest vermillion, each about twenty four grains; and having reduced them separately to impalpable powders, they mix and administer them in about a gill of arrack. This, in two or three hours, generally throws the patient into a sound sleep, and perspiration: If not, they repeat the dose, and think the cure certain. See Phil. Trans. N°. 474. p. 225. seq. Where Mr. Reid, to whom we are obliged for this receipt, observes, as to the vermillion, that though it be a preparation of cinnabar, yet, as the Tonquinese seem to think its virtue different, it were to be wished, that we knew their method of preparing it, in which they certainly excel.

This composition of musk and cinnabar has been applied with success to other distempers, only as Tonquin vermillion is not easy to be had, Mr. Reid substituted an equal quantity of factitious cinnabar in its stead, and sometimes administered it in rum or brandy instead of arrack. See the article MUSK.

MADNING-*Money*, old Roman coins, found about Dunstable, are so called by the country-people; and have their name from *magintum*, used by the emperor Antoninus in his Dunstable itinerary. *Camb. Blount.*

MADON, in botany, a name by which Pliny, and some other authors, have called the white bryony. *Ger.* Emac. Ind. 2.

MADOR, a word used by some authors to express the sweat which arises under a syncope or fainting, whether it be cold or hot, or in larger or smaller quantities.

MADREPORA, in botany, the name of a genus of sea plants, the characters of which are, that they are almost of a stony hardness, resembling the corals, and are usually divided into branches, and pervious by many holes or cavities, which are frequently of a stellar figure.

The species of *Madrepora*, enumerated by Mr. Tournefort, are these: 1. The starry *Madrepora*. 2. The branched *Madrepora*. 3. The *Madrepora*, commonly called *Millepora*. 4. The common white oculated *Madrepora*, called the oculated white coral. 5. The small white stellated and verrucose *Madrepora*, called the coralloide porus, and the astroites. 6. The much branched, and elegantly stellated white *Madrepora*. 7. The punctated verrucose *Madrepora*. 8. The abrotanum-like *Madrepora*. 9. The branched erect *Madrepora*, with numerous tubercles bending upwards. 10. The white compressed *Madrepora*, of a foliaceous structure, and sieve-like texture. 11. The white cypress-like *Madrepora*, or white porus, with hollow tubercles. 12. The great tree *Madrepora*. *Tourn.* Inst. p. 573.

MAEL *Coronde*, in the language of the Ceylonese, the flowering cinnamon tree. This is a name given to a peculiar species of the cinnamon tree, which is all the year round found full of flowers. The flowers are not easily to be distinguished from the very finest cinnamon flowers, but they produce no fruit, which the flowers of the fine cinnamon always do. The bark is much like that of the best cinnamon, in external appearance; but it has very little taste or smell. The tree grows very large, and the inhabitants sometimes tap it, by boring a hole into the trunk, at which it bleeds a thin watery juice, in the manner of our birch tree.

MÆMACTERION, Μαιμακτηριών, in chronology, the fourth month of the Athenian year. It contained twenty-nine days, and answered to the latter part of our September and beginning of October. The Bœotions called it *Alalcomenius*.

It took its name from the festival *Mæmacterica*, sacred to Jupiter, kept at this time. See *Pott.* Archæol. Græc. l. 2. c. 20. Tom. I. p. 413.

MÆMACYLON, in the materia medica, a name given by Dioscorides, and the antients in general, to the fruit of the Arbutus, or strawberry-tree.

MÆNA, in zoology, the name of a small fish, caught in vast abundance about the shores of the Mediterranean, and common in the markets of Italy, where they are accounted but a poor sort of fish, and sold at a very cheap rate. It is somewhat of the figure of the pearch, but broader and thinner, and is seldom above four or five inches in length. Its colour is a dusky pale green, and pale yellow, variegated with transverse black lines, and some longitudinal ones of a fine blue; and on each side, near the middle of the body, and just below the line which runs from the gills to the tail, it has a large black spot. This fish changes its colour in the different seasons of the year, being white in winter, and greenish, or yellowish, and streaked and spotted in the summer. The eyes are large, and the tail not much forked. Its back fin has the anterior rays prickly, the rest smooth. *Rondelet.* de Pisc. l. 5. c. 13. p. 138. *Aldrovand.* de Pisc. l. 2. c. 39. p. 223. *Gesner.* de Pisc. p. 612.

MÆNA *Candida*, in ichthyology, a name given by many authors to the smaris. It is not very improper, for they are

both of the fame genus of the fparus, and are very nearly allied to one another; the principal difference confifting in the tail and belly fins of the fmaris being red. See the articles MÆNA and SPARUS.

MAESTOSO, or MAESTUOSO, in the Italian mufic, fignifies to play with grandeur, and confequently flow, but yet with ftrength and firmnefs.

MAFORTIUM, among the Romans, a veil, or head-drefs, worn by the married women. *Pitifc.* in voc.

MAGAS, in the antient mufic, is ufed to denote the bridge of any inftrument.

MAGAURI, in zoology, the name of a Brafilian bird, a fpecies of ftork. It is of the fize of the common white ftork. Its neck is a foot long, and its beak ftrait and pointed, and nine fingers breadth in length; its legs long and naked. Its tail is fhort. Its head, neck, and body, are covered with fnow-white feathers. On the throat thefe are very long, very white and valuable. Its wing and tail have their long feathers black. Its legs are red; and its flefh eatable. *Marggrave*'s Hift. Brafil.

MAGBOTE, or MÆGBOTE, in our old writers, a compenfation for the flaying or murder of one's kinfman, in antient times, when corporal punifhments for murder, &c. were fometimes commuted into pecuniary fines, if the friends and relations of the party killed were fo fatisfied. Leg. Canuti, cap. 2. *Blount*, Terms of Law.

The word comes from the Saxon *Mæg*, i. e. *Cognatus*, and *Bote*, *Compenfatio*.

MAGDALEO, a word ufed by difpenfatory writers, to exprefs any thing made up into a cylindric form. The common rolls of plafters which the apothecaries make up, to be ready for fpreading upon occafion, are thus called, as alfo the rolls of fulphur, or common brimftone.

MAGDALIÆ, or MAGDALIDES, the fame as *Magdaleones*, rolls of fulphur, plafters, &c. Vid. fupra.

MAGELLANIC *Clouds*, whitifh appearances like clouds, feen in the heavens towards the fouth pole, and having the fame apparent motion as the ftars.

They are three in number, two of them near each other. The largeft lies far from the fouth pole; but the other two are not many degrees more remote from it than the neareft confpicuous ftar, that is, about eleven degrees.

Mr. Boyle conjectures, that if thefe clouds were feen thro' a good telefcope, they would appear to be multitudes of fmall ftars, like the milky way. *Boyle*'s Works abr. vol. 1. p 295.

MAGELLANIC *Goofe*, *Anfer Magellanicus*, in zoology. See the article GOOSE.

MAGGOT, the common name of the fly-worm, bred in flefh, from the egg of the great blue flefh-fly Notwithftanding the diftafte for this animal, its figure, and ftructure of parts is greatly worth attending to, and may ferve as a general hiftory of the clafs of worms produced from the eggs of flies.

This animal is white and flefhy; its body is compofed of a number of rings, like the bodies of caterpillars, and other the like infects, and is capable, at the pleafure of the animal, of affuming different figures, being, at times, more or lefs extended in length, and confequently more or lefs thick.

Notwithftanding that this creature has no legs, it is able to move itfelf very fwiftly, and, in its firft attempt to move its body, is extended to its greateft length, and affumes fomething of the figure of a pointed cone. The pointed part of this cone is the head of the animal, and is not feparated from the next ring by any deeper furrow than the reft of the rings are from one another. In fome ftates of the animal, one may fee two fhort horns thruft out from the head; but what are more conftantly obfervable are two brown fealy hooks; thefe are, however, fometimes hid, and have each of them a fheath, or cafe, into which the animal can retract them at pleafure. Thefe hooks are bent into an arch, the concavity of which is toward the plane on which the creature is placed, and they are thickeft at their infertion in the head, and thence diminifh gradually, till they terminate in a fine fharp point.

Thefe two hooks are placed in a parallel direction, and can never come together, and therefore cannot ferve in the place of teeth to grind the food between, but merely to pull and fever it to pieces, that it may be of a proper fize for the mouth of the creature.

The creature has befide thefe two hooks a kind of dart, which is of about a third part of their length, and is placed at an equal diftance between them. This alfo is brown like them, and fealy; it is quite ftrait, and terminates in a fine point. The hooks have, as it were, two fealy thorns at their points, and this dart feems intended, by reiterated ftrokes, to divide and break the pieces of flefh thefe have feparated from the reft into fmaller parts.

Immediately below the apertures for the egrefs of the hooks, is placed the mouth of the animal; the creature does not fhew this little opening unlefs preffed, but if the preffure be properly managed, it will fufficiently open it, and there may be difcovered within it a fmall protuberance, which may very naturally be fuppofed either the tongue, or the fucker of the animal.

The hooks in thefe creatures not only fupply the place of teeth, but alfo of legs, fince it is by faftening thefe hooks into the fubftance it is placed on, and then drawing up its body to it, that it pulls itfelf along.

The back of this creature lowers itfelf by degrees as it approaches the extremity of the belly, and near the place where the back begins to lower itfelf, are placed the creature's two principal organs of refpiration. One may perceive there two fmall roundifh brown fpots; thefe are very eafily diftinguifhable by the naked eye, becaufe the reft of the body of the creature is white; but if we take in the affiftance of glaffes, each of thefe fpots appears to be a brown circular eminence raifed a little above the reft of the body. On each of thefe fpots one may alfo difcover three oblong oval cavities, fomething of the fhape of button-holes; thefe are fituated in a parallel direction to one another, and their length nearly in a perpendicular direction to that of the body of the animal.

Thefe apertures are fo many ftigmata or air-holes, openings deftined to admit the air neceffary to the life of the animal. The creature has fix of thefe ftigmata, three in each fide of its body.

The great tranfparence of the body of this infect, gives us an opportunity alfo to diftinguifh that it has on each fide a large white veffel running the whole length of the body. It is eafy to follow the courfe of thefe veffels through their whole length, but they are moft diftinct of all toward its hinder part, and they are always feen to terminate each in the brown fpot before defcribed; this leaves us no room to doubt but that they are the two principal tracheæ.

Thefe pofterior tracheæ have been well known to the later naturalifts; but there are two others befides thefe which they feem not to have diftinguifhed. Thefe are fituated in the anterior part of the animal, and are eafily difcovered by following the courfe of the tracheæ on each fide; for though thefe all the way diminifh in their diameters as they approach the head of the animal, yet it may be eafily enough feen where they terminate, which is (taking the head for one ring) in the junction of the fecond and third ring. In this place the naked eye eafily difcovers a fmall fpot at the extremity of each, which viewed with a good microfcope appears to be a plain ftigma, of the figure of a funnel with half of it cut off, and very elegantly indented, and as it were fringed at the edges.

Thefe ftigmata in the anterior part of the body, are as conftant in this creature as the pofterior ones, but it feems to have none of thofe which the caterpillar clafs are furnifhed with along their fides; though it feems from the ftructure of the fly it afterwards transforms itfelf into, that it ought to have them, fince that has ftigmata in their places.

The ramifications of the two great tracheæ are very beautifully feen in this creature, efpecially on its belly; and it is remarkable, that no veffel analogous to the great artery in the caterpillar clafs can be difcovered in thefe; though, if there were any fuch, their great tranfparence muft needs make them very eafily diftinguifhable; nor could its dilatations and contractions, if fo confiderable as in that clafs of animals, be lefs fo. See ERUCA.

Malpighi imagined that artery, in the caterpillar clafs, a feries of hearts; in its place, however, there may be feen in thefe animals a true heart. It is eafy to obferve in thefe creatures, about the fourth ring of their body, a fmall flefhy part, which has alternate contractions and dilatations, and is not only difcoverable in the body by means of the creature's tranfparence; but on making a proper fection of them in the fecond, third, and fourth rings, will be thrown out of the body of the creature, and will afterwards continue its beats for fome minutes. *Reaumur*'s Hift. Infect. vol. 4. p. 166, feq.

MAGIC (*Cycl.*)—The moft ignorant and barbarous people have been generally moft fufpected of *Magic*. Among ourfelves, the moft miferably ignorant perfons have been accufed of it; and among foreign nations the Laplanders and Iflanders have been fuppofed moft converfant of all others in it. Thefe people themfelves place an abfolute confidence in the effects of certain idle words and actions, and the reft of the world is deceived in the fame manner. The famous *magical drum* of the Laplanders is ftill in conftant ufe in that nation, and Scheffer, in his hiftory of Lapland, has given us an account of its ftructure.

This inftrument is made of beech, pine, or fir, fplit in the middle, and hollowed on the flat fide where the drum is to be made. The hollow is of an oval figure, and is covered with a fkin clean dreffed, and painted with figures of various kinds, fuch as ftars, funs, and moons, animals, and plants, and even countries, lakes, and rivers; and of later days, fince the preaching chriftianity among them, the acts and fufferings of our Saviour and his apoftles, are often added to the reft. All thefe figures are feparated by lines into three regions or clufters.

There is befide thefe parts of the drum an index and a hammer. The index is a bundle of brafs or iron rings, the biggeft of which has a hole in its middle, and the fmaller ones are hung to it. The hammer or drum-ftick is made of the horn of a rein deer, and with this they beat the drum fo as to make thefe rings move, they being laid on the top for that purpofe. In the motion of thefe rings about the pictures figured

gured on the drum, they fancy to themfelves fome prediction in regard to the things they are to enquire about.

What they principally enquire into by this inftrument, are three things: 1. What facrifices they fhall offer as moft acceptable to their gods. 2. What fuccefs they fhall have in their bufineffes or undertakings, fuch as hunting, fifhing, curing of difeafes, and the like. And, 3. What is done in places remote from them. On thefe feveral occafions they ufe feveral peculiar ceremonies, and place themfelves in feveral odd poftures as they beat the drum, which influences the rings to one or the other fide, and to come nearer to one or the other fet of figures. And when they have done this, they have a method of calculating a difcovery, which they keep as a great fecret, but which feems merely the bufinefs of imagination in the diviner or magician.

MAGICAL (*Cycl.*)—MAGICAL *arrows*, a fort of weapon very common among the barbarous inhabitants of Lapland, and many other of the northern climates, and fuppofed to poffefs great and very ftrange virtues. The people who are poffeffed of them, pretend that they can, by their means, caufe difeafes even to people at a great diftance from them; and not only difeafes, but any other kind of mifchiefs they defire; and they pretend to practife this not only againft ftrangers, but one another. There is a ftory recorded in Scheffer's hiftory of this country, as a legend univerfally believed among them, of a magician who, by means of one of thefe arrows, tore up a rock, near which another magician, with whom he was at enmity, was fleeping, and buried him under it.

MAGIOTAN, a name given by the people of Provence, and fome other places, to the ftony matter, as they efteem it, which choaks up in time the mouths of fome of their rivers. This is a foft fpongy matter, refembling a coarfe and very friable ftone; and, according to the opinion of count Marfigli, it is no other than a congeries of the fand from the bottoms of the rivers farther up the country, which is rolled downwards, and in thefe places is full of fparry and bituminous matter, which, in the place where it meets the full body of fea-water, is ftopp'd and coagulated by it into this firm and folid ftate.

MAGMA, a word ufed by medical writers on many occafions, fometimes in a very lax, and fometimes in a more appropriated fenfe. Some writers ufe it to exprefs a mafs of any thing; others for a thick ointment made up with very little fluid matter, to prevent its running; and others for the remains of an ointment after expreffion from its ingredients. Galen reftrains the word *Magma* to exprefs only the fæces of mirobalans.

MAGNA (*Cycl.*)—MAGNA *Affiza eligenda*, a writ directed to the fheriff to fummon four lawful knights before the juftices, of affize, there, upon their oaths, to chufe twelve knights of the vicinage, &c. to pafs upon the *great affize* between A. B. plaintiff, and C. D. defendant, &c. Reg. Orig. 8. *Cowel.*

MAGNALE, a word ufed by Van Helmont, and other enthufiaftical chemifts, to exprefs what he calls a kind of fpirit, which adminifters to fympathy and antipathy, and is the prompter and promoter of actions, and by virtue of which magnetifm is conveyed, as by a vehicle, to a diftant object. In other places he fays *Magnale*, in mixed fubftances, is the æther, which is thinner than the air; and, as he expreffes it, of an ambiguous nature between body and no body. In other places he fays, that as the *Magnale* has nothing like itfelf in created beings, fo it will admit of no manifeftation by refemblance. The *Magnale*, he fays, is not light, as many fuppofe, but is a fort of conjugal form affifting the air.

MAGNANINE, in zoology, the name of a fmall bird defcribed by Aldrovand, Gefner, and fome other authors, and feeming to be the fame with our hedge-fparrow, commonly known among authors by the name *curruca*. *Ray*'s Ornitholog. p. 158.

MAGNES *Carneus*, in natural hiftory, a name given by Cardan, and fome other authors, to a white earth dug in Italy and fome other places, and called alfo by many *calamita alba*. It is an indurated earthy fubftance of the hardnefs of ofteocolla, and is of a white colour variegated with black lines. It adheres very firmly to the tongue, and is hence faid to attract flefh in the fame manner as the magnet does iron. It is even pretended, that if an iron ftylus be rubed over with this ftony earth, and then plunged into the flefh, the virtue of the earth will heal the wound as foon as made, and when the weapon is taken forth, there will remain no appearance of hurt. Cardan affirms that he faw this tried with fuccefs, but fufpects witchcraft in the cafe! *De Boot.* de Gem. p. 474.

MAGNET (*Cycl.*)—MAGNET, in medicine. Some writers of the middle ages have, from a miftaken tranflation of Theophraftus, been induced to account the *loadftone* poifonous, which the antients were fo far from doing, that they gave it inwardly. Galen afcribes a purgative quality to it, and recommends it in dropfies; and Diofcorides prefcribes it as a good medicine to evacuate grofs melancholic humors.

It is doubtlefs poffeffed of the fame virtues with the other ores of iron, though of late never ufed inwardly, being only made an ingredient in fome plafters.

Arfenical MAGNET, a cauftic made of equal quantities of antimony, common fulphur, and white cryftalline arfenic; which are to be kept in a fand heat, till the whole melts into one uniform mafs. It fucceeds very well in taking down fungous flefh in wounds.

MAGNETIC *Needle*, in navigation, &c. See the article NEEDLE, *Cycl.*

MAGNETICAL *Meridian*, in navigation. See the article MERIDIAN, *Cycl.*

MAGNETIS *Lapis*, in the natural hiftory of the antients, the name given in different ages to two very different fubftances. The earlieft Greek authors expreffed by it the loadftone, which became afterwards called *heraclius lapis*; and then the word *Magnetis* was applied to a very different ftone brought from the fame place, the neighbourhood of Magnefia in Lydia.

This was a fine beautiful and bright fubftance, of a pure white, and fo very bright and gloffy, as to carry a refemblance of polifhed filver. It was dug in large maffes, and was of a texture eafy to be wrought into any figure; this made it in great efteem among the antients, who had it in conftant ufe turned into veffels of different kinds for the ufe of the table. It feems to be wholly unknown at prefent among the nations we have commerce with. *Hill's* Theophraft. p. 79.

MAGNISSA, in mineralogy, a name given by fome of the antients to the white pyrites, called by others *leucolithos* and *argyrolithos*. Many have fuppofed the *Magniffa* to be the fame with the magnefia, that is, manganefe, but this is an error; nor is there the leaft fimilitude between the two ftones. It is plain, indeed, that the antients called a white and filvery looking ftone alfo by the name *Magnefia*; but neither does this appear to have been the *Magniffa* here defcribed, for Theophraftus defcribes it as a ftone that artificers ufed for turning things out of, which is utterly impoffible to be done with the pyrites; the fhattery texture of which would make it fall to pieces on the flighteft attempt to cut it into fhape by the wheel. The chemifts of the preceding ages have plainly underftood this word *Magniffa* of the pyrites, and have made thefe two words and the *fory* fynonymous. Pliny mentions a gold-coloured and filver-coloured pyrites; thefe therefore were diftinctions fufficient for the white and yellow pyrites; but Diofcorides has only mentioned one kind of the marcafite or pyrites, which is the yellow or braffy one, the moft common of all the fpecies. When the word pyrites, therefore, was only the name of this yellow ftone, it is not wonderful that the white one fhould be called by another name, as *Magniffa*. See the article MARCASITE.

MAGNITUDE (*Cycl.*)—*Geometrical magnitudes* may be ufefully confidered as generated or produced by motion. Thus, lines may be conceived as generated by the motion of points; furfaces, by the motion of lines; folids, by the motion of furfaces; angles may be fuppofed to be generated by the rotation of their fides.

Geometrical magnitude is always underftood to confift of parts; and to have no parts, or to have no *Magnitude*, are confidered as equivalent in this fcience. There is, however, no neceffity for confidering *Magnitude* as made up of an infinite number of fmall parts; it is fufficient that no quantity can be fuppofed to be fo fmall, but it may be conceived to be farther diminifhed; and it is obvious, that we are not to eftimate the number of parts that may be conceived in a given *Magnitude*, by thofe which in particular determinate circumftances may be actually perceived in it by fenfe, fince a greater number of parts become fenfible, by varying the circumftances in which it is perceived. See *Mac Laurin*'s Fluxions, Art. 290, 291.

Many of late have fuppofed geometrical *Magnitude* to be compofed of infinitely fmall parts, and infinite in number; and hence have raifed many paradoxes and myfteries in a fcience wherein there ought to be none. Nay, infinitely fmall parts of infinitely fmall parts, &c. *ad infinitum*, have been introduced without the leaft neceffity. See *Mac Laurin*'s Fluxions in the Introduction, where he makes feveral remarks on Monfieur de Fontenelle's *Geometrie de L'infini*. See the article EXTENSION.

MAGNOLIA, in botany, the name of a very beautiful genus of plants, the characters of which are thefe: The perianthium is compofed of three oval and hollow leaves, which look like petals, and fall with the flower. The flower confifts of nine petals of an oblong form, hollowed, narrow at the bafe, and broader at the apex, and terminating in an obtufe point. The ftamina are very numerous, fhort, and pointed filaments; they grow to the common receptacle of the piftil, which is placed beneath the germen, and are of a compreffed figure. The antheræ are oblong and flender, and grow on every fide to the filaments; the germina are numerous, of an oval oblong figure, and are placed about a clavated receptacle; the ftyles are crooked and contorted; the ftigmata are placed longitudinally on the ftyles, and are hairy; the fruit is a ftrobilus of an oval form, with compreffed, roundifh, and fcarce imbricated capfules; thefe are compofed of two valves, and contain one cell; they ftand clofe to one another without pedicles, and open in their outer part. The feeds are fingle, and hang

hang by a thread from every fcale or capfule of the fruit when that is fo ripe as to burft thofe fcales. *Linnæi* Gen. Plan. p. 254. *Dillen.* Hort. Elth. p. 168.

MAGNUM *Os Carpi*. This is the third bone of the fecond row in the carpus, and is the largeft of all the bones of that part. It is of a confiderable length, and has a kind of articular round head, which is received into the cotyloide cavity formed by the two firft bones of the firft row; and this articulation is capable of a fmall degree of flexion and extenfion. The digital fide is a cartilaginous bafis unequally and obliquely triangular, the apex being turned inward. It is articulated with the fecond metacarpal bone, and is alfo a little notched on the radial edge for its articulation with the fmall edge of the metacarpal bone. The radial fide is very fmall, and near the bafis, being articulated with the os pyramidale; the reft of this furface is without cartilage; the cubital fide is double, anfwering to a like fide in the os uniforme with which it is articulated. The outer furface, which forms a part of the outer furface of the carpus, is broad, rough, and uneven, for the infertion of ligaments; the inner furface is likewife rough, but narrower; and round both furfaces are feveral depreffions, which, while the bone is in the body, are filled with fmall glands, ligaments, &c. *Winflow*'s Anatomy, p. 84.

MAGODUS, among the Romans, a name given to thofe players who fometimes acted the part of men, and fometimes of women. *Pitifc.* Lex. Ant. in voc.

MAGOSTANS, in botany, the name by which Garcias calls the genus of plants, afterwards named by Linnæus *garcinia*. See the article GARCINIA.

MAGRA, a word ufed by fome writers for a fort of red earth, and by others for the cornelian, the red jafper, or any other ftone of a red colour.

MAGUDARIS, a name by which Diofcorides calls the filphium. See SILPHIUM.

MAGYDARIS, in botany, a name ufed by Theophraftus, and other of the old authors, for the laferpitium or laferwort. *Ger.* Emac. Ind. 2. See LASERPITIUM.

MAHALEB, in the materia medica, the name of the fruit of a fort of wild cherry called *cerafus fylveftris amara*, or the wild bitter cherry, by Bauhine. The wood of the tree is of a greyifh caft and fine grain, with a mixture of red in the veins, and is very firm, and of a fweet fmell; the leaves and flower carry a rude refemblance of thofe of the common cherry; the fruit is round, black, and refembles a cherry, having the fame fort of ftone in it, the kernel of which is like the bitter almond in tafte. It is commended in external applications, and the perfumers of France ufe it in their wafhballs. It is to be chofen frefh and fweet, for it very often has an intolerable ftinking fmell, like that of bugs. *Lemery*'s Dict. of Drugs.

MAHOMET *Pigeon*, the common Englifh name of a fpecies of pigeon, called by Moore the *columba numidica alba*. It is of the fame fhape and fize with the Barbary pigeon, and has all the characters of that fpecies, but is always perfectly white, which gives the red circle about the eyes a more lively look. *Moore's* Columbarium, p. 51.

MAJA, in zoology, the name of a bird defcribed by Nieremberg as very common in the ifland of Cuba, and frequenting the fields of rice in large flocks. It is defcribed to be a fmall bird of a yellowifh colour, very delicate, and well tafted, and remarkable for having a ftomach on the back or outfide of the neck. *Ray*'s Ornithol. p. 297.

MAIAGUE, in zoology, the name of a Brafilian bird of the web-footed kind, but having its hinder toe loofe. It is of the fize of the common goofe; its head is large and round; its neck long, and it always carries it crooked like the fwan; its beak is ftrong and hooked at the end; it is all over of a brownifh black in colour, except that its throat is yellow. It is found about the mouths of rivers, and feeds on fifh; it builds on the ground; it is very nimble both in running, flying, and diving, and is not eafily taken, but is a very well-tafted fowl. *Marggrave*'s Hift. Brafil.

MAIDEN (*Cycl.*)—MAIDEN *Affizes*, affizes where no perfon is condemned to die, are thus called.

MAIDEN-*hair*, *Adiantum*, in medicine. See the article ADIANTUM.

MAIDEN-*rents*, in our old writers, a noble paid by the tenants of fome manors on their marriage. This was faid to be given to the lord, for his omitting the cuftom of marcheta, whereby he was to have the firft night's lodging with his tenant's wife, but it feems more probably to have been a fine for a licence to marry a daughter. *Blount.*

MAILE, in our old writers, a fmall kind of money. Silver half-pence were likewife termed *Mailes*, 9 Hen. 5. By indenture in the mint, a pound weight of old fterling filver was to be coined into three hundred and fixty fterlings, or pennies, or feven hundred and twenty *Mailes*, or half-pennies, or one thoufand four hundred and forty farthings. *Lownd*'s Eff. on Coins, p. 38. *Blount.*

MAIN, (*Cycl.*) a term applied to feveral parts of a fhip, as the *Main-capftan*, *Main-maft*, *Main-top-maft*, *Main-fail*, &c. and fignifying the chief or largeft of the kind. See the articles CAPSTAN, MAST, SAIL, &c.

MAIN-*body of an army*, is the body of troops that marches between the advance and the rear guard. In a camp it is that part of an army which is encamped betwixt the right and left wing.

MAINIS, in ichthyology, a name ufed by Ariftotle, Athæneus, and others of the old Greek writers, for the fifh now called the *mena menerela*, and *menola*. It is a fpecies of the fparus, and is diftinguifhed from all the other fpecies of that genus, by having four large teeth, and a variegated body, ornamented with a black fpot in the middle of the fides. This is the fifh the Narbons call *jafcele*. See the article SPARUS.

MAINPERNABLE, in law, is applied to one that is bailable, or who may be let to bail. *Terms of law*, *Blount*. See the article BAIL, *Cycl.*

MAINTAINERS, are thofe that maintain or fecond a caufe depending between others, by difburfing money, or making friends for either party, &c. not being interefted in the fuit; or attornies employed therein. Stat. 19 Hen. 7. c. 14. *Blount.* See the article MAINTENANCE, *Cycl.*

MAJOR (*Cycl.*)—MAJOR *Helicis*, in anatomy, a name given by Albinus to one of the mufcles of the eye, called by Santorini and others, *helicis mufculus*. This author diftinguifhes it under the name *Major*, from another mufcle which he calls the *minor helicis*, and which Santorini calls only *fibræ mufculares in plana helicis facie*, tho' it be a true and proper mufcle.

MAJORANA, *Marjoram*, in botany, the name of a genus of plants, the characters of which are thefe: The flowers and feeds are wholly like thofe of origanum, but the heads are rounder, more denfe, compact, and fhort, and compofed of four orders of leaves, placed regularly in the manner of fcales. *Tourn.* Inft. p. 199.

The fpecies of *Marjoram*, enumerated by Mr. Tournefort, are thefe: 1. The common fweet *Marjoram*. 2. The broad-leaved golden *Marjoram*. 3. The round-leaved hairy *Marjoram*, with the fmell of favory. 4. The round-leaved fentellated *Marjoram*. And 5. The narrow-leaved woody *Marjoram*.

Marjoram is an attenuant, diffolvent, and detergent. It is good in nervous cafes, and diforders of the breaft and lungs. Its flowery tops, dried and powdered, and given a fcruple for a dofe, are greatly recommended in epileptic cafes. The dried plant is only kept in the fhops.

The common fweet *Marjoram*, though a plant fo commonly cultivated with us, never ripens its feeds in England: And, as it is an annual plant, we are obliged yearly to have a fupply of its feeds from Marfeilles, and other places in the fouth of France, where it grows wild in great abundance.

It is to be fown in the latter end of March, or beginning of April, on a dry warm fpot; and when they are come up, they muft be carefully watered and cleared from weeds. In June the plants will be grown pretty ftrong, at which time fome beds of rich light earth fhould be prepared, to tranfplant fuch into as ftand too thick. Thefe muft be planted at four inches diftance, and the others left in the fame manner. Thefe are to be watered till they have taken root; and it is always found that thofe which have been tranfplanted produce finer and larger knots of heads, than thofe which remain where they were fown. They flower toward the latter end of July, at which time they are to be pulled up, and dried in a fhady place for ufe. *Miller*'s Gardener's Dict.

MAIZ. The Indians in New England, and many of our other fettlements in America, had no other vegetable but *Maiz*, or Indian corn, for the making their bread of. They call it *weachin*; and where our colonies are at this time numerous, there is yet much of the bread of the country made of this grain, not of the European corn.

The ear of the *Maiz* yields a much greater quantity of grain than any of our corn ears. There are commonly about eight rows of grains in the ear, often more if the ground be good. Each of thefe rows contains at leaft thirty grains, and each of thefe gives much more flour than a grain of any of our corn. The grains are ufually either white or yellowifh, but fometimes they are red, bluifh, greenifh, or olive-colour'd, and fometimes ftriped and variegated.

This fort of grain, though fo effentially neceffary to the natives of the place, is yet liable to many accidents. It does not ripen till the end of September; fo that the rains often fall heavy upon it while on the ftalk, and the birds, in general, peck it, while it is foft and unripe. Nature has, to defend it from thefe accidents, covered it with a thick hufk, which keeps off flight rains very well; but the birds, if not frighted away, often eat thro' it, and devour great quantity of the grain.

There feem to be three or four diftinct fpecies of *Maiz*, in different parts of America. That of Virginia is very tall and robuft, growing to feven or eight foot high; that of New England is fhorter and lower. And the Indians, further up in the country, have a yet fmaller kind in common ufe. The ftalk of the *Maiz* is jointed like the fugar cane; it is very foft and juicy, and the juice is fo fweet and faccharine, that a fyrup, as fweet as that of fugar, has been often made of it; and things fweetened with it have been found not diftinguifhable from thofe done with fugar. It has not been tried yet whether it will cryftallize into fugar; but in all probability it will.

The Americans plant this corn any time from the beginning of March to the beginning of June; but the beft feafon is the middle of April. The favage Indians, who knew nothing of our account of months, ufed to guide themfelves in the feed-time of this ufeful plant, by the budding of fome particular trees of that country, and by the coming up of a fort of fifh into their rivers, which they call the *aloofe*. Thefe things were both fo regular, that they were in no danger of miftaking the time. Phil. Tranf. N°. 142.

The manner of planting *Maiz* is in rows, at equal diftances, every way about five or fix feet. They open the earth with a hoe, taking away the furface to five or fix inches deep, and of the breadth of the hoe; they then throw in a little of the finer earth, fo as to leave the hole four inches deep, or thereabouts, and in each of thefe holes they place four or five grains at a little diftance from one another. If two or three of thefe grow up, it is very well; fome of them are ufually deftroyed either by the birds or other animals.

When the young plants appear, they hoe up the weeds from time to time; and when the ftalk gathers fome ftrength, they raife the earth a little about it, and continue this at every hoeing, till it begins to put forth the ears; then they enlarge the hill of earth, round the root, to the fize of a hop-hill, and after this they leave it till the time of harveft without any farther care.

When they gather the ears, they either immediately ftrip off the corn, or elfe hang up the ears, tied in traces at diftances from one another; for if they are laid near together, they will heat and rot, or elfe fprout and grow; but kept cool and feparate, they will remain good all the winter. The beft method of all others, is to threfh out the corn as foon as the harveft is over, and then lay it up in holes of the ground, well lined with mats, grafs, or the like, and afterwards covered at top with more earth. The moft careful among the Indians ufe this method, and this fort of fubterranean granary always proves good. Id. Ibid. See the article TRACING.

The ufes of this plant among the Indians are very many. The great article is the making their bread of it; but befides this, the ftalks, when cut up before they are too much dried, are an excellent winter food for cattle; but they ufually leave them on the ground for the cattle to feed on. The hufks about the ear are ufually feparated from the reft, and make a particular fort of fodder, not inferior to our hay. The Indian women have a way of flitting them into narrow parts, and they then weave them artificially into bafkets and many other toys.

The original way of eating the grain, among the Indians, was this: They boiled it whole in water till it fwelled and became tender, and then they fed on it either alone, or eat it with their fifh and venifon, inftead of bread. After this, they found the way of boiling it into a fort of pudding, after bruifing it in a mortar; but the way of reducing it to flour is the beft of all. They do this by parching it carefully in the fire, without burning, and then beating it in mortars, and fifting it. This flour they lay up in bags, as their conftant provifion, and take it out with them when they go to war, eating it either dry or with water. Id. Ibid.

MAKINBOY, a name given by the people of Ireland to a kind of fpurge, or tithymale, common there: This is a very violent purge, as all the other fpurges are; but the Irifh have an opinion, that it will produce this effect only by being carried in the pocket. This opinion, which had been univerfally believed for many ages, was proved to be falfe by Dr. Mullen, who carried a large quantity of it about him many days together, on purpofe to give a fair trial; but it had not any the leaft effect on him.

MAKING *Up*, a term ufed by the diftillers to exprefs the bringing fpirits to a certain ftandard of ftrength by the addition of water. See LOWERING.

It is ufed principally in the diftilling fpirits, after their firft drawing, either by way of rectifying them, or of giving them the virtues of aromatic ingredients, in order to make the compound waters; fuch as cinnamon, annifeed, and the like. See DISTILLERY.

In the making thefe compounds, fome ufe an alcohol, or totally inflammable fpirit, which is much the beft method; others ufe ordinary proof fpirit of malt, or melaffes. If the latter be ufed, it is beft not to put any water with it into the ftill; but if the former, fo much water is to be added as will reduce it to the proof ftrength, which is juft an equal quantity. When this is done, there fhould be drawn off three fifths of the whole by diftillation; and the far better way would be to keep this liquor in this very ftate, which is juft the ftrength of the trois cinques brandy of the French: But as people require thefe waters to be kept for drinking, in fuch a ftate as not to exceed, at the utmoft, the ftrength of proof fpirit, generally to fall much fhort of it, it is neceffary to reduce this three fifths, to the whole, or more than the whole quantity of the proof fpirit put into the ftill. The apothecaries, to this end, ufually let the ftill continue to work without changing the receiver, till an equal quantity is produced to the fpirit put in, or one fourth more; it being the ufual ftandard in thefe waters, to have five quarts made from a gallon of the fpirit. By the method of doing this, by letting the ftill run, the faints are taken into the water, and give it a vapid and difagreeable tafte. Inftead of this the diftiller, when he has drawn off his three fifths of the quantity of proof, makes up the whole to the deftined quantity, by adding the two other fifths, or more than that, if requir'd, of common water, in which it is alfo cuftomary to diffolve fome fine fugar; and this gives a fullnefs in the mouth to the water, and makes it mellow, or loofe the fiery tafte of the ftill much fooner. If it be only made up to the ftrength of proof, it will mellow much fooner than if reduced one fifth below that ftandard, as the oil is much more perfectly diffolved in fpirit of a ftandard proof ftrength, than in fuch as is weaker.

The water employed in the *making up*, fhould be either foft and clear river water, or elfe fpring water rendered foft by diftillation, otherwife it is apt to turn the water thick, and precipitate a fediment, efpecially if the water be drawn lower than proof, or if the fpirit, originally employed, partake of an alkaline nature from the falts ufed in its rectification, as is ufually the cafe in the malt fpirits, the grofs oil of which requires to be feparated, by mixing falt of tartar or pot-afh with it in the ftill in the rectification.

When it is neceffary to *make up* waters lower than proof, they are generally cloudy; but this may be remedied, and they may be fined down in a day or two with a fmall quantity of alum, or with whites of eggs, or the jelly of ifinglafs beat up to a froth, and mixed in the fame manner as is ufually done in the refining of wines.

The fugar, added to thefe cordial waters, has not only the advantages of mellowing and filling the mouth, but it unites the oil to the fpirit in a manner that it could never be united in without it. *Shaw's* Effay on Diftillery.

MALA *Aurea*, in botany, a name by which fome authors have called the *poma amoris*, or fruit of the lycoperficon. *J. Bauhin.* vol. 3. p. 620.

MALABATHRUM, among the antients, an excellent fweet-fcented ointment. *Hofm.* Lex. in voc.

MALABATHRUM, *Indian Leaf*, in botany. See the article TAMALAPATRI.

MALACCA *Stones*, a name given by many authors to the pedro del porco, or hog bezoar. A ftone found in the gall-bladder of the Indian boars, and fuppofed as a remedy for the plague, and many other difeafes. It is ufually kept in a gold box, and infufed for a few minutes in any liquor, till it communicates a bitternefs to it.

MALACHE, a term ufed by authors in a different fenfe; fometimes expreffing fuch medicines as gently loofen the belly, and fometimes fuch ointments as relax and mollify.

MALACHITES, or MOLOCHITES, in natural hiftory, a fpecies of jafper, but of lefs beauty than moft of thofe of that clafs. It is naturally of a pure and deep green, but fometimes variegated with whitifh or blackifh fpots and clouds. It is found in the Eaft and Weft Indies; alfo in many parts of Europe. See JASPER.

Its amuletic virtues, formerly in great efteem, are too ridiculous to be particularized. It is faid to be a violent purgative, operating both by vomit and ftool, and as fuch given in dropfies, in fo fmall a dofe as five or fix grains. If, as is very probable, its green colour be owing to particles of copper, it is not wonderful that it fhould have this effect; but there are fo many better medicines for this purpofe, as to fuperfede its ufe. See COPPER.

MALACOCISSOS, in botany, a name ufed by fome authors for the common ground ivy, or *hedera terreftris*; and by fome others for the marfh-marygold. *Ger.* Emac. Ind. 2.

MALACODERMATA, in natural hiftory, a term ufed to exprefs fuch animals as have only foft fkins for their covering; in oppofition to the oftracodermata, which have hard fhelly matters for their covering, fuch as crabs, lobfters, &c.

MALACOIDES, in botany, the name of a genus of plants, the characters of which are, that they have the flower of the mallow-kind, but their fruit refembles that of the common bramble, except that it is dry, not juicy. It confifts of a number of capfules, collected into a head, and fixed to a placenta, and containing feeds like thofe of the mallow, or of a kidney-like form.

The fpecies of *Malacoides* are only two. 1. The betony-leav'd kind. 2. The fmall-flowered *Malacoides*, with an angular leaf. *Tourn.* Inft. p. 98.

MALACOPTERYGII, in the Linæan fyftem of zoology, the name of a large order of fifhes which have not prickly fins.

The term is derived from the Greek μαλακος, foft, and πτερυγιον, a fin. The fifh of this order, are thofe which have bony fins, with all their extremities not pointed or fharp, but foft and harmlefs. Of this order are the carp, &c. *Linnæi* Syftema Naturæ, p. 55.

MALACOSTOMOUS, in ichthyography, the name of a large genus of fifhes, called in Englifh the leather-mouth'd kind. Thefe fifhes are wholly deftitute of teeth in their jaws, but have them placed in their throats, near the orifice of the ftomach. *Ray's* Ichthyography, p. 245.

The word is derived from the Greek μαλακὸς, foft, and ςόμα, a mouth. All the fifh of this genus have their fwimming, or air-bladder, divided into two parts; and of this genus are the carp, tench, bream, chub, and the like. *Ray*, Ichthyogr. p. 245.

MALA-

MALACOSTRACA, in natural hiftory, a term ufed by fome, as Ariftotle, to diftinguifh what we call cruftaceous animals of the fea, &c. from thofe which he calls oftracodermata, or teftaceous, as we exprefs it. See table of teftaceous and cruftaceous animals.

Ariftotle fays, that cruftaceous animals, or *Malacoftraca*, are foft within, and hard without; but that though their covering is not apt to be parted by contufions, yet the one part of it may eafily be torn from the other; and the teftaceous animals, or oftracodermata, are foft within, and hard without; and their covering may be bruifed or broken to pieces, though its parts are not liable to be torn from each other. Thefe definitions have been ufually acquiefced in, but being in reallity infufficient for the diftinctions they are intended to make, they have been the origin of great confufion and error. The confequences which Ariftotle puts into his definition or characteriftics, neceffarily arife from doctrines founded on facts; for when the fhell is but one, as is the cafe in all the teftaceous kind, it may be bruifed, or it may be broken, according as it is more or lefs brittle, but it cannot be torn afunder; whereas in the whole cruftaceous kind, the coverings which are over every feveral part, as the legs, back, belly, and tail in lobfters, are joined to each other only by membranes, which though tough may be torn afunder, though the body of the cruft in any part is too firm to be fo torn. The naturalifts of late ages have been much diftreffed about a place for the *echini marini*, or fea urchins, in their cabinets and books, fome calling them teftaceous, and others cruftaceous animals.

It is very evident, however, according to Ariftotle's diftinctions, that the echini are of the clafs of thefe malacoftraca, or cruftaceous animals, for they move upon their fpines, which demonftrates that their covering is moved by parts, and fo put together, that it may be torn afunder, as the legs of a lobfter may from the body; and indeed every fpine is riveted into its proper cruft, which alfo by confequence muft have its peculiar mufcle which guides the motion of the fpine, by means of which the animal moves itfelf about any way that it pleafes; it being peculiar to thefe animals, that they move by rolling about upon their fpines, not by walking upon them, as the other animals do on their legs, the purpofes of which thefe fpines feem formed by nature to anfwer. Phil. Tranf. N° 219. p. 195.

It is evident alfo, even to ocular infpection, that all the crufts of the echini are united by membranes, as they are in the crabs and lobfters. Agoftino Scilla has accurately figured the internal parts of feveral fpecies of thefe animals in his book of petrifactions, and thefe draughts of his put the matter out of all doubt, as they exactly agree with nature, and are of the nature of the joinings of the lobfter kind. The fifh of the echinus kind are by thefe proved to be cruftaceous animals in the ftricteft fenfe of the term.

MALAGMA, a word ufed by fome authors to exprefs a cataplafm in general, of whatever nature, or made of whatever ingredients; but fome have ufed it only for the emollient cataplafms.

Galen never ufes it in any fenfe but the laft; it was a form of medicine meant only for external ufe, and was not very different in its confiftence from a plafter. It feems to have confifted only of emollient ingredients at firft, but afterwards to have been compofed of aftringents, or of medicines of any other kind, whofe virtues could be conveyed under that form; gums, aromatics, falts, and other ftimulating ingredients, often made a part of the compofition; and fometimes a fmall quantity of oil, lard, or wax, entered the mafs; very often the malagma's confifted only of gums diffolved in wine or vinegar, and fometimes only of refins, which naturally hardened of themfelves after being reduced to powder, and mixed with wine and vinegar to a proper confiftence for applying to the part.

MALANKUA, in the materia medica, the name by which fome authors have called the plant whofe root is the round zedoary.

Many indeed efteem the long and round zedoary the roots of different plants, but they feem rather to be only the different parts of the roots of the fame fpecies. Hort. Mal. 11, 17. *Dale*'s Pharmac. p. 251.

MALARMAT, in ichthyology, a name given by authors to the fifh called by fome *lyra atera* and *cornuta*. It is a fpecies of the trigla, and is diftinguifhed by Artedi by the name of the trigla, with many cirri, and with an octogonal body.

MALARUM *Offa*, in anatomy, are the cheek bones; they make the prominent upper part of the cheeks moft remarkable in lean perfons: They form likewife a portion of the orbit, and compleat the zygomatic arches. They have their name from the Latin *mala*, the cheek; they are two in number, and are fituated in the lateral and middle parts of the face. They are, in fome meafure, triangular or irregularly fquare, and are divided into two fides, the external gently convex, the internal unequally concave.

The eminences in each bone are the fuperior or angular orbitary apophyfis, which joins by future with the external angular apophyfis of the os frontis, and affifts in forming the external angle of the orbit: from this apophyfis another fubaltern procefs runs inward on the infide of the bone, one fide of which forms a portion of the orbit, the other a portion of the zygomatic foffa: The inferior or maxillary orbitary apophyfis, which with the angular apophyfis forms the inferior external portion of the orbit: The apophyfis malaris, which is in fome meafure the bafis of the reft, and together with the apophyfis maxillaris, joins the orbitary apophyfis of the os maxillare, and the zygomatic apophyfis, which makes a part of the zygoma, and alfo of the zygomatic foffa.

The cavities are the great orbitary flope, which makes the inferior external portion of the edge of the orbit; the zygomatic notch above the zygoma, and one or more little holes on the outfide, and in the orbitary apophyfis. Each bone is compofed of two pretty compact tables, with a fmall quantity of diploe between them, except in the anterior part of the apophyfis malaris. The os malæ on each fide is joined to the os frontis by the angular apophyfis; to the os fphœnoides by the fubaltern apophyfis; to the os temporis by the zygomatic apophyfis; and to the os maxillare by its bafis. *Winflow*'s Anatomy, p. 34.

MALKARABÆLA, in zoology, the name of an Eaft Indian fpecies of ferpent found in the ifland of Ceylon. It is remarkably variegated with white and dufky-brown, in various figures. *Ray*'s Syn. Anim. p. 332.

MALL, or *Sea*-MALL, in zoology, the Englifh name of a bird of the gull or larus kind, and diftinguifhed by authors by the name of *larus cinereus minor*. It is very like the *larus cinereus major*, or herring gull, but much fmaller, not weighing above a pound. Its head and neck are grey, with fome brown fpots; the lower part of the neck is white, the back is grey, and the breaft and belly white as fnow; the tail is alfo perfectly white, and is not forked. *Ray*'s Ornitholog. p. 263.

MALLEOLUS, in ichthyology, a name given by Gaza and fome others, to the fifh called by Ariftotle and the other old writers, *fphyræna*, and by the Italians *luzzo marino*.

It is a beautiful fifh, and feems to belong to the fcombri, or mackrel kind. Salvian has figured it under the name of *judis*, a name by which it is alfo called by Varro and fome other old authors, but Salvian's figure is very imperfect; he has omitted the back fin.

MALLEOLI, among the Romans, bundles of any combuftible matter befmeared with pitch, and ufed by the Roman foldiers either for giving light in the night-time, or for fetting fire to fome of the enemies works.

The *Malleoli* were fometimes fixed to a dart or javelin, that they might be fure to catch firm hold, and communicate the fire wherever they happened to light. *Pitifc.* in voc.

MALLEUM *Movens*, in anatomy, a name given by Fabricius to one of the mufcles of the ear, called by Cowper the *internus auris*, and by Albinus, who had confidered its proper ufe, *tenfor tympani*. See TENSOR.

MALLEUS (*Cycl.*)—The *malleus*, or hammer of the ear, is a long bone with a large head, a fmall neck, a handle, and two apophyfes, the one in the neck, the other in the handle. The top of the head is confiderably rounded, and from thence it contracts all the way to the neck; both head and neck are in an inclined fituation, and the eminences and cavities in it anfwer to thofe in the body of the incus. The handle is looked on by fome as one of the apophyfes of the *Malleus*, and in that cafe it is the greateft of the three. It forms an angle with the neck and head, near which it is fomething broad and flat, and decreafes gradually toward its extremity. The apophyfis of the handle, termed by others the fmall or fhort apophyfis of the *Malleus*, terminates the angle already mentioned, being extended toward the neck, and lying in a ftrait line with that fide or border of the handle which lies next it. The apophyfis of the neck, called alfo the apophyfis gracilis, is in a natural ftate very long, but fo flender withal, that it is very eafily broken, efpecially when dry, which is the reafon why the true length of it was for a long time unknown. It arifes from the neck, and fometimes appears much longer than it really is, by the addition of a fmall dried tendon fticking to it. When the *Malleus* is in its true fituation, the head and neck are turned upwards and inwards, the handle downwards, parallel to the long leg of the incus, but more forward; the apophyfis of the handle upwards and outward, near the fuperior portion of the edge of the tympanum, near the center of which is the extremity of the handle; and the apophyfis gracilis forward, reaching all the way to the articular fiffure in the os temporis. By the knowledge of this, the *Malleus* of the right ear may be known from that of the left when out of their places. *Winflow*'s Anat. p. 49.

MALLOW, in botany. See the article MALVA.

MALMIGNATTO, in natural hiftory, a name given by the inhabitants of the ifland of Corfica to a fpecies of animal, or large infect, called by fome *tarantula*, and ignorantly fuppofed to be the fame with the tarantula of Apulia. This ifland produces neither wolves, ferpents, nor many other of the mifchievous and deftructive animals which infeft the neighbouring countries, but it produces two fpecies of this venomous infect, called the *Malmignatto*; the one of thefe has a round body, and the other an oblong one, refembling that of our large kind of ant; it has alfo fix legs, not eight, and never makes any web. From all which it appears not to be a fpider,

but

but truly of the ant kind, though a monſtrous ſized one, and very venomous. The round bodied kind, by its bite, occaſions violent pains, a ſenſation of coldneſs, and cramps all over the body; and the long-bodied one is yet more venomous. Its ſting occaſions an immediate lividneſs of the fleſh, with intolerable cramps and convulſions over the whole body; ſometimes the natural evacuations by ſtool and urine are alſo wholly ſtopped by it. The cure in both caſes, is to be attempted by cutting and cauterizing the wound, and dreſſing it with Venice treacle, as alſo by giving the ſame in large doſes diſſolved in wine. *Boccone*, Muſ. de Fiſ.

MALOGRANATUM, the *Pomgranate*, in botany. See the article POMGRANATE.

MALPIGHIA, in botany, the name of a genus of plants deſcribed by Plumier and Linnæus, the characters of which are theſe: The perianthium is ſmall, hollow, and permanent, and is compoſed of one leaf divided into five ſegments, in the ſinus of each of which there is placed a melliferous glandule. The flower is compoſed of five very large petals, which ſtand hollow, and are of a kidney-like ſhape, with long and ſtrait ungues. The ſtamina are ten broad and erect filaments which grow into a ſort of cylinder. The antheræ are ſimple, the germen of the piſtil is roundiſh and ſmall, the ſtyles are three, they are erect, ſhort, and crowned with obtuſe ſtigmata; the fruit is a large globoſe berry, having one cell, in which are contained three oblong, obtuſe, and hard ſtones, each of which contains an oblong and obtuſe kernel. *Plumier*, Rar. Plant. Hiſt. p. 36. *Linnæi* Gen. Plant. p. 194.

MALPOLON, in zoology, the name of a ſpecies of ſerpent found in the iſland of Ceylon, and very beautifully variegated with red marks in the form of ſtars. *Ray*'s Syn. Anim. p. 332.

MALT (*Cycl.*)—Almoſt every malſter has his ſecret in the making *Malt*, but there are ſome neceſſary cautions to be obſerved by all, which will enſure ſucceſs in the work; theſe are, 1. That the barley be newly thraſhed, or at leaſt newly winnowed. 2. That the whole be of one kind, not mixed up of ſeveral ſorts. 3. That it be not over-ſteeped in the ciſtern, or ſo long as to make it ſoft. 4. That it be well drained. 5. That it be carefully looked after in the wet couch, ſo as to ſtop the firſt tendency of the blade to ſhooting. 6. To turn the wet couch inſide outermoſt, if the barley comes, that is, ſhoots more in the middle than on the ſides. 7. To keep it duly turning after it is out of the wet couch. 8. To give it the proper heating in the dry heap. 9. To dry and criſp it thoroughly on the kiln, but without a fierce fire, ſo as to be ſeveral days in drying a kiln of pale *Malt*. *Shaw*'s lectures, p. 187.

Good *Malt* may be made of the grain of the maiz or Indian corn, but then a particular method muſt be taken for the doing it. Our barley *Malt*-makers have tried all their ſkill to make good *Malt* of it in the ordinary way, but to no purpoſe; that is, the whole grain will not this way be malted or rendered tender or floury, as in other *Malt*; for it is found, by experience, that this corn, before it be fully malted, muſt ſprout out both ways, that is both root and blade, to a conſiderable length, that of a finger at leaſt, and if more the better. For this purpoſe it muſt be laid in a heap a convenient time; and in this proceſs, if it be of a ſufficient thickneſs for coming, it will quickly heat and grow mouldy, and the tender ſprouts will be ſo entangled, that the leaſt moving of the heap will break them off; and the farther maturation of the grain into *Malt*, will be hindered by this means; and on the other hand, if it be laid thin, and often ſtirred and opened to prevent too much heating, thoſe ſprouts which have begun to ſhoot ceaſe growing, and conſequently the corn again ceaſes to be promoted to the mellowneſs of *Malt*. Phil. Tranſ. N° 142.

To avoid all theſe difficulties, the following method is to be uſed: Take away the top of the earth in a garden or field, two or three inches, throwing it up half one way, and half the other; then lay the corn for *Malt* all over the ground ſo as to cover it; the earth that was pared off is now to be laid on again, and nothing more is to be done till the field is all over covered with the green ſhoots of the plant. The earth is then to be taken off, and the roots of the grain will be found ſo entangled together, that they will come up in large cakes or parcels; it muſt be gently waſhed in order to take off all the dirt, and then dried on a kiln, or on a clean floor expoſed to the ſun. Every grain of the maiz will be thus tranſmuted into good *Malt*, and the beer brewed with it will be very pleaſant and very wholeſome, and of an agreeable brown colour, but very clear.

It may be worth trying whether the ſame proceſs is not with due care applicable to the malting of turneps, potatoes, carrots, parſneps, and the like. It might poſſibly be of ſervice alſo to attempt this leſs laborious way of making *Malt* of barley and other ſmall grains; the diſadvantages would be the not ſo eaſily ſeparating the dirt from the grain as in that larger kind; and as barley requires the root only, not the ear, to ſhoot in order to the making of *Malt*, it would be ſome difficulty to know the exact time of taking it up; but with all theſe diſadvantages the method is worth a trial.

MALT *Diſtillery*. This is an extenſive article of trade, and by which very large fortunes are made. The art is to convert fermented *Malt* liquors into a clear inflammable ſpirit, which may either be ſold for uſe in the common ſtate of a proof ſtrength, that is, the ſame ſtrength with French brandy; or is rectified into that purer ſpirit uſually ſold under the name of ſpirit of wine; or made into compound cordial waters, by being diſtilled again from herbs and other ingredients. See the articles BREWING and WASH.

To brew with *Malt* in the moſt advantageous manner, it is neceſſary, 1. That the ſubject be well prepared. 2. That the water be ſuitable and duly applied; and, 3. That ſome certain additions be uſed, or alterations made, according to the ſeaſon of the year, and the intention of the operator; and by a proper regulation in theſe reſpects, all the fermentable parts of the ſubject will thus be brought into the tincture, and become fit for fermentation.

The due preparation of the ſubject conſiſts in its being juſtly *malted* and well ground. When the grain is not ſufficiently *malted* it is apt to prove hard, ſo that the water can have but very little power to diſſolve its ſubſtance; and if it be too much *malted*, a part of the fermentable matter is loſt in that operation. The harder and more flinty the *Malt* is, the finer it ought to be ground; and in all caſes, when intended for diſtillation, it is adviſeable to reduce it to a kind of finer or coarſer meal. When the *Malt* is thus ground, it is found by experience, that great part of the time, trouble, and expence of the brewing is ſaved by it, and yet as large a quantity of ſpirit will be produced; for thus the whole ſubſtance of the *Malt* may remain mixed among the tincture, and be fermented and diſtilled among it. This is a particular that very well deſerves the attention of the *Malt* diſtiller, as that trade is at preſent carried on; for the diſpatch of the buſineſs, and the quantity of ſpirit procured, is more attended to, than the purity or perfection of it.

The ſecret of this matter depends upon the thoroughly mixing, or briſkly agitating and throwing the *Meal* about, firſt in cold, and then in hot water; and repeating this agitation after the fermentation is over, when the thick turbid waſh being immediately committed to the ſtill, already hot and dewy with working, there is no danger of burning, unleſs by accident, even without the farther trouble of ſtirring, which in this caſe is found needleſs, though the quantity be ever ſo large, provided that requiſite care and cleanlineſs be uſed: And thus the buſineſs of brewing and fermenting may very commodiouſly be performed together, or reduced to one ſingle operation. *Shaw*'s Eſſay on Diſtillery.

Whatever water is made choice of, it muſt ſtand in a hot ſtate upon the prepared *Malt*, eſpecially if a clear tincture be deſired, but a known and very conſiderable inconvenience attends its being applied too hot, or too near to a ſtate of boiling, or even ſcalding with regard to the hand. To ſave time in this caſe, and to prevent the *Malt* running into lumps and clods, the beſt way is to put a certain meaſured quantity of cold water to the *Malt* firſt; the *Malt* is then to be ſtirred very well with this, ſo as to form a ſort of thin uniform paſte or pudding; after which the remaining quantity of water required may be added in a ſtate of boiling, without the leaſt danger of making what, in the diſtillers language, is called a pudden.

In this manner the due and neceſſary degree of heat in the water, for the extracting all the virtues of the *Malt*, may be hit upon very expeditiouſly, and with a great deal of exactneſs, as the heat of boiling water is a fixed ſtandard which may be let down to any degree by a proportionate mixture of cold water, due allowances being made for the ſeaſon of the year, and for the temperature of the air.

This little obvious improvement, added to the method juſt above hinted for the reducing brewing and fermentation to one operation, will render it practicable to very conſiderable advantage, and the ſpirit improved in quality as well as quantity.

A much more profitable method than that uſually practiſed for the fermenting *Malt* for diſtillation, in order to get its ſpirit, is the following: Take ten pound of *Malt* reduced to a fine meal, and three pounds of common wheat meal: Add to theſe two gallons of cold water, and ſtir them well together, then add five gallons of water boiling hot, and ſtir all together again. Let the whole ſtand two hours, and then ſtir it again, and when grown cold, add to it two ounces of ſolid yeaſt, and ſet it by looſely covered in a warmiſh place to ferment.

This is the Dutch method of preparing what they call the waſh for *Malt* ſpirit, whereby they ſave much trouble and procure a large quantity of ſpirit. Thus commodiouſly reducing the two buſineſſes of brewing and fermenting to one ſingle operation. In England the method is to draw and maſh for ſpirit as they ordinarily do for beer, only inſtead of boiling the wort, they pump it into large coolers, and afterwards run it into their fermenting backs, to be there fermented with yeaſt. Thus they beſtow twice as much labour as is neceſſary, and loſe a large quantity of their ſpirit by leaving the groſs bottoms out of the ſtill for fear of burning. *Shaw*'s Lectures, p. 216.

All simple spirits may be considered in the three different states of low-wines, proof spirit, and alcohol, the intermediate degrees of strength being of less general use; and they are to be judged of only according as they approach to, or recede from these. Low-wines, at a medium, contain a sixth part of pure inflammable spirit, five times as much water as spirit necessarily arising in the operation with a boiling heat. Proof goods contain about one half of the same totally inflammable spirit; and alcohol entirely consists of it.

Malt low-wines, prepared in the common way, are exceeding nauseous; they have, however, a natural vinosity, or pungent agreeable acidity, which would render the spirit agreeable to the palate, were it not for the large quantity of the gross oil of the *Malt* that abounds in it. When this oil is detained in some measure from mixing itself among the low-wines, by the stretching a coarse flannel over the neck of the still, or at the orifice of the worm, the spirit becomes much purer in all respects; it is less fulsome to the taste, less offensive to the smell, and less milky to the eye. *Shaw's* Essay on Distillery.

When these low-wines, in the rectification into proof spirits, are distilled gently, they leave a considerable quantity of this gross fetid oil behind them in the still along with the phlegm; but if the fire be made fierce, this oil is again raised and brought over with the spirit; and being now broken somewhat more fine, it impregnates it in a more nauseous manner than at first. This is the common fault of the *Malt* distiller and of the rectifier both; the latter, instead of separating the spirit from this nasty oil, which is the principal intent of his process, attends only to the leaving the phlegm in such quantity behind, that the spirit may be of a due strength as proof or marketable goods, and brings over the oil in a worse state than before. To this inattention to the proper business of the process, it is owing, that the spirit, after its several rectifications, as they are miscalled, often is found more stinking than when delivered out of the hands of the *Malt* distiller. All this may be prevented by the taking more time in the subsequent distillations, and keeping the fire low and regular, the sudden stirring of the fire, and the hasty way of throwing on fresh fuel, being the general occasions of throwing up the oil by spurts, where the fire in general, during the process, has not been so large as to do that mischief.

The use of a balneum mariæ, instead of the common still, would effectually prevent all this mischief, and give a purer spirit in one rectification, than can otherwise be procured in ten, or indeed according to the common methods at all.

Malt low-wine, when brought to the standard of proof spirit, loses its milky colour, and is perfectly clear and bright, no more oil being contained in it than is perfectly dissolved by the alcohol, and rendered miscible with that proportion of phlegm, which is about one half the liquor; its taste also is cleaner, though not more pleasant; there being less of the thick oil to hang on the tongue in its own form, which is not the case in the low-wines, where the oil being undissolved, adheres to the mouth in its own form, and does not pass lightly over it.

When proof spirit of *Malt* is distilled over again, in order to be rectified into alcohol, or as we usually call it, spirits of wine, if the fire be raised at the time when the faints begin to come off, a very considerable quantity of oil will be raised by it, and will run in the visible form of oil from the nose of the worm. This is not peculiar to *Malt* spirit, but the French brandy shews the same phænomenon, and that in so great a degree, that half an ounce of this oil may be obtained from a single piece of brandy.

Malt spirit, more than any other kind, requires to be brought into the form of alcohol, before it can be used internally, especially as it is now commonly made up in the proof state, with as much of this nauseous and viscous oil as will give it a good crown of bubbles. For this reason it ought to be reduced to an alcohol, or totally inflammable spirit, before it is admitted into any of the medicinal compositions. If it be used without this previous caution, the odious taste of the *Malt* oil will be distinguished among all the other flavours of the ingredients.

Malt spirit, when it has once been reduced to the true form of an alcohol, is afterwards more fit for all the curious internal uses than even French brandy, it being after this purification a more uniform, hungry, tasteless, and impregnable spirit, than any of the other spirits which we esteem so much finer. *Shaw's* Essay on Distillery.

A pure spirit being thus procured, should be kept carefully in vessels of glass or stone, well stopped to prevent the evaporation of any of its volatile part. If preserved in casks, it is apt to impregnate itself very strongly with the wood. The quantity of pure alcohol obtainable from a certain quantity of *Malt*, differs according to the goodness of the subject, the manner of the operation, the season of the year, and the skilfulness of the workman; according to which variations, a quarter of *Malt* will afford from eight or nine, to thirteen or fourteen gallons of alcohol. This should encourage the *Malt* distiller to be careful and diligent in his business, as so very large a part of his profits depends wholly on the well conducting his processes.

After every operation in this business, there remain a quantity of faints, which in their own coarse state ought never to be admitted into the pure spirit; these are to be saved together, and large quantities of them at once wrought into alcohol. It is easy to reduce these to such a state, that they will serve for lamp spirits. Their disagreeable flavour being corrected by the adding of aromatics during the distillations, the reducing them into a perfect and pure alcohol is practicable, but not without such difficulties as render it scarce worth the trader's while. One way of doing it is by distilling them from water into water, and that with a very slow fire. By this means a pure alcohol may be made out of the foulest faints.

The *Malt* distiller always gives his spirit a single rectification *per se*, in order to purify it a little, and make it up proof, but in this state it is not reckoned fit for internal uses, but serves to be distilled into geneva and other ordinary compound strong waters for the vulgar.

The Dutch, who carry on a great trade with *Malt spirit*, never give it any farther rectification than this, and it is therefore that the *Malt spirit* of England is in general so much more in esteem. The Dutch method is only to distil the wash into low-wines, and then to full proof spirit; they then directly make it into Geneva, or else send it as it is to Germany, Guinea, and the East-Indies, for the Dutch have little notion of our rectification. Their spirit is by this means rendered very foul and coarse, and is rendered yet more nauseous by the immoderate use they make of rye meal. *Malt* spirit, in its unrectified state, is usually found to have the common bubble proof, as the *Malt* distiller knows that it will not be marketable without it.

The whole matter requisite to this is, that it have a considerable portion of the gross oil of the *Malt* well broke and mixed along with it; this gives the rectifier a great deal of trouble if he will have the spirit fine; but in the general run of the business, the rectifier does not take out this oil, but breaks it finer, and mixes it faster in by alkaline salts, and disguises its taste by the addition of certain flavouring ingredients. The spirit loses in these processes the vinosity it had when it came out of the hands of the *Malt* distiller, and is in all respects worse, except in the disguise of a mixed flavour. *Shaw's* Essay on Distillery.

The alkaline salts used by the rectifier, destroying the natural vinosity of the spirit, it is necessary to add an extraneous acid in order to give it a new one. The acid they generally use is the *spiritus nitri dulcis*; and the common way of using it is the mixing it to the taste with the rectified spirit: this gives our *Malt* spirit, when well rectified, a flavour somewhat like that of French brandy, but this soon flies off; and the better method is to add a proper quantity of Glauber's strong spirit of nitre to the spirit in the still. The liquor in this case comes over impregnated with it, and the acid being more intimately mixed, the flavour is retained. See the article Spiritus *nitri dulcis*.

Malt-*worm*, in the manege. See the article Crepance.

MALTA *Earth*. See the article Melitensis *terra*.

MALTHA, the name of a voracious fish of the shark kind, called the *sorrat*, and the *lamiola* by some authors, a diminutive of *lamia*, signifying a small shark. Its teeth are broad and pointed as those of the shark; the fish has also many rows of these; the nose is short, and its flesh lax and soft. *Willughby's* Hist. Pisc. p. 50.

MALTHOCODE, a term by which the Greek writers express'd the emollient topical remedies prepared with oil. Hippocrates expresly forbids the use of these in old ulcers.

MALVA, *mallow*, the name of a very large genus of plants, the characters of which are these: The flower consists of one leaf, and is very open at the mouth, and divided into several segments; from the bottom of the flower there arises a pyramidal tube, which is usually loaded with stamina; and from the cup there arises a pistil, which is fixed like a nail to the lower part of the flower, and also to the tube. This ripens into a flat orbicular fruit, though sometimes pointed, usually surrounded by the cup, and composed of a number of capsules, so placed round an axis, as that each of its striæ receive their capsule as if in a kind of articulation. The seed contained in these is usually of the shape of a kidney. This genus is also distinguished from the alcea, or vervain *mallow*, by having its leaves less divided and cut in, and from the althæa, by having them less hoary. *Tourn.* Inst. p. 94.

The species of *Mallow* enumerated by Mr. Tournefort, are these: 1. The rose *Mallow*, or, as we call it, the hollyoak, with round leaves and pale-red flowers. 2. The white flowered roundish leaved rose *Mallow*. 3. The deep red flowered round leaved rose *Mallow*. 4. The shining purple flowered round leaved rose *Mallow*. 5. The blackish red flowered round leaved rose *Mallow*. 6. The violet coloured round leaved rose *Mallow*. 7. The single yellow flowered round leaved rose *Mallow*. 8. The double flowered red round leaved rose *Mallow*. 9. The double white flowered round leaved rose *Mallow*. 10. The double flesh-coloured round leaved rose *Mallow*. 11. The double purple-flowered round leaved rose *Mallow*. 12. The double black-flowered round leaved rose *Mallow*. 13. The double yellow-flowered round

round leaved rose *Mallow*. And, 14. The pale yellow-flowered round leaved rose *Mallow*, without stalk. These are the species of what we call hollyoaks, and most of which we have in our gardens. The others are, 15. The Virginian maple-leaved *Mallow*, with smooth leaves. 16. The hairy Virginian maple-leaved *Mallow*. 17. The American *Mallow* of Caspar Bauhine. 18. The hairy shrubby American *Mallow*, with clustered yellow flowers. 19. The curled-leaved *Mallow*. 20. The cut-leaved large flowered *Mallow*. 21. The white-flowered wild *Mallow*, with sinuated leaves. 22. The blue-flowered wild *Mallow*, with sinuated leaves. 23. The purplish flowered wild *Mallow*, with sinuated leaves. 24. The wild *Mallow*, with sinuated leaves, and blue flowers streaked with white. 25. The wild *Mallow*, with sinuated leaves, and a very small purple flower. 26. The large flowered wild *Mallow*, with a deep green leaf, rounded and much sinuated. 27. The erect wild *Mallow*, with glossy leaves and large flowers. 28. The small flowered rounder leaved wild *Mallow*. 29. The round leaved variegated wild *Mallow*. 30. The stellated *Mallow*, with various leaves. 31. The purple bottomed early *Mallow*, called by authors *malva trimestris*. 32. The ivy leaved *Mallow*. 33. The round leaved smooth Spanish *Mallow*, with large red flowers. 34. The round leaved Italian *Mallow*, with a large purple flower. 35. The annual white-flowered *Mallow*, with the flowers standing in rundles. 36. The hairy *Mallow*, with a heart-fashioned leaf. 37. The hairy annual *Mallow*, with angular leaves, resembling those of ivy. 38. The currant-leaved Portugal *Mallow*. 39. The Indian *Mallow*, with the heart-fashioned leaf. 40. The elm-leaved American *Mallow*, with the rostrated seed. 41. The elm-leaved *Mallow*, with the double-beaked seed. 42. The elm-leaved *Mallow*, with the double-beaked seed, and with flowers standing in long clusters. 43. The roundish-leaved Indian *Mallow*. 44. The mulberry-leaved Canada *Mallow* with double-beaked seeds. 45. The elm-leaved American *Mallow*, with flowers clustered together in the alæ of the leaves. 46. The vine-leaved American *Mallow*, with a roundish echinated fruit. 47. The purple-flowered ivy-leaved American *Mallow*. 48. The low American *Mallow*, with the leaf and the whole appearance of ground-ivy, and with bifurcated capsules. 49. The melon-leaved hairy American *Mallow*. *Tournefort*'s Inst. p. 95, 96.

The fresh roots of *Mallow* are used as a diuretic and emollient, and the dried leaves as an ingredient in clysters, and in emolient fomentations and cataplasms. The antients gave the juice of the *Mallow*, in large doses, for inflammations and obstructions of the viscera. A strong decoction of *Mallow* root is apt to be mucilaginous, and to sit ill on the stomach. It is a good common drink in pleurisies, peripneumonies, and peculiarly in cases of gravel, or inflammations of the kidneys; also in stranguries and suppressions of urine of all kinds.

MALVA *Marina*, the *Sea Mallow*, in botany, a name not very judiciously given by some writers to a species of submarine plant, supposed in some degree to resemble the leaves of the common *Mallow*. It is very common in the places where they fish for coral, and grows to the rocks without any regular root; it is found at different depths, but most usually far from the surface, and its height is usually about two inches. It is of a dusky greenish colour, with an admixture of a faint yellow; it is composed of several leaves of about half an inch broad, and a little more than that in length. Each of these is fastened to a pedicle of about an inch and half long; the leaves are of a fine thin membranaceous substance, but their stalks or pedicles are thick and tough like horn. When examined by the microscope many glandules discover themselves upon the surfaces of the leaves, but the stalks or pedicles are entirely covered with glandules in form of small protuberances, which make it as rough in those parts as the common chagrin. The stalks when cut transversely shew an infinite number of pipes or vessels running up to every part of the leaves. Count Marsigli has given an elegant figure of this, both as it appears to the naked eye, and by the microscope. *Marsigli*, Hist. de la Mer.

MALUS, the *apple tree*, in botany, the name of a genus of trees, the characters of which are these: The flowers are of the rosaceous kind, each being composed of several petals arranged in a circular form; the cup finally becomes a fleshy fruit of a roundish figure, umbilicated and divided within into several cells, containing oblong callous seeds. See the article APPLE.

MALUS *Assyria*, in botany, one of the many names given by the antients to the citron: They also called it *malus medica*, and by several other names, as these were expressive of the country whence they had the fruit. See the articles CITRON and CITREÆ *mensæ*.

MAMIRA, in the materia medica of the Arabians, a root frequently mentioned by Avisenna, Serapion, and other of the Arabian writers. It seems mentioned as a poisonous drug, and is so described, that it seems to be the same with one species of the durunegi, or doronicum of the same authors, and the common doronicum of the shops, distinguished from the antithora, or other sort of durunegi, by the yellowness of the inside of the root. Avisenna says that it is hard and woody, and formed of knots or joints. This is the very description the same author gives of the durunegi of the first or poisonous kind. Paulus Ægineta says its root is composed of several joints also; and Alphagus calls it a *nodose* or jointed root. Some have supposed that the *Mamira* was the same plant which we call small celandine, but this has no title to be placed among the plants suspected as poisonous, nor any other plea to be guessed at as the *Mamira*, but only its roots consisting of many tubercles. Many things beside have been conjectured to be the *Mamira* of the Greeks and Arabians, but the doronicum seems to be the plant.

MAMMEA, in botany, the name of a genus of plants called *mammei* by Plumier. The characters are these: The perianthium is composed of two small deciduous and oval leaves; the flower consists of four roundish concave expanded petals larger than the cup; the stamina are numerous simple filaments, of about half the length of the flower; the antheræ are roundish; the germen of the pistil is roundish; the style is conic, and of the length of the stamina; the stigma is simple and permanent; the fruit is a very large and fleshy berry, of a spherical figure, but acuminated with the style; the seeds are of an oval figure and callous texture, and there are sometimes found four of them, sometimes only one in the single cell of the fruit. *Linnæi* Gen. Plant. p. 234. *Plumier* Gen. p. 4.

MAMMOTH's *Teeth*, or MAMMOUT *Bones*, in natural history, a name given by travellers and other writers to certain fossile teeth, and other bones, found in Russia and some other parts of the world, and that usually at great depths in the earth. The Russians and other people give them this name, supposing them to have belonged to an animal which they describe as being of a monstrous size, and living in caverns under ground. But the true account of them is, that they are in reality the teeth and other bones of elephants, there being no such beast as these people describe.

Breynius has given a very good account of these bones to the Royal Society, which is printed in the Philos. Transactions. He observes, that they are principally found in the northern parts of Siberia about the borders of rivers, toward the icy sea; they are originally buried in the mountains; but when the frosts have cracked the higher banks of those rivers, as they run under the sides of the mountains, the earth falls in, and they are discovered among it. Sometimes compleat skeletons are found in these places, but more frequently the bones of some particular parts of the body, and nothing so frequently as the teeth. The teeth and bones are not always found of the same size, but often small, and appearing to have belonged to young animals, often so large, that the grinders weigh from twenty to forty pounds; and often the ivory tusks or dentes exerti weigh more than two hundred pounds each. It is very evident that these last are the tusks of elephants, and the rest of the bones, when strictly examined, will all be found to have the same origin, all being reducible to some part of the skeleton of that creature. The tusks are actually used as ivory, and the Czar of Muscovy carries on a very large trade with them; they are wrought both there and abroad into combs and other works; and, according to the observation of captain Muller, perfectly resemble the common ivory, except that they are more brittle, and are apt to turn yellow sooner in the using. See Philos. Trans. N° 446. p. 129.

The comparison of the descriptions and figures of the Siberian *Mammoth*'s teeth with the fossile elephant's teeth of Ireland, and some parts of England, proves very clearly that the bodies are the same.

The fossile bones of elephants are found in many other places beside Siberia, but not in such plenty as in this country; Italy, Germany, Poland, England, France, and Ireland, all afford them; but they are more altered by lying in the earth in these places. The greater warmth of these climates may be naturally enough supposed to have brought on this change in them, and the severe cold of Siberia to have been the principal agent in the preserving them intire in the manner in which we see them.

The bones and teeth of elephants found under ground in other places, and called *ebur fossile*, are of the same origin with these, as are also those dignified in the German shops with the pompous title of *unicornu fossile*, the difference in the preservation being all that distinguishes them. Phil. Trans. N° 447. p. 149. and Mem. Acad. Par. 1727.

MAN, in the materia medica of the antients, a name by which manna has been called by the oldest writers. There has been, however, some confusion in the history of manna, owing to the too general use of this word, the same authors using it as the name of several other substances of very different kinds, which came to their hands in form of small granules or flakes like the manna. The fragments of frankincense in particular were called by this name, with the addition of the word *thuris*, and sometimes without, *Man* or *Men* standing singly for that drug.

MAN *the Capstan*, on board a ship. See the article CAPSTAN, *Cycl.* and *Suppl.*

MAN *the Side, or Ladder*, on board a ship, is when an officer, or any person of distinction is at the ship's side ready to come aboard, the men are commanded to wait, and help him up the side.

MAN *the Top, or Yard*, on board a ship, a word of command for the men to go up to the top, or yard, for some particular service.

MAN *of War*, the same with a ship of war. See the articles SHIP and RATE, *Cycl.*

MAN-*Eaters*. See the article ANTHROPOPHAGI.

MAN-*Bird*. See the article BIRD.

MANAA, in the Jewish customs, a kind of offerings made in the temple, otherwise called *Mincha*. The word *Manaa* is used in the septuagint. See the article *Mincha*.

MANANAOG, in the materia medica, a name by which some call the fruit known with us by the name of St. Ignatius's bean. *Pluk.* Mantiss. p. 60.

MANATI, the *sea cow*, a marine animal, the head of which is like that of a calf, but somewhat narrower; its eyes are like those of a dog, its skin very thick and tough, and covered with a few greyish brown hairs. Its usual length is about sixteen foot, and it measures seven or eight foot round the body. At the fore part of the body it has two short legs, with very broad feet, armed with claws; on the hinder part of the body it has no legs, but has a broad tail, with which it swims very swiftly. From the navel to the tail the body gradually lessens, but just at the tail it becomes very broad again. *Clusius. Ray*, Syn. Quad. p. 193.

Its eyes are very small in proportion to its size, and it has, in the place of ears, two apertures like those of the sea calf, and the female has two teats on the breast, for they bring forth two young ones, and nourish them by suck. It feeds on vegetables, usually living in large rivers, and rising near the shore to feed on the herbs and roots that are found there.

MANATI *Lapis*, a name given to a bone, of which there are two found in the head of the *Manati*, or sea cow; they are roundish and are usually of the size of a hand-bell. They are said to have great virtues against the stone and gravel, when burnt to ashes, and given in white wine. The world need not, however, regret the scarcity of this remedy, for probably any animal bone, when burnt to ashes, is possessed of all its virtues.

MANBALLA, in zoology, the Ceylonese name of a species of serpent, called also the *canine*, or *dog-serpent*, from its manner of flying at every thing that comes in its way, as our dogs do. It is of a deep brown colour, beautifully variegated with white. *Ray*, Syn. An. p. 332.

MANBOTE, in our old writers, a compensation or recompense for *homicide*, particularly due to the lord for killing his man or vassal. *Terms of Law*.

MANCANILLA, in botany, a name given by Plumier to a genus of plants, since characterized by Linnæus in the name of Hippomane. See the article HIPPOMANE.

MANCORON, a word used by the antients to express what they call a sort of honey, which seems to have been evidently our modern sugar. They say that it was a sort of dry honey found concreted in canes or reeds, and was of the consistence of salt, and that it was found in India and Arabia Felix, and that when taken into the mouth, it broke under the teeth like salt. See the article SUGAR.

MANDATARY, *Mandatarius*, he to whom a command or charge is given: Also he that comes to a benefice by a *mandamus* is called by this name. *Blount*.

MANDRAGORA, the *Mandrake*, (*Cycl.*) the name of a genus of plants, the characters of which are these: The flower is composed of one leaf, fashioned like a bell, and divided into many segments at the end. This is enclosed in a cup, from the bottom of which rises a pistil, which perforates the base of the flower, and grows finally into a roundish soft fruit, in which are contained a number of seeds, which are usually of the figure of a kidney.

The species of *Mandrake* are, 1. That with a round fruit, called the male *Mandrake*. 2. The bluish or purplish-flower'd kind, called the female. 3. The blue flower'd one, with small leaves, and a round fruit. Most of the *Mandrakes* may be known even when not in flower, by their having large roundish leaves of an ill smell, and very large roots. *Tournefort*, Inst. p. 76.

Mandrake has been recommended in case of barrenness, but without foundation. Its fresh root is a violent purge, the dose being from ten grains to twenty in substance, and from half a dram to a dram in infusion. It has been found to do service in hysteric complaints, but must be used with great caution, otherwise it will bring on convulsions, and many other very mischievous symptoms. It has also a narcotic quality. At present we only use the fresh leaves in anodyne and emollient cataplasms and fomentations.

MANDRAGORITES *Vinum*, *Mandrake Wine*, a sort of medicinal impregnation of wine with the virtues of *Mandrake* root. It is prepared by cutting into thin slices half a pound of the bark of *Mandrake* roots, and stringing them on a thread, and letting them down into a vessel containing nine galllons of white wine, so that they may hang loosely in it, and by that means fully impregnate it with their virtues. It was used in small doses as an anodyne and soporific. It had the same effects also, if only smelled to, and was sometimes injected in clysters to the same purpose. They say that half a pint of this liquor mixed with twelve times its quantity of wine, brings on a carus; and that even a smaller dose than this, less diluted, is mortal.

MANDRAKE, *Mandragora*, in botany and medicine. See the article MANDRAGORA.

MANE-*Sheet*, in the manege, is a sort of covering for the upper part of a horse's head, and all round his neck, which at one end has two holes for the ears to pass through, and then joins to the halter upon the fore part of the head, and likewise to the surcingle, or long girth, upon the horse's back.

MANEGE. A horse is said to *manege* when he works upon volts and airs, which supposes him broke and bred. See the article MANEGE, *Cycl.*

MANEGE *for a Soldier's Horse*, is a gallop of unequal swiftness, but so that the horse changes hands readily.

High MANEGE, is the high or raised airs, which are proper for leaping horses. See the article AIRS, *Cycl.*

MANEGED. A horse is said to be thoroughly *maneged*, or a finished horse, that is well broken, bred, and confirmed in a particular air or manege, so as to bear well upon the hand, know the heels, and sit well upon the hips.

MANGANESE, *Magnesia*, in natural history, a very poor kind of iron ore. See the article IRON.

It is a dense, ponderous, and heavy substance, in its finest and purest pieces, approaching greatly to the texture of the *lapis hæmatites*, being composed of regular parallel stria, diverging from a center to the circumference. This kind, however, is rare; beside which there is another somewhat less pure kind of an iron grey colour, and irregularly streaked like the steel-grained lead ores. But the common *Manganese* is of a perfectly irregular structure. It is very heavy, moderately hard, and of a deep dusky grey, approaching to black, though sometimes of a ferrugineous brown. It is found in large masses of no determinate shape, and of a rude, rugged, and unequal surface.

Manganese gives fire but difficultly with steel, and makes no effervescence with aqua fortis. It is found in many parts of England and Germany.

This substance is of vast use in the glass trade, but neither the industrious Neri, nor any others who have written of the art, can ever deliver the true proportions in which it is to be mixed with the glass metal on the several occasions. The same thing is also to be observed in regard to zaffer, another substance in continual use with them. And the reason of this is, that there is vast difference in the quality of these bodies, some which are sold being very pure and rich, others good for almost nothing, and much of middle degrees of purity between these. For this reason there is no determining how much of each is to be added to the glass, but the conciator adds them at several times and in small quantities, and takes frequent proofs by his eye, till he knows that they are properly proportioned. *Merret's* Notes on Neri, p. 274.

MANGANUM, Μαγγανον, among the Greeks, a general name for instruments to throw large stones with. *Potter*, Arch. Græc. T. 2. p. 95.

MANGARATIA, in botany, a name given by some authors to the plant of which the common ginger of the shops is the root. *Piso*, p. 227.

MANGER, in a ship, a circular place made with planks fastened on the deck, right under the hawses, being about a foot and half in height; the use of which is to catch and receive the sea-water, beating in at the hawses in a stress of weather.

MANGOUSTAN, in natural history, the name of a fruit of the East Indies. The tree which produces it is large, and usually much branched. The leaves are six inches long, and two inches wide, of a lively green, and ornamented with a double series of ribs, one part of which makes a border that surrounds the whole verge of the leaves. The flower is small, and of a pale green colour; it is composed of four petals, which, when they open, shew the rudiments of the fruit forming itself within. These leaves do not fall off at all, but remain fastened to the bottom of the fruit till it is ripe, serving as a sort of support to it. The fruit grows to the bigness of an apple. It is perfectly round, and is covered with a hard and tough skin, which is of the twelfth of an inch thick, and is of a lively red, streaked with several yellow lines, which are so many filaments running along it: At the extremity there are placed several rays, which running to the length of a tenth of an inch, meet together, and terminate in a point. The substance of the fruit is white, soft, and of a very agreeable taste, approaching to that of raspberries. The body of the fruit is composed of several lobes or quarters, as we call them, which will separate from one another like those of an orange; but they are not enclosed each in a separate skin as those are. These are in number the same with the rays at the end of the fruit, that is, there are seven of them. When the fruit is eaten before it is perfectly ripe, the whole is eaten together; but when it is thoroughly ripened, there is found a single kernel in the middle; this is greenish without and white within, and is

is of an insipid taste, and therefore usually thrown away. Mem. Acad. Scienc. Par. 1699.

This is an extremely agreeable fruit, and the eating it is never attended with any bad consequences, even though it be eaten in ever so large quantities. People who are not used to the Indies are apt to give this the preference to all the fruits of the place; but the natives, and others who have accustomed themselves to the smell of the *durion*, give that infinitely the preference. This is a large prickly fruit of the size of a melon, of an intoxicating quality, and of a taste like that of sugar and cream, but with a smell like that of rotten onions. The smell is intolerable to strangers, but custom has made it familiar to the Indians, and they disregard it. The peel or rind of the *Mangoustan* is a more powerful astringent than the pomegranate bark, and is given in decoction in diarrhœas and dysenteries with great success, as also in all other hæmorrhages. There is a sort of wild *Mangoustan*, called by the Portuguese, *mato*, which grows in the woods both in the East Indies and in America. The fruit of this perfectly resembles the true *Mangoustan*, but is not eatable.

MANHEB, a word used by some chemical writers to express scoriæ of any kind.

MANIA, (*Cycl.*) *Madness*, the most violent and acute species of a delirium, arising from a perturbation of the imagination and judgment.

Signs of it. These are a bold and resolute aspect, and eyes suffused with blood; only it is to be observed, as to the first-mentioned symptom, that those persons who have gone *mad* through fear, have always in their aspect a mixture of that terror the object first gave, and of that natural boldness which arises from *Madness*. The patient often lays traps and snares for the getting other people into his power, with intent to hurt them, though they never have in jured him. Sometimes mad people have been known to murther others; and they always have so much strength as to overpower almost any one person; and though they have no actual fever, yet they are insensible of the external cold, and in general of other pains or injuries; nay, they are so lost in speculation, as often scarce to feel the blows and lashes they receive in the course of their cure. They often do not even hear the people who speak to them, and are naturally of a very jocund and chearful imagination, fancying themselves kings and princes, and are delighted with music. They have a violent propensity to venery, and such an absence of shame, that they will go to stool, or do any thing of a like kind, before any body. This is the usual case in the height of the disorder; and in its decline some are dull and stupid, others very sorrowful and melancholy, and sensible of their unhappy disorder. *Junker*, Consp. Med. p. 689.

Persons subject to it. These are principally men of a choleric habit of body, and of violently passionate dispositions. Those who have continual domestic quarrels, are also frequently thrown into *Madness* by it; and women frequently incur this disease from long suppressions of the menses, and a habit of giving loose to lascivious thoughts. Suppressions of the hæmorrhoids, and of the evacuation of the semen, have sometimes also driven men into *Madness*; worms have also sometimes occasioned it, and sometimes drunkenness.

Prognosticks. *Madness* arising from immaterial causes, is much more difficult of cure than when it arises from disorders of the bodily organs; hence when it arises from violent perturbations of the mind, or from intense study, it is almost incurable. When it arises from suppressions of the semen, or of the uterine, or hæmorrhoidal discharges, there is great hope of a cure by proper means. But *mad* persons in general, when they sleep sound, and always awake in outrageous fits, are to be esteemed incurable, or at least greatly more difficult of cure than others.

Method of Cure. A brisk purge is first to be given; after this the patient is to be blooded pretty freely, ten ounces at the least should be taken away; after this the senses are to be attempted to be roused by strong vomits. White hellebore was famous on this occasion among the antients; and there are some cases in which it may be given with safety, and with great good effect. After this the violent emotion of the blood is to be attemperated by nitrous and absorbent medicines; and, after these, the several remedies usually esteemed specifics take place. Of this number are decoctions of the red anagallis or pimpernel, the ruta muraria, or white maidenhair, the several preparations of silver, the berries of the *Herba Paris*, asses blood, and the like; and great care is to be taken to bring the hæmorrhoidal and menstrual discharges as far as possible to regularity. In cases of retention of the semen, purified nitre is to be given in great quantities, and may be also externally used, applying it to the testes in a cataplasm. The use of opiates is scarce to be suffered in any delirium, but of all things is never to be given in *Madness*, for it never gives them any sleep, but enrages and adds to the complaint, having the same effect that strong liquors would have upon them. The use of white hellebore, as a vomit, may be of great service in some cases; but in all hypocondriac complaints, and consequently in *Madness*, in the causes of which these complaints have a share, it is certain to encrease the disease. Id. Ibid. p.691.

We read of a *Mania* arising from a callous pia-mater. See Med. Eff. Edinb. vol. 4. art. 26. See also the article MADNESS.

MANICUM *Strychnum*, in botany, a term used by the old Greek writers to express a kind of nightshade, which, when taken internally, caused madness. Pliny, describing this species, says that it has leaves like the ocymum or basil; and Theophrastus and Dioscorides say it had leaves like the eruca or rocket. Where Pliny had his information is not easy to guess, for he commonly copies from these authors. They are, however, much more to be depended on; and as the leaves of the ocymum or basil are not at all like those of the rocket, Pliny is certainly wrong in his account; and the most probable reason for his error is, that he mistook the Greek name of the plant, to which these authors compared the leaves of the *Manicum Strychnum*, and translated *euzomon*, which is the name of the rocket into ocymum, basil; a name somewhat like the Greek one in sound, but wholly different in signification; the two plants basil and rocket not only having leaves very unlike one another, but being also of different genera. A yet greater error of Pliny, in regard to this plant, is his placing it among the esculent garden herbs, and saying that it was in use as a food, immediately after he had told us of its causing madness in those who eat it. This is an evident confusion of the maniac solanum with the pomum amoris or love-apple, the fruit of which is eaten in soups at this time.

MANIFESTUS *Clitoridis*, in anatomy, a name given by Vesalius and others to one of the muscles of the female pudenda, called by Verheyen simply the *musculus clitoridis*, but by Albinus and Cowper, *erector clitoridis*. Verheyen is not to be censured for calling it only the *musculus clitoridis*, for it is properly the only muscle of that part, the other generally attributed to the clitoris, and called by Riolan and others, *clitoridis inferior* and *latus*, not properly belonging to that part, but being truly a sphincter vaginæ, or as Albinus by a more coarse name calls it, the *constrictor cunni*. See the article SPHINCTER.

MANIHOT, in botany, the name of a genus of plants, the characters of which are these: The flower is of the one-leav'd kind, and is shaped like a bell, and is wide open, and divided into many segments at the edge. The pistil finally becomes a roundish fruit, containing three capsules joined closely together, each of an oblong figure, and containing a seed of the same figure.

The species of *Manihot*, enumerated by Mr. Tournefort, are these: 1. The common *Manihot* of Thevet, called *jucca*, and *cassada*. 2. The prickly American *Manihot*, with vine-like leaves. 3. The American *Manihot*, with broad elm-like leaves. 4. The American *Manihot*, with narrow elm-like leaves. 5. The climbing American *Manihot*, with leaves like betony. And 6. The smallest germander-leav'd American *Manihot*. *Tourn.* Inst. p. 658.

This plant is also called *Manioc*; its juice is poisonous; but the bread made of the plant, after the expression of the juice, is innocent, and in frequent use in the Brasils, and other parts of the West Indies. Mem. Acad. Par. 1700.

MANIQUE, in the materica medica, the name given by authors to an American root, commended greatly for curing tertian and quartan agues, and as an infallible remedy against venomous bites. Redi procured some of this famous root, and gave it many very fair trials, but could never discover any of these virtues in it. *Redi*, Esperien.

MANNA (*Cycl.*)—This is a substance in many things very nearly related to sugar and to honey; it is inflammable in the same manner, and it melts in water as easily as sugar, and in the same manner is indissoluble in spirit of wine, except in regard to a very small quantity of some seemingly extraneous particles: This is a very sufficient proof that salts abound in it more than sulphurs. M. Lemery, in his analysis, drew from *Manna* a vinous liquor, of the same kind with that obtained from honey. Mead may also be made of *Manna*, in the same way that it is made from honey; but it is neither so strong, nor so agreeable to the taste, as that of honey. From as much mead as was made from two pounds of *Manna*, M. Lemery drew off by distillation eight ounces of a sort of brandy, and on rectifying this, procured an ounce and half of a pure burning spirit, like in all respects to rectified spirit of wine. This spirit of *Manna* is accounted by some a sudorific, and is given from half a dram to a dram and a half. M. Lemery having left the remaining liquor, after the distillation of the spirituous part of the *Manna*-mead, in a warm place for two years, found that it deposited to the bottoms of the bottles seven drams of an essential salt of *Manna*, which was white, hard, brittle, and formed into fine needles, and was of an acid taste, with an admixture of sweet. This salt is purgative, and its dose is a dram. All the remaining acid liquor being distilled, there remained at the bottom of the retort a quantity of matter of the consistence of honey, which weigh'd twenty ounces; so that out of two pounds of *Manna*, there had been twelve ounces consumed, to make the spirit, and to give the acidity to the remaining liquor. This honey-like residuum, being finally distilled with a strong fire, there arose a reddish liquor of an acrid taste, and with a strong empyreumatic smell, and with this a few drops of a blackish oil; after this operation, the remainder in the retort was four ounces of a very light black coal. The coal, it is to be observed, is here only one eighth of

of the weight of the *Manna*, which is fomewhat fingular, fince in the pureft honey, treated in the fame manner, it always weighs one fourth of the original whole quantity. It is plain from hence, that *Manna* is a much purer fubftance than honey: It is alfo remarkable, that in farther treatment of this coal, there is a fmall quantity of iron always difcovered in it. *Manna*, honey, and all the other fweet fubftances, we fee, alfo lofe all their fweetnefs, as foon as ever their acid is feparated from their oil. Hift. Acad. Par. 1708. p. 56.

Manna is far from being peculiar to the afh tree of Calabria, on which it is ufually found. It is no other than the matter of the fenfible tranfpiration of trees and plants in general, and is found on many different kinds in different quantities. The lime and fycamore ufually have a great deal of it on their leaves in the heats of fummer, and if fteeped in water, render it fweet and purgative. The fweet matter found in the bottom of the trefoil, or jafmine flowers, is alfo *Manna* in a certain ftate. The bees are well acquainted with the famenefs of this extravafated juice in different plants, and collect it for their honey, as well from the leaves of the lime and fycamore, and many other trees, as from the flowers of plants. The elaboration it fuffers under their management afterward is all that makes the difference between that and what men collect in Calabria; and honey is *Manna* in a certain ftate.

At Briançon in France they collect *Manna* from all forts of trees that grow there; and the inhabitants obferve, that fuch fummers as produce them the greateft quantities of *Manna*, are very fatal to their trees. Their walnut-trees produce annually a confiderable quantity; but if there happen a year in which they produce more than ordinary, they ufually find many of them perifh in the following winter.

It feems very plain from the whole, that *Manna* is only the extravafated juice of the tree, which cannot furvive fo great a lofs of it: And what not a little confirms this is, that the very hot fummers are always thofe which are the moft abundantly productive of *Manna*. The antients were fenfible of this fpontaneous production of *Manna*, of feveral fpecies of trees, fo very different from one another, and from thence fell into the error of fuppofing it fomething wholly foreign to the tree; an error very natural to thofe who did not know that the nutritive juices of very many trees are nearly, if not wholly, the fame. It was from this opinion of its origin, that they called it aerial honey.

My Boyle tells us, that in Apulia and Calabria, between the months of March and November, they obtain, by incifion, from the common afh-tree, a fweet juice fo like *Manna*, in that feafon adhering to the leaves of the fame kind of trees, that they call it *Manna del Corpo*, trunk-*Manna*; and ufe it fuccefsfully. Works abr. vol. 1. p. 51.

MANNA *Alhagina*, a word ufed by fome authors to exprefs that kind of *Manna* called by others *Manna maftichina*, from its drops refembling maftic in fmall tears. It is called *alhagina* from the plant which produces it, it being collected from the *alhagi maurorum*, in the fame manner as the common *Manna* from the Calabrian afh. See the article MANNA *Perficum*, infra.

MANNA *Libanotis*, in the materia medica, a name given by the old Greek writers to the fmall flakes and fragments of the frankinfenfe which flew off the larger pieces in the gathering and putting them up. See the article LEPTOS *Libanotis*.

MANNA *Maftichina*, in the materia medica, a name given by fome authors to a kind of *Manna* which they defcribe as refembling maftic in its colour, and the fize of the lumps it is collected in. This is what we ufually know at this time under the name of *Manna Perficum*, or Perfian *Manna*, which is at this time in ufe in medicine in the Eaft, as a common purge. See the next Section.

MANNA *Perficum*, *Perfian Manna*. It does not appear in the writings of the antient Greek phyficians, that they were acquainted with any fpecies of *Manna*, though that medicine be now fo common in the fhops. They had the word indeed, but they applied it to a very different fenfe; what they called *Manna* being what fome authors ftill call the *Manna* of frankincenfe, that is, fuch pieces of the common olibanum as broke off in the carriage from the larger pieces. Philof. Tranf. N°. 472. p. 86.

The Arabians are by fome fuppofed to have firft brought what we call *Manna* into ufe in medicine; but if they were not the abfolute inventors of this ufe of it, it is certain they were the firft who made it general and common as a purge. Their country afforded feveral diftinct fpecies of *Manna*, all which feem to have been fo common among them, that they thought defcriptions of them needlefs; and for that reafon have not left us fufficient accounts of them, from which to determine what were their characters and differences. They diftinguifhed three kinds of this purging medicine, under three abfolutely different names, which were *Manna*, *tereniabin*, and *firacoft*; but it is not eafily proved whether thefe are all now known, or by what appellations they are at this time diftinguifhed.

Rawwolf, in his itinerary publifhed by Mr. Ray, and Tournefort in his voyage to the Levant, have given the cleareft intimations, in regard to this fubject, of any of the known writers; and if to thefe we add Clufius, we have among the three all that is to be expected of any certainty upon the fubject; yet the defcriptions of thefe, though eye-witneffes of all they write, have not prevented fo eminent and late a writer as Geoffroy from falling into an error concerning the *Manna* of the Arabians. It is very evident, however, that we have ftill one fpecies of the *Manna Arabum*, that is, the *tereniabin*, produced in fome parts of the world, there having been fpecimens of it fent over into England from Peterfburgh, near which place it is collected from a plant, known among botanical writers under the name of *alhagi maurorum*.

This is ufually called *Manna Perficum*; it appears at firft fight a mixed mafs of a dirty reddifh brown colour, but, upon a nearer view, it is feen to confift of feveral forts of particles. Firft, a great number of globular cryftalline and almoft tranfparent bodies of different fizes, and of a yellowifh white colour. The largeft of thefe do not much exceed a large coriander-feed in fize, and they have fomewhat of the appearance of fmall lumps of maftic, but are of a fomewhat reddifh caft. Secondly, there are among thefe a large quantity of fmall prickles, and other little woody bodies, which feem to have been the pedicles of leaves. Thirdly, there are a few fmall leaves, which are of a firm texture, and terminate in narrow points. Fourthly, there are a large number of fmall long reddifh-colour'd pods, of a fweetifh gelatinous tafte, containing from one to fix or feven hard irregular and kidney-fhap'd feeds, which to the tafte are very acerb. And fifthly, there is ufually fome fand and earth among it. Four ounces of this *Manna* diffolved in water ufually leaves about one ounce of thefe fubftances in the filtre.

The globules firft defcribed are fomewhat hard, they break between the teeth like fugar-candy, and are of a pleafant fweet tafte, but have much lefs of the *Manna* flavour than the Calabrian, but enough of it to difcover to what family the fubftance belongs. The feeds, fticks, leaves, and pods, feem to be all of them parts of the plant which produces the *Manna*; and the feeds having been fown with us, have raifed plants of the alhagi. About the year 1537, when Rawwolf wrote his itinerary, it appears that large quantities of this kind of *Manna* were brought from Perfia to Aleppo, where it was then known by the name of *trunfchibil*, or *trunfchibin*, a corruption doubtlefs of the word *terenjabin*, or, as it ought to be written, according to Denfingius, *tereng jabin*.

Rawwolf alfo exprefsly informs us, that this fpecies of *Manna* was gathered from a plant called *alhagi*. This plant is minutely defcribed by Tournefort, who confirms the account of the *Manna* being gathered from it, which Rawwolf had given fo long before.

Tournefort fays, that it is chiefly gathered about Tauris a city of Perfia, under the name of *trunjibin*, or *terenjabin*, mentioned by Avifenna and Serapion; he adds, that thofe authors thought it fell upon certain prickly fhrubs, whereas it is really the nutritious juice of the plant; and that, during the great heats in that part of the world, there are perceived fmall round drops, as it were, of honey ftanding upon the leaves of this plant; and that thefe harden into globules about the fize of coriander-feeds, and are then gathered by the inhabitants, together with leaves, ftalks, dirt, and the like foreign matter, which greatly take off from their virtue. Mr. Tournefort obferves, that this *Manna* is greatly inferior to the Calabrian in virtue; and that twenty or thirty drams of it are given for a dofe. Philof. Tranf. N°. 472. p. 90.

Clufius tells us, that the *terenjabin* of the Arabians is gathered from a prickly fhrub, fuch as the alhagi is defcribed to be; and Avifenna declares, that it was found upon a thorny plant; though his tranflators have been mifled from the near refemblance of two Arabic words, to make it ftones, not a plant, that it was gathered from.

It appears very plainly from the whole, that this fubftance now known in Ruffia, and fome other parts of the world, under the name of *Manna Perficum*, is truly the *terenjabin* of the Arabians and of Clufius, Rawwolf, and Tournefort; only that the word is differently fpelt by the latter authors, and it is probably alfo that *Manna* called by Bauhine, and fome other writers, *Manna Maftichina Orientalis*, from the round globules it is compofed of, refembling the drops of maftic. See the article TERENJABIN.

MANNA *Thuris*, the *Manna of Frankincenfe*, a term ufed by the antient phyficians to exprefs fuch fmall pieces of frankincenfe, or olibanum, as broke off from the larger in the carriage. See the articles MANNA *Perficum*, fupra, and LEPTOS *Libanotis*.

MANNIFERA *Arbor*, in the materia medica, the name by which the round-leav'd afh, on which the manna is found, is often called. *Dale*, Pharm. p. 332.

MANNING, in the navy. To *man* a fhip or fleet, is to provide them with a fufficient number of men for an expedition.

In *manning* the navy, it is ufual to promife, by proclamation, a bounty to all feamen and able-bodied land-men, who come into the fervice by a certain time, which is commonly two months pay, and but feldom any more. This does indeed prevail on a good many, yet great numbers conceal themfelves till the fleet is at fea, and others lurk about till the time limited for fuch bounty is expired, which does not a little prevent the fleet's being in a readinefs for an early expedition.

And

And as seamen are thus encouraged to enter themselves voluntarily, so there is another method used to compel them to it, and that is *pressing*, by warrants from the lord high admiral to the captains, which are by them assigned to their lieutenants: And to render this the more effectual, vessels are purposely hired into the service, to proceed from place to place, with those officers and their press-gangs, not only to receive volunteers, but also to impress what men they can light on. But their success has been very uncertain, and always very expensive; therefore it were much to be wished, in a matter of so great consequence to the nation, that more speedy and effectual methods could be taken for *manning* the fleet.

MANONOETOC, in natural history, a name given by the people of the Philippine Islands to a species of horned owl common in those parts.

MANSORIUS *Musculus*, in anatomy, a name given by some writers to that muscle of the face more generally known under the name of the *Masseter*. See the article MANSORII, *Cycl.*

MANTECU, a sort of preparation of butter used by the Turks when they travel with their caravans. This is first oiled over the fire, and then salted and kept in vessels made of a tough leather, worked round a wooden frame, of the same shape with the vessels in which they bring their balsam from Mecca. *Pocock's* Egypt, p. 186.

MANTICA, in zoology, the name by which Piso and some other writers have expressed the pouch or bag of skin under the belly of the opossum, into which the young are received in time of danger. See the article OPOSSUM.

MANTICHORA, in natural history, a name given by the Roman authors to a fierce and terrible creature, which they describe from the Greeks, who call it sometimes also *Mantichora*; but when they write more correctly *Marticora* and *Martiora*. We have formed the name *man-tiger* on the sound of the Roman name, though expressing a very different sense; and our authors of the histories of animals, figure to us under this name a terrible creature, partly from the accounts of Pliny exaggerated, and partly from their own imagination, with three rows of teeth, and with such a shape as no animal ever possessed. Pliny tells us, that this creature had three rows of teeth which closed in with one another in a surprising manner; and Pausanias, Aristotle, and Ctesias, all agree in the account of its having three rows in the under, and as many in the upper jaw. They also add, that the teeth, when they close, fall in one with another in the manner of the teeth of a comb; and this they have also told us of the crocodile; and that therefore no bite is so terrible as that of these animals. Pliny and Aristotle both add to this, that the *Mantichora* had the face and ears perfectly resembling those of a man; and Aristotle adds, that its eyes were grey or bluish, and perfectly like the eyes of a man also. The voice of this animal is as oddly represented as its body; Ctesias and Aristotle, and many other of the Greek authors, say it had the sound of a musical instrument of the pipe kind; and Pliny says, that it was a sort of mixed sound, like that of the pipe and trumpet together; and Ælian gives it a power of imitating either the one or the other, as it pleased, by the different modulations of its throat. The Greek authors also give it a very great swiftness; but the Latins, not contented with any thing that does not look miraculous in such an animal, give it a power of leaping in its running, which is little less than flying.

The whole story of this animal seems founded on the love of the wonderful; and very probably the *Mantichora*, properly speaking, was no other than some of the large hyænas which was at first ill described, and afterwards more and more wonders were added to the story, till all shadow of truth was lost.

MANTIS, the preying locust. See Tab. of Insects, N°. 4. and the article LOCUST.

MANUAL, *manualis*, signifies what is employed, or used by the hand, and whereof a present profit may be made. Thus such a thing is said to be in the *manual* occupation of one, where it is actually used or employed by him. *Staundf.* Prærog. p. 54. *Cowel*, *Blount*.

MANUALIS *Lapis*, in natural history, the name of a stone found in America, of which Monardes relates that it has great virtues in curing chaps and cracks in the hands and feet; but he does not describe it.

MANUBIÆ, among the Romans, the spoils of the enemy, or rather the money made of the booty, when sold by the quæstor. *Pitisc.*

MANUCMANUC, in natural history, a name given by the people of the Philippine Islands to a very beautiful species of parrot, which is found very frequently wild in the woods there. It is of the same bigness with the common parrot, and is variegated with a great many different colours.

MANUCODIATA, in zoology, the name of the bird of paradise, as it is usually called in English; a bird of which many fabulous accounts have been propagated, as that it had no legs, that it took in no food, and lived only on the dews; that it was always on the wing, and had no other way of resting than as it hung in the air; that it was never taken alive, and that the male had a cavity in his back, which served for the female to lay her eggs, and hatch her young in; all which are wholly fabulous. The bird is a bird of prey, but of a peculiar kind, the use of whose long feathers is not well known. See Tab. of Birds, N°. 6. *Ray's* Ornithol. p. 55.

There are several species of this beautiful bird; Mr. Ray has reckoned eleven, and others have mentioned more, which were unknown to that author; but it is much to be questioned whether many of these are not rather the varieties of age and sex in the same species. The distinguishing character of these birds is their extremely long feathers which they carry behind. It is well known now that they feed on small birds, and build in the woods, perching upon trees like other birds, most of those now brought into Europe being killed while sitting. *Ray's* Ornitholog. p. 62.

MANULCA, in antiquity, that part of the *catapulta* to which the cord used in working it was fixed. *Pitisc.* See the article CATAPULTA, *Cycl.*

MANURE. See the article MANURING, *infra.*

MANURING (*Cycl.*)—Sea sand is often made use of by way of *manure*, in some parts of Cornwall, near the sea-shore. When the sand is notably shelly, that is, much mixed with the broken pieces of sea-shells, it is reckoned best. It is spread upon such land as is intended for wheat, or usually in the first crop of four, whatever be the grain; for after four crops it is the custom in Cornwall to leave the land six or seven years for pasture before it is tilled again; and the grass will be so good the first year, where this *manure* is used, as to be fit for mowing: This is called *mowing of gratten* by the people there. The Cornish acre is eight score yards, at eighteen foot to the yard. In one of these acres, the farmers bestow, according to the distance from the sea-shore, from three hundred sacks to one hundred, each sack containing thirteen gallons, which is called a horse load, the roads in many parts of this country being so bad, that they are forced to carry the sand on horseback from the water-side to the land, though eight or ten miles distant. In this case the sand costs them in the whole about eight pence a load. Where the lands lie very distant from the shore, and from all water-carriage, they bestow very little of this *manure*, but they do not care to be any where wholly without it. In some of these places they lay twenty load on an acre, and find a proportionable advantage from it. Where much sand is used, the corn is large and plentiful, and the straw little. Hence has grown the old Cornish phrase of *a bushel of corn to a peck of straw*; which is not miraculous in a place where the ears of barley are frequently found as long or longer than the stalks they grow on.

Where little of this sand is used, there is generally a great deal of straw, and but little and hungry ears of small grain. After the corn is taken off, the grass that naturally comes up is a white clover; and where the land is any thing deep, a red kind comes up among it. This is usually but short the first year, but it grows thick, and affords good feeding for the cattle; and they are found to thrive better, and give better milk than when they are fed on the high grass, which generally succeeds where there has been less sand used.

Another great advantage of the lands where much sand is used, is, that no snow lies upon them; there is a continual winter-spring, and an early harvest, usually six weeks before the neighbouring lands that do not use it in proper quantities; so that all the expence of procuring it in quantities, is many ways amply repaid to the farmers.

We have about Erith, and in many other places, the same sort of sand in great abundance in the Thames, that is used with this great advantage in Cornwall; and if it should be found on trial to answer as well, probably there would be found few places where this river would not afford it at some depth, or in some part of its bed. The coral sand of Falmouth is dredged up from under about a foot thickness of the Ouze; and perhaps in the Thames, where the bottom seems of another nature, the same sand, or some of equal efficacy, may be found underneath. The sand taken up out of the Thames at Erith, is used by the brick-makers, and they observe that the grass always grows patticularly fresh and strong about the edges of their heaps of it, and that clover naturally grows there among the other grass. Phil. Transf. N° 113.

In some counties of England, particularly in Oxfordshire, they use, by way of *Manure* for some of their lands, the cuttings and chippings of stone in the quarries, which is supposed to enrich the land by means of a salt that the stone contains, which being dissolved by the weather is imbibed by the earth. *Plot's* Oxfordshire, p. 249.

MANUS *Martis*, in botany, a name given by some authors to the common cinquefoil, or *quinque folium vulgare*. *Ger.* Emac. Ind. 2.

MAO, or *Mau*, in botany, a name by which some authors have called the *magna Indica*, or Indian mango tree. *Hort.* Mal. vol. 4. p. 1.

MAPLE, *Acer*, in botany, the name of a genus of trees, the characters of which are these: The flower is of the rosaceous kind, and is composed of several petals arranged in a circular form. The pistil arises from the cup, and finally becomes

comes a fruit compofed ufually of two, fometimes of three capfules, which are terminated by a foliaceous wing, and contain roundifh feeds.

The fpecies of *Maple* enumerated by Mr. Tournefort, are thefe: 1. The greater *Maple*, called the white mountain *Maple*, and by fome the plane tree. 2. The common great *Maple*, with variegated leaves. 3. The mountain great *Maple*, with deep green leaves, refembling thofe of the platanus. 4. The great *Maple*, with rounder and lefs jagged leaves, fuppofed to be the Italian opulus of fome authors. 5. The common or fmall *Maple*. 6. The trifoliate *Maple*. 7. The bindweed leaved climbing American *Maple*, with flowers of a fcarlet and gold colour. 8. The citron-leaved climbing American *Maple*, with blue fpiked flowers. 9. The purple-flowered climbing American *Maple*, with pfeudo-acacia leaves. *Tourn.* Inft. p. 615.

The feveral forts of this tree are eafily propagated by fowing the feeds, foon after they are ripe, in an open bed of common earth, covering them about half an inch thick with light fandy earth. The fpring following they will appear above ground, and will grow to a foot high the firft fummer. About the Michaelmas following they are to be removed, and planted at three feet diftance, in which place they may remain four years; and at that time they will be large enough to plant out into the places they are to ftand in.

The great *Maple* commonly, though very improperly called the *fycamore-tree*, is raifed very eafily in this manner, and is a very valuable tree for gentlemen who have plantations near the fea, as it bears the fpray of the falt water very well, and will defend all the reft if planted behind them.

The Virginian kinds may be propagated, either thus by fowing, or by laying down the young branches early in the fpring, giving them a little flit at a joint, by which means they will take fufficient root in a twelve-month to be tranfplanted out. *Miller's* Gard. Dict.

Maple *Sugar*, a kind of fugar made from a fpecies of the *Maple* called by Monfieur Sarazin, *Acer canadenfe facchariferum fructu minori*. Mr. Sarazin, a phyfician at Quebeck, intending to enquire at large into the nature of this fort of fugar, obferved that there were four fpecies of *Maple* common in the places where it was made, all which he fent over to the garden at Paris. One of thefe fpecies, diftinguifhed from the reft by the fmallnefs of its fruit, is called the fugar *Maple*; this grows to fixty or eighty foot high, and its juice, which is very redundant in the months of April and May, is eafily made into a very good fugar. They procure this juice from the tree by piercing a hole into the trunk, and placing veffels to receive it: This juice, being evaporated, yields about one twentieth part of its own weight in pure fugar. A middle-fized tree, of this fpecies, will yield fixty or eighty pints of this juice, without receiving any damage as to its growth; and much more than this may be drawn, but then the tree manifeftly fuffers for it.

Mr. Sarazin obferved fome very remarkable particulars in regard to the faccharine quality of this juice, without which it never had it in the proper perfection. 1. The tree at the time that the juice is drawn out, muft have its bottom covered with fnow; and if it is not naturally fo, the Indians know fo well the neceffity of it, that they always bring fnow from elfewhere, and heap it up round it. 2. This fnow muft afterwards be melted away by the fun-fhine, not gradually thawed by a warm air. 3. There muft have been a frofty night before the opening the hole in the trunk. It is remarkable that thefe circumftances are fuch as cuftom and experience alone could have pointed out, fince they feem contrary to reafon; and fo it is in many of the operations in chemiftry, where the moft feemingly rational means fail, while thofe which fhould feem quite contradictory to reafon fucceed. It is obferved, that if the juice of the *Maple* be not in a condition to become faccharine while the fnow lies at its root unthawed, that it almoft immediately becomes fo on the melting of the fnow, and its penetrating into the earth. Mem. Acad. Par. 1730.

MARACANA, in zoology, the name of a bird of the parrot kind, but larger than the common fpecies, and covered all over with bluifh-grey feathers. It is very common in the Brafils.

The natives alfo call another bird of the parrot kind by the fame name, which is of a fine green on the head, neck, and back, but the crown of the head looks a little bluifh; the tail is mixed of red and a bluifh-green; the under part being red, as is alfo the under part of the wings; at the origin of each wing, it has alfo a red fpot; and on each fide of the head a brown one. The noife this bird makes, is oe, oe, oe. *Marggrave's* Hift. Brafil.

MARANA, in botany, a name by which fome authors have called the ftramonium, or thorn apple, a plant kept in fome gardens. *Ger.* Emac. Ind. 2.

MARATHRUM, in botany, a name by which fome authors have called the common fœniculum or fennel. Id. ibid.

MARBASIS, in botany, a name given by fome to a kind of plant which they fay climbed up trees, and there hung down from their branches in form of long jointed and naked filaments.

The word feems to be only a corruption of the word *anabafis* of Pliny, which he calls alfo *ephedra*, and gives the fame characters to. It fhould feem that this is all an error, that no plant, fuch as they defcribe, ever exifted, but that the whole was founded on this: The hippuris, or horfetail, was diftinguifhed by having naked and flender ftalks full of joints; it thence became natural for the Greeks to call by the fame name any thing that was in like manner compofed of fuch long and naked filaments; and the common *ufnea*, or hairy tree mofs, which hangs down from the branches of large foreft trees, is more like a horfe's tail by far than the plant commonly fo called is: it is not wonderful, therefore, that it fhould be called by the fame name.

The Greeks, from the watery places in which the common horfetail ufually grows, called it *ephydron*; and this word mif-fpelt feems to have made the *ephedra* of Pliny in this place. If this was found hanging from the branches of trees, and no body had ever mentioned its growing on the trees themfelves, it is no wonder that fo carelefs a writer as Pliny fhould defcribe it as growing on the ground near the roots of trees, and climbing up their trunks, and then hanging down from their branches in form of horfes tails.

This feems to account for the whole that Pliny has left us concerning this plant; and it is very evident, that the common *ufnea*, or hairy tree mofs, very well agrees with his defcription of the *ephedra* and *anabafis*, though no other plant does. He fays it hangs down from the large branches in form of numerous hairy threads, which are naked or wholly without leaves. The *Marbafis* of the antients feems, therefore, to mean our *ufnea*. See the article Usnea.

MARBLE, *Marmor*, (*Cycl.*) in natural hiftory. *Marbles* make a peculiar genus of foffils, the characters of which are thefe: They are bright and beautiful ftones, compofed of fmall feparate concretions, moderately hard, not giving fire with fteel, and fermenting with and foluble in acid menftrua, and calcining in a flight fire.

By thefe characters the *Marbles*, properly fo called, are diftinguifhed from the porphiries and granites, which are properly ftones of a very different kind, being compofed of very different particles, and exhibiting contrary properties. See the article Porphiritis, &c.

The *Marbles* are a genus of bodies fuppofed to be very well known, becaufe feen every day, and in common ufe; but they are in reality, notwithftanding that, perhaps one of the moft confufed, and leaft underftood of all the bodies of this kind. The people who work upon them, know nothing more of them than that this will, and that will not receive a polifh in a high degree; and that this may be worked, and another refufes the tools; and the men of fcience have confidered them even lefs than thefe.

The *Marbles* were one of thofe fets of bodies that the antients were well acquainted with, and it may give no fmall light into their true hiftory, to pay a ftrict attention to what they have left us concerning them, and enquire which of thofe in ufe among them are known to us, and which loft, and by what names we now call their *Augufteum*, *Tiberianum*, *Luculleum*, and the reft. This may ferve to give a certain account of what they knew, and perhaps may point out to the builder, ftatuary, and phyfician, fome new ufes, at leaft new to us, of many of them. *Hill's* Hift. of Foff. p. 461. See the article Luculleum, Augusteum, &c.

Ægyptian Marble, a name given by our artificers to a very beautiful green-and-white *Marble*, greatly in ufe among us, and brought in great quantities from Egypt and other places. It was alfo in frequent ufe, and in great efteem among the Romans, who received it alfo from Egypt, and diftinguifhed too lightly two kinds of it, from the different difpofition and order of its variegations, and honoured them with the names of two of their emperors in whofe reign they were firft brought into ufe. Thefe were the *marmor Augufteum* and *Tiberianum*. Thofe pieces in which the variegations were waved and thrown into arches and circular figures, they called the *Auguftan*, and thofe which were marked with more diffufed and fcattered veins, they called the *Tiberian*. Thefe were the whole differences between the two; and if we were to acknowledge different fpecies from fuch differences as thefe, we muft allow almoft as many different fpecies as we fee blocks of *Marble*. *Hill's* Hift. Foff. p. 482.

This kind of *Marble*, in all its appearances, is, tho' a very beautiful yet a very rude, irregular, and various mafs. It is of a firm compact texture, and moderately heavy, and may be properly called a green *Marble* variegated with white, for thofe are its two confpicuous colours; but it has thefe mixed in fo great a variety as to afford lights and fhades of a vaft number of degrees of colours. It has befides thefe, alfo many other variegations of a dufky colour approaching to black. It is very bright and glittering when frefh broken, and varioufly fo in its various parts. In the white parts it is brighteft of all, and the other colours are more lucid as they are paler, or nearer approach to the white. It has, however, among its other particles, fome of a very beautiful green foliaceous talc. The whole is capable of a good polifh, and is common

mon in tables, &c. in the houfes of the polite part of the world. *Hill's* Hift. Foff. p. 481.

Coralloide MARBLE, in natural hiftory, the name given by authors to fuch *Marbles* as have fpecimens of the marine corals or bodies of that kind immerfed in them, as the fea fhells are buried in, and make a part of the body of others.

There are feveral fpecies of *Marble* fubject to hold thefe bodies, but we have in England principally two in ufe, the one of a greyifh black, the other of a fine deep jetty black. The firft is found in many parts of Derbyfhire, and the corals it contains are of the porus kind, and of one of the moft elegant fpecies in the world; they are lodged in it at all angles, and in all directions, and are in general about an inch and half long, and three quarters of an inch broad, though fome are much larger, and others fmaller. They are compofed of longitudinal plates, very fine and thin, and of a fnow white, ranged in diftinct orders, and finely interfperfed at fmall diftances, with thin tranfverfe plates; the whole internal part of the coral being thus divided into a fort of fquare cells. This net-like divifion runs through about three-fourths of the body, but the top has only the longitudinal plates without the tranfverfe ones. It is plain that thefe before they were received into the bed of marble, had been fuftained in a fluid containing a very beautiful greyifh white fpar, for the net-like plexus of the bed is full of this matter; but the open part at top having no plates for the retaining this matter, has remained empty till received into the *Marble*, and is there found filled up with the common blackifh matter of the reft of the ftratum. It is an extremely beautiful fubftance when polifhed, and is ufed in many ornamental works. It is found in many parts of Derbyfhire and in Wales.

The other, or black *coralloide Marble*, is alfo a very beautiful fpecies; it is a very clofe compact fubftance, and of a fine even texture, very hard, of a deep jetty black, and capable of a high polifh. It is elegantly variegated with fair and perfect fpecimens of a coralloide porus, approaching to the nature of the former, but fmaller and of a lefs elegant texture; and among thefe has ufually a great number of fea fhells, both of the turbinated and bivalve kinds. Thefe are lodged in various directions, and all of them, the corals as well as the fhells, are of a pure fnow white; and as the matter and texture of the others plainly fhewed that they had been filled with fpar before they were immerfed into the bed of *Marble*; thefe, on the other hand, retaining now no part of their original texture, though exactly their external figure, but being all made up of the fame plain white fpar, plainly fhew that they were lodged in the *Marble* empty, and in their own native ftate; for the cavities both of the corals and fhells are all nicely filled with the matter of the *Marble*; but they have now no coralline nor teftaceous matter about them, but in tract of time have plainly perifhed, and the cavities they left in the hard and fmooth mafs of the *Marble* have been nicely and finely filled up with this fpar, which therefore now as perfectly reprefents their figures, as if themfelves were there. *Hill's* Hift. Foff. p. 473.

It is found in great plenty in many parts of Ireland, particularly about Kilkenny, and is brought in great quantities to London, and ufed about chimney-pieces, and other ornamental works, and is commonly known among the artificers by the name of Kilkenny *Marble*.

Alabandium MARMOR, a name given by the antients to a very remarkably gloffy fpecies of black marble, dug near a city of that name in Caria, and much ufed in building among the Romans.

Caryftium MARMOR, a name given by the antients to a fpecies of marble, dug in the ifland of that name, and much ufed in ornamenting the public buildings; it was of a beautiful green, deeper than the Tiberian and Auguftan marble, and without the white variegations. We meet with it fometimes among antient remains; and the Italian antiquaries particularly mean this, by a name alfo in ufe among us, and proftituted to every other fpecies of green marble, the *verde antiquo*.

Chium MARMOR. See the article CHIUM *Marmor*.

Fufile MARBLE. See the article FUSILE *Marble*.

MARMOR *Hymettium*. See the article HYMETTIUM *Marmor*.

Imitation of MARBLE in brimftone. See the article BRIMSTONE.

Jaffenfe MARMOR. See the article JASSENSE *Marmor*.

Lychnitis MARMOR. See the article LYCHNITIS *Marmor*.

Lydium MARMOR. See the article LYDIUM *Marmor*.

Lygdinum MARMOR. See the article LYGDINUM *Marmor*.

Lunenfe MARMOR. See the article LUNENSE *Marmor*.

Melium MARMOR. See the article MELIUM *Marmor*.

Numidicum MARMOR. See the article NUMIDICUM *Marmor*.

Parium MARMOR. See the article PARIUM *Marmor*.

Thafium MARMOR. See the article THASIUM.

Tiberianum MARMOR. See the article TIBERIANUM *Marmor*.

Derby MARBLE, among our artificers, a name given to a very beautiful fpecies of *Marble*, found in many parts of Derbyfhire, and frequently worked into chimney-pieces in London.

It is a very fingular and beautiful fpecies; its conftituent matter is a pale, fine, whitifh brown *Marble*, of a fine clofe texture, and very bright and glittering hue: This is fo full of entrochi, that they make more than half the fubftance of the mafs; and thefe cutting in different directions, and taking a fine polifh, add greatly to the beauty of the whole, when wrought. *Hill's* Hift. of Foff. p. 479.

The various forms in which thefe bodies appear in the ftone, when cut, might give a fufpicion that many of them were fome other foffile; but this is only owing to their lying in all directions in the mafs; but when nicely examined, the oddeft of them will be found to be no other than what a fingle common entrochus may be cut into. They are of all fizes, from the thicknefs of a large pin, to half an inch or more.

Italian MARBLE. See the article ITALIAN *Marble*.

Kilkenny MARBLE. See the article *Coralloide* MARBLE, *fupra*.

Namur MARBLE. See the article NAMUR.

Colouring of MARBLE. The colouring of *Marbles* is a nice art, and in order to fucceed in it, the pieces of *Marble*, on which the experiments are tried, muft be well polifhed, and clear from the leaft fpot or vein. The harder the *Marble* is, the better it will bear the heat neceffary in the operation; therefore alabafter, and the common foft white *Marble*, are very improper to perform thefe operations upon.

Heat is always neceffary for the opening the pores of the *Marble*, fo as to render it fit to receive the colours; but the *Marble* muft never be made red hot, for then the texture of the *Marble* itfelf is injured, and the colours are burnt, and lofe their beauty. Too fmall a degree of heat is as bad as too great; for, in this cafe, though the *Marble* receive the colour, it will not be fixed in it, nor ftrike deep enough. Some colours will ftrike, even cold, but they are never fo well funk in as when a juft degree of heat is ufed. The proper degree is that which, without making the *Marble* red, will make the liquor boil upon its furface. The menftruums ufed to ftrike in the colours, muft be varied according to the nature of the colour to be ufed. A lixivium made with horfe's or dog's urine, with four parts quick-lime, and one part pot-afhes, is excellent for fome colours; common lye of wood-afhes does very well for others: For fome, fpirit of wine is beft; and finally, for others, oily liquors, or common white wine.

The colours which have been found to fucceed beft with the peculiar menftruums, are thefe: Stone blue diffolved in fix times the quantity of fpirit of wine, or of the urinous lixivium; and that colour which the painters call litmoufe, diffolved in common lye of wood-afhes. An extract of faffron, and that colour made of buckthorn berries, and called by the painters, fap green, both fucceed well diffolved in urine and quick-lime, and tolerably well in fpirit of wine. Vermillion, and a fine powder of cochineal, fucceed alfo very well in the fame liquors. Dragons blood fucceeds very well in fpirit of wine, as does alfo a tincture of logwood in the fame fpirit. Alkanet root gives a fine colour, but the only menftruum to be ufed for this is oil of turpentine; for neither fpirit of wine, nor any lixivium, will do with it. There is another kind of *fanguis draconis*, called dragon's blood in tears, which, mixed with urine alone, gives a very elegant colour. Phil. Tranf. N°. 268.

Befide thefe mixtures of colours and menftruums, there are fome colours which are to be laid on dry and unmixed. Thefe are dragons blood, of the pureft kind, for a red; gamboge for a yellow, green wax for a green, common brimftone, pitch and turpentine for a brown colour. The *Marble*, for thefe experiments, muft be made confiderably hot, and then the colours are to be rubbed on dry in the lump. Some of thefe colours, when once given, remain immutable, others are eafily changed or deftroyed. Thus the red colour given by dragons blood, or by a decoction of logwood, will be wholly taken away by oil of tartar, and the polifh of the *Marble* not hurt by it.

A fine gold colour is given in the following manner: Take crude fal armoniac, vitriol and verdegreafe, of each equal quantities; white vitriol fucceeds beft, and all muft be thoroughly mixed in fine powder.

The ftaining of *Marble* to all the degrees of red, or yellow, by folutions of dragons blood or gamboge, may be done by reducing thefe gums to powder, and grinding them, with the fpirit of wine, in a glafs mortar; but for fmaller attempts, no method is fo good as the mixing a little of either of thefe powders with fpirit of wine in a filver fpoon, and holding it over burning charcoal. By this means a fine tincture will be extracted, and with a pencil dipped in this, the fineft traces may be made on the *Marble*, while cold, which, on the heating it afterwards, either on fand, or in a baker's oven, will all fink very deep, and remain perfectly diftinct in the ftone. It is very eafy to make the ground colour of the *Marble* red or yellow by this means, and leave white veins in it. This is to be done by covering the places where the whitenefs is to remain with fome white paint, or even with two or three doubles only of paper, either of which will prevent the colour from penetrating in that part. All the degrees of red are to be given to *Marble* by means of this gum alone; a flight tincture of it, without the affiftance of heat to the *Marble*, gives only a pale flefh colour, but the ftronger tinctures give it yet deeper; to this the affiftance of heat adds yet greatly; and finally the addition of a little pitch to the tincture

tincture gives it a tendency to blacknefs, or any degree of deep red that is defired.

A blue colour may be given alfo to *Marble* by diffolving turnfol in a lixivium of lime and urine, or in the volatile fpirit of urine; but this has always a tendency to purple, whether made by the one or the other of thefe ways. A better blue, and ufed in an eafier manner, is furnifhed by the canary turnfol, a fubftance well known among the dyers: This needs only to be diffolved in water, and drawn on the place with a pencil; this penetrates very deep into the *Marble*, and the colour may be encreafed by drawing the pencil wetted afrefh feveral times over the fame lines. This colour is fubject to fpread and diffufe itfelf irregularly; but it may be kept in regular bounds, by circumfcribing its lines with beds of wax, or any other fuch fubftance. It is to be obferved, that this colour fhould always be laid on cold, and no heat given even afterwards to the *Marble*; and one great advantage of this colour is, that it is therefore eafily added to *Marbles* already ftained with any other colours, and it is a very beautiful tinge, and lafts a long time. Mem. Acad. Par. 1732.

MARBLE *Colour*. To give this variegated colour to glafs is a very eafy operation: There needs no more than to put cryftal frit into a pot in the furnace, and to work it before it has ftood the ufual time to purify in the fire. *Neri's* Art of Glafs, p. 99.

MARBLE *Wood*, a name given by the people of fome parts of America to the *lignum rhodium*, or rofe-wood, from the heart of the tree being fometimes variegated like *Marble*.

MARBLED (*Cycl.*)—MARBLED *China Ware*, a name given by many to a fpecies of porcelain, or China-ware which feems to be full of cemented flaws. It is called by the Chinefe, who are very fond of it, *tfou tchi*.

It is generally plain white, fometimes blue, and has exactly the appearance of a piece of China which had been firft broken, and then had all the pieces cemented in their places again, and covered with the original varnifh. The manner of preparing it is eafy, and might be imitated with us. Inftead of the common varnifh of the China-ware, which is made of what they call oil of ftone and oil of fern mixed together. They cover this with a fimple thing made only of a fort of coarfe agates, calcined to a white powder, and feparated from the groffer parts by means of water, after long grinding in mortars. When the powder has been thus prepared, it is left moift, or in form of a fort of cream, with the laft water that is fuffered to remain in it, and this is ufed as the varnifh. Our cryftal would ferve fully as well as thefe coarfe agates, and the method of preparation is perfectly eafy. Obf. fur les Cout. de l'Afie.

The occafion of the fingular appearance of this fort of Porcelain is, that the varnifh never fpreads evenly, but runs into ridges and veins. Thefe often run naturally into a fort of mofaic work, which can fcarce be taken for the effect of chance. If the *marbled* China be defired blue, they firft give it a general coat of this colour, by dipping the veffel into a blue varnifh; and when this is thoroughly dry, they add another coat of this agate oil.

MARCASITE, (*Cycl.*) in natural hiftory, a name ufed in a very vague fenfe by many writers upon foffils, but reftrain'd by Dr. Hill to be the name of a peculiar genus of foffils, the characters of which are, that they are compound inflammable metallic bodies, naturally conftituting whole ftrata; of a folid and firm fubftance, of an obfcurely and irregularly foliaceous ftructure, and of a bright glittering appearance, very freely and readily giving fire with fteel, not fermenting with acid menftruums, and when put into the fire, yielding a deep blue flame, and finally calcining into a purple powder.

Though the natural difpofition of thefe bodies be to form whole ftrata, and that they are moft ufually found in this ftate, yet they are at times found in loofe maffes, as many, even of the ftones of ftrata, at times are. They are fubject alfo, by their frequent admixture with adventitious matter, the ores of metals, and other foffile bodies, to fuch various external appearances, that their varieties are almoft innumerable, and moft of them are very beautiful: But tho' thefe accidental differences are fo very numerous, the genuine fpecies are very few, the naturalift allowing only three. Thefe are, 1. The bright filver-colour'd *Marcafite*. 2. The bright gold-colour'd *Marcafite*. And 3. The pale heavy dead white *Marcafite*.

The firft fpecies ufually conftitutes ftrata of great extent, and of about a foot in thicknefs; very often much lefs, but fcarce ever much more: It is compofed of a number of foliaceous flakes, not regularly difpofed, but oddly contorted and waved, and often folding round one another; though fometimes this ftructure is lefs diftinct, and the whole feems run into one folid mafs. Its colour is extremely bright, very like filver, but more glittering. This is its common and its more pure ftate; but it is liable to a vaft number of varieties. Sometimes it contains a large quantity of the ore of lead or tin, and very often a dufky brown ferrugineous matter is intimately mixed with it; at other times many of the angular and regularly figured phlogoniæ are immerfed in it, and feem to make a part of its very ftructure; and fometimes where it has room, its conftituent flakes rife on its furface in feveral conjunct feries, and form a very elegant foliaceous top to it. Nor is this all the difference of appearance it puts on; for very often, where there has not been a fufficient quantity of it to form itfelf into any figure alone, it is found depofited in fpecks, or flat cakes, of a more or lefs complex, but always of a flaky ftructure, on ftones or ores of various kinds; and frequently, befide its native filvery white, it has all the rainbow-colours on its different parts, as differently turned to the light. *Hill's* Hift. of Foff. p. 609.

The *golden Marcafite* is a more beautiful fubftance than the former: It is of a lefs firm or compact ftructure than the others, and is ufually found in very long but very thin ftrata, and is of an extremely bright and glittering appearance, and is fometimes found in large and mif-fhapen nodules, or loofe maffes. It is liable to all the accidental varieties that the former is, and in many of them makes a very elegant appearance. The third, or dead white kind, is the hardeft and heavieft of all. It is, in its more ufual and natural appearance, of much lefs beauty than the former kinds, but it is, like them, fubject to various accidents, under fome of which its makes a very gay and fplendid appearance. It, like the reft, fometimes forms compleat ftrata, fometimes detach'd nodules; but its moft ufual appearance is in the horizontal cavities of other ftrata; in thefe it often forms a fort of baftard ftratum of many yards continuance, and frequently of very confiderable thicknefs, for it almoft always fills up the whole vacuity, and that fo clofely as feldom to leave room for any foliaceous fhoots at its furface, or protuberances at its edges, but forms a plain mafs like that of a metal melted and poured into the place. It is of the fmootheft furface of all the *Marcafites*, and is fomewhat foft to the touch, and in colour refembles tarnifhed pewter.

This is its common appearance, but it fometimes fhews itfelf like the reft in fmall patches on the furfaces of ftones, and is there often very beautifully foliated; it is liable alfo to all the accidents of the other kinds.

The *Marcafites* are all found in great plenty in the Englifh and German mines. Devonfhire and Cornwall afford vaft quantities of them; and very beautiful ones are found in Derbyfhire. They often contain the feveral metals, but the quantity of fulphur has yet baffled all the attempts that have been made to work them to advantage. *Hill*, Hift. of Foff. p. 610.

Avifenna mentions four kinds of *Marcafite*; the golden, the filvery, the braffy, and the iron *Marcafite*. He does not pretend that the two firft contain really the metals whofe names they bear, but fays they are fo called from their likenefs in colour, and that they are thought by fome to poffefs, in part, their virtues. Diofcorides mentions only one kind, that is, the braffy pyrites or *Marcafite*. This is, of all others, the moft common; and the preference is given by this author to fuch of it as is of a bright brafs colour, and fuch as, when ftruck againft fteel, yields the largeft fparks. This is the kind called by Avifenna and Serapio, *Marcafita nubafi*, and it is called by the Perfians, *hagiar alruxenani*, that is, the ftone of light or brightnefs, there being a very vivid and fparkling luftre in this ftone when newly broken. The antients ufed to calcine it, and then made it an ingredient in their feveral compofitions for difeafes of the eyes. The calcining it renders it a fort of colcothar of vitriol, for the fulphureous parts burn away in the operation, and leave only the *caput mortuum* of the vitriol behind; fome have fuppofed it called *lapis lucis*, from its reftoring light to the eyes; but this is a very far fetch'd etymology.

The firft opinion of the world, in regard to this glittering fubftance, was, that it was almoft all gold or filver, according to the colour: But the error of this opinion being foon difcovered by trials, there grew another contrary one, that *Marcafite* never contained any metal at all. This is, in general, true of our *Marcafites*, but it is not to be extended into a general rule for thofe of all the world. The fearchers after royal mines are not to throw away all thefe fubftances as ufelefs, wherever they find them. For Alonfo Barba, a very great judge of thefe things, and himfelf very converfant in mines, affures us, that the *Marcafites* of the mines of Montferrat *en los chicas* contain ufually one half filver: And in the mines of Potofi there is great plenty of a *Marcafite*, in which there is embodied a large quantity of the black filver ore, well known there, and efteemed one of the richeft kinds, except the native filver. They always are glad to find this *Marcafite* vein, it being efteemed a proof, that the black ore is very rich in filver. They make the fame fort of obfervation in regard to orpiment and gold, that they do in regard to *Marcafite* and filver; that the orpiment ufually contains itfelf fome gold, and is a certain fign that there is gold in the neighbourhood wherever it is found. *Alonfo Barba* de Met.

MARCH, (*Cycl.*) in military affairs, is in general the fteps made in marching, or the moving of a body of men from one place to another.

But the beat of the drum, when the foldiers are upon *March*, or beginning to march, is likewife called the *March*. It is likewife a word of command, when a battalion is to alter its difpofition.

To *march* is to move from one place to another. The orders being given the evening before a *March*, that the drums beat at a certain hour, the foldiers are then ready drawn up at their ftandards and colours, in fquadrons or battalions, ready to begin their *march*.

As

As many accidents may happen in the *March* of an army; as defiles, marshes, woods, and the like, it is the prudence of a general to order his *March* accordingly, and to take care that the columns of his army have a free communication one with the other. The *March* of an army is composed of an advance guard, the main body, and the rear guard, and is sometimes in two, four, six, or eight columns, according as the ground will allow.

MARCH, *Marchia*, in our old writers, is used for a limit or border. Thus we read of the *Marches*, between England and Wales; or England and Scotland; which last are divided into *West* and *Middle Marches*. And the word is used generally for the precincts of the king's dominions, in 24 Hen. 8. c. 12. Terms of Law.

The word comes from the German *March*, i. e. *Limes*; or from the French *Marque*, i. e. *Signum*, used for the marks or signs to distinguish between two countries or territories. *Blount*, *Cowel*.

MARCHANTIA, *Liverwort*, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: It is of the nature of what we generally call the *lichens* or *liverworts*, and produces male and female flowers on the different parts of the same plants.

The male flower stands on a long erect peduncle, which arises from a sort of cup or case on the plant. The cup is a common perianthium, of the peltated kind, and divided into four, five, or ten parts, every segment having its edges depressed, and all being of the same size. This perianthium is large, and contains under it as many flowers as there are segments of it. Each flower is monopetalous, of a turbinated form, standing erect, and somewhat shorter than the cup. The stamen in each flower is single, and is a slender filament, longer than the flower. The apex or anthera, sustained on this stamen, is of an oval figure, and is commonly found burst at the top into as many parts as there are segments in the perianthium, be that four, five, or ten. The farina within it is affixed to a sort of hairyness.

The female flower has no pedicle; the cup is a one-leav'd perianthium, erect, open at the top, and undivided, consisting of a sort of membranaceous ring, which does not fall off till the seeds are ripened. There is no other flower but this cup, which contains several naked seeds in the bottom; they are of a roundish compressed figure. Dillenius has comprised this genus under the general term *lichen*; and Micheli has called different species of it by the different names of *lunularia* and *hepatica*; and, according to these distinctions, the *Marchantia* is the name of those species which have the cup of the male flower divided into eight or ten segments, which are flat, and do not enclose the flowers. The *hepatica* is the name of those species which have the male cup, of a conic figure, divided into five segments, and those bending inwards, and the *lunularia* of those species which have the male cup, of a cruciform figure, with curled segments, enclosing the flowers. *Linnæi* Gen. Plan. p. 506. *Micheli* Nov. Gen. Plant.

Livervort is said to be aperient, attenuant, and resolvent, and therefore good in obstructions of the liver, and other viscera; but at present is only used as an ingredient in some compositions.

MARCHERS, or *Lords* MARCHERS, in our old writers, noblemen that lived on the marches of Wales, or Scotland. These, in times past, according to Cambden, had their laws, and power of life and death, &c. like petty kings. But such powers were abolished by the stat. 27 Hen. 8. c. 26. and 1 Edw. 6. c. 10. Terms of Law, *Blount*.

MARCHIONIS *Pulvis*, a term used for a certain compound powder, prescribed in the Leyden Dispensatory, and greatly recommended by many as an anti-epileptic and absorbent.

The ingredients are male piony root, half an ounce, wood of misletoe of the oak, raspings of ivory, elks hoof, spodium, the tooth of the unicorn fish, or, in its stead, the antlers of the stag's horn, red and white coral, and pearls, of each a dram. These are all to be rubbed into a powder, with twenty leaves of pure gold, and given half a dram twice a day.

MARCULUS, among the Romans, a knocker, or instrument of iron to knock at the doors with. *Pitisc.* Lex. Ant.

MARDAC, in the materia medica of the antients, a name given by some to litharge. The Arabian writers have sometimes called it by this name, and sometimes by that of *mardesengi*. Many of their commentators have thought that they meant two different substances by these two names; but it does not appear to be truly the case, the two words standing, in different writers, for the same thing. Avisenna has given us a chapter on *Mardac*, in which he has translated the chapter of Dioscorides on litharge: And Serapio has given us a chapter on the *merdesengi*, in which he has given us an account of the same substance, under the terms that Galen uses for the description of litharge, and even quotes him for the account.

MARES, *Equa*, in zoology, the female of the horse kind. See the articles EQUUS and HORSE.

No *Mares* in the world are better for breeding out of of than the English, provided they are properly chosen for the sort of horse intended to be bred. The *Mare*, whatever sort of horse is intended to be raised from her, should be perfectly found, and as free from all defects as the stallion. They should have no splaint, spavin nor curb about them; for the colt will certainly take after them if they have. The highest spirited *Mares* are best, and, in general, if there be any natural defect in the *Mare*, it should be remedied in the stallion; and if any in the stallion, it should be remedied in the *Mare*, as much as possible, in order to the having good colts.

The particular directions regarding the kinds of horses to be bred, are these: If for the manege, or pads, the *Mares* should have their heads well set on, and their breasts broad; their legs not too long, their eyes bright and sparkling, and the bodies large enough, that the foal may have room to lie in their belly. They should be of a good and gentle disposition, and their motions easy and graceful: The more good qualities the *Mares* have, the better, in general, the colts will prove.

If the owner would breed for racing, or for hunting, the *Mares* must be chosen lighter, with short backs and long sides; their legs must be longer, and the breast not so broad; and such should always be chosen as have good blood in their veins. If the speed and wind of any particular *Mare* have been tried, and found good, there is the more certainty of a good colt from her: But she should be in full health and vigour at the time, and not above seven years old, or eight at the utmost. The younger the breeders are, the better, in general, the colts will be.

A *Mare* may be covered any time after she is two years old; but the best time is after she is four; at this age, or between this and seven, she will nourish a colt best of all; and though she will breed till she is thirteen, yet it is generally observed, that when she is past ten, the colts bred from her are dull and heavy. People who regard the moon, in these cases, will have their *Mares* covered only between the end of the first quarter and the full; they pretend that these colts will be the most strong and vigorous, but that those begot in the waning of the moon, will always be weakly and tender. A much more essential caution, however, is, that before the *Mare* is to be covered, she should be taken into the house for six weeks, at least, and fed well with good hay and oats, well sifted, to give her strength to go through the operation. If there is any reason to suspect that the *Mare* will not conceive, the best method to insure it is to let her blood in the neck, about six days before she is cover'd: The quantity of blood taken away should be about two quarts, or somewhat less. It is a general custom to open the veins on both sides the neck for this, taking half the quantity from each, but this is trifling.

The method of covering, so as to make it most sure to succeed, is this: The *Mare* is to be brought into some open place, and tied to a post; and the stallion is to leap her in the morning fasting, and as soon as he dismounts, a pail of cold water is to be thrown upon her, to make her shrink in and retain the seed. She is then to be taken away out of hearing of the horse, and is neither to eat or drink for four or five hours after.

It may be known if she stands to her covering, by her keeping a good stomach, and not neighing at the sight of a horse. Some, to make it quite secure, put the *Mare* and horse together in an empty house every night, for four or five nights, taking away the horse in the morning, and feeding him very liberally, and the *Mare* very sparingly, and particularly giving her very little water.

There must be proper care taken of her after covering. The same method of feeding her with good hay, and sifted oats, must be continued three weeks, or a month, and she must be kept within doors, and without any exercise; her stable must be kept very clean, and her feet pared, and with thin shoes on. After this she may be turned out for the summer season, and only taken up in September, in order to be kept well fed till she foals. If there be great difficulty in her foaling, or the secundine be retained, the method is to hold her nostrils, so that she cannot breathe; and if this does not do, a decoction of madder-root, or of fennel, in water, with a mixture of ale or wine, is found very effectual.

When the whole is over, the *Mare* is very apt to eat up her secundine; but this should be prevented, for it is an unnatural food for her, and will injure her health. When she has licked her foal, some persons should stroak and milk her before the foal sucks. This will make the milk come down in greater plenty, and will prevent it from clotting into lumps, or from disagreeing with the young creature's stomach. It often happens, that the milk clods in the udder, and the foal, being able to get none out, the *Mare* is supposed to be dry; and in consequence of this supposition, she actually becomes so. But the remedy is easy. Let as much milk as can be got from her be boiled with some lavender flowers, and the udder bathed thoroughly with it warm, several times a day: If no milk, or not enough can be obtained from her, other milk or common water will do; for the principal effect is from the heat of the liquor, and the virtue of the lavender, which breaks the clods and lumps, and then the foal's sucking more as it grows stronger, will prevent the like accident for the future.

The water given the *Mare* for the first month after foaling, must be what the dealers in horses call the white mash, that is,

is, bran and water, ftirred together till the liquor is white: A month after foaling a decoction of brimftone and favin will be very proper; and will give ftrength to the colt.

After this the *Mare* may be put to any moderate exercife, as harrowing, or the like, and both fhe and the colt will be the better for it; only care is to be taken that fhe do not let the colt fuck while fhe is hot.

Many are of opinion, that the winter is a very bad time for a *Mare* to be foaling; but though there is fcarcity of grafs, the *Mare* may be houfed at this time, and well fed with hard meat, and, in this cafe, it will prove better both for her and the colt; he will be better limbed and ftronger than if bred at grafs. See the article FOAL.

MARECA, in zoology, the name of a Brafilian fpecies of duck, much valued there at table. It is of the fhape of our duck. Its head is grey, but has a beautiful red fpot on each fide, at the infertion of the beak, and a whitenefs in the lower part under the eyes. Its breaft and belly are of the colour of frefh cut oak, variegated with black fpots. Its legs and feet are black. Its tail grey; and its wings elegantly variegated with grey and brown; but they have in the middle a large mixture of that gloffy green which we fee in the necks of our drakes. There is, befide this, another fpecies of the *Mareca*, which is of a dufky olive-colour'd brown on the back, white on the throat, and grey on the breaft and belly, and very remarkable for the fine bright red colour of its feet. *Marggrave*, Hift. Brafil.

MARENA, in zoology, the name of a fifh of the harengiform kind, much approaching to the nature of the common pilchard; but differing from it in that it has not the ferrated longitudinal line under the belly, and lives in lakes, not in the ocean. It feldom arrives to more than five inches in length; its back is blackifh, and its fides white and filvery, and its fcales are very loofe, and eafily rubbed off. It is a better tafted fifh than the pilchard, and its flefh is firmer. *Willughby*, Hift. Pifc. p. 229.

MARGA, *Marle*. See the article MARLE.

MARGEN, in the materia medica, a name ufed by fome of the later Greek writers to exprefs red coral. It is founded on an error, however, the word *Margen* being made from the Arabian *margian*, which does not fignify coral, but a purple fea wrack, or fucus, ufed in dying. See the article MARGIAN.

MARGENSTEIN, in natural hiftory, a name given by the German writers to a fort of indurated marle, which while in the ftrata is nearly of the hardnefs of ftone; but when laid on the furface of the earth, and expofed to the wind and rain, foon diffolves, and enters the pores of the ground, enriching the foil to a very great degree. We have the fame fort of ftony marle in fome parts of England, only that ours is lefs hard, and yet takes more time to break and diffolve in the air. They are both moft proper for lands of a loofe loamy nature, and keep them in heart a long time. *Swedenborg*, de Rebus Natural.

MARGGRAVIA, in botany, the name of a genus of plants, the characters of which are thefe: The perianthium is compofed of fix fcales, difpofed in oppofite pairs, and the fmaller placed below the others. The flower is very fingular, it confifts of one petal, and is of a conic oval form, every where whole and perfectly clofed at the mouth; this never opens, but, when it has ftood a fmall time, is thruft off at the bafe by the other parts of the fructification. The ftamina are numerous, fhort, and expanded filaments; the antheræ are large, erect, and of an oval figure; the germen of the piftil is oval; there is no ftyle, and the ftigma is obfolete. The fruit is a globofe berry, having only one cell, in which there are numerous very fmall feeds. Befide the flowers there is fomething very fingular in the umbels of this plant: In the middle of thefe there ftand a number of oblong feffile bodies of a wonderful figure; they are compofed of one leaf with an open mouth, and are bent downwards, and open at the bafe. Thefe are not flowers, but mere excretory glands for the plant, thus oddly fituated. *Linnæi* Gen. Plant. p. 282. *Plumier* Gen. p. 29.

MARGIAN, in botany, a name given by fome of the antient writers, particularly the Arabian phyficians, to the plant called by others *argina* or *arginem*. This is defcribed to be a purple fea plant. Some have fuppofed that cochineal was meant by this word, but that is an error. Others have come fomewhat nearer, in fuppofing it to be the name of coral; but as the antients have faid that it was ufed in dying, it could not be coral; and indeed there is no other plant that it can mean, but that fucus ufed by the Greeks in dying, and called *fucus porphyrizon*, or the purple dying fea plant. See the articles ARGINA and FUCUS.

MARIGOLD, in botany. See the article MARYGOLD.

MARQUES *de Ladre*, in the manege. See the article DULL.

MARINE-*Barometer*. See the article BAROMETER, *Cycl.*

MARINE *Remains*, a term ufed by many authors to exprefs the fhells of fea fifhes, and parts of cruftaceous and other fea animals, found in digging at great depths in the earth, or on the tops of high mountains. Their being lodged in thefe places, is an evident and unqueftionable proof of the feas having once been there, fince it muft have covered thofe places where it has left its productions.

It has been a favourite fyftem with many, and particularly with the late Dr. Woodward, that all thefe marine bodies were brought to the places where they now lie, by the waters of the univerfal deluge; which, as we are informed by holy writ, covered the whole furface of the globe, and even the higheft mountains. But though this is a very ready expedient to account for many of the natural phænomena, yet there are evident proofs that it cannot have been the caufe of all that is attributed to it; and there muft neceffarily have been fome other caufe of many of thefe remains having been placed where we now find them. Neither does the opinion of fome particular authors, that partial inundations of different places have left thefe *marine* bodies behind them at the recefs of the waters, feem fufficient to account for the multitudes of thefe remains, many of which we find thrown upon places inacceffible to fuch floods. *Moro* de Cruftaceis in Montib. deprehenf.

Signior Moro has attempted to account for thefe phænomena on a new plan of reafoning. He obferves, that it is the beft bafis of argument to begin from facts; and that if we can certainly find how fome part of thefe animal remains come to be depofited at fuch great diftances from their natural refidence, we may very rationally conclude, that by the fame means, be they what they will, all the reft were alfo brought thither. He adds, that the earth, once the bottom of the fea, or the level furface of a plain, may be, and frequently has been, in the memory of man, raifed up into a mountain by fubterranean fires, earthquakes, and volcanos. He mentions the famous inftance of the new ifland raifed out of the bottom of the fea near Santorini in the year 1707, which became of a circumference not lefs than fix miles, and of the new mountain raifed near Puzzoli in 1538.

Thefe and many other like facts, prove that the origin of mountains and iflands may have been fuch, and that the matter they confift of may have been the fame with what was once the bottom of the fea; and that the *marine* bodies found in thefe mountains, were fuch as were living, or remaining of living fifh at the time when the iflands or mountains were fo raifed above the furface of the water which before covered it.

This is no new opinion; but this author has fet it in a new and much ftronger light than it ever had appeared in before, by the inftances and examples he has brought in proof of it. Some have been fond of believing that the bodies we call *marine remains*, were never indeed any parts of living animals, but that they are mere *lufus naturæ* formed in the places where they are found; but Fabius Columna proved this to be an error, fhewing that the fhark's teeth, or gloffopetræ of the ifland of Malta, when calcined by a ftrong fire, yielded afhes, the fame with thofe from animal bodies, and by no means of the fame nature with thofe produced from calcined ftones.

That changes of parts of the bottom of the fea into dry land, have often been made, is proved not only from the late known inftances, but from the teftimonies of Strabo, Pliny, and other writers of credit: And nothing is more obvious to reafon, than that in the fudden rife of fuch parts of the bottom of the fea, all its contents, all the fhells, and other hard parts of fifhes lying there, would be carried up with it.

As fome mountains and fome iflands muft have certainly been produced in this manner, it is not impoffible but that all of them may have been fo; and there is no more than this required to account clearly and evidently for all the vaft profufion of *marine* bodies at land as we find them, without having recourfe to the improbable means of the univerfal deluge, which for many plain reafons cannot have been the caufe; or to the effects of particular inundations, which muft have been wholly incapable of lodging many of them there. The lodgment of fhells in the folid ftrata of mountains, is better accounted for by this fyftem of Signior Moro than any other: And if it be afked why fome mountains afford them in great plenty, and others not at all, it will not be difficult to anfwer, by obferving, that among the mountains of the more known parts of the world, fome confift of more folid rock, and others of various ftrata of earthy and other matter; that the firft of thefe may be fuppofed primary or natural mountains, and the others fecondary or accidental ones; and that thefe *marine remains* are always wanting in the former, and ufually are found in the latter, which is a fact greatly favourable to this fyftem.

There are many difficulties attending the accounts of all authors of the formation of the earth, and the lodging thefe bodies in it; nor is this laft fyftem without difficulty. The caufes here affigned as to the origin of mountains and iflands, doubtlefs have been fo in regard to fome, but fcarce to all; and the bodies here treated of are fo numerous, in fome particular places, that fcarce any account can folve the difficulty of their being collected together in fo ftrange a manner.

MARINE *Salt*. See the article SALT.

MARINELLA, in botany, a name by which fome authors have called the great *plu*, or garden valerian. *Ger.* Emac. Ind. 2.

MARINER, the fame with feaman or failor. See the article SAILOR, *Cycl.*

MARI-

MARINERS-*Compass*. See the article COMPASS, *Cycl.*

MARIO, in ichthyology, a name given by Pliny, and other of the old Roman authors, to a large fish allied to the accipenser or sturgeon. There seems, from all that they have said of it, great reason to believe that it was the fish we at present call *huso*, or the ichthyocolla fish, from isinglass made of it. Artedi makes this a species of the accipenser or sturgeon, and distinguishes it by the name of the accipenser without tubercles. See the article ACCIPENSER.

MARJORAM, in botany. See the articles MAJORANA and ORIGANUM.

MARIS, in ichthyology, a name given by Charleton and some others, to a fish called, by the generality of both the antient and modern writers, *smaris*, and by some *leucomenides*, from its whitish colour, and its external resemblance to the fish called *mænis* and *mæna*; it is, like that fish, a species of the sparus; and is distinguished by having a black spot on each side, and the tail and belly fins red.

MARISCA, a word used by chirurgical writers to express an excrescence about the anus.

MARITACACA, in zoology, the name of a very remarkable American animal, more usually known by the name of the opossum. See the article OPOSSUM.

MARITUS, in the chemical jargon, a word used to express the sulphur of metals. The writers on the subject of the philosophers stone usually express themselves in this enigmatical manner, calling sulphur the husband, and mercury the wife in all metals; which, as they are more or less perfectly combined, make the metal more or less pure, and approaching to perfection.

MARK, (*Cycl.*) at sea, the same with *land-mark*. See the article LAND-*Mark*.

MARK, in the manege. A horse *marks*, that is, he shews his age by a black spot, called the bud or eye of a bean, which appears when he is five and an half, in the cavity of the corner teeth, and is gone when the horse is eight years old. After that age he ceases to *mark*, and is said to have razed. See the article EYE *of a Bean*.

False-MARKED is the same with *counter-marked*.

MARK, among bowlers. See the article BOWLING.

MARLE (*Cycl.*)—The *Marles* in the northern parts of England contain sand, and run into a sort of loam: Those in Sussex are more like fullers earth, and therefore are by much the fattest and richest.

Marle, in general, is much of the nature of chalk, and the potters find, that when either chalk or *Marle* happen to be mixed with their clay, they will burn with the rest of the substance, and the vessels will seem very sound; but as soon as any water is put in them, they will run, the chalk or *Marle* having been burnt into a sort of lime, and flaking like common lime with the water.

The *Marles* that are so sandy, that they can scarce hold together, are a very good manure for cold clay lands, and are an objection to the general rule, that *Marle* is not to be used to clay. *Marle*, in general, suits best with hot lands, for it is apt to bind and sadden the tough clays; but as there are no rules without their exceptions, where *Marle* is not laid too thick, and is not of too binding a kind, it will often very much improve pasture grounds, though they are upon a clayey soil.

Cowshut or stone *Marle* is, in most countries, found under clay, or low black land, eight or ten foot deep; clay and steel *Marle* sometimes under sandy land: In clayey ground it seldom lies more than three foot deep; but in sandy ones it is often much deeper. The Sussex *Marle* commonly shews itself pretty low among the broken strata of hanging grounds.

For the digging of *Marle* they commonly use pick-axes, shovels, spades, and wheel-barrows; and where the pit is broad, that they can make an easy ascent, small carts of four foot ten inches long, and two foot three inches wide, and about fourteen inches deep, made so that a load is very easily shot out of them.

Marle is supposed to be fruitful from its salt and oily quality: The salt it is supposed to contract from the air, and therefore many are of opinion, that the longer it is exposed to the air before it is used, the better. They lay it upon the grass ground, in some places, three or four years before they plow it up; and when they cover the arable lands with *Marle*, they will not plow, in many places, to more than an inch deep, that they may not bury it. Markham, indeed, is of a contrary opinion, and would have it buried deep, that the sun may not draw out its virtue. The *Marles* of different places are in themselves so different, that both these opinions seem right in part; the *Marles* of Sussex being found to succeed best where buried deep, as soon as taken from the pit; and those of the north of England seldom doing much good to the lands, unless they are exposed a long time first.

The experience of the farmers in different places has shewn also, that different times are to be observed for the laying it on, according to its nature and that of the land to be improved by it. In Sussex they always lay on the *Marle* in the beginning of winter; and in Staffordshire in May and June. Good *Marle* will flake like lime with the sun's heat in a hot day, especially if there has happened any rain. Some farmers harrow in the *Marle*, just before they plow the land, which is a very good way to mix it perfectly. Cole seed, clover, and all kinds of hay plants, grow well upon marled lands. Lands seated on *Marle* are usually very rich, tho' in their own nature cold and heavy. The deeper these lands are turned up in plowing, the better crops they will always yield. *Mortimer's* Husbandry, p. 95.

It is a very material circumstance in the marling of land, to find out how much the land requires of this manure; and till experience has thoroughly shewn this, it is better to err in laying on too little, than too much; because the latter is a fault not to be remedied. It is to be observed also, that *Marle* never makes so great an improvement on land the first year, as it does afterwards.

In Staffordshire they lay two hundred load of *Marle* upon an acre of land of the common kind; but where the soil is black, loose, and sandy, or full of worms, they will lay on three or four hundred load to an acre; it being a rule with them, that this sort of soil cannot be marled too much. If the mould be thin, the less *Marle* does; if deep, it must have the more.

'Tis best sowing of marled lands under furrow; because if these lands are well husbanded, they will be very mellow and hollow, which will occasion the earth's sinking from the roots of the corn, if it stand too high. If *Marle* saddens land, or makes it stiff or binding, it must be well dunged, and laid down for grass. In Staffordshire, after their land is marled, their way is to take the crops following. After the first crop of wheat is off, they plow in the wheat stubble in December, and if the weather proves frosty, to mellow it, they do not plow it again till April. They then sow it with barley, allowing three bushels of seed to an acre. The common produce of this is thirty bushels. After this they sow pease, for which they plow only once in the February following, allowing only three bushels of seed to an acre, as in the barley. Next after this, if they intend six crops, they sow wheat again upon the pease crop; the fifth crop is barley again; and the sixth year's crop is red oats. Some sow two or three crops more, when the ground has been well marled, but that is much better let alone.

In digging for the *Marle* they use in manuring their lands in Ireland, they meet with fossile horns, and other curious fossils. The *Marle* always lies in the bottoms of low bogs. It is never met with in any other places, and is found by boring with augurs made for that purpose. It usually lies at five, seven, or nine foot depth. The obtaining it in many places is attended with very considerable expences, in draining off the water. The manner of digging it is this: They employ six able labourers, and a supernumerary; and these cut up a hole of twelve foot square, which is supposed a pit that this number of men can manage in one day. Two men dig, two throw it up, and two throw it by, and the supernumerary man supplies defects on all occasions. For the first three foot they dig through a fuzzy earth, fit for making of turf or fuel. Under this lies a stratum of gravel, of about half a foot. Under this often, for three foot more, there is a more kindly moss, which would make better fuel. This lower stratum of turf is always full of fossile wood, which is usually so soft, that the spade cuts as easily through it, as through the earth it lies in. Under this, for about three inches, is found a series of leaves, principally of the oak; these appear very fair to the eye, but fall to pieces on touching; and this stratum is sometimes interrupted with vast heaps of seed, which seem to be broom or furz-seed. In some places there appear berries of different kinds; and in others, several species of sea plants, all lying in the same confused manner as the oak leaves. Under this vegetable stratum, there lies one of blue clay, half a foot thick, and usually full of sea shells. This blue clay is not so tough as common clay, but is thrown carefully up, and used as *Marle* in some places. Under this always appears the right *Marle*; the stratum of this is usually from two to four foot thick, and sometimes much more. Phil. Transf. N°. 394. p. 122.

This *Marle* looks like buried lime, and is full of shells; which are usually of a small size, and of the perwinckle kind; but there are several other sorts, at times, found among them. Among this *Marle*, and often at the very bottom of it, are found great numbers of very large horns of the deer kind, which are vulgarly called elks horns. These, where they join to the head, are thick and round; and at that joining there grows out a branch, which is about a foot long, and seems to have hung just over the creature's eyes; it grows still round for about a foot above this, and then spreads broad, and terminates in branches long and round, turning with a small hind. The labourers are obliged to work in a hurry in all these pits, so that they seldom bring them out whole. There are also, at times, found the leg bones, and other parts of the skeletons of the same beasts; but this more rarely, only a few together, and but in few places.

MARLE, in medicine, is esteemed an astringent, and given as such in diarrhœas, dysenteries, and hæmorrhages; the red kind is preferred for the last intention, though the difference is hardly worth regarding. The Germans give it also in fevers, in convulsions, and particularly in epileptic cases; also in internal bruises.

Dice MARLE, in huſbandry, a name given by the people of Staffordſhire to a reddiſh *Marle*, that breaks into ſmall ſquare pieces like dice, or elſe into thin flakes, in the manner of lead ore, and looks ſmooth on the ſurface. This is a good manure, and the way of judging which of it is beſt, is to expoſe it to the air in rainy weather, or to put it in water. That which moulders ſooneſt to powder in the air, and breaks quickeſt in the water, is ſure to be the beſt, and proves very beneficial to land.

MARLINE, aboard a ſhip, is a ſmall line made of hemp untwiſted, that it may be the more gentle and pliable: Its uſe is to ſeize the ends of ropes from fareing out. They uſe it alſo to ſeize the ſtraps at the arſe (as they call it) or lower end of the block.

MARLING *a Sail*, is when being ſo ript out of the bolt rope, that it cannot be ſewed in again, the ſail is faſtened by a *Marline*, put through the eye-let holes, made in it for that purpoſe, unto the bolt rope.

MARMARYGÆ, a word uſed by the old writers in medicine to expreſs ſparks of fire, or the appearance of ſuch flaſhing before the eyes in ſome diſorders.

MARMORA, *Marbles*, in natural hiſtory. See the article MARBLE.

MARMORARIA, in botany, a name given by ſome authors to the *brancha urſina*,

MARMORATA *Aurium*, a term uſed by ſome authors to expreſs ear-wax.

MARMORELLA, in botany, a name by which ſome authors have called agrimony. *Ger.* Emac. Ind. 2.

MARMOREUS *Tartarus*, a word uſed by ſome authors to expreſs the hardeſt kind of the calculus, or ſtone in the human bladder. See the article STONE.

MARMOTTE, *Marmotta*, the mountain rat, a creature very common in many parts of Europe, and frequently carried about as a ſhew by the poor Savoyards. It is of the ſize of a leveret, or between that of the hare and the rabbit; and is larger bodied than a cat, but much ſhorter legged. Its whole figure and appearance are like the common rat, whence it has its name. Its furr is much harder or harſher than that of the rabbit, and its colour a reddiſh tawney, ſometimes lighter, ſometimes darker; the end of its tail is back. Its eyes are large and prominent, and its ears ſhort, and ſeeming as if cut off. It has two large teeth at the front of each jaw, as the ſquirrel, and other creatures of this kind, and theſe are not white, but yellow, as in the beaver. Its noſe and mouth are adorned with a large number of black whiſkers, making a ſort of beard. The tail is about five inches long, and the legs are thick, and theſe and the belly are covered with long hair. Its toes are diſpoſed as in the bear, and its claws are very long and ſtrong, by means of which it digs the earth very readily. It makes great uſe of its hinder legs, and ſometimes walks on them in an erect poſture. Its back always appears very fleſhy and fat, tho' the reſt of the body be ever ſo lean; but this is not real fat, but a proviſion made by nature to guard the animal from cold. *Ray*, Syn. Quad. p. 221.

They will play with one another in the manner of kittens, and make a ſoft and not diſagreeable noiſe on thoſe occaſions; but when they are provoked, or when they are affected, as they always are by a change of weather, they make a very ſhrill and diſagreeable ſqueaking. They feed on vegetables, and are very fond of the roots of ſeveral plants; they are very fond alſo of milk, butter, and cheeſe. They ſit on their buttocks to eat, and uſe their fore-feet as hands to reach their food to their mouths, in the manner of the ſquirrel. They lie hid in the winter in holes which they dig in the earth, and ſleep away a great part of that ſeaſon. They make their holes in a very nice and artful manner, and make themſelves a bed of ſtraw, and other ſoft matters, that they may lie the ſofter and the warmer. It is a creature eaſily bred up tame, and will be perfectly good-humour'd and familiar, but it hates dogs.

Its legs are very robuſt and ſtrong, and it digs extremely quick. It runs but ſlowly on even ground, ſo that a man may overtake it; but if it once gets into the earth, it is ſaid, it will burrow faſter than a man with a ſpade can dig after it to take it.

This animal, in Poland, is ſaid to herd in large communities, and be governed by a regular policy, making war with parties of its own ſpecies from other places, and taking ſpies and ſlaves, and keeping them for the moſt ſervile uſes; particularly in the carrying in their proviſion for the winter, which they lay on the bellies of theſe ſlaves, firſt laying them on their backs, and then drawing them along with the load, in manner of a cart or waggon.

MAROGUS, a word uſed by Paracelſus to expreſs a very powerful narcotic.

MARQUE (*Cycl.*)—*Letters of* MARQUE. See the article PRIZE.

MARRIAGE (*Cycl.*)—The people in Java *marry* and have children at nine or ten years old, and the women leave childbearing before they are thirty; and at Tunquin there are women common to any that will hire them, at eight or nine years of age.

Potter gives a large account of the ſeveral ceremonies obſerved by the Greeks in their *Marriages*. The Spartans were not permitted to *marry* till they arrived at their full ſtrength. The reaſon aſſigned for this cuſtom by Lycurgus, was, that the Spartan children might be ſtrong and vigorous: And the Athenian laws are ſaid to have once ordered, that men ſhould not *marry* till thirty-five years of age. *Potter*, Archæol. Græc. l. 4. c. 11. T. 2. p. 263. ſeq.

Moſt of the Grecian ſtates, eſpecially ſuch as made any figure, required their citizens ſhould match with none but citizens. The uſual ceremonies in promiſing fidelity was kiſſing each other, or giving their right hands, which was a general form of ratifying all agreements. Before the *Marriage* could be ſolemnized, the gods were to be conſulted, and their aſſiſtance implored by prayers and ſacrifices, which were offered to ſome of the deities that ſuperintended theſe affairs, by the parents, or neareſt relations of the perſons to be married. When the victim was opened, the gall was taken out and thrown behind the altar, as being the ſeat of anger and malice, and therefore the averſion of all the deities who had the care of love, as well as thoſe who became their votaries. For the particularities relating to the bride and bridegroom, ſee the articles BRIDE and BRIDEGROOM.

The ceremonies of the Spartan *Marriages* being different from all others, deſerve to be mentioned at length, as related by Plutarch. "When the Spartans had a mind to marry, "their courtſhip was a ſort of rape upon the perſons they had "a fancy for; and thoſe they choſe not tender and half-"children, but in the flower of their age, and full ripe for a "huſband. Matters being agreed between them, the Νυμφευτρία, or woman that contrived and managed the plot, "ſhaved off the bride's hair cloſe to her ſkin, dreſſed her up "in man's cloaths, and left her upon a mattreſs: This "done, the bridegroom entered in his common cloaths, "ſober and compoſed, as having ſupped at his ordinary in "the common hall, and ſtole as privately as he could into "the room where the bride lay, untied her virgin girdle, and "took her into his embraces. Having ſtayed a ſhort time "with her, he returned to his comrades, with whom "he continued to ſpend his life, remaining with them "as well by night as by day, unleſs when he ſtole a ſhort "viſit to his bride; and that could not be done without a "great deal of circumſpection, and fear of being diſcovered: "Nor was ſhe wanting (as may be ſuppoſed) on her part, to "uſe her wit in watching the moſt favourable opportuni-"ties for their meeting, and making appointments when "company was out of the way. In this manner they lived "a long time, inſomuch that they frequently had children by "their wives before they ſaw their faces by day-light. The "interview being thus difficult and rare, ſerved not only for "a continual exerciſe of their temperance, and furthered "very much the ends and intentions of *Marriage*; but was "a means to keep their paſſion ſtill alive, which flags and "decays, and dies at laſt by too eaſy acceſs, and long conti-"nuance with the beloved object." *Potter*, Archæol. loc. cit. p. 295. ſeq.

According to Mr. Kerſſeboom's obſervations, there are about 325 children born from 100 *Marriages*. See Phil. Tranſ. N°. 468. Sect. 3.

Mr. Kerſſeboom, from his obſervations, eſtimates the duration of *Marriages*, one with another, as in the following table.

Thoſe whoſe ages, taken together, make

40	live together between	24 and	25 years.
50		22	23
60		23	21
70		19	20
80		17	18
90		14	15
100		12	13

Phil. Tranſ. N°. 468. Sect. 3. p. 319.

MARROW (*Cycl.*)—The greateſt part of the bones contain, in their large cavities or cells, this unctuous ſoft ſubſtance, which is more ſolid in ſome, and more ſoft in others. This, while it lies in the cavities of the large bones, is more particularly called *Marrow*; when diſperſed in the ſmall cellulous cavities, it is commonly called the medullary juice. The *Marrow* of the large hollow bones is a maſs compoſed of an infinity of ſmall veſicles, or membranous cells, joined together, and communicating with each other, furniſhed with blood-veſſels and nerves, and filled with a fine ſweet oily matter. All theſe cells are ſurrounded by a fine membrane, which, like an internal perioſteum, ſticks cloſe to the inner ſurface of the bone, by means of an infinite number of capillary veſſels, and of ſeveral other kinds of very ſmall filaments. The reticular ſubſtance of the bones runs through this medullary maſs, and, as it were, interlards it, and by this means ſuſtains it in the middle of the great cavities. The *Marrow* of the cellulous or cavernous ſubſtance of the bones, is divided by ſmall bony ſepta or plates, and by filaments of the reticular ſubſtance of the bones into a vaſt number of veſicles or membranous cells, which line the bony cells, and communicate with each other.

This cellular *Marrow* in the cavernous texture of ſome bones, differs from that in the great cavities of others both in colour and conſiſtence. It is liquid, and of a red colour throughout; whereas

whereas the other is more folid, and is only red on its furface. This difference is owing to the blood-veffels which run thro' each membranous cell, whereas the *Marrow* in the great cavities feems to be furnifhed with them in the common membrane only. Many of thofe medullary cells are likewife divided by the bony filaments of the cavernous fubftance; and thefe fmall filaments, as well as thofe of the reticular texture, are covered by portions of the medullary membrane, as by a periofteum.

The medullary membranes may be feparated from the liquor which they contain, by fteeping the whole mafs in very hot water, and afterwards compreffing it by gentle degrees. But it is to both thefe fubftances, taken together, that the anatomifts give the common name of *Marrow*, not to either of them taken fingly. The medullary membrane is very fenfible, but not the juice, which is neceffary to be obferved, to underftand properly what is meant by the fenfibility of the *Marrow*. The *Marrow*, by its liquid and unctuous part, renders the bones in fome meafure pliable, and lefs brittle, as it continually pervades their fubftance in fmall degrees: This continues to old age, and then the bones, being deprived of their *Marrow*, become very brittle.

In the bones of the offa innominata, there are no internal large cavities; but their fubftance being cellulous or cavernous, they contain no medullary mafs, but their cells are all moiftened with a medullary juice, which diftils inceffantly through the membrane with which they are lined. In the os femoris the *marrow* lies in a large mafs, in the middle cavity of the bone, and in fmall diftinct clufters in the cells of each extremity. The firft is penetrated at different diftances by the bony filaments, and is thereby fuftained in all violent motions and fhocks, as running, leaping, and the like. In the bones of the leg the difpofition is exactly the fame; and in the bones of the foot, the *Marrow* is fuitable to their internal ftructure, and is lodged in moleculæ, in the cavernous portions, and in maffes in thofe which have cavities to receive them. Thus the *Marrow* of all the tarfal bones is difperfed in moleculæ, becaufe their internal ftructure is fpongy. In the metatarfal bones, and firft phalanges of the toes, it is difpofed in the fame manner as in the tibia and fibula, that is, it lies in moleculæ in the extremities, and in their middles in greater or leffer maffes, according to the fizes of the cavities. In the other phalanges, which are entirely fpongy, it is accordingly difpofed in moleculæ. In the vertebræ, fternum, and ribs, the internal ftructure of all which is cellular and fpongy, the *Marrow* is contained only in fmall feparate portions, and is no other than a red medullary juice. The bones of the head alfo being in like manner cellular in their internal ftructure, contain alfo their *Marrow*, in like manner, in diftinct portions, and lying in membranous cells in the diploe. *Winflow*'s Anatomy, p. 118, 136, 150, 152.

The tranfpiration of the unctuous matter of the *Marrow* is not confined to the time of the animal's life, it is even carried on in the dead carcafs, and is one great obftacle to the whitening and cleaning the bones in a fkeleton; for if there be not an opening made at one end of a bone, and the *Marrow* wafhed out of the whole bone at this aperture, by means of proper liquors injected with a fyringe, the bone, though made ever fo white at firft, will certainly turn yellow afterwards, by this tranfpiration of the *Marrow* contained within it, which certainly happens on the leaft heat of the weather, or otherwife. For this reafon it is alfo, that the workmen who ufe bones always cut them longitudinally in two, and take out all the *Marrow*, and even all the fpongy fubftance of the bone, which might be fuppofed to contain it, otherwife they know that the heat of any one's hand will turn their works yellow, tho' ever fo white when firft made. It is to be obferved, that there are in the hollow bones feveral fmall apertures thro' which there pafs blood-veffels, which go from the membrane enclofing the *Marrow*; whence it appears that the bones are indeed nourifhed from within as well as from without, though that be not by the *Marrow*, but by the blood-veffels only: Thus the two tables of the fkull are evidently nourifhed; the external one by the veffels of the pericranium, and the interior by the branches of thofe veffels which are fpread along the *dura mater*.

It has been fuppofed that the quantity of *Marrow* increafed in the bones according the increafe of the moon; but this has been found a wholly erroneous opinion, the increafe of the *Marrow* in all the bones depending on the quantity of nourifhment, and the ftate of reft which the creature is allowed.

The fenfation of the *Marrow* has been a point very varioufly fpoken of. When a limb has been taken off, and the *Marrow* is left bare, if any thing touch it roughly, the patient feels an exquifite pain. Some had fuppofed that this fenfation might rather arife from the membranes, than from the fubftance of the *Marrow*: This, however, was put beyond all doubt by a curious, tho' very cruel operation, performed before the Paris academy. A living animal had its leg taken off before the academy, and the end of the bone left very bare, the membranes were all carefully removed, to the exquifite pain and torture of the creature; and when the pain of this was over, the end of a ftyle was plunged into the *Marrow*, without touching any other part whatever, and the creature, on this, expreffed as violent a fenfation of pain as from any of the former operations: This was repeated feveral times, and always with the fame event; fo that it is very evident that the *Marrow* is, in its natural ftate, highly fenfible of pain; and how much more may it be fo in diftempered bodies! Mem. Acad. Par. 1700.

The antients fuppofed that the *Marrow* ferved for the nourifhment of the bones; and their reafons for believing it were, that they faw no blood-veffels enter the fubftance of the bones, by which they could be nourifhed, all the veffels of that kind, which they could difcover, going directly into their cavities, where the blood they contained feemed to undergo a fort of concoction, which converted it into *Marrow*, and by that means rendered it fit nutriment for the bones; and they obferved, in proof of this, that the longer any bone was, and the more violent ufes it was intended for, the larger was its cavity for the containing this nutritious matter.

Thefe reafons, though they carry a great fhew of probability, yet are eafily refuted by accurate obfervation. We fee, in young fubjects, a vaft number of blood-veffels diftributed thro' the fubftance of the bones, the texture of which, at that time, is lax and fpongy. It is alfo to be obferved, that there are many bones in the human body, as well as in brutes, which, according to this fyftem, could not be nourifhed at all, fince they contain no *Marrow*. Of this kind alfo are the horns of deer, and many other creatures, which, tho' they contain no *Marrow*, yet grow very vigoroufly. There are alfo other bones which are hollow, yet are only cloathed with a glandulous membrane; fuch are the cavities between feveral parts of the two tables of the fkull: And in the elephant, the foliaceous bones, which are in the place of the diploe, contain no *Marrow*, and are only covered with a membrane, which has feveral blood-veffels fcattered through it. The hollows of thofe bony fubftances alfo which compofe the claws of crabs, lobfters, and the like, contain no *Marrow*, but only the mufcles, whofe office it is to move thofe parts; and yet all thefe grow, and are nourifhed, as well as thofe bones which contain ever fo much *Marrow* in their cavities. In fine, it may be well concluded, that it is not for the fake of containing *Marrow*, that the bones are made hollow, but merely that they may be lighter, and more fit for motion. Mem. Acad. Par. 1700.

Obfervation gives abundant proofs, that a great quantity of the *Marrow* continually tranfpires through the folid fubftance of the bones, and in this action it is of great ufe, though not in the nourifhing, yet in the preferving the bones, its oily and unctuous matter foftening the rigid fibres of which the bone is compofed, and rendering them more fupple, foft, and flexile, and confequently the whole bone much lefs liable to break.

MARRUBIASTRUM, baftard *Horehound*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf, and is of the labiated kind. The upper lip is hollowed in the manner of a fpoon, and the lower is lightly divided into three fegments. The piftil arifes from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower. It is furrounded alfo by four embryos, which afterwards become as many feeds of a roundifh fhape, ripening in a fort of open cafe, which was the cup of the flower. There is, befide thefe marks, alfo a peculiar face in the flower of this plant, by which it is, at fight, diftinguifhed from the galeopfis.

The fpecies of *Marrubiaftrum*, enumerated by Mr. Tournefort, are thefe: 1. The common *Marrubiaftrum*, called by fome, the Germander-leav'd Ironwort, or Sideritis. 2. The marfh ftinking *Marrubiaftrum*. 3. The white-flowered fideritis-leav'd *Marrubiaftrum*, with prickly flower-cups. 4. The fideritis-leav'd *Marrubiaftrum*, with prickly cups, and yellow flowers, with edges of a blackifh purple. 5. The motherwort-leav'd *Marrubiaftrum*. 6. The American *Marrubiaftrum*, with the flowers collected into heads, and with a fweet fmell like that of baum. *Tourn.* Inft. p. 190.

MARRUBIUM, *Horehound*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf, and is of the labiated kind; the upper lip ftands erect, and is divided into two horns; the lower is divided into three fegments. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. It is furrounded by four embryos, which afterwards become four oblong feeds, and are contained in a fort of open capfule, which was before the cup of the flower. *Tourn.* Inft. p. 192.

The fpecies of *Horehound*, enumerated by authors, are thefe: 1. The common white *Horehound*. 2. The hairy white *Horehound*. 3. The broad and roundifh-leav'd exotic *Horehound*. 4. The fhort-leav'd white *Horehound*. 5. The narrow-leav'd white *Horehound*. 6. The procumbent Spanifh *Horehound*, with ftellated and prickly flower-cups. 7. The procumbent Spanifh *Horehound*, with filky and filvery leaves. 8. The ftinking *Horehound*, as we call it, is the *ballote*, a different genus of plants; and the water *Horehound*, which is the *lycopus*, is alfo to be feen under its proper head.

Marrubium is faid to be an attenuant and refolvent; it is famous for the relief it gives in moift afthmas, and in all dif-

cafes of the breaft and lungs, in which a thick and vifcous matter is the caufe. It is alfo capable of doing great good in many chronic complaints, where the caufe is of the fame kind. At prefent, however, it is very little ufed in the fhops. There ufed to be a compound fyrup of it, which is now out of ufe. See the article ASTHMA.

MARSHMALLOW, *Althæa*, in botany, the name of a genus of plants, the characters of which are the fame with thofe of the mallow, excepting that this has hairy or hoary leaves. See the article MALLOW.

The fpecies of *Althæa* or *Marfhmallow*, enumerated by Mr. Tournefort, are thefe: 1. The common *Marfhmallow*, the *Althæa* of all the old medicinal writers. 2. The angular-leav'd *Marfhmallow*. 3. The rounder-leav'd *Marfhmallow*. 4. The fhort blunt-leav'd *Marfhmallow*. 5. The round-leav'd hoary fhrubby *Marfhmallow*. 6. The great-flowered *Marfhmallow*. 7. The fharp-pointed-leav'd tree *Marfhmallow*, with fmaller flowers. 8. The round-leav'd Spanifh tree *Marfhmallow*. 9. The Portugal tree *Marfhmallow*, with round undulated leaves. 10. The larger-leav'd lefs hairy Portugal tree *Marfhmallow*. 11. The Venetian fea tree *Marfhmallow*, the common *malva arborea* of authors. 12. The French tree fea *Marfhmallow*. And 13. The Spanifh *Marfhmallow*, with undulated leaves. *Tourn.* Inft. p. 97.

The parts of *Althæa*, ufed in medicine, are the leaves and roots. The leaves, by decoction, afford a foft mucilaginous fubftance, good in all complaints arifing from acrimony; of great fervice in dyfenteries, *&c.* where the *mucus* of the inteftines is raked off, and in many kinds of colics. It is alfo found of ufe in obftructions of the urinary paffages, ftranguries, heat of urine, *&c.* and is, by fome, held a great fecret for the cure of a *gonorrhœa*. Ray and others alfo fpeak of it as a pectoral; of ufe in coughs, and alfo pleurifies.

Marfhmallow root is a very valuable medicine. It is emollient and diuretic, and gives great relief in diforders of the kidneys and bladder, whether arifing from acrimony of the urine or gravel. It is good alfo in all diforders of the breaft and lungs, arifing from a thin acrimonious phlegm. In both which cafes, a decoction of the frefh root is the beft way of giving it. In diarrhœas and dyfenteries, a ftrong decoction of *Marfhmallow*-root, given clyfterwife, is alfo of great ufe. Externally, in form of a cataplafm, it is excellent for foftening and maturating hard tumours.

The fyrup of *Marfhmallows*, is lefs efficacious than the decoction; on account of the fugar in the former, which makes an improper mixture with medicines of the mucilaginous kind.

Ointment of *Marfhmallows*, called *Unguentum Dialthææ*, is applied to tumours and inflammations, as an emollient and fuppurative; which qualities it derives from the mucilage of the plant, being boiled a long time with the oil, before any of the other ingredients are mixed.

The *Emplaftrum Diachylon* receives much of its virtue from the fame plant.

The *Althæa* of the antients was plainly a different plant from that which we call by that name. Our *Althæa*, or *Marfhmallow*, is a very common plant, and grows in watery places, principally near the fea; but the *Althæa* of the antients was a fcarce herb, and grew in the barren defarts of Arabia, Afia, and the ifland of Sicily. Theophraftus fays it was found in no other place. The Arcadians called it, the *wild Mallow*; and only the people who ufed it in medicine called it *Althæa*. Theophraftus gives us this account of it, and adds, that its flowers are yellow; a circumftance in which it wholly differs from any of the accounts of later authors of the *Marfhmallow*. and from the plant itfelf, which we know by this name, its flowers being white. Diofcorides gives the fame account of the colour of the flower, and adds, that it was like a rofe in fhape: And other authors fay, that its flower was like a rofe, but do not mention whether that likenefs confifted in the fhape or colour. Others have recorded the liknefs of a rofe, and applied it to the colour of this flower, calling it a little flower, of the pale colour of a rofe. Thefe authors may, probably, have adapted the defcriptions of the antients, in the cafe of the rofe-like flower, to the common *Marfhmallow* of our times; but the defcriptions, as we find them in the antients, feem rather to refer us to the *Abutilon*, or yellow *Mallow* kind, than to our own *Althæa*. *Theophraft.* l. 9. c. 15. See the article ABUTILON.

MARSHY *Lands*, a name given by our farmers to a fort of pafture land, or grazing ground, which lies near the fea, rivers, or fens.

As to lands lying near rivers, the great improvement of them is their being overflowed, which brings the foil of the uplands upon them, fo that they need no other mending, though kept conftantly mowed. The great inconveniency of thefe lands, is their being fubject to floods, which high hills near the fides of rivers, and the long courfe of them, befpeak to be frequent. And though the richeft land generally lies near fuch rivers, yet there is the greateft danger of the crops being fpoiled, efpecially when they are not enclofed; and therefore cannot be fed with cattle. This, when feeding bears any thing of a price, would be the very beft way of managing thefe uncertain lands; and enclofing them would be highly beneficial, on this account. *Mortimer*'s Hufbandry.

The *Marfh*-lands in Lincolnfhire, and many other parts of England, produce a fort of grafs, which feeds fheep in a better manner than that of almoft any other land, in regard to their fize, and the quantity of wool. The fheep about Grimfby, and fome other places in this county, produce fuch lufty wool, or, as they call it, wool of fo large a ftaple, that three or four fleeces ufually make a tod of twenty-eight pound weight. Several hundred loads of this wool are yearly carried from thefe places to Norfolk, Suffolk, and other parts of the kingdom, for the cloth manufacturers. They fend this in large packs, which they call pockets, each containing about five and twenty hundred weight. Phil. Tranf. N°. 223.

When *Marfh*-lands lie flat, it is neceffary for the owner to keep all the water he can from them. The fea water, in particular, is to be kept from them as much as poffible; and this is ufually done at a very great expence, by high banks and walls.

Two things greatly wanting in thefe lands in general, are good fhelter for the cattle, and frefh water. The careful farmer may, however, in a great meafure, obviate thefe, by digging, in proper places, large ponds to receive the rain water, and by planting trees and hedges in certain places toward the fea, where they may not only afford fhelter to the cattle, but keep off the fea breezes, which often will cut off the tops of all the grafs in thefe places, and make it look as if it had been mowed.

Thefe lands fatten cattle the fooneft of any, and they preferve fheep from the rot. It would be a great advantage to them, if there were raifed, in the middle of every large *Marfh*, banks of earth in a crofs, or in the form of two femicircles, and thefe planted with trees; thefe would ferve as a fhelter for cattle, let the wind blow from what quarter it would, and would foon repay the expence of making. *Mortimer*'s Hufbandry.

There are, in different parts of England, very large quantities of land upon the fea coafts that would be worth taking in, though no one has yet thought of doing it. The coafts about Bofton, Spalding, and many other parts of Lincolnfhire, give frequent inftances of this, where the fea falls from the land, fo that on the outfide of the fea walls, on the owfe, where every tide the falt water comes, there grows a great deal of good grafs, and the owfe is firm to ride upon when the water is upon it.

This owfe, when taken in, hardly finks any thing at all, and they dig the walls from the outfide of it, all the earth they are made of being taken from thence, and the fea, in a few tides, filling it up again: And though the fea, at high water, comes only to the foot of the bank, yet once in a year or two fome extraordinary tides go over the banks, though they are ten foot high. Thefe banks are fifty foot broad at the bottom, and three foot at the top; and the common price of making them is twenty-fix fhillings a pole, the earth being all carried in wheel-barrows, and the face toward the fea, where the greateft flope is, being turfed. *Mortimer*'s Hufbandry.

MARSILÆA, in botany, the name by which Linnæus has called the pepper-grafs, called by the Englifh botanifts, *gramen piperinum*; by Vaillant and others, *pilularia*; and *falvinia* by Micheli. The characters are thefe: It is one of the *cryptogamia*, or thofe plants which perform their fructification in fecret. The male flowers are very numerous, and ftand on the leaves without any pedicles. Thefe have no cup, but are each only a fingle filament, or receptacle, of a hemifpherico-convex form, with four pointed antheræ, which are long, erect, and fpirally twifted. The female part of the fructification has no cup or petals, but confifts of a round quadrilocular fruit, which contains a vaft number of roundifh feeds. *Linnæi* Gen. Plant. p. 508. *Micheli*, p. 58. *Vaill.* Bot. Par. 15. 6. See the article PILULARIA.

MARSUIN, in zoology, a name by which many have called the *phocæna* or *porpeffe*, a fifh too often confounded with the dolphin. *Willughby* Hift. Pifc. p. 31. See the articles DELPHINUS and PHOCÆNA.

MARSUPIALE, in natural hiftory, a name given by Tyfon to the creature commonly called, the *poffum*, or *opoffum*. The peculiar diftinction of this creature from all others, is its having a pouch, or *marfupium*, under its belly, into which it receives its young in time of danger. This has given occafion to its name *Marfupiale*, but it is more generally called *opoffum*. See the article OPOSSUM.

MARSUPIALIS *Mufculus*, in anatomy, a name given by Cowper, and fome others, to a mufcle of the thigh, called alfo by fome, *burfalis*. It is that mufcle, called by Albinus, Winflow, and the generality of modern authors, *obturator internus*.

MARSUPIUM *Carneum*, in anatomy, a name given by Spigelius, Cowper, and fome other authors, to certain mufcles of the thigh, called by the French writers, *les petits jumeaux*, and by Albinus, *gemini*. Vefalius does not efteem them feparate mufcles, but calls them only *carneæ portiones decimo femur moventium mufculo attenfæ*, flefhy portions affixed to the tenth mufcle of the thigh.

Riolan, who calls the *pyriformis*, or pyramidal mufcle of the thigh, the *quadrigeminus*, or *quadrigeminus prior*, calls thefe the *quadrigemini fecundi & tertii*. They are fometimes diftinct, fometimes they grow together.

MARTEAU, the name given by French naturalifts to a peculiar fpecies of oyfter, called alfo *malleum* by others. It is one

of

of the most curious shells in the world. Its figure is that of a hammer, with a very long head, or rather of a pick-ax. It has a body of moderate thickness, and two long arms. It is of a brownish colour, with a beautiful tinge of a violet blue. Notwithstanding the strange shape of these shells, they close very exactly. See the article OSTREA.

MARTIALES *Flores*. See the article FLORES *Martiales*.

MARTES, the *Martin*, or *Martlet*, in the history of quadrupeds, the name of a creature of the weasel kind, called also by some *Fogua*. There are two species of this creature, the one called the *Martes Abietum*, or fir *Martin*, the other the *Martes Fagorum*, or beech *Martin*. The beech *Martin* is distinguished from the other by having a larger and blacker tail, and being all over of a darker colour, and by being white on the throat, whereas the others are yellow; but the species are scarce kept up distinct, the creatures mixing with one another in the breed. When distinct, the beech *Martin* is found to be a much tamer creature than the other, and may be kept about houses like a cat; and often lives of its own accord about houses, and among old walls. Their skins make a valuable furr; and that of the fir *Martin*, or yellow kind, is much the most valuable. *Ray*'s Syn. Quad.

The *Martin* is of the size of a cat, but longer bodied; its legs also are shorter, and its claws less sharp, and shorter. Its whole body is covered with hair of a yellowish black, except only the throat, which, in the beech *Martin*, or tame kind, is white; and in the wild kind, or fir *Martin*, yellow. Its teeth are sharp and strong, and the dog-teeth, in particular, stand out a great way.

Gesner once kept one of the beech *Martins* tame like a dog, which would go out with him, and run about to the neighbours houses, always returning carefully home again, and would play like a cat, lying on its back, and biting in jest, but never hurting any thing. *Gesner*, de Quad.

This creature leaves so strong a scent, that the hounds, when out in a morning, will often take it, and make a noble cry. The chace, in this case, is very good while it lasts, but it is very perplexed; for the creature is not able to run long; and when she is tired, she gets up into a tree; the hounds often lose her on this occasion; but if she is spied up in the tree, she is to be hunted down with sticks, &c. When killed, the hounds are not to be suffered to eat her flesh, for it is unwholesome. See Tab. of Quadrupeds, N°. 22.

MARTICHORA, in natural history, the name given by the antient Greeks to the animal which we call the *Mantichora* or *Man-tyger*. See the article MANTICHORA.

MARTIN, in zoology. See the article MARTES, supra.

MARTINAZZO, in zoology, the name of a species of water fowl, of the larus or gull kind, and called by the Dutch, the burgomaster of Greenland; by the Cornish people, the *waggell*, or the *great grey gull*. It is a large bird, usually weighing a pound and half. It is all over of a mottled colour of brown, grey, and white; but is much darker on the back than on the belly. The back and wing feathers are all brown in the middle, and grey at the edges; but those of the rump are mostly white. They say that this gull will follow the smaller lari, and persecute and terrify them till they void their food in excrements half digested, which he afterwards picks up, esteeming it better than fresh food. *Ray*'s Ornithology, p. 266.

MARTINO *Pescatore*, in ichthyology, a name given by Salvian, and some others, to the *Rana Piscatrix* of authors; the *lophius* of Artedi. See the article LOPHIUS.

MARTIOBARBULI, among the Romans, a designation given to soldiers, who carried leaden balls to annoy the enemy with. *Pitisc*. Lex. Ant. in voc.

MARTIORA, or MARTICORA, in natural history, the name which the antient Greeks gave to the animal which the Romans called *Mantichora*, and we, from a corruption of that word, the *man-tyger*. See the article MANTICHORA.

MARTIS *Arbor*. Beside the common *Arbor Martis*, which is but a poor resemblance of the *Arbor Dianæ*, Mr. Lemery has found a method of making a saline or vitriolic one, which is of greater beauty than any other metallic vegetation, and which differs from the generality of them, in that it is produced above the surface of the liquor, not under it, and buried in a fluid as they are. Mem. Acad. Par. 1707.

The method by which he first made this beautiful production was this: He dissolved steel filings in spirit of nitre, and adding to the solution oil of tartar *per deliquium*, when the fermentation was over, there arose beautiful vegetations above the surface of the liquor, many of which expressed trees and plants, not only in their leaves and branches, but even in their roots, the small fibres which represent them in this vegetation being truly hollow, and seeming to serve the office of roots in conveying up the fluid matter to the other parts, there to condense into leaves and branches.

In the making the solution of iron for this process, there is always a great quantity of red vapours thrown up out of the mouth of the vessel; if these are saved, by making the solution in a cucurbit, they are found to be a weak spirit of nitre, impregnated with the sulphur of iron; and this spirit serves much better for the making this *Arbor Martis* than the plain spirit. Mr. Lemery observing this, distilled spirit of nitre on purpose for this use, from a solution of a large quantity of iron in the same spirit.

This new spirit evidently contained many of the sulphureous particles of the iron, and produced infinitely more beautiful vegetations than the plain kind. Nor is it wonderful that it should do so, since the success of the process seems wholly to depend on the quantity of the sulphur of iron which is concerned in it. The solution of iron in spirit of nitre, whether the common kind, or this prepared on purpose for this vegetation, is of a reddish colour, and when the oil of tartar is mixed with it, the vegetation is more or less perfect according to the proportions, as will be learned by experiment, and very often the whole liquor, or nearly the whole, raises itself up to the top of the vessel in form of beautiful branches. Mem. Acad. Par. 1707.

The oil of tartar, when first mixed with the solution, causes an effervescence, and when this is over, the liquor becomes quiet and clear again, but is of a deeper red colour than before. Soon after this the vegetations begin to form themselves, by small crystals, which appear upon the surface of the liquor. These are extremely small and slender, and they increase in length continually by the addition of others at their bottoms, thrusting them farther up, till at length they form threads or filaments, which arise out of the surface of the liquor, and thence diverge and divaricate into all the beautiful variety of trees, bushes, and herbs. These nicely adhere to the internal surface of the glass, and, when they have risen to its verge, fall over it, and run down the outside in the same manner, so as beautifully to represent vines, ivy, or other creeping plants running along a wall. Many of the first formed filaments, in this case, encrease greatly in size, often becoming, at length, as thick as a writing quill; and these are always hollow within, and resemble so many pipes. They are so arranged at the bottom of the glass, round the surface of the liquor, as to support the rest of the vegetations. The least heat melts and destroys all these vegetations; barely touching them with the finger being sufficient to resolve them into the liquor from which they arose.

The essential substance of this beautiful vegetation is a mixture of iron with salt petre. The differences in the time and manner of the formation of the branches, does not depend wholly upon the different proportions of the liquors, but frequently on the temperature of the air; and sometimes on the shape and size of the vessels. When the vegetation is first formed, it is usually less beautiful and distinct than afterwards. This is owing to its being too humid, the abundant moisture swelling the parts, and injuring their figure. When it is dried to a certain degree, it appears in all its beauty; and after this it usually soon changes for the worse, the leaves appearing as if faded, and their red colour being changed to a faint orange colour.

The same vegetations which have been once raised, will not, on melting them in water, vegetate again; but only form a number of flat and thin crystals. This is the general event of the operation; yet sometimes, when the solution has been suffered to stand till it acquires a deep red colour, a part of the salts will rise up from the surface, in something like their pristine form; but this is only a small portion of the whole that does it, the greater part remaining at the bottom of the vessel, in form of rigid crystals.

The author of this curious discovery acknowledges that it was owing to accident; for that he had a very different thing in his thoughts, when he mixed the oil of tartar with the solution of iron; but as so beautiful an effect appeared, he was at the pains to vary all the ingredients, in different mixtures afterwards, to try what differences would be produced. He mixed the volatile alkalis instead of the fixed; other acids instead of spirit of nitre, and other metals instead of iron, in the several processes, the events of which were as follow:

Spirit of sal armoniac added to the solution instead of oil of tartar, precipitates a yellow powder to the bottom of the vessel, but does not make the least tendency towards vegetating. All the other acids were tried also in the place of spirit of nitre, and though all of them made the liquor begin to rise sooner than that, yet they only produced a saline crust over the surface, without any tendency to vegetation. Nay, spirit of nitre itself cannot form the vegetations, if impeded by a mixture of any of the other acids. Distilled vinegar, used instead of these acids of the mineral kingdom, produced only a a set of crystals which crossed one another, without any appearance of vegetation. Copper seemed the metal most likely to succeed instead of iron, as being, of all the others, the most sulphureous; but the event, on trial, by no means answered the expectation, and not the least tendency to vegetation was found on treating it in this manner. Copper and iron, mixed together, produced only a low and very poor vegetation, evidently shewing that the copper did nothing but impede the iron from shewing itself in its natural beauty. Quicksilver succeeds no better than copper; there is only formed, by long standing, a thin crust upon the surface of the glass, whence the liquor has evaporated, and the mercury is finally found precipitated to the bottom of the vessel. Bismuth was also tried

tried with the same circumstances, but without success. Mem. Acad. Par. 1707.

MARTIS *Lixivium*. See the article LIXIVIUM *Martis*.

MARTLETT, in zoology, a name used by some for the *Martin*, a creature of the weasel kind. See the article MARTES.

MARTNETS, in a ship, small lines fastened to the leetch of a sail, being reeved through a block on the top-mast head, and coming down by the mast to the deck. Those *Martnets* which belong to the top-sails are fastened after the same way to the heads of the top-gallant masts, but their fall comes down no farther than the top, when it is haled. The word is, *top the Martnets*; *i. e.* hale them up. Their design is, in furling the sail, to bring that part of the leetch which is next the yard-arm close up to the yard, that so the sail may furl up the closer.

MARTYNIA, in botany, the name of a genus of plants, the characters of which are these: The perianthium is composed of one leaf, divided into five segments, which are pointed at the ends, and serrated at the sides; three of these stand erect, the other two are reflex. The flower consists of one petal, and is of the bell-fashioned kind. The tube is large, inflated, and open, and contains a honey juice in its base. The limb is small, and is slightly divided into five segments, the lower of which is larger than the rest, and is more erect and crenated at the edges. The stamina are four capillary and and crooked filaments, one pair of them being bent between the other, and returning back again; and between the upper pair there appears the rudiment, as it were, of another filament, which terminates in a point. The antheræ are connected together, and bend toward each other at the points. The germen of the pistil is oblong, and placed beneath the cup. The style is short and simple. The stigma is flat. The fruit is an oblong, gibbous capsule, of a square figure, each side having two furrows on it. It is pointed at each end, and, when fully ripe, opens at the top into two parts, and is found to enclose four oblong seeds in a sort of square case or nucleus. The bending of the stamina is a very singular thing in this plant; but it does not happen till the apices have burst, and discharged their farina. *Linnæi* Gen. Plant. p. 292. *Martin.* 1. 42. Hort. Malab. 9. 53.

The plant called by Houston *martyniæ species*, is properly another genus, and has been since described by the accurate Linnæus under the name of *craniolaria*. *Houston*, A. A. See the article CRANIOLARIA.

MARTZIAN, in the materia medica, a word formed by the modern Greek writers, to express a sort of sea plant, used in painting, dying, &c.

The word is formed of the Arabian name *margian*, by changing the *g* into *tz*, a very common practice among these writers, and of which we have numerous other instances. It is generally supposed that the *Margian* of the Arabs, and consequently the *Martzian* of the Greeks, is coral. But all accounts of the antients disagree with this, and shew that the plant, meant by these names, is the *fucus thelassius* of the old Greeks, a red kind of sea weed, growing upon the rocks, and used in painting and dying. The antient Arabs all used the word in this sense. But the modern Greeks have been led away by the errors of the successors to the Arabians; so that they use it as a name for coral.

MARU, in botany, a name by which Dodonæus and some others have called the *cerinthe*, or *honey-wort*. Ger. Emac. Ind. 2.

MARUBIUM, *Horehound*, in botany, &c. See the article MARRUBIUM.

MARVELL *of Peru*, a name given to the plant more usually called *jalap*. See the article JALAP.

There are many species of this beautiful plant propagated in flower-gardens. They are all to be raised by sowing their seeds in March, on a moderate hot bed. When they come up, they are to be transplanted to another hot bed, where they are to be set at ten inches distance; and when they are grown to about a foot high, they are to be transplanted into pots filled with light earth, and set in the shade till they have taken root, after which they may remain abroad till October. The stronger kinds should be then removed into the greenhouse, where they must be frequently watered during the winter, and in summer they must be often pruned to keep them in shape.

They flower in June, and continue flowering till the frost prevents them. Some take up the roots when the stalks are dead, and lay them up in sand till spring, when they are planted again in pots, and plunged into a moderate hot bed to facilitate their taking root. And the plants, from the roots of the former year, will always flower much stronger than the seedlings of the same year's growth. *Miller's* Gardener's Dict.

MARUM, the herb *Mastic*, in botany, a name given to one of the species of *thymbra*. See the article THYMBRA.

It is a plant very common with us in the gardens of the curious, and is propagated by planting cuttings in any of the summer months on a bed of fresh light rich earth, where they are to be carefully watered and shaded till they have taken root; after which they may be removed either into pots or borders. But the greatest difficulty attending the keeping this plant, is the preserving it from cats, which will come a great way, and tear them to pieces. It is observed, however, that though these animals never spare a plant that grows single, they will not meddle with it when planted in large clusters, which is indeed the only way to save it. *Miller's* Gardener's Dict.

The common herb *mastic* is a cephalic, and is of service in all disorders of the nerves. It has also an astringency, by means of which it is of service in hæmorrhages of all kinds, particularly in profluvia of the menses.

MARYGOLD, *Caltha*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the radiated kind; its disk is composed of several floscules, and its outer circle of semi-floscules; these are all placed upon the embryo seeds, and contained in a common cup. The The embrios finally become flat, crooked, and marginated capsules, containing a long shaped seed.

The species of *Marygold*, enumerated by Mr. Tournefort, are these: 1. The common *Marygold*, with pale yellow flowers. 2. The common *Marygold*, with deeper yellow flowers. 3. The common *Marygold*, with reddish yellow flowers. 4. The tallest many-flower'd *Marygold*. 5. The common great many flower'd *Marygold*. 6. The great many flower'd *Marygold*, with bright yellow flowers. 7. The great many flower'd *Marygold*, with honey-colour'd flowers. 8. The *Marygold* with bending flowers. 9. The great flower'd proliferous *Marygold*. 10. The great proliferous *Marygold*, with honey-coloured flowers. 11. The proliferous *Marygold*, with smaller flowers. 12. The *Marygold* with variegated flowers. 13. The wild or field *Marygold*. 14. The smallest dwarf *Marygold*. 15. The African *Marygold*, with flowers white within, and of a violet blue on the outside. 16. The wild Portugal *Marygold*. 17. The woolly sea Portugal *Marygold*. *Tourn.* Inst. p. 498.

The flowers of the common *Marygold* are cordial and alexipharmic; they promote sweat, and are good to throw out the small-pox, or any other eruption. They also promote the menses, and are so far aperient, that they are found of service in the jaundice, and in indurations of the spleen. The midwives burn them under women whose labour does not come on properly, and suppose they are of great virtue in promoting the pains. They also distil a water from them, as a remedy for sore eyes; but these last virtues are not so well warranted.

African MARYGOLD. See the article TAGETES.

Corn MARYGOLD. See the article CHRYSANTHEMUM.

Marsh MARYGOLD. See the article POPULAGO.

Zoophyte MARYGOLD, in natural history, the name of a species of sea animal, of a very beautiful kind, and of the nature of those commonly called *Zoophytes*, or plant animals, by the old naturalists. In St. Lucy's parish, in Barbadoes, there is a cave in which is a bason of very clear salt water; and in the midst of this bason lies a stone, which has been for many years found to be the habitation of a great number of animals of this species.

The stone is always covered with water; and from small holes in its sides, in several parts, there appear, at all times of the year, a number of creatures representing the flowers of some of the radiated plants, and particularly of the common *Marygold*: They are yellow, and seem compofed of a very great number of petals. These, in their natural state, are all regularly and beautifully expanded; but as soon as any thing disturbs them, if it be only the motion of a stick that comes within three or four inches of them, they in an instant close all the leaves up together, and the whole body, flower, stalk and all, is retracted back into the hole of the stone; but if the water be left a few minutes undisturbed again, they will appear and expand themselves in the former manner.

When they are nicely observed, there is a yet farther resemblance of a flower in their structure; for there arise from the center of the body certain oblong bodies, which very naturally resemble the stamina arising from the center of a flower; but these have evidently the powers of animal limbs; for they no sooner appear, but they dart themselves about to the verge of the flower in several directions, and are plainly busied in search of prey. They are composed of several joints, and the creature often makes them meet in the manner of a forceps, to lay hold of any thing it pleases. These parts, however, seldom appear thus exerted any long time together, but are, after a time, received back into the body.

These arms may easily be conceived to be of use to draw in the prey within the compass of the body of the animal; and as soon as it is there, the same contraction of the several rays which serves them to escape danger, and bury themselves in the cavity of the stone, will also serve to hold fast the prey till the creature has fed on it.

Beside these large yellow radiated *Zoophytes*, the top of the stone usually affords a number of others of a blue colour, which stand among a sort of vesicles of water bladders, disposed like clusters of grapes. Philos. Transf. N°. 470. p. 591.

Marygold *Flower*, in zoology. See the article Regulus *Criſtatus*.

MASARINO, in zoology, a name given by the Portugueſe, in the Braſils, to a large bird of the curlew kind, approaching to the gooſe in ſize; and more commonly known by its Braſilian name *curicaca*. See the article Curicaca.

MASCHARADA, in the Italian muſic, is applied to muſic compoſed for the geſtures of pantomimes, buffoons, mimics, and ſuch groteſque characters.

MASLACH, the name of a medicine greatly in uſe among the Turks, and called alſo *Anſion* or *Amphion*. It is prepared principally of opium. They take a dram of it at a time, and ſometimes two or three: They always uſe it when going to battle, and very often as a provocative to venery, as they do the crude opium.

MASLIN. See the article Bullimony.

MASORAH and Masorites. See the article Cabbalists.

MASSALIS, a word by which ſome of the chemical writers have expreſſed mercury.

MASSIMA, in the Italian muſic, is a note or character made in a long ſquare, with a tail to it; thus, . It contains eight ſemi-breves in common time. This character is diſuſed in the modern muſic, for they have found other ways to ſeparate the bars, and to mark the length of notes.

MASTED. A ſhip is ſaid to be *maſted*, when ſhe has all her maſts compleat.

Armed Mast, in a ſhip, one that is made of more than one tree.

Over-Masted, or *Taut*-Masted, is ſaid of a ſhip whoſe maſts are either too long or too big; which makes her lie too much down by the wind, and labour too much *a-hull*.

Spending a Mast, at ſea, is when it is broke by foul weather.

Springing a Mast, at ſea, is when it is cracked in any place.

Under-Masted, or *Low*-Masted *Ships*, ſuch whoſe *Maſts* are either too ſmall, or too ſhort: In which caſe ſhe cannot bear ſo great a ſail as ſhould give her true way.

MASTER (*Cycl.*)—Master *of a Ship of War*, the next officer to a lieutenant; he has under his care and direction every thing relating to the conducting and ſailing of the ſhip, as to determine the courſe ſhe is to ſail, command the ſailors, and give orders for ſteering, trimming and ſailing the ſhip. He is to keep the moſt accurate account of the ſhip's way, and be at all times able to give eſtimate, or prick off her place on the true ſea-chart; and is allowed mates to aſſiſt him in his office.

In merchantmen the *Maſter* is the chief officer.

Master *Load*, in mining, a term uſed to expreſs the larger vein of a metal, in places where there are ſeveral veins in the ſame hill. Thus it often happens, that there are ſeven, ſometimes five, but more uſually three veins or loads, parallel to each other, in the ſame hill. Of theſe the middle vein is always greatly the largeſt. This is called the *Maſter Load*; and the others which lie three, two, or one, on each ſide of this, are called the concomitants of the *Maſter Load*.

The general breadth of the *Maſter Loads*, in Cornwall, is from three to ſeven foot. They are ſeldom larger than this, except in certain peculiar places, as where all the veins meet together, as they ſometimes do, and form a knot, from which they ſeparate again, and each takes its peculiar courſe. The ſize of ſuch a knot is not eaſily determined, and it is uſually very rich in tin, or the other metal of the mine. The ſeveral parts, even of the *Maſter Load*, are not at all regular in breadth, but from ſix foot, it will, in ſome places, dwindle to one foot, or even to an inch broad, in a very ſmall ſpace; but the miners are not diſheartened at this, for they know it will ſoon grow wider again, unleſs really worked out. Phil. Tranſ. N°. 69.

The *Maſter Load* uſually lies in a hard rocky or ſhelfy ſtratum, made up of metalline matter, ſpars, mundic, and other unprofitable ſubſtances, or weeds, as the miners call them, and is, as it were, all along a continued rock; but has many veins and joints, as they are called. In ſome places the matter in which the ore lies is ſofter, and then it is much more eaſily worked. In Cornwall they uſually allow two ſhovel-men to three beele-men or pickers; but where the load runs in a ſofter ſubſtance, there muſt be a greater proportion of the ſhovellers or carriers away.

There is generally water found about the *Loads* of the metal. In moſt places it is met with at ſome feet deep from the *loady* ſurface; and it often runs through the heart of the *Load*, not in a direct channel, but windingly, in and out, inſenſibly through the veins and joints of the *Load*. When the miners have followed a *Load* to ſome depth, and the water begins to be troubleſome, as it generally ſoon is, if there be any in the work, they deſcend to the bottom of the hill, where they have that conveniency, and at the loweſt place begin as little a drift as the convenience of working or driving will permit, ſcarce half ſo big as that for a *Load*; they carry this on, on a level, till they come to the work itſelf. In this the uſe of the dial is needful, which they term *plumming* and *dialling*. See the article Dialling, *Cycl.* and Plumming, *Suppl.*

By this means the exact place of the work is known, where to bring the adit, or where to ſink down to make an air ſhaft. Though the water is troubleſome in the *Loads*, yet there is always one great convenience attending it; which is, that where there is water, there is never want of air for the reſpiration of the miners, and the candles always burn well. But it is alſo to be obſerved, that in a ſoft, looſe, quagmire country, the earth ſometimes falls in after the workmen, in ſuch a manner as, though it does not choak up the whole ſhaft, yet it ſo far ſtops it, as to render the current of air leſs free, and the miners find the utmoſt neceſſity of opening a ſhaft for air to reſpire from the ſurface. If the ſoil be ſo ſoft as not to be able to ſupport itſelf in the working, as is ſometimes the caſe in theſe wet clayey hills, it is neceſſary to prop it up, as they go on, with boards, poſts, and the like. This adds greatly to the expence of mining; but in the working a *Maſter Load*, it is often worth while. When the miners are out of heart at the trouble of walling and propping, on this occaſion, it ſometimes happens, that a dipping of the *Load* carries them down into a firmer ſtratum, and they are at once reliev'd from all that trouble and danger.

Master-*Wort*, in botany, *&c.* See the article Imperatoria.

Master-*Yaw*, a large *Yaw* ſometimes remaining after ſalivation. Se the article Yaws.

MASTICA *De ſobo*, in the materia medica, the name given by the Indians to the ſtone commonly known among authors by the name of *Pedro del Porco*, a ſort of bezoar taken out of the gall-bladder of an Indian boar. The Indians, and many of the European nations, eſteem this one of the greateſt medicines in the world in peſtilential diſeaſes, and the ſmall pox.

MASTIC (*Cycl.*)—The Arabian writers, Aviſenna and Serapio, in their chapters of the turpentine tree, often mention the lentiſk and its reſin, which they ſay was very much like the reſin of the common turpentine tree. But beſide this, Aviſenna has a peculiar chapter on *Maſtic*; whence it ſhould ſeem, that by the name lentiſk they do not mean the tree which produces *Maſtic*, as we do, but ſome peculiar ſpecies of the turpentine tree.

Aviſenna diſtinguiſhes two kinds of *Maſtic*, the one called *rumi*, and the other *cupti*: The *rumi* came from the iſland of Chios, and was white; the *cupti* was or a blackiſh colour, and was brought from Ægypt. See the article Lentiscus.

Mastic is alſo uſed as the name of an herb, otherwiſe called *Marum*. See the article Marum.

Mastiche *Terra*, *Maſtic Earth*, a name given by ſome of the old writers on the materia medica to the Chio earth, or *Terra Chia*. The reaſon of this ſtrange appellation ſeems to have been, that the fineſt *Maſtic* coming from the Iſland of Chios, had obtained the name of *Kio*, or *Chio*, and *Maſtic* and *Chia* being thus become, in one ſenſe, ſynonimous words, the uſe of them was, in this manner, carried much farther, and the earth of that iſland called by the name of the *gum*.

The Arabians ſeem to explain this very well, in their name of this earth; they not calling it *Maſtic earth*, but *thin beled Almaſtichi*, that is, *Terra Regionis Maſtichis*, the earth of the country where *Maſtic* is produced.

MASTICHINA, in botany, a name given by ſome authors to the herb maſtic, or garden *marum*. *Boer.* Ind. 156. See the article Marum.

MASTIGADOUR, or Slabbering-Bit, in the manege, is a ſnaffle of iron, all ſmooth, and of a piece, guarded with pater noſters, and compoſed of three halves of great rings, made into demi-ovals of unequal bigneſs, the leſſer being incloſed within the greateſt, which ought to be about half a foot high. A *Maſtigadour* is mounted with a head-ſtall and two reins. A horſe, by champing upon the *Maſtigadour*, keeps his mouth freſh and moiſt.

To put a horſe to the *Maſtigadour*, is to ſet his croupe to the manger, and his head between two pillars in the ſtable. Horſes that uſe to hang out their tongue, cannot do it when the *Maſtigadour* is on; for that keeps their tongue ſo much in ſubjection, that they cannot put it out.

MASTIGOPHORI, Μαστιγοφοροι, among the Greeks, certain officers appointed to preſerve the peace, and correct ſuch as were unruly at the olympic games. *Potter*, l. 2. c. 22. See alſo Mem. Acad. Inſcript. T. 1. p. 338, 339.

MASTON, in botany, a name by which Pliny and ſome other authors have called the *ſcabioſa*, or *ſcabious*, a blue-flowered plant, common among corn. *Ger.* Emac. Ind 2.

MATCHING, in the wine trade, the preparing veſſels to preſerve wines and other liquors, without their growing ſour or vapid. See the article Wine.

The method of doing it is this: Melt brimſtone in an iron ladle, and, when thoroughly melted, dip into it ſlips of coarſe linnen cloth; take theſe out, and let them cool. This is what the wine-coopers call *match*. Take one of theſe *matches*, ſet one end of it on fire, and put it into the bung-hole of a caſk; ſtop it looſely, and thus ſuffer the *Match* to burn nearly out; then drive in the bung tight, and ſet the caſk aſide for an hour or two. At the end of this time examine the caſk, and you will find that the ſulphur has communicated a violently pungent and ſuffocating ſcent to the caſk, with a conſiderable degree of acidity, which is the gas, and acid ſpirit of the ſulphur. The caſk may, after this, be filled with a ſmall wine, which has ſcarce done its fermentation, and bunging it down tight, it will be kept good, and will

will soon clarify. This is a common and a very useful method; for poor wines could scarce be kept potable, even a few months, without it. Nor could stums be prepared in large quantities without this help. *Shaw's* Lectures, p. 191.

MATER (*Cycl.*)—MATER *Metallorum*, in natural history, a name given by the Saxon mineralists, and those of some other places, to a peculiar kind of marcasite or mundic, which they suppose, according to the expression, to be the mother, or parent of metals.

The marcasite they call by this name is the common yellow kind, but in a foul state, it being usually mixed with some, poor ore of iron, or with some stony matter, which has made it concrete loosely and irregularly, and it is found sometimes formed into thin undulated plates, and sometimes into complex masses; but is always cavernous or spungy, or full of smaller or larger holes. These are often empty; but in some pieces they contain parcels either of pure native metals, or of rich ores. Pieces of native copper are found in some, and ores of iron and tin in others. And it is said in Saxony, that native silver, in thin plates, is found in some few.

MATERFILON, in botany, a name given by some authors to the *jacea nigra*, or common knapweed. Our English name *matfellon* seems a corruption of this. *Ger.* Emac. Ind. 2. See the article JACEA.

MATERIA (*Cycl.*)—MATERIA *Chemica*, a term used by authors to express such bodies as are the peculiar objects of chemical experiments.

The *Materia Chemica*, in a larger sense, takes in all the bodies of the globe, all these being the subjects of chemistry in its extensive sense; but the curious, in chemical researches, may be desirous of knowing in general, what bodies they ought to procure, and have in readiness for them. Dr. Shaw has given a list of these for his portable laboratory, which will serve in general as well as on that particular occasion.

This collection being distributed under proper classes, will come into a small compass, and may be conveniently carried either by land or sea, along with that useful furnace, and its necessary apparatus.

The natural arrangement of the *Materia Chemica* is into the general division of animal, vegetable and mineral substances. But those who are desirous of a larger collection, may enlarge the number of general divisions, according to Becher's method, by which all chemical subjects are arranged into eight general classes; metals, minerals, decompounds, salts, gums, earths, stones, spirits, and oils.

The class of metals contains gold, silver, copper, iron, tin, and lead; and all these are to be kept both in their natural and artificial state; that is, in their ores, and as separated from them for human uses. To these natural metals are to be added the artificial or compound ones, *viz.* pewter, bell-metal, brass, gun-metal, pin-metal, Bath-metal, wells-metal, princes-metal, London-metal, white copper, white gold, and yellow silver. Under minerals are included, antimony, bismuth, zink, marcasite, cobalt, zaffer, smalt, arsenic, manganese, orpiment, mercury, native cinnabar, and sulphur. All these are to be kept both in their natural state as dug out of the earth, and as purified. *Becher's* Phys. Subter. p. 187.

The decompounds of minerals include aurum fulminans, luna cornea, the calxes of gold and silver, ultramarine, distilled verdegrease, burnt copper, putty, or calcin'd tin, sugar of lead, cadmia, tutty, black lead, red lead, litharge, white lead, glass of lead, simple and martial regulus of antimony, glass and cinnabar of antimony, the preparations of quicksilver, as sublimate, precipitate, and the rest. The same sort of arrangement may also take in the several kinds of decompounds of animal and vegetable substances. *Shaw's* Port. Laborat.

The class of salts takes in sea salt, nitre, alum, vitriol, borax, tartar, sugar, potash, and the compound saline fluxes for stubborn ores. And to these are to be added the tribe of artificial salts, of which number are the tartarum vitriolatum, fixed nitre, soluble tartar, terra foliata tartari, nitrum nitratum, sal ammoniac, Epsom salts, volatile salts, and several others of a similar nature.

Under the gums are ranked pitch, resin, turpentine, wax, camphor, amber, pit-coal, jet, and all bitumens, balsams, and inspissated juices.

Among the earths are taken in ores, washed ores, fluds, calxes of metals, lime, plaster, gypsum, chalk, boles, shells, sand, and the fossils commonly and properly called earths, whether they be of the calcarious or of the vitrescible kinds; that is, whether in the fire they are converted into a sort of lime, or run into a glass.

Stones include flints, pebbles, quarry stone, crystal, talc, the vulgar stones, and all the gems from the diamond down to the spars.

Lastly, under spirits and oils come aqua regia, aqua fortis, oil of vitriol, spirit of salt, spirit of nitre, spirit of sulphur, spirit of alum, spirit of vinegar, spirit of wine, spirit of urine, spirit of tartar, spirit of turpentine, oil of tartar per deliquium; the essential oils of nutmegs, cloves, and the like; the expressed oils of olives, almonds, linseed, and the like; and the compound oils, as butter of antimony, artificial balsams, &c.

It is easy to see that this sort of classing is not fit for the naturalist, who studies bodies for their natural qualities, nor indeed for the nice distinguisher of any kind; but in this manner Becher advises the young operator in chemistry, to procure to himself a sort of artificial alphabet of nature, and this will serve the purpose very well, where no more is meant than a mere *Materia Chemica*, to be put in such order, that it may be readily had recourse to in all its parts. With this the young operator is to proceed regularly, as he would do in learning a language. Forming first syllables out of the joining of two or more letters of this alphabet, and then words, by combining these first sets together, and finally, whole discourses; that is, forming these various simple bodies into mixts, compounds, and decompounds. *Becher's* Phys. Subter. p. 179.

To avoid miscarriages, and prevent being imposed upon, it will be very proper to cultivate a knowledge of the productions of nature in their crude state, and peculiar places of growth, where being first viewed and examined before they are gathered or dug up, an exact knowledge of them, as nature furnishes them, may be procured. For want of this previous qualification, men, otherwise of great sagacity, have erred in their operations, and perhaps blamed the original author of a process, in which they miscarry; while they are all the while using a wrong subject, or an adulterated or imperfect one, instead of the true. From this mistake alone, numberless complaints have arisen of the failure and uncertain success in the processes and experiments recorded even by the best authors.

The person who would work in chemistry with pleasure and success, should make a sufficiently copious collection of a *Materia Chemica* of this kind, all the particulars of which he is well assured of, as to their genuineness and perfection in their kinds. These being always ready, will prevent the necessity of sending to the druggist at every turn, where the things sent for are often either not to be had, or only in a sophisticated state; when this alphabet of nature, composed of the several materials of chemical researches, is like the letter in a printing-house, distributed and lodged in proper cells, it may readily be drawn out for use as occasion requires. It is impossible to express with how little expence and trouble, yet with how great profit and pleasure, numerous experiments, and those of the most difficult kind, may be made, when the operator has, in this manner, all his materials about him.

Becher tells us, that he has, in this manner, gone through fifty experiments in a day; and, while writing on chemical subjects, if any difficulty or uncertainly occurred, he immediately got up from his desk, made the necessary experiment, and sat down again to write the certain fact: So that he affirms, there was very little more trouble in making the experiment at the fire, than in describing the process by the pen.

MATES, on board a ship, are assistants to the several officers; as *Master's Mates*, *Surgeon's Mates*, *Gunner's Mates*, *Carpenter's Mate*, *Boatswain's Mate*, *Cook's Mate*, *Corporal's Mate*.

MATHEDORAM, a name by which some chemists have called *sal gemm*.

MATITES, in natural history, the name of a stone described by several authors. The characters they give of it are, that it is of a pale greyish colour, and of the form of the nipples of a woman's breast, several of these nipples appearing upon one stone.

There have been many absurd and idle conjectures, as to the origin of this stone; but it may be easy to account for its figure on very plain and natural principles. We find in the earth many stones, resembling exactly the figures of shells of various kinds, and parts of other animals. These have, in general, once been the things they thus represent petrified, or altered into the nature of stone, by the insinuation of stony particles into their pores.

Among these none are so frequent as the remains of the *echini marini*, or sea eggs, as we call them. These we find in various forms; sometimes single spines, sometimes whole shells, and sometimes only parts of shells preserved. It is well known, that all the *echini marini* have spines or spikes, whence they have their name; and in many of the species which we find recent on our shores, these spines are joined to the body of the shell by a small protuberance, which, from its resemblance to a nipple, we call *papilla*. Now we frequently find these papillæ delineated in creux, in pebbles, and other stones, sometimes singly, and sometimes in numbers together, in the form in which they adhered to the shell. We find, in other fossils, that whatever shell, &c. is sometimes delineated in creux on stone, is also sometimes done in the elevated manner; and it is plain, that there needs no more to the formation of one of these *matitæ* than the petrifaction of a piece of the shell of one of those *echini* which have large papillæ, such as those of the red sea, with some of its papillæ upon it. As to the colour, it is not to be limited to grey alone, but may be as various as the colours of stones, since any species of stone may have gone to the formation of it; and whatever colour the stony matter was, of that will the *Matites* be.

MATKNELTZEL, in zoology, the name of a bird approaching to the snipe kind, and called by Gesner *gallinula erythra*; and

and by the common people of Germany, *mattkern*. It is all over of a reddish or ruddy hue, except the belly, which is white; on the back the colour is more dusky, and is variegated with black spots. On the wings the colour is much fairer and clearer, some of the longer feathers of them approaching to the colour of the painters red earth, called reddle. It is common in watery places, in many parts of Germany and Italy. *Ray*'s Ornithology, p. 226.

MATO, in natural history, the name of a tree growing both in the East and West Indies, and bearing a fruit of the size of an apple, and covered with a thick and tough red skin. This is called by some, the wild *mangoustan*. Its fruit perfectly resembles that of the mangoustan in figure, but is not eatable. Mem. Acad. Par. 1699.

MATORIUM, a word used by some of the chemical writers to express the *gum ammoniacum*; and by others *galbanum*.

MATRASS (*Cycl.*)—The *Matrass*, used in assaying, is a vessel of very pure and transparent glass, not too thick at the bottom, which would make it apt to burst in the fire. It is, for this use, to be about eight or ten inches high, and to have an orifice scarce so much as half an inch wide, lest the matters contained in it, being in a violent state of ebullition, should either rise over the mouth of the vessel, or at least be partly thrown out in form of small drops, like a thin rain, which drops always carry some of the metal with them. The bottom is capacious enough, when it will hold an ounce or two of aqua fortis, and the height of the vessel is of farther use in making a greater repercussion of the fumes. The mouth ought also to be turned backwards, in form of a broad lip, that the solutions, when poured out, may not run down the sides of the vessel. *Cramer*, Art Ass. p. 68.

MATRICARIA, *Feverfew*, in botany, the name of a genus of plants, the characters of which are these: The flower is naturally of the radiated kind. Its disk is composed of flosccules, and its outer circle of semi-flosccules, all placed on the embryo seeds, and contained in one common cup, which is of a squammose structure, and hemispheric figure. The embrios finally become seeds of an oblong figure, affixed to the thalamus of the flower. To this it is to be added, that the flowers always grow many together, in a sort of clusters, and the leaves are divided ino somewhat regular segments, standing in pairs over against one another.

The species of *Feverfew*, enumerated by Mr. Tournefort, are these: 1. The common garden *Feverfew*. 2. The garden *Feverfew*, with red stalks. 3. The wild *Feverfew*, with flowers altogether yellow. 4. The sweet-scented *Feverfew*. 5. The double-flowered *Feverfew*. 6. The white-flowered *Feverfew*, with three series of semi-flosccules. 7. The *Feverfew*, with fistular petals. 8. The curled-leav'd *Feverfew*, with the petals of the flower all fistulous. 9. The *Feverfew*, with the marginal petals of the flower flat, the inner ones fistular. 10. The naked-flower'd *Feverfew*. 11. The tanzy-leav'd *Feverfew*, with large flowers, and umbilicated seeds. 12. The tanzy-leav'd *Feverfew*, with smaller flowers, and umbilicated seeds. 13. The buphthalmum-leav'd Pyrenean *Feverfew*. 12. The American *Feverfew*, with leaves like the *ambrosia*, and with small white flowers. *Tourn.* Inst. p. 493.

Feverfew has always been allowed one of the first places among the hysteric and uterine plants. It is prescribed in powder from a scruple to half a dram the dose; but the much better way is in a slight infusion made in the manner of tea. Taken in this easy manner for a continuance of time, it will bring the menses, tho' subject to be interrupted and irregular, to their true period; and will remove a number of complaints, the natural consequence of such an irregularity.

It is also an agreeable carminative and bitter. It strengthens the stomach, and disperses flatulences; and the expressed juice is said to kill worms. Some likewise commend it in disorders of the head, and in all nephritic complaints. Hoffman gives it great praises, used as a febrifuge. We used to keep a simple water and syrup of *Feverfew* in the shops; but at present they are wholly disused, and the dried herb only kept ready for fomentations, and sometimes as an ingredient in clysters.

Many species of this plant are cultivated in gardens, for the beauty of their flowers. They are propagated by sowing them in March, on a bed of light earth; when they are come up, they should be transplanted out into nursery beds, at about eight inches asunder; and in the middle of May they should be removed into the flower beds, where they are to stand. They flower in July and August; but they should not be permitted to seed, which always weakens, and often destroys the roots: So that the stalks should be cut down to the ground, when the flower decays. *Miller*'s Gardener's Dict.

MATRIMONY. See the articles Espousals and Marriage.

MATRISYLVA, in botany, a name by which some authors call the common honey-suckle, or wood-bind, and others the wood-ruffe.

MATRIX, (*Cycl.*) in anatomy. See the articles Womb, Uterus, Foetus, &c. *Cycl.* and *Suppl.*

Matrix *Succini*, in natural history, a name given by Hartman, and some other authors, to a sort of substance resembling fossile wood, or the barks of trees, common in the clifts of the shores of the Baltic, and found in digging all over Prussia. This is the bed in which the fossile amber of that kingdom is lodged, and it is supposed to have no small share in the production or formation of that fossile. The workmen who dig for amber always make this their guide, and follow the veins of it, never searching any where else for the amber. The very surface of this fossile substance is often covered with a kind of amber; but this is poor, and of no value. Many authors have supposed this cortical or wood-like substance to be real fossile wood; but this is an error. The masses of it are too large, ever to have been trees, and their fibres run often to twenty, thirty, or forty foot diameter, in the same unbroken compages. It differs from trees also in this, that as they have been form'd by successive additions of matter by vegetation, their whole bulk is composed of circular strata, if they may be so called, or additions of coats round a medulla or pith; but in this fossile wood, as some have supposed it to be, there is no pith or medulla, no addition of circular coats, but the same vast mass of it is continued to a vast length and breadth, in the manner of an earthy stratum, and is composed of thin laminæ, or plates laid flatwise one over another. Were this substance really formed of the bodies of trees, we should also find in it that variety of fibres which the several parts of wood are known to consist of; but nothing of this kind appears, we see the whole mass, consisting of absolutely the same shaped fibres; and there never was found, in any of this substance, the least resemblance of a knot or leaf, or the pedicle of a leaf, as might well be expected, had leaves ever grown from it. Phil. Transf. N°. 248. p. 14.

The fossile wood, which is truly such, and has been once vegetable matter, whatever part of the world it is found in, agrees in the same general marks of distinction and knots, and other evident proofs of its having been once vegetable are found in all of it; but this *Matrix* of amber, whether found in Prussia, Denmark, or elsewhere, is still of the same kind, and shews none of these characteristic marks of wood. See the article Succinum.

MATTS, on board a ship, a kind of broad, thick clouts, wove out of spun yarn, sinnet, or thrums; and used to preserve the main and fore-yards from galling against the masts at the ties, and at the gunnel of the loof. They also serve to keep the clew of the sail from galling there; as also to save the clews of the fore-sail from doing so at the beak-head and boltsprit.

MATTAGESS, in zoology, the English name of the larger species of the *lanius* or *butcher bird*.

The word *Mattagess* is borrowed from the Savoyards, and signifies the murdering pye; and has been given it from its savage disposition, and its resemblance to the magpye in the shape of its tail.

It is barely of the bigness of a thrush; its beak is moderately long, black, and hooked at the end, but strait all the way to that. Its tongue is bifid and hairy, and there are several black and short bristles at the top of the beak. Its head, back, and rump, are grey. Its chin and belly white, and its throat and breast variegated with dusky streaks. Its feet and legs are black. It is very common in Germany, and is sometimes seen in the northern parts of England, but with us is not very frequent. It lives among low bushes, and builds in them. Its nest is made of moss, wool, and soft herbs, and the tender branches of heath. It has seven young ones at a brood, which are of a greenish colour, and very little resemble their parent. It feeds on thrushes, and smaller birds, and is a very terrible destroyer among them. *Ray*'s Ornithology, p. 53.

MATTHIOLA, in botany, the name of a genus of plants, the characters of which are these: The cup is a cylindric perianthium, is very short, erect, and undivided, and remains after the flower is fallen; the flower is monopetalous, and consists of a very long tube, which dilates, by degrees, into a large and wide mouth, with a smooth or undivided edge. The stamina are five pointed filaments, shorter than the flower. The apices are simple. The germen of the pistil is globose, and is placed beneath the cup. The style is very slender, and of the length of the cup. The stigma is large and obtuse. The fruit is a drupa of a globose figure, containing only one cell, and crowned with the cup. The seed is a globose nut or stone, containing a kernel of the same globose form. *Plumier*, 6. *Linnæi* Gen. Pl. p. 519. *Ponteder*. p. 39.

MATTKEM, in zoology, a common name in Germany for the *matkneltzel*. See the article Matkneltzel.

MATUITUI, in zoology, the name of a Brasilian bird, of the turdus or thrush kind, and of the bigness of the common starling. Its neck is short; its breast large and strong; its legs short, and its beak a little hooked at the end, and of a fine high red. Its head, neck, back, wings and tail, are all of a fine deep brown, variegated with spots of a pale yellow. Its throat is yellow, and its breast and belly white; a little spotted with brown. Its thighs are grey. *Marggrave*'s Hist.

Hist. Brasil. See the article CURICACA, where *Matuitui* is corruptly printed *Matrictici*.

MATURAQUE, in natural history, the name of an American fish, of the harengiform kind, and having only one short fin on the back. It seldom grows to more than four inches long, and is somewhat flattish, but not very broad. Its head is very broad, and covered with a shelly crust. Its lower jaw is something longer than the upper, and has several very sharp teeth, usually six in number. The upper jaw has a larger number, but they are small. Its gills are large, and its tail is made of a somewhat square fin, a little rounded at the extremity. Its scales are large, and very regularly arranged. Its head, back, and the upper part of its sides, are black, and its belly of a hoary white, and its fins are all black. It is caught in lakes, not in rivers, and is a well tasted fish. *Willughby*, Hist. Pisc. p. 235.

MAUDIHOCA, the *Cassada*, or the poisonous root of which bread is made in many parts of the West Indies. See the article MANIHOT.

MAVIS, in zoology, the common name of the song-thrush, or throstle, called by authors the *turdus viscivorus minor*, to distinguish it from the larger species, called in English the *missel bird*; and usually known among us also by the simple name *thrush*. It is called *viscivorus* by authors, from its resemblance in colour to the other *viscivorus*, not from its feeding on the misletoe-berries, as that does.

It is much smaller than the missel bird, and of a middle size between the fieldfare and redwing. Its back is of a greyish brown, somewhat like the colour of the Spanish olives; its belly white, and its breast yellowish, and spotted with brown and blackish spots, and it is spotted round about the eyes; its under small feathers of the wings are of a yellowish or reddish brown, and those under the tail whitish. Its legs are brown. It feeds on worms, snails, and small insects, and remains with us the whole year. It builds with moss and stubble, and lines the nest with mud. On this it lays five or six eggs, which are of a bluish green, variegated with a few black spots. It sits on hedges and bushes, and sings very agreeably. *Ray*'s Ornithology, p. 138.

MAUMY *Soil*, in agriculture, an earth consisting of a white marly clay, chalk, and sand, which causes it to work very short, as the farmers call it, when any thing dry. This sort of land is usually sowed with wheat, miscellan, or barley, and requires the same tillage that the clay land does, and must be kept dry and warm.

Its most proper manure is the rottenest dung. As they frequently sow beans next after wheat in clayey grounds, so in these they choose to sow peas, chusing a fair and settled season for their seed-time; for if there happen a smart shower soon after their sowing, the earth will bind so firmly together after it, that most of the seed will be lost. *Plot*'s Oxfordshire, p. 246.

MAUND, in our old writers, a kind of great basket or hamper, containing eight bales, or two fats: It is commonly a quantity of eight bales of unbound books, each bale having one thousand pounds weight. Book of Rates, p. 3. *Blount*.

MAUROUSE, the name of a creature of the deer kind, mentioned by Josselyn. It seems to be the same with the *Dama Virginiana* of Mr. Ray, one of which creatures was, in his time, kept alive in St. James's park. See the article DAMA. This is not certain, however; for Josselyn's description is very imperfect; he only says it is like the moose-deer, but is small, and has small horns.

MAUZ, a name used by some authors for the *musa*, or plantain-tree. *Alpin*. Egypt. p. 78.

MAXILLA (*Cycl.*)—MAXILLÆ *Quartus*, in anatomy, a name given by Vesalius, and some others, to one of the muscles of the lower jaw, commonly known by the name of the *digastricus*, and called by Albinus, *biventer maxillæ inferioris*.

MAXILLAM *Attollens Tertius*, in anatomy, a name given by Riolanus, and some others, to a muscle of the face, more generally known by the name of *masseter*.

MAXILLARY (*Cycl.*)—MAXILLARY *Bones*, *Maxillaria ossa*. The *maxillary* bones, or great bones of the upper jaw are two in number, situated one on each side, in the anterior and middle part of the face; their conformation is very irregular, and they are of very considerable extent. Anatomists generally divide them into the external and internal sides. By the external side they mean all that appears in an entire skull, without taking in the arch of the palate, and by the internal side, that which makes part of the arch of the palate, and all that is turned to the *septum narium*. The separation of this bone, by a small transverse suture behind the *foramen incisorium*, is seldom found but in young subjects, before the ossification is compleated. The *maxillary* bone is almost all compact, and without diploe, except in the alveolary arch, and at the point of the orbitary apophysis.

The *Ossa Maxillaria* are connected with the *os frontis*, *os ethmoides*, *os sphenoides*, *ossa unguis*, *ossa malarum*, *ossa nasi*, *ossa palati*, *vomer*, *conchæ narium inferiores*, and with one another. They assist in forming the organ of mastication, the arch of the palate, the cheeks, the orbits, the nose, &c. *Winslow*'s Anatomy, p. 33. seq.

MAXILLARY *Muscles*, in fish, two large muscles placed under the lower jaw, and serving to move it; these, with the two hypophthalmic muscles, which are placed under the eyes, are the four cephalic muscles of fishes, according to authors.

MAXIMIS ET MINIMIS. For the *method of Maximis & Minimis*, see the article MAXIMUM, *Cycl.* and *Suppl.*

MAXIMUM (*Cycl.*)—The fluxion of the base of a curve, or of its abscissa being given, when the fluxion of the ordinate vanishes, the tangent becomes parallel to the base, and the ordinate, most commonly, is a *Maximum* or *Minimum*, according to the rule given by authors on this subject, and mentioned in the Cyclopædia, under this head. But it is to be observed, that if the second fluxion of the ordinate vanish at the same time, and the third fluxion be real, this rule does not hold; for the ordinate is, in that case, neither a *Maximum* nor a *Minimum*. If the first, second, and third fluxions vanish, and the fourth fluxion be real, the ordinate is a *Maximum* or *Minimum*. The general rule given by Mr. Maclaurin, is, that when the first fluxion of the ordinate, with its fluxions of any subsequent successive orders, vanish, and the number of all these fluxions that vanish is odd, then the ordinate is a *Maximum* or *Minimum*, according as the fluxion of the next order to these is negative or positive. But if the number of all the fluxions of the ordinate, of the first and subsequent successive orders that vanish, be an even number, the ordinate is then neither a *Maximum* nor a *Minimum*. See Treat. of Fluxions, B. 1. c. 9. and B. 2. c. 5. art. 859. seq. The greatest and least ordinates are likewise discovered in some cases, by supposing $\dot{y}$ to be infinite in respect of $\dot{x}$. But there are several exceptions to this rule. See *Maclaurin*, loc. cit. art. 262, 865.

A late author has formed some objections to the universality of Mr. Maclaurin's rule. See the Harmony of Antient and Modern Geometry, by Mr. *Paman*, Lond. 1745. 4°. in the Preface.

MAXY, in mineralogy, a name given by some to mundic, a sulphureous mineral, common in the tin mines of Cornwall, and elsewhere. *Boerhaave*, Chem. p 99. n.

MAY *Dew*. See the article ROS *Mayalis*.

MAYA, in natural history, a name given by the people of the Philippine islands to a small species of sparrow, much less than ours, and very common among them. It feeds on rice, and is very destructive of it.

MAZA, a name given by the antients to a sort of food, in common use among the poorer sort of people. It was made of the meal of parched barley, sprinkled with some liquid, and was eaten with honey or with defrutum.

Hippocrates every where speaks of this as of a coarse kind of bread, and advises the changing the common finer bread, in the spring season, for this coarser kind, as a thing very conducive to health. He seems every where to consider bread as the drier, and *Maza* as the moister diet.

MAZA, Μαζα, among the Athenians, a sort of cake, which was the common fare of such as were entertained at the public expence in the common hall, or *prytaneum*. *Potter*, Archæol. Græc. l. 1. c. 25. T. 1. p. 136.

These cakes were made of flour boiled with water and oil. *Pitisc.* Lex. Ant. in voc.

MAZONOMUS, among the antients, a very large dish, commonly of wood, in which the *Maza* was served. *Pitisc.* Lex. Ant. in voc. See the article MAZA.

MAZORAH, among the Jews, denotes the science of reading the scriptures. See the article CABBALA.

MAZUR, a species of birds, which the Arabian sailors esteem very lucky, because it lays its eggs close by the sea shore before a tract of good weather; so that when these are observed, they promise themselves a safe voyage. They also pretend that this bird gives notice to sailors, when the ship approaches any danger, by flying and fluttering up and down. *Hofm.* Lex. in voc.

MEADOW *Land*. Too much water, and too little, are equally prejudicial to *Meadow* grounds. The best lands for *Meadow* pasture are either low lands, or hanging grounds, where there is a rich soil and a moist bottom; especially where any little brook, or running spring, may be brought over it; and where there is some descent in the *Meadow*, that the water may not lodge on it. These *Meadows* are much better for the farmer than those near large rivers, where great crops are often lost. *Mortim.* Husb.

MEADOW-*Saffron*, *Colchicum*. See the article SAFFRON.

MEAL. The *Meal* or flour of England is the finest and whitest in the world. The French is usually browner, and the German browner than that. Our flour keeps well with us, but in carrying abroad it often contracts damp, and becomes bad. All flour is subject to breed worms; these are white in the white flower, and brown in that which is brown; they are therefore not always distinguishable to the eye; but when the flour feels damp, and smells rank and musty, it may be conjectured that they are there in great abundance.

The colour, and the weight, are the two things which denote the value of *Meal* or flour; the whiter and the heavier it is, other things being alike, the better it always is. Pliny mentions these two characters as the marks of good flour, and tells us, that Italy, in his time, produced the finest in

the world. This country, indeed, was famous before his time for this produce; and the Greeks have celebrated it; and Sophocles, in particular, says, that no flour is so white, or so good, as that of Italy. The corn of this country has, however, lost much of its reputation since that time; and the reason of this seems to be, that the whole country being full of sulphur, alum, vitriol, marcasites, and bitumens, the air may have, in time, affected them so far, as to make them diffuse themselves through the earth, and render it less fit for vegetation; and the taking fire of some of these inflammable minerals, as has sometimes happened, is alone sufficient to alter the nature of all the land about the places where they are. *Desland.* Trait. Phys.

The flour of England, though it pleases by its whiteness, yet it wants some of the other qualities valuable in flour; the bread that is made of it is brittle, and does not hold together, but after keeping a few days becomes hard and dry, as if made of chalk, and is full of cracks in all parts; and this must be a great disadvantage in it when intended for the service of an army, or the like occasions, where there is no baking every day, but the bread of one making must necessarily be kept a long time.

The flour of Picardy is very like that of England, and after it has been kept some time, is found improper for making into paste or dough. The French are forced either to use it immediately on the grinding, or else to mix it with an equal quantity of the flour of Bretany, which is coarser but more unctuous and fatty; but neither of these kinds of flour keep well.

The flour of almost any country will do for the home consumption of the place, as it may be always fresh ground; but the great care to be used in selecting it is in order to the sending it abroad, or furnishing ships for their own use. The saline humidity of the sea air rusts metals, and fouls every thing on board, if great care be not taken in the preserving them. This also makes the flour damp and mouldy, and is often the occasion of its breeding insects, and being wholly spoiled.

The flour of some places is constantly found to keep better at sea than that of others; and when that is once found out, the whole caution needs only be to carry the flour of those places. Thus the French find that the flower of Poitou, Normandy, and Guienne, all bear the sea carriage extremely well, and they make a considerable advantage by carrying them to their American colonies.

The choice of flour for exportation being thus made, the next care is to preserve it in the ships; the keeping it dry is the grand consideration in regard to this; the barrels in which it is put up ought to be made of dry and well-seasoned oak, and not to be larger than to hold two hundred weight at the most. If the wood of the barrels have any sap remaining in it, it will moisten and spoil the flour; and no wood is so proper as oak for this purpose, or for making the bins and other vessels for keeping flour in at home, since, when once well dried and seasoned, it will not contract humidity afterwards. The beach wood, of which some make their bins for flour, is never thoroughly dry, but always retains some sap. The fir will give the flour a taste of turpentine; and the ash is always subject to be eaten by worms. The oak is preferable because of its being free from these faults; and when the several kinds of wood have been examined in a proper manner, there may be others found as fit, or possibly more so than this for the purpose. The great test is their having more or less sap. See the articles FLOUR and WOOD.

MEAL *worm.* See the article WORM.

MEAN (*Cycl.*)—MEAN *Anomaly*, in astronomy. See the article ANOMALY, *Cycl.*

MEAN $\left\{ \begin{matrix} \textit{Conjunction,} \\ \textit{Opposition,} \end{matrix} \right\}$ in astronomy, is when the *mean* place of the sun is in $\left\{ \begin{matrix} \textit{Conjunction,} \\ \textit{Opposition,} \end{matrix} \right\}$ with the *mean* place of the moon in the ecliptic. See the articles CONJUNCTION and OPPOSITION, *Cycl.*

MEAN *distance of a planet from the sun*, in astronomy, is the right line drawn from the sun, to the extremity of the conjugate axis of the ellipsis the planet moves in; and this is equal to the semitransverse axis, and is so called because it is a *mean* between the planets greatest and least distance from the sun.

MEAN *Motion*, in astronomy, that whereby a planet is supposed to move equally in its orbit, and is always proportional to the time.

MEASURE (*Cycl.*)—We have lately had some accurate comparisons between some of the French weights and measures, and those of England, the result of which is, 1. The Paris half toise, as set off on the standard kept in the Royal Society, contains of English inches, by the same standard, 38.355. whence it appears, that the English yard and foot is, to the Paris half toise and foot, nearly as 107 to 114; for as 107 to 114, so is 36 to 38.35514.

2. The Paris two marc, or sixteen ounce weight, weighs English Troy grains 7560; whence it appears, that the English Troy pound of twelve ounces, or 5760 grains, is to the Paris two marc, or sixteen ounce weight, as 16 to 21; that the Paris ounce weighs English Troy grains 472.5; and that consequently the English Troy ounce is to the Paris ounce, as 64 is to 63.

3. The English avoirdupois pound weighs Troy grains 7004; whence the avoirdupois ounce, whereof sixteen make a pound, is found equal to 437.75 Troy grains. And it follows, that the Troy pound is to the avoirdupois pound, as 88 to 107 nearly; for as 88 to 107, so is 5760 to 7003.636; that the Troy ounce is to the avoirdupois ounce, as 80 to 73 nearly; for as 80 to 73, so is 480 to 438. And, lastly, that the avoirdupois pound and ounce, is to the Paris two marc weight and ounce, as 63 to 68 nearly; for as 63 to 68, so is 7004 to 7559.873.

4°. The Paris foot, expressed in decimals, is equal to 1.0654 of the English foot, or contains 12.785 English inches. Phil. Trans. N°. 465. Sect. 5.

MEAT (*Cycl.*)—MEAT, in the manege. See the article DRY *Meat.*

MEB, or *Sea* MEB, in zoology, the name of a water bird of the larus or gull-kind, which is all over of a dusky grey on its upper part; its head is blackish at the top, and the beak is red. The legs are short and black, and the wings very long, reaching beyond the tail when folded.

MECAXOCHITL, in the materia medica, the name of the *piper longum humilius*, or small American long pepper. *Dale*, Pharm. p. 286.

MECHANICAL (*Cycl.*)—MECHANICAL *Force.* See the article FORCE, *Appendix.*

MECHANICAL *Operation of Medicines.* See the article MEDICINE.

MEDAL (*Cycl.*)—*Impressions of* MEDALS. A very easy and elegant way of taking impressions of *Medals* and coins, not generally known, is this: Melt a little isinglass glue, made with brandy, and pour it thinly over the medal, so as to cover its whole surface; let it remain on for a day or two, till it is thoroughly dry and hardened, and then taking it off, it will be fine, clear, and hard as a piece of Muscovy glass, and will have a very elegant impression of the coin. *Shaw's* Lectures, p. 430.

Sulphur is sometimes used to take off impressions of *Medals*, coins, *&c.* The method is this: Having made a ledge of clay about the work, whose impression is desired, and carefully oiled the whole, gently pour brimstone melted in a covered vessel, to prevent its firing upon the metal. About the edge of this mould make a border of clay, as before, and lightly oil the internal surface of both; then gradually put into it, to the thickness of about a quarter of an inch, a mixture made up with calcined alabaster and water, to the consistence of stiff honey. This soon growing hard, may be taken out of the mould, and gives figures of the coin or *Medal.* *Boyle's* Works abr. vol. 1. p. 151. A method somewhat different is described in the article BRIMSTONE.

We have an easy method of procuring the true impression or figure of *Medals* and coins, by Mr. Baker in the Phil. Trans. N°. 472. Sect. 13.

Take a perfect and sharp impression in the finest black sealing-wax, of the coin or *Medal* you desire. Cut away the wax round the edges of the impression; then with a preparation of gum-water, of the colour you would have the picture, spread the paint upon the wax impression with a small hair pencil, observing to work it into all the sinking or hollow places, these being the rising parts of the *Medal*; and the colouring must be carefully taken from the other parts with a wet finger. Then take a piece of very thin post paper, a little larger than the *Medal*, and moisten it quite through. Place it on the wax impression, and on the back of the paper lay three or four pieces of thick woollen cloth or flannel, of about the same size. The impression, with its coverings, should be placed between two smooth iron plates, about two inches square, and one tenth of an inch thick. These must be carefully put into a small press, made of two plates of iron, about five inches and an half long, one inch and a half wide, and half an inch in thickness, having a couple of long male screws running through them, with a turning female screw on each, to force the plates together. These being brought evenly together, by means of the screws, will take off a true and fair picture of the *Medal*; which, if any deficiencies should appear, may easily be repaired with a hair pencil, or pen, dipped in the colour made use of.

If a relievo only be desired, nothing is necessary, but to take a piece of card, or white paste-board, well soaked in water, then placing it on the wax mould, without any colouring, and letting it remain in the press for a few minutes, a good figure will be obtained.

This Method of taking off *Medals*, *&c.* is convenient, and seems much more so than the several inventions usually practised in sulphur, plaster of Paris, paper, *&c.* wherein a mould must be formed, either of clay, horn, plaster, or other materials, which require a good deal of time and trouble.

Some take impressions on paper from the *Medals* themselves, by passing them through the rolling-press, and colouring them afterwards; but this is not only more difficult, but does great injury to the *Medals*, by impairing the sharpness of their most delicate

delicate and expreffive ftrokes: Whereas wax does not hurt the fineft *Medal* in the leaft degree; and though a brittle fubftance, yet it effectually refifts the force of a downright preffure.

Red feems the beft colouring, and therefore black wax is directed to be ufed; but if the pictures are chofen in black and white, to refemble copper plates, the wax fhould be red; for the wax and paint ought to be of different colours, in order to diftinguifh when the colour is laid on properly, or rightly cleared away.

The fubftance of *Medals*, being metalline, is liable to be corroded; and the figures being raifed, are alfo liable to be effaced by friction. Hence it is rare to find any perfectly preferved. Gems are not fubject to thefe inconveniencies. See the article GEM.

MEDEA, the name of a ftone defcribed by Pliny and the antients. They fay it was black, and was variegated with gold-coloured veins, and that, when rubbed in water, it yielded a yellowifh red juice, which had the flavour of wine. We know no ftone at prefent anfwering thefe characters. Rulandus, indeed, mentions a kind of black hæmatites, or blood-ftone, which tinges water to a faffron colour. This account he takes from Encelius; but this wants the much greater character, of giving it the tafte of wine.

MEDENA, a word ufed by Paracelfus to exprefs an inveterate kind of ulcer.

MEDEOLA, in botany, the name given by Linnæus to a genus of plants, called *falfa* by other authors. The characters are thefe: There is no cup, but fome have erroneoufly taken the flower for a cup, and have defcribed it under this name, and allowed no flower. The flower confifts of feveral petals, of an oblong oval figure, equal in fize, and ftanding expanded, with their ends often bent backwards. The ftamina are fix fubulated filaments, of the length of the flower. The antheræ are incumbent. The piftil has three corniculated germina. The ftyles are of the fame number, one terminating each germen. The ftigmata are thick and crooked. The fruit is a roundifh berry, dividing into three parts, and containing three cells. The feeds are fingle, and of a cordated form. *Linnæi* Gen. Plant. p. 154.

MEDIALE, in botany, a name given by the antients to the central part of any tree. It is fometimes ufed to fignify the fpungy pith that fils up the young branches of a tree, as in the elder, and the like. And fometimes for the firm and hard fubftance, called the heart of the wood, and found to be much harder than any other part of it. Thus the name of *tree*, to which the word *Mediale* is annexed, muft be the means of explaining what is meant by the word, whether a fpongy pith, or a found and hard wood. The moft accurate writers, however, make a diftinction which ought to be kept up, that is, the calling the heart, or found internal part of wood, only *Mediale*, and the fpungy part within the elder, *&c. Medulla*.

MEDIANTE, in mufic. *The Mediant of a mode* is that note which is a third higher than the final; or that which divides the fifth of every authentic mode into two thirds. See the articles MODE and THIRD.

This term is chiefly in ufe among the French. See *Broffard*, Dict. Muf.

MEDIATORS *of Queftions*, in our old writers, were fix perfons authorized by ftatute, who, upon any queftion arifing among merchants, relating to any unmercable wool, or undue packing, *&c.* might, before the mayor, or officers of the ftaple, upon their oath, certify and fettle the fame; to whofe order and determination therein, the parties concerned were to give entire credence, and fubmit. 27 Edw. 3. Stat. 2. c. 24. *Blount*.

MEDIATORS, Μεσαζοντες, under the emperors of Conftantinople, officers of ftate who had the direction of all affairs tranfacted at court. Their chief, or prefident, was called *megas mefazon*, Μεγας μεσαζων, and anfwered to the prime or grand vifier of the Turks. *Hofm.* Lex. in voc.

MEDICA, *Lucerne*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the papilionaceous kind, and its piftil, which arifes from its cup, becomes finally a feed-veffel, of the fhape of a fnail, containing ufually kidney-fhaped feeds.

The fpecies of *Medica*, enumerated by Mr. Tournefort, are thefe: 1. The great upright *Medica*, with purple flowers. 2. The great upright *Medica*, with violet-coloured flowers. 3. The great upright *Medica*, with yellow flowers. 4. The great upright *Medica*, with variegated flowers of violet colour and yellow. 5. The wild *Medica*, with faffron-coloured flowers. 6. The wild *Medica*, with pale yellow flowers. 7. The wild *Medica*, with bluifh green flowers. 8. The fmall wild *Medica*, with blue and yellow flowers. 9. The fea *Medica*. 10. The *Medica*, with broad fcutellated fruit. 11. The *Medica* with orbiculated fruit. 12. The *Medica* with fmooth leaves, marked with black fpots, and with echinated fruit. 13. The echinated-fruited *Medica*, with fmooth leaves, without the black fpots. 14. The great *Medica*, with turbinated fruit. 15. The hairy *Medica*, with very rigidly echinated fruit. 16. The hairy echinated *Medica*. 17. The fmalleft echinated *Medica*. 18. The little coronated *Medica*. 19. The many fruited *Medica*, with obtufe, and not crenated leaves. 20. The many-fruited *Medica*, with obtufe crenated leaves. 21. The prickly two-fruited fnail *Medica*, with elegantly divided leaves. 22. The perennial *Medica*, with the ciliary fruit. 23. The perennial fhrub *Medica*, with orbiculated fruit. 24. The many-fruited orbicular-headed *Medica*, with a fmaller fruit. 25. The orbiculated *Medica*, with a broad fruit, with a fingle voluta. 26. The fmaller orbiculated prickly *Medica*, with a fingle large voluta. 27. The elegant orbiculated *Medica*, with the fruit rugofe at the edges. 28. The barrel-fruited *Medica*, with the circles of the fruit wrinkled on each fide, and turning black with age. 29. The larger and fmaller fmooth *Medica*, with the turned fruit. 30. The elegant *Medica* of Catalonia. 31. The prickly cochleated *Medica*, with large echinated fruit, turbinated at each end, and armed with fpines turning backwards. 32. The *Medica* with the leaves and feeds of the heart-leav'd *Medica*, and with harder fruit. 33. The large double-fruited prickly barrel-headed *Medica*. 34. The two-fruited prickly *Medica*, with oval fruit, and fhort rigid fpines. 35. The many-fruited prickly barrel-headed *Medica*. 36. The leaft, hairy and prickly barrel-fruited *Medica*. 37. The great prickly fea *Medica*. 38. The *Medica* with lax fruit, of the fmall echinated kind, but with prickles not ftanding out. 39. The foft and hoary-leav'd hop *Medica*, with heart-fafhion'd feeds. 40. The great fruited *Medica*, with the prickles of the head turning both upward and downward. 41. The *Medica* with a large fruit, with the prickles turning all upwards. *Tourn.* Inft. p. 413. See the article LUCERNE.

Malus MEDICA, in botany, a name given by fome authors to the citron tree. *Ger.* Herb. 1287.

MEDICAL *Stones*. See the article STONE.

MEDICAGO, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the papilionaceous kind, and its piftil, which arifes from the cup, finally becomes a plain orbiculated fruit, of a fort of falcated fhape, and containing one kidney-fhap'd feed.

The fpecies of *Medicago*, enumerated by Mr. Tournefort, are thefe: 1. The annual trefoil-like *Medicago*. 2. The Spanifh *Medicago*, with the appearance of the kidney vetch. 3. The cretic *Medicago*, with the appearance of the kidney-vetch. And 4. The hoary trifoliate fhrubby *Medicago*, commonly called the Cytifus with crooked pods. *Tourn.* Inft. p. 412.

MEDICINES (*Cyc.*)—By *Medicines* is meant whatever corrects a depraved or vitiated conftitution of body, and reftores it to a heathful ftate: So that they differ from aliments, which preferve the body in a found ftate, whereas *Medicines* reftore it when impaired; and from poifons, which tend to deftroy the body. All the parts of diet may indeed be termed alimentary *Medicines*, in as much as they may ferve to confirm health, againft the firft approaches of a difeafe; as poifons, which are always detrimental to the body, have been called deleterious *Medicines*.

Medicines are either fimple, or compound: Simple *Medicines* are thofe which are formed fpontaneoufly, or by the affiftance of nature alone; and thofe are called compound, which are owing to the art and induftry of men; and to the mixtures of various fimples put together.

The principal differences of fimple *Medicines* are taken either from their form and texture, or from their virtues. In refpect to their texture, they are divided into minerals, vegetables, and animals; each of which divifions is termed a clafs, kingdom, or family.

In what the antients have left us concerning the *Medicines* they ufed, there is the utmoft confufion and obfcurity; the fame fubftance is frequently called by many different names; fome *Medicines* are barely mentioned by them, without any account of their nature or defcription; and in regard to many others, the virtues afcribed by them to one fimple, have been, by later writers, attributed to others. To clear up, and fet right all thofe difficulties, at this time, would be a tafk as difficult as it would be ufeful. So great and fo many virtues are afcribed, by different authors, to particular *Medicines*, that, if they could be depended on, each ought to be looked on as an almoft univerfal remedy; but as many of thefe virtues are merely imaginary, it requires even the greateft caution to diftinguifh the fictitious from thofe which truly belong to them; and though the knowledge of the virtues of *Medicines* be at this time carried to a very great length, there are neverthelefs many things remaining yet to be difcovered, and room enough ftill to enrich the fcience with new fpecific remedies; nor will the judicious phyfician find lefs worthy employment for his thoughts, in endeavouring to determine the manner in which thofe *Medicines* act, whofe effects are already known, and to afcertain the fafeft and beft methods of adminiftring them. *Geoffroy*, Tract. p. 2.

Such *Medicines* as are of a terreftrial, or other the like nature, and will not diffolve in water, the new Difpenfatory of the college has ordered to be prepared in the following manner: They are firft to be pounded in a mortar, and then levigated with a little water, upon a hard and fmooth marble, into an impalpable powder, and afterwards dried upon a chalk ftone, and

and then set by for a few days, in a warm, or at least a very dry place. In this manner are to be prepared amber, antimony, bezoar, which should be levigated with spirit of wine instead of water, blood-stone, calamy, first calcined for the use of the makers of brass, chalk, coral, crabs claws, crabs eyes (so called); egg-shells cleansed from the membrane adhering to them by boiling in water, oyster-shells first cleansed, pearls, verdegrease, tutty.

In antimony, calamy, and tutty, singular care ought to be taken to reduce them to the most subtle powder that can be. *Pemberton*'s College Disp. p. 145.

Mechanical Operation of MEDICINES. To account for the operations of *Medicines* mechanically, seems to have been the favourite scheme of physicians and physiologers of the last and present century. Stahl and his disciples reject these accounts, and think them sufficiently refuted by the operation of opium, and of astringents. One grain of opium, properly taken, will, for a time, asswage pains all over the body. A very few grains of crocus martis astringens sometimes stop an hæmoptysis, before they can be supposed to have entered into the humours of the body. Is it not past all belief, say they, that so few grains mixed with so many pounds of fluids, should retain any mechanical force, especially as it is well known that astringents lose their force by dilution. They farther urge, that the various effects of the same *Medicine* are a refutation of the mechanical hypothesis; thus emetics sometimes purge, and *vice versa*; astringents encrease hæmorrhages; opium excites alacrity in some, instead of stupifying. Again, the sight, or even bare imagination of some *Medicines*, will produce a sensible effect on the body, without any contact. Stahl and his followers therefore hold, that *Medicines* operate chiefly by exciting the vital sense; and that this is the chief effect of *Medicines*, even where they seem most to act mechanically. See *Juncker*'s Consp. Therap. p. 3. seq.

Hoffman, Heister, and others, have attacked the hypothesis of Stahl. We shall not pretend to give any farther account of the controversy. Perhaps in this, as in others, there may be a good deal of logomachy. Strictly speaking, mechanical principles must be insufficient to account for the operation of *Medicines*, as this sometimes undoubtedly depends (in the *primæ viæ* at least) on chemical principles; and no body has hitherto been able to account mechanically for the phænomena of chemistry. The laws of the *minima naturæ* have not hitherto been reduced to those of the pressure and impulse of large sensible masses. And perhaps when the laws, that obtain in the minute parts of matter, have been found, we shall still be at a loss to account for all the phænomena of animated bodies, particularly the human.

Heister says, Stahl pretends that the rational soul and nature are synonimous terms; and that it is the rational soul which formed the fœtus in the womb, and which directs all vital, animal, and natural actions, to the preservation of the body; hence sometimes exciting evacuations, sometimes spasms, to get rid of disorders. *Heister*, Differt. de Medicin. Mechan. præstantia in Compend. Medicin. Practic. where he endeavours to refute the Stahlians.

Juncker, who wrote according to Stahl's principles, does not deny that there is something mechanical in the operation of *Medicines* independantly of the will or spontaneity of nature; but he asserts that their chief operation is owing to nature, which makes use of the remedy to attain its end. His words are, *Operationem Medicamentorum ab ipsa natura gubernari innumeræ confirmant Observationes. Licet enim non negamus, subesse interdum actioni eorum aliquid mechanici, a naturæ arbitrio non pendentis, tanti tamen hoc non est habendum, ut operandi modus illi maxime adscribi mereatur. A potiori enim fit denominatio, & natura utitur remedio ad finem suum.* *Juncker*, Conspect. Therap. p. 1, 2.

A late author observes, as to *Medicines*, that let what disease soever be named, and any *Medicine*, as universally useful in it, yet he can shew circumstances of patients, or of the disease, where that *Medicine* would be very improper. He mentions several instances of this kind. See Medic. Ess. Edinb. vol. 1. p. 267. seq.

MEDICINES *from Metals*. See the article METALS.

Pocket MEDICINES, in surgery, are such necessary remedies as the surgeon ought never to be without; but always to carry in a convenient case or box about him. These are the common digestive ointment, and the brown or Ægyptian ointment, for cleansing and digesting foul ulcers, and some vulnerary balsams, as the *linimentum Arcæi*, or the balsam of Peru, of Gilead, or Capivi, or the Samaritan balsam: To these must also be added a plaster or two, as the diachylon, or stypticum Crollii, since one or other of these is almost constantly wanted. Neither should there be wanting a piece of blue vitriol for the taking down luxuriant flesh, and to stop hæmorrhages; but if vitriol is wanting, burnt alum, red precipitate, the infernal stone, or any other corrosive *Medicine*, will supply its place in corrosive intentions, and the last will also serve to open abscesses, to make issues, and perform many other operations of that kind. With these there should always be kept in readiness also a quantity of scraped lint, that the surgeon may be able to give immediate assistance to wounded persons, since, if he is unprepared for this, they may be easily taken off by an hæmorrhage, a circumstance which ought also to prevail with the surgeon never to be wholly unprovided with bandages. *Heister*'s Surg. p. 11.

MEDIMNUM, Μέδιμνον, among the Greeks, a measure of capacity, holding six Roman *modii* or bushels. *Danet*. in voc.

MEDINE, an Egyptian piece money, of iron silver'd over, and about the size of a silver three-pence. *Pocock*'s Egypt. p. 173.

MEDINUS, a name given by some to the *medus*, a stone celebrated by the writers of the middle ages for many imaginary virtues. See the article MEDUS.

MEDITRINALIA, among the Romans, feasts instituted in honour of the goddess *Meditrina*, and celebrated on the 30th of September. They were so called from *medendo*, because the Romans then began to drink new wine, which they mixed with old, and that served them instead of physic.

MEDIUM, in botany, a name given by Dioscorides to the violet, and by Lobel, to the sea flag-flower, or *iris maritima narbonensis*. *Ger*. Emac. Ind. 2.

MEDLAR, *Mespilus*, in botany. See the article MEPSILUS. We have two kinds of *Medlar* propagated very frequently in orchards, for the sake of their fruit; the one is the common *Medlar*, or, as it is called by some, the Nottingham *Medlar*; the other the Dutch *Medlar*. The first of these was once almost the only kind known in England; but since the other has been introduced, it is found so much superior in the size, and flavour of the fruit, that it is now almost the only kind thought worth the cultivating.

They are propagated by budding or grafting them upon the hawthorn, or the pear stock, upon either of which they take very well, and may be afterwards transplanted into the fruit-garden, either as standards, or trained up against an espalier, in both which methods they will succeed very well. If the larger sort are trained up in an espalier, the fruit will be much larger; but great care must be taken in the pruning, not to shorten the bearing branches, for the fruit is almost all produced at the extremities of these. The *Medlar* will grow on any soil; but on a moist and strong soil, the fruit will grow larger, and on a dry one, it will, though smaller, be much better tasted. *Miller*'s Gardener's Dict.

The fruit should be suffered to remain on the branches till October, at which time it will begin to fall of itself, and it should then be gathered in the middle of a dry day, and laid up in a dry place till soft, and beginning to decay, which is usually about a month after it is gathered; at this time they are fit for eating, for, till they begin to decay, they are too harsh for the palate.

MEDOKINA, in natural history, the name of a species of oyster. See the article OSTREA.

MEDULLA (*Cycl.*)—MEDULLA *Spinali*. In fishes, the spinal marrow does not run through the middle of the vertebræ, as it does in other animals, but is carried through a whole series of the apophyses which stand on the upper part of the bone, and are therefore called the *apophyses dorsales*, to distinguish them from the others, which their situation occasions to be called the lateral and ventral. All these dorsal apophyses of the vertebræ are hollow at their base, and by that means afford a continued channel for this marrow. The bases of the lower apophyses reaching from the anus to the tail, have also the same sort of hollow at their base; but this serves only for the passage of the larger blood-vessels.

MEDUS, or MEDINUS, a name given by the writers of the middle ages to a stone brought from Media, of which they say there were two kinds, the one black, and the other green. They attribute many strange virtues to these stones; the black they say was a fatal poison when taken inwardly, but that if wetted with milk, and rubbed upon the skin of a woman with child, it caused her to bring forth a boy. This, and a number of other as probable virtues, did these ignorant and fanciful writers bestow at pleasure on stones never known to the world before, and of which themselves gave no descriptions. This seems to be only a false history of the *Medea* of Pliny.

MEDUSÆ *Caput*, in natural history, a name given by authors to the *stella marina*, called by some, from its various branchings, *stella arborescens*. Rumphius, Gesner, and many other authors, have described this strange fish in its recent state, and in the acta eruditorum, we have an accurate figure, and a very remarkable account of one which was found fossile, and preserved in a remarkably perfect manner in stone.

The stone in which it was found was of the fissile or slaty kind, and it was so large as to extend over a piece of this stone of four foot in length, and between three and four in breadth. The body of the fish, from which all the rest seemed originally to have arisen, lay at one corner of the stone, and the arms extended themselves lengthways in a very distinct and natural manner the whole length of the stone; and from these there parted, on every side, other smaller ones, and these were finally divided into others more minute, in such a manner as to represent the nicest painting. Act. Erudit. Ann. 1725. p. 377.

The study of fossils is more improved by this single specimen, than by thousands of others, and by the reasonings of almost as many authors. The fossils called *entrochi*, have always perplexed the writers on these subjects to account for; some having judged them a sort of stony vegetables; some *lusus naturæ*; and others as different things; but in this

this table the whole fish is so perfectly preserved, that there can remain not the least doubt of its being really the *stella arborescens*; and in this both the figure and the author's words exprefs, in the plainest manner possible, that the long arms or branches reaching from one end to the other of the stone, are composed of a number of *entrochi* as it were, tied together in the same manner as the single joints of those *entrochi* which we meet with are to one another; or, in plain fact, that our *entrochi*, which have perplexed us so much to account for their origin, are in reality the fragments of the arms or branches of this fish. These branches in this famous specimen, were composed of what we call *trochitæ*, and had many rudiments of smaller branches, as well as perfect ones, growing from their sides, and would have been so many common *entrochi*, if broken off.

What was most remarkable in this fossil was, however, the separating of smaller branches which ran entire to their ends, and there terminating in an infinite number of small ramifications, all growing from one head; they formed clusters of four or five inches in diameter, and of an inconceiveable beauty, resembling the compound flower of some elegant plant. The matter of the larger branches, when examined, appeared to be the same with that of the common *entrochi*, that is, spar. The author calls it *selenites*, but that was a word indeterminately used by authors, till of late, for all plated and bright fossils.

It is plain that this compleat fish could have no way come into this stone but at the time when it was yet moist and soft; and the author calls it *novum diluvii monumentum*, a new remembrancer of the deluge.

MEER, in mining, a space containing twenty-nine yards in length in any vein. *Houghton*'s compl. Miner in the Explan. of the Terms.

MEER-*Stake*, in mining, is a pin of wood drove into the superficies of the earth, to shew the extent or end of a *Meer* of ground. *Houghton*'s Compl. Miner in the Explan. of the Terms.

MEER-*Swiin*, in zoology, a name given by some to a sea fish, more usually known by the name of *caprifcus*. *Ray*'s Ichthyogr. Append. p. 1. See the article GOAT-*Fish*.

MEGALARTIA, Μεγαλαρτια, in antiquity, a festival in honour of Ceres, being the same with *Thesmophoria*. *Potter*. Arch. Græc. See the article THESMOPHORIA.

MEGALASCLEPIA, Μεγαλασκληπεια, in antiquity, a festival in honour of Æsculapius. See the article ASCLEPIA.

MEIDANS, in the eastern nations, are a sort of country seats, where the greater people have open summer-houses, to which they retire on the three days of the week in which they do not attend the pashas divan, and where they divert themselves with seeing their slaves ride, shoot, and throw the dart, while they are regaling with their pipe and coffee. *Pocock*'s Egypt, p. 184.

MEL, *Honey* (*Cycl.*)—See the article HONEY.

MEL *Cedrinum*, in the materia medica of the antients, a term used to express a sort of liquid manna, used rather as a pleasant sweet in foods, than as a medicine, and which seems to have been the same with the *Mel Roscidum* of Galen, and with the liquid manna of mount Sinai; that mountain having been the place where it was annually collected in large quantities, even in Galen's time; and the account Bellonius gives of the manner of collecting it in his time, agreeing very well with what Galen has left about it. It is, however, an error in Bellonius, to suppose this to be the *terenjabin* of the Arabians, that being evidently a solid, not a liquid substance, and being, from all accounts the same with what is now called, *manna Persicum*, or Persian manna. See the article MANNA *Persicum*.

The *Mel Cedrinum* is a term used only by Hippocrates for this substance, and seems so odd, that many are apt to believe there is an error in the text, and that the author never meant any such thing. Foesius is of opinion, that these ought to be read as two distinct names, with a comma between them, and that the author only meant by them two substances very well known in his time, which were common honey, and the liquid substance called *Cedrinum*, or *Cedria*. See the article CEDRIA.

MEL *Roscidum*, in the materia medica of the antients, a name given to a kind of liquid manna collected in their time, as it is at present, in considerable quantities, on mount Sinai. The monks who collect it call it *terenjabin*, after the name of a kind of manna, common among the Arabians. But this is an error, the terenjabin of those authors not being a liquid manna, but the small round kind, collected from the *albagi maurorum*, and now called *manna Persicum*. It does not appear that the *Mel Roscidum*, or any other species of manna, was used in medicine by the antients; this was esteemed a curiosity, rather than a thing of any use, by Galen; and other authors say, it was sweeter than honey itself, with no farther account; whence it seems rather to have been used as a delicacy than as a medicine. See the articles TERENJABIN and MANNA *Persicum*.

MELAMPYRUM, *Cow-wheat*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the personated kind, consisting of one leaf, and divided into two lips, the upper of which is hooded, and the lower usually whole, not divided into any segments. The pistil arises from the cup of the flower, and is fixed to its hinder part in the manner of a nail, and finally ripening into a roundish capsule, divided into two cells, containing grains like those of wheat. *Tourn.* Inst. p. 173.

The species of *Melampyrum*, enumerated by Mr. Tournefort, are these: 1. The purple-flower'd *Melampyrum*. 2. The broad yellow-leav'd *Melampyrum*. 3. The purple and white flower'd crested *Melampyrum*. The plant called the smallest yellow *Melampyrum* by Caspar Bauhine, has no right to that name, being truly a species of the ranunculus.

MELAN *Pharmacon*, a word used by Hippocrates, and by some supposed to mean common writing ink: He orders this to be poured upon the cranium, in case of a fissure, in order to discover how far it has penetrated. Galen seems to refer to this, in some places, and mentions his having treated of it in his book of ulcers; but as no such medicine is found prescribed there, it is probably one of the lost compositions of the antients. In the spurious editions of Hippocrates, his book treating of the diseases of women, there is a black medicine ordered to be made of the squammæ and flos æris.

MELAENATOS, the *black eagle*, a species called also *aquila valeria* by some authors. It is a small eagle, of twice the bigness of a crow. Its jaws and eyebrows are destitute of feathers, and look reddish; its head, neck, and breast, are black, and in the middle of its back he has a large triangular spot, of a pale brownish red, with something of whiteness intermixed. His rump is a reddish brown, and his wings variegated with black, white, and grey. His beak is not large, black at the end, the skin covering the nostrils red, and the iris of his eye hazel-colour'd. His legs are feathered a little below the knee, and below that are red; and the claws very sharp. *Willughby*'s Ornithology, p. 30.

MELANCHOLY, *Melancholia*, (*Cycl.*) in medicine, the name of a disease which consists in the perturbation or injury of the imagination, which prevents it from forming a regular and determinate idea of things, as at other times; so that its due operations are interrupted, and often second ideas, having no connection with the first, crowd in, and are succeeded by actions no way analogous to that first idea, and therefore appearing irrational.

Authors distinguish *Melancholy* into three kinds; the sad, the merry, and the mixt, partaking of the nature ofboth; but in all these the cause is the same, and the difference is only owing to the temperament and habit of the patient.

This distemper has, however, its more essential differences, in regard to the causes from which it is produced. In some people, it seems wholly to depend upon a false prefiguration and judgment of things in the mind; and in this case it is usually habitual and incurable. In others it arises from injuries of the body; and in these it always is observed to bear a proportion to the injury or debility of the parts. This peculiar species is called hypochondriac *Melancholy*; and finally, in others it seems of a mixt nature; as when it has taken its first origin from distemperatures in the body, but is afterwards so encreased by mental disorders, that even after the total removal of the corporeal ones, it still remains in all its force upon the mind. This is a too common, and very unhappy case.

Signs of it. These are a perpetual anxiety of mind, without any rational cause; a distaste and dislike to every thing, even before it comes in sight, and often a weariness even of life itself. A frequent weeping for imaginary causes, or for no cause at all. Many people, in this case, seem always to want room; they are for opening all the windows they can, and for running out into the streets or fields, thinking themselves every where imprisoned; others leave their houses, and dread being taken up for capital offences, tho' never guilty of any; and, in others, these distemperatures of the mind are evidently joined with others of the body, such as palpitations of the heart, sighing very deeply, painful respiration, strictures of the tonic motions of the parts, tremblings, paleness of the countenance, and extenuation of the body. Sometimes, instead of these restrictions, there are frequent remissions of the same tonic motions, whence arise sudden flushings of the face, uncertain heats in the body, and a general lassitude and loss of strength. In most cases of this kind, there is an obstinate costiveness of the bowels, and the affections of the mind are increased by terrible watchfulness, and if the persons sleep a little, they are terrified with troublesome dreams all the while; if of sanguine habits, they are continually dreaming of blood, of battles, and of fires; and, if of phlegmatic constitutions, of water and drowning. Dreadful apprehensions happen also between sleeping and waking, and they usually awake in agonies, with violent tremblings, and difficulty of respiration. In the merry *Melancholy*, the alienations of the patient's mind are employed about chearful, and often obscene ideas; and sometimes their fancy exalts them to the state of kings and princes.

Persons subject to Melancholy. These are principally men of great learning, and of sedentary lives, hypochondriac people, and such as are troubled with disorders of the spleen; and to these are to be added women subject to hysteric complaints.

Causes of it. These are principally a spissitude of the blood, and a detension of it about the vena portæ; a bad disposition of the internal parts, as a schirrous or ulcerous constitution in them, or an actually ulcerated state. Persons who are afflicted with *Melancholy*

Melancholy from thefe caufes, are ufually fubject to very unruly paffions, and thofe of various kinds; love, fear, dejection of fpirits, defpair and anger, are often very predominant in them. A fuppreffion of the hæmorrhoidal difcharges in men, and of the menftrual ones in women, will alfo frequently throw them into this diftemper; as will alfo an over great application to ftudy, efpecially on abftrufe fubjects; a confcientious dread from paft crimes; continual difappointment in the expectations; and fometimes a timorous difpofition, brought on in infancy, by the folly of nurfes.

Prognoftics in it. That kind of *Melancholy* which is brought on by immaterial caufes alone, fuch as that arifing from too intenfe ftudy, or other imaginations or effects of the mind, is always greatly more obftinate and difficult of cure than that which depends upon material caufes, and has its origin in a diftempered ftate of the body. The hypochondriac *Melancholy* is the moft eafy of all to be cured, efpecially if the hæmorrhoidal difcharges can be brought on regularly again, yet even thefe cafes muft be taken in time, for when the *Melancholy*, even from fuch caufes, is become habitual, it will remain after the caufe is removed which gave them origin.

Method of Treatment. *Melancholy*, when it depends on immaterial caufes, requires phyfic for the mind rather than for the body, and the frequent converfation with an ingenious friend, of a calm and quiet difpofition, will go farther towards a cure than a thoufand medicines. Perfons in this ftate muft be as little thwarted or contradicted as poffible, and whips and chains are to be avoided, unlefs in cafes of the moft extreme neceffity; this is alfo a method equally neceffary in thofe cafes where habit has confirmed upon the mind that diforder, which at firft arofe merely from material caufes. But when the difeafe not only arifes, but as yet depends entirely upon material caufes, the cure is eafy, and is to be performed in the following manner: The *primæ viæ* are to be cleanfed by purges, particularly thofe made of black hellebore, and after this the patient is to be blooded in the foot, taking away about fix ounces. Then the blood is to be attemperated by giving, three or four times a day, powders compofed of purified nitre, and the common abforbents; and after a due ufe of thefe, the parts are to be reftored to their priftine tone and vigour, by the milder chalybeates; the greateft care muft alfo be taken to bring the hæmorrhoidal difcharges in men, and the menftrual ones in women, to a natural and proper ftate, and then a fufficient quantity of weak liquors drank at meals, and a moderate degree of exercife, will bring the patient ufually to an abfolute ftate of health.

Hypochondriac *Melancholy* always is more relieved by bleeding than by any other practice; and indeed all attempts of a cure are vain, if this be not firft done: Purified nitre diffolved in fmall quantities in all the patient's drink, will, in time, be found to do great things alone, as to a cure. It is the practice of fome perfons to give vomits in thefe cafes; but they often turn *Melancholy* into a true *mania*. See the article MANIA.

MELANCORYPHUS, in natural hiftory, the name of a bird, in the nefts of which, the antients tell us, they found the callais or turquoife. This feems a very ridiculous ftory, and the whole to be only founded on the refemblance of colour between that ftone and the eggs of this bird. It has been alfo difputed among authors, what was meant by the *melancoryphos* of the antients; the general opinion is, that it was that little bird which, from the blacknefs at the top of the head, we call the *black cap*. But the antients themfelves feem to have meant a fomewhat larger bird by it; for they tell us, that the ficedula, at a certain time of the year, changed colour, and became the *Melancoryphos*, or black crown. There is no great foundation for fuch an opinion as this, but it may, however, ferve to fhew, that thefe two birds were much of a fize.

MELANOCERASUS, a name given by fome botanical authors to the *folanum lethale*, or *bella donna*, a poifonous fort of nightfhade, with a beautiful berry refembling a large black cherry. *Pluk.* Almag. p. 352.

MELANOPIPER, in the materia medica, a name given by fome writers to the common black pepper. *Mont.* Exot. p. 9.

MELANTERIA, in natural hiftory, the name of a foffile fubftance, much talked of by the antient writers in medicine, and fuppofed by moft of the moderns to have been loft among the later ages. This, however, is an erroneous opinion, for it is really produced at this time in many parts of the world; though its refemblance to fome of the other foffils, in its external appearance, has made it almoft univerfally overlooked by the writers on thefe fubjects. It is, in its moft perfect ftate, a very beautiful fubftance, of a clofe, even, and regular texture, moderately heavy, and of a very beautiful yellow, like that of the fineft gold. It is, in this ftate, found in loofe irregular lumps, never very large, being ufually only from an ounce to two ounces in weight, and of a fmooth, even, and polifhed furface. This is the cafe when it is pure and folid, and it is then alfo of as bright and fine a colour on the outfide as within. *Hill's* Hift. of Foff. p. 607.

This is a ftate, however, in which it is very rarely found; we ufually meet with it either in the form of a downy efflorefcence on various fpecies of vitriolic minerals, particularly on the common marcafites and pyritæ; or elfe in loofe, fhattery, and friable maffes, of rough furfaces, of a fpongy texture, and of a coarfe dufky yellow; in either of thefe ftates, however, it fo much refembles a more or lefs pure native fulphur, that it is generally miftaken for that body. It makes no effervefcence with acid menftruums, and when put into the fire, is found not to be inflammable, but calcines firft to a whitifh, and finally to a ftrong red colour.

Water diffolves a part of its fubftance, and this may again be procured feparate from the liquor, by evaporation and cryftallization, and then it appears in form of rhomboidal bluifh green cryftals.

It is found in the mines of fome parts of the harts foreft in Germany, and is often met with on the fides of hills in many parts of the Eaft Indies, and in America; it is ufually miftaken in all thefe places for a native fulphur. Id. ibid.

MELANTZANA, in botany, a name given by many authors to the mad apple, called more ufually *Melongena*. See the article MELONGENA.

MELANURUS, in zoology, the name of a fifh caught in the Mediterranean, and fometimes, though rarely, in the Britifh feas; and called by fome writers, *occulata* and *occhiata*.

It is of an oblong and rounded body, and its back very little prominent, and of a bluifh black. Its fides are of a filvery white, but are variegated with dufky tranfverfe ftreaks. Its eyes are remarkably large, and their iris of a fine fhining yellow. Its mouth is moderately large, and its fore teeth broad, its hinder ones narrow, flender, and fharp. It has only one back fin, the anterior rays or nerves of which are prickly, but the hinder ones foft and inoffenfive. Its fcales are moderately large, and its tail is very remarkably forked. It feldom exceeds five or fix inches in length: And its tail has a remarkable black fpot in it, whence it has its name, as it has that of *occulata*, from the largenefs of its eyes. *Gefner*, de Pifc. p. 638. *Aldrovand.* de Pifc. l. 1. p. 63.

MELAONES, a word ufed by certain authors for a black kind of worm found in meadows, in the month of May, which, when bruifed, emit an agreeable fmell. Some alfo have called a fmall fpecies of beetle by the fame name.

MELASMA, a fugillation, or black mark, from a bruife.

MELASSES. See the article MOLASSES, *Cycl.* and *Suppl.*

MELASTOMA, in botany, the name of a genus of plants, called by Burman, *acinodendron*. The characters are thefe: The perianthium confifts of one leaf, and is obtufe and permanent; it is inflated in the middle, and fcarce at all divided at the edge. The flower confifts of five roundifh petals, inferted near the rim of the cup. The ftamina are ten filaments, fhort, and inferted into the cup. The antheræ are long and erect, but fomewhat crooked. The germen of the piftil is roundifh, and placed under the cup. The ftyle is crooked and emarginated. The fruit is a berry containing five cells; it is of a roundifh figure, but crowned with a cylindric rim, and furrounded by the cup. The feeds are numerous and fmall. *Linnæi* Gen. Pl. p. 190. *Burman.* Thefaur. Zeyl. p. 363. Hort. Malab. vol. 4. p. 42.

MELCHITES, a name of reproach given to the orthodox, who afferted and maintained the canons of the council of Chalcedon. It was given to the catholics by the heretics, and not by the catholics to the heretics, as mentioned in the Cyclopædia. See the article MELCHITES, *Cycl.*

The word is derived from the Hebrew *melech*, a king or prince, and fignifies the fame as royalifts, or thofe who were of the emperor's religion. For the fame reafon the emperor Juftinian had the epithet *Chalcedonenfis* given him. *Hofm.* Lex. in voc.

MELDFEE, in our old writers, a recompence due and given to him that made the difcovery of any breach of penal laws, committed by another perfon, called the promoters or informers fee. *Leg.* Inæ. c. 20. *Blount.*

The word is Saxon from *meldfeoh.*

MELEAGRIS, the *Turkey*. In the Linnæan fyftem of zoology, this makes a diftinct genus of birds, of the order of the gallinæ; the diftinguifhing characters are, that it has four toes on each foot, a flefhy papillofe creft on its forehead, and long naked wattles. *Linnæi* Syftem. Natur. p. 48.

MELECH, a word ufed by fome of the chemical writers to exprefs falt. See the article SALT.

MELECHIL, a word fometimes ufed as the name of the gum *bdellium*, and fometimes as that of the fruit of a tree of the palm kind, much ufed by the antients as a cordial and reftorative. The word *mokel* has the fame double fenfe, and both are, by the more accurate writers, determined in their meaning by the epithets annexed to them, the gum *bdellium* being called *Molechil*, or *mokel judaicum*, and the fruit *mokel mechenfe*; yet the confequence of even this has been more confufion; for the later writers fuppofed, that the fruit was not produced by a palm-tree, but by the fame tree which produced the gum. See the articles MOKEL and BDELLIUM.

MELEGEION, a word ufed by fome writers in medicine to exprefs a fætid matter, of the confiftence of honey, difcharged from old ulcers.

MELES, the *Badger*, in the Linnæan fyftem of zoology, makes a diftinct genus of animals, among which the author includes the civet cat, as the creature which affords us the

perfume of that name is usually called. The characters of this genus are, that the animals of it have eight paps, two on the breast, and six on the belly, with feet with five toes on each, on the hinder as well as the fore ones. The author distinguishes the common *Badger* by his having the claws of his fore feet much longer than those of the hinder ones; and the civet animal by its having all its claws of the same length. *Linnæi* System. Natur. p. 37. See the article TAXUS.

MELET, in zoology, a name used by some for a small transparent sea fish, called by authors, *hepsetus* and *anguilla*, and by some, *atherina*. *Willughby*'s Hist. Pisc. p. 210. See the article HEPSETUS.

MELIA, Μελία, of the Greek writers, the name of a vegetable that often occurs in the Greek naturalists, and which has so many significations, that it is not easy to understand the authors, without being well acquainted with them. All late writers have perplexed the world by miscalling things, and thence rendering names synonimous and confused, which were at first clear and distinct; but the confusion of the senses of the word *Melia* is as old as the earliest writers we are acquainted with: Theophrastus complains of it in his time.

The most common use of the word is for the *fraxinus*, or ash-tree. The antients used to make the handles of their spears and darts of this, and therefore they sometimes called them *Melia*. This word was also used as the name of a seed, called also by some, *meline*. This was of the nature of panic, and by some confounded with the panic. Suidas mentions this as different from the panic; but Diocles seems to have made them the same seed. Pliny has translated the passage from Diocles, and, by an unaccountable error, has called the plant *melfrugum*, and says, that it has the same virtues with millet.

MELIA, in botany, the name by which Linnæus calls the *azedarach*. See the article AZEDARACH.

MELIA *Terra*, in natural history, a name given by some authors to the *melinum*, or white earth of the island of Melos, used among the antients in painting; but in the works of Dioscorides and Galen signifying a substance of a very different kind; the *melinum* of the painters having been a *Marle* (see the article MELINUM) and the *Melia Terra* of the physicians a tripela. The confusion between these two substances, arises from the same source with that of a vast number of others in the materia medica, and natural history of the antients, things having, though ever so different in their nature and structure, been at different times called by the same name, merely because brought from the same place.

The *Terra Melia* of Dioscorides, and the antient physicians, is a dry, loose, and harsh earth, found in masses of different size, and lodged among the looser strata of other matter, never making a stratum of itself. It is very firm and hard, of a pale greyish white or light ash colour, very heavy, of a loose, open, and spungy texture, and of a rough, uneven, and dusty surface. It adheres slightly to the tongue, and does not stain the hands, but leaves a dust after the handling, which is so harsh as to make a grating noise, when the fingers are afterwards rubbed together. It makes no effervescence with acids. It is found in all the islands of the Archipelago, and was used by the antients for the same purposes that the pumice was. *Hill*'s Hist. of Foss. p. 68.

MELIANTHUS, in botany, the name of a genus of plants, the characters of which are these: The flower is of the polypetalous anomalous kind, being composed of four leaves, sometimes expanded into the shape of a fan, and sometimes contracted into that of a cone. The cup is unequally divided into several segments, and from it arises a pistil, which afterwards becomes a square fruit, inflated in the manner of a bladder, and divided into four cells, which contain roundish seeds. *Tourn.* Inst. p. 430.

The species of *Melianthus*, enumerated by Mr. Tournefort, are these: 1. The African *Melianthus*, called the great spiked African pimpernel. 2. The smaller procumbent African pimpernel-leav'd *Melianthus*. And 3. The least American *Melianthus*. See Tab. 1. of Botany, Class 11.

MELICA, in botany, a name given by some authors to the plant which produces the *sorghum*, or Indian millet. *Park.* Theatr. 1136.

MELICA, a word used by the antients as the name of a food of a refrigerating and moistening quality. It seems to have been a kind of *oxygala*; for Galen, where he directs persons of a hot habit to use a refrigerating diet, among other aliments of that kind, directs the eating of *Melica*, which, he says, is prepared of milk. Constantine, in his book of Agriculture, mentions *Melica*, and says it was made by pouring milk into an earthen vessel, first well impregnated with boiling hot vinegar, by means of which there was a separation of the milk into whey and curd.

MELICERIOLA, a diminutive of the word *Meliceris*, a small encysted tumour. See the article MELICERIS, *Cycl.*

MELICHLORUM, in natural history, a name given by some of the antient writers to a species of jasper, of a greenish yellow, usually found variegated with other colours.

MELILOTUS, *Melilot*, in botany, the name of a genus of plants, the characters of which are these: The flower is of papilionaceous kind. The pistil arises from the cup, and finally becomes a naked capsule or pod, not inclosed in the cup in the manner of those of the trefoil, and containing one or two roundish seeds. The leaves grow three on every stalk. *Tourn.* Inst. p. 406.

The species of *Melilot*, enumerated by Mr. Tournefort, are these: 1. The common or German *Melilot*. 2. The common *Melilot*, with white flowers. 3. The *Melilot* with long and sharp pods. 4. The tall shrubby white-flower'd *Melilot*. 5. The tall shrubby yellow-flower'd *Melilot*. 6. The greater *Melilot*, with reflected pods. 7. The little creeping *Melilot*, with reflected pods. 8. The Italian *Melilot* with roundish seed-vessels. 9. The narrow-leav'd creeping *Melilot*, with roundish seed-vessels. 10. The little yellow *Melilot*, with small flowers, and seed-vessels arranged in thick spikes. 11. The little yellow-flower'd *Melilot*, with larger flowers and seed-vessels, dispos'd in longer and looser spikes, and with narrower leaves, each having a black spot near the pedicle. 12. The procumbent *Melilot*, with longish rugged leaves, and short spikes of flowers. 13. The *Melilot* with kidney-shaped seed-vessels collected into heads, called the yellow-field trefoil, with numerous seeds. 14. The great sweet-scented *Melilot*, with violet-colour'd flowers. 15. The cretic *Melilot*, with very large fruit. *Tourn.* Inst. p. 408.

In the acts of the academy of Petersburgh, we have a description and draught of a new species of *Melilot* growing from seeds gathered in Siberia. It is there called *Melilotus siliqua membranacea compressa*. See Tom. 8. p. 229. seq.

Melilot is scarce ever given internally, but used externally; it is a great emollient, resolvent, and digestive. It is a good ingredient in cataplasms and fomentations of this intention. The flowers are recommended by some in infusion, in the manner of those of chamomile, as a remedy for the *fluor albus*.

MELINTZANIUM, in botany, a name given by the later Greek writers to the plant called *strychnus* by the earlier writers of that nation. Theophrastus, and all the old Greeks, use the word *strychnus*, and say there are three kinds, two of which are poisonous, and the other not. The first causing madness, the second causing sleep, and the third bearing an esculent fruit. This last is the plant we call *pomum amoris*, the fruit of which is at this time eaten by many people.

It is not agreed by the late Greek writers whether this word *Melintzanion* shall stand for some one kind of the nightshade, or for them all: If they borrowed it from the Italian *melanzana*, which seems probable enough, then it can only stand for that kind, not for the whole class of nightshade; but we find some of them using it for the whole number of the nightshades, poisonous and not poisonous, and making it only a synonym to *strychnus*, others using it as the name of the fruit of the *pomum amoris*, or love-apple, and others for the fruit of the male mandrake, which is also esculent, and which, Dioscorides tells us, was eaten by the peasants of his time, but that it made them sleepy, if eaten in too large quantities.

The Arabian physicians use the word *bedengian* in the same sense, sometimes applying it to the love-apples alone, and sometimes to the whole family of the nightshades; and it is probable enough, that both the Italians and later Greeks copied their name *melanzana* and *melantzanion*, from *melongena*. Myrepsus has the words *melentzanon* and *agriomelentzanon*, that is, a wild kind of the *pomum amoris*, very frequent, and commends the seeds, and other parts of the plant, in fevers, and many other diseases. Fuchsius confesses that he does not know what to make of the word; but it is wonderful that the similitude of sound between this and the *melanzana* and *melongena* did not lead him to the knowledge of what it was, as he was acquainted with those words.

MELINUM, in natural history, the name of an earth, famous in the earliest ages of painting, being the only white of the great painters of antiquity; and, according to Pliny's account, one of the three colours with which alone they performed all their works.

It is a fine white marly earth, of a very compact texture, yet remarkably light; a sort of texture which must render any earth fit for the painter's use, that is of a proper colour. It is frequently found forming a stratum in the earth, lying immediately under the vegetable mould. It is of a very smooth, but not glossy surface, is very soft to the touch, adheres firmly to the tongue, is easily broken between the fingers, and stains the skin in handling. It melts readily in the mouth, and is perfectly fine, leaving not the least grittyness between the teeth. Thrown into water, it makes a great bubbling and loud hissing noise, and moulders away into a fine powder. It does not ferment with acids, and suffers no change in the fire. These are the characters by which the *Melinum* of the antients is distinguished from all the other white earths. It is still found in the same place from whence the painters of old had it, which is that from whence it has its name, the island of Milo, called Melos by the Greeks, and is common in most of the adjacent islands. It has been of late tried here as a paint, and is found not to make so bright a white as the other substances now in use among the painters, but seems not liable, like them, to turn yellow; and if so, would be worth the consideration of persons in the colour trade, especially as it may be had in any quantities for carriage. *Hill*'s Hist. of Fossils, p. 43.

MELINUS *Color*, Μήλινον χρῶμα, in antiquity, a colour often mentioned in speaking of the habits of players. It was a reddish yellow, or the colour of ripe apples, in Greek called μῆλα, and their colour μηλοειδὲς χρῶμα. *Hofm.* Lex. in voc.

MELISSA, *Balm*, or *Baum*, in botany, the name of a genus of plants, the characters of which are these: The flower is composed of one leaf, and is of the labiated kind. The upper lip is erect, and of a roundish figure, but bifid at the end. The lower lip is divided into three segments. The pistil arises from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower, and surrounded with four embryos, which afterwards become so many roundish seeds, ripening in an open capsule, which was the cup of the flower. The flowers of *Baum* always grow in the alæ of the leaves, but they do not always surround the stalks like those of the sideritis. *Tourn.* Inst. p. 193.

The species of *Baum*, enumerated by Mr. Tournefort, are these: 1. The common garden *Baum*. 2. The hairy strong smelling Roman *Baum*. 3. The low broad-leav'd *Baum*, with a large purple flower. 4. The low broad-leav'd *Baum*, with a very large white flower. 5. The low narrow-leav'd *Baum*, with a very large flower. 6. The short-stalk'd, plantain-leav'd Pyrenean *Baum*.

Baum is greatly esteemed among the common people, as good in disorders of the head and stomach; but is less regarded in the shops. It is most conveniently taken by way of infusion, like tea; and the green herb, contrary to the general rule in regard to other plants, is much better than the dry. See the article BALM.

Hoffman has contrived a process for the obtaining the virtues of this plant, which affords its principles better than any other, and gives two medicines to the physician, unknown before, but of great value.

This method might be pursued with the same success in other cases, and many plants, not sufficiently esteemed at present, might thus afford useful preparations.

He took a large quantity of the leaves of *Baum*, fresh picked from the stalks, and filling a glass vessel more than half full, with them, fixing the stopper carefully in, he put the vessel into a dung-hill, where he let it remain three months: At the end of this time he took it out, and found the whole reduced to a kind of pultice. This being distilled in a retort, yielded first an empyreumatic liquor, but afterwards, when the fire was increased, a black and stinking oil came over, in form of thin laminæ, spreading itself over the surface of the liquor. There remained at the bottom of the retort a black and burnt mass, resembling a coal, which, being thrown on burning charcoal, had very much the smell of the common tobacco.

In this first distillation no volatile salt appeared, but the empyreumatic liquor being examined, was found very sharp and acrid on the tongue, and of a sharp and pungent smell. Spirit of vitriol being mixed with it, it afforded no effervescence; but on the mixing it with spirit of hartshorn, spirit of urine, or the like, a small ebullition always was produced, though it lasted but a few moments.

This liquor, rectified by a second distillation, affords the volatile salt of *Baum*, which is a fine white and pellucid substance, adhering to the neck of the glass, in form of fine white and striated crystal, and a yellow ætherial oil, of a very penetrating smell, and sharp taste, becomes separated by the same rectification. These are both found to be very great medicines, the salt as a sudorific, and the oil as a high cordial, a carminative, and a deobstruent. *Hoffman*, Act. Laborat. Chem.

MELITENSIS *Terra*, *Earth of Malta*, in the materia medica, an earth of which there are two very different kinds, the one of the genus of the boles, the other of the marles. The latter is that known by medicinal authors under this name; the former is the Malta earth now in use: But both being brought from the same place, are confusedly called by the same name.

The Maltese bole, which is what we use now, is a fine earth, of a close compact texture, and very heavy; when dug, it is of a very pure white, but it is apt to contract a yellowness in drying, and become of a cream colour. It is of a very smooth and shining surface, scarce at all stains the skin in handling, adheres strongly to the tongue, and melts into a butterlike substance in the mouth. It makes no effervescence with aqua fortis, or any other acid menstruum, and suffers no change of colour in the fire. *Hill's* Hist. of Fossils, p. 4.

The Maltese marle, which is the *Terra Melitensis* of medicinal authors, is a loose, crumbly, and very light earth, of an unequal and irregular texture, and when exposed to the weather, soon falls into fine soft powder; but when preserved and dried, it becomes a loose light mass, of a dirty white colour, with a greyish cast; it is rough to the touch, adheres firmly to the tongue, is very easily crumbled to powder between the fingers, and stains the hands. Thrown into water it swells, and afterwards moulders away into a fine powder. It ferments very violently with acid menstruums.

Both kinds are found in great abundance in the island of Malta, and the latter has been much esteemed as a remedy against the bites of venomous animals, but with how much justice we cannot say. The other has supplied its place in the German shops; and is used there as a cordial, a sudorific, and astringent. *Hill's* Hist. of Fossils, p. 37.

MELITITES, in natural history, an indurated clay, of a yellowish colour, but in many respects approaching to the nature of the morochthus or common French chalk.

It has its name from the Greek μέλι, honey, according to Dioscorides, from the sweet taste of the liquor it dissolved into on rubbing with water; and probably it might be also so called from its colour, which does not ill resemble that of honey.

The antients used it much in medicine; they applied it externally in ulcers, and gave it inwardly as a soporific to people who were to suffer pain, supposing it would make them less sensible of it. It is at present very common in Italy, and probably in many other places, but is not known or regarded. It is a very smooth substance, nearly as hard as the *morochthus*, of a very compact texture, and of great weight; of a fine even and glossy surface, very smooth and soft to the touch, and in colour of a greyish yellow. It does not at all adhere to the tongue, nor stain the fingers in handling; but drawn along a rough surface, leaves a fine slender white line; and shaved into very thin pieces, has some faint degree of transparence. It dissolves, on rubbing in water, into a yellow thick liquor like cream, which has a luscious or sweetish taste. It does not ferment with acids, and burns to a pure white. The sweet taste of this is common, in some degree, to the *steatites*, *morochthus*, and all the indurated clays, as are also their semi-transparence in thin pieces, and all their other properties. *Hill's* Hist. of Fossils, p. 24.

MELITITES *Lapis*, a name given by some authors to some of the rounder species of *echinitæ*, from their resembling an apple in their shape.

MELITTOMA, a word used by the antients to express a sort of sweet-meat, or confection, made with pleasant ingredients mixed in honey.

MELLAGO, a word used by medicinal writers to express any medicine that has the consistence and sweet taste of honey. It is often applied to the rob, or inspissated juice of fruits, mixed with sugar in the making.

MELLE, or MULLI. The Peruvians, by gently rubbing the fruit of this tree between their hands in warm water, deprive it of all its sweetness; after which they strain the liquor, and leaving it a few days to subside, it becomes a very transparent drink, and by boiling becomes an excellent kind of honey. Garcil. ap. *Boyle's* Works abr. vol. 1. p. 53.

MELLEGUETTA, in the materia medica, a name used by some authors for the great cardamom, commonly called grain of paradise. *J. Bauhin.* vol. 2. p. 204. *Jons.* Dendr. p. 114.

MELLEUM *Marmor*, in natural history, the name of a plain yellow marble, resembling honey or pure Venice turpentine in colour, and thence called by Cæsalpinus, *Marmor specie Mellis aut Terebinthinæ*. It is a very beautiful marble, tho' but of one plain colour, and 'tis a wonder it is not more imported into England. It is of a very agreeable colour, and is considerably hard, and capable of a very elegant polish. It is dug in many parts of Italy, and is greatly esteemed there. It never has any veins. *Hill's* Hist. of Fossils, p. 464.

MELLINE, in botany, a name given by many of the antient writers to the garden plant we call *Baum*. It had the name *Melline* from its yielding honey to the bees.

It has many other names, derived from the same source; such as *apiastrum*, from *apis* the bee, *meliphyllum*, the honey-leaf, and from this, *melissophyllum*. Many also are of opinion, that the *amello* of Virgil is the same plant. He describes it as having a gold-colour'd flower, and purple leaves at the bottom; this they explain by observing, that in *Baum* the stamina of the flowers which stand out, and are the most conspicuous parts, are yellow, and the leaves of the calyx or flower-cup are purple: These, they say, are what Virgil means by the leaves at the bottom, not the common leaves of the plant growing from the root, which are not to be supposed purple in any plant.

MELLISODIUM, a word used by some chemical writers to express burnt lead.

MELLITA, in natural history, the name of a genus of the *echini marini*, of the general class of the placentæ. The characters of the *Mellita* are, that they are plain and flatted shells, with their edges arched and waved, and have on their superficies two or more oblong apertures, which reach to the base. Of this genus, there are two known species; 1. A smooth one with a circular vertex. 2. A scutellated kind, resembling the shell of the tortoise, and with a pentagonal vertex. *Klein's* Echin. p. 30. See Tab. of Testaceous Animals, N°. 9.

MELO, the *Melon*, in botany. See the article MELON.

MELOCACTUS, the *Melon Thistle*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the monopetalous kind, and is tubulated at the bottom, and expanded into the form of a bell at the top, with serrated edges; this stands upon a cup, which finally becomes a soft fleshy fruit, of the shape of an olive, which contains a small seed. In many of the species, however, the fruit is collected into an elegeant head.

The species of *Melocactus*, enumerated by Mr. Tournefort, are these: 1. The common East Indian *Melocactus*. 2. The purple

purple *Melocactus*, with crooked fpires. 3. The fquare creeping American *Melocactus*, with white flowers and fcarlet fruit. 4. The creeping trigonal American *Melocactus*, with white flowers. 5. The fquare tree American *Melocactus*, with white flowers. 6. The arborefcent American *Melocactus*, with ftriated very prickly leaves, white flowers, and yellow tuberofe fruit. 7. The very prickly American *Melocactus*, with feveral globules joined together in the manner of the opuntia. 8. The fmall lanuginous tuberous American *Melocactus*. 9. The fingle-ftalked American *Melocactus*, with white flowers, and blackifh purple fruit. 10. The tuberous purple American *Melocactus*, with very ftrong and fharp prickles. 11. The trigonal undulated American *Melocactus*, with very robuft prickles, and white flowers and greenifh fruit. 12. The trigonal American *Melocactus*, with fhort prickles and white flowers, and fcarlet fruit. 13. The creeping pentangular American *Melocactus*, with white flowers and red fruit. *Tourn*. Inft. p. 653.

MELOCARPUS, a word ufed by fome of the old authors to exprefs the fruit of the *ariftolochia*, or *birthwort*, ufed in fome external applications. See the article ARISTOLOCHIA.

MELOLANTHUS, the name of a peculiar fort of beetle, which is found in all parts of England, and in many other countries among trees and hedges. The French call them *hanneton*, and we *cock-chafers*, *dorrs*, and by many other names. The name *melolanthus* is as old as Ariftotle, and is given this creature from its feeding on the bloffoms of the crab or wild apple. We have, of late years, had great damages done by the grubs of thefe beetles working under ground; but in Ireland they have been ufed to come in fwarms, in certain years, in the beetle ftate, and have been fo terrible to this country, that the people have called them locufts.

The firft time they are remembered by authors to have appeared in this vaft abundance, in this country, was in the year 1688. They then appeared in the fouth-weft part of the county of Galway; they appeared firft upon the coaft, and were brought by a fouth-weft wind, a wind fo common there, that it may almoft be called, the trade wind of Ireland; from the coaft they foon fpread over the inland parts of the county, and were feen every where in fuch numbers, as were fcarce to be conceived. They never ftirred in the day-time, but were feen covering the leaves and branches of trees and hedges, and in many places hanging down in prodigious clufters on one another's backs, in the manner of bees when they fwarm. As foon as the fun fet, they ufed to leave the hedges, &c. and take wing, gathering into bodies, and making a humming confufed noife like that of drums at a diftance. They fometimes formed bodies together, that darkened the air for three or more miles fquare. They flew fo low fometimes, that it was fcarce poffible for a perfon, going along, to make his way through them; and by ftriking againft the faces and necks of women and children, they did much mifchief, every one leaving a mark behind it; and thofe of this fex or age, who had been among them, came home all over bruifes.

This, however, was little to the mifchief they did the fields; for though the middle of the fummer was the feafon in which they came, they had, in a few days, eaten up all the leaves of the trees fo compleatly, that they all looked as bare as in the depth of winter. The noife they made, while eating in vaft numbers together, was like that of fawing timber. The gardens fared no better than the hedges, for they eat up leaves, young ftalks, and fruit, and every thing that was green and foft there, and left only a parcel of naked fticks behind them. Many of the trees, thus ftripped, wholly perifhed. Phil. Tranf. Nº. 234.

MELOMELI, a word ufed by the antients to exprefs honey impregnated with quinces.

MELON, *Melo*, in botany, makes a diftinct genus of plants, the characters of which are thefe: The flowers confift only of one leaf each, and are wide at the mouth, and divided into feveral fegments, wholly refembling the flowers of cucumbers. Of thefe alfo fome are male or fteril flowers, having no embryo fruit; others are fruitful or female flowers, having an embryo which ripens into a large fruit of an oval figure, fometimes fmooth, fometimes rough, divided into three cells, and containing oblong feeds; each of thefe cells feems alfo divided into two.

The fpecies of *Melon*, enumerated by Mr. Tournefort, are thefe: 1. The common *Melon*, with Dodonæus calls the *cucumis* of Galen. 2. The great fmooth green *Melon*, with fmaller feeds. 3. The Spanifh *Melon*. 4. The fmall round *Melon*, called the fugar *Melon*, and round mufk *Melon*. 5. The turbinated *Melon*. 6. The reticular *Melon* of John Bauhine. 7. The little Egyptian *Melon*. *Tourn*. Inft. p. 104.

Melon feed is cooling and diuretic, and has the fame virtues with the other cold feeds, as they are called. See the article GOURD.

The proper management and culture of *Melons* is this: The feeds fhould be procured from good *Melons*, produced in fome diftant garden; for if fowed on the place where it was raifed and ripened, it is very apt to degenerate. This feed fhould be kept three years before it is fowed, and it fhould be fowed at two feafons. The firft for the early crop, to be raifed under frames, fhould be fown in January or the beginning of February; the fecond, to be raifed under bell or hand-glaffes, is to be fowed in *March*, and this is the fowing which produces the general crop of *Melons*, which ripen in July and Auguft.

About a week before the time of fowing the feed, fome dung fhould be prepared in a heap with the litter, or fome coal-afhes, and the fame methods ufed as in the early cucumbers, for the firft crop; but for the fecond, which is of more general ufe, the fowing may be on the upper fides of the hot-beds that were for the early *Melons* or cucumbers, or on a frefh moderate hot-bed. When the young plants are come up, they muft be removed to another hot-bed, and covered with hand-glaffes, and watered and fhaded till they have taken root; and after this they muft have as much air and fun as the feafon will permit, and their ftalks fhould be earthed up as they grow, which will vaftly ftrengthen them.

In the beginning of April the plants will begin to fhew their rough leaves, a parcel of dung is then to be prepared with the litter and coal-afhes. The common quantity is a load to five holes; a trench muft then be dug, which fhould be ten inches deep, if the foil be dry, but only three if it be wet. The dung muft be evenly laid in this, and heaped up to three foot high. Then the places intended for the holes muft be marked out, at each of which muft be laid a bafket-full of light rich earth, thrufting a ftick of two foot long into the middle. Then cover the dung all over with the earth which was dug up out of the trench, laying it fmooth, and about three inches thick; then the glaffes are to be placed clofe down over the place where each of the fticks is, and in two days the earth will be warm enough to receive the feedling plants. The fticks are now to be taken out, and the earth formed in the places into a hollow like a bafon, that it may retain the water which is given to the plants. The plants are then to be taken up, and two ftrong and thriving ones put into each of thefe holes, which muft be watered and fhaded till they have taken root. The plants having taken root, and thruft out a fourth leaf, the top of each of them fhould be pulled off, in order to force out fhoots from the bottom, and as the weather becomes warmer, the glaffes muft be raifed with ftones on the fouth fide, to give them air, and about twice a week they fhould have a little water.

About the middle of May the ftalks of the plants will begin to prefs upon the glaffes on every fide, and the glaffes are then to be raifed up on bricks, to give them room to run out; and they fhould be pegged down with forked fticks, and turned into a proper direction for their running, fo that they may be out of the way of tangling one with another: They fhould now, if the weather be fevere, be fheltered with mats in the night, and watered gently at times. When the ftalks of the plants are grown to the edges of the bed, the earth muft be raifed with old dung buried under it, till it be upon a level with the beds, for two foot wide on each fide. The branches are here to be trained in a proper courfe, and the glaffes are to be left over the roots of the plants, and after this, what water is given them is to be fprinkled all over the plants.

When the fruit begins to appear, the waterings muft be very gentle on the plants; but it will be proper to foak the earth well with large quantities of water about the beds, which will fpread a moifture even to the roots of the plants; from this time the plants fhould be gently watered twice a week, and that always in the evening. When the *Melons* are grown of the fize of a tennis ball, a piece of tile fhould be laid under each to keep them from the ground. As they afterwards approach to ripenefs, they fhould be turned feveral times, that they may ripen equally on every fide; and if the weather be not very favourable, they fhould be covered with glaffes. If the *Melon* is defigned to be eaten as foon as cut, it fhould be fuffered to remain on the plant till it changes pretty yellow, and the ftalk begins to feparate from the fruit; but if it be to be kept two or three days after cutting, it muft always be cut proportionably ealier.

It is a practice with many to take off the leaves about the fruit, that it may have more fun; but it is wrong, and the fruit is always the worfe tafted for it, and the fkin is hard and tough. *Miller*'s Gardener's Dict.

Whenever a *Melon* appears well knit on a branch, it is proper to cut off all the reft of the branch beyond it, that the fruit may receive all the nourifhment that would have been conveyed into the whole branch; only it muft be obferved, that a fufficiency of leaves, of the neighbouring branches, be left or brought over it, to fhade it from the exceffive heat of the fun in the drought and heat of the day.

There is ufually required the fpace of forty days, from the time of a *Melon*'s firft knitting on the branch, to its being perfectly ripe: But in cold feafons they are fometimes longer.

In order to fave good feed for the next year, no other feeds are to be taken out than thofe which have lain in that part of the fruit which is next the fun, and thefe fhould be taken out at the time of the eating the *Melon*, and immediately wiped dry with a cloth, and laid up in a dry place.

Melons fhould not be eaten till they have been gathered twenty-four hours; they fhould, in the mean time, be laid in a cool but dry place. The proper time of gathering them is a thing of great confequence to the eating them in perfection; they generally difcover the proper degree of ripenefs

 for

for gathering, by their smell, and by the splitting of their tail. The common kinds shew the approaching ripeness by a yellowness coming on in some part: This begins in one place, and spreads, by degrees, over a great part of the fruit. It is to be observed that twenty-four hours after the time of the first appearance of a yellowness in some part, is the exact season for the gathering of these *Melons*. A *Melon* that ripens too fast is never good; such a ripeness is unnatural, and proceeds only from the poorness or sickness of the root, which makes it turn thus suddenly. Phil. Transf. N°. 46.

When a *Melon* is perfectly fine, it is full, without any vacuity: This is known by knocking upon it, and when cut, the flesh must be dry, no water running out, only a little dew, which is to be of a fine red colour. Large *Melons* are not to be coveted, but firm and well flavour'd ones. Our Gardeners, who raise *Melons* for sale, sow the seeds of the large rather than the good kinds, and they encrease the size of these by much watering the roots, but this spoils the taste. Some of the French raise at this time particularly fine *Melons*, by a method kept as a secret, but which we find, on a strict enquiry, is no other than the ingenious Mr. Quintiny's, of that nation, published near eighty years ago in our Philosophical Transactions.

The *Melons*, particularly proper to be treated in this manner, are those which have a thin and somewhat embroidered skin, not divided by ribs, and have a red pulp, dry and melting on the tongue, not mealy, and of a high flavour. These are what succeed in the following method, and are greatly improved in size and flavour by it.

When the seeds of this *Melon* are placed in the ground, the first thing that appears is a pair of seminal leaves, or ears, as the Gardeners call them. Between these two leaves there shoots, some days after, a leaf, called the first leaf, or knot; and out of the same place, after some days more, there shoots another leaf, called the second knot. Out of the midst of this stalk of the second knot, there shoots a third knot: This third knot must be cut off at its insertion, without hurting the branch of the second knot from whence it grows. Out of this place there will grow, after this cutting, a branch, which will be what the gardeners call the first arm, and this arm will, in the same manner as the first plant, shoot out, first one, then a second, then a third knot; this third knot must be cut again as before, and thus the third knots are all along to be cut off, and arms or branches will grow up in the places of them, all the way in the same manner as the first; and it is at those arms that the *Melons* will be produced; and they will be always good, if the foot or root be well nourished in good earth, and cherished by a good hot bed and the sun. The foot of the *Melon* must never be suffered to pass into the dung, nor the earth must not be watered but moderately, when it is seen to grow too dry; but in this case, it must be moderately moistened in time, least the shoot suffer by it. Twice or three times a week is often enough to water in the driest weather, and this must always be done about sunset; and when the heat of the sun is too violent, the *Melons* must be covered with straw mats from eleven in the morning to about two in the afternoon. When it rains much, the *Melons* must also be covered, lest it hurt them by too much moisture. Phil. Transf. N°. 45.

If the root produce too many branches, the weakest are to be cut off, and only three or four left; and those which are left are to be such as have their knots closest to one another.

When the plants are removed from the seed-bed to the places where they are to stand, if they are very strong, they should be planted single, but if otherwise, two are to be set in each hole.

When they are planted single, the two branches which always grow on each side, from the base of the seed-leaves, are to be left on; but when two plants are set together, these branches are to be cut off, otherwise all the branches will be too numerous, and they will entangle and spoil one another.

When the *Melons* are knit, two of them only are to be left upon each foot, chusing those which are best placed, and next to the first and principal stalk that is to the heart of the foot. None but fair fruits are to be left, and such as have a thick and short tail; and the foot of the *Melon* must be short, well trussed, and not far distant from the ground. *Melons* of a long stem, and having the stalk of the leaf too long and slender, are never vigorous.

All the superfluous branches must be cut off from time to time, as they shoot out.

There sometimes shoots out a branch more than is here mentioned, between the two seed-leaves or ears. If this is strong and vigorous, it is to be kept on, but if weakly, it is best to take it off, for it will never bear good fruit.

MELON *Seeds*. We read of *Melon* seeds thirty-three years old, vegetating and producing a fine number of plants. Phil. Transf. N°. 475. Sect. 6. and in N°. 464. we read of *Melon* seeds 43 years old, producing fruit.

Petrified MELONS, a name given by the people who have written books of travels, &c. to certain stones found on mount Carmel. The monks who inhabit that mountain at this time, and who pretend to be the followers of Elias the prophet, tell a legendary story about these stones, which has given occasion to the name. They say, that when Elias lived on that mount, a certain Gardener passing by his cave with *Melons*, the prophet asked one of them; but the fellow replying, that they were not *Melons*, but stones that he carried, the prophet miraculously fulfilled the saying, and converted them into stones. Travellers who are fond of these stories, were usually glad to pick up one of these sacred stones as they went on; and the monks have been careful enough to gather all they could find for the better opportunity of obliging their visiters; so that though they were once very common, they are now only to be had by the favour of these people.

Breynius is the only author who has given a good account of them; he says that they are spheric or spheroidal stones, of various sizes, from that of a hen's egg to that of the largest *Melon*, or even more than that. They are generally found bedded in a very hard sand stone, of a greyish or ash colour; but they come out whole on breaking the stone, and are of a smooth surface; a greyish colour, or sometimes a brownish ferrugineous hue. When they are broken, there is always a cavity found in them, sometimes regular and even, sometimes very irregular, and generally proportioned to the bigness of the stone. This cavity is lined on all sides with minute crystals, which are very bright and pellucid, and have their points standing toward the center of the cavity. The substance of the stone itself approaches to the nature of marble, of a yellowish colour, and capable of a good polish; when wrought looking very like the Florentine marble. This is a crust of about half an inch or an inch in thickness, according to the bigness of the stone, and sometimes this is covered with a paler-coloured crust, of the thickness of a straw, which in some degree resembles the bark or rind of the fruit. These stones are truly a sort of concave natural nodules, of the nature of our hollow flints. They have had no fruit for their matrix, nor have ever any of the ribs and furrows which the *Melon* has, nor any mark of the stalk; and within they have neither the natural divisions of the *Melon*, nor any thing resembling the seeds. It is not only the want of many parts absolutely essential to the fruit supposed to be petrified, which shews that opinion to be erroneous; but the course of nature, in petrifactions in general, argues also greatly against it.

The things we meet with, in this state, are all of them such as are naturally hard, dry, and permanent, and none of the tender and succulent bodies, such as the *Melon*, and the like fleshy fruits, which must necessarily rot in the water that conveys the stony matter, before it could at all enter their pores. And the stones are certainly analogous to those concave nodules of a ferrugineous colour, in the cavities of which amethysts are produced; and to that genus of stones which Woodward calls concave crystalline balls, common in many parts of the world.

The fallacy of an extravagant opinion, in regard to fossils of any particular form, is not peculiar to these stones, as witness the small shells petrified and found in Ægypt, which from their flat and roundish shape, are said to be the lentiles which the children of Israel eat when making the pyramids; the *cornua ammonis*, which is the remains of a sea shell, and yet is supposed to be a petrified serpent; the *nummi minerales*, which are the operculums of shell-fish, but are generally supposed by the vulgar, about the places where they are found, to be medals and coins, petrified with lying in the earth, and many the like follies. *Breyn.* de Melon. Petr. Mont. Carm.

MELON *Thistle*. See the article MELOCACTUS.

MELONGENA, *Mad Apple*, in botany, the names of a genus of plants, the characters of which are these: The flower consists of one leaf, and is of a rotated form, and divided into several segments at the edges. The pistil arises from the cup, and is fixed in the manner of a nail to the middle part of the flower. This afterwards changes to a fleshy fruit, in which there are contained a number of kidney-shaped seeds.

The species of *Melongena*, enumerated by Mr. Tournefort, are these: 1. The long violet-fruited *Melongena*. 2. The *Melongena* with long white fruit. 3. The *Melongena* with long yellow fruit. 4. The *Melongena* with long bright red fruit. 5. The *Melongena* with cylindric violet-coloured fruit. 6. The round fruited *Melongena*. 7. The crooked-fruited *Melongena*. 8. The thorny *Melongena*, with round saffron-colour'd fruit. 9. The *Melongena* with round fruit, armed with violet-colour'd thorns. 10. The *Melongena* with round fruit, armed with greenish white thorns. 11. The *Melongena* with prickles, and with a round black fruit. 12. The prickly *Melongena*, with a long black fruit. *Tourn.* Inst. p. 151.

This plant is propagated in the gardens of the curious with us; and in Spain, Italy, and Barbary, common in the kitchen gardens, the fruit of them being frequently eaten there boiled with fat flesh, putting thereto some scraped cheese, and preserving it through the winter with vinegar, honey, or salt pickle. This they esteem of great efficacy to provoke venery. In summer also, when the fruit is just ripe, they eat it fresh dressed, with spices and other ingredients.

The manner of propagating them with us, is to sow the seeds in March, upon a moderate hot bed, and when the plants are come up, they are to be thinned by planting them in another

hot bed at about four inches afunder, watering and fhading them till they have taken root. They muft afterwards have as much air as the feafon will allow, and in May they muft be tranfplanted into a warm border, fetting them at two foot diftance every way. About the middle of June the fruit will appear, and if the weather be dry at this time, they muft be often watered, which will make the fruit grow large. The fruit ripens in the end of July. *Miller*'s Gardener's Dict.

MELOPEPO, in botany, the name of a genus of plants, of a middle nature, as their name expreffes, between the melon and the pompion. The characters which diftinguifh this genus from the others of the like kind, are, that the fruit is roundifh, ftriated, angular, and ufually deeply divided into five parts. The feeds are flat, and fixed to a fpongy placenta.

The fpecies of this genus, enumerated by Mr. Tournefort, are thefe: 1. The flatted or compreffed *Melopepo*. 2. The great white-fruited *Melopepo*. 3. The yellow rough-fruited *Melopepo*. 4. The broad depreffed *Melopepo*. 5. The citron-fhaped *Melopepo*. 6. The conic *Melopepo*. 7. The *Melopepo* with a doubly turbinated fruit. 8. The yellow thin-fkinned *Melopepo*. 9. The clypeated, or fhield *Melopepo*. 10. The verrucofe or warted *Melopepo*. 11. The tuberofe warted *Melopepo*. 12. The lightly ftriated yellow warty *Melopepo*, with rough leaves. 13. The white lightly ftriated warty *Melopepo*, with rough leaves. 14. The warty *Melopepo*, with a white fruit and white feeds.

MELOTIS, a word ufed by the chirurgical writers to exprefs a fmall probe, properly one intended to be ufed only to the ear.

MELT (*Cycl.*)—MELT *of Fifhes*. In the *Melt* of a living cod-fifh there are fuch incredible numbers of thofe fmall animalcules found in the male feed of all animals, that in a drop of the juice of it, no more in quantity than a fmall grain of fand, there are contained more than ten thoufand of them; and, confidering how many fuch quantities there are in the whole *Melt* of one fuch fifh, it is not exceeding the bounds of truth to affirm, that there are more animals in one *Melt* of it, than there are living men at one time upon the whole face of the earth. However ftrange and romantic fuch a conjecture may appear at firft fight, a ferious confideration, and calculation, will make it appear very plain. An hundred fuch grains of fand as are here mentioned, will make about an inch in length; therefore in a cubic inch there will be a million of fuch fands.

The *Melt* of one of thefe fifhes is frequently about the quantity of fifteen cubic inches, it muft therefore contain fifteen millions of quantities as big as one of thefe fands; and if there be ten thoufand animals in each of thofe quantities, there muft be, in the whole, a hundred and fifty thoufand millions: Which is a number vaftly exceeding the number of mankind, even tho' we were to fuppofe the whole earth as populous as Holland. See Philofophical Collections, p. 4.

MELTING (*Cycl.*)—MELTING *Cone*, in affaying, is a fmall veffel made of copper or brafs, of a conic figure, and of a nicely polifhed furface within. Its ufe is to receive melted metals, and ferve for their precipitation, which is effected, when two bodies melted together, and yet not mixing perfectly with one another in the fufion, feparate in the cooling into two ftrata, on account of their different fpecific gravity. This precipitation might be made in the fame veffel in which the fufion is performed; but then the melting-pot or crucible muft be broken every time to get it out, whereas the conic fhape, and polifhed furface of this veffel, makes it eafily got out without violence. The fhape of this veffel is alfo of another ufe in the operation; for by means of it, the heavy matter fubfiding to a point, is formed into a perfect and feparate regulus, even where the whole quantity, as is very frequently the cafe, has been but very fmall.

When the quantity of the melted matter is great, it is common to ufe, inftead of this cone, a large brafs or iron mortar, or any other conveniently fhaped brafs or iron veffel. It is neceffary, when the cone is of brafs, to be cautious that it be not made too hot; for the brittlenefs of that metal, when hot, makes it eafily break, on the ftriking with any force on that occafion, to make the melted mafs fall out.

Thefe, and all other moulds for the receiving melted metals, muft always be well heated before the mafs is poured into them, left they fhould have contracted a moifture from the air, or have been wetted by accident; in which cafe the melted metal will be thrown out of them with great violence and danger. They ought alfo to be fmeared over with tallow on their infide, that the regulus may be the more eafily taken out of them, and the furface of the mould not corroded by the melted mafs poured in.

If a very large quantity of a metal is, however, to be received into them, and efpecially if any thing fulphureous have place among it, this caution of tallowing the moulds does not prove fufficient; for the large quantity of the mafs makes it continue hot fo long, that this becomes but a flight defence to the furface of the mould. In this cafe the affayer has recourfe to a lute, reduced to a thin pap with water, which being applied in form of a very thin cruft, all over the infide of the cone, or mould, foon dries up indeed, but always preferves the fides of the veffel from the corrofion of the mafs. And this caution is found neceffary, even when pure copper is melted alone, without any mixture of fulphur. See Tab. of Chemiftry, N°. 31. *Cramer*, Art. Aff. p. 72.

MEMÆCYLUM, in botany, a name by which fome authors have called the *arbutus*, or ftrawberry-tree, a fhrub preferved in the gardens of the curious. *Ger.* Emac. Ind. 2.

MEMAICULA, in the materia medica of the antients, a name given to a fruit, ordered in fome compofitions as an aftringent and a cooler. When the Greek writers ufe this word, their Latin tranflators ufually render it by the word *unedo*. Pliny fays, that *unedo* is the name of the fruit of the *arbutus*, or ftrawberry-tree; but we find the earlieft Latin writers do not countenance this. Varro calls the fruit of the *arbutus* by the name *arbutus*, as he does the fruit of the mulberry or morus, by the name *morus*. And it feems to have been contrary to the general cuftom of the times to have impofed a name upon a fruit, different from that of the tree which bore it. Some of the commentators fay that the *Memaicula*, or *Unedo* was no other than the common wood-ftrawberry. And Ægineta in one place fays, that the fruit of the *camarus*, that is, of the *arbutus*, was called *Memaicula*; but in another place he gives a much better explication of the word, faying, that fome of the Greeks ufed it as the name of the fruit of the *cornus mas*, or male cornel-tree. See the article CORNUS.

MEMBRANE (*Cycl.*)—Mr. Lewenhoek has been at the pains of examining, with great nicety, the fine *Membranes* which enclofe the fafciculi or fmall bundles of fibres of which a mufcle is compofed. Between thefe fafciculi the *Membrane* is of a confiderable thicknefs; but it divides itfelf every way into very fine and fmall branches. This *Membrane* is evidently compofed of a number of fmall veffels, and thefe may be diftinguifhed not only in its thick parts, but even where it is ever fo fmall and fine, fo far as the microfcope can trace it; but this is not fo far as might be wifhed; for the *Membrane* ftill divides itfelf in its progrefs into more and more ramifications, and where it envelopes only a fingle fibre, is not to be diftinguifhed with any degree of precifion, even with the beft microfcopes. The fmall veffels extended through this *Membrane*, are doubtlefs intended to convey nourifhment to it; but it is very certain, that the globules of blood can never pafs into fuch fmall canals. Phil. Tranf. N°. 122. p. 140.

Adipofe MEMBRANE, *Membrana Adipofa*. It was the opinion of Boerhaave that the feat of the *lues venerea*, or pox, was in the *Membrana Adipofa*. There are many feeming difficulties which have prevented the generality of the learned world from giving into this; but there have been feveral particular cafes, the fymptoms of which feem to prove it really to be fo.

Of thefe Dr. Huxam gives one, which alone may feem fufficient to prove the reality of it. This is of a gentleman of about 27 years of age, and of a hot bilious conftitution, who fome years before his death had got a gonorrhœa, and before that was well cured, a fecond, and after that a third; and after all thefe, had frequent impure converfations with the negro women in the Weft Indies, who probably had that worft fpecies of pox, the yaws. He had, after this, a terrible itching under his fkin, and a terrible ftinking breath, and fpit corrupt matter, but had no running ulcer, bubo, node, or other of the common fymptoms of a confirmed pox; but after repeating his rafh conduct with fome women in England, he had a Gonorrhœa of which he could not get cured; but a bubo appeared in the groin, and verrucofe fwellings about the anus.

One of thefe breaking difcharged a great quantity of matter, and after that others appeared, the bubo would not fuppurate, and fcabs appeared in feveral parts of his body. He was fumigated with cinnabar, and a falivation propofed; but after taking, at times, five drams of calomel, he had not the leaft forenefs of the gums, though that medicine had not purged nor vomited him. At length turbith vomits, and large dofes of mercurials, to which he had been much accuftomed before, brought on a forenefs of the mouth; but the fpitting was tough, and did not amount to a pint a day. During this courfe the fcaly eruptions encreafed, and he was at length covered with them all over, and his limbs fwelled, and even burft in many places, the fiffures difcharging a ftinking ichorous matter.

Hot baths and mercurial ointments were ufed on this, but the difeafe ftill encreafed under thefe means; the fcales grew fo ftiff, that he could not move his limbs, and ulcers appeared in many parts, particularly a large tumour on each breaft, which difcharged vaft quantities of an oily ftinking matter. It was obfervable, that where thefe tumours and ulcers appeared, they only ran under the fkin, being entirely feated in and feeding on the *Membrana Adipofa*, fo that the mufcles and tendons underneath appeared as fair and florid as in the moft healthy conftitution.

It was now plain, that mercury could do nothing toward a cure in any form, and the old method of fweating was attempted with warm baths, to loofen the fcales; by this means they came off apace in the manner of thofe of the confluent fmall pox, but larger, fome of thefe being four or five inches over. In a week's time, the coat of mail was cleared off,

off, and his breath became ſweet; but the ulcers ſtill diſcharged great quantities, and notwithſtanding all that had been done, two large ſhankers appeared on the glans, and a bubo in each groin: He was alſo ſeized with a cough, and ſpit purulent and bloody matter. It was evident that the whole *Membrana Adipoſa* had been conſumed from the external part of the body, and the diſeaſe now began to ſeize on that part of it which inveſted the more vital parts; but nature could ſupport it no longer, and he died in the moſt extreme degree of a pocky conſumption. It is obſervable, that not one bone in the whole body appeared to be touched, though he died with more than forty ulcers upon him. Phil. Tranſ. N°. 460. p. 671.

MEMBRANACEOUS *Leaf*, among botaniſts. See the article LEAF.

MEMBRAS, in ichthyology, a name given by Rondeletius, Aldrovand, and ſeveral other writers, to the *halec* or herring. See the articles HALEC and CLUPEA.

MEMIREN, in the materia medica, the name by which Serapion and ſome other authors have called the pilewort, or ſmall celandine. *Ger.* Emac. Ind. 2.

MEMITHA, in the materia medica of the antients, the name of a plant which ſome have ſuppoſed to be our cerinthe, but others the glaucium, or yellow-horned poppy.

MEMORY (*Cycl.*)—Many have been the attempts, in all ages, to aſſiſt the *Memory*. Some have had recourſe to medicine, ſuch as Horſtius [a], Marſilius Ficinus [b], Johnſton [c], and others. That good health, a good digeſtion, and a mind free from care, are helps in this reſpect, is an old obſervation [d]. That attention, application, frequent recapitulation, are neceſſary, is known to every one. But whether, beſides natural health and parts, and the exerciſe of our faculties, art may not give a farther aſſiſtance to *Memory*, has been a queſtion. Simonides is ſaid to be the firſt who found out the art of *Memory* [e]. His method was by a choice of *places* and *images*, as a repoſitory of ideas; ſuch, for inſtance, as a large houſe divided into ſeveral apartments, rooms, cloſets, &c. All theſe, and their order, were to be rendered extremely familiar to the imagination and *Memory*. Then, whatever was to be remembered, was by ſome ſymbolical repreſentation or another, as an anchor for navigation, to be connected with ſome part of the houſe, or other artificial repoſitory, in a regular manner. Cicero [f] and Quinctilian [g] give us ſome account of this method, and ſpeak of it with reſpect. Several moderns have attempted improvements of artificial *Memory*. There was a collection of various treatiſes of this kind publiſhed at *Leipzig* [h]; this and Bruxius's Simonides Redivivus [i] are commended by Morhof [k]. Paſchius gives us ſome account alſo of ſeveral authors who have treated of this art [l]. It is certainly of uſe in hiſtory and chronology. The chief artifice, in this reſpect, is to form an artificial word, the letters of which ſhall ſignify numbers. Hence a date or æra may more eaſily be recapitulated and remembred than without ſuch a contrivance. This invention is mentioned as a ſecret known to few, by Paſchius [m]. It has been proſecuted lately in England [n], by Dr. Grey.—[[a] De Sanitat. Studioſor. lib. 2. c. 1. [b] De Vita, lib. 1. c. 25. [c] *Johnſton*, Idea Medicin. Practic. lib. 8. c. 4. Vid. *Paſch.* de Nov. Invent. p. 134. [d] *Quinctil.* Inſt. Orat. p. 992. [e] *Quinct.* lib. cit. p. 985. [f] Ad Herenn. lib. 3. [g] Lib. cit. [h] Variorum de Arte Memoriæ Tractatus, Lipſ. 1678. 8°. [i] Polyhiſtor. lib. 1. p. 374, 375. [k] *Adami Bruxii*, Simonides Redivivus, ſeu Ars Memoriæ & Oblivionis. Lipſ. 1640. in 4°. [l] Lib. cit. p. 133—140. [m] Lib. cit. p. 140. *Numerus per certas literas, verbo memoriali comprehenſas, exprimitur.* [n] Vid. *Memoria Technica*, or a New Method of Artificial Memory, &c. Lond. 1730. 8°. alſo *Lowe*'s Mnemonics.]

The method is this: To remember any thing in hiſtory, chronology, geography, &c. a word is formed, the beginning whereof being the firſt ſyllable or ſyllables of the thing to be remembred, does, by frequent repetition, of courſe draw after it the latter parts, which is ſo contrived as to give the anſwer. Thus in hiſtory, the deluge happened in the year before Chriſt 2348. This may be ſignified by the word Dél-*étok*; Del ſtanding for deluge, and *etok* for 2348. How theſe words come to ſignify theſe things, or contribute to the remembring them, is now to be ſhewn.

The firſt thing to be done, is to learn exactly the following ſeries of vowels and conſonants, which are to repreſent the numerical figures, ſo as to be able at pleaſure to form a technical word, which ſhall ſtand for any number, or to reſolve a word already formed into the number it ſtands for.

a	*e*	*i*	*o*	*u*	*au*	*oi*	*ei*	*ou*	*y*
1	2	3	4	5	6	7	8	9	0
b	*d*	*t*	*f*	*l*	*s*	*p*	*k*	*n*	*z*

Here *a* and *b* ſtand for 1, *e* and *d* for 2, *i* and *t* for 3, and ſo on. Theſe letters are aſſigned arbitrarily to the reſpective figures, and may very eaſily be remembred. The firſt five vowels in order naturally repreſent 1, 2, 3, 4, 5. The diphthong *au* being compoſed of *a*, 1, and *u*, 5, ſtands for 6; *oi* for 7, being compoſed of *o*, 4 and *i*, 3; *ou* for 9, being compoſed of *o*, 4 and *u*, 5: The diphthong *ei* will eaſily be remembered for 8, being the initials of the word. In like manner for the conſonants, where the initials could conveniently be retained, they are made uſe of to ſignify the number, as *t* for 3, *f* for 4, *s* for 6, and *n* for nine. The reſt were aſſigned without any particular reaſon, unleſs that poſſibly *p* may be more eaſily remembred for 7 or *ſeptem*, *k* for 8, or ὀκτω, *d* for 2, or *duo*; *b* for 1, as being the firſt conſonant, and *l* for 5, being the Roman letter for 50, than any others that could have been put in their places. Memor. Techn. p. 2, 3. 'Tis farther to be obſerved, that *z* and *y* being made uſe of to repreſent the cypher, where many cyphers meet together, as 1000, 1000000, &c. inſtead of a repetition of *azyzyzy*, &c. let *g* ſtand for 100, *th* for a thouſand, and *m* for a million. Thus *ag* will be 100, *ig* 300; *oug* 900, &c. *ath* 1000, *am* 1000000, *loum* 59000000, &c. Ib. p. 5.

Fractions may be ſet down in the following manner: Let *r* ſignify the line ſeparating the numerator and denominator, the firſt coming *before*, the other *after* it; as *iro* $\frac{3}{4}$, *urp* $\frac{5}{7}$, *pourag* $\frac{79}{100}$, &c. When the numerator is 1 or unit, it need not be expreſſed, but begin the fraction with *r*; as *re* $\frac{1}{2}$, *ri* $\frac{1}{3}$, *ro* $\frac{1}{4}$, &c. So in decimals, *rag* $\frac{1}{100}$, *rath* $\frac{1}{1000}$. Ibid.

This is the principal part of the method, which conſiſts in expreſſing numbers by artificial words. The application to hiſtory and chronology is alſo performed by artificial words. The art herein conſiſts in making ſuch a change in the ending of the name of a place, perſon, planet, coin, &c. without altering the beginning of it, as ſhall readily ſuggeſt the thing ſought, at the ſame time that the beginning of the word, being preſerved, ſhall be a leading or prompting ſyllable to the ending of it ſo changed. Thus, in order to remember the years in which Cyrus, Alexander, and Julius Cæſar, founded their reſpective monarchies, the following words may be formed; for Cyrus, Cyr*uts*; for Alexander, Alex*ita*; for Julius Cæſar, Jul*ios*. *Uts* ſignifies, according to the powers aſſigned to the letters before mentioned, 536; *itu* is 331, and *os* is 46. Hence it will be eaſy to remember, that the empire of Cyrus was founded 536 years before Chriſt, that of Alexander 331, and that of Julius Cæſar 46. Mem. Techn. Introd. p. viii and ix.

For the farther application of this method, we refer to the ingenious author of the laſt cited book. We ſhall only add, that *technical verſes* contribute much to the aſſiſtance of the *Memory*, both as they generally contain a great deal in a little compaſs, and alſo becauſe, being once learned, they are ſeldom or never forgot. The author before quoted has given us ſeveral ſpecimens of ſuch verſes in hiſtory, chronology, geography, and aſtronomy, as alſo the Jewiſh, Grecian and Roman coins, weights and meaſures, &c. He adviſes his reader to form the words and verſes for his own uſe himſelf; as he perhaps will better remember them than thoſe formed by the author. Lib. citat. Introduct. p. xi.

It was a practice among the Jews not only to abbreviate ſentences and names of many words, by putting together the initial letters of thoſe words, and making out of them an artificial word to expreſs the whole, as *Rambam* for *Rabbi Moſes ben Maimon*; but they alſo made uſe of natural words to repreſent numbers, when they could meet with ſuch as happened to anſwer the number which they wanted to expreſs [a]. It is to obſervations of this kind the author laſt quoted ſeems to ſay he owed the firſt hints of his method [b].—[[a] Mem. Tech. Introd. p. xv, xvi. [b] Lib. cit. p. xvii.]

As to Simonides's method, Quinctilian ſays he will not deny it to be of ſome uſe; for inſtance, in repeating a multitude of words in the order they occur, and in things of this nature: But he thinks it of leſs uſe in getting by heart a continued oration, and in this reſpect rather an incumbrance [a]. He himſelf adviſes, if the ſpeech to be remembred be long, to get it by heart in parts, and thoſe not very ſmall. The partition ought chiefly to be made according to the different topics. He thinks it beſt to get things by heart tacitly, and if, the better to fix the attention, the words be pronounced, yet it ſhould be in a low voice. Apt diviſions help the *Memory* greatly. But after all, the great art of *Memory* is exerciſe: To get many things by heart, and daily, if poſſible. Nothing increaſes more by uſe, or ſuffers more by neglect, than the *Memory*. At whatever age a man aims at the improvement of this faculty, he ſhould patiently ſubmit to the uneaſy labour of repeating what he has read or written. Here, as in other caſes, where habits are to be acquired, exerciſe ſhould be increaſed by degrees [b].—[[a] *Nonne impediri eorum, quæ dicit, decurſum neceſſe eſt duplici memoriæ cura? Nam quomodo poterunt copulata fluere, ſi propter ſingula verba ad ſingulas formas reſpiciendum erit.* *Quinct.* Inſt. Orat. Lib. xi. c. 2. p. 989. [b] *Quinct.* loc. cit. p. 993. ſeq.]

Lord Bacon enumerates ſeveral helps to *Memory*, as order, artificial place, verſe, whatever brings an intellectual thing to ſtrike the ſenſes, and thoſe things which make an impreſſion by means of a ſtrong paſſion, as fear, ſurprize, &c. Thoſe things alſo ſink deepeſt, and dwell longeſt in the *Memory*, which are impreſſed upon a clear mind unprejudiced either before or after the impreſſion; as the things we learn in childhood, or think of juſt before going to ſleep; as likewiſe the firſt times things are taken notice of.

A multitude of circumftances alfo, or, as it were, handles or holds to be taken, help the *Memory*; as the making many breaks in writing, reading or repeating aloud: But as to this laft, fee Quinctilian's opinion before mentioned. Thofe things which are expected, and raife the attention, ftick better than fuch as pafs flightly over the mind; whence if a man reads any writing twenty times over, he will not remember it fo well, as if he read it but ten times; with trying between whiles to repeat it, and confulting the copy where his *Memory* failed. *Bacon*'s Works abrid. vol. 2. p. 475. See alfo vol. 1. p. 135, 136. vol. 3. p. 176. and the article MNEMONIC *Tables*.

Weaknefs of the MEMORY, in many cafes, is to be confidered as a difeafe, and is looked on in that light by the medical writers, who have prefcribed various remedies for it. The principal caufes of this debility, are a too frequent and conftrained ufe, or rather abufe of it, in the getting by rote numbers of words and fyllables, particularly in the learning different languages; a paralytic affection in the head; violent external injuries in the fame part; violent pains in the head, attended with deliriums, or attending a phrenitis. And to thefe are to be added drunkennefs, and an abufe of venery.

Prognoftics. All debilities of *Memory* are cured with great difficulty by medicines alone; and indeed this complaint is feldom removed, unlefs the whole frame of mind and courfe of life be altered; all paffions avoided, and excefs of every kind left off. But of all other kinds, that debility of *Memory* which proceeds from a paralytic diforder of the head, particularly when that diforder affects the tongue, is found to be the moft obftinate and difficult of cure. Much fleep, or exceffive waking, are equally hurtful to the *Memory*, and frequently bring on an almoft total lofs of it.

Method of treatment. All fuch medicines as are of an agreeable tafte or odour, are generally fuppofed to be of fervice in ftrengthening the *Memory*; and lignum aloes, ambergrife, and fome other of the fcented drugs, have been known to do great good. The aromatic, volatile, and fpirituous medicines, alfo all help in this cafe, if taken in fmall dofes, and continued for a long time together. The analeptics and nervine medicines are alfo greatly recommended, but they are feldom found of ufe; for among people afflicted with a debility of *Memory*, many are thofe of robuft conftitutions and ftrong appetites, who eat already more than nature requires, and have therefore very little ufe for analeptics or nutritive things.

Bleedings in fmall quantities frequently repeated, in cafes where there is no contrary indication, frequently prove of great fervice in this cafe; but the *primæ viæ* are firft to be cleanfed before fuch a courfe is entered upon. Many greatly recommend bags of aromatics to the head, to be conftantly worn in caps; but it is much to be feared thefe can have but very little effect. *Junck.* Confp. Med. p. 682.

MEN *allegro*, in the Italian mufic, is ufed to denote a movement not fo brifk and lively as *allegro*. See the article ALLEGRO.

MEN *forte*, in the Italian mufic, intimates that the part to which it is added ought to be played or fung not fo ftrong or fo loud as the reft.

MEN *prefto*, in the Italian mufic, fignifies lefs quick. See the article PRESTO.

MENALD *deer*, a fpecies of the common fallow deer, beautifully variegated. See the articles CERVUS and DEER.

MENENCHYTA, in medicine, certain compofitions of medicinal ingredients made for injecting into the womb, in the cure of feveral difeafes of that part.

MENINGOPHYLAX, a word ufed by Celfus as the name of a chirurgical inftrument, contrived for guarding the membranes of the brain while the bone of the cranium is rafped or cut, after the operation of the trepan.

MENING, in botany, a name given by the people of Guinea to a plant of the ricinus or palma Chrifti kind, which they ufe in medicine: They dry and powder the leaves, and then give them to be fnuffed up the noftrils to cure all forts of ftuffings or ftoppages in the head. Its leaves refemble thofe of the finch and ivy, and are hairy; whence Petiver has named it *ricinus Guineenfis hæderæ quinquefoliæ Virginianæ facie foliis hirfutis*. It is not known to grow any where in America. Phil. Tranf. N° 232.

MENOGENIEN, in botany, a name by which fome authors have called the pæonia, or common garden piony. *Ger.* Emac. Ind. 2.

MENSARII, among the Romans, officers appointed to manage the public treafury, being fometimes three, and fometimes five in number. *Pitifc.* in voc.

MENSORES, among the Romans, harbingers or officers, whofe bufinefs it was to go and fix upon lodgings for the emperor, when he took a journey to any of the provinces. Their office was alfo to mark out encampments, and affign every regiment its poft. *Danet.* in voc.

MENSORES alfo fignified land-furveyors, architects, or appraifers of houfes and public buildings. Thofe likewife who diftributed the provifions in the army, were called *menfores frumentarii*; and fervants who waited at table had the appellation of *Menfores*. *Pitifc.*

MENSORES was likewife the title of officers among the Romans, appointed to receive the provifions brought to the city by fea, and to fee them carefully laid up and preferved in public granaries, of which there were great numbers. *Hoffm.* Lex. in voc.

MENSTRUUM (*Cycl.*)—As many more things might be done in chemiftry than we now find practicable if we had more *Menftruums* than are at prefent known, it muft be a fubject of infinite ufe in chemiftry to difcover new ones. To this purpofe let it be confidered, that in whatever way falts are united with other falts, new *Menftruums* are produced by the mixture.

Thus if pure alkali be added to a folution of fea falt, earthy matter is precipitated, and the falt afterwards obtained by criftallization, from the clear liquor, will be a fea falt much purer than before, and capable of acting on bodies in a different manner.

The fame fixed alkali being added to the brine of nitre, makes the liquor thick and milky, and precipitates an earthy matter; after which the nitre, obtained by criftallization, is much purer than before.

When fixed alkali is added to the brine of fal armoniac, it lays hold of the acid of that falt, and fets the volatile alkali of the compofition free, and fuffers it to fly off in the air, leaving only a very pure and fixed fea falt at the bottom of the veffel. If a pure volatile alkali be added to the brine of fea falt, it makes the liquor thick, then purifies it, and flies off; and it does the fame when added to a folution of nitre; and when added to a folution of fal armoniac, it, in like manner, purifies the falt without altering its nature, and flys off as it was poured on. Vegetable acids produce but little alteration on being mixed with fea falt, nitre, and fal armoniac. Fermented vegetable acids, even after being purified by diftillation, produce no great alteration when mixed with the fame falts. If calcined vitriol, or alum, be mixed with nitre and diftilled, they yield aqua fortis, which contains nothing of the acid of vitriol or alum, but is a mere fpirit of nitre; and if mixed with fea falt, and treated in the fame manner, the produce is a fpirit of falt; and if with nitre and fea falt together, they make an aqua regia. So if nitre and calcined vitriol be melted together in an open fire, the acid of the nitre is difcharged, and a kind of tartarum vitriolatum is left behind. Sea falt, treated in the fame manner, leaves a fort of Glauber's falt behind; and, in general, what way foever it be by which falts are joined with falts, new faline productions, and new *Menftruums* will arife; whence the art of chemiftry may be perpetually improved, and new *Menftruums* will give new phænomena on different bodies. New *Menftruums* of particular virtues, may alfo be made by varioufly combining the known *Menftruums* together; and this may be done by an almoft infinite variety of ways; much may be alfo done by reducing every known *Menftruum* to its utmoft degree of purity. And, laftly, by reducing fome of them into the minuteft particles, they can be reduced to, whether by art or nature; for upon thefe three particulars the extraordinary fkill of the chief chemifts feems principally to depend. For inftance, fuppofe an extremely pure, ftrong, and fubtle fermented vegetable acid was wanting: Take fine verdegreefe prepared from copper corroded by the fubtile vapour of a fermenting acid; add to it twenty times its weight of the ftrongeft diftilled vinegar that can be made; digeft them together till the verdigreefe is thoroughly diffolved, and the whole become a deep green liquor; purify this by filtration, and infpiffate it over a gentle fire to a pellicle; fet it in a quiet place, where it will fhoot into cryftals like emeralds, confifting of an acid vinegar and diffolved copper; pour off the liquor, collect the cryftals, and evaporate as before; and by this means collect all the cryftals that can be obtained; then dry thefe, and diftil them in a retort, and the produce will be a moft pure and ftrong vegetable acid, not in the leaft partaking of the nature of copper. But this experiment will not fucceed with lead, tin, or any other of the metals foluble in vinegar; for the copper attracts the acid free of its water, and again reftores it unaltered; but the others, though they equally attract and feparate it, yet always yield it altered and impure. Zwelfer imagined this acid to be the alkaheft, or univerfal diffolvent; but Tachenius foon proved that it was no other than diftilled vinegar of a much greater purity than ufual.

To fhew that by the compounding one *Menftruum* with another, new, and often, excellent falts may be produced, let it be confidered, that the regenerated tartar, properly prepared, may be intimately united to pure alcohol, and thus produce a vegetable *Menftruum*, compofed by the moft clofe union of the moft fubtile vegetable particles, *viz.* alkali, acid, and fulphur; whence the effect of fuch a liquor cannot but be extremely great, both as a *Menftruum* and a medicine. So again, if a pure ftrong alkaline fpirit be united with pure alcohol, it produces an admirable *Menftruum* called the offa Helmontii, which intimately diffolves diftilled vegetable oils, and thus makes a *Menftruum* compounded of the genuine vegetable fulphur, and an alkali, and is perhaps one of the beft medicines, as well as the beft *Menftruums* hitherto known.

In

In like manner pure spirit of nitre saturated with the alkaline spirit of sal armoniac, makes a kind of volatile nitre, and thus affords an opportunity of examining, by experiments, whether the great things expected from a volatile nitre by the chemists, will be performed by it or not. Experiments of this kind are extremely worth prosecuting. It is not certain whether any *Menstruum* will dissolve any substance without the assistance of fire, as no experiment could ever be made in any place destitute of all fire; there being evidently fire in our utmost known degree of cold; and we all know that *Menstruums*, of whatever kind, act greatly the better for being assisted by heat.

Menstruums can scarce act as such, unless reduced to a fluid form, or at least approaching thereto; this is chiefly given them by means of fire, air, water, and triture: These are the four causes which usually excite the latent powers of *Menstruums*. Certain *Menstruums* contain a cause within themselves apparently capable of exciting motion, though in reality it depends upon the near approach of some other body. Thus if a good loadstone be suspended by a thread, and hang at rest in a great degree of cold, it will seem to have no active virtue; but if iron come near it, a motion is produced in both these bodies, till they come together, and remain in contact; and this kind of power generates motion spontaneously, without the assistance of any fire sensible to us, and is not excited by motion. So likewise strong spirit of nitre confined in a close vessel, yields an acid fume constantly playing about the surface of the liquor, and issuing out whenever the vessel is unstopped. So also the alkaline spirit of sal armoniac yields a fume never observed to be at rest; and the spirit of this salt, made with lime, yields a fume much more volatile and moveable: All the bodies of this kind therefore strangely retain, and strangely excite motion. We are always to remember also that air, even in the coldest places, has always a strong vibratory motion, and therefore may often excite these motions in these bodies; as on the other hand solutions are often immediately performed by means of the motion peculiar to the *Menstruum* arising from it; while another motion of a different kind, and proceeding from a different cause, would not produce the effect. Thus, for instance, if a fine piece of English chalk be calcined in a strong fire, or even in the focus of a burning-glass, it will scarce alter its nature by this violent motion, nor again by being exposed to a hot or cold air, either at rest, or agitated by winds; and though if long boiled in water, or a brine of salt of tartar, it will not dissolve; yet it immediately melts and disappears when put into cold vinegar. Whence we see there is a very great difference between the motion excited by the reciprocal force of the solvent and solvend, and the motion excited by fire, air, water, and impulse. The acrimony of a *Menstruum*, with respect to a human body, so as to excite pain, corrode or consume the parts thereof, is no sign that such a *Menstruum* is suited to dissolve other bodies, as appears from oil of vitriol, spirit of nitre, spirit of salt, and *aqua regia*, which though they readily consume flesh, yet do not consume or dissolve wax and sulphur, though these two may be easily dissolved in the body. Many bodies incapable of solution in certain *Menstruums*, may be suited for dissolving therein, by being previously dissolved in other *Menstruums*. Thus if common sulphur be boiled ever so long in alcohol, it dissolves no more than a stone in water; but if the sulphur be first melted with salt of tartar into a dusky mass, the alcohol will then dissolve it; so also powdered antimony remains untouched after boiling in alcohol; but if first boiled to a dry mass in an alkaline lixivium, this mass presently yields a golden tincture to alcohol. Some chemists have conceived so highly of this regular and successive application of different *Menstruums*, particularly Mr. Boyle and Mr. Homberg, that they say even metals may by this means be resolved into their component running mercury and fixing sulphur. Thus they assert, that if silver be first dissolved in spirit of nitre, and then long digested with pure fixed alkali, and afterwards several times sublimed with sal armoniac, it will at length, by means of these resuscitating salts, afford a true running mercury; in which operation the acids procure an entrance for the alkalis into the substance of the metal, as the fixed alkalis procure admission to the volatile ones, which else could not enter. Boerhaave waves disputing upon the point, whether the metals can be thus resolved into their running mercuries, and only affirms, that after many trials, he was never able to effect it. *Boerh.* Chem. part 1. p. 562. seq.

It is an error to think a *Menstruum* cannot be too strong. Oil of vitriol diluted with several times its weight of water, dissolves iron best. So aqua fortis diluted works best in lead. And Mr. Boyle makes the like observation as to the solution of silver. Works Abr. vol. 1. p. 165.

Animal MENSTRUUM. There are of the animal *Menstruums* very many both of the natural and artificial kind; the natural are blood, serum, gall, urine, saliva, rennet, whey, buttermilk, &c. most of which, being properly employed, will either produce or discharge colours, and might be made serviceable in the painting and dying trades. Thus recent urine discharges the common ink out of linnen, &c. Blood affords, by proper management, the noble Prussian blue; and gall is a natural yellow, well deserving to be treated in the manner of blood in that preparation. Of the artificial kind are the spirit of urine produced by chemistry, which serves to produce, alter and destroy a vast number of colours. The liquors distilled from recent, or fermented whey, buttermilk, &c. might be also found of great value; and variously compounding these several animal substances, even by random trials, or chance experiments, new discoveries in colours might be made; though much more, probably, by a right reasoning and analogy. As for instance, the common bones burnt to a blackness, being found to afford the bone black, the experiment was easily transferred to ivory, and so the ivory black was discovered: And so of the rest. *Shaw's* Lectures. p. 183.

MENSTRUUM *Peracutum*. Mr. Boyle gives the name of *Menstruum peracutum* to a *Menstruum* made by pouring on the rectified oil of butter of antimony as much strong spirit of nitre as would serve to precipitate out of it all the bezoarticum minerale; and then with a smart fire distilling off the liquor which would come over, and cohobating it upon the antimonial powder. Works Abr. vol. 1. p. 260, 377.

He put some highly refined gold into a large proportion of this *Menstruum peracutum*, where it dissolved slowly and quietly; and he found at the bottom of the glass a considerable quantity of a white powder, which the *Menstruum* would not touch, and which was also indissoluble in aqua regia. The solution of gold being abstracted, and the gold again reduced into a body, yielded, upon a second solution, more of the white powder. This powder he melted down into a metal, answering in colour, malleability, solubility in aqua fortis, and in bitterness to the taste of that solution, to silver. Hence he infers, that notwithstanding the supposed unchangeableness of gold, this experiment shews it to be really changeable into silver, or at least into a new kind of metal very different from gold. And he therefore concludes, that there is no impossibility in the nature of the thing, that one metal should be transmuted into another. Ibid. p. 260—262.

By dissolving gold in this *Menstruum peracutum*, Mr. Boyle also tells us, he made the gold rise in the retort, in the top and neck of which it was found in the form of yellow and reddish sublimate. Works abr. vol. 1. p. 263, 377.

We do not find that Mr. Boyle gave the name of *Menstruum peracutum* to the *Menstruum* he extracted from bread, as it is said he did, in the Cyclopædia, under the head MENSTRUUM. See Boyle's Works Abr. vol. 1. p. 34, 49.

MENTHA, *Mint*, the name of a well known genus of plants, the characters of which are these: The flower consists of one leaf, and is of the labiated kind; the upper lip is arched, and the lower is divided into three segments; and the whole is so disposed, that at first sight the flower appears a four-leav'd one, or at least one regularly divided into four segments. The pistil arises from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and surrounded with four embryos which afterwards become so many seeds, and are contained in the cup of the flower.

The species of *Mint*, enumerated by Mr. Tournefort, are these: 1. The common round-leav'd wild *Mint*. 2. The purple-flower'd round-leav'd wild *Mint*. 3. The verticillated garden *Mint*, with the smell of basil. 4. The common curled-leav'd verticillated *Mint*. 5. The round-leav'd spiked curled *Mint*. 6. The beautiful Danish or German curled *Mint*. 7. The round-leav'd spiked wild *Mint*. 8. The great roundish-leav'd marsh or Water *Mint*. 9. The great round-leav'd Marsh *Mint*, with variegated leaves. 10. The hairy verticillate field *Mint*. 11. The rounder-leav'd verticillate field *Mint*, with an aromatic smell. 12 The spiked *Mint*, with variegated leaves. 13. The narrow-leav'd spiked *Mint*. 14. The smooth narrow-leav'd wild *Mint*, with rugged leaves, and a strong scent. 15. The long blackish-leav'd less hairy wild *Mint*. 16. The common thick spiked pepper *Mint*. 17. The long-leav'd horse *Mint*. 18. The longer-leav'd water *Mint*. 19. The water *Mint*, commonly called *Pennyroyal*. 20. The common white-flowered *Pennyroyal*. 21. The water *Mint*, called by many authors *male Pennyroyal*. 22 The smallest woolly water *Mint*. 23. The savory-leav'd water *Mint*. *Tourn.* Inst. p. 189. See the article MINT.

MENYANTHES, *Buckbean*, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, is funnel-shap'd, and divided into several segments at the edges. From the cup there arises a pistil, which is fixed in the manner of a nail to the hinder part of the flower, and afterwards becomes a fruit or shelly case, usually of an oblong figure, bivalve, and full of small roundish seeds.

The species of this plant, enumerated by Mr. Tournefort, are these: 1. The broad-leav'd trifoliate marsh *Menyanthes*, called by many writers, *Trifolium palustre*, and by us, *Marsh Trefoil*, or *Buckbean*. 2. The narrow-leav'd trifoliate marsh *Menyanthes*. And 3. The American white-flower'd *Menyanthes*, with leaves like those of the water lilly. *Tourn.* Inst. p. 117.

The characters of *Menyanthes*, according to Linnæus, are these: The cup is a perianthium consisting of one leaf, divided into five segments at the end, and is placed erect, and remains

remains after the flower is fallen. The flower consists of a single petal, in form of a short cylindric and somewhat open-mouth'd tube. The rim beyond the middle is divided into five segments, the jags being open, obtuse, bent backward, and covered with a woolly hairyness. The stamina are five short and tapering filaments, and the antheræ are acute, bifid at the bases, and erect. The germen of the pistil is of a conic form; the style is cylindric, and nearly of the length of the flower; and the stigma is bifid and compressed. The fruit is an oval capsule, containing only one cell, and surrounded with the cup. The seeds are very numerous, small, and of an oval figure. *Linnæi* Gen. Plant. p. 64.

MENTZELIA, in botany, the name of a genus of plants, the characters of which are these: The perianthium consists of one leaf, divided into five expanded segments. These are lanceolated and deciduous, and terminate in a very long germen. The flower consists of five ovated petals, which stand expanded, and are somewhat longer than the segments of the cup. The stamina are numerous erect setaceous filaments; the antheræ are simple; the germen of the pistil is of a cylindric figure, and is extremely long, and stands under the cup; the style is setaceous, and of the length of the flower; the stigma is simple; the fruit is a long capsule, of a cylindric clavated form, containing only one cell, in which there are lodged numerous small and roundish seeds. *Linnæi* Gen. Plant. p. 236. *Plumier*, Gen. 6.

MERCATORUM *Festum*, among the Romans, a festival kept by the mercantile people on the ides or 15th of May, in honour of Mercury, to whom they sacrificed a sow; then sprinkling themselves with the water of a fountain called *aqua mercurii*, they prayed the god to prosper their trade. *Danet*, in voc.

MERCURIALIS, *Mercury*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the apetalous kind, consisting only of a number of stamina placed in a cup. These flowers are barren, and the embryo seeds appear on other plants of the same species, which have no flowers. These finally become a fruit composed of two capsules, containing a roundish seed.

The species of *Mercurialis* enumerated by Mr. Tournefort, are these: 1. The testiculated *Mercury*, commonly called the male *Mercury*. 2. The spiked *Mercury*, commonly, but improperly called, the *female Mercury*; this being truly the male, and the testiculate the female, those testicles containing the seeds. 3. The mountain testiculate *Mercury*, called *Cynocrambe*, or *Dogs Mercury*. 4. The spiked cynocrambe, or dogs *Mercury*. 5. The shrubby hoary testicu late *Mercury*, called *Phyllon*. 6. The spiked *Phyllon*, or shrub hoary *Mercury*. 7. The Portugal shrub almond-leav'd testiculate *Mercury*. 8. The spiked almond-leav'd shrub spiked *Mercury*. 9. The round-leav'd three-mouths *Mercury*, the male and female kinds. *Tourn.* Inst. p. 534.

Mercurialis is of an emollient nature, and eaten in the manner of spinach, which, when cultivated in a garden, it greatly excels. If eaten largely, it opens the bowels. A cataplasm of the leaves is much recommended in pains of the limbs, in tumours, and even in ulcers, which it cleanses and disposes to heal. Poor people in country places use it as a cataplasm for the rheumatism, and even for the gout, with success. In the shops, it is chiefly kept as an ingredient in decoctions for glysters.

MERCURIFICATION, in metallurgic chemistry, the obtaining the *Mercury* from metallic minerals in its fluid form. For the effecting this, those who have been engaged in these researches have proposed three methods. The first is by means of a certain mercury, so prepared as to have a dissolving power, by which it could take up the mercuries of metals in the same manner as water dissolves salt from ashes. The second is by means of certain regenerating salts, such as sal armoniac, which are to detain the more earthy parts of metals, and leave their mercuries separate or separable from them by sublimation or otherwise; and the third method is by means of a large lens or burning-glass, in the focus whereof if any metal be applied, its mercurial part is said to separate and go off in fume, which when collected and condensed, appears to be running mercury. *Shaw's* Lectures, p. 160. The first of these methods would be very easy, if the proper mercury were to be readily produced; the second is extremely laborious, and requires much patience and reiteration. But the third seems easy enough, and practicable to advantage, when a glass of three or four foot in diameter is at hand, the sky serene, and the sun shines strong.

MERCURY (*Cycl.*) — The manner of separating *Mercury* from its ore, when not sulphureous, is this: Take a pound of the ore beat to powder; this with the assayer must stand for one centner; put this into a glass retort, coated half way to its neck, which must be long, and turned back with such declivity, that a glass recipient may be applied perpendicularly to it. The retort must be of such a size, that the belly of it may be filled nearly two thirds with the ore; and must be placed so that nothing of the fluid, adherent to the neck of it, may fall into the cavity of the belly, but that the whole may run forward into the recipient, which must be filled with cold water: This must be so placed as to receive the nose of the retort about one half inch into the water. The joints need not be luted. *Cramer's* Art of Assaying, p. 350.

Let the retort be surrounded with burning coals, placed at a distance, lest it burst; by degrees bring the coals nearer, and at length close to the retort; add fresh charcoal, and make it slightly red hot. When this fire has been continued an hour, take off the recipient, first striking the neck of the retort to throw off the loose drops that may hang there; and in the bottom of the water you will find the *Mercury*. This process may be also performed in a sand heat; but the bottom of the retort must touch the bottom of the vessel that contains the sand, and that be made red hot. The *Mercury* is to be separated from the water by filtration.

The supposition of a sympathy between *Mercury* and gold has been the great basis of the attempts of the alchemists of all times, toward the making gold of it. But if they mean that the common *Mercury* has this sympathy with gold, the contrary is proved by that remarkable process, in which it appears that *Mercury* will incalesce with that metal. If they mean that *Mercury* which they call the seed of metals, it is hard to offer any thing in argument against it, this being a sort of ideal substance which no body has yet seen. It is much disputed by the alchemists, whether there be or be not any such thing as *Mercury* that will heat or incalesce with gold, or produce a sensible heat in the mass, on being only simply mixed with that metal reduced to fine parts. It has been said by some, that those *Mercuries* which they call *Mercurii Corporum*; that is, such as have been extracted from the compleat metals by certain processes, which they keep as inviolable secrets, will incalesce on the mixture with gold; and on this they build their processes. But the negative part of the question is more generally maintained, the famous *Mercuries* of metals being held as non-entities with them; and even the searchers after transmutation of metals have in general acknowledged, that they themselves never saw any such incalescence of *Mercury* with gold, though they had heard others speak of it as a thing they had seen. A *Mercury*, however, was some years ago produced before the Royal Society, which in the hands of the president himself, on the fairest trial, did incalesce with that metal. Phil. Transf. N°. 122.

Among the several methods recommended for the fixing this fluid metal into solid silver, oil of talc, and oil of the human fæces, are the most strongly affirmed to be the infallible mediums. The first of these which has been so much misunderstood, by reason of its name, as to be searched for in the stone talc, is truly an oil prepared from the flowers of zink. See the article *Oil of* TALC.

The other is required to be clear and colourless as water, and without any ill smell. These were qualities so difficultly to be found in an oil of that fætid matter, that both the one and the other of these oils were looked upon by many as impracticable processes. But after the first had been made by two or three chemists, Mr. Homberg at length hit upon the last, but without finding any the least tendency to such an effect in it, or any change at all produced by it on *Mercury*, after ever so long digestion, or ever so many processes. Mem. Acad. Par. 1711.

If *Mercury* be dissolved in aqua fortis, so that the solution be clear and total, and if whilst it is yet warm some lead filings be poured in by degrees, the lead will be precipitated into a white powder, and the *Mercury* reduced to a mass of running quick-silver. *Boyle's* Works abr. vol. 1. p. 318.

Mercury may be dissolved in vegetable acids. This is done by reducing it to a calx by a long digestion. A scruple of this calx may be dissolved in an ounce of distilled vinegar, in a boiling heat. The solution being filtred and exposed to the cold, will in part be changed into fine crystals. This calx dissolves likewise in the juice of lemons, rhenish wine, and other vegetable acids.

But a precipitate of *Mercury* made from its solution in aqua fortis, by means of oil of tartar *per deliquium*, and well edulcorated by boiling water, is more easily dissolved in distilled vinegar. It may even be dissolved cold without digestion. *Marggraf*. in Mem. de L'Acad. de Berlin, 1746.

Boerhaave has observed, 1. that quicksilver, however well purified, yields always a soft black powder, of a sharp brassy taste, when long exposed to violent conquassation, or to a degree of heat, twice as great as that of animals. 2. Heat, near as strong as what is necessary for distilling quicksilver, changes the greater part of *Mercury*, if not all of it, into a heavy, shining, red, friable powder, of a sharp nauseous taste, which long and violently disorders the human body, and disposes it to excretions. 3. The fluid quicksilver remaining after this red powder is separated, is more fluid, and of less specific weight than common *Mercury*. 4. All the black, and near the whole red powder, can be brought into the former fluid state, by a more intense heat; and this revivified quicksilver enjoys all the properties of common *Mercury*.

The experiments on *Mercury* above-mentioned were sent by Boerhaave to the Royal Society. He sent an account of others to the Royal Academy of Sciences at Paris. The conclusions from these experiments are, that he could not change quicksilver into any other metal, and that no quicksilver was to

to be got from lead or tin. See Mem. de l'Acad. Royal. des Scienc. 1734.

Mercury diffolved by rubbing it ftrongly with any chemical oil, or with Venice turpentine, has been given to the quantity of a fcruple, half a dram, or two fcruples in a day. Such pills keep fome people's belly open, others they purge, and a gentle ptyalifm has fometimes been occafioned, nay, a high falivation has been raifed by them. See Medic. Eff. Edinb.

Dr. Dover, in his Phyfician's Legacy to his country, having recommended crude *Mercury* or quickfilver as a moft beneficial medicine for feveral difeafes, it had for fome time a great run at London, which occafioned the writing a great many pamphlets for and againft it. Dr. Cheyne alfo greatly recommends this medicine in his treatife, entituled, *The Rational Method of curing Difeafes.*

The authors of the medical effays of Edinburgh affure us, that though fome they knew had taken an ounce or two of crude *Mercury* each morning for feveral weeks, yet they knew no inftance of its encreafing any of the fenfible evacuations; but they have been told, that fome who ufed it thus, had paffed fome of it with their urine, and that the hands of others, taking this medicine, had tinged their fnuff-boxes, &c.

But we have an account of the effects of crude *Mercury* on a perfon who had the advice of his phyfician for the taking it, in a remarkable cafe recorded in the Philofophical Tranfactions, about the time when Dr. Dover had brought it into fuch general ufe; and as the effects of it, in this cafe, may ferve to caution people as to the ufe of it, it may be proper to give the fubftance of it, which is this: A perfon had long been fubject to great difficulty in going to ftool, for which he at length took feveral ounces of crude *Mercury* at different times, but without relief. Upon the opening of the abdomen there iffued out a great quantity of wind, before the ftomach or guts were wounded. The ftomach was empty, and its inner coat violently inflamed. The fmall guts were, in many places, fouled with a black powder refembling Æthiops mineral, and in feveral parts of them were found fmall globules of quickfilver. The black powder was doubtlefs the quickfilver altered into a fort of æthiops in the body. The colon was inflamed and diftended, and contained fix quarts of liquid excrement, among which was a great deal of crude *Mercury*, and of the fame black powder. This gut alfo was inflamed on the outfide, and had formed an abfcefs where it adhered to the omentum; the other guts in contact with this part alfo fhared this diforder. In the lower part of the colon the coats became fchirrous, and the paffage was very fmall. Some of the valves were alfo become fchirrous, and obftructed the paffage, and a fmall plumb-ftone was found buried in the villofe coat of this inteftine. This had alfo formed a fmall abfcefs, which difcharged itfelf into the pelvis. What part of thefe fymptoms was owing to the taking the quickfilver is eafy feen, and fuch effects may be guarded againft for the future, by obferving the ftate of the patient before it is given. Philof. Tranf. N°. 442. p. 295.

Chemifts having obferved that fome fimple preparations of antimony and *Mercury* had furprizing effects in the cure of obftinate diftempers, employed their art to change thefe Herculean medicines into various fhapes, to feparate their noxious and ufelefs parts, and to combine their active principles. To thefe labours are owing the butter and cinnabar of antimony, *Mercurius vitæ*, bezoard mineral, folar, lunar, jovial, and feveral other preparations, on which the moft exorbitant encomiums have been lavifhed. But with all this care, many of thefe remained unactive, and others incorrigible, and unfit for ufe. However it is certain that thefe two minerals, properly combined, have wonderful effects. We have, in the medical effays of Edinburgh, a preparation of Dr. Plummers, which is much recommended from the experience of its effects. See PLUMMER'S *Æthiops.*

Mercury is often ufed in anatomical preparations, efpecially for fuch parts that do not eafily retain air, as the lungs, or fpleen, and glans penis. See *Monro* in Med. Eff. Edinb. vol. 3. art. 10. But it is to be obferved, that the quickfilver does confiderable damage to the fmall cells of the lungs and glans.

Befide the numerous other phænomena attending this remarkable mineral, the light it gives when fhaken in a glafs tube, which proceeds from electricity, is not to be omitted.

If *Mercury* be enclofed in a glafs tube, clofe ftopped, that tube is found, on being rubbed, to give greatly more light than when it had no *Mercury* in it. When this tube has been rubbed, after raifing fucceffively its extremities, that the *Mercury* might flow from one end to the other, one fees a light creeping in a ferpentine manner all along the tube; that is to fay, the *Mercury* is all luminous. The *Mercury* being made to run along the tube afterwards without rubbing it, was found to emit fome light, though much lefs than before; this proves that the friction of the *Mercury* againft the glafs, in running along, does in fome meafure electrify the glafs, as the rubbing it with the hand does, only it is in a much lefs degree. This is more plainly proved by laying fome very light down near the tube, for this will be attracted by the electricity raifed by the running of the *Mercury*, and will rife to that part of the glafs along which the *Mercury* runs; and it is very plain from this, that what has been long known in the world under the name of the *phofphorus* of the barometer, is not a phofphorus, but merely a light raifed by electricity, the *Mercury* electrifying the tube. Phil. Tranf. N°. 484.

If *Mercury* be put into large exhaufted tubes, and thefe afterwards rubbed to excite their electricity, it is obferved that they give, on all fides, rays of a very bright and very lively light.

Calcin'd MERCURY, *Mercurius Calcinatus*, a new and more expreffive name for the preparation of *Mercury*, commonly called *precipitate per fe.* It is made by fetting purified quickfilver for feveral months in a fand heat, in a glafs veffel with a broad bottom, and opening it to the air by a fmall hole, till it is reduced to a red powder.

The quickfilver muft have a communication with the external air, as is neceffary to the calcining of all the metals. This opening is beft made, not as in the common bolt-heads, but at the lower end of a ftem, going into the body of the glafs; that if the quickfilver rife with the heat, it may not, by afcending into the ftem, be removed out of the heat that is to calcine it. *Pemberton's* Lond. Difp. p. 225.

Coralline MERCURY, *Mercurius Corallinus*, the name given in the London Difpenfatory to a preparation of *Mercury*, commonly known by the name of *arcanum corallinum.* It is prepared in this manner: Pour upon the red corrofive *Mercury*, commonly called *red precipitate*, thrice its weight of rectified fpirit of wine, digeft them together in a gentle heat for two or three days, often fhaking the phial, then fet fire to the fpirit, and continue ftirring the powder till the fpirit is burnt away. *Pemberton's* Lond. Difp. p. 227.

This operation proceeds upon the principle of fpirit of wine dulcifying acid fpirits.

Oil of MERCURY, the name given by the chemifts to a preparation of *Mercury* in a fluid form, by means of a ftrong acid. The preparation is this: Calcine *Mercury* with oil of vitriol to a dry fnowy calx; fuffer it to cool, then put it into a glafs, and pour upon it an equal quantity of oil of vitriol; let this boil away almoft to a drynefs, carefully avoiding the poifonous fumes; then increafe the fire, and by degrees reduce it to a drynefs again; which is, in this ftate, a very difficult and tedious tafk. When the powder is dry, put the fame quantity of oil of vitriol again to it, and proceed as before: At length it will fcarce dry by means of ever fo long or ftrong a fire, but only ceafe flowing freely, and become fomewhat rigid like a fixed oil. It is then highly fharp, cauftic, and not to be touched, like the *ignis gehennæ* of Paracelfus. By this means the *Mercury* is fo fixed with the oil of vitriol, as not to be evaporated, or fly off, by the action of a very violent fire. *Boerh.* Chem. p. 317.

By this procefs we fee the method of impregnating, faturating, and incerating metals by acids to any degree, and alfo of fixing, in a great degree, volatile *Mercury* by them; but no metal is hence to be expected, for in whatever manner *Mercury* is fixed with acids, it is always recoverable again in its priftine ftate, by grinding it with twice its weight of iron filings, and diftilling in a glafs retort, with the greateft degree of a fand heat. Ibid. p. 320.

Corrofive Sublimate of MERCURY. Mr. Boulduc defcribes an eafy manner of making corrofive fublimate. He pours equal quantities of quickfilver and dephlegmated oil of vitriol into a retort, then draws off part of the acid, which does not incorporate with the quickfilver; the fire is continued till the white mafs of diffolved *Mercury* is dry, when he fpeedily mixes it with equal parts of dried fea falt, and fublimes it in the common way.

MERCURY, *Mercurialis*, in botany and medicine. See the article MERCURIALIS.

MERCURIUS *Dulcis*. *Mercurius Dulcis* in large dofes, with cinnabar of antimony, is recommended in nervous difeafes, palfy, hemiplegia, epilepfy, and apoplexy. Med. Eff. Edinb.

Mr. Dictericus gives us thefe rules for knowing whether fublimate is fufficiently edulcorated in making *Mercurius Dulcis*. If after rubbing the *Mercury* on gold, the gold becomes only pale, and not white, the *Mercury* is dulcified enough; or if fweet *Mercury* becomes black when mixed with lime-water, it is fit for ufe; but if either the gold becomes white, or the *Mercury* is of a brown or yellow colour, after mixing with lime-water, it is not fufficiently dulcified. Commerc. Norem. 1737. hebd. 29. § 2.

MERCURIUS *Emeticus Flavus*, a name given in the late London Difpenfatory to the mercurial preparation commonly known by the name of *turbith mineral. Pemberton's* Lond. Difp. p. 228.

MERCURIUS *Vitæ* may, according to Mr. Boyle, be moderated in its evacuating quality, by continually ftirring it in a flat glazed earthen veffel, over a fire, till it emits no fumes, and turns of a grey colour; and he thinks this is the *Mercurius Vitæ purgans* fo often mentioned by Riverius. *Boyle*, Works Abr. vol. 1. p. 74.

Mr. Godfrey obferves, that what is called *Mercurius Vitæ*, prepared of fublimate mercury and antimony, has no *Mercury* in it, but is the reguline part of the antimony, with the acid of the fublimate; and what remains is the *Mercury* formed

formed into cinnabar by the fulphur of the antimony. Mifcel. vere Util. p. 58.

MERCY, in law, is ufed for the arbitrament of the king or judge, in punifhing offences, not directly cenfured by law. *Blount, Cowel.*

MERDESENGI, in the materia medica of the Arabians, a name given by Serapio to litharge. Avifenna calls this fubftance *mardac*, and it has been erroneoufly fuppofed from this, that *mardac* and *Merdefengi* were not the fame fubftance; but this is a falfe conjecture. See the article MARDAC.

MERDIVORÆ, the *Dung Eaters*, in natural hiftory, the name given by authors to feveral flies which feed on excrements of different animals. Of thefe there are three kinds very common among us, the *coprophagos*, which is of a dun colour, with a reddifh head, and a white ftreak along the middle of it. The red *dung-fly*, which has filvery wings, a red body, and black fhoulders. And 3. The green one, which is of a very glittering hue, and has filvery wings.

MERGANSER, in zoology, the name of a large water fowl, called in Englifh, the *Goofander*, and by fome authors, the *Harle*. See MERGUS.

Its common weight is four pounds, its body is oblong, and its back broad and flat. Its head, and the upper part of its neck, is in the male of a fine bluifh or greenifh black, very bright and fhining; the lower part of its neck is white, and the middle of the back, part of the neck and part of the wings are black, the reft are grey; the tail is grey; all the under part of the body is of a faint afh-colour. The beak is near four inches long, hooked and pointed at the end, and ferrated, and is part black and part red. The feet and legs are red; the three fore toes are joined by a membrane, but the hinder one loofe, yet that is encreafed in breadth by a fmall membrane. Its head feathers ftand loofe, and make the head look larger than it is; but it has not, properly fpeaking, the creft which many of the birds of the fame genus have. *Ray*, Ornithol. p. 253.

This is the figure of the male *Merganfer*; the female differs fo much from this, as to be not only efteemed a different bird by the common people, but even defcribed as fuch by authors. It is called by our people the *Dundiver*, or *Sparling Fowl*, and by authors, *mergus cirratus longiroftер*, the long-beak'd crefted diver. The great difference, however, is, that the female is of a fomewhat reddifh brown on the head, and has a creft. See the article DUNDIVER.

MERETRIX, among the Romans. The *Meretrices* were the better fort of curtezans, and differed much from the *proftibulæ*, or common proftitutes, who had bills or infcriptions, *tituli*, over their doors, and were ready at all times to entertain their cuftomers; whereas the *Meretrices* entertained none but at night.

The *Meretrices* were diftinguifhed from the matrons by their drefs, being obliged to wear the *toga* and fhort tunics, like thofe of the men; whereas the matrons wore the *ftola*, which was a garment that reached down to their feet, as did likewife their *palla*, or outer robe. *Pitifc.*

MERGEN, a word ufed by fome of the chemical writers to exprefs coral.

MERGUS, in the Linnæan fyftem of zoology, the name of a diftinct genus of birds, of the order of the anferes. The diftinguifhing characteriftic of this genus is, that the beak is fomewhat cylindric, and has a crooked point. *Linnæi* Syft. Natur. p. 46.

The characters of this genus, according to Mr. Ray, are thefe: The feet are webbed, the three fore toes being connected by a membrane, but the hinder toe is left loofe. The beak is narrow, hooked at the end, and ferrated.

Of this genus are the *merganfer*, or goofander, the female of which fpecies is called the *dundiver*. 2. The *albellus* of Aldrovand. 3. The *ferula* of the Venetians. Which fee under their feveral heads. And laftly, the *Mergus Rhein*; commonly called fimply by the name *Mergus*. *Ray*'s Ornithol. p. 254.

This laft is of the fize of a duck, and fomewhat refembles that bird in fhape. It is all over very beautifully variegated with black and white. Its beak is black; and its belly is variegated with grey, with the black inftead of white. Its tail is black; its legs brown, and the membrane of its feet black. Notwithftanding that this feems defcribed as a different fpecies by authors, there is much room to fufpect that it is the fame with our *albellus*. *Aldrovand.* de Avib. T. 3. p. 275. *Ray*'s Ornithol. p. 254.

MERGUS *Albellus Dictus*, in zoology, the name of the common *Mergus*, called *Mergus cirratus major*, the greater crefted diver, and *Mergus Rhein*, the diver of the Rhine, and commonly known in England by the name of the *fmew*.

Its common weight is a pound and a half, and its beak is an inch and half in length. Its head and neck are white, except that it has a large black fpot ending in a point, and furrounding the bottom of that tuft of feathers which hang from the back part of the head, and are what authors call the *cirrus* or *creft*; and another oblong black ftreak which runs from the angles of the beak to the eyes. Its throat, breaft, and belly, are all fnow white, and its back all over of a fine deep black; but its fhoulder feathers, which are long and hang over the back, in part on each fide, are white. Near the joining of the wings to the back, there are two or three arched black lines; and on the lower part of the neck there is another line, making a fort of ring of the fame colour. The wing feathers are partly black, partly white. Its beak is of a lead-colour'd grey, large at the bafe, and tapering to a fharp hooked point. In the female the head is reddifh, the throat is white; but there is a fort of circle of a brownifh colour on the breaft. Its upper part alfo is almoft all grey, and it has no creft. It feeds on fifh, and is very common on our coafts. *Ray*'s Ornithol. p. 254.

MERGUS *Cirratus Minor*, in zoology, a name by which Gefner calls the *capo negro*, a fpecies of duck, called in Englifh, the tufted duck, from its having a tuft of feathers, of an inch and half in length, hanging from the back of its head. *Gefner*, de Avib.

MERIDIONAL (*Cycl.*)—MERIDIONAL *Parts*. To find the *Meridional Parts* to any fpheroid, with the fame exactnefs as in a fphere.

Let the femi-diameter of the equator be to the diftance of the focus of the generating ellipfe from the center as m to 1. Let A reprefent the latitude for which the *meridional* parts are required, s the fine of this latitude, the radius being unit; find the ark B, whofe fine is $\frac{s}{m}$; take the logarithmic tangent of half the complement of B from the common tables; fubtract this logarithmic tangent from 10.0000000, or the logarithmic tangent of 45°; multiply the remainder by $\frac{7915.7044678978}{m}$, &c. and the product fubtracted from the *meridional* parts in the fphere, computed in the ufual manner for the latitude A, will give the *meridional* parts expreffed in minutes for the fame latitude in the fpheroid, provided it be oblate.

Example: If $mm : 1 :: 1000 : 22$, then the greateft difference of the *meridional* parts in the fphere and fpheroid is 76.0929 minutes: In other cafes it is found by multiplying the remainder above-mentioned by 1174.078.

When the fpheroid is oblong, the difference of the *meridional* parts in the fphere and fpheroid, for the fame latitude, is then determined by a circular ark. Phil. Tranf. N. 461. Sect. 14. See alfo *Maclaurin*'s Fluxions, art. 895—899.

Mr. Murdoch has folved this problem by infinite feries, and has computed a table of *meridional* parts for an oblate fpheroid, fuch as is mentioned in the foregoing example. See his Treat. intituled, *Mercator's Sailing applied to the true Figure of the Earth*, Lond. 1741. 4°.

MERIS, in mufic, an appellation given by Mr. Sauveur to the forty third part of an octave. See Mem. Acad. Scienc. 1701. The word is Greek, μερις, a part.

MERLANGUS, in ichthyography, a name given by Bellonius, and fome other authors, to a fmall fpecies of whiting or *afellus mollis*, called by the Venetians, *mollo*, and by fome other nations, the *capelan*. *Willughby*'s Hift. Pifc. p. 171. See the article MOLLO.

MERLANUS, a name given by fome writers in ichthyography to the common whiting or *afellus mollis five albus*. *Rondelet*, de Pifc. p. 97. See the article WHITING.

MERLUCIUS, in zoology, the name of a fifh commonly called the *hake*, and by fome authors the *afellus alter*.

It is a moderately large fifh, growing to two foot or more in in length, and refembling the common pike in figure, from whence it has its name, *Merlucius*, *quafi maris lucius*, the fea pike. It in fome meafure refembles the common whiting in colour, the back being of a pale greyifh hue, and the belly white. It is covered with fmall fcales. Its head is broad and flat, and its mouth very wide, as in the frefh water pike. The jaws are both, but efpecially the lower, armed with long fharp teeth, with others fmaller and fhorter between them. The eyes are large, and their iris of a fine yellow. It has two fins on the back, the firft near the head, the other not far diftant from it, and fo long as to reach nearly to the tail. Its gill-fins are narrow, and its belly-fins are placed very high. Its tail is not forked. It is caught in the Englifh and other feas, and is a valuable fifh for the table. *Ray*'s Ichthyogr. p. 174.

MEROPS, in zoology, the name of a bird called alfo *apiafter*, and in Englifh the *bee-eater*.

It refembles the king-fifher in fhape, and is of the fize of a black-bird. Its beak is long, black, and a little crooked, and the irifes of its eyes of a fine red. Its head is long and large. The feathers growing at the infertion of the upper chap are of a bluifh green; but thofe on the middle of the head are white; the crown, however, a little backwarder is of a reddifh brown, fometimes with a flight admixture of green; and there runs on each fide a black line from the angle of the beak through the orbit of the eyes; its neck and fhoulders are green, but with a caft of rednefs; and its belly and breaft are blue. The tips of the long wing feathers are blackifh, and the reft are variegated with a bright green and a fine orange colour. Its tail is of a fine blue, and the two middle feathers of it are longer than any of the others. Its legs are very fhort and thick, and are of the fame form with the

the kingfisher's. It is very common in Italy, and extremely so in the island of Crete; but is not known in England. It feeds on bees and other insects, and sometimes on seeds. See Tab. of Bird, N°. 17. *Ray's* Ornithol. p. 102.

MEROS, in zoology, the name of a very large American fish, growing to five or six feet long, and called by the Brasilians, *cugupu-guacu.* Its head is very large, and its mouth wide and toothless. Its eyes have a black pupil and a yellow iris. It has five fins, one running the whole length of the back, and reaching nearly to the tail; the anterior part of this is narrow, and armed with small but sharp spines; the other part is broader, and sustained by softer rays. Behind the anus is one like the hinder part of that on the back, and two others behind the gills, which are large and broad. The tail fin is very large and broad, and much more so at its extremity than at its origin. Its scales are small. Its head, back, and sides, are of a brownish grey, and its belly white. It is accounted a well tasted fish. See Tab. of Fishes, N°. 53. *Ray's* Ichthyography, p. 303.

MERULA, in ornithology, the name of the black-bird, a bird of the turdus or thrush kind, of which there are several species. 1. The common kind, well known in our hedges. 2. The kind called the *passer solitarius*, or solitary sparrow. See PASSER. 3. The *Cæruleus*, of which there are two kinds. See CÆRULEUS. 5. The Brasilian *Black-bird*, remarkable for the shortness and crookedness of its beak, and for its remarkably beautiful colours. Its tail and wings are black, and the rest of its body of a fine beautiful deep red. Its legs and feet are black, or of a brownish grey. Its wing feathers also have some slight variegations of red. 6. The *Merula Rosea*, or rose-coloured black bird; this is smaller than the common kind, and its back, breast and wings are of a pale red or damask rose-colour. Its wings and tail black. 7. The red-breasted Indian *Black-bird*, called by the Brasilians *jacapu.* See JACAPU. 8. The *Merula Torquata*, or ring amzell. See AMZELL. Beside these there is the *Merula Montana*, or common amzell: And the *Merula Bicolor*: And two other birds, called *Merula Congeneres* described by Aldrovandus, but not now known. See Tab. of Birds, N°. 29, 30. and *Ray's* Ornithol. p. 140.

MERULA, in ichthyology, the name of a sea fish of the turdus or wrasse kind, of a short aod flat figure, and all over of a dull and dead bluish black. The back, sides, and belly, are all of this colour, as are also even the fins and tail. It is a fish not much esteemed, being of an insipid watery taste, but is sold among the poorer sort in the Italian markets. *Rondelet.* de Pisc. L. 6. c. 5. p. 172.

MERULA *Aquatica*, the name of a bird, called the *water ouzel* in English.

It is about the size of the common black-bird, but has a shorter body, and a thicker neck. Its beak is strait, sharp, and black, and its head, and the upper part of its neck, are of a brownish black. Its back and wings are variegated with black and grey; its throat and breast are of a snow white; but the belly toward the tail is black; its tail is short, and it is very thick feathered, as are in general all the water birds. It frequents waters, and is very common in many parts of Germany, nor much less so in the northern counties of England. It feeds on fish, and sometimes on insects, and though not a web-footed fowl, will sometimes dive under water after its prey. *Ray's* Ornithol. p. 104.

MERULA *Fluviatilis*, in ichthyology, a name given by Schoneveldt, and some other writers, to the common tench. These are whimsical and arbitrary names, and express nothing. Artedi has much better distinguished the fish, having taken away even its generical name, and reduced it to the *cyprini*, of which genus it is evidently a species: He has called it the *black mucous cyprinus*, with an even, not forked or invected tail. This is a name by which it can never be mistaken. *Artedi* Gen. Pis.

MERULA *Saxatilis*, a name given by some to the *tordo marino.* See the article TORDO *Marino.*

MERZENIUS, in botany, a name used by some authors for marjoram. *Ger.* Emac. Ind. 2.

MES-AIR, in the manege, is a manege half *terra a terra*, and half corvet. See the articles TERRA *a Terra*, and CORVET, *Cycl.*

MESANGIA, in natural history, the name of a bird common in France and Italy; it is of the size and shape of the ficedula, and differs from it in very little, except the having a black spot upon the head. This seems to be the *melancoryphos* of the antients, who supposed, as many do at this time, that the ficedula changed into this bird. The ficedula, or fig-eater, comes into the gardens in France only at the time when the figs, which are its proper food, are ripe: These it devours in an insatiable manner, and as soon as it has done with them, goes away again. Soon after this the *Mesangia* or black cap appears, and is supposed to be the same bird, with the addition of this beautiful ornament. The antients were very fond of this imaginary change of one bird into another; and Aristotle tells us that the upupa is the same bird with the cuckow, only changed in the colour and disposition of its feathers. Æschylus tells us in the same manner, according to the opinion of his times, that the cuckow sings all the summer, and after that disappears; and that soon afterwards it comes again in a new form, with a plume upon its head, and is called the *upupa.*

MESAZONTES, Μεσαζοντες, officers under the emperors of Constantinople. See the article MEDIATOR.

MESE, in the Greek music, was the ultimate note of the meson tetrachord, and answers to Guido's *a la mi re. Wallis*, Append. *Ptolem.* Harm. p. 157. See the article DIAGRAM.

MESEMBRYANTHEMUM, in botany, the name by which Dillenius, Linnæus, and others, have called the plants usually named *Ficoides. Linnæi* Gen. Pl. p. 250.

MESENTERICA *Febris*, a name given by some authors to a peculiar kind of acute fever, called by our Sydenham, *nova febris* in a peculiar treatise; and by Heister more properly the stomachic or intestinal fever. See the article INTESTINALIS *Febris.*

MESERA, a name given by some medicinal writers to the Alexandrian tutty.

MESENTERIC (*Cycl.*)—MESENTERIC or MESERAIC *Arteries.* Ruysch [a] painted the *meseraic* arteries and veins as having different courses in the distribution of their branches in the intestines. Albinus [b] attributes this mistake to Ruysch's having injected the arteries at one part of the intestines, and the veins at another; and by a figure representing the internal cellular membrane of the ilium, with both arteries and veins injected, shews their courses to be the same.—[[a] Adv. Dec. 3. Tab. 1. fig. 4, 5, 6, 7. [b] Differt. de Arter. & Ven. Intestin. ap Med. Ess. Edinb.] See the article MESENTERIC, *Cycl.*

MESIRE, a name given by Avisenna to a distemperature of the liver, attended with a sense of heaviness, tumour, inflammation, and pungent pain, and always with thirst, a dry mouth, and a parched black tongue.

MESITICUM, among the Romans, a toll paid for a place to sell goods in the forum. *Pitisc.* in voc.

MESMARCHURES, in the manege. See the article PASTERN.

MESOCHORUS, Μεσοχορος, among the antients. The *mesochori* were musicians who presided in concerts, and by beating a desk in a regular manner with their feet, directed the measure of the music. For this purpose in the theatre they wore wooden clogs on their feet, that they might be better heard, which were called by the Greeks, *Crupezia. Hofm.* Lex. in voc.

MESOCHORUS, among the Romans, was also used for a person in public assemblies, appointed to give the signal for acclamation at the proper time, that all might join in it at once. *Pitisc.* in voc. See the article ACCLAMATION.

MESOCUROS, Μεσοκουρος, in antiquity, an actress in tragedies who had the middle part of her head shaven: But others think that *Mesocuros* signifies a girl, or very young woman. *Hofm.* in voc.

MESOGLOSSI, a name given by some writers to the muscles of the tongue, more usually called by anatomists, the *Genioglossi.*

MESOPYCNI, Μεσοπυκνοι, in the antient music, was an appellation given to such chords as formed the middle notes of the spissa. There were five *Mesopycni* in the scale. See the articles PYCNI and SPISSUM.

MESORO, in ichthyology, a name given by Salvian to that fish which we call the butterfly-fish, the blennus or belennius of other authors. It is distinguished by Artedi by the name of the *blennus*, with a furrow between the eyes, and a large spot in the back fin. Salvian has taken his name from the common appellation of this fish among the Italian fishermen. See the article BLENNUS.

MESORO is also used by the Italians for the fish commonly called the *uranoscope* or *star-gazer.* It is a species of the trachini, and is distinguished by Artedi under the name of the *trachinus*, with many beards on the lower jaw. *Willughby*, Hist. Pisc. p. 132.

MESOTHENAR, a flat and nearly triangular muscle, lying between the first phalanx of the thumb and the bottom of the palm of the hand. It is inserted by a very broad basis in the ligament which connects the os magnum to that which supports the thumb. It is likewise inserted along the internal or angular part of that bone of the metacarpus which supports the middle finger, and in the small extremity of that which answers to the index; from thence the fibres contracting to an angle, terminate in a flat tendon of different breadths, which is inserted in that side of the head of the first phalanx of the thumb, which is turned to the hollow of the hand, and in the neighbouring part of the basis of the second phalanx, by means of the second sesamoide bone belonging to that joint. *Winslow's* Anatomy, p. 197.

MESPILEUS *Lapis*, in natural history, a name given to some species of the echinitæ, from their resemblance to the ripe fruit of a medlar. This was a name given them before they were much known, and they were some time afterwards called, from their five lines on the surface, *pentexoche.*

MESPILUS, the *Medlar*, in botany, the name of a genus of trees, the characters of which are these: The flower is of the rosaceous kind, being composed of several petals arranged in a circular form, the foliaceous cup of which becomes afterwards a fruit of a roundish figure, coronated at the end, fleshy,

fleſhy, ſoft, and unicapſular, containing ſeveral ſtones, each having an oblong kernel. See Tab. of Botany, Claſs 21.

The ſpecies of *Meſpilus* enumerated by Mr. Tournefort, are theſe: 1. The common wild *Medlar*, or German *Medlar*, with bay-like, not ſerrated leaves. 2. The greater bay-leav'd *Medlar*. 3. The great bay-leav'd *Medlar*, with an early-ripe, oblong, ſoft, and ſweet-taſted fruit. 4. The great bay-leav'd *Maple*, with a ſoft ſweet-taſted ſmaller fruit. 5. The *Medlar* with a middle-ſized oblong auſtere and ill-taſted fruit, with the corona always cloſed. 6. The parſley-leav'd *Meſpilus*, called the *lazerole*. 7. The double-flowered jagged apium-leav'd *Meſpilus*. 8. The *Lazerole*, with a large deep red and well-taſted fruit. 9. the *Lazerole*, with a ſmaller yellowiſh fruit. 10. The wild ſmall-fruited yellowiſh white *Lazerole*, with a turbinated fruit. 11. The Canada ſervice-leav'd *Meſpilus*. 12. The prickly *Meſpilus*, with pear-like, ſhining, and denticulated leaves, and with very beautiful red fruit. 13. The common apium-leav'd prickly *Meſpilus*, called the white thorn. 14. The common *white Thorn*, with double flowers. 15. The almond-leav'd prickly *Meſpilus*. 16. The barren wild trifoliate apium-leav'd *Meſpilus*, with very ſtrong thorns. 17. The large-fruited wild *Meſpilus*, with ſtrong prickles, and with hairy palmated apium leaves. 18. The roundiſh-leav'd *Meſpilus*, with black ſweetiſh fruit. 19. The roundiſh-leav'd *Meſpilus*, with red fruit. And 20. The American *Meſpilus*, with red fruit, and with broad leaves prickly underneath. *Tourn.* Inſt. p. 644. See the article MEDLAR.

MESSE *da Capella*, in the Italian muſic, is uſed for maſſes ſung by the grand chorus. In theſe, various fugues, double counter-points, and other ornaments, are uſed *Broſſard.*

MESSE *Concertate*, in the Italian muſic, is a maſs wherein the parts reciting are intermixed with choruſſes. *Broſſard.*

MESUA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is permanent, and conſiſts of four ſmall oval leaves. The flower conſiſts of four large hollow and rounded petals. The ſtamina are numerous filaments, of the length of the cup. The antheræ are ſimple. The germen of the piſtil is roundiſh. The ſtyle is ſimple; and the ſtigma indented in four places. The fruit is a roundiſh, pointed, coriaceous capſule, with four longitudinal ſutures. It is compoſed of four valves, and contains four large fleſhy, obtuſe, three-corner'd, and turbinated ſeeds bedded in it. *Linnæi* Gen. Plant. p. 235. *Hort.* Mal. vol. 3. p. 53.

METACAL, an Ægyptian weight, uſed in the weighing of pearls, and conſiſting either of a carrat and a half, or of two carrats. Sixteen of theſe carrats make a dram, each of the carrats weighing four grains, and twelve drams an ounce. *Pocock*'s Ægypt. p. 175.

METACARPIUS, a ſmall very fleſhy muſcle, ſituated obliquely between the large internal annular or tranſverſe ligament of the carpus, and the whole inſide of the fourth metacarpal bone.

It is fixed by a ſmall ſhort tendon to the os orbiculare, and to the neighbouring part of the large ligament of the carpus; from thence its fibres run more or leſs obliquely toward the inſide of the fourth metacarpal bone, in the outer edge of which they are inſerted. The fibres of this muſcle are of unequal lengths, and extend all the way to the articulation of the firſt phalanx of the little finger, with the fourth metacarpal bone; but they have no manner of relation to that finger. *Winſlow*'s Anatomy, p. 194.

METACARPUS (*Cycl.*)—The antient anatomiſts reckoned five bones in the *metacarpus*, including that bone which is now looked upon to be the firſt phalanx of the thumb, the rejecting which from among them, has reduced the number to the four we allow. Theſe bones are all long, thicker at their extremities than in the middle, and of unequal length and bigneſs: The two firſt are ſometimes, though very rarely, equal, and the others leſſen by degrees from them. Anatomiſts, in their deſcriptions, divide each of theſe bones into a middle and two extremities, or into a baſis, body, and head. The baſes of them all are angular, and turned toward the carpus, and their head rounded like condyles, and turned toward the fingers. Both extremities are covered with cartilages, and the heads remain for a long time very diſtinct epiphyſes.

The firſt bone of the metacarpus is longeſt and largeſt, and ſupports the fore finger; its baſis is a little hollow, anſwering to the digital ſide of the os pyramidale of the carpus. On the outer edge there is a ſmall angular notch, and on the cubital edge of the baſis is a ſmall lateral ſide, which is articulated with the baſis of the ſecond bone. The inner edge is terminated laterally by an oblique angle, which is articulated with the neighbouring angle in the baſis of the os magnum; round the baſis are inequalities and depreſſions for the ligaments and articular glands. The outſide of the body of the bone is broader toward the head than toward the baſis.

The ſecond bone of the *Metacarpus* ſupports the middle finger, and has this very peculiar in it, that its baſis is very oblique, terminating at the outer edge by an angular point toward the firſt bone. By the triangular ſide of its baſis it is articulated with the baſis of the os magnum, and by its lateral ſides with thoſe of the firſt and third bones of the *Metacarpus.* The third bone is that which ſupports the ring finger, being leſs than the firſt and ſecond. Its baſis is irregularly triangular, and proportionably leſs than the two former, and by the principal ſide thereof, it is articulated with the firſt half of the ſide of the os unciforme; the ſmall lateral ſides of the baſis join thoſe of the ſecond and fourth bone. The fourth bone ſupports the little finger; the principal ſide of the baſis of this, inſtead of being triangular, as in other bones, is all of an equal breadth, a little oblique, and ſome part of it gently convex, the reſt gently concave, and articulated with the ſecond half of the ſide of the os unciforme; by its lateral ſide it joins the correſponding ſide of the baſis of the third bone, but in a much looſer manner than in the other articulations of that kind. In the oppoſite ſide there is a ſmall tuberoſity. *Winſlow*'s Anatomy, p. 86.

Fractures of the METACARPUS. In fractures of the hand or *Metacarpus*, the beſt method of reducing and replacing the bones, is, to extend the hand upon a ſmooth table, and while an aſſiſtant holds the whole hand evenly in that poſture, the ſurgeon is to replace the bones; and when that is carefully and perfectly done, to ſecure them with a proper bandage. *Heiſter*, Surg. p. 129.

Luxation of the METACARPUS. The four ſmall bones in the palm of the hand are ſometimes luxated from the carpus to which their upper parts are connected; this happens from external violences, not unfrequently, notwithſtanding that theſe bones naturally muſt much reſiſt ſuch a luxation; for the two carpal bones, which are ſeated in the middle between the two external ones, cannot be diſlocated to either ſide, as the two external ones, which ſuſtain the firſt and little fingers, cannot be luxated inwardly, but are very eaſily driven outward; and each of them may be luxated on the fore or back part of the hand; but which ever of theſe happens, the particular diſorder may be diſcovered and examined by feeling and inſpecting, and the cure may be performed by extending the hand on a flat board or table, and replacing with the thumb whatever of the bones have ſtarted from their natural ſituation. *Heiſter*'s Surg. p. 166.

METACHORESIS, a word uſed by Galen to expreſs a receſs of a morbid humour from one part of the body to another, a thing very common in many diſtempers.

METACOE, in botany, a name given by the people of Guinea to a plant, of which they are very fond, becauſe of its virtues as a balſamic and vulnerary. Its leaves, being bruiſed and applied to a freſh wound, cure it. They have alſo another uſe for it, twiſting the dried leaves into a ſort of match for their muſkets. Phil. Tranſ. N°. 232.

METAGITNION, Μεταγειτνιων, in chronology, the ſecond month of the Athenian year. It contained twenty-nine days, and anſwered to the latter part of our July and beginning of Auguſt. The Bœotians called it *Panemus*, and the people of Syracuſe, *Carnius*.

It was ſo called from *Metagitnia*, one of Apollo's feſtivals kept in it. Vid. *Potter*, Archæol. Græc. T. 1. p. 414.

METAL (*Cycl.*)—Experiments on *Metals*, made with the great burning-glaſs at Paris, have proved, that all the imperfect metals, copper, iron, tin, and lead, are compoſed only of two parts, a ſulphur or oily matter, and a more denſe ſubſtance, called their earth, capable of vitrification. That from this oil or ſulphur proceed the opacity, the glittering brightneſs, and the malleability of theſe metals; that this ſulphur or oil ſeems no way different from the oils of vegetables and animals, and that it is the ſame in all the four imperfect *Metals*, and in mercury: That theſe four metals have a different ſubſtance for their baſe, the earth of each vitrifying in a different manner; and that to this is owing their difference from one another. Mem. Acad. Par. 1709.

Specific Gravity of METALS. The ſpecific gravity of *Metals* can never be very exactly determin'd, for it varies a little from many cauſes; firſt, according to the different heat of the atmoſphere, which expands water, and other fluids, infinitely more than it does ſolid bodies; and by that unequal diminution of the weight, makes it impoſſible to aſſign them a conſtant proportion, unleſs the heat be determined with the greateſt exactneſs. Secondly, according to the ſeveral degrees of purity in the water, which difference is ſometimes found not inconſiderable. Thirdly, according to the different purity of the *Metals*; for there is hardly any *Metal* found ſo very pure, but that it may be eaſily demonſtrated to be mixed with ſome others. Fourthly, according to the different weight of the atmoſphere itſelf; though the effects of its variations be not ſo conſiderable as of the reſt. *Cramer*, Art. Aſſay. p. 4.

Hence it is that there are, in a manner, as many different accounts of the ſpecific gravities of *Metals* as there are authors who have given an account of their experiments on the ſubject. However, except the *Metals* be of a very great impurity, the ſum of all the variations reſulting from all theſe cauſes, is not ſufficient to hinder any *Metal* from being certainly diſtinguiſhed from any other *Metal*, by its ſpecific gravity.

Slight variations in hydroſtatical experiments are indeed neither new things, nor are they by any means avoidable, either

either in making these or other experiments of affinity to them. By way of proof to such as may distrust this, from their never having made such experiments themselves, two very eminent testimonies may be produced. That most industrious and diligent mathematician Mersennus candidly acknowledges, that when he has occasion to mention the experiments of the learned Ghetaldus, and of the accurate French engineer Monsieur Petit, with his own, there will be often a variety of weight of some few grains; but he says, it is only like the variety of astronomical observations, which do almost always differ also by a few minutes or seconds; and to this he afterwards adds, that he expected not an exact uniformity between the observations of Ghetaldus, &c. already made, and the trials of any new experimenter, who would go through the work again. And our famous experimenter the lord Verulam confesses, that it is not to be doubted but that many of the bodies which he has set down in the table he has given, of their dimensions and weights, differ in the same species or denomination, some being heavier than others, and that therefore there is some contingency in the affair; so that tis not necessary that the individuals he made his trials upon should be exact standards of the weight of their respective species, or should, which makes directly to our present purpose, agree altogether to a tittle with the experiments of other men. *Boyle*, Hydrost. Experim. in Pref.

But this scarce evitable imperfection of hydrostatical experiments does not hinder, but that by their help we may make good estimates of the weights and bulks of very many bodies; and these estimates will be found not only preferable to those that can be made of the same bodies by geometrical instruments, but accurate enough to be very useful on a great number and variety of occasions.

METALS *for Specula*. In the making reflecting telescopes, the greatest article of all is the hitting upon a proper *Metal* for the specula. The common search is for a white and hard *Metal*, that shall be bright and durable; but Sir Isaac Newton advises, that at the same time great care must be taken that the *Metal* be not full of holes or pores, which, though so small as to be only discoverable by the microscope, yet will greatly impede the office of the speculum. This *Metal* may seem to take a very fine polish, but, in reality, the edges of these small pores will wear away faster in the polishing, than any other part of the *Metal*, and then however polite the *Metal* may seem, yet it will not reflect with such an accurate regularity as it ought to do. Thus tin-glass, mixed with the common bell-*Metal*, renders it more white and capable of reflecting a greater quantity of light than it otherwise would do; but then the fumes of this semi-*Metal* raised in the fusion like so many aërial bubbles, fill the *Metal* with microscopic pores. White arsenic both blanches the *Metal*, and renders it rather more dense than before, giving it no microscopical pores, unless the fusion has been too violent. The stellate regulus of Mars is recommended by the same gentleman to farther trials.

When the proper mixture is hit upon for the making such a *Metal*, there requires yet great caution in the polishing it. Whatever this is done with ought to be of the most extreme fineness, for if otherwise, its particles will scratch the face of the *Metal*, and make such microscopical holes as the tin-glass gives in the other instance. The proportion of arsenic is to be judged by trials, but something between a sixth and an eighth part of the weight of the copper seems to be the just proportion; when there is much less than an eighth, the *Metal* wants of its whiteness and brightness; and when much more, it is rendered too brittle. The method of making the mixture is this: The copper is first to be melted alone, and then the arsenic is to be put in; but while this mixture is stirred, great care must be taken to avoid the poisonous fumes. When the copper and arsenic are mixed, the tin is to be put in; this soon melts, and then the whole is to be stirred together, and poured off. Some add silver; but it is found, on trial, that this does as much harm in rendering the *Metal* soft, as it does good in rendering it white and luminous. Six ounces of copper, two ounces of tin, and one ounce of arsenic, seems one of the best proportions. It is to be carefully managed in the fire, and not kept too long in fusion, lest it grow porous by that means. Phil. Transf. N°. 81.

Colours from METALS. As metals have a strong texture in their metalline form, so they preserve their natural colours durably, unless corroded or dissolved by particular menstruums, after which their solutions strike particular durable colours, or afford the strongest stains.

Iron dissolved in stale small beer gives the beautiful yellow used in callico printing; when sublimed with sal armoniac it also affords a yellow: And the common iron-moulds made by ink are owing to the iron dissolved in the copperas of which ink is made.

Copper melted with zink appears of a gold colour; dissolved in aqua fortis, it affords a beautiful green; and in any alkali, a beautiful blue. And these solutions may be reduced to dry colours by crystallization or evaporation; and the same *Metal*, precipitated out of aqua fortis with common salts, gives the turquoise colour to white glass.

Tin, a white or colourless *Metal*, affords a light blue colour, when fluxed with antimony and nitre. The same *Metal* is necessary in striking the scarlet dye, with aqua fortis and cochineal; and its calx, by strong infusion, turns to a glass of an opal colour.

Lead, corroded by the fumes of vinegar, gives the fine white cerus; burnt in a strong naked fire, it becomes the strong red lead or minium; and melted into a glass with sand, is of the hyacinth colour. *Shaw's* Lectures, p. 171.

Silver being dissolved in aqua fortis, if chalk be put to the solution, turns of a beautiful purple or amethyst colour; and its own solution, though pale as water, durably stains the nails, skin, or hair, brown or black.

Quicksilver mixed with brimstone makes a black mass, and this, by sublimation, affords the beautiful red pigment, called cinnabar, or vermillion; and the solution of quicksilver being precipitated with common salt, yields a snow-white powder, which also turns black by being mixed with sulphur.

Gold, dissolved in aqua regia, affords a fine yellow liquor, which stains animal substances beautifully purple; and if the solution be sufficiently weakened with water, and mixed with a solution of tin, a fine red or purple powder may be procured, very useful for staining of glass and pastes to a beautiful red.

Fluxes of METALS. See the article FLUXES.

Granulation of METALS. See the article GRANULATION.

Medicines from METALS. All medicines that have lead in their composition, are scarce to be trusted for internal use; for we have numerous instances of the poisonous nature of this *Metal*, in the workers at the white lead or cerus-houses, and indeed in all who work on that *Metal*: And it were enough to banish the internal use of *saccharum saturni*, and the *tinctura antiphthisica*, to read in the *Miscellanea Curiosa*, Decad. 3. Obs. 30. how many men were poisoned at a time by drinking of prick'd wine, which had been rendered sweet by litharge.

Metals, however, do not act in the body unless dissolved; whence large quantities of crude mercury being swallowed, prove harmless for want of a proper menstruum to dissolve it in the stomach: But when crude mercury is dissolved in its proper menstruum, as in the making corrosive sublimate, we see it becomes one of the strongest poisons. Lead, Iron, and copper, being much more easily dissolved than quicksilver, are seldom taken without some remarkable effect, which must always prove the greater, the more of an acid humour, or in case of copper, even an alkaline is lodged in the stomach or intestines. The internal use of the crystals of silver, though sometimes successfully given in dropsical cases, should hardly be trusted, on account of their corrosive acrimony, which has sometimes occasioned bloody stools, and extreme weakness. The common tinctures of copper and solutions of blue vitriol, can scarce be taken internally with safety; as being not only emetic, but in some degree corrosive and poisonous. Even the *aurum fulminans* cannot be safely given till thoroughly washed from its salts; and even then if it meet with an acid solvent in the stomach, it may do very great mischief. Iron and tin have not been found so pernicious in the body, but rather beneficial, especially iron, when properly prepared and used.

Metallic bodies corroded by acids, generally erode when applied to sores. Some of these, sublimate mercury, for instance, and particularly arsenic, have shaken the whole frame of the body, when applied externally; and mercurial preparations do sometimes enter the blood, and produce a salivation. Med. Ess. Edinb. vol. 5. art. 24.

Salts of METALS. The salts of the several *Metals* have been medicines long known in the world, and are of excellent use in the cure of many diseases: But they might be of yet infinitely more service to the world, if a happier way of extracting them could be found than the general one now in use, of doing it by acids, and such strong and corrosive menstruums. Beside the mischiefs these menstruums bring as corrosives, which is assuredly much less than is vulgarly supposed, because they lose the greater part of this in acting on the *Metal*, they produce a great number of bad effects, and render the salts unfit for a great number of uses, by making them all vitriols, that is, by converting them into salts, which, like the common native vitriols, have a septic and violently acrimonious quality. The crystals, or salt of silver, called by the chemists, lunar vitriol, are a plain instance of this.

Borrichius and Kunkell devised another method to be used for obtaining the salts of *Metals*. This was the use of fire instead of acids, as the menstruum that should prey upon the *Metal*, and seeking the salts of all *Metals* from the mere action of a reverberatory furnace; but this method, though a very laudable attempt, yet is by no means calculated to be of general use, because the quantity of salts thus obtained is very small, and that obtained with great pains and expence. Kunkell has given the world an account of the effects of another method of treating *Metals*, of which he relates wonders; but

but he conceals the method. The ſolemn manner in which he declares the fact, however, ſeems to imply, that what he relates is truth; and he every where ſpeaks from his own perſonal knowledge, and the work of his own hands. The menſtruum he uſed was known by himſelf and many others, at Hall in Saxony, under the name of *Eſſentia Dulcis*; he ſacredly affirms, that this was neither acid nor corroſive, even in the ſlighteſt degree; that it left behind it no fæces, no ſaline nor earthy matter on evaporation alone; and that it more approached to the nature of ſpirit of wine, than to any other known liquid. He ſays, that this liquor diſſolved even gold, and that ſo perfectly, that it would all riſe with the liquor in diſtillation. Mercury being diſſolved in it, and the ſolution diſtilled in a retort, he ſays, that only a ſmall quantity of earthy matter remained in the retort, which was white, of a ſpongy texture, and fixed in the fire; and that the reſt of the body of the quickſilver was converted into a thin colourleſs and pellucid ſpirit in the receiver: And that gold, treated in the ſame manner, and diſtilled with a very gentle heat, was left at the bottom of the retort in form of a reſin; and that this reſin was ſoluble in common rectified ſpirit of wine, as was alſo the earth of the mercury; and that ſome days after the ſolution of this laſt earth, the ſalt with which this ſubſtance abounded, would ſeparate itſelf from the menſtruum, and form regular cryſtals at the ſide of the glaſs. This, he ſays, is the true ſalt of mercury, containing all the virtues of that *Metal*, and not converted into a vitriol or corroſive ſubſtance, by means of the menſtruum uſed to extract it.

When the ſalt has thus formed as many ſhoots as it will yield by this proceſs, the remaining liquor is to be evaporated gently, and there will be found a like ſalt at the bottom of the veſſel, of a white colour, an agreeable ſmell, and inſipid to the taſte: This, he ſays, is ſo fixed in the fire, that it is no more to be deſtroyed or altered by it, like the *Metal* from which it is obtained. It readily melts into a maſs in the fire; but if it be not immediately after that taken off from the fire, it will run through whatever veſſel it is melted in.

The author attributes to this ſalt all the wonderful virtues that the metal it is made from is known to poſſeſs; and gives inſtances of cures performed by it, which are ſo well atteſted, as ſcarce to leave any doubt of his veracity. He ſays, it works mildly by ſtool, urine, and ſweat. The caſes he gives of cures performed by it, are theſe: Two women, who were very bad with the venereal diſeaſe, two men in the laſt ſtages of hectic fevers, ſeveral perſons in bad kinds of the ſmall pox, and ſome in peripneumonies. The reſin-like ſubſtance into which gold is converted by the ſame operation, he ſays alſo may be transformed in the ſame manner into a white and ſubtile ſalt, of a very penetrating taſte; and to this he attributes great virtues in the cure of hæmorrhages and epileptic caſes, and adds, that it is an ingredient of the black compound powder, ſo famed for epileptic caſes, prepared at the public orphan hoſpital at Hall. *Kunkel*'s Diſſert. de Sal Met.

That a diſcovery of a manner of extracting the ſalts of *Metals* thus without the help of acids would be of great uſe to the world, is very evident, and the ſolemn manner in which this author aſſerts the having done it, ſeems to infer a probability of its being arrived at by others. He is very blameworthy in not declaring the method; but perhaps ſome hints may be gathered from what he has been pleaſed to declare about it.

Prince's METAL. See the article PRINCE.

METALLIC (*Cycl.*)—The antients have uſed this word very frequently as an epithet in the diſtinctions of the ſeveral ſubſtances which they have treated of. But it is to be obſerved, that the various writers have taken the word in a very different ſenſe. The medical writers in general mean by it ſomething of the mineral kind, that more or leſs partakes of the nature of ſome one of the metals, and that is wholly different from earths, ſtones, &c. In this ſenſe they call the *Lapis Armenus*, which indeed is properly not a ſtone, though we call it ſo, but an ore of copper, *metallic*; and by this term alone they diſtinguiſh it from the laps lazuli, which they call a ſtone. The naturaliſts, on the other hand, make no ſuch diſtinction, but call every thing *metallic* that is obtained out of the bowels of the earth; and thus ſtones, earths, ſalts, and even the liquid bitumens, are by them called *metallic* ſubſtances. The terms *metallic* oil, and *metallic* pitch, are found in the Greek naturaliſts, as the names of the *Petroleum* and *Piſſaſphaltum*; but the medical writers of the ſame time diſtinguiſh theſe by the name *Oryctæ*, which is properly foſſil, a word of a very wide ſenſe, taking in every thing produced in the earth; but the particular ones, which contained the particles of metals in a more or leſs perfect form, they ſeparated from theſe, and treated diſtinctly of under the name of the *Metallics*; chalk, ſand, earth, and ſtones of all kinds, are called by the Greek naturaliſts *metalla*, and the Latins have ſometimes uſed the word *metallum* for *lapis* a ſtone.

METALLIC *Germination*. See the article GERMINATION.

METALLIC *Vegetation*. See the article VEGETATION.

METALLORUM *Mater*. See the article MATER *Metallorum*.

METAPEDIUM, in natural hiſtory, a name given by ſome authors to a kind of ſtone, called by others *metatarſum*, and ſuppoſed to imitate a human foot. It is only a luſus naturæ in the formation of a common pebble.

METAPTOSIS, a word uſed by many phyſical writers to expreſs a change of one diſtemper into another, whether it be by *diadoche* or *diadexis*, as it is called; when the change is for the better, and the morbid matter removes from a more noble to an ignoble part: Or by *metaſtaſis*, when the change is for the worſe, and the morbid matter removes from an ignoble to a more noble part.

METASTASIS, Μετάστασις, *Remotio*, in rhetoric, is uſed for the removing the blame from the perſon accuſed to another perſon, or laying it upon ſomething as a cauſe. Thus Adam's excuſing himſelf by blaming Eve, is an example of the former; and the laying the crime of drunkenneſs upon the wine, is an inſtance of the latter. *Voſſ.* Rhet. l. 1. p. 147.

METATARSUM, in natural hiſtory, a name given by authors to a ſort of ſtone, ſuppoſed to repreſent a human foot. See the article METAPEDIUM.

METATARSIUS, a fleſhy maſs lying under the ſole of the foot, fixed by one end in the fore-part of the great tuberoſity of the os calcis, and running forward from thence, terminates in a kind of ſhort tendon, which is fixed in the tuberoſity, and poſterior part of the lower ſide of the fifth bone of the *Metatarſus*. It may move this bone, much after the ſame manner as the metacarpus moves the fourth bone of the metacarpus. *Winſlow*'s Anatomy, p. 226.

METATHESIS, a word uſed by medical writers for a change of place in ſuch humours, or other diſeaſed parts, as cannot be abſolutely removed or ſent off. Thus a *Metatheſis* of a cataract is a depreſſion thereof, ſo that it no longer ſhuts out the light.

METATOR, among the Romans, a quarter-maſter. Out of every legion a tribune, and ſome centurions, were appointed to go before the army, in order to chuſe a place for a camp, and aſſign and mark out quarters to each legion. *Pitiſc.* Lex. Antiq. in voc.

METAXA, a word uſed by ſome medical writers to expreſs ſilk.

METEGAVEL, in our old writers, a tribute or rent paid in victuals; which was a thing uſual in this kingdom, as well with the king's tenants as others, till the reign of king Henry the firſt. *Blount.*

The word is Saxon, *metegavel*; i. e. *cibi gablum, ſeu vectigal.*

METEL, in natural hiſtory, the name of a ſort of *nux vomica*, of the ſame ſhape with the common kind, but ſomewhat larger.

METEMPSYCHI, in church hiſtory, heretics, who, in imitation of the Pythagoreans, maintained the tranſmigration of ſouls. *Hofm.* Lex. in voc. See the article METEMPSYCHOSIS, *Cycl.*

METESSIB, an officer of the eaſtern nations, who has the care and overſeeing of all the public weights and meaſures, and ſees that things are made juſtly according to them. *Pocock*'s Egypt, p. 166.

METHOD (*Cycl.*)—The ſupreme law of the philoſophical *Method* is, to premiſe that which is neceſſary towards the underſtanding or eſtabliſhing what follows. *Wolf.* Diſc. Prælim. Logic. c. 4.

The mathematical and philoſophical *Method* are the ſame, as may be ſeen by the practice of the geometers of antiquity, who conſtantly obſerve the law here mentioned. Id. ib.

Several authors, as Ramus, Meſſrs. de Port Royal, &c. have accuſed Euclid of want of *Method.* Had theſe gentlemen attended to the ſupreme law of all true *Method*, they would have been more cautious in their cenſures. The jeſuit Caſtel has renewed this groundleſs accuſation; and to convince his reader how much he excels the antients, he begins his geometry by a *petitio principii.* Thus to prove that the oppoſite angles *a*, *b*, as alſo *c*, *d* are equal. He aſſumes this principle, that the two lines whoſe interſection forms theſe angles, are equally inclined to each other above and below. Now, being equally inclined to each other, is the ſame as forming equal angles, which is the very thing to be proved [a]. We find the ſame confuſion of thought, which he introduces by way of illuſtration, in bis doctrine of parallel lines; not to mention the abſurdity of *parallels being as it were one broad line* [b].—[[a] *Caſtel.* Math. Univerſ. p. 264. [b] Ib. p. 271.]

METHOD *of Maximis & Minimis.* See the article MAXIMUM, *Cycl.* and *Suppl.*

METHODISTS, in botany, perſons who have attempted that ſtudy upon certain principles, and have beſtowed their labours upn the diſpoſition and arrangement of plants, and allotting them proper and diſtinctive names. *Linnæi* Syſt. Nat. p. 1.

METOPIUM, in botany, a name given by Pliny to the plant which produces the gum ammoniacum. He ſays that the antient Greeks called it alſo by this name, but in that he errs. See the article AMMONIACUM.

METRENCHYTES, a name given by chirurgical writers to a ſort of ſyringe, contrived on purpoſe for injecting medicinal ſubſtances into the womb.

METRETES, the name of a meaſure uſed among the antients, containing ſomewhat more than nine gallons.

METROCELIDES, a word uſed by medical writers to expreſs a mark made by the imagination of the mother on the fœtus in utero.

METRONOMI, Μετρονόμοι, among the Athenians, officers that inſpected all ſorts of meaſures, except thoſe of corn; there were five of them in the city, and double that number in the *Pyræus*, in which the greateſt mart in Attica was kept. *Potter*, Archæol. l. 1. c. 15. T. 1. p. 83.

METROPTOSIS, a word uſed by ſome medical authors to expreſs a falling down of the womb, or prolapſus uteri. There is a plaſter calculated to be of ſervice againſt this caſe, and called hence, *emplaſtrum metroptoticum*.

METTESHEP, or METTENSCHEP, in our old writers, an acknowledgment paid in a certain meaſure of corn; or a fine or penalty impoſed on tenants, for their defaults in not doing their cuſtomary ſervices of cutting the lords corn. Paroch. Antiq. 495.

METUPORANGA, in zoology, the name of a Braſilian bird, called alſo by ſome *Tepetototl*, and by Aldrovand by the too general name *Gallus Indicus*.

It much approaches to the Gallinaceous fowls, called *Mitu* and *Pauxi*, of the ſame country, but differs from them in having no tail, if the deſcriptions of authors are accurate, and from the *mitu* in having a protuberance of the ſize of a cherry over the top of its beak. *Marggrave*'s Hiſt. Braſil. *Aldrov.* de Avib.

METYS, a word uſed by many of the antient writers to expreſs a ſubſtance collected by bees, in order to the ſtopping up cracks and crevices in their hives.

The old authors mention three kinds of ſubſtances uſed by the bees on this occaſion, the *Metys*, *Piſſoceros*, and *Propolis*. The moderns uſe only the latter term to expreſs every thing of this kind. The *Metys* and *Piſſoceros* ſeeming to have been only the ſame *Propolis*, more or leſs mixed with wax. This ſubſtance is a reſin, of a middle conſiſtence between the hard and the fluid ones. It is uſually of a reddiſh brown on the ſurface, and yellow within, and is collected from ſeveral trees, of which the poplar ſeems to be the principal, and the willow the next. *Reaumur*'s Hiſt. Inſ. vol. 10. p. 83. See the article PROPOLIS.

MEVIUM, a name mentioned by *Fallopius* and others, as given by ſome medical writers to the venereal diſeaſe.

MEUM, in botany, the name of a genus of umbelliferous plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular form, and ſtanding on a cup which afterwards becomes a fruit, compoſed of two oblong ſeeds, which are gibboſe and ſtriated on one ſide, and flat and plain on the other. To this it may be added, that the leaves are finely divided, and ſtand on branched ſtalks. There is only one known ſpecies of this genus. The plants uſually called by this name, and different from the common *Meum*, being all ſpecies of fennel; and Mr. Tournefort obſerves, that this anſwers ſo well to all the characters of fennel, that he ſhould have made it no more than a ſpecies of that genus, but in compliment to its having been ſo long received under a ſeparate name. *Tourn.* Inſt. p. 312.

The root of *Meum* is eſteemed by ſome a very great medicine in malignant diſeaſes.

It is alſo eſteemed an attenuant, and is preſcribed wherever there are thick humours to be evacuated. It is given in aſthma's, and all obſtructions of the lungs, and is by many recommended in flatulencies, colics, and ſuppreſſions of urine, and of the menſes. Dioſcorides and Galen tell us, that the too frequent uſe of this medicine, or the taking it in too large doſes, will occaſion violent pains in the head. It may be given in ſubſtance from half a dram to two ſcruples, or from a dram to two drams in infuſion. *Geoffroy*, Mat. Med. vol. 2. p. 105.

It ought to be choſen as long and large as can be had, round, not flatted, plump, and full, and of an aromatic ſmell, and a ſomewhat acrid taſte, and ſuch as is not duſty or worm-eaten. It is ſudorific and diuretic; but the principal uſe now made of it is only as an ingredient in the Venice treacle.

MEUTANG, in botany, the name of a flower much eſteemed by the Chineſe, which, on that account, they call the king of flowers. It is larger than our roſe, and imitates its figure, only its leaves are more expanded. As its ſmell comes ſhort of that of the roſe, ſo in beauty the roſe is outdone by it. It has no prickles, and its colour is a mixture of white with purple, but ſo as to incline moſt to white; yet ſometimes there are found reddiſh and yellow ones. The tree it grows on is not unlike our alder tree, and is cultivated throughout that large empire with great care, being covered in the ſummer time with a ſhade to defend it from the ſcorching heat of the ſun. *Hofm.* Lex. in voc.

MEZEREUM, the female *ſpurge laurel*, in botany, a ſpecies of thymelæa. See the article THYMELÆA.

The bark of the root of this ſhrub, or the inner bark of the trunk, are preſcribed by ſome in dropſies, and other caſes where ſtrong purges are neceſſary; but it is ſo violent, that it ought never to be uſed internally. Externally it is uſed as a ſeaton, to draw a copious diſcharge from the ear in inflammations of the eyes.

MEZUZOTH, in the Jewiſh cuſtoms, certain pieces of parchment which the Jews fix to the door-poſts of their houſes, taking that literally which Moſes commands them [a], ſaying, “Thou ſhalt never forget the laws of thy God, but thou “ſhalt write them upon the poſts of thy houſe, and on thy “gates.” This expreſſion means nothing elſe, but that thou ſhalt always remember them, whether thou comeſt into thy houſe, or goeſt out. But the Hebrew doctors imagined, that the law-giver meant ſomething more than this. They pretended that, to avoid making themſelves ridiculous, by writing the commandments of God without their doors, or rather to avoid expoſing them to the profanation of the wicked, they ought at leaſt to write them on a parchment, and to encloſe it in ſomething. Therefore they wrote theſe words upon a ſquare piece of parchment, prepared on purpoſe, with a particular ink, and a ſquare kind of character, Deut. vi. 4, 5, 6, 7, 8, 9. “Hear O Iſrael, the Lord our “God is one Lord, &c.” Then they left a little ſpace, and afterwards went on, Deut. xi. 13. “And it ſhall come “to paſs, if thou ſhalt hearken diligently to my command-“ments, &c.” as far as, “Thou ſhalt write them upon “the door-poſts of thy houſe, &c.” After this they rolled up the parchment, and put it into a caſe of reeds, or other matter; they wrote on the end of the caſe the word *Shadai*, which is one of the names of God; they put it at the doors of their houſes, chambers, and all places moſt frequented; they fixed it to the knockers of the door, on the right ſide; and as often as they entered in, or went out, they touched it in this place with the end of their finger, which they afterwards kiſſed out of devotion. The Hebrew word *Mezuza* properly ſignifies the door-poſts of an houſe; but it is alſo given to this roll of parchment now mentioned. Leo of Modena may be here conſulted [b].—[[a] Deut. vi. 9. [b] Ceremon. of the Jews, part 1. c. 1. *Calmet*. Diction. Bibl.]

MEZZA *Pauſa*, in the Italian muſic, *half a pauſe*, intimates that the part wherein it is found muſt lie ſtill the time of a ſemi-breve in common time. See the article PAUSE.

MEZZA *Tirata*. See the article TIRATA.

MEZZO *Soprano*, in the Italian muſic, is the high tenor, which has the cleff C on the ſecond line.

MICA, in natural hiſtory, a name given by authors who have written of foſſils to many of the bractearia, or ſmall ſpangled talcs, whether in pure maſſes of themſelves, or immerſed in the matter of other foſſils.

The principal kinds of theſe are the white and the yellow, from their colour and ſplendid appearance, called the ſilver and gold glimmer, or *Mica aurea* and *Mica argentea*.

Of each of theſe there are ſeveral kinds, as many of the yellow and white bractearia, more or leſs, deſerve the name; but the moſt conſiderable ſpecies are thoſe called by Dr. Hill the *bractearium lucidum aureum bracteis parvis*, and the *bractearium argenteum lucidum bracteis variis*, the bright gold-colour'd bractearium with ſmall ſpangles, and the bright ſilvery bractearium with variouſly ſized ſpangles. Theſe have frequently led people of ſanguine imaginations, who have met with them in different places, to ſuppoſe they had found ores of gold and ſilver, but they, in reality, contain not the leaſt grain of either of thoſe metals, and are mere talc in ſmall flakes, accidentally colour'd. The yellow kind is found in many parts of the world, but no where ſo plentifully as in Arabia and Ægypt. In Germany and France there is alſo conſiderable plenty of it, and in our American plantations it is found in great abundance; nor is England without it even in various forms. We have ſome of it in pure homogene maſſes, ſome mixed among ſtony matter, ſome among ſand. The white is extremely plentiful in Sileſia and Bohemia, as alſo in France, Italy, and England. It is like the former, found either pure, or mixed among the matter of ſtone, and makes a very glittering and beautiful appearance. *Hill*'s Hiſt. of Foſſ. p. 77, ſeq.

MICARAGUÆ *Pomum*, a name given by ſome authors to the Spaniſh pear. *Chabræus*, p. 596.

MICHAH, a word uſed by ſome of the chemical writers to expreſs copper.

MICHALALATLI, in zoology, a name by which Nieremberg informs us, ſome of the Mexicans call the *achalalactli*. See the article ACHALALACTLI.

MICHELIA, in botany, the name of a genus of plants eſtabliſhed by Dr. Amman, the characters of which are theſe: The flower is monopetalous and of an anomalous kind, it is tubular, and opens into a kind of bilabiated mouth. The piſtil ariſes from the cup and finally becomes a fleſhy fruit, containing a kernel, or ſtone, divided into two cells, each of which contains one ſeed. This riſes to the ſize of a ſhrub, its branches are covered with a deep green bark, and do not grow ſtrait and even, but variouſly intorted; they ſend out many ſmall ſhoots, and are armed with very ſharp thorns of half an inch long; the leaves are about an inch and half long, and an inch broad; they ſtand on ſhort pedicles, and are of a pleaſant green on the upper ſide, and whitiſh underneath. The branches uſually terminate in long

and loose spikes of yellow flowers; these are each divided into four very uneven segments, the upper segment is very large and is arched; but the lower, and the side ones are much smaller and bend outwards. In the middle of the segments there stand two yellow stamina, sustaining each a round yellow head; the pistil arises between these, and is of the same colour, length, and thickness, with the stamina. The cup is very short, consisting only of one leaf; it is green and is divided in its upper part into two or three obtuse segments: The fruit is round and fleshy of the size of a walnut, green while young, but yellow when ripe, composed of a large quantity of a pale coloured pulp, surrounding a stone of an oval figure divided into two cells; in each of which is contained one kernel or seed. Act. Petropol. Vol. 8. p. 219.

MICROCOSMETER, a name given by Dolœus to an imaginary being, which he supposes to reside in the brain, and direct all the actions.

MICROCOUSTICS, the same with *microphones*. See the article MICROPHONES.

MICROPHONES, instruments contrived to magnify small sounds, as *microscopes* do small objects.

MICROSCOPE (*Cycl.*)—compound *Microscopes* sometimes exhibit a fallacious appearance, by representing convex objects, concave, and *vice versa*. See Philos. Transf. N°. 476. p. 387. See some accounts of the famous Leuwenhoek's *Microscopes* in the Philosophical Transactions, N°. 380. & 458.

The solar or *camera obscura Microscope*, and the *Microscope* for opaque objects, are the invention of Dr. Luberkhun; and have been executed by Mr. Cuff in England. Phil. Transf. N°. 458. p. 516, & 518.

Camera obscura MICROSCOPE. See *Solar* MICROSCOPE.

MICROSCOPE *for opaque objects*. The *Microscope* for opake objects remedies the inconvenience of having the dark side of an object next the eye: For by means of a concave speculum of silver, highly polished, in whose center a magnifying lens is placed, the object is so strongly illuminated, that it may be examined with ease. Phil. Transf. N°. 458. Sect. 9.

Solar MICROSCOPE. The *Solar Microscope* is composed of a tube, a looking-glass, a convex lens, and a *Microscope*. The tube is brass, near two inches in diameter, fixed in a circular collar of mahogany; which, turning round at pleasure, in a square frame, may be adjusted easily to a hole in the shutter of a window, in such a manner, that no light can pass into the room but through the aforesaid tube. Fastened to the frame by hinges, on the side that goes without the window, is a looking-glass, which, by means of a jointed brass wire coming through the frame, may be moved either vertically or horizontally, to throw the sun's rays through the brass tube into the darkened room. The end of the brass tube without the shutter has a convex lens, to collect the rays, and bring them to a focus; and on the end within the room, Wilson's pocket *Microscope* is screwed, with the object to be examined, applied to it in a slider. The sun's rays being directed by the looking-glass through the tube upon the object, the image or picture of the object is thrown distinctly and beautifully upon a screen of white paper; and may be magnified beyond the imagination of those who have not seen it. Phil. Transf. N°. 458. Sect. 9.

MICROSCOPIC *Objects*. All things too minute to be viewed distinctly by the naked eye, are proper objects for the *Microscope*. Mr. Hook has distinguished them to be exceeding small bodies, exceeding small pores, or exceeding small motions.

Exceeding small bodies must either be the parts of larger bodies, or things, the whole of which is exceedingly minute, such as small seeds, insects, sands, salts, &c.

Exceeding small pores are the interstices between the solid parts of bodies, as in stones, minerals, shells, &c. or the mouths of minute vessels in vegetables, or the pores in the skin, bones, and other parts of animals.

Exceeding small motions are the movements of the several parts or members of minute animals, or the motion of the fluids, contained either in animal or vegetable bodies. Under one or other of these three heads, almost every thing about us affords us matter of observation, and may conduce both to our amusement and instruction.

An examination of these objects, however, so as to discover truth, requires a great deal of attention, care, and patience, with some skill and dexterity, to be acquired chiefly by practice, in the preparing, managing, and applying them to the *Microscope*.

Whatever object offers itself as the subject of our examination, the size, contexture, and nature of it, are first to be considered, in order to apply it to such glasses, and in such a manner as may shew it best. The first step should always be to view the whole together, with such a magnifier as can take it in all at once, and after this the several parts of it may the more fitly be examined, whether remaining on the object or separated from it. The smaller the parts are which are to be examined, the more powerful should be the magnifiers employed; the transparency or opacity of the object must also be considered, and the glasses employed accordingly suited thereto, for a transparent object will bear a much greater magnifier than one which is opake, since the nearness that a glass must be placed at, unavoidably darkens an object if in its own nature opake, and renders it very difficult to be seen, unless by the help of the apparatus contrived for that purpose, which has a silver speculum. Most objects however become transparent by being divided into extremely thin parts. *Baker's* Microf. p. 52.

The nature of the object also, whether it be alive or dead, a solid, or a fluid, an animal, a vegetable, or a mineral substance, must likewise be considered, and all the circumstances of it attended to, that we may apply it in the most advantageous manner. If it be a living object, care must be taken not to squeeze or injure it, that we may see it in its natural state and full perfection. If it be a fluid, and that too thick, it must be diluted with water; and if too thin, we should let some of its watery parts evaporate. Some substances are fittest for observation when dry, others when moistened; some when fresh, and others after they have been kept some time.

Light is the next thing to be taken care of, for on this the truth of all our observations depends; and a very little observation will shew how very different objects appear in one degree of it to what they do in another; so that every new object should be viewed in all degrees of light, from the greatest glare of brightness to perfect obscurity, and that in all positions to each degree, till we hit upon the certain form and figure of it. In many objects it is very difficult to distinguish between a prominency and a depression, a black shadow and a black stain, and in colour between a bright reflection and whiteness. The eye of a fly in one kind of light appears like a lattice drilled full of holes, in the sun-shine like a solid substance covered with golden nails, in one position like a surface covered with pyramids, in another with cones, and in others with still different shapes.

The degree of light must always be suited to the object, if that be dark it must be seen in a full and strong light; but if transparent, the light should be proportionably weak; for which reason there is a contrivance both in the single and double *Microscope* to cut off abundance of the rays, when such transparent objects are to be examined by the largest magnifiers. The light of a candle for many objects, and especially for such as are very bright and transparent, and very minute, is preferable to day-light; for others a serene day-light is best; but sun shine is the worst light of all, for it is reflected from objects with so much glare, and exhibits such gaudy colours, that nothing can be determined from it with any certainty. This however, is not to be extended to the solar, or *camera obscura Microscope*; for in that nothing but sun-shine can do, and the brighter that is the better; but in that way we do not see the object itself on which the sunshine is cast, but only the image or shadow of it exhibited on a screen; and therefore no confusion can arise from the glaring reflection of the sun's rays from the object to the eye, which is the case in other *Microscopes*. But then in that solar way we must rest contented with viewing the true form and shape of an object, without expecting to find its natural colour; since no shadow can possibly wear the colour of the body it represents.

Most objects require also some management in order to bring them properly before the glasses. If they are flat and transparent and such as will not be injured by pressure, the best way is to enclose them in sliders between two Muscovy talcs or isinglasses. This way the feathers of butterflies, the scales of fishes, and the farinæ of flowers may be very conveniently preserved, as also the parts of insects, the whole bodies of minute ones, and a great number of other things. These are to be kept in sliders, each containing three, four, or more holes, and these must not be filled promiscuously; but all the things preserved in one slider should be such as require one and the same magnifying power to view them, that there may not be a necessity of changing the glasses for every object; and the sliders should be marked with the number of the magnifier it is proper to be viewed with. In placing the objects in the sliders, it is always proper to have a small magnifier, of about an inch focus, in your hand, to examine and adjust them by, before they are fixed down with the rings.

Small living objects, such as lice, fleas, bugs, mites, minute spiders, &c. may be placed between these talcs without injuring them, if care be taken to lay on the brass rings without pressing them down, and they will remain alive many weeks in this manner; but if they are too large to be treated thus, they should be either preserved between two concave glasses, or else viewed immediately, by holding them in the pliers, or sticking them on the point at the other end of that instrument.

If fluids come under examination, to discover the animalcules in them, a small drop is to be taken with a hair pencil, or on the nib of a clean pen, and placed on a plate of glass; and if they are too numerous to be thus seen distinctly, some water warmed by holding it in the mouth must be added to the drop, and they will then separate and be seen distinctly. This is particularly necessary in viewing the animalcules in the *semen masculinum* of all creatures; which, tho' extremely minute, are always so numerous, that without this caution their true form can seldom be seen. But if we are to see the salts in a fluid, the contrary method must be observed, and the

the plate of glafs muft be held gently over the fire, till part of the liquor is evaporated.

The diffection of minute animals, as lice, fleas, &c. requires patience and care; but it may be done very accurately by means of a needle and a fine lancet, placing the creature in a drop of water, for then the parts will readily unfold themfelves, and the ftomach, guts, &c. be very diftinctly feen.

Thefe feem the beft ways of preferving tranfparent objects; but the opake ones, fuch as feeds, woods, &c. require a very different treatment, and are beft preferved and viewed in the following manner.

Cut cards into fmall flips about half an inch long, and a tenth of an inch broad; wet thefe half-way of their length in gum-water, and with that faften on feveral parcels of the object, and as the fpots of cards are of different colours, fuch fhould be chofen for every object as are the moft different from its own colours. Thefe are very convenient for viewing by the *Microfcope* made for opake objects with the filvered fpeculum; but they are proper for any *Microfcope*, that can view opake bodies.

A fmall box fhould be contrived for thefe flips, with little fhallow holes for the reception of each; and this is conveniently done, by cutting pieces of pafte-board, fuch as the covers of books are made of, to the fize of the box, fo that they will juft go into it, and then cutting holes through them with a fmall chiffel, of the fhape of the flips of card, thefe pafte-boards having then a paper pafted over their bottom, are cells very proper for the reception of thefe flips, which may be taken out by means of a pair of plyers, and will be always ready for ufe.

Great caution is to be ufed in forming a judgment on what is feen by the *Microfcope*, if the objects are extended, or contracted, by force or drinefs.

Nothing can be determined about them, without making the proper allowances; and different lights and pofitions will often fhew the fame object as very different from itfelf. There is no advantage in any greater magnifier than fuch as is capable of fhewing the object in view diftinctly; and the lefs the glafs magnifies, the more pleafantly the object is always feen.

The colours of objects are very little to be depended on, as feen by the *Microfcope*; for their feveral component particles being by this means removed to great diftances from one another, may give reflexions very different from what they would, if feen by the naked eye.

The motions of living creatures alfo, or of the fluids contained in their bodies, are by no means to be haftily judged of, from what we fee by the *Microfcope*, without due confideration; for as the moving body, and the fpace wherein it moves, are magnified, the motion muft be fo too; and therefore that rapidity with which the blood feems to pafs through the veffels of fmall animals muft be judged of accordingly: Suppofe, for inftance, that a horfe and a moufe move their limbs exactly at the fame time, if the horfe runs a mile while the moufe runs fifty yards; tho' the number of fteps are the fame in both, the motion of the horfe muft notwithftanding be allowed the fwifteft; and the motion of a mite, as viewed by the naked eye, or through the *Microfcope*, is perhaps not lefs different. *Baker's* Microfcope, p. 62.

MICTUS *Cruentus*. See the article *Bloody* URINE.

MID-*Feather*, in the Englifh falt-works, the name given to a fort of partition placed in the middle of the furnace, over which the pan is fet for boiling the fea-water or brine into falt.

This partition divides the body of the furnace into two chambers. See the article SALT.

MID-*Ship Beam*. See the article BEAM, *Cycl.*

MIDA, in natural hiftory, the name of a worm or maggot, of which is produced the purple fly, found on bean-flowers, and thence called the bean-fly.

MIDAD *Albendi*, in the materia medica of the Arabians, a name given to the common indigo blue.

The exprefs meaning of the words is Indian ink; but this is an erroneous name, founded on Pliny's mifunderftanding the words of Diofcorides. The Greeks in general have called the common writing ink *Melan*; but they have alfo ufed this word *Melan* as an adjective, expreffive not only of black, but of deep blue. Thus Theophraftus has called both the violet flowers and the fine deep blue fapphires, *Melanes*. Pliny, finding him call the indigo when of a very fine and deep colour, *Melan Indicon*, thought it to be different from the common indigo, and thence fuppofed it a fort of Indian ink. Thus Indian ink has become a fort of name for this blue.

MIDDLING-*Teeth*, in the manege, are the four teeth of a horfe that come out at three years and a half, in the room of other four foal-teeth, feated between the nippers and the corner-teeth; from which fituation they derive the title of *Middling*. There's one of them above, and one below, on each fide of the jaws. See the article TEETH.

MIDYON, a word ufed by Theophraftus, as the name of a fpecies of oak. It is prefcribed by fome of the old phyficians, in their compofitions; but is ufually fuppofed to ftand there, by an error of the copies; the word meant being mify.

MIFRES, a name by which fome writers have called afphaltum. See the article ASPHALTA.

MIGRATING-*Bog*.—Thefe foft maffes of earth have been fometimes known to move out of their place. An inftance of this there was in Ireland, in the year 1697, about Charleville, in the county of Limerick. There was heard for fome time a noife under ground like that of thunder at a great diftance, or almoft fpent; and foon after this the earth of a large bog in the neighbourhood began to move, and a hill or rifing fituated in the middle of it ftood no longer above the level of the reft, but funk flat.

The *bog* not only moved itfelf, but moved with the neighbouring pafture-lands, tho' feparated by a large and deep ditch; the motion continued a confiderable time, and the furface of the moving earth rofe into a fort of waves, but without breaking up or burfting any where. The pafture-land rofe very high, and was carried on in the fame motion till it refted upon a neighbouring meadow, the whole furface of which it covered, remaining fixteen feet deep upon its furface. The whole quantity of the bog was torn from its former feat, and left great gaps in the earth where it had joined, which threw up foul water, and very ftinking vapours. Phil. Tranf. N° 233.

All the country came in to fee fo ftrange a fight as this, for it continued moving a long time; but few gueffed the true caufe of it, which was this: A more than ordinary wet fpring occafioned the rifing of the bog to a great height in one part, and thence propagated itfelf through the whole bog; fo that the hill in the midft was undermined, and naturally funk flat; this and the greater than ordinary weight of this large bog preffing upon the adjoining pafture-land, forced up its foundations, which were only a loofe fand. This was pufhed on fideways where there was a defcent from the bog, and at length having given the bog more room, all was quiet and remained in that ftate. The bog was more than forty acres of ground.

MIGRATING-*Birds*. See the article *Birds of* PASSAGE.

MIHA, in the materia medica, a name ufed by fome authors for ftyrax. *Ger.* Emac. Ind. 2.

MILAX, a name by which *fmilax* is often meant by the Greek writers. The adding or taking away the letter *s* from words beginning with an *m*, was a thing common and indifferent among them. This name is however one of the fynonimous terms of the Greeks, fometimes being ufed as the name of the yew-tree, and fometimes as that of the creeping plant we call *fmilax* at this time. Diofcorides, and Galen, and moft of the later Greek authors, call the tree *Milax*, and the herb fmilax, as if there were a difference between the two names; but this is not regularly kept up by any of them, and in the antients is not regarded at all; there being no more difference between the words *Smilax* and *Milax*, than between fmaragdus and maragdus, as that word, the name of the emerald, is at times varioufly written.

MILDEW (*Cycl.*)—Some have fuppofed the blight and *Mildew* to be both the fame thing, but very erroneoufly. The *Mildew*, properly fo called, fometimes refts upon the leaves of trees in form of a fatty juice, and fometimes on the ears of corn; it is tough and vifcous to the touch, and the fun's heat drying it up, it becomes yet more vifcous and hard, and fo daubs over the young grains in the ear, that they can never after expand themfelves properly, nor grow to their due fize or weight. Bearded wheat is lefs fubject to the *Mildew*, than the common fort; and it is obferved, that newly dung'd lands are more fubject to the *Mildew*, than others. The moft happy remedy for this is out of the farmer's power, but often happens naturally; this is a fmart fhower of rain, and immediately afterwards a brifk wind. This wholly difperfes it. If the *Mildew* is feen before the fun has any power, it has been recommended by many, to fend two men into the field with a long cord, each holding one end, and drawing this along through the ears, the dew will be diflodged from them before the fun's heat is able to dry it to that vifcous ftate in which it does the mifchief. Some alfo fay, that lands which have for many years been fubject to *Mildews*, have been cured of it by fowing foot with the corn, or immediately after it. See the article BLIGHT.

MILE (*Cycl.*)—In Scotland the *Mile* is equal to 1184 paces, every pace being five feet; fo that the Scotch *Mile* contains 5920 feet. Tr. Pract. Geom. p. 4. See the article MEASURE.

MILIARIUM, the name of a tall and narrow veffel, ufed in the bathing of the antients, for heating water to any degree, to give warmth to the reft. See Mem. Acad. Infcript. Vol. I. p. 127.

MILIARY *Fever*. See the article PURPUREA *Febris*.

MILIOLUM, a word ufed by fome medical writers, to exprefs a fmall tumor in the eye-lid, of the fize and fhape of a feed of the common millet.

MILITARY *Rewards*. See the article REWARDS.

MILIUM, *Millet*, in the Linnæan fyftem of botany, makes a diftinct genus of plants; the diftinguifhing characters of which are, that the calyx is a glume containing feveral flowers, and compofed of three valves, which are of an oval figure and pointed;

pointed; the two inner ones are placed opposite to one another; the third is situated behind one of these. The flower is smaller than the cup, and is made up of two valves which are of an oval figure, and one of them much smaller than the other. The stamina are three very short capillary filaments, the antheræ are oblong, the germen of the pistil is roundish, the styles are two in number and are very slender, the stigmata are like pencils. The flower incloses the seed, and does not open to let it fall out. The seed is single, and of a roundish figure. *Linnæi* Gen. Plant. p. 17. See Tab. 1. of Botany, Class 15.

Millet is reckoned by Pliny the most fertile of all grain; one grain of it producing three Roman sextaries. *Hoffm.* Lex. in voc. See the article SEXTARIUS, *Cycl.*

MILIUM *Arundinaceum*, in botany, a name by which some authors call the lacrymæ Jobi, or Job's tears. *Herm.* Cat. p. 426.

MILIUM *Indicum*, in botany, a name by which some authors call the maize, or Indian wheat. *Park.* Theatr. 1138.

MILK (*Cycl.*)— *Milk* is evidently one of the best nourishments of the body; and it is not wonderful that it should prove so, when we consider that in all cases of nourishment the proximate matter taken to nourish ought to be as like as may be to the body to be nourished by it. We subsist by the same things by which we are generated, and even while in the state of a fœtus in the womb, we are nourished not by blood, as some suppose, but by a lacteous juice, which is separated from the blood in the uterus by means of the placenta, as it is in the breasts of women who give suck, by glandules and tubuli destined for that purpose. Meats which we daily feed upon pass down into the stomach indeed in their own form, but they do not nourish us till they are changed into chyle, or a milky liquor.

Milk being analysed is found to be composed of fatty, serous, and terrestrial parts; and these its constituent principles being easily mixed and separated again, are made of it matter for the nourishment of the different parts of the body. The serous part, which is also nitrous, being a proper vehicle to convey through the vessels the fatty parts, which are as well adapted to all the offices of nutrition as any substance can be. It is easy to infer from this account of *Milk*, that it is not only a proper food for children, but for grown people also; but proper regulations are to be observed as to its use in particular cases; no aliment any more than this being capable of suiting all constitutions and circumstances. Meat in the stomach is converted into chyle, or a substance like *Milk*; this chyle passes into the heart through the blood-vessels, and its finest and most spirituous parts are there transmuted into the red part of the blood; and after this the other grosser parts of it are by different elaborations transformed into bile, and the several other humours in the body. It is evident that these humours, as well as the blood itself, must all have a supply; and that meat cannot give this supply, till it is converted into chyle or *Milk*; how much labour then is sav'd the animal functions by giving at once into the stomach chyle ready form'd, that is *Milk*; and in cases where the action or juices of that organ are so debilitated as not to be of power to convert the meat into chyle, what remains but that the person must die slowly, by a want of the supplies of the several fluids of the body, if something be not given that is capable of passing into the blood with less preparation than meats are; and what is so proper on such an occasion as *Milk*, which is already so nearly allied to the nature of the fluid that should have been there separated from meat, that it will readily supply all its offices.

MILK-*Diet* is useful in the gout and stone. See the article STONE.

Dr. Cheyne recommends *Milk* and seed-diet with water for drink, as the surest preservative against diseases, and cure of them. See the articles CANCER, PALSY, FITS, GOUT and STONE.

Upon opening a vein, especially after meals, *Milk* is sometimes found instead of blood. See Phil. Transf. N°. 6. pag. 100.

The salt of *Milk* may be prepared by boiling whey to one half, then filtrating it; the coction and filtration is to be continued, till the liquor becomes of the consistence of a syrup. This being put into a cellar to chrystallize, the salt will be formed into a cake of a saccharine taste, resembling manna. This preparation is Dr. Gaubius's, and is somewhat different from that which Valentini, in his *Medicina Nov. Antiq.* alledges to be the famous saccharum lactis, so much cried up by Lodovicus Festi, and recommended by others as an infallible cure for the gout. Med. Eff. Edinb.

MILK *of Sulphur*. See the article SULPHUR *Precipitatum*.

MILK, in the wine trade. The coopers know very well the use of skim'd *Milk*, which makes an innocent and efficacious forcing for the fining down of all white wines, arracks, and small spirits; but is by no means to be used to red wines, because it discharges their colour. Thus, if a few quarts of well-skim'd *Milk* be put to a hogshead of red wine, it will soon precipitate the greater part of the colour, and leave the whole nearly white; and this is of known use in the turning red wines when prick'd into white; in which a small degree of acidity is not so much perceived. *Shaw's* Lect. p. 209.

Milk is, from this quality, of discharging colour from wines, of use also to the wine-coopers, for the whitening of wines that have acquired a brown colour from the cask, or from having been hastily boiled before fermenting; for the addition of a little skim'd *Milk* in these cases, precipitates the brown colour, and leaves the wines almost limpid, or of what they call a water whitenefs, which is much coveted abroad in wines, as well as in brandies.

Womens MILK.— The *Milk* is often a very troublesome and dangerous thing to women in their lyings-in, and subjects them to many painful disorders. About the third or fourth day after delivery they are usually affected with chilnesses and shiverings, which are well known to be owing to that cause, and are therefore not to be treated as a disease, nor any medicines to be given in them; only it is proper to keep the person warm, and promote perspiration, especially in the breasts. Sometimes indeed this symptom is joined with a febrile heat, or a real inflammatory fever, which is then to be taken off by the proper means. See the article *Inflammatory* FEVER.

Very frequently there come on inflammations of the breasts, of the erysipelous kind; these are usually taken off by the external use of spirit of wine and camphor with a little saffron in it, and by carefully keeping the parts warm.

The *Milk* often proves very difficult to be drawn out; this is to be helped by the keeping the body carefully open by carminative and emollient clysters, by keeping up a gentle diaphoresis, and by attemperating medicines mixed with the milder alexipharmics. The breasts are all the time to be kept carefully covered with flannel, and gently pressed and rubbed at times; and finally they are to be drawn by means of a pipe, or by the mouth of an experienced person.

Deficiency of MILK, is also a very common complaint, and it is in some cases absolute, there being no *Milk* at all derived into the breasts; in others, it is only a partial one, there being some *Milk*, though not enough to supply the child with nourishment. A total deficiency of *Milk* most frequently happens to persons who have their first child when somewhat advanced in years, and to such as are of a choleric disposition; but a partial deficiency of it is often owing to a saltness of the serum, and sometimes to the want of nourishments, and often is brought on by sorrow.

When saline and bilious humours are in fault, then lac lunæ, calcin'd crystal, and other absorbent powders, become of great use: Some also prescribe the powder of earth-worms carefully dried, and the voiding the humours by stool, by means of gentle purges: When a want of nourishment is the only occasion of it, the *Milk* may always be recovered in a proper quantity by means of good foods, with *Milk* and other nourishing fluids.

An over-abundance of MILK is as common a complaint, as a deficiency of it, and requires as much care in the treatment, otherwise the person is frequently subject to nodes and abscesses in the breast. The proper remedies are the eating and drinking more sparingly, and the letting two children suck instead of one.

Many people do not suckle their children, and therefore find it necessary to drive away their *Milk* absolutely. This is best done by taking internally the digestive salts, with diaphoretic and diuretic medicines. Externally, it is proper to apply to the breasts bags of the dried leaves of parsley, mint, chervile, &c. with the seeds of coriander and parsley, and a little camphor; and spirit of wine with camphor, and a little saffron is to be rubbed in, or linnen rags wetted in it and applied. Cerates may also be made of white wax melted in oil of almonds, with a little camphor, and applied to the breasts fresh every morning and evening, or oftner if necessary.

A too great thinness of the MILK, is another common complaint with nurses; this is to be laid sometimes to the diet, sometimes to the concoction, and sometimes to the unnatural tenuity of the humors; in this case the *Milk* is often perfectly watery, and the child is thrown into an atrophy by it. The remedies for this are, a change of diet, and a purging of the primæ viæ by some gentle cathartic, and afterwards a strengthening of them by bitters, and stomachic medicines. Sometimes also, it is necessary to evacuate the serous humours by the common phlegmagogues, such as jalap in proper doses mixed with a little powder'd ginger, which is an excellent corrective for it.

The *Milk* is sometimes salt to the taste, and sometimes of a bilious yellow colour; and these distemperatures of it usually throw the child into colics, diarrhœa's, vomitings, cutaneous eruptions, with scabs, and sometimes absolute ulcerations, and sometimes into fevers. In this case, the nurse or parent is to take the absorbents and nitrous medicines, with intermediate purges; thus, powders of crabs-eyes, oyster-shells, and purified nitre, with small doses of rhubarb between whiles, often perfect a cure; but during the course of taking these remedies, and for some time afterwards, the diet must be under some regulations, particularly salt foods are to be avoided; and all acids, aromatics, and strong liquors, either wholly let alone, or taken very sparingly. The person must also carefully avoid all violent passions of the mind, as anger, fear,

fear, and the like; and from all violent emotions of the body.

A contrary extreme to the thinness and watery appearance of the *Milk* before described, is, *a mucous thickness of it.* This is principally troublesome and dangerous to the parent, as it is apt to bring on tumors and nodes in the breast. The method of treatment in this case, is to give gentle alexipharmics for some days, then the gentle laxative medicines in small doses, and finally to allow a moderate use of wine.

Stagnations of the MILK. These are very frequent in lyings-in, and are to be discussed by the same method as was before ordered for the sending it back, in cases where persons do not choose to give suck; and, to the things there directed, may be added, the internal use of sperma-ceti and of calcin'd mountain crystals, in powder; and externally, cataplasms of sperma-ceti with some volatile urinous salt, and the gentle compression of the breasts by wearing strait cloths about that part.

Nodes of the Breasts often arise from the abundance and the mucous nature of the *Milk.* They are to be discussed by plasters of sperma-ceti, with annise, parsley, and coriander seeds; and by gently rubbing with a soft flesh-brush, as also by wearing some animal's skin that has a thick fur on it, which at once serves the double office of warmth and a gentle friction.

Abscesses of the Breasts very often happen also from the same causes; and these when there appears no hopes of discussing them are always to be brought to suppuration as quick as possible. A maturating plaster is to be laid on the parts that are to be broke, and the other parts are to be rubbed with spirit of wine and camphor, and saffron infused in it. When the matter in the abscess is ripe, if the skin do not burst of itself it is to be immediately opened with a lancet; after this a plaster of equal parts of diachylon simplex and that with the gums, with a little comphor mixed in it is to be applied; and afterwards digestives are to be wholly avoided, and no dressings but balsamics allowed. The liquor of myrrh, or a mixture of essence of myrrh and amber and spirit of turpentine, make an admirable dressing; and internally, gentle purges are to be given, and the milder dieuretics, with the nitrous and saline medicines.

Cracks and fissures of the Nipples, is another terribly troublesome complaint with those who give suck. The best applications to these, are the oil of eggs with the liquamen of the buds of the poplar, oil of wax, linseed oil shook together with the whites and yelks of eggs, a liniment made of marygold-flowers and fresh butter, an ointment of liquorice, and the liquor produced from the flowers of mullein and marrygolds, heated together in an oven. The sucking out the *Milk,* by means of a glass pipe, is very necessary during the continuance of this complaint; but the best method of preventing it, is the applying white wax to the nipples for some time before, as well as after the time of the labour.

The Smallness of the Nipples is a trouble to many nurses; these when the complaint is only owing to their lying-in, the breasts are to be forced out by the sucking of a robust child of six or more months old, by the application of the common glass-pipe first made warm, and by the sucking of a grown person experienced in such cases: All natural accidents of this kind may be cured by this means; but often the nipples have been so forced in by stays, at the very time of their growth in young girls, and this force continued so long, that no art is able to recal them to their natural state, or make them fit for an infant to suck from.

The mischiefs that sometimes attend persons who have given suck, in the weaning of children, or on the death of a child, and the *Milk* being left undrawn out, are to be avoided, by letting some other child suck a little at a time, and that less and less every day, and by drawing afterwards a little every day with a pipe.

It is very common among nurses to be extremely scrupulous about diet, and to require the nicest foods for the creating good *Milk*; but it is evident, that though some care is necessary to this purpose, yet it is not this; for the poorer people, who live on the coarsest food, often have the richest *Milk.* The whole necessary caution seems to consist in avoiding excess, and feeding as much as possible on simple foods, without too many vegetables, and not to lead too sedentary a life.

Things hard of digestion are to be abstained from, as also acids; too salt meats, and all flatulent things, and the acrid and aromatic things, are to be very carefully meddled with; since, tho' they do not affect the mother, they seldom fail to bring distempers upon the child. There is no better drink for those who give suck than malt liquors, when they are well settled and clear. Stronger things, even wine in those who are habituated to it, tho' it do not hurt them, is to be refrained from, since it subjects the child to convulsions and many other disorders.

Over large draughts of cold liquors, and the exposing the breasts too much to the cold, are often the causes of very great disorders both in the mother and the child. Gentle exercise, and motion of the body in general, is highly serviceable to nurses, as is also that of the breasts in particular. The gently shaking and pressing them throwing off the aqueous part of the *Milk,* and filling the lactiferous ducts more freely and copiously, than would otherwise be done. The improper methods of dress in some places, and squeezing the girls into slenderness by strait stays, often occasions the lactiferous ducts to be so contracted, and the nipples so repressed, that no art can afterwards bring the person to be properly qualified for suckling a child. *Junker's* Consp. Med. p. 732, seq.

Violent passions of the mind are extremely injurious to those who give suck. It is very common to see nodes and abscesses of the breasts brought on by these alone, and erysipelatous inflammations are as frequent in persons of other habits, from the same causes. The child also is often thrown into diarrhœa's, by it; and in general, it is a very necessary rule to squeeze and shake the breasts to discharge the *Milk* after a great fright, or a violent fit of passion, before the child is suffered to suck. If the menses appear at the time of giving suck, the child is usually greatly injured by the alteration the *Milk* suffers.

When women are newly lain in, if the breasts become turgid, and there is danger of the *Milk's* coagulating in them, the child if it be strong should be immediately put to suck; but if otherwise, the breasts are to be gently shaken and pressed to discharge the redundance, or another child, or grown person, put to suck them.

Extract of MILK, a sweet dry extract of cows milk made by evaporation.

Fred. Hoffman recommends this extract boiled with pure water to the quantity of what is exhaled of the *Milk,* as an excellent drink in many disorders, where *Milk* itself is not proper. See his Dissert. *de saluberrima seri lact. virtut.* oper. Tom. VI. p. 13.

Milk is often thought improper with purgatives, and it certainly does render some persons costive; but this does not hold generally, nor perhaps for a long time, even in those whom it may so affect at first. Hoffman recommends an ounce of manna dissolved in a pint of *Milk* as a good laxative.

Moon's MILK. See the article LAC *Lunæ.*

MILK-WORT. See the article LACTARIA.

MILK-*wort,* in botany. See the article GLAUX.

MILL (*Cycl.*)—MILL-*Dams.* A very firm way of making these in a quick or running sand, which is usually found a very troublesome circumstance in the making them, is by laying the foundation with unslacked lime; which, by slacking among the sand, runs together into a hard stone, which gives a very firm and sure foundation. *Plot's* Staffordshire, p. 336.

MILL-*Stones.* The *Mill-stones* which we find preserved from antient times, are all small and very different from those in use at present. Thoresby mentions two or three such found in England, among other Roman antiquities, which were but twenty inches broad; and there is great reason to believe that the Romans, as well as the Egyptians of old, and the antient Jews, did not employ horses, or wind, or water, as we do, to turn their *Mills,* but made their slaves and captives of war do this laborious work; they were in this service placed behind these *Mill-stones,* and pushed them on with all their force. Sampson, when a prisoner to the Philistines, was treated no better, but was condemned to the *Mill-stone* in his prison. The runner or loose *Mill-stone* in this sort of grinding, was usually very heavy for its size, being as thick as broad. This is the *Mill-stone* which it is expresly prohibited in Scripture to take in pledge, as lying loose it was more easily removed. The Talmudists have a story, that the Chaldæans made the young men of the captivity carry *Mill-stones* with them to Babylon, where there seems to have been a scarcity at that time; and hence, probably, their paraphrase renders the text "have borne the *Mills,* or *Mill-stones*;" which might thus be true, in a literal sense. They have also a proverbial expression of a man with a *Mill-stone* about his neck; which they use to express, a man under the severest weight of affliction. This also plainly refers to these small sort of stones.

MILLAINS, according to Mr. Wingate, are the third subdivision of the primes in Gunter's line; and express the thousandth parts of such primes.

MILLEFOLIUM, *Yarrow,* in botany, the name of a genus of plants, the characters of which are these: The flower is of the radiated kind; its disk is composed of flosculès, and its outer edge of semi-flosculès, which all stand up on the embryo-seeds, and are contained in one general squammose cup, of a sort of cylindric figure. The embryo's finally ripen into slender seeds; to this it is to be added, that the leaves are always finely divided, and the flowers are collected into tufts.

The species of *Yarrow,* enumerated by Mr. Tournefort, are these: 1. The great white-flowered *Yarrow,* called Achillæa. 2. The common white-flowered *Yarrow.* 3. The great purple-flowered *Yarrow.* 4. The common *Yarrow,* with purple flowers. 5. The noble *Yarrow,* or scented *Yarrow.* 6. The Montpelier sweet *Yarrow.* 7. The hoary alpine *Yarrow,* with flesh-coloured flowers. 8. The hoary alpine *Yarrow,* with beautiful flowers. 9. The woolly yellow *Yarrow.* *Tourn.* Inst. p. 495.

The

The common *Yarrow* which is in flower on our ditch-banks, and in dry paſtures the greateſt part of the ſummer, is a much nobler medicine than is ſuppoſed. The medical writers have ſaid much of it as a vulnerary, and recommended its external uſe in tumors and ulcers; and internally, as a remedy for hæmorrhages of all kinds; in which caſes experience ſhews us, that a ſtrong decoction of the whole plant, roots and leaves, does wonders. The flowers of this plant have the ſingular property of yielding a fine deep blue oil, by diſtillation. The flowers of Chamæmile do the ſame; but we do not know any other plant, except theſe two, that do it.

MILLEMORBIA, in botany, a name given by ſome authors to the ſcrophularia, or figwort, from its ſuppoſed virtues in many diſeaſes. *Ger.* Emac. Ind. 2.

MILLEPEDA, in conchyliology, the name given by authors to a ſpecies of murex of the ſpider ſhell-kind, ſo called from the great number of prominences in the ſhape of points called feet in this ſeries of ſhells, which ariſe from its lip which is greatly extended. The body of the ſhell is full of bumps and tubercles, and the tail is long and crooked. See the article MUREX.

MILLEPEDES (*Cycl.*)—Well-known inſects, uſed on many occaſions in medicine. This inſect is otherwiſe called *Aſellus*, or *Oniſcus*, in Engliſh the *Wood-louſe*. Mr. Ray deſcribes ſeven different ſpecies of this inſect, ſome of which we ſee every day, others are more rare. Theſe are, 1. The common *Millepes*, called the *Aſellus Aſininus*; this is thinner and flatter than the blue kind, and carries antennæ ſtrait forward, and its colour is a pale browniſh grey; the laſt ring of its body is acute, not annular, and the appendages of the ſides are forked, as is alſo the tail. This kind is common in old walls, and under the barks of old trees. 2. The greater blue or livid *Millepes*; this is conſiderably larger than the former, and is of a duſky bluiſh black colour; the laſt ring of its body is annular, not pointed, its tail is not forked; its body, like that of the former, is divided into fourteen rings, and it eaſily rolls itſelf up into a round ball. 3. The great ſea *Aſellus*; this is three times as large as the common kind, its body is divided into twelve rings, its eyes are large and round, the antennæ are long, and are compoſed only of three points, the tail is double, and has four horns; its colour is ſomewhat paler than the common kind. 4. The mountain *Aſellus*; this is of the ſize of the livid kind, and in the ſame manner rolls itſelf up when touched; its body is divided into eleven rings, and its colour is a mixture of black and red. 5. The great Cornwall *Aſellus*; this is about an inch in length, its antennæ are very long, it has fourteen feet, and is of a reddiſh brown colour; it is diſtinguiſhed from all the other kinds by the ſhape of its tail, which is a flat lamina, divided into three points at the end; the eyes are ſmall and black, and the body is compoſed only of ſeven rings beſide the head and tail; the feet have all a ſort of hooks at their end, and the hinder legs are longer than any of the others. 6. The *Aſellus aquaticus*, or water *Millepes*; this is ſomewhat ſmaller and ſlenderer than the common kind, its antennæ are very ſlender, and its colour is a pale browniſh grey, with a dark ſtreak running down the back; its body conſiſts of ſeven joints, each of which has a pair of legs; its hinder pair of legs are longer than the others, and it has another peculiar mark, which is, there are two very ſlender horns iſſuing from the tail, and making a kind of fork. The 7th kind is the ſhort ſea *Millepes*; this is broader as well as ſhorter than the common kind, and has two appendages on each ſide the tail, which it uſes in ſwimming; this is of the ſame colour with the common kind, but has a black liſt running down the back; the eyes are ſmall, the body conſiſts of ten joints, beſides the broad tail; it rolls itſelf up in the manner of the blue *Wood-louſe*, and has under each ring of the body, beſide a pair of legs, two fins that ſerve it in ſwimming. *Ray's* Hiſt. Inſ. p. 41.

The firſt and ſecond kinds are uſed in common in medicine; but the ſecond or blue kind, which rolls itſelf up into a ball, is the proper medicinal kind.

Beſide theſe proper *Aſelli*, there are ſome other ſpecies commonly called *Pulices marini*, which ſeem greatly to approach to their nature. Theſe are, 1. The horned ſea *pulex*; its body is compoſed of twelve joints, it has ſeven pair of legs, and the hinder ones are longer than the others, the antennæ are a pair of very large horns, and at the baſe of theſe there ſtand two other very ſhort and ſlender ones: It has fins to ſwim with, and it is of a whitiſh colour, and very ſlender body. 2. The *pulex marinus* of Bellonius; this is of the ſhape of the common *aſelli*, but ſomewhat ſlenderer and rounder bodied, and its legs are much longer; its back is brown, its eyes are large and black, and the antennæ are articulated and have two ſmall ones growing from their roots; its body is pellucid, and it moves very ſwiftly in the water; the tail is compoſed of a large bundle of hairs. This is found in great plenty under ſtones by the ſides of rivers near the ſea. 3. The freſh-water *pulex*; this differs very little from the laſt ſpecies, but is ſingular in the places it inhabits, which are the banks and mud of hot ſprings, in which no other animal can live. *Ray's* Hiſt. Inſect. p. 44.

MILLEPORA, in botany, a name by which Linnæus diſtinguiſhes that genus of ſea-plants, of a hard ſtructure and full of holes, which are not ſtellate or radiated, in which it differs from the madrepora.

MILLERS-*Thumb*, in ichthyology, an Engliſh name for the fiſh called alſo the bull-head, and by authors the cottus. See the article BULL-HEAD.

Some are ſo erroneous as to ſuppoſe this fiſh, and the loach to be the ſame. See the articles LOACH, and COBITIS.

MILLIARIA *Cohors*, in antiquity. See the article COHORS *Equitata*.

MILLMOTH, in natural hiſtory, the name of an inſect approaching to the nature of the beetle, but having no ſheath wings. It is common in the abodes of millers and bakers, and other perſons who deal in meal.

MILPHOSIS, a word uſed by the antient medical writers, as a name of the diſeaſe of the eye-lids, by which the hairs fall off from them, and the edges become red and tumid.

MILTOS, in the natural hiſtory of the antients, the name of what we call reddle, a red earth of the ochreous kind, uſed in painting. The Greeks uſed the word in a leſs determinate ſenſe, and called all the red earths by this name, with adjectives derived from the names of the places where they were found, &c. to denote their differences.

Many however have thought too boldly, that the cinnabar found native, and called by the Greeks *minium*, was alſo comprehended under this name; but for this there is no warrant, and the paſſage in Pliny which gave birth to the opinion, is merely an error in the copies from the falſe pointing; and all that Pliny ſeems really to have meant, was, that the Greeks called reddle by the name of *Miltos*, and minium by that of cinnabar. Reddle ſeems to have been of very antient uſe in painting; for we have plain teſtimony in Homer, that it was uſed by the Greeks in the time of the Trojan war, that poet calling their ſhips by an epithet which ſignifies their being painted with reddle; and the accounts of the earlieſt painters, which tell us that they uſed only four colours, make reddle to be one of theſe four. *Hill's* Theophraſt. p. 124. See the articles REDDLE and RUBRICA.

MILVAGO, in ichthyology, a name given by Geſner and ſome others, to a fiſh called by authors in general *milvus* and *cuculus*, and by ſome *lucerna*, and the flying fiſh. It is a ſpecies of the trigla, and is called by Artedi the trigla, with a ſnout bifid at the extremity, and the ſide-lines forked near the tail. See the article TRIGLA.

MILUS, μιλος, a name given by the Greek writers to a plant uſed in garlands, and ſometimes to a tree. Theophraſtus evidently uſes it as the name of a tree, and Crato as that of a garland herb.

It ſhould ſeem by compariſon of what they ſay of this *Milus*, that it is no other than a corruption of the word *milax*, or *ſmilax*. This we know was uſed as the name of the yew-tree, and alſo as the name of that climbing plant which we at this time call ſmilax; and what ſtrengthens the opinion is, that this creeping ſmilax was one of the common herbs uſed in garlands, having got into eſteem on theſe occaſions by the length and toughneſs of its branches, which were eaſily twiſted into any form, and wound round about whatever they pleaſed.

Pliny tells us, that it was a melancholy herb, and not fit for garlands; becauſe it had been once a virgin, and was turned into this form in conſequence of an unhappy love for the inconſtant youth crocus; but if this were to have been an objection to the uſe of theſe plants among the antients, thoſe garlands muſt have been either very thin, or made of paltry weeds; for the fancy of their poets had ſcarce let any flower or herb worthy obſervation paſs without ſome ſuch hiſtory.

There ſeems to have been no plant uſed ſo frequently in the rites of Bacchus as the *ſmilax*, or this climbing herb; and this is by the earlieſt writers ſometimes called *Milax*, or *Milos*, and ſometimes *Smilax*; ſo that it ſhould ſeem that they were only the ſame word differently ſpelt.

Euripides frequently mentions it in his Bacchi, and ſometimes celebrates it in flower, ſometimes in fruit, calling it καλλικαρπος, and ανθεσφορος, the elegant fruited and the flowery ſmilax; and this laſt ſenſe of it Pliny has taken, calling it *anthophorus*, the flowery ſmilax. Athenæus, in his fifth book, mentions the bacchides as carrying ſpears covered with vines, ivy, and ſmilax, or *Milos*. In this ſenſe of ornamenting garlands, ſpears, &c. they meant only the herb ſmilax, not the yew-tree.

MILVUS, the *flying fiſh*, the name of a fiſh remarkable for the length and ſize of its gill-fins, which it ſometimes makes uſe of to fly with: It is of the cuculus or gurnard kind, and is called by ſome the rondine, and by others the falcone. See Tab. of fiſhes, N°. 41.

Its general ſize is about ſix inches in length; its head is broad and flatted, and its body long and rounded, and very ſlender toward the tail. The ſpace of the forehead between the eyes is large and hollow, and the whole head is covered with a ſtrong bony cruſt; this is rough and of ſeveral colours, as blue, yellow, and purple: This cruſt covers alſo ſome part of the back, and terminates in two very long and ſtrong ſpines, which lie down upon the back: It is covered with very hard ſcales, every one of which riſes into a ſharp tubercle in the middle. The back is of the ſame colours with the head, but ſomewhat

fomewhat dufkier. Its eyes are large, and the coverings of the gills terminate on each fide in a very long and fharp thorn, which is ferrated on the outfide. The mouth is fmall, and is placed low in the head; and its jaws are granulated, rather than toothed. Its belly is white, and its tail forked. Its gill-fins, commonly called its wings, are fo long as when laid clofe to the body to reach to the tail, and they are as it were double, a fmall fin compofed of a feries of fhort nerves or rays connected by a fmall membrane ftanding before each. Thefe wings are of an olive colour on their upper fide, and are fpotted with very beautiful blue fpots near their edges. *Willughby*'s Hift. Pifc. p. 284.

This fifh, when it pleafes, is able to rife out of the water and fly to a confiderable diftance in the air; but when its wings are dry, is obliged to plunge again into the water to moiften them. It does this often, when purfued by an enemy; and whole fhoals have been feen thus flying together. It is common in the Mediterranean, and fome other feas; but is not known in ours, nor in any of the colder climates.

MILVUS, in ornithology, the name of the common kite: A bird diftinguifhed from all other birds of prey, by its forked tail. It remains with us the whole year; but in many other countries is a bird of paffage. *Ray*'s Ornithol. p. 41.

MILVUS *Æruginofus*, in zoology, the name of the moor-buzzard; a bird of the long-wing'd hawk kind, fmaller than the common buzzard, and not fo flat on the head. Its beak is large and crooked, covered with a greenifh yellow fkin near the top, and black in other places. Its mouth is bluifh within. Its head is of a whitifh orange colour, variegated with black ftreaks; its throat is of the fame colour; and all the reft of its body, as well back as belly, is of a dufky ruft colour, only that in each wing there is a yellowifh white fpot; and the feathers at the root of the tail are yellowifh. Its legs are long and flender, and of a yellowifh colour. The infide of its wing-feathers are whitifh. It is common with us about heaths and marfhes. *Ray*'s Ornithol. p. 42.

MIMOSA, the *fenfitive plant*, in botany, the name of a genus of plants, the characters of which are thefe: The flowers are ufually collected into tufts or heads, and each confift of one leaf of a fennel-like fhape, containing a great number of ftamina: The piftil arifes from the bottom of the flower, and finally becomes either a fimple bivalve pod containing a number of oblong feeds, or elfe a compound one made up of feveral parts joined to one another by a fort of tranfverfe articulation, each containing one roundifh feed. To this it is to be added, that the leaves of all this genus of plants, when touched, become capable of a fort of reciprocal motion. *Tourn.* Hift. p. 605.

The fpecies of *Mimofa*, enumerated by Mr. Tournefort, are thefe: 1. The common *fenfitive fhrub*. 2. The prickly and more *fenfitive Mimofa*. 3. The broad-leav'd *fenfitive plant*, with pods collected in round clufters. 4. The Jamaica *fenfitive plant*. 5. The prickly Pernambuco *Mimofa*. See the article SENSITIVE *Plant*.

MINA, or MNA, among the antient Greeks, a piece of money worth an hundred drachmas.

The *Mina* was fomewhat more than three pounds Sterling; fixty *Minæ* made the Attic talent. *Danet.* in voc. See the article COIN, *Cycl.*

MINCA, a name given by the antients to a very coarfe and bad kind of myrrh.

MINCHA, in the Jewifh cuftoms, offerings of meal, cakes, or bifcuits, made in the temple of the Lord [a]. The Seventy have fometimes preferved this word in their tranflation [b]; but inftead of *Mincha* they read *Manaa*, which doubtlefs was the received pronunciation in their time. We find *Manaa* in the fame fenfe, in Baruch i. 10 [c].—[[a] Levit. ii. 3, &c. [b] See the Greek of Jerem. xvii. 26. Dan. ii. 46. 2 Kings viii. 5, 9. xvii. 7. xx. 12. 2 Chron. vii. 7. Nehem. xiii. 5, 9, &c. [c] *Calmet*. Dict. Bibl.]

MINE (*Cycl.*)—The difcovery of *Mines* is not always attended with a certainty of advantage. The firft thing to be confidered in regard to it, is whether it can be dug to profit; and to be able to determine in this refpect, we are duly to weigh the nature and fituation of the place, and compare the refult of the whole with the profit from the richnefs of the ore, and the charges of digging, fmelting, and working it.

A *Mine* is either found in a mountain, a hill, a valley, or a flat; of thefe, mountains and hills are dug with greateft eafe and conveniency, chiefly becaufe the drains and burrows, that is, the adits and avenues may be here readily cut both to drain off the water, and to form gangways for bringing out the ore. In whatever place the *Mine* lies we are to look for the veins, which rains or other accidents may have difcovered; and where fuch a vein is found, if it be tolerably large and rich, it is beft to open the *Mine* there. Otherwife the moft commodious place for fituation is to be chofen, that is, neither on a flat, nor on the tops of mountains, but in their fides. *Shaw*'s Lectures, p. 244.

The beft fituation for a *Mine*, is a mountainous, woody, wholefome fpot, of a fafe eafy afcent, and bordering upon a navigable river. For wood is indifpenfably neceffary for making the engines and inftruments, building the huts, fencing in the works, and working the ores. But tho' wood fhould be wanting, if a navigable river be nigh, that may be fupplied, as water-carriage is cheap. Water however muft never be wanting. This is beft fupplied by a large river, and is neceffary on a thoufand occafions, to wafh the ores, turn the works, &c. Good convenience of carriage muft alfo be regarded, both for the carrying the ore or metal to market, and the bringing neceffaries to the workmen: For provifions are feldom to be found where there are *Mines*. See the articles DIGGING, MINING, and TRACING.

MINE-*Dial*, is a box and needle with a brafs-ring divided into 360 degrees, with feveral dials graduated thereon; generally thus made for the ufe of *Miners*.

MINERAL (*Cycl.*)—*Englifh*-MINERALS. Dr. Woodward has obferv'd, that the Englifh *Minerals* are much more valuable and numerous, than has been generally fuppofed. Fullers-earth, a thing fo cheap as to be difregarded by many, he obferves, is of almoft as much value to our commerce, as any article of foreign production. The property this earth has of imbibing oil and greafe, is not confined to the trifling fervice of taking out accidental ftains in clothes, but it is of fo much ufe in cleanfing the wool and the cloth made of it, that we could never have flourifhed in the cloth-trade in the manner we have done, had we not this foffil among us fo very plentiful and cheap, and at the fame time fo excellently good. This earth is one inftance of the pre-eminence of our foil above others. Another inftance we have in our black-lead or wadd, a *Mineral* of great ufe and value in feveral branches of trade and arts; and which is found no where fine and good, except in England, and in our colonies; and that of the laft place, tho' better than the black-lead of other nations, is greatly inferior to our own.

The amber and jet of England are found in confiderable quantity, and are equal to thofe of any other part of the world. Our cannal-coal comes very near the beauty of jet; and even our common coal for firing is greatly fuperior in goodnefs, to that of any other part of the world, and is no where found in fuch vaft plenty as with us. The Englifh earths and gravel are well known to be fuperior to thofe of other countries, in none of which fuch grafs-plats or fuch gravel-walks are to be feen, as in the Englifh gardens. We have ftones, flates, flags, and the other neceffary foffils for building, in fufficient plenty.

Vitriol and alum are found in greater plenty in England, than in any other country; and are fo eafily worked or procured from their ores, that we can fell them cheaper than any other people. *Woodw.* Cat. Fof. Vol. I. p. 5.

Tin is another article in which England has always had a great pre-eminence; the county of Cornwall alone produces more tin than all the world befide; and the tin of England is well known to excel that of other nations, as well in value as in quantity.

Lead ore is alfo richer in England than in any other country, and is found in greater quantity here than any where elfe; befide this, it runs more kindly in the fire, and requires lefs trouble and expence in the working, than any other lead; and is, when wrought, much finer and more ductile, than any other lead.

This does not arife from any peculiarity in the metal, for lead is the fame in all countries, when equally purified; but the fpar which lies about, and is mixed with our lead-ore, is of fuch a nature and difpofition, that it is eafily wrought upon and readily parts from it, leaving the metal more pure than it can be procured by the common large operations in other countries; fo that they are forced to fend it away much lefs pure than ours is.

Copper and iron are alfo found in England in very great plenty, and feveral ores of thefe metals have of late been brought into ufe, which were not known before the modern improvements in chemiftry.

MINERAL *Waters*. See the article *Mineral* WATERS.

Earth of MINERAL *Waters*. See the article EARTH.

MINERAL *Juices*. See the article JUICE.

MINERAL *Courts*, *Curiæ Minerales*, in law, courts for regulating the concerns of lead-mines; as *ftannary courts* are for tin. *Blount*.

MINERVALIA, among the Romans, called alfo *Quinquatria*, were feafts celebrated in honour of Minerva. They began March 19th, and lafted five days. The firft day was fpent in prayers to the goddefs; the reft in offering facrifice, feeing gladiators fight, acting tragedies upon mount Albanus, and reciting pieces of wit, wherein the conqueror had a prize given him. Scholars had then a vacation, and made a prefent to their mafters, which was called *Minerval*.

MINICULATOR, among the Romans, a fervant who embellifhed any writing with *Minium*. *Hoffm*. Lex. in voc. See the article MINIUM, *Cycl.* and *Suppl.*

MINING, the finking or digging into the earth in fearch of metals, or other valuable foffils.

The neceffity of cleaving and opening rocks has been always accounted one of the moft troublefome articles in the bufinefs of *Mining*; as being often compofed of fuch ftone as tools can work but very flowly upon in the common ways. Fire and gunpowder have been the two things principally had recourfe to on thefe occafions; and both fuccefsfully, but in dif-

ferent ways. The fire calcines ftones, and they then eafily become fhattered to pieces, and give way to tools that would not touch them before; but in this cafe, befide the expence of wood, the hindrance of the labourers is an article to be confidered, for the rocks are made fo hot all about the place where the fire has been, that the people cannot get to work again of a day or two, and then the effect of fire reaches but a little way in the rock.

Gunpowder makes its way much farther, and at the fame time is much cheaper and does not delay the work, but the labourers may go on immediately afterwards. There have been many ways contrived of ufing this, but one of the fimpleft and beft, feems that delivered by Mr. Beaumont, in the Philofophical Tranfactions. For this there are only three fimple inftruments required, a borier, a gun, and the quinet or wedge. Thefe are the names the *Miners* on Mendip hills give the inftruments. The borier is an iron inftrument, fteeled at the end; it is two foot two inches long, and is fomewhat thicker at the fteel'd end than in any other part: The ufe of this is to make the hole in the rock deep enough to receive the powder. The gun is about fix inches long, and an inch and quarter in diameter; and has a hole drilled through it, to receive the priming. The quinet is a wedge of iron of about fix inches long, and fo fhaped that its flat part on one fide joins with a flat part in the gun made to receive it, and by that means the gun is faftned very firmly in its place. Philofoph. Tranf. N°. 167. p. 854.

The manner of ufing thefe inftruments, is this: One man holds the borier on the rock, turning it round while another forces its point in by blows of a large hammer on the other end. When the hole is made fomewhat deeper than the length of the gun, they dry it with a rag, and then put into it two or three ounces of powder; over this they lay a paper, and then they put the gun into the hole, and faften it in by driving in the quinet or wedge againft its flat part. When the powder and gun are thus fixed, they pafs down a wire through the hole drilled in the gun, and with this they pierce a hole through the paper which covers the powder; they then prime the gun, and lay a train with a lighted match; but all go out of the *Mine* before the gunpowder takes fire, and as foon as it has gone off they go down to work again, finding the rock fplit and the inftruments unhurt. The paper in this cafe is put over the powder only that the tools may be fafely employed in driving down the gun and the quinet, becaufe were not the powder covered it might do mifchief to the workmen by going off by fome fpark caufed by ftriking either againft thofe inftruments or againft the rock itfelf.

MINIUM, (*Cycl.*) in the natural hiftory of the antients, a name given to what we now call *Cinnabar*. A native mineral of a fhinining red colour, out of which quickfilver was extracted.

This native mineral becoming much in ufe, was foon adulterated, and that commonly with lead ore calcined to a rednefs; and hence, after the two words *Minium* and *Cinnabar* had been long ufed in common, the cinnabar became retained only to the native mineral, and the *Minium* to that adulterated with lead-ore, or to the red adulterating matter alone, which is the fenfe in which it is ftill ufed.

The word *Cinnabar* however, by which they at laft diftinguifhed it, among the oldeft writers on medicine, was ufed as the name of a very different fubftance, a vegetable juice of a ftrong red colour, called by us dragon's blood, and among them long believed to be the dry'd blood of dragons; and when the antients called the mineral body here defcribed by the fame name, they always diftinguifhed the other cinnabar, where they had occafion to name it, according to their ufual method by an adjective derived from the name of the place whence it was brought, calling it *cinnabari Indicum*, the Indian cinnabar.

The native *cinnabar* of the antients was the fame with ours at this time, and was found in the fame variety of forms. Theophraftus tells us, that it was hard and ftony, and that they had it from Spain and Colchis, where it was produced among the rocks. *Hill's* Theophraft. p. 140.

Many have fuppofed, from the name of a factitious *cinnabar* among the moft antient writers, that they were acquainted with our method of making the artificial *cinnabar*; but this was by no means the cafe. What they called factitious *cinnabar*, was, according to the fame Theophraftus, no other than a fine arenaceous fubftance of a fcarlet colour, and very bright and fhining, which they had from one particular place only, which was in the country above Ephefus. This they carefully collected, and rubbed to a fine powder, in veffels made of ftone, and afterwards wafhed it in other veffels of brafs or of wood; the coarfer matter they went to work upon again, rubbing and wafhing it as before, till by thefe repeated powderings and wafhings they feparated all the pure cinnabar, which always funk to the bottom of the veffels, leaving the accidental foulneffes at top.

The factitious *cinnabar* of the antients, was therefore no other than a preparation of a native mineral, which contained a quantity of true cinnabar mixed among a large quantity of other matter, and the operation confifted in nothing but the feparating it from its other matter. The invention of this is attributed to one Callias, an Athenian, who belonged to the filver mines; and was difcovered, as moft other things have been, by accident. This man had got together a vaft quantity of this fand, fuppofing from its colour and brightnefs that it contained gold; and tho' he found himfelf miftaken in that, yet the working on it in hopes of difcovering that precious metal difcovered to him this excellent paint. See the article CINNABAR, *Cycl.* & *Suppl.*

The method in which *Minium* is made in large quantities with us, is this: They firft burn lead in a furnace into a kind of litharge, by continually ftirring it while melted with an iron rake; this they afterwards grind with two pair of ftones, which deliver it from one to another, the firft pair grinding it coarfer, the fecond finer; thefe are worked by means of a mill which moves fix pair of them at once. When thus reduced to a fine powder, it is wafhed and then put into a furnace, and is burnt with a reverberatory fire for two or three days, all the while they continue ftirring it with a large iron rake, hung on a fwivel or iron hook; and toward the end of the time they watch its being of the right colour. When this is doing, the fire muft not be carried beyond a certain degree, left the matter clod and run together. *Ray's* Englifh Words, p. 138.

MINIUM, in medicine, is ufed externally; it obtunds the acrimony of the humors, allays inflammations, and is excellent in the cleanfing and healing of old ulcers: It is ufed, on thefe occafions, in many of the plafters and ointments of the fhops.

MINORATIO, a word ufed by the antients to exprefs a flight or moderate evacuation, only ferving to leffen the humors, not to carry them off.

MINOW, or MINIM, in ichthyology, a name given by the Englifh to the fmall fifh, called by authors the phoxinus. According to the new Artedian fyftem, this is a fpecies of the cyprinus. See the articles CYPRINUS, and PHOXINUS.

MINT (*Cycl.*)—All the forts of *Mint* of which we have feveral propagated in gardens for medicinal ufe, are to be propagated by parting the roots in fpring, or planting cuttings in any of the fummer months, but they muft have a moift foil; and if the weather proves dry, they will require very frequent waterings, after they are firft planted. They fhould be planted in beds of four foot width, with walks two foot wide between them, and fhould be fet at five inches diftance. And they fpread fo faft at the roots that the beds fhould never ftand above three years before they are taken up and tranfplanted; for the roots after this time will mat and clog together, fo as to choak one another. *Miller's* Gardener's Dict. See the article MENTHA.

Many people are fond of *Mint* fallad early in the fpring; the way to propagate this, is to take up fome roots of *Mint* before Chriftmas, and plant them pretty clofe upon a moderate hot bed, covering them an inch deep with frefh earth; the beds muft then be covered either with mats, or frames and glaffes, and in a month's time the *Mint* will come up and will foon be fit for ufe.

When *Mint* is cut for drying, it fhould be done juft when it is in flower, and muft always be done in a dry day; for if cut in wet weather, the leaves will change black. It fhould then be ty'd in fmall bunches, and hung in a fhady place upon lines.

If the foil be good, *Mint* will afford three crops every fpring; but after July, they feldom are fo good, fo that the fhoots made after that time fhould be fuffered to remain till the end of September, to be cut for drying. After this cutting there fhould be about an inch of frefh earth fifted over them, which will make them fhoot much better the following fpring.

No plant grows fo vigoroufly and readily in water as *Mint*; and therefore none is fo proper to try experiments in vegetation upon.

It is generally fuppofed, that plants are the fame in their tafte and virtues in whatever foil they grow; and this is true in regard to all of them, while they live and flourifh; the greateft difference being only in degree.

But plants removed into a foil in which they cannot thrive, but in which they will be killed in time, are often altered in their nature, before they perifh. This is inftanced in nothing fo clearly as in experiments made on *Mint*, growing in glaffes of water. Let feveral fhoots of the plant grow in this manner till very vigorous and ftrong, and then place near one of them a glafs of water in which fea-falt is diffolved, remove one of the roots from the frefh water into this, and the plant will be killed in a few days; and its leaves, ftalk, and every part will tafte ftrongly of fea-falt, though none could be imbibed any other way than by this fingle root. Let another plant of *Mint* be fet near a bottle of ink, and one of its roots put into the ink, the whole plant will in a few days become black, and after that yellow, and will tafte of the copperas.

It is lefs wonderful that thefe unnatural falts fhould affect the *Mint* in this manner, than that the infufion of another plant fhould do it; yet this is evidently the cafe. Let a quantity of the feeds of wild garlic be bruifed and put into water, and let two or three of the roots of a vigorous plant of *Mint* growing in common water be put into this liquor, the whole plant will in a few days decay, and the whole plant being chew'd

chew'd in the mouth will be found to have a very ftrong flavour of garlic.

MINT, in medicine, is a famous ftomachic and carminative; it is alfo efteemed a great cephalic. There is a fimple water, and an effential oil of it kept in the fhops. The plant itfelf is taken by way of infufion or decoction, and enters many compofitions for the above intentions.

MINUET, or MENUET, in mufic, a compofition anfwering to a kind of dance of the fame name, faid to be invented in Poitou; the motion whereof is triple. It has commonly two ftrains, each played twice over; the firft has four or eight bars; the laft note of which fhould be either the *dominant*, or *mediant* of the mode, never the final; and the fecond has eight bars, it ufually ends on the final of the mode, with a pointed minim or whole bar. *Broffard.*

MINUTE *Tithes*, *Minores Decimæ*, fmall tithes of wool, lambs, pigs, butter, cheefe, &c. 2 Inft. 649. *Blount.*

MIRALETUS, in ichthyology, a name given by Bellonius and fome other writers, to the fpecies of ray, commonly called by others *raja oculata*. This is accurately diftinguifhed by Artedi, by the name of the ray with a fmooth back and belly, and with a row of fpines round the eyes, and three other rows of them on the tail.

MIRROR (*Cycl.*)—*Burning*-MIRRORS. An experiment has of late been tried with a machine invented by Mr. De Buffon at Paris, conftructed of a number of *Mirrors*, which feems the great fecret of Archimedes revived, and vindicates the credit of antiquity in this point.

The machine confifts of 140 fmall plane *Mirrors*, each about four inches long, and three broad; thefe are fixed at about a quarter of an inch diftance from each other upon a large wooden frame about fix foot fquare, ftrengthened with many crofs-bars of wood; for the mounting of thefe *Mirrors* each of them has three moveable fkrews, which the operator commands from behind, and which are fo contrived that the *Mirror* can be inclined to any angle, and in any direction that meets the fun; and by this means the folar image of each *Mirror* is made to coincide with all the reft.

They firft tried the experiment with only 24 of the *Mirrors*, which readily fet on fire a combuftible matter which they had prepared of pitch and tow daubed upon a deal-board, at the diftance of fixty-fix French feet. The only difficulty that was found, was the making the folar images exactly coincide; but this was the fault of the apparatus. Philof. Tranf. N°. 483.

This trial, and fo much fuccefs from it, engaged the inventor to pufh the attempt much farther; he put together therefore a kind of polyhaedron confifting of 168 pieces of plane looking-glafs of fix inches fquare each, and by means of this with the faint ray of the fun in the month of March he fet on fire fome boards of beech-wood at an hundred and fifty foot diftance; and by increafing the number of the *Mirrors*, he is in hopes of doing the fame at nine hundred feet off. This machine has, befide other advantages, the convenience of being able to burn downwards or horizontally, as one pleafes; and it burns either in its diftant focus, or in any nearer interval, which our common burning-glaffes cannot do, their focus being wholly fixed and determined. And perhaps this machine may afford a manner of meafuring either light or the different degrees of heat of burning bodies. The difficulty is to find the method of marking the degrees and of fixing a point of comparifon, for the point of kindling will not determine it, becaufe that chiefly depends upon the greater or lefs degree of inflammability of different combuftible bodies. Phil. Tranf. N°. 483.

MIROUETTE, in the manege, is ufed for a dapple bay. See the article DAPPLE.

MISADIR, or MIXADIR, a name given by fome authors to fal armoniac.

MISEN, MISSON, or MIZEN, in a fhip, denotes either the maft, or fail of that name; but at fea, they always mean the fail when the word *Mifen* is ufed.

The ufe of the *Mifen* is, to keep the fhip clofe to a wind: Wherefore if a fhip is apt to gripe too much, they ufe no *Mifen*. But it is often ufed when a fhip rides at anchor, to back her a-ftern; fo that fhe may not foul her anchor, on the turning of the tide; and fometimes a fhip lies a-try with her *Mifen* only. See the article MAST, *Cycl.*

Set the MISEN, at fea, the word of command to fit the *Mifen*-fail right as it fhould ftand.

MISEN-*Stay*, in a fhip. See the article STAY, *Cycl.*

MISEN-*Yard*, in a fhip. See the article YARD, *Cycl.*

MISERERE-*Mei*, (*Cycl.*) a name by which many authors call the *Iliaca Paffio*, or what is vulgarly termed a twifting of the guts. Medical writers diftinguifh this into three kinds: 1. The convolutionary. 2. The herniofe. And 3dly, the obftructionary.

In the convolutionary kind, the fituation of the inteftines in regard to one another is altered, and very frequently has a remarkable duplicature. In the herniofe kind, the inteftines, diftended with fæces and with flatulencies, are received into the fcrotum, or fome other part, fo as not eafily to be reduced into their natural places. And in the obftructionary, there is no other caufe but a violent coftivenefs.

The *Miferere* differs from the ordinary kinds of colic, in degree, as all the fymptoms are greatly more violent in this cafe; and in its fituation, as the ilion and fmall guts are affected in this, and in the other colics ufually the larger; and it is always a much more dangerous cafe than an ordinary colic.

Signs of it. Thefe are extremely fharp and violent pains acrofs the navel, a remarkable anxiety of mind, with frequent eructations and heartburn, and great internal heat; a violent obftruction in the bowels, in which glyfters have very little or no effect; and as the difeafe increafes, a vomiting, which, as it continues, at length brings up the ftools by the mouth, with violent pains, and frequent faintings; after this, unlefs the medicines take place, there comes on an inflammation of the ilion, and thence a fuppuration and mortification, on which the pains inftantly go off, and the patient falls into cold fweats, and dies in a very little time after. It is a very rare cafe, and though many colics are called by this name, yet in reality it is rarely met with. People, however, of all ages and fexes, are equally fubject to it from the following caufes.

Caufes of it. Thefe are either a convolution of the inteftines, with an immediate inflammation, or a tumour in the parts of the inteftine contained in the hernial fack, and the ufe of violent and powerful aftringent medicines bringing on fuch a coftivenefs as never happens naturally. Violent commotions of the body in leaping, riding, or running, have been known fometimes to bring on the difeafe, as alfo violent fneezing and coughing, and the carrying of too great weights; as alfo crude foods, and fuch as have been indurated by fmoak, and flatulent and fermenting liquors. Sometimes alfo it has been evidently owing to worms killed in the bowels, and not voided by ftool.

Prognoftics in it. This is a very terrible difeafe, both in regard to the danger that attends it, and to the pain. In cafes where its origin is from a diftortion and convolution of the inteftines, there is very little hope of recovery; and when it arifes from a hernia, it is very often fatal alfo, efpecially when attended with an inflammation and plethora. Its mildeft ftate is when it arifes only from indurated ftools, and an obftinate coftivenefs; this is ufually cured, if proper affiftance be given in time.

Method of Cure. When a convolution of the inteftines is the caufe, the whole effort is to be ufed to explicate them; but this is a thing more eafily conceiv'd in the mind than effected; to this purpofe fome recommend the fwallowing of a mufket-bullet, others a globule of antimony, and others a pound of quickfilver, taking before-hand a fpoonful or two of oil of fweet almonds, and ordering motion by walking or riding afterwards; others advife the introducing the nofe of a pair of bellows into the orifice of the rectum, and blowing up into the inteftines; but as that gut is ufually fo conftricted in this cafe, as fcarce to admit the pipe of a clyfter apparatus, there is no great hope of fucceeding in the other attempt; and others finally advife the throwing in the fume of tobacco. The difcuffion of the inflammation is fcarce lefs neceffary than the other; this is to be done by powders of nitre, cinnabar, and crabs eyes, taken four times a day, and by rubbing the abdomen with camphorated fpirit of wine, in which faffron has been infufed; bags of carminative ingredients, with camphor, may alfo be applied to the abdomen with good effect: And finally, if there be a plethoric habit, bleeding is a very neceffary operation.

In cafes where this is occafioned by a hernia, the firft thing to be done is the reducing the inteftine into its proper place. To this purpofe the patient muft lie upon his back, and emollient and carminative fomentations muft be applied to the part, made of decoctions of marfhmallows, camomile flowers, and the feeds of anife fennel, and fœnugreek, boiled in milk; and, when there is no inflammation, fomentations of this kind may be applied in the manner of cataplafms, by wetting a fponge with them, and applying it to the part. An inflammation is carefully to be guarded againft, by nitrous medicines, and by gentle diaphoretics, and as foon as the gut is replaced, clyfters muft be given to bring on again a laxity of the bowels.

When the cafe only arifes from an induration of the fæces, there are firft to be given internally nitrous and cinnabarine medicines, to prevent or take off an inflammation, and at the fame time clyfters are to be given, with the emollient decoctions, and a little nitre and camphor, with fome oil; and if it be neceffary for a yet farther ftimulus, fome venice foap may be added; acrid fuppofitories are to be introduced into the rectum, and the foap plafter to be applied to the abdomen, or elfe fpirit of wine camphorated is to be rubbed in; bags with carminative ingredients may alfo be applied warm, and where the ftate is plethoric, bleeding is neceffary.

Thefe are the general methods, and ufually one or other of them takes effect in the milder cafes. But it is to be obferved, that honey, though ordered by fome, is never to be put into thefe clyfters, for where there is an inflammation, it promotes fuppuration. Clyfters of common warm water, with falt, have fometimes been found to have very great effect. The patient is to be kept warm during the courfe of the difeafe, and the diet is to be very fparing, though the drinking warm liquors is to be indulged. *Junker*, Confpect. Med. p. 574. feq.

MISERICORDIA,

MISERICORDIA *in Cibis & Potu*, in our old writers, is uſed for any gratuitous portion of meat and drink, given to the religious in convents beyond their ordinary allowance. *Matt. Paris.* And in ſome convents they had a ſtated allowance of theſe over-commons upon extraordinary days, which were called *Miſericordiæ Regulares*. Mon. Angl. T. 1. p. 149.

MISGUM, in zoology, the name of a fiſh of the anguilliform kind, but broader and flatter than the eel, and of much the ſame ſize from the head to the tail. It has five black lines, one on the back, two which are ſomewhat broader, in the middle of the ſides, and two others which are narrower lower down; theſe are all extended from the head to the tail. The intermediate ſpaces, and the belly, are of a ſomewhat bluiſh white, dotted with black ſpots. The fins are alſo ſpotted in the ſame manner. The mouth is ſmall and round, like that of the lamprey, and is ſurrounded with beards, ſix on the upper jaw, and four on the under. And there are two other very ſlender ones near the noſtrils. The eyes are ſmall; the gills four on a ſide; and beſide the back fin there are four, two near the gills, and two lower on the body. This is a common fiſh about the German ſhores, and is eſteemed a very delicate one at the table. It lays its ſpawn in March, and is in beſt ſeaſon for eating in January and February. It is caught principally in ſtanding and muddy waters; and it is ſaid, that when out of water, it makes a ſort of hiſſing noiſe. *Willughby*, Hiſt. Piſc. p. 119.

MISLETOE (*Cycl.*)—It has been formerly ſuppoſed that the *Miſletoe* was produced as a ſort of excreſcence from the tree it is found on; but time and experiments have ſhewn, that it is raiſed like other plants from ſeeds. Its berries are of a viſcous nature, and ſticking to the beaks of the birds that eat them, they may be rubbed off againſt the branches of other trees, and there take root and grow, but this is not neceſſary for their propagation, for the great numbers of plants of it uſually found on the ſame trees, ſeem to prove very plainly, that it is produced by the falling of its ſeeds, like all other plants, but that the matrix for theſe is not earth, but the branches of a living tree.

The trees on which *Miſletoe* is principally found, are the apple, the aſh, and other ſmooth-rind'd ones. It is very rarely found upon the oak; and though it may eaſily be propagated by its ſeeds on other trees, yet it has not been found to take readily upon the oak. *Miller*, Gardener's Dict.

Ariſtotle thought that *Miſletoe* was not a plant produced from ſeeds, but a mere excreſcence of the trees on which it was found, produced either by an extravaſation of the nutritive juices of the tree, or by a tranſpiration of it; and many authors who have written of it, have been of the ſame opinion. But Theophraſtus and Pliny were of opinion that it ow'd its origin to ſeeds, but that they muſt neceſſarily paſs through the bowels of a bird before they were in a condition to grow.

The ſeeds of *Miſletoe* are ſo ſoft, that one would imagine they would be digeſted by the ſtomach of a bird. Bonone, however, has obſerved, that they are voided entire; but there is no neceſſity of ſuppoſing their paſſing this ſtate, in order to their germinating. Malpighi has very perfectly deſcribed the ſeeds of *Miſletoe*; he ſays, that it germinates by puſhing out two horns from two of its angles; and Camerarius has made the very ſame obſervation. But the firſt account we have of *Miſletoe*'s being regularly raiſed by planting the ſeeds, is from Mr. Ray, who mentions its having been done by Mr. Doody.

The fruit of the *Miſletoe* are roundiſh ſoft berries, faſtened by a ſhort pedicle to the bottom of a fleſhy cup. That part of the berry which ſtands oppoſite to this pedicle, is ſomewhat flatted, and there may be ſeen there a ſmall ſhining brown body of an oval figure, which is that part of the piſtillum called by Linnæus, the *ſtigma*; and round about this ſtigma there are four longiſh marks, which ſhew the places where the leaves of the flower have been faſtened. The ſkin of the fruit, when ripe, is very ſmooth, tranſparent, and tough, and on examining it by the microſcope, it is ſeen very full of veſſels produced from the pedicle, and making frequent anaſtomoſes with one another. Within this is the ſeed wrapped up in a viſcous matter, and of a flatted ſhape, and greeniſh colour; they are beſt ſeparated from this viſcous matter by ſteeping in warm water, and are uſually found to be triangular, ſometimes oval.

When a berry of *Miſletoe* is cruſhed and broken againſt the bark of a tree, the viſcous matter which ſurrounds the ſeed ſoon dries away into a thick and tough ſkin, which ſurrounds the ſeed, and keeps it faſt down to the bark; but the rains frequently waſh theſe off afterwards, eſpecially when they have fallen upon the ſmoother part of the bark, or upon ſuch parts of a tree as are clean and free from moſs. And hence it is, that moſt of the *Miſletoe* we find, is either found upon the under part of the branch of a tree from whence the rain could not ſo eaſily diſlodge it, or on ſuch as have a rough bark, or are in part covered with the common tree-moſſes.

Mr. Du Hamel determined to inveſtigate the nature of this odd plant, put ſeveral of the ſeeds of it into ſmall ſlits, which he cut in the barks of different trees, by that means to defend them from being waſhed away by rains, and theſe all ſucceeded well and ſhot, except thoſe he planted on the fig, on which he made ſeveral unſucceſsful attempts; the miſchief done to the ſeeds by the milky juice of this tree, was probably the cauſe of this. It is no wonder that *Miſletoe* grows equally on all ſorts of trees, ſince there requires no more to make it grow than the effect of the rains and night dews; and this author found the ſeeds ſhooting on earthen pots and ſtones, which he kept ſhaded from the heat of the ſun; and from parallel experiments it ſhould ſeem alſo, that the tranſpiration of trees helps greatly the germination of theſe ſeeds.

The ſeeds of *Miſletoe* ſown, if we may ſo call it, on the bark of trees in February, begin to ſhoot in June, and at that time there are ſeen two little round bodies iſſuing out at the two angles of the triangular ſeeds; but as theſe ſeeds are ſubject to ſome irregularities in their figure, ſo they alſo are in their germination, for from the oval ſeeds there is only one ſhoot, and from thoſe which are irregularly angular, there are ſometimes four or five.

Each of theſe round bodies is faſtened to a pedicle, which has its inſertion in the fleſhy part of the ſeed, in which there are a ſort of grooves, which make it ſeem as if theſe pedicles came out of a ſort of caſe.

This ſort of germination is peculiar to *Miſletoe*, no other ſeed ſhooting out ſo many radicles. Theſe alſo are often found of very different lengths, tho' coming from the ſame ſeed, nor do they all appear at the ſame time, but ſeem to vegetate differently and diſtinctly.

The length of theſe radicles is in a great meaſure owing to the poſition of the ſeed on the branch of the tree, for they always grow in length till they reach the bark; ſo that if the ſeed be ſo placed that the germ iſſues out cloſe to the tree, it is proportionably ſhort; but if it happens to proceed from the upper part of the ſeed, it bends and grows in length till it reaches the bark to which it is to be fixed.

Mr. Du Hamel, willing to try how far this elongation of the radicle might be carried, placed two ſeeds of *Miſletoe*, which had already germinated, upon a ſmall ſupport, raiſing them from the branch of the tree. In the one of theſe the radicle was turned toward the branch, tho' at an unnatural diſtance, in the other it was directed a contrary way. The conſequence was, that the firſt grew to twice its natural length, and then the blackneſs of the round body at the end ſhewed it began to decay; after which it grew no more; the other turned its germ back to the ſupport, and fixing there, periſhed for want of nouriſhment. Another time, making a hole in the branch of a nut-tree, juſt when the radicle of a *Miſletoe* ſeed was ſtriking, he cauſed the radicle to grow to twice its natural length, and it finally reached the bottom of the hole, and ſtuck there, and produced a vigorous plant. It is to be obſerved alſo, in regard to the germination of theſe ſeeds, that they are the only ones in which the radicle takes indifferently any direction, in all other ſeeds it points ever downwards only.

The ſeeds of *Miſletoe* will ſhoot equally well on the upper and under ſides of a branch of a tree, and thoſe on the upper will bend their radicles downward, while thoſe on the under will ſtrike theirs directly upward with the ſame eaſe.

The radicles of *Miſletoe* are, as has been already obſerved, compoſed of a little round body, ſuſtained by a pedicle. When this pedicle has grown to ſuch a length that the round body touches the bark, it opens before into the ſhape of the trunks of flies, and other inſects, and by this means touching cloſely at all its edges, it becomes faſten'd extremely firm to the tree. From this reſemblance in ſhape to the trunks of ſmall animals, Dr. Du Hamel calls theſe radicles the trunks of the ſeed of *Miſletoe*. The ends of theſe trunks of the radicles are alſo faſtened to the bark of the tree by a viſcous matter, which, when the trunk is gently raiſed, draws out into ſtrings on all ſides to ſome length.

In the inner part of this trunk, or open button, there are two ſubſtances to be diſtinguiſhed; in the center there is a white granulated matter, and round that a greeniſh one; both theſe are juicy, but the outer leſs ſo than the central white part; the outer one is plainly the ſame with the outer rind of the root of the *Miſletoe*, or the ſecond bark of its trunk. Theſe both very quickly adhere to the tree, ſtriking their ſeveral granulæ into it, and theſe furniſh afterwards the roots of the *Miſletoe*.

The outer bark of *Miſletoe* is thin, of a deep green, and ſomewhat rough; it is ſtronger than that which it covers; and this is not extended to the roots of the plant, but ſpreads over the bark of the tree at the bottom of the ſtalk, juſt as the feet of the corals and other ſea plants do over ſtones. The viſcous matter, by which the trunk adheres to the tree, is furniſhed from all parts of the radicle, but principally from its outer bark, and is not at all owing to the juices of the tree, ſince it is found as abundantly on thoſe radicles which have been made to adhere to ſtones, as on thoſe which have been on trees. A little time fixes theſe trunks very firmly; but it is obſervable, that though the outer bark or edge of theſe open balls adheres equally all round to the bark of the tree, the granulæ of the inner ſubſtance always direct themſelves to and inſinuate in the little clefts or cracks of the rind of the tree. While the ſeeds of *Miſletoe* are in this ſtate, they may be tranſplanted to other places, and ſet on other trees, and ſeldom fail to thrive.

Seeds of this plant may be made to ſhoot on ſtones, and will fix their trunks to them, but here they naturally ſoon periſh; they may however be removed from theſe ſtones to the

branches of trees, as ſoon as they have affixed themſelves, and being then in a ſtate of drawing nouriſhment, they will affix themſelves to the tree, and from its juices begin to thrive immediately.

It has been very naturally ſuppoſed by thoſe who thought the *Miſletoe* no perfect plant, that it had no roots, nay even thoſe who allowed it to be a perfect plant, and produceable from ſeeds, yet have ſuppoſed it had no root. Malpighi, however, affirms that he plainly ſaw its roots. And Tournefort countenances the ſame opinion; but neither of theſe authors have perfectly deſcribed them.

In that part of the branch of a tree where the *Miſletoe* grows, there is always obſerved a thickneſs, and the bark is always chopped in ſeveral places; but the roots of the *Miſletoe* are by no means to be ſeen externally, being hid both by the bark of the tree, and by the expanſion of the bark of the plant itſelf at its bottom. It is neceſſary, therefore, for the diſcovery of the roots, to raiſe very nicely both the bark of the plant, and that of the tree; but the hardneſs of theſe barks, and their ſtrict attachments to the roots, makes this difficult; and there is indeed no way of ſucceeding well in the attempt, but by boiling the part in water, and making nice diſſections of it before it is cold. By this means the bark of the *Miſletoe*, and that of the tree, are both eaſily raiſed, and the roots of the *Miſletoe* are found partly inſerted into the bark, and partly into the wood of the branch.

The bark of trees is a ſubſtance compoſed of ſeveral beds or ſtrata, the upper or outer of which is an extremely thin one, and the others, which are thicker, are formed by the extenſion of the woody fibres, which run longitudinally into a ſort of network, the cells of which are filled with a parenchymatous ſubſtance. This is the ſtructure of all the barks of a tree, except the outer thin one; but of theſe, thoſe are always the moſt ſucculent and rich which lie innermoſt, or neareſt the wood of the tree.

It is obſervable, that when an inſect wounds the bark of a tree or plant, there is always a greater derivation of the juices to the wounded part than elſewhere, and hence galls and other protuberances are formed; this ſeems alſo the caſe here, and the application of the trunk of the *Miſletoe* ſeed, and the penetration of its roots ſeem alſo to wound the part ſo much, as to cauſe in the ſame manner a derivation of a great quantity of juices for the nouriſhment of the young plant: And as the roots ſtrike deeper in, there is made a greater extravaſation of the juices of the tree, and a ſort of tumour is neceſſarily formed.

Among the ſeveral roots of the *Miſletoe*, there are ſome which extend themſelves among the more ſucculent parts of the bark, and others which penetrate to the wood of the branch. Theſe ſpread themſelves every way with great eaſe, as they are principally formed at a time when the tree is full of ſap.

It has been ſuppoſed by many, that the roots of the *Miſletoe* penetrated the woody ſubſtance of the tree; but though appearances make greatly for this ſyſtem, it is by no means true in fact. The roots of the young plants, when they have penetrated through all the lamina of the bark, and reach the wood, turn off, as the roots of plants do which meet with ſtones, *&c.* in their paſſage, and ſpread horizontally between the inner bark and wood, or elſe re-aſcend the bark, the looſe and juicy nature of which is much fitter for affording them nouriſhment than the hard ſubſtance of the wood. It is true, that in making ſections of the branches where old plants of *Miſletoe* grow, there are often found roots, nay ſometimes even the woody ſtem of the plant plunged into the matter of the hard wood; but this is merely owing to the inner bark of the branch having become woody ſince the penetration of the roots, not to the roots finding their way into what was actual wood at the time.

There are alſo found always a multitude of woody excreſcences, like warts and wens, about the place where the *Miſletoe* grows; theſe are formed like the woody galls produced on trees by the punctures of inſects, by an extravaſation of the woody juices. Theſe make the ſwelling about that part of the branch where the *Miſletoe* grows, and theſe, as they become woody, and ſwell about the roots, ſerve to cover them with hard wood, which they never penetrated. Theſe make it probable enough that the roots of *Miſletoe* never penetrate hard wood; but what proves it much more evidently, is, that if the branches of trees full of *Miſletoe* plants be cut and ſplit in different directions, juſt at the place of the inſertion of the plant, the ſeveral annual circles of the wood within are found perfect, regular, and in their natural ſtate, ſo far as the branch was form'd at the time the *Miſletoe* took root upon it; theſe ſhew the age of the branch at that time, but above theſe there are always ſeveral other laminæ, which are what have been formed ſince the time of the *Miſletoe*'s growing there; and theſe which have been formed out of the inner laminæ of the bark, in which the roots of *Miſletoe* had made many wounds and great extravaſations of the juices, are found, tho' woody, full of the roots of the plant, and are very irregular, and full of the tubera which thoſe extravaſations occaſion, by by no means appearing like the annual circles of the wood formed before. The ligneous fibres in the outer, or ſince form'd wood, are laid in very irregular directions, and the roots of the *Miſletoe* may be eaſily diſtinguiſhed among them by their colour.

The *Miſletoe*, as the bark in which its roots were ſpread, hardened into wood, would be in the ſtate of a tree, planted in an earth which, by degrees, petrified about it, and muſt periſh; but nature has provided for it in this caſe; for as theſe roots are impriſon'd in wood, and a new bark is formed by the ſap of the tree, the trunk of the *Miſletoe* ſends out a new ſeries of roots, which ſpread thro' this in like manner; ſo that tho' a plant of *Miſletoe* has ever ſo many ſeries of its roots embodied in the hard wood, from which it can have no nouriſhment, it has alſo ſome, ſufficient for its ſupport, ſpread among its yet new-form'd bark.

The *Miſletoe* is frequently found in this ſtate; nor are we to ſuppoſe, indeed, that tho' the wood is not able to furniſh ſo much juice as the bark, that it furniſhes none at all; for the roots of the plant do not decay, when they have penetrated what afterwards becomes perfect wood; even in its hardeſt ſtate, they are ſtill found perfect in it, and in a living ſtate, and undoubtedly furniſh ſome, tho' not a great deal of nouriſhment to the plant. Another thing very remarkable in thoſe plants of *Miſletoe*, many of the roots of which are lodged in the hard wood, is, that the roots diffuſed through the bark have often a large tubercle at their ends, which probably is furniſhed with numerous openings for the receiving the juices the plant is to be nouriſhed by, and ſerves in the place of many roots.

There are ſometimes indeed found plants of *Miſletoe* which live wholly by the nouriſhment they receive from the wood; theſe are in the ſtate of grafts of common fruit-trees; but theſe are rare, and it very ſeldom ſucceeds when the *Miſletoe* is attempted to be propagated by the common method of grafting, though the plants of *Miſletoe* may very eaſily be grafted by approach into one another.

A farther circumſtance worthy obſervation, is, that tho' ſome plants of *Miſletoe* have been found growing very well with their roots only in the wood, yet this is generally fatal to them, and many plants of it are found dead and wither'd, by means of the woody part of the tree riſing into a ſort of wen or tubercle about them, and by its cloſely ſurrounding their ſtalk, preventing all intercourſe with the bark, by means of new roots. This is uſually the caſe when the plants of *Miſletoe* are weak, and the branch on which they grow very ſtrong and vigorous; and on the contrary, when the plants are very ſtrong, and the branch weak; in which caſe, the roots of a large *Miſletoe* plant will ſometimes penetrate the whole round of the bark, and taking in all the nouriſhment to itſelf, the end of the branch beyond it will periſh and rot off; but the *Miſletoe*, in this caſe, is not able to ſupply the place of the ſtarved part of the branch, but the remainder of the bough generally dies quite to the trunk of the tree, and the *Miſletoe* periſhes with it.

Though this plant is evidently propagated by its ſeeds, yet it alſo propagates itſelf very often by ſuckers, and it is not uncommon to find young ſhoots at a finger's breadth or two from the old one. The gardeners, who value their trees, are very careful to deſtroy the *Miſletoe* from them, and that very properly, ſince it is extremely obvious from what has been obſerved, that it robs the tree it grows on of a great deal of its nutritious juice. The common method of cutting off the plants to this purpoſe, is, however, by no means ſufficient; for the old ſtock frequently puſhes out new ſhoots, and the roots afford ſuckers, ſo that the caſe becomes worſe than before. There is indeed no way of deſtroying it, but the cutting away with it a part of the turbercle it forms on the branch where it grows.

The roots of *Miſletoe*, while young, are green, very tender, and granulated, as is alſo the bark of the older ones; but theſe have a woody filament within. They are not regularly round, but are often flat, and uſually adapted in their ſhape to the place where they are lodged; and about their inſertions it is not unfrequent to ſee a ſort of elongation of their bark, which blends itſelf with the bark of the tree on which they grow.

The progreſs of the branches of *Miſletoe* is much ſlower than that of the roots. The firſt year, and often the ſecond, is ſpent wholly on their part, in the raiſing themſelves into an erect poſture, and very often this operation proves fatal to them.

The ſeeds, as has been before obſerved, faſten themſelves to the branches of trees, by means of the viſcous juice contained in the berries. The radicles produced hence affix themſelves, by means of the hollow button at their extremity, to the bark of the tree; and the other end being yet held faſt in the ſeed, the whole proceſs forms a ſort of arch. When the button end of the radicle has got itſelf good root in the bark of the tree, and begins to ſend up ſap in abundance into its pedicle, which is to be the ſtalk of the plant, that by degrees begins to looſen itſelf from the ſeed; and this is often a work of great difficulty; for the ſeed being firmly attached by its viſcous matter now dried to the bark of the tree, holds down the end of the ſtalk, that very often the force of riſing in the young plant is not enough, and it remains in its arched form, and periſhes; and often

often the open end is forced away from its hold on the bark by the reſiſtance, and the young plant dies.

Thoſe ſhoots which are ſingle from ſingle ſeeds are ofteneſt deſtroy'd at this juncture, for they have ſingly the force of the whole ſeed to ſtruggle againſt, and when they ſucceed, uſually raiſe it up, and keep it on their extremity; but where the ſame ſeed ſends three or four radicles, theſe all ſtruggle ſo many different ways to riſe, and the huſk of the ſeed is uſually torn, by their efforts, into three or four pieces; and every radicle carrying its portion on the top, becomes a diſtinct plant. It might ſeem from this, that the feminal lobes were neceſſary to the growth of the young plant; but this is not the caſe, for if the ſtalks of the ſeveral radicles are cut off while they adhere to the ſeed, they thrive not at all the worſe for it.

It is a very ſingular circumſtance in this plant, that its ſeeds produce ſingly ſeveral young plants. No other vegetable has this property. 'Tis true, indeed, that two young hazels have been ſeen to riſe from the ſame nut; but then we know very well, that nuts have frequently double kernels in the ſame ſhell; but here the ſeed is contained ſingly in a berry, and, to all examination, appears of a ſimple uniform ſtructure, tho' it doubtleſs is compoſed according to the number of young plants it will produce, of three, four, or more perfect ſeeds.

When the young plant of the *Miſletoe* ſeed has freed itſelf from the huſk at its end, and raiſed itſelf upright, it is found terminated at the end by a ſort of button, like that of other young ſhoots, which contain the leaves. This button ſtands, however, unalter'd all the firſt year, and ſometimes all the ſecond; in the ſpring following there appear from the button two leaves, and in the alæ of theſe leaves there are ſeen two other buttons; and afterwards there iſſue from theſe buttons branches terminated uſually by two, but ſometimes by three leaves. Theſe are the produce of the third or fourth year; all the ſucceeding years there are new buttons formed in the alæ of the leaves, and the branches from theſe expand themſelves ſo regularly, that very frequently the whole ſhrub is of a regularly round figure.

The old leaves become yellow, and fall off, and there come no new ones in their places, ſo that the old ſtalks, and conſequently the whole inner part of the plant is naked, and the leaves are only found on the circumference growing on the young branches.

It is a remarkable obſervation, that every button of the *Miſletoe* contains the rudiments of three young branches, and hence every knot ought to be furniſhed with ſix branches; and this would ever be the caſe, but that ſeveral of the young branches die either before, or ſoon after their emerging from the button.

Among the other ſingularities of this plant, it is alſo worthy obſervation, that its ſtalks have not that tendency natural to thoſe of all other plants, of riſing directly upwards; for if it grow on the under part of a branch of a tree, it ſhoots as regularly downwards, as it does upwards when it grows from the other ſide, and this without ſeeming at all to ſuffer by it, or to have any inclination to turn upwards.

Some of the old authors have ſaid, that the *Miſletoe* kept its leaves all the winter, when it grew on an ever-green tree, but that when the leaves fell from the tree it grew on, its leaves fell alſo; but this is erroneous, *Miſletoe* holding its leaves all the year, on whatever tree it grows, and ſtanding unhurt in the ſevereſt winters.

Miſletoe will grow on all kinds of trees; but it does not grow on all with the ſame ſtrength and vigour. The pear, the apple, the white thorn, and the lime, are trees it grows on very ſucceſsfully. The oak, the hazel, and the juniper, are very ſtarving for it. Mr. Du Hamel could never make it ſucceed by ſowing on the laſt of theſe trees; but it has ſometimes been found naturally propagated on it, tho' in a ſtarving condition. It will alſo grow on annual plants, but on theſe it never can come to any height, as their ſtalks periſhing at the approach of winter, the *Miſletoe* periſhes with them. Mr. Du Hamel took great pains to ſow and try to raiſe it on the ground, and ſucceeded ſo well as to make the ſeeds ſhoot, and their radicles grow to ſome length; but finding no proper hold to fix themſelves upon, they all periſhed; whence it ſeems that this is abſolutely a paraſitical ſhrub, and can grow no where but on ſome other tree.

The *Miſletoe* is covered with two barks, an external thin one of a greeniſh colour, and ſomewhat wrinkled and granulated; and under this with a much thicker, of a paler green, and ſomewhat granulated, and interſperſed with woody fibres. Under this lies the wood, which, when dry, is very hard, but has no appearance of any grain, and cuts with equal eaſe in a longitudinal or tranſverſe direction. The ſtalk between every two knots is perfectly ſtrait, but at the knot it takes great inflections. Each of theſe pieces of the ſtalk in ſome meaſure repreſents the tibia of the human leg, being a little larger at one end than at the other, and always much ſmaller in the middle than at either extremity. It joins the ſucceeding ſtalk not in the common manner of vegetables, but by a ſort of articulation, and has a ſort of epiphyſes like the bones. The analogy is carried alſo yet farther, in that as in young animals the epiphyſes of the bones are all ſoft and tender, but harden in older ones; ſo in this plant the young branches ſeparate eaſily at their articulations, but in the old ones theſe are as hard as any other part of the ſtalk.

The leaves of *Miſletoe* are thick without being ſucculent, their pedicle is very ſhort, and there run from it four or ſix longitudinal ribs, which reach the outer end of the leaf without making any obſervable ramifications.

Miſletoe is a very vigorous and lively plant, and is one of thoſe to which nature has allotted males and females in diſtinct plants of the ſame ſpecies. Authors however are not perfectly agreed as to the manner of this. Pliny abſolutely affirms, that there are two ſorts of *Miſletoe*, the one which bears fruit, and the other which never does. And Mr. Edmund Barrell greatly confirms this opinion by his own obſervation, giving an account that he raiſed four plants of *Miſletoe* from ſeeds, two of which bore fruit, but the other two only flowers. Mr. Tournefort, Linnæus, and Boerhaave, however, affirm, that the flowers and fruit are not produced in different plants, but on the different branches of the ſame individual. The matter thus remained doubtful till Mr. Du Hamel determined to enquire thoroughly into the truth; and his obſervations wholly confirmed thoſe of the antients, and of Mr. Barrell. Nay, he adds, that the whole habit of the male and female plants of the *Miſletoe* is ſo different, that they are eaſily known aſunder, without having recourſe to their flowers, or fruit; and he never found, in all his obſervations, ſo much as a ſingle flower on a female plant, or a ſingle berry on a male one.

The buds which contain the male flowers of *Miſletoe* are rounder than thoſe which contain the female flowers, or the embryo fruit, and are three times as large. The buds ſhew themſelves diſtinctly on the branches in autumn, and in December they are of a conſiderable ſize, tho' not at all inclined to open; and the female plants are yet full of the berries of the former year. The male buds uſually grow three and three on the ſame pedicle, and they open in February or the beginning of March. Their flower is of one regular piece, forming a ſort of open bell; it is cut into four parts, the notches going down to the middle of the flower, and the ſegments being ſo many half ovals. There are four thick oval bodies, or four granulated ſhoots which are attached to the inner part of the bell, and which riſe over its lips; they are greeniſh at firſt, but they afterwards become yellow; theſe are full of an extremely fine powder: Theſe are truly the ſtamina of the *Miſletoe*, and that part of them which to the naked eye appears granulated, is by the microſcope found to be formed into a multitude of ſlight cavities, like thoſe of the morel. The flowers are placed in cluſters ſix or ſeven together, either in the alæ of the branches, or at their extremities; and having done their office, they fall off in May. The female plants have their flowers in the ſame places, but theſe have only three or four at a joint; they open at the ſame time that the male flowers do, on the other plants: When theſe flowers are perfectly opened, we ſee the embryo fruit crowned with four petals, which are planted in a ſort of cleft that runs all round the fruit, and which becomes more and more diſtinguiſhable as the fruit grows larger.

Theſe petals are at firſt united at their tops, and form a ſort of cone, but they ſoon after open and ſhew the figure of an antique crown; and there is then ſeen in the middle a ſort of rough eminence granulated like the peel of an orange, and of a browniſh colour. That part of the fruit which is below the inſertion of the petals grows much faſter than that which is above them, ſo that when theſe are grown to a conſiderable ſize, the petals ſeem placed merely upon them.

By the beginning of June almoſt all the petals are fallen, but the four inſertions remain however very diſtinguiſhable on the berry; and we may obſerve on their tops, as they are now about as big as a grain of hempſeed, a brown eminence which is the remains of the rough protuberance contained within the petals; and, on cutting them, the ſeed is found in the middle, of a greeniſh colour; the berries continue growing all July and Auguſt, and are ripe in September or October. Mem. Acad. Par. 1740.

MISOPTOCHOS, the *Beggar-hater*, an affected name given by ſome to the gout, a diſeaſe that ſeldom invades the poor or induſtrious.

MISSA, in the church of Rome. See the article MASS, *Cycl.*

MISSEL-*Bird*, in zoology, the common Engliſh name of the larger ſpecies of thruſh, called alſo the *ſhrite*, and by authors the *turdus viſcivorus major*. It is much larger than any other of the thruſh-kind. Its legs and feet are yellow; its head of a browniſh lead colour; and its back, tail, and rump, of the ſame colour, with an admixture of yellow; but in the ſummer months it a little changes its colour, and becomes more grey or of the colour of unripe pickled olives; its throat, breaſt and belly, are all variegated with black ſpots; the middle of its belly whitiſh, and the upper part of its breaſt and part of its ſides and the under feathers of its tail yellowiſh. *Ray's* Ornithol. p. 138.

It uſually is ſeen on the top branches of tall oaks, elms, and other high trees, and ſings very ſweetly. It remains the whole year with us, and flies ſingly, except with its female. It is the beſt of all the kind for the table.

MISSILIA, among the Romans, a name given to largesses, thrown among the people on occasion of games and shews, such as small gold or silver coins, sweet-meats, and sometimes animals, as sheep, oxen, deer, &c. which were let loose to be carried off by the people. *Hofm.* Lex. in voc.

The word comes from *mittere*, to throw, or let loose.

MISSING *Wood*, a phrase used among bowlers. See the article Bowling.

MISSION, *Missio*, among the Romans, a term used to signify the emperor's sending to rescue a wounded gladiator from his antagonist. The *Munerarij* or persons who exhibited the games, and likewise the people, used to rescue a favourite gladiator. The manner of their signifying this favour, was *pollice presso*, or with the thumb hid in the palm of the hand. However the gladiator was only saved for that time; whereas by the *Rudis* he had a free discharge. *Hoffm.* Lex. in voc. See the article Rudis.

MIST (*Cycl.*)—The bluish *Mist* which we sometimes see on our fields and pastures in a morning, though often innocent, yet has been in some places found to be the actual cause of murrain, and other fatal diseases among the horned cattle.

Dr. Winklar gives, in the Philosophical Transactions, an account of a murrain affecting the cattle in Italy and other places, which was evidently seen to spread itself over the countries in form of a blue *Mist*. Wherever this was perceived, the cattle were sure to come home sick; they appeared dull and heavy, and refused their food; and many of them would die in four and twenty hours. Upon dissection there were found large and corrupted spleens, sphacelous and corroded tongues; and in some places those people who were not careful of themselves in their management of their cattle, were infected and died as fast themselves. The principal cause of this disease seemed to be the exhalation of some unwholesome steams from the earth; and it was observable, that there had been three earthquakes in Italy the year before it happened. The method of cure which succeeded best, was this: As soon as any beast appeared to be sick, they examined the tongue, and if aphthæ or little blisters were found on it, they scraped it with a silver instrument made with sharp teeth at the sides, till it bled in all those parts where the aphthæ were; the blood was then wiped away with a cloth, and the whole tongue washed several times with vinegar and salt. After this the following medicine was given internally: Take of soot, brimstone, gunpowder, and salt, of each equal parts; mix these in as much water as will make a mixture thin enough to be swallowed, and let a spoonful be given for a dose three or four times a day. The cattle which were in health had this medicine given them, as well as the sick; and the consequence was, that very few died in Swisserland, while almost all died in other places.

It was very remarkable that the contagion, on this occasion, seemed to travel slowly and regularly on: It came at the rate of about two German miles in twenty-four hours: This it kept regularly to during the whole time of its raging, and never appeared in very distant places at the same time.

The whole surface of the earth emitting these effluvia, no cattle escaped them in the course of their way, but those which were kept within doors at rack and manger fell ill at the same time, and in the same manner with those in the open fields. Dr. Slare was of opinion, that it was owing to certain insects which could not fly faster than at the rate of two German miles a day; and that they travelled regularly, and spread the mischief where they passed; but there wanted some judicious persons, versed in these observations, to have examined both the state of the air, and the beasts, on this occasion. Philos. Transf. N°. 145.

MISURER, in our old writers, an abuse of any liberty or benefit: As he shall make fine for his *Misurer*. Old. Nat. Br. 149.

By *Misurer*, a charter of a corporation may be forfeited; so also an office, &c. *Blount*, *Cowel*.

MISY, (*Cycl.*) in natural history, the name of a fossile substance, used very frequently by the antients in medicine, and supposed to be one of their now lost medicines, but erroneously; it being still very common in the Turkish dominions, and not unfrequently found in the mines at Cremnitz in Hungary. It is a considerably firm substance, tho' of an irregular and seemingly not compact texture, and much resembles some of our gaudy marcasites; but that it wants their hardness and their weight, and is not inflammable.

It is commonly found in large loose masses, which are usually broad and flat, and uneven at their edges; but sometimes it constitutes whole strata, which are continued often for a considerable length, but are seldom of more than three inches in thickness, and usually lie like horizontal veins among other metallic minerals. It is soft and smooth to the touch, and may be rubbed to pieces between the fingers; and is both on the outside and within of a very elegant bright pale yellow, having much the appearance of brass, when that metal is clean and well scoured. Its internal substance seems made up of numbers of very bright and small moleculæ, mostly of angular figures. It is never covered with any investient coat or crust; but when it has lain some time exposed to the air, it becomes of a duskier colour than before on the surface. It will not raise any effervescence with acid menstrua, and in the fire becomes of a deep purple. Water dissolves a very considerable part of its substance, and this may afterwards be separated from the liquor by evaporation and crystallization, and appears to be of the same nature with the common green vitriol: Its crystals being exactly of the same figure, and their effect upon a decoction of galls being the same, instantly turning it into ink. It has so much of the appearance of a sulphureous body, that one is surprised not to find it inflammable. *Hill's* Hist. of Fos. p. 606.

It is at present no where put to any use. The antients esteemed it of the same nature with the chalcitis, but that it possessed those virtues in a more remiss degree; they had it from Ægypt and Cyprus, and used it externally in hæmorrhages, and some cutaneous eruptions.

Misy, in botany, a name given by Theophrastus, and all the old Greek writers, to a kind of truffle or subterranean mushroom, of a very delicate flavour. The truffles of Numidia, and some other parts of Africa, were always esteemed superior to those of any other part of the world. They are called *terfez*, *camaha* or *kema*, by some later writers, and were brought to Rome, and so greatly esteemed, that no dish was ranked above them. These were called Libyan truffles by the Romans, and they seem to have been the same with the Cyrenian *Misy* of the Greeks. It is to be observed, that the Greeks in general, in early times, were very little acquainted with the affairs of Africa; and all that they had from this part of the world, was said to come from Cyrene, some old cities of their forefathers being there, and keeping up a friendship and traffic with them. The *thyon*, a tree growing plentifully in almost all parts of Africa, and which is the same with the citrus of the Romans, was in this manner attributed to Cyrene, by the same Theophrastus. And thus, when speaking of truffles, he adds, that the Cyrenean *Misy* surpassed all the other kinds in flavour; his words stand at large in Athenæus; and thence Pliny has taken his account, which he closes in this manner: "The thing which they call *Misy*, in "the province of Cyrene, is of this kind; but it is more fleshy "and of a finer taste and smell." This is the sense of Pliny, as the text stands in our copies; but it is probable that he translated Theophrastus better than they, at least as we know that what he says is not his own, but taken from that author, we have a right to understand it his way, and that is, that the roots of this Cyrenean *Misy* have a delicate smell resembling that of meat, or flesh newly cut. *Pliny*, L. 19. c. 3.

It is very certain, that this Cyrenean *Misy* of the old Greeks is the same thing with the delicate African truffle or terfez of LeoAfricanus, and the moderns; and Pliny had read some of the antients who were sensible of this, and has taken from them an account that the African truffles are the finest in the world; and yet did not perceive, that these African truffles were the same with the Cyrenean *Misy*, which he immediately after mentions from Theophrastus.

MITE, (*Cycl.*) in natural history, the name of a small animal, very well known and found in old cheese, and in many other bodies both recent and perishing.

To the naked eye the *Mites* in cheese appear like moving particles of dust, but the microscope discovers them to be perfect animals, having as regular a figure and performing all the functions of life as perfectly as creatures that exceed them many times in bulk. See Tab. of Microscopical Objects, Class 1.

They are crustaceous animals, and are usually transparent; the principal parts of them are the head, the neck, and the body. The head is small in proportion to the body, and has a sharp snout and a mouth that opens and shuts like a mole's. They have two small eyes, and are extremely quick-sighted; and when you have once touched them with a pin, you will easily perceive how cunningly they avoid a second touch.

They are of different sorts; for some of them have six legs, and others have eight. Each leg has six joints surrounded with hairs, and two little claws at the extremity, with which it very nicely takes hold of any thing. The hinder part of the body is plump and bulky, and ends in an oval form, from which there issue out a few exceeding long hairs. Other parts of the body and head are also beset with thin and long hairs.

The males and females are easily distinguished in these little animals. The females are oviparous as the louse and spider, and from their eggs the young ones are hatched in their proper form, without having any change to undergo afterwards. They are however, when first hatched, extremely minute; and, in their growing to their full size, they cast their skins several times.

These little creatures may be kept alive many months between two concave glasses, and applied to the microscope at pleasure. They are thus often seen *in coitu*, conjoined tail to tail; and this is performed by an incredibly swift motion. Their eggs, in warm weather, hatch in twelve or fourteen days; but, in winter, they are much longer. These eggs are so small, that a regular computation shews, that ninety millions of them are not so large as a common pigeon's egg. *Baker's* Microscope, p. 187.

Mites are very voracious animals; they not only prey upon cheese, but on all sorts of dry'd flesh, fish, fruits, and seeds; and almost on all things which have some degree of moisture, without

without ever being wet; and they have often been feen to eat one another. Their manner of eating is by thrufting alternately one jaw forward and the other backward; and in this manner grinding their food; and after they have done feeding, they feem to chew the cud.

There are feveral leffer diftinctions obfervable in the *Mites*, which are found among different fubftances. Thofe in malt-duft and oatmeal, are much nimbler than the cheefe *Mites*; and have more and longer hairs. The *Mites* among figs refemble beetles, and have two feelers at the fnout, and two very long horns over them; thefe have only fix legs, and are more fluggifh than thofe in malt-duft. Thofe found among figs had alfo very long hairs, and thofe befet at certain diftances with other fmaller hairs; whence Mr. Lewenhoek conjectures, that thefe longer and larger hairs are jointed at thofe places where the fhort ones are found.

There are a fort of wandering *Mites*, found wherever there is any thing they can feed on; thefe are often found in form of a white duft, and are not fufpected to be living creatures.

The *Mite* is an animal very tenacious of life; it will live months without food; and Mr. Lewenhoek had one which lived eleven weeks on the point of a pin, on which he had fixed it for examining it by his microfcope. *Lewenhoek*'s Arcan. Nat. T. 4. p. 368.

MITELLA, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the rofaceous kind, confifting of many petals difpofed in a circular form. The piftil arifes from the cup of the flower, and finally becomes a roundifh and pointed fruit, which when ripened fplits into two parts, and in fome degree refembles a mitre, and contains ufually roundifh feeds.

The fpecies of *Mitella*, enumerated by Mr. Tournefort, are thefe: 1. The American *Mitella*, with fimbriated petals. 2. The American *Mitella*, with whole petals. 3. The great American dying *Mitella*, called *Orellana*, *Achiotl*, and *Wruow*. Tourn. Inft. p. 241.

MITELLA, in furgery, a name given to the fcarf for fufpending the arm when injured.

MITHRIDATES, in natural hiftory, the name of a ftone found in fome parts of Perfia, feeming to be the fame as the *mithridax* or *mithrax*. See the next article.

MITHRIDAX, in natural hiftory, the name of a gem defcribed by Solinus, and mentioned by fome of the later writers, who have quoted him, or borrowed from him; but the name is not met with in any author earlier than his time. The qualities he beftows upon it, are the fame with thofe given by Pliny to the *mithrax*; and as the word *mithrax* never occurs in Solinus, it is highly probable that he means this ftone by it. He fays, that when the fun fhines upon the *Mithridax*, it fhews a great many various colours.

Ifidore fays the fame thing, evidently borrowing the account and almoft the words from him.

Pliny tells us, that the *mithrax* has the fame quality, and that it is in itfelf whitifh. Its name is taken from the Perfian word for the fun, and is the fame as *gemma folis*. Pliny indeed, in the latter end of his book, defcribes a ftone called *folis gemma*, without faying that it is the fame with the *mithrax*; but his accounts in both places agree very well one with another; and the common cuftom of that author of collecting at large from all the writers of his time, might eafily lead him to defcribe a thing twice, which he found in two authors called by two different names.

The *mithrax* both of Pliny, and all the other antients, is evidently the opal; and the *Mithridax* having no other qualities attributed to it, but thofe the opal poffeffes, may be determined to be only a corruption of the fame name.

MITHRAX, in natural hiftory, the name given by Pliny and the antients, to a gem found in Perfia, which when held up to the fun fhewed many colours. It was probably no other than the opal. Hence the barbarous writers of the middle ages feem to have taken their account of the *Mithridates*. See the preceding article.

MITRE (*Cycl.*)—*Mitre* is ufed by the writers of the Irifh hiftory for a fort of bafe money, which was very common there about the year 1270; and for thirty years before, and as many after. There were befide the *Mitre*, feveral other pieces called according to the figures impreffed upon them, rofaries, lionades, eagles, and by the like names. They were imported from France, and other countries, and were fo much below the proper currency of the kingdom, that they were not worth fo much as a half-penny each. They were at length decry'd in the year 1300, and good coins ftruck in their place. Thefe were the firft Irifh coins in which the fcepter was left out. They were ftruck in the reign of Edward the fon of our Henry the Third, and are ftill found among the other antiquities of that country. They have the king's head in a triangle full-faced. The penny, when well preferved, weighs twenty-two grains; the half-penny ten grains and a half. *Simon*'s Irifh Coins.

MITTA, in our old writers, an antient Saxon meafure. Its quantity is not certainly known; but it is faid to be *menfura decem modiorum*, a meafure of ten bufhels. *Doomfday*.

Mitta, or *Mitcha*, befides being a meafure for falt and corn, is ufed for the place where the caldrons were put to boil falt. *Calderias quoque ad fal conficiendum cum propriis fedibus* Mitchæ *vocantur*. *Gale*'s Hift. Brit. 767. *Blount*.

MITTENDARII, among the Romans, commiffioners fent into the provinces by order of the *præfectus prætorio*, or captain of the guards, upon fome public account, as to infpect the behaviour and management of provincial governors, and obferve whatever was amifs; all which they were to lay before the præfect, who had authority to remedy fuch abufes. *Pitifc.* in voc.

MITTENDO *Manufcriptum pedis finis*, in law, a writ judicial, directed to the treafurer and chamberlains of the exchequer, to fearch for and tranfmit the foot of a fine, acknowledged before juftices in eyre, into the common-pleas, &c. Reg. Orig. 14. *Blount. Cowel.*

MITU, or MITU-PORANGU; in zoology, the name of a Brafilian bird of the pheafant-kind, according to Marggrave, and the generality of thofe who fpeak of it; but fuppofed by Mr. Ray, rather to approach to the nature of the peacock, or turkey-cock.

It is larger than the common Englifh cock, and is all over the back, wings, &c. of a fine deep black; but on the belly of a partridge-brown; and has a feries of fine gloffy black feathers on its head, which it occafionally raifes up into a fort of creft. Its beak is very beautiful, broad at the bafe and narrow at the point, and of a fine bright red. Its tail is very long, and it can at pleafure raife and expand it like the turkey. It is very eafily tamed, and loves to rooft on trees. Its flefh is very fine and delicate. See Tab. of Birds, N°. 24. *Marggrave*'s Hift. Brafil.

MIXT, in chemiftry. See the article AGGREGATE.

MIXTURE (*Cycl.*)—MIXTURA *Simplex*, *fimple* MIXTURE, in pharmacy, the name of a form of medicine ufed in the prefcriptions of fome modern phyficians. It is made by mixing ten ounces of the fpiritus theriacalis camphoratus of Bates, fix ounces of fpirit of tartar, and two ounces of fpirit of vitriol; thefe are to be fet in a glafs hermetically fealed for three weeks that they may be perfectly mixed; the dofe is a dram or thereabouts. Its virtues are, that it refifts putrefaction, promotes fweat, and is of great fervice in malignant fevers. See the article MIXTURE, *Cycl.*

MIZNEPHETH, in the Jewifh antiquities, a kind of mitre worn by the high-prieft. See the article CIDARIS.

MIZQUITL, in botany, a name ufed by fome authors for that fpecies of the Acacia, or Egyptian thorn, whofe unripe fruit affords the infpiffated juice, which is the true fuccus acaciæ of the fhops, and whofe gum, naturally flowing from the trunk and branches, is the true gum arabic. *Hernand*, p. 59. *Dale* Pharm. p. 343.

MNEME-CEPHALICUM *Balfamum*, the name of a famous compound balfam, faid to have been purchafed from a certain Englifh phyfician by Charles Duke of Burgundy, at the price of ten thoufand florins. Some who have been very lavifh in its praifes have affirmed, that it has a power of preferving in the mind the remembrance of all things that are paft; but this feems ftretching the praife of it a little too far. It is prepared in the following manner: Take of the juices of the leaves of baum, and bafil juices, of the flowers of tamarifk lillies, primrofes, rofemary, lavender, borrage, and broom, of each two ounces; of lillies of the valley, rofes, and violets, each one ounce; of cubebs, cardamoms, grains of paradife, and yellow faunders, carpobalfamum, florentine iris, faffron, favory, piony-flowers, and thyme, of each half an ounce; of liquid ftorax, ftorax-calamita, oppoponax, bdellium, galbanum, gum ivy, and labdanum, of each fix drams; roots of long birth-wort and piony, and oil of turpentine, fpikenard, coftus, juniper, bays, maftich, ben, and fpike, of each five drams. The dry ingredients are to be beaten to powder, then mixed with the reft, and a fufficient quantity of water being added the whole is to be diftilled by an alembic, and the oil carefully feparated from the water. The method of ufing it is this: The firft two months the paffages of the ears and noftrils are to be anointed with the bignefs of a pea of it every day; then for two months longer, the fame is to be repeated every third day; after this, it is to be ufed once a week, then once a fortnight, till a year is expired; and after this it is to be ufed once in two months for the fucceeding years. This is the account of Sennertus. *Sennert.* Pract. L. 1. c. 5.

MNEMONIC *Tables*. Among the artifices to affift the memory, this is one of great ufe.

Mnemonic Tables exhibit in a regular manner, what is to be remembered of the fame fubject. And altho' the fciences ought to be taught in a fcientifical manner, as much as poffible, and that every thing fhould be fo placed as to be intelligible and demonftrable from what has preceded it; yet tables ought not to be rejected, as they are helps to retain the doctrines of which the mind has had fufficient evidence[a]. In fuch tables the properties of things are to be expreffed concifely; illuftrations and demonftrations fhould be left out, as the propofition ought to have been made fufficiently clear and certain, before it is regiftred in the table. Hence the contents of fuch tables ought only to be the definitions, and the propofitions relative to the fubject. If a fubject require a long table, this may be fubdivided into fmaller; by making firft a table of the moft general heads, and referring from each

each of these heads to a separate table; by this means the order and connexion of the whole will be preserved. Such tables would produce a local and artificial memory, of great use to the retention and recollection of things. They would greatly facilitate a distinct view of the properties of their subjects, and facilitate recapitulation. Besides, as the expressions used in such tables ought to be very concise, so as just to be sufficient to excite the idea of the object to be remembered, soon after that idea has been acquired; after some time a certain obscurity will be found in perusing the tables, which will give us timely warning that our ideas begin to fade, and that they ought to be renewed. And this may be done without much trouble, if not too long delayed [b].—[a *Wolf*. Psycol. Empir. §. 200. not. p. 140. [b] Vid. Tabul. Mnem. Constrúct. & usus ap. *Wolf*. Horæ subseciv. Marburg. An. 1730. Trim. Æstiv. p. 468. seq.]

MNIUM, in natural history, the name of a genus of mosses, the characters of which are these: It has heads of two different kinds, the one sort naked and dusty, having no calyptra or other covering; the others are regular capsules, like those of the hypnum and bryum, containing a fine powder, and covered with a calyptra or hood. This diversity in the fructification distinguishes the *Mnia* from all the other mosses; but these diversly constructed heads are in some species found on the same plants; in others, on different ones of the same species, as the male and female flowers are in hemp, mercury, and many other of the larger plants. The stalks which support the membranaceous heads are long, and naked; those which support the naked heads, are in some naked, in others covered with leaves; but they are in all shorter than the others. See Tab. of Mosses, N°. 7. *Dillen*. Hist. Mosc. p. 230.

It is the general opinion, that the fine powder inclosed in the capsules of the hypnum and bryum, is of the nature of the farina fœcundans of the flowers of plants, and serves to impregnate the buds or young shoots in the alæ of the leaves, which are the female part of the fructification in this class of plants; and in this sense the membranaceous heads of the *Mnia* contain a like farina, which impregnates the globules in these naked heads, and qualifies them for acting as seeds or young plants; but all this is rather hypothesis and conjecture than observation; tho' Dillenius does suppose he has seen the germination from the globules of the dusty heads in one species of the *Mnium*. Haller says, that these dusty heads are only so many congeries of young plants when viewed with good glasses, and that therefore the *Mnium* is not properly a genus of plants, but should be referred to the bryums, to which it belongs. All this however is yet but lightly founded, and the more natural opinion seems to be that of supposing the powder in the capsules of all the mosses a true seed, not a farina. *Haller*. Helvet. p. 81. See the article Moss.

There are properly two orders of the *Mniums*. Those of the first order are erect; those of the latter procumbent, or creeping. Of the first order there are four known species: 1. The common narrow and short-leav'd *Mnium*: This is a very small moss, it grows in tufts, and produces stalks from a third of an inch to an inch in length; from these in March and April there are produced dusty or naked heads, of the size of poppy seeds. These soon ripen and shed their dust; but the membranaceous capsules arrive at their maturity more slowly, and retain their perfect state much longer: these are much less frequent than the dusty naked heads, but they usually grow upon the same stalks. 2. The transparent mother of thyme leaved *Mnium*: This seldom rises to more than an inch in height, and is very common about the bottoms of rocks and roots of trees. 3. The common large upright and forked bog *Mnium*: This is three inches high in a flourishing state, and has all its branches bifurcated: It is common in boggy places. 4. The greater bog *Mnium*, with many heads: This is less branched than the former, and has very numerous dusty heads.

Of the creeping or procumbent *Mniums*, there are only three known species: 1. The transparent trichomanes-leaved *Mnium*, with uncut leaves: This is a very elegant plant, and is common in boggy places. 2. The transparent trichomanes-like *Mnium*, with divided leaves: This is common about Hampstead and Highgate. And, 3. The lichen-leaved *Mnium*: This grows in shady places, and has the dusty heads at the extremities of the leaves.

MOAR-*Loore*, in husbandry, a term used to express a peculiar distemperature of corn, generally comprehended under the common term of a blight. In this case the earth sinks away from the roots of the corn, and leaves the plant standing in great part above ground with naked roots; these being too weak to support the stalks, the plants fall and the ears become light. This is a distemperature peculiar to corn growing on light and loose lands. *Tull*'s Horsehoeing Husbandry.

The remedy is this: Turn a shallow furrow against the rows, when they are strong enough to bear it, and the mold is fine and dry, the motion of the stalks with the wind will draw in this loose powder, and it will spread itself equally among all the plants of the row, tho' it be triple or quadruple. It is easy to see that this remedy is only practicable in the method of the horsehoeing husbandry; for in the common way of sowing, there is no means of relief in this case. And in general, the horsehoeing husbandry prevents the falling of the wheat; the stalks never drooping so absolutely in the drill'd wheat as they do in that sown in the common way.

MOARING, at sea. See the article Mooring, *Cycl.*

MOBILES, in the antient music, was an appellation given to the two intermediate chords of a tetrachord; because their variations produced the different genera and species of music [a]. They were called by the Greeks κινητοι, or κινουμενοι [b].—[a Vid. Phil. Transf. N°. 481. p. 270, 271. [b] *Wallis*'s Append. ad Ptol. Harm. p. 159.]

MOCHLICA, a term by which some authors call the violent or drastic purges.

MOEHRINGIA, in botany, the name of a genus of plants described by Linnæus; the characters of which are these: The perianthium stands expanded, and is composed of four leaves of a lanceolated figure. The flower is composed of four petals of an oval figure not indented at the ends, and smaller than the segments of the cup. The stamina are eight capillary filaments; the antheræ are simple; the germen of the pistil is globose; the styles are two, they are erect and of the length of the stamina; the stigmata are simple. The fruit is a globose capsule, composed of four valves, but having only one cell in which are several seeds, convex on one side and angular on the other. *Linnæi* Gen. Pl. p. 167.

MOCHUS, in botany, a name used by some authors for the orobus or bitter vetch. Dodonæus, among others, calls it by this name. *Ger*. Emac. Ind. 2.

MOCK-*Bird*, the name of an American bird of the merula kind, and very much approaching to the cæruleus or blauvogel. It is of the size of the common lark: Its beak is short, and strait; its tail very long; and its whole body of a very fine deep blue. *Ray*'s Ornith. p. 142.

Mock-*Lead*, in mineralogy, a name given by the English writers to a sort of fossil, called also *blende* and *galena*. It has very much the appearance of an ore of lead, being bright and glossy, of a bluish black colour, and plated; but on trial it is found to yield very little or none at all of that metal.

MODERATA *Misericordia*, in law, a writ that lies for him who is amerced in a court-baron, or other court not of record, for any transgression, beyond the quality or quantity of the offence. It is directed to the lord of the court, or his bailiff, commanding them to take a *moderate amercement* of the party. This writ is founded upon *Magna Charta*.

If a man be amerced in a court-baron, on presentment by the jury, where he did not any trespass, he shall not have this writ, unless the amercement be excessive and outrageous: And if the steward of the court, of his own head, will amerce any tenant or other person without cause, the party ought not to sue for this writ of *Moderata Misericordia* if he be distrained for that amercement; but he shall have action of trespass. New. Nat. Br. 167.

When the amercement which is set on a person is affeered by his peers, this writ of *Moderatæ Misericordiæ* doth not lie; for then it is according to the statute 10 Edw. II.

MODERATOR (*Cycl.*)—Moderator-*Ring*, in anatomy, is used by Valsalva for that ring which the muscles of the eye make round the optic nerve, at the bottom of the orbit. He alledges, that the exterior fibres of these muscles which rise from the nerve, must shorten it when they contract, and when the interior fibres act they must compress it; so that these different fibres of the muscles affect the nervous fluid here very differently.

Valsalva also describes such another ring made round the motory nerves of the eye; but acknowledges, that it is neither so remarkable nor distinct as the former. Med. Ess. Edinb. abr. Vol. 2. p. 410, 411.

MODERN-*Music*, *Musica moderna*, may be divided into two parts: First, *Antiquo-Moderna*, which is generally a serious sort of music, consisting of many parts; and which has been in use from Guido's time, to the beginning of the last century. Secondly, the *Modern* which has been used in this and the last century: It is very different from the *Antiquo-Moderna*, being brisker, lighter, gayer, and more sprightly.

MODIOLI, in natural history, a name given by some authors to the trochitæ or single joints of the rays of the petrified magellanic star-fish, which when connected in numbers together form that fossil called *entrochus*. Others also have used this word *Modiolus* to express the compound body, or entrochus itself. Tho' the general form of the trochitæ be thin and flat, yet they are sometimes found considerably thick; and tho' the entrochi or compound *Modioli* are usually so many cylinders of equal diameter in all parts, yet there are sometimes found such as are thick in the middle, and thence gradually taper to each end; some also are composed of joints, each of this form; these differ very greatly from the common kind, and instead of consisting of a number of little wheels are made up of a series of little barrels, joined, as it were, end to end.

Among large quantities of these some are found ornamented with what naturalists call the summitates or fastigia, which are long and slender pieces, and have a little button at the top.

All entrochi have a central cavity, or hollow, running thro' the whole length; and they are of different fpecies, according to authors, as this cavity differs in fize and figure. It is fometimes a mere point in the center of the ftone, and fometimes takes up a third part or more of its bulk. In fome places there are indeed found entrochi which are perfectly hollow, being only a thin cruft; of thefe, fome are perfectly fmooth and even on the furface, and others are in the common way, made up of rings, or marked with deep circular furrows. The hole in thofe *Modioli* which are thicker, is fometimes round, fometimes formed like a cinquefoil-leaf; but this laft is more rarely met with, and is called by fome of the later writers on foffils, *entrocho-afteria*, the ftarry entrochus, to diftinguifh it from the common kind. The roots, as they are called, of the entrochi have very often a configuration which leads to this; they have ufually five feet, and from each foot there paffes inwardly a little furrow to the top of the ftone. This may very well give birth to the five enlargements of the central hollow in the others, and make them *entrocho-afteriæ*. There is a fcarce fpecies found fometimes on Mendip-hills, which has fix hollows inftead of the five of the other, and thefe all terminate in angles, fo that the whole is a fexangular hollow, whereas the cinquefoil inlets are ufually round as the leaf whofe name they bear, thu' fome few of them have fharp angles. Phil. Tranf. N°. 129.

The joints and fockets by which the entrochi are joined together are very various, for as feveral rays fhooting from a center muft of neceffity have confiderable wideneffes between them, as they pafs toward the circumference, according to the bignefs; fo to fill up thofe wide fpaces in fome, between two rays there iffues from the center a third ray, which paffes as the others to the circumference of the ftone. Some have their rays gently widening from the center all the way to the circumference: In fome, between two forks, made by a ray that parted fingle from the center but divides afterwards, there rifes alfo a little ray which runs to the circumference: And fome others are ramofe, having a trunk rifing from the center, with three, four, or five branches, running to the circumference: Some alfo are fmooth half way of the ftone from the center, and have a circle of fmall rays near the circumference; and fome are perfectly fmooth, and have no rays at all. Thefe are ufually very thick, and are joined together in the entrochus after this manner: One trochite, or fimple *modiolus*, a little within the outer circle, in the upper and lower parts, where the rays ufe to be, has round inlets or fockets confiderably deep, fo that only a thin tympanum hinders the trochite from being hollow at this width all through; and in the middle of this tympanum there is a hole as in the other trochitæ, which is fometimes round, and fometimes of a pentangular figure. The trochites that anfwer this, have fmooth joints on both fides, without any fkrew-like ridges entering into thefe fockets, thofe joints being hollow alfo; and fo other trochitæ with fockets come on again upon thefe; and thus the entrochus is made up. Some of thefe *Modioli* have both fockets and rays, and fome have a focket alone on one fide, and rays without a focket on the other. Finally, fome are perfectly fmooth, only that a fmall ridge runs round them, a little within the outer circle, which enters into a fmall furrow anfwering to it; and fome are fmooth and joined only *per harmoniam*. Some of the trochitæ hold of an equal thicknefs from the center to the circumference, and others are confiderably thick at the circumference, and thence grow gradually thinner to the central cavity, at the verge of which, all round, they make a fort of edge. Thefe have concavities on both fides, to which convexities in the adjoining trochitæ anfwer: Some hold of an equal thicknefs half way from the circumference toward the center of the ftone, but they then grow thin, and continue fo to the very verge of the cavity.

Befide the generality of thefe trochitæ which are round, there are others found which are of an oval figure, fome rounded at the ends, and fome pointed; thefe have their central cavity as well as the others, and fome have it very fmall, others very large. In thefe it is always oblong, according to the fhape of the ftone, not round, as in the round ones. Thefe ufually are not joined in the entrochus by means of rays, but have a ridge running all along the verge in one, which is received into a furrow in the other. Some of thefe joints are fhaped with a double oval, the oval of the upper part of them ftanding contrary to the oval in the lower: in others, the ovals do not ftand fo entirely oppofite one to another, but only the oval in the upper part feems a little wrefted from the direct line of the oval of the lower part, fo that they ftand bendwife to each other, and make up a figure like a St. Andrew's crofs. There are entrochi made up in this manner, and it is in general obferved, that moft of the oval entrochi grow crooked and twifting. Thefe oval ones are found lefs frequently in the entrochus ftate, than in the fingle trochites; but they are fometimes met with, and are liable to all the accidents in figure and furface of the common round ones. The obfervations of the manner of joining of the feveral trochitæ into the entrochus, and of the rays and fpaces, with the manner of filling up the latter, and the various divarications of the former, are a very pleafing obfervation; but it is neceffary, in many cafes, to have recourfe to the affiftance of glaffes for the perfectly underftanding them, the naked eye lofing a great part of the ftructure.

MODIRA *Kaniram*, in botany, a name given by fome authors to the tree, whofe wood is the *lignum colubrinum*, or fnake-wood of the fhops. Hort. Malab. vol. 8. p. 47.

MODULUS *of the logarithmic Syftem*. See the article LOGARITHM.

MOFFAT *Waters*, mineral waters of confiderable efficacy at *Moffat*, in the county of Annandale. They arife from two fprings on the declivity of a hill, which yield about 1360 gallons of water daily. Thefe waters have a fulphureous tafte, and fmell of the wafhings of a gun-barrel; their colour is milky or bluifh. The feafon for ufing them is between the middle of April and the end of September; but they may be drank all winter, and if the rains be moderate, the ftrength of the water is not found to be impaired. The water of the upper fpring being too foul for drinking, is made ufe of for bathing, and is, for this purpofe, made fomewhat warmer than tepid. The quantities of water ufually drank are pretty large, exceeding fometimes a gallon. It is ufual to join purgatives, and that in great dofes, frequently repeated with the ufe of the waters; but this is thought unjuftifiable by fome [a]. The water is alterant and diuretic. Its purging is owing to the large quantities drank, or to fome fingularity in the conftitution, as a weak ftate of the ftomach and inteftines. Few medicines are faid to be fuperior to thefe waters in diforders of the ftomach and bowels. It has alfo proved ufeful in nephritic, nervous, and hyfteric colics, melancholy, barrennefs, female weakneffes and diforders, as alfo in old gleets, either natural, or caufed by venereal diforders. In rheumatic and fcorbutic complaints it is advantageous, and in cutaneous eruptions. It is faid feldom to fail in fcrophulous diforders [b]. This water gives no marks of a chalybeat nature with galls, nor of acidity with tincture of rofes, or fyrup of violets, neither does it produce any effervefcence with oil of tartar *per deliquium*, or fpirit of fal ammoniac. It feems to contain a fubtil volatile fulphur, but in fmall quantity, fince it foon lofes its remarkable fmell and tafte, when expofed to the air, and that acid liquors can neither feparate nor precipitate it. Upon evaporation there is found a dirty falt mixed with earth. This falt feems not to be nitre, nor fal ammoniac, but common falt, and by a flow evaporation of a folution of fea falt, cryftals not unlike thofe of the falt of *Moffat* water have been obtained [c].—[[a] Medic. Eff. abr. vol. 1. p. 99. [b] Ibid. p. 101. [c] Ibid. p. 103. feq. where other experiments on thefe waters may be feen.]

MOGORIN, in botany, a name given by the Portuguefe to an Indian or Chinefe flower, growing on a fmall fhrub. It is of a wonderful white colour, and not unlike the *gin-feng*, only that it abounds more with leaves, and fmells much fweeter; one fingle flower filling a whole houfe with its odoriferous effluvia. On this account the Chinefe put a high value upon it, and carefully defend the fhrub it grows on from the inclemency of the winter, by covering it with vafes provided on purpofe. *Hofm.* Lex. in voc.

MOHAUKS *Corn*, in botany, a name given by the Indians to a peculiar fort of the maiz, or Indian corn. It is moft frequent in the more northerly parts of America. The general time of fowing the maiz in Virginia and other places, is in the end of April; but this *Mohauk* kind need not be fown before June, and yet will come well to maturity before the winter. The ftalks of this kind are fhorter than thofe of the common fort. The ears alfo are fhorter, and grow nearer the ground, and the corn is generally of various colours. Phil. Tranf. N°. 142.

MOIRE, in conchyliology, the mohair fhell, a name given by the French virtuofi to a peculiar fpecies of voluta, which feems of a clofely and finely reticulated texture, and refembles on the furface a piece of mohair, or a very clofe filk-worms web. See the article VOLUTA.

MOISTURE (*Cycl.*)—The *Moifture* of the air has confiderable effects on the human body. For the quantity and quality of the food, and the proportion of the meat to the drink, being given, the weight of a human body is lefs, and confequently its difcharges greater in dry weather than in wet weather; which may be thus accounted for: The *Moifture* of the air moiftens the fibres of the fkin, and leffens perfpiration, by leffening their vibratory motion. When perfpiration is thus leffened by the *Moifture* of the air, urine, indeed, is by degrees increafed, but not equally. See Dr. *Bryan Robinfon*'s Diff. on the Food and Difcharges of human Bodies, p. 68. feq.

Hence we learn, that to keep a body of the fame weight in wet weather as in dry, either the quantity of food muft be leffened, or the proportion of the meat to the drink increafed; and both thefe may be done by leffening the drink, without making any change in the meat.

MOLA, (*Cycl.*) a mole, or falfe conception, in medicine, is a membranaceous and fibrous concretion in the womb, containing ufually a large quantity of coagulated or thick blood. This is fometimes produced alone in the uterus, fometimes at the fame time with a regular fœtus. There are many origins to be affigned to thefe concretions, but the moft ufual feems to be the

the leaving behind of part of the fecundines after abortion. In young people thefe are lefs dangerous, and feldom remain in the womb more than a year, but in older perfons they fometimes remain many years, and at length often occafion the death of the perfon. When they are produced in the womb at the fame time with a regular fœtus, they ufually deprive it of part of its nutriment, and occafion falfe pains, and many irregular complaints, during the time of geftation; but thefe ufually are attended with fewer accidents at the time of delivery than when the fame fubftances are produced alone in the womb. The German writers of wonders give accounts of thefe concretions being living animals, armed with claws and beaks, or wide mouths, and deftroying the fœtus when they are in the womb at the fame time with one; but thefe are idle reports, and are to be looked upon in the fame light with the hiftories of Sooterkins. *Junk.* Confp. Med. p. 721.

The figns of a *Mole* in the uterus are very dubious, and during the firft months of geftation, it is fcarce poffible to diftinguifh it from a genuine fœtus; but after this, if the fymptoms of pregnancy go on, and there is no motion perceived at a time when the fœtus ought to ftir, it is fhrewdly to be fufpected that this is the cafe; and this becomes the more evident, if after this time there come on irregular and uncertain difcharges of blood from the uterus, at different times; in this cafe there is alfo ufually fo great a flaccidity in the ligaments of the uterus, that it does not retain its place in the body; but when the perfon turns in bed, is plainly felt falling like a dead weight from one fide of the abdomen to the other. It is alfo obferved, that in thefe cafes, tho' the belly fwells as much as when there is a genuine fœtus, yet it is not fo regularly rounded before, but is flatter at the middle, and more turgid toward the fides, fo that the burthen feems carried on one or the other fide, or partly in both, while the middle remains empty. There is always in this cafe alfo a fenfation of a weight on the lower part of the abdomen, greater by much than in the cafe of their being really a child there. At the regular time of delivery, the cafe becomes much plainer than before; for there then come on either no pains at all, or thofe which come are flight and inconfiderable, very irregular in their periods and returns, and by no means fufficient for the exclufion of a fœtus. When the *Mole* happens at the fame time with the fœtus, it is feldom to be difcovered till the time of delivery, or if it be found out fooner, there can be nothing done till both that and the fœtus are excluded; after this the womb is to be very carefully cleanfed, as in abortions. At other times, when the cafe is obvious, that there is a *Mole* without any fœtus, the common forcing medicines are to be given for feveral days every month, about the time of the periodic returns of the menfes; and if thefe do not bring it away, recourfe is to be had to the hand of the midwife. *Junker's* Confp. Med. p. 723.

We find a very fingular inftance in Kerkring, of a *Mole*, in which a child was enclofed. The whole was declared a falfe conception, and might have been facrificed as fuch, had not fome perfon prefent obferved fomething ftir within it, and, on the opening it, taken out the living child. *Kerkring*, Specil. Anat.

Mola, in zoology, the name of a fifh commonly called in Englifh, the *fun fifh*. It is of a very fingular figure. Its body is broad and fhort, and its hinder extremity is terminated by a circular fin, which ferves it for a tail; fo that it looks like the head of a large fifh fever'd from its body; it is frequently of two foot in length, and fometimes very much exceeds that fize, growing even to two hundred weight. It has no fcales, but is cover'd with a hard, harfh, and rough fkin. Its back is black, and its belly white; the fides are of a middle colour between both. Its back and belly both terminate in a narrow edge. Its mouth is very fmall for the fize of the fifh, and, when open, is round. Its jaws are hard, and edged like a knife within; externally they are rough, as if befet with feveral rows of fmall teeth. The head does not at all project from the reft of the body. The eyes are very fmall. It has only one pair of fins, which are fituated near the gills, which are only two elliptic holes covered with their proper membranes. Its flefh is very foft, and its bones are all grifly and tender. The fkin fticks very firmly to the flefh, and is not eafily taken off. It is caught in the Mediterranean, and fometimes in the Britifh feas. See Tab. of Fifhes, N°. 27. *Willughby's* Hift. Pifc. p. 151.

MOLAGO *Codi*, in botany, a name by which fome authors have called the plant which produces the common black pepper. Hort. Mal. vol. 8. p. 23.

MOLANGA, in botany, a name given by fome authors to the plant which produces the common black pepper. *Pifo.* Mant. Arom. p. 492.

MOLARES *Dentes* (*Cycl.*)— Thefe are twenty in number, five being placed on each fide of both jaws, immediately after the canini. The two firft in each row are fmall, the two next larger, as is alfo the laft, which appears very late, and is often wholly wanting. The *Molares* have been, according to this difference in their fize, diftinguifhed into fmall grinders, large grinders, and *dentes fapientiæ*, or the teeth of wifdom, fo called, becaufe they feldom appear till people are arrived at years of difcretion.

The bodies of the *Molares* in general are very thick, fhort, and irregularly cylindrical, or rather with four fides, a little rounded, and terminated by a broad end, more or lefs filled with obtufe points, cut, in fome meafure, like fo many diamonds. The name of *crown* is alfo frequently given to the bodies of thefe teeth, from fome fort of refemblance they are fuppofed to have to it. In the two fmall *Molares*, the crown is lefs than in the others, and often not fo large as the bodies of the canini: they have ufually but two points. In the two large *Molares*, the crown has a much greater extent, and the points are three, four, or five in number. The fifth grinder, or *dens fapientiæ*, has ufually a crown much like the two former, but commonly more rounded, and with fewer points. The roots of the *Molares* are long, and more or lefs flat; in fome fingle, in others two, three, or four, and fometimes, but rarely, five in number; fometimes all thefe roots are diftinct, fometimes they are wholly united, and fometimes they are united only in part; they are generally ftrait, and at a greater diftance from one another at their extremities than at the crown of the tooth. The roots of the fmall grinders appear often fingle, without being fo in reality; for in examining them narrowly, they are found to have two roots united, or foldered together; and fometimes all the diftinction that appears, is in their having two feparate points. The great *Molares* have commonly feveral roots, the firft three, and the fecond four; or fometimes, the firft four, and the fecond five; but thefe numbers are variable. The roots are fometimes all perfectly diftinct, and fometimes they are partly diftinct, and partly united in the fame tooth in different degrees; and in fome fubjects, one or more of their points are bent outward, inward, or in other directions; and it is not always that more roots are met with in the upper teeth than in the lower. The fifth grinder has often but one root, and that is fometimes very fhort, and fometimes remarkably long. It is common to meet with this tooth in grown perfons almoft wholly hid in its focket, and it has, in thefe cafes, but a very fmall opening for it to appear at. In all the *Molares*, near the collar, the roots, be they ever fo many, meet and unite into one body. *Winflow's* Anatomy, p. 43.

Molares, in the natural hiftory of the antients, the name for the compound mineral bodies we now call *pyritæ* and *marcafites*. See the articles Pyritæ, and Marcasite.

MOLDAVICA, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf, and is of the labiated kind. The upper lip is fomewhat arched, bifid at the extremity, and turned upwards; the lower one is alfo bifid, and both of them terminate in marginated edges, refembling the mouth of fome animal. The cup is tubulated, and ufually divided into two unequal lips. The piftil arifes from this, and is fixed in the manner of a nail to the hinder part of the flower, and furrounded by four embryos, which ripen into oblong feeds, and are contained in the cup of the flower.

The fpecies of *Moldavica*, enumerated by Mr. Tournefort, are thefe: 1. The blue-flowered betony-leaved *Moldavica*. 2. The white-flowered betony-leaved *Moldavica*. 3. The betony-leaved *Moldavica*, with flefh-coloured flowers: And 4. The ftrong-fcented trefoil *Moldavica* of America, called by fome, the balm of Gilead plant, from its fmell. *Tourn.* Inft. p. 184.

MOLE, *Talpa*, in zoology. See the article Talpa.

Mole, *Mola*, in medicine. See the article Mola.

Mole-*Hills*. Thefe little hillocks of earth are a very great prejudice to the pafture lands, not only in wafting fo much of the land as they cover, but in hindering the fcythe in mowing. In the weft of England they ufe a peculiar inftrument for the breaking up of thefe; it is a flat board, very thick, and of about eight inches in diameter, into which there is faftened a perpendicular handle of three or four foot long. It has four broad and fharp iron teeth at the front, which readily cut through the hill, and fpread the earth it confifts of; and behind there is a large knob, proper for breaking the clods with, if there are any. Some ufe a fpade, or other common inftrument, in the place of this, but not fo well. There is, however, a much better inftrument even than this, for deftroying thefe hills, where they are in very great numbers. This is a kind of horfe machine; it has a fharp iron about three foot over, and with a ftrong back. It is about four or five inches broad, and has two long handles for a horfe to be harneffed to, and a crofs bar of iron to ftrengthen it at the bottom of the handles, reaching from the one handle to the other. The middle of this crofs bar is furnifhed with one, two, or more, fharp pieces of iron, like fmall plow-fhares, to cut the *Mole-hills* into two, three, or more parts. The iron behind is of a femicircular figure. A fingle horfe is harnefs'd to this machine, and a boy muft be employed to drive it, and a man to hold and guide it; the fharp irons or fhares are the firft things that meet the hill, they run through it, break its texture, and cut it into feveral parts, and the circular iron following immediately behind them, cuts up the whole by the roots, and leaves the land level. This inftrument will deftroy as many *Mole-hills* in one day as a common labourer can in eight, and would be of very great advantage to the kingdom, if brought into general ufe. *Mortimer's* Hufbandry, p. 331.

It is to be obferved, that this leaving a naked fpace in the place of every hill, it will be neceffary to go over the land, and fow them with hay-feed, otherwife thefe fpots will want the

the produce of grafs the firft years. The farmers in fome parts of England are not willing to deftroy the *Mole-hills*, but let them ftand from year to year, fuppofing that they get fome ground by them; but the advantage by this means is fo little that it does not ballance the unfightlinefs and damage to the mowing.

MOLE-*Cricket*. See the article GRYLLOTALPA.

MOLES-*Carnea*, in anatomy, a name given by Vefalius, and others, to a mufcle, called by Winflow, Albinus, and others, the *complexus*. Spigelius calls it the *Carnea Moles Trigemino adjuncta*. See the article COMPLEXUS.

MOLES *Carnea Labia formans*, in anatomy, a name given by Fallopius to the mufcle called by Albinus *orbicularis oris*, and by Cowper *conftrictor labiorum*.

MOLLE, in botany, the name of a genus of plants: The characters of which are thefe: The flower is of the rofaceous kind, or compofed of a number of petals arranged in a circular form; the piftil finally becomes a fruit refembling a grain of pepper. *Tourn.* Inft. p. 661.

There is only one known fpecies of this genus, which is the *Molle* of Clufius, called by Cafpar Bauhine the Peruvian lentifk.

MOLLE, in ichthyography the name of a fmall fpecies of whiting, common in the Mediterranean, and in the markets of Rome, Venice, &c. and called by authors the *Afellus omnium minimus*, and the *merlangus*. It is the fmalleft of all the afellus kind, feldom exceeding four inches in length; it has a beard like the cod, hanging from the angle of its lower jaw; and has on each fide nine fpots on its nofe and gills; the back is of a pale brown, the belly white, and it has extremely fmall and foft fcales. The flefh is very delicate. *Ray*'s Ichthyogr. p. 171.

MOLLE, in the antient mufic, a name given to a fpecies of the diatonic; and alfo to a fpecies of the chromatic. See the articles DIATONIC, and CHROMATIC.

The Greeks called it μαλακον, and ufed the term in oppofition to *intenfum*, συντονον. As the latter was formed by increafing the tenfion of the chord, and thereby making it approach nearer to the higheft extreme of the tetrachord, fo the *Molle* was formed by remiffion or relaxation. Hence the divifion of the diatonic into *Molle*, μαλακον, and *intenfum*, συντονον. *Ariftoxenus*, p. 50, 51. edit. Meibom. See the articles DIATONIC, and GENUS.

MOLMAN, in our old writers, a man fubject to do fervice. It is applied to the fervants in a monaftery. *Spelm.* Gloff. *Blount.*

MOLOCH, an effected term ufed by fome chemical writers, to exprefs a leaden pot, through which mercury is made to pafs in the fire.

MOLOCH, in antiquity, the name of the Phœnician god. See the article DÆMON, *Cycl.*

MOLOCHITES, in natural hiftory. See the article MALACHITES.

MOLOPS, a word ufed by fome medical writers, to exprefs the purple fpots which appear upon the fkin in malignant fevers.

MOLOSSES (*Cycl.*)—*Artificial* MOLOSSES. There has been found a method of making *Moloffes* from apples, without the addition of fugar. The apple that fucceeds beft in this operation is a fummer-fweeting of a middle fize, pleafant to the tafte, and fo full of juice, that feven bufhels will yield a barrel of cyder.

The manner of making it is this: The apples are to be ground and preffed, then the juice is to be boiled in a large copper, till three quarters of it be evaporated: This will be done with a moderate fire in about fix hours, with the quantity of juice above-mentioned; by this time it will be of the confiftence and tafte as well as of the colour of *Moloffes*.

This new *Moloffes* ferves to all the purpofes of the common kind, and is of great ufe in preferving cyder. Two quarts of it put into a barrel of racked cyder, will preferve it, and give it an agreeable colour.

The invention of this kind of *Moloffes* was owing to Mr. Chandler of Woodftock in New-England, who living at a diftance from the fea, and where the common *Moloffes* was very dear and fcarce, provided this for the fupply of his own family, and foon made the practice general among the people of the neighbourhood. It is to be obferved, that this fort of apple the fweeting, is of great ufe in making cyder, one of the very beft kinds we know being made of it. The people in New-England alfo feed their hogs with the fallings of their orchards of thefe apples; and the confequence of this is, that their pork is the fineft in the world. Phil. Tranf. N°. 374. p. 230.

MOLOSSES *Spirit*; a very clean and pure fpirit, much ufed in England, and made from *Moloffes* or common treacle diffolved in water, and fermented in the fame manner as malt for the common malt-fpirit. If fome particular art is not ufed in the making this, it will not prove fo vinous as the malt-fpirit, but more flat and lefs pungent and acid, tho' otherwife much cleaner tafted, as its effential oil is of a lefs naufeous flavour. Whence if good frefh wine leys, abounding in tartar, be duly fermented in the folution made thin for that purpofe, the fpirit will by that means become much more vinous and brifk, and approach more to the nature of the foreign fpirits.

After the firft diftilling of *Moloffes* fpirits from the wafh into low wines; it is to be rectified, and in the fucceeding rectifications proper additions are to be made. Alkaline falts, fo common in the rectifying the malt fpirits, muft be avoided in this cafe, as not at all fuiting this fpirit, and the neutral ones only muft be ufed, fuch as fandiver, common decrepitated falt, fal enixum Paracelfi, and the like; but upon the whole nothing fo confiderable is to be expected from thefe falts, as from a careful rectification in balneo mariæ, without any other admixture; by this alone repeated two or three times with frefh water each time, the fpirit will at once be made fit for the niceft ufes.

Where the *Moloffes* fpirit is brought to the common proof ftrength, if it be found not to have enough of the vinofity in it, it will be very proper to add to it fome good fpiritus nitri dulcis; and if the fpirit be clean worked, it may by this addition alone be made to pafs on ordinary judgments for French brandy.

When newly diftilled, this fpirit like all others is colourlefs, and limpid as water; but our diftillers always give it the fame fort of yellow tinge, which the foreign fpirits are found to obtain from the cafks they are fent over in. They have many ways of giving this colour extempore; but the two moft in ufe are, either by an extract of oak-wood, or by burnt fugar. *Moloffes* fpirit coming dearer than that of malt, it is frequently met with bafely adulterated with a mixture of that fpirit, and indeed feldom is to be bought without fome dafh of it. Many have a way of mixing malt in the fermenting liquor, by this the yield of the whole is greatly increafed, and the maker may affure the buyer that the fpirit is pure as it ran from the worm.

England is the principal place where this fpirit is made at this time; it was at one time prepared in great quantities in France, efpecially in the river Loire; but it is now forbid there, under a fevere penalty. In Holland alfo they have it not, on account of the high duty laid upon treacle in favour of their own fugar-bakers.

We meet with very little of *Moloffes* fpirit reduced to the ftrength of alcohol or fpirit of wine, tho', when rectified to this ftate in a proper manner, it is very little inferior to the real alcohol of wine, the name of which is fo well known among us, tho' the thing itfelf is perhaps never feen here. All that we call fpirit of wine being no other than malt fpirit reduced to an imperfect alcohol, or a fpirit almoft totally inflammable. Great quantities of *Moloffes* fpirit are ufed in the adulterating of brandy, rum, and arrack; and great quantities are ufed alone in the making cherry-brandy and other drams by infufion, in all which many prefer it even to the foreign fpirits.

In moft of the nice cafes in our compound diftillery the *Moloffes* fpirit fupplys the place of a pure and clean malt fpirit, which we have not yet the way of producing in the large way to advantage. Our cinnamon, citron, and other fine cordial-waters, are made with it; for the malt fpirit would give thefe a very difagreeable flavour.

There is alfo another ufe to which this fpirit ferves extremely well, and which even a foreign fpirit that has any remarkable flavour will not do fo well in; this is the making the extemporaneous wine, which fome people are fo fond of. See the article *Extemporaneous* WINE.

It gives a yellow ftain to the hands, or other fubftances dipped into it; and may therefore be of ufe in dying. It is poffible alfo, that the vinegar-makers may find ufe for it in their way; but the moft advantageous of all its ufes, is to the diftiller himfelf, a quantity of it added to new treacle intended for fermentation will be of great ufe in the procefs, and increafe very confiderably the quantity of fpirit; but the proportion in regard to the new matter muft not be too great. *Shaw*'s Effay on Diftillery.

MOLTEN-*Greafe*, in the manege, is a fermentation or ebullition of pituitous and impure humours, which precipitate and difembogue into the guts, and oftentimes kill a horfe. This difeafe does not commonly feize upon any but very fat horfes, when over-rid in very hot weather.

MOLVA, in zoology, a name by which fome authors have called the common cod-fifh, called the *morhua*, and *afellus major* by other writers. *Gefner* de Pifc. p. 102. See the article COD-*Fifh*.

MOLUCCA, in botany, the name of a genus of plants; the characters of which are thefe: The flower confifts of one leaf, and is of the labiated kind; the upper lip is hollowed in the manner of a fpoon, and the lower is divided into three fegments. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and furrounded by four embryos, which afterwards become four angular feeds, ripening in a bell-fafhioned open capfule, which was before the cup of the flower. See Tab. 1. of Botany, Claff. 4.

The fpecies of *Molucca*, enumerated by Mr. Tournefort, are thefe: 1. The fmooth *Molucca*. 2. The prickly *Molucca*. And, 3. The fhrubby *Molucca* of Sicily, called by fome authors fhrubby balm. *Tourn.* Inft. p. 187.

Thefe plants are otherwife denominated *Anacardiums*. See the article ANACARDIUM.

MOLUCCA-*Beans*, a name given by Sir Robert Sibbald, in his prodromus; and by Mr. Wallace, in his defcription of the Orkney-iflands, to a fort of fruit frequently caft on fhore in the north-weft iflands of Scotland; efpecially on the coafts moft expofed to the waves of the great ocean.

They are called by fome Orkney-beans, and are not the produce of that ifland, or indeed of any other part of Europe, but of America.

Sir Hans Sloane procured four fpecies of them little injured by the fea, and found on examination that three of them were the common produce of the ifland of Jamaica; where he had himfelf gathered them, and defcribed them in his catalogue and hiftory.

The firft fort was a kind of kidney-bean, and the plant which produces it is defcribed by Sir Hans under the name of the great perennial kidney-bean with a great crooked lobe. It is alfo figured in the Hortus Malabaricus, by the name of *Perim Kakuvalli*, and Sir Robert Sibbald alfo calls it *Nux Indica ex qua Pyxides pro pulvere fternutatorio parant*. This is a native of the Eaft and Weft-Indies, and is fometimes found thrown on fhore in the county of Kerry in Ireland; and in fome other places.

A fecond kind of fruit thrown on fhore in the Orkneys, is a very common fruit in Jamaica, known there by the name of the horfe-eye bean; it has this name from its refembling the eye of fome large animal by reafon of a hilus or welt which furrounds it. This is defcribed by many authors, and among the reft by Sir Hans Sloane, in his catalogue of the Jamaica plants; and is found in many other of the hotter parts, both of the Eaft and Weft-Indies.

A third kind of fruit found on thefe fhores, is that called by the people of Jamaica the afh-coloured nickar-nut; it has this name from its colour, and from its being perfectly round and of the fhape of a nickar or marble, fuch as boys play with: This alfo is common to the Eaft and Weft-Indies.

A fourth kind is alfo a Jamaica fruit, with the hiftory of which we are not yet well acquainted; no body has feen it growing, but the fruit itfelf is preferved in many of the collections of the curious, and has been figured and defcribed by Clufius, and others, under the name of a round exotic fruit ridged with four rifing nerves.

Thefe are the principal kinds of fruit thus toffed on fhore with us; but how the products of Jamaica, or other parts of America, fhould be brought to the fhores of Scotland and Ireland, feems not eafy to determine on any certain foundation. It is eafy to conceive, that when they grow by the fides of rivers they may fall off from the trees into them, and be thence conveyed into the fea. It is likewife eafy to fee, that when they are thus floating on the furface of the fea they may be carried about by the winds and currents, and be carried a great way; but their journey this way muft naturally be ftopped by the main continent of America, and they muft be forced through the gulf of Florida, or the canal of Bahama, going thence conftantly eaft, and into the North-American fea. This is eafily conceived by a fimilar fact which happens every day: which is, that a kind of fea-lentil, called *fargaffo*, which grows very plentifully on the rocks about Jamaica, is wafhed off from thence and carried by the winds and currents, which for the moft part go impetuoufly the fame way, toward the coaft of Florida, and thence into the North-American ocean; and are there found floating on the furface. Thus far it is eafy to trace our fruits from their native foil; but how after this they fhould make the reft of their voyage is a great myftery, and not to be accounted for by us, unlefs we fuppofe, that as fhips when they go fouth expect a trade eafterly wind, and when they come north expect and generally find a wefterly wind, for at leaft two parts in three of the year; fo we are to fuppofe thefe fruits being brought north by the current from the gulf of Florida, are put into thefe wefterly winds way, and by them conveyed to the coafts of Scotland and Ireland. Philof. Tranf. N°. 222. p. 300.

By the fame means that thefe beans came to Scotland, it is reafonable to believe that the fame winds and currents brought from America thofe feveral things towards the Azores and Porto Santo, which are recorded by Ferdinand Columbus, in the life of his father; which gave this bold adventurer the firft notions of there being fuch a place as America. The things he mentions as wafhed afhore in this manner, were a piece of wood very ingenioufly wrought, but evidently without the help of iron tools. This was taken up by a Portuguefe pilot, four hundred and fifty leagues from fhore, off cape St. Vincent, after a weft wind, which had blown violently for many days: After this fuch another piece of wood was taken up on the fhores of Porto Santo, after fuch another long and violent weft wind. After this large canes, vaftly fuperior to any of the growth of the then known parts of the world, were found thrown on the fame fhores, and the fruits of pines which did not grow in any known part of the world; and finally the bodies of two men appearing to be of a different nation from any of the known people, and two of their canoes, were driven on fhore on the ifland Flores, one of Azores. All thefe things having been found only after ftrong and continued weft winds, it appeared very evident, that there muft be land fomewhere to the weft, where fruits and men were to be found; and that thefe men had no knowledge of our arts, by their want of iron. It was eafy to fee from this how ufeful we might be to them, if they could furnifh us with any thing of value. And on this plan was founded the greateft difcovery of the modern times.

MOLY. The name of this plant is rendered famous by Homer, and has been on this occafion much enquired into as to its true fenfe, by the botanifts of almoft all times. The old interpreters of Homer all explain this word by the wild rue; and the only reafon for this is, that at fome time, probably long after the days of Homer, the people of Cappadocia called the wild rue *Moly*. But this plant is wholly different from the *Moly* of Homer, which Theophraftus affirms grew in his time in Arcadia, in great plenty, and had a round bulbous root like an onion, and long and graffy leaves like the fquill.

The authority of this author, who wrote profeffedly on the fubject of plants, and wrote fo early, is fufficient to explode the abfurd opinion of the *Moly* of Homer, being wild rue; but tho' the commentators are thus eafily fet afide, there is yet another author who will lead into no lefs errors. This is Pliny, who has blended together the accounts of all the writers before him on this fubject; and as they have contradicted one another, he has preferved all their contradictions. After telling us the fabulous ftory of its being found out by the god Mercury, and being good againft witchcraft and the like, he tranflates the words of Theophraftus, that it grows about Phineas and Cyllene, in Arcadia; and has a round and black root of the fhape of an onion, and leaves like the fquill. To this Theophraftus has added, that it is not however difficult to be dug up, as Homer feems to think; but Pliny, to make Theophraftus and Homer agree at any rate, leaves out the word *not* in his tranflation, and fays, that it is very difficult to be dug up. *Pliny*, L. 25. c. 4.

The phyficians of Italy, in the time of Pliny, were fond of believing that they had the true *Moly* of Homer growing in the Campania of Rome; and Pliny feems to have been alfo wholly convinced of it; and mentions as a reafon of his conviction, that they had brought to him a root of *Moly*, which was dug up with prodigious difficulty from among rocks and ftones, and which, when he faw it, meafured thirty foot long, yet was not compleat, but broken off at the end; fo that it might poffibly have been much longer. The author's fkill in botany appears to have been very little, that could make him believe, becaufe of the fingle obfervation of the difficulty of getting it up, that this was the true *Moly* which he had juft before defcribed from Theophraftus, as having a round root like an onion.

It is probable that this was the root of the faint-foin or lucerne, both thefe plants growing wild in Italy, and both having roots of a prodigious length, probably not lefs than that here mentioned by Pliny; but that he could fuppofe thefe roots to be of the bulbous kind, fhews an ignorance that but ill agrees with the veneration fome people have for this author.

This plant had nothing in common with the *Moly* of Homer and that of Theophraftus, excepting the difficulty of getting it up, which Theophraftus denys to be a truth; and in which probably Homer was mifinformed, as no bulbous root can be very difficult to get up; but Pliny, that the Roman root might agree with the true *Moly*, firft compels Theophraftus againft the letter of his own account, to fay *Moly* was hard to be dug up, and then makes this a reafon for a plant's being the true *Moly*, which does not appear to have had any one character in common with it. Nature is uniform in her productions, and tho' a bulbous plant fuch as the *Moly* of Theophraftus, would naturally have graffy leaves, as all bulbous plants have; yet this long-rooted plant, defcribed by Pliny, in the common courfe of nature could not have fuch, but probably had either pennated or trifoliate leaves.

Pliny adds, that the Greek authors have made the flowers of the *Moly* yellow, whereas Homer fays that they were white; but it does not appear that this is a juft accufation, for neither any of the Greek writers extant at this time, nor any of the fragments of others which we find recorded, exprefs any fuch thing: On the contrary, the whitenefs of the flower feems to have been always looked upon as one of the great and effential characters of the *Moly*; and the wild rue feems to have been fuppofed the *Moly* of Homer, only becaufe it has white flowers, and roots black on the outfide. The error of Pliny in fuppofing the Greeks to have called the flowers of the *Moly* yellow, feems to have arifen from a Greek writer having faid, that the flowers are like thofe of the leucoium, but white as milk. He has probably taken this fentence, but without the laft word, and then accufed the author of faying they were like the leucoium flowers in colour, when he only fays they are fo in fhape.

The author of the Priapeian verfes feems to follow this, and fays, that yellow or gold-coloured flowers arife from the *Moly*; but this is by no means confonant to Homer's account, who fays they are white like milk. And fo fay all that have written after him.

On the whole, the *Moly* of Homer feems to have been a fpecies of allium or garlic. See the article GARLICK, fp. 32.

MOLYBDÆNA, *Leadwort*, in botany, a name given by ſome authors to the great toothwort, or dentillaria of Rondeletius. *Ger.* Emac. Ind. 2. See the article PLUMBAGO.

MOLYBDÆNA is alſo a mineral ſubſtance, called *black lead.* See the article BLACK *Lead.*

MOLYBDIA, in natural hiſtory, the name of a genus of cryſtals. The word is derived from the Greek Μόλυβδος, lead; and expreſſes cryſtals altered in their figure by particles of that metal. The cryſtals of this genus are of a cubic form, or compoſed of ſix ſides, at right angles, like a die.

Of this genus there are three known ſpecies. 1. A colourleſs one, compoſed of extremely fine cruſts. This is found in many parts, both of this and other kingdoms, where there are lead mines; and tho' naturally colourleſs, is ſometimes tinged with a red, green, or blue. 2. A dull one with thicker cruſts, ſometimes whitiſh, and ſometimes coloured to a yellowiſh or other hue. This is found in the lead mines of Yorkſhire, and ſome other places. And 3. A dull bluiſh white one, with very thick cruſts. This is very frequent in the lead mines in Derbyſhire, and is generally found in large cluſters. *Hill's* Hiſt. of Foſſ. p. 193.

MOLYBDOMANTIA, Μολυβδομαντεια, in antiquity, a ſpecies of divination, by obſerving the motions, figures, &c. of melted lead. *Potter's* Archæol. Græc. lib. 2. c. 18.

MOLYZA, μώλυζα, a word uſed by the Greek phyſicians to expreſs a head of garlick. Hippocrates has ſeveral times preſcribed this under the name of *Molyza*, and this having ſome ſort of reſemblance to the word *moly*, ſeveral of the interpreters of Hipprocrates have been very deſirous of making it the ſame thing with the *moly* of Homer. But the words of Hippocrates himſelf, in his book of the diſeaſes of women, ſet this in a clear light; for he there adds the name of garlick to the *Molyza*, and orders a *Molyza* of garlick to be ſcraped clean for uſe. Heſychius calls *Molyza* a head of garlick, and Pſellus, on the antiquated words of the Greek phyſicians, ſays the ſame thing.

MOMENT (*Cycl.*)—A *Moment* ought not to be conceived as the leaſt part of time, but as a termination or limit of time. *Maclaurin's* Fluxions, vol. 1. p. 245.

MOMISCUS, a word uſed by ſome as a name of the *dentes molares*, and by others only as the name of that part of thoſe teeth which is near the gums.

MOMORDICA, in botany, the name of a genus of plants called by many authors, *balſamina* and *charantia*. The characters of the plants of this genus are theſe: The flower conſiſts of one leaf, ſhaped like a bell, wide open at the mouth, and deeply divided into five ſegments, ſo as to ſeem a five-leaved flower. Of theſe, ſome are male or ſteril flowers, having no embryo fruit, others are fruitful, and have each its embryo fruit at the bottom, which ripens into a capſule, more or leſs turbinated, fleſhy, hollow, and endued with an elaſtic power, by means of which it throws out the ſeeds on touching it, when ripe, to a conſiderable diſtance.

The ſpecies of this genus, enumerated by Mr. Tournefort, are theſe: 1. The common *Momordica*, called the round-leaved, male, or creeping *balſamina.* 2. The *Momordica* of Ceylon, with a ſhorter fruit, and a vine-like leaf. 3. The longer-fruited *Momordica* of Ceylon, with vine-like leaves.

The flower of this genus of plants is ſo very deeply cut into its ſegments, that there is ſome doubt whether it be not properly a five-leaved flower. The error of calling it *balſamina*, and confounding it with the ſpecies of that genus, is very great. See the article BALSAMINA.

MOMOT, the name of a bird deſcribed by Nieremberg, and ſaid to be an inhabitant of the hot countries. It is of the ſize of a pigeon; its beak is black and crooked, three fingers breadth long, and ſerrated at the edge. Its head is blue like the peacock's, and its feet brown. The reſt of the body is of a pleaſant green. But what is moſt ſingular in this bird, is, that it has in its tail one feather much longer than the reſt, which is naked for a great way, and is feather'd only at the end. This laſt circumſtance Mr. Ray judges wholly falſe, as no birds have ſingle feathers in their tails, but all that are there grow in pairs.

MONACANTHUS, in zoology, a name given by ſome to the alpheſtes, or cinedus, a fiſh approaching to the turdus kind; but differing, in that its back fin is prickly all along, whereas the forepart only is ſo in the turdus.

MONACHELLE, in ichthyology, a name given by ſome to the fiſh called, by the oldeſt Greek writers, the *chremps*, and by the later ones, as alſo by the Latin authors on theſe ſubjects, *chromis*. It is properly a ſpecies of the ſparus, and is diſtinguiſhed by Artedi from the others, by the length of the ſecond ray of the belly fins.

MONADELPHIA, in botany, a claſs of plants whoſe ſtamina or male parts, by reaſon of their filaments running in among one another, are all formed into one body.

The word is formed of the Greek μονος, ſingle, and ἀδελφὰ, brotherhood, or community. Theſe coalitions of the ſtamina in flowers being underſtood in botany by that term.

Of this claſs are the craneſbill, mallow, &c.

The general characters of this claſs of plants are theſe: There is always a perianthium to the flower, no ſpecies of the whole claſs being without it. This is always permanent, and ſurrounds the baſe of the ſeed-veſſel, after the flower is fallen.

The flower always conſiſts of five petals, which are cordated at the top. The ſtamina are a great number of filaments, which grow together in one body at the baſe, and are looſe at the top. The external ones are ſhorter than the others; and the antheræ are always incumbent. In the piſtils there is found a receptacle of the fructification, which is placed in the center of the flower. The germina are erect, and ſurround in a rotary manner the apex of the receptacle. The ſtyles are all found growing together at the bottom, into one body with the receptacle, and in their upper part they are divided into as many filaments as there are germina. The ſtigmata are ſlender and expanded. The fruit is a capſule, divided into as many cells as there were piſtils in the flower. This is of very various figures in the various genera and ſpecies; but the ſeeds in all are reniform, or ſhaped like kidneys. See Tab. 1. of Botany, Claſs 1.

This is an extremely natural claſs, and there is not one plant uſually allowed to belong to the reſt of this kind, that this character ſeparates, nor one of any other kind that it brings in among them. Tournefort has been guilty of a very great error, in regard to the flowers of the plants of this claſs; he ſays that they are monopetalous, and only divided into five ſegments; but a ſtrict obſervation will ſhew, that they really conſiſt each of five ſeparate petals, which only are joined at the baſe by certain filaments, which together make one body. Hence it follows, that they are ſtrictly and truly pentapetalous, tho' they fall off together, not ſeparately, on ſhaking the plant. *Linnæi* Gen. Pl. p. 325.

It is obſerved, that all the plants of this claſs are mucilaginous and emollient, and have great virtues, as diuretics, &c. The common marſhmallow deſervedly ſtands at the head of theſe, and is common in the preſcriptions of phyſicians on theſe occaſions, as well as in many of the ſhop compoſitions, as the ſyrrup of marſhmallows, and the like.

Tho' authors in general have kept this claſs of plants together, they have been much divided in their opinions, as to the characters or parts of them, by which they ſhould divide them into genera. Some have had recourſe, on this occaſion, to the ſeed-veſſel; others finding that inſufficient, have conſulted the leaves. Linnæus uſes the cup of the flower on this occaſion, which is a very eſſential part in this claſs of plants, and ſufficiently different in the different genera.

MONANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with only one ſtamen in each.

The word is formed of the Greek μόνος, ſingle, and Ἀνὴρ, male. Of this claſs of plants are the blite, turmeric, and the like. See Tab. 1. of Botany, Claſs 1.

MONARCHICI, in church hiſtory, heretics towards the end of the ſecond century, who allowed but one perſon in the godhead, and taught that the father was crucified. *Hofm.* Lex. in voc.

MONARDA, the name by which Linnæus calls the plant which is the *origanum ſpurium*, or baſtard wild marjoram of Rivinus. This, in the Linnæan ſyſtem of botany, makes alſo a diſtinct genus of plants, the characters of which are, that the cup is made of one leaf, and is cylindric and tubulated, with an even edge marked with five notches. The flower conſiſts of only one petal, which is a cylindric crooked tube, longer than the cup, and with a labiated opening. The upper lip is long, narrow, ſtrait, whole, and ſurrounded with rims; the lower lip is bent back, is broad, and ſlightly trifid, the middle ſegment being the longer, narrower, and rimmed round the edge. The ſtamina are two filaments, of the length of the upper lip of the flower, in which they are hid. The antheræ are of a compreſſed form, truncated above, and convex below. The piſtil is a quadrifid germen, with a thread-like ſtyle involved among the ſtamina, and a ſtigma bifid and pointed. It has properly no fruit, the cup encloſing in its bottom the ſeeds, which are roundiſh, and four in number. *Linnæi* Gen. Plant. p. 6.

MONEMERION, Μονημεριον, among the antient Romans, a ſhew, according to ſome, wherein none but tame beaſts were expoſed to view.

Others will have it to be a ſhew of one day's continuance. *Pitiſc.* in voc.

MONEY (*Cycl.*)—*Madning* MONEY. See the article MADNING.

MONGER, a little ſea-veſſel which fiſhermen uſe. Stat. 13 Eliz. c. 11. *Blount.*

MONK-*Fiſh*, the Engliſh name of a ſpecies of the ſqualus, according to the new Artedian ſyſtem; called *rhina* and *ſquatinus* by the old authors. It is diſtinguiſhed by Artedi from the other ſquali, by the name of the *ſqualus* with no *pinna ani*, and with the mouth on the top of the head. See Tab. of Fiſhes, N°. 7.

MONK'S *Hood*, a name given to ſeveral ſpecies of aconite, or wolfs-bane. See the article ACONITE.

The flowers of this plant are in common uſe in the country, to garniſh diſhes, tho generally ſuſpected of being poiſonous; but the ſtalks have been found very violently ſo, according to an account given in the Philoſophical Tranſactions, of a perſon who eat them inſtead of celeri.

The firſt ſymptom this perſon felt, was a biting, and ſenſation of a tingling heat, not only affecting his tongue, but his jaws;

jaws; his teeth, after this, seemed loose, and his cheeks were so much irritated, that he thought they were swelled to three times their natural size, and he could not be persuaded of the contrary by the people who were about him, nor by his glass. This tingling sensation by degrees spread itself farther, till by degrees his whole body, but especially the extremities, were affected by it; he then felt a weakness in his joints, especially in his knees and ankles, and frequent twitchings of the tendons. At length, he felt a pain that gave him an idea of the circulation of the blood being wholly affected, and absolutely stopped in his legs toward the feet, and from his wrists to his fingers ends. He had all this time no sickness, or disposition to vomit. He took near a pint of oil, and swallowed after that great quantities of carduus tea; this made him vomit; but after this his head grew misty, his eyes dim, and a humming noise was continually in his ears; after this he fell into absolute faintings, and his eyes were closed, his limbs stiff, and his teeth fixed. He was, however, recovered at length by repeated draughts of carduus tea, and cordial draughts of wine, with tincture of saffron, castor, and the like, between the times of his reachings to vomit. Philos. Transf. N°. 432.

The young shoots of this plant have some resemblance to salary, and were put into the salad as such. The whole quantity put in, was but the top of one root; and one other person eat of the sallad beside the man. She eat more sparingly, and had all the symptoms of which the man complain'd, only in a less degree.

MONOCEROS *Minor*, in ichthyography, the name of a fish caught in the American seas; its usual length is a foot and half; its height about nine inches, very flat bodied, and high backed like a perch, and bow bellied. Its head has some resemblance to that of a baboon. Its mouth is situated low, and is not above an inch over. Its teeth are of the eighth of an inch long, and of the thickness of a midling needle; and the gills are subtended to the eyes and mouth, like the segment of a circle. The eyes stand near the top of the head, and are an inch over. From the top of the head is prolonged a smooth, round, tapered, strait horn, two inches round about the root, and about three inches long. This seems to have no bone within it, nor is inserted into any, but seems merely the cuticle hardened, as in corns, into a sort of horny substance. The back fin reaches from the head to the tail. It is covered with a tough thick skin, feeling somewhat rough. *Grew's* Mus. Soc. Regal. p. 104.

MONOCEROS *Piscis*, is also used as the name of a fish, common in the American seas, and called *pira-aca* by Marggrave, and some other authors; and by the Portuguese, *piexe porto*.

It is a very small fish, of about three fingers breadth long, and two broad where broadest; it is of a flatted or compressed shape; the mouth is very small, but of the figure of that of a hog; and there are in the lower jaw only two broad teeth, and several small ones in the upper. The eyes are very large and yellow, with black pupils. A little behind the eyes, on the ridge of the back, it has an upright horn, a little bending backwards, less than a finger's breadth long, of a rounded figure, and of the thickness of a large thread; this is serrated on each side by a row of small teeth or prickles, their points bending downwards; and the whole horn seems supported by a small membrane, which is laid transversly on the back. It has a small furrow under each eye, in the cavity of which is placed a little fin; under the belly it has another larger fin, at the insertion of which there is also another horn like that on the back, but smaller. Its skin is very rough to the touch, and is of an obscure yellowish colour. The fins and the ridge of the back are yellower than any other part of it. See Tab. of Fishes, N°. 36. *Clus.* Exot. lib. 6. c. 28.

MONOCOLI, Μονόκωλοι, a kind of fabulous men, who, as the Arabians give out, inhabit the country of Segir in Arabia Felix. They are furnished with only half the head, breast and belly; and have but one eye, one ear, one hand, and one foot; notwithstanding which they can walk very swiftly, and even climb trees; talk with one another, and sing verses very elegantly composed. Their chief residence is said to be by the sides of lakes, or the sea shore. *Hofm.* Lex. univ. in voc.

The word is Greek, compounded of μονος, one, and κωλον, a member.

MONODON, in the Linnæan system of zoology, the name of the monoceros, or sea unicorn, a fish of the whale kind, which makes a distinct genus of fishes; the characters of which are, that it has no fin on the back, and a very long tooth in its upper jaw. *Linnæi* Syst. Nat. p. 51.

The word is Greek, compounded of Μονος, one, and οδους, a tooth, and expresses this fish's having only a single tooth. Artedi makes the *Monodon* a peculiar genus among the cetaceous fishes, or plagiuri. The *Narwal* is the only known species of this genus. See the article NARWAL.

MONOECIA, in botany, a class of plants which have not the male and female parts, that is, the stamina and pistillum in the same, but in different flowers; and those on the same individual, or on the different stalks, growing from the same root; those which contain the stamina are called the male flowers, those which contain the pistillum, the female ones.

The word is derived from the Greek, μονος, the same, and οἰκος, habitation. The plants of this class are the alder, mulberry, amaranth, &c. See Tab. of Botany, Class I.

MONOGASTRIC, in anatomy, a name given by Vieussens, and some of the French writers, to one of the muscles of the ear, called by Cowper, the *internus auris*; and more properly by Albinus, the *tensor tympani*.

MONOGRAPHI, in botany, authors who have written express treatises on only one plant; as Douglass on the Guernsey lilly, &c. *Linnæi* Fund. Bot. p. 1.

MONOMACHON, a name given by some to the intestine, otherwise called *cæcum*.

MONOMERES, a word used by the antients alone, but more frequently joined with the word *phorbeia*, to express one sort of the bandage used to confine the breath, by those who played on the antient pipe. This consisted only of one strait, and one transverse piece; and the latter came fully over the mouth, and closed it up, except that a hole was cut in it to receive the mouth-piece of the pipe. The *diemeres* consisted of several pieces, and only tied up the lower lip.

MONOPAGIA, a word used by some medical writers, for that species of headach which affects only one point, or small part of the head.

MONOPETALOUS (*Cycl.*)—See these flowers represented in Tab. I. of Botany, Class I.

MONOPHAGI, Μονοφαγοι, in antiquity, a designation given to those who celebrated the Æginean festival, because they feasted or eat together without the assistance of their servants; none but denizens of that island being allowed to be present. *Potter*, Archæol. Græc. l. 2. c. 20. T. I. p. 364.

MONOPODIA, among the antients, a sort of tables used in their feasts, and distinguished by this name from their having but one foot; the name being derived from the Greek, μονος, one, and πους, foot. *Hardouin*, in Plin. vol. 2. p. 641.

MONOPS, in natural history, a name given by Ælian, and some other of the old Greek writers, to the *bonasus*. It should appear from this name, which expresses a single eye, that the creature had but one eye; but this is not the case, and the word is rather formed upon the name *monopus*, which was originally written *monapus*, and the *a* only changed into an *o*, by the corruption of the copies of the authors who had treated of it. The name *monapus* was given this animal, according to Aristotle, by the people of the country where the creature was most frequent, and therefore is not to be attempted on any Greek etymology. Some of the Greeks have called the same creature *monepos*, and some *bolinthos*. See the article BONASUS.

MONOSCELI, Μονοσκελεις, a fabulous race of men, who are represented by Pliny to have only one leg. They were also called *sciapodes*. See the articles SICAPODES and MONOCOLI.

The word is Greek, compounded of μονος, one, and σκελος, a leg.

MONOSPERMALTHÆA, in botany, a name given by Mr. Isnard, in the *Acta Germanica*, to a genus of plants afterwards called *waltheria* by Linnæus. *Isnard*, A. G. 1720. See the article WALTHERIA.

MONOTROPA, in botany, the name of a genus of plants, called by Tournefort, *orobanchoides*, and by Dillenius, *hypopitis*. See the article OROBANCHOIDES.

MONRINGION, in botany, a name given by some authors to the tree whose fruit is the ben nut, and whose wood the *lignum nephriticum* of the shops. Hort. Mal. vol. 6. p. 19.

MONSTER (*Cycl.*)—The French Academicians have of late disputed whether *Monsters*, that is, creatures born with their organs preternaturally formed or situated, supernumerary or defective, were originally so formed in their first stamina; or whether this deformity has been owing to some accidental change upon them. The arguments for these opinions, are remarks on particular histories of such *Monsters*, which we cannot abridge, and therefore must refer to the Memoirs de l'Acad. des Sciences, 1733, 1734, 1731, 1739.

MONTENSES, a name given to the Donatists. See the articles CAMPITÆ, *Suppl.* and DONATISTS, *Cycl.*

MONTH (*Cycl.*)—Among the antient Greeks, the year was divided into twelve *Months*, which contained thirty and twenty-nine days alternately; but so as the *Months* of thirty days always went before those of twenty-nine; the former were termed πληρεις, full, and δεκαφθινοι, as ending on the tenth day; the latter were called κοιλοι, *hollow*, and from their ending on the ninth day, εναφθινοι.

In order to understand their method of reckoning the days of the *Month*, it must be considered that every *Month* was divided into τρια δεχημερα, or three decads of days; the first decad they called μηνος αρχομενε or ισαμενε; the second, μηνος μεσουντος; the third, μηνος φθινοντος, παυομενε or ληγοντος. Whence the first day of the *Month* was called νεομηνια, as falling upon the new moon, and πρωτη αρχομενε or ισαμενε, as being the first day of the first decad; the second day was termed, δευτερα ισαμενε; the third, τριτη ισαμενε; and so on to the δεκατη ισαμενε.

The first day of the second decad, which was the eleventh day of the *Month*, was called πρωτη μεσουντος or πρωτη επιδεκα; the second of this decad, δευτερα μεσουντος, or επιδεκα, and so on to εικας, the twentieth, which was the last of the second decad.

The

The firſt day of the third decad was termed πρωτη επ' εικαδι; the ſecond, δευτερα επ' εικαδι, and ſo of the reſt. Sometimes they inverted the numbers of this laſt decad, the firſt being called φθινοντος δεκατη; the ſecond, φθινοντος εννατη; the third, φθινοντος ογδοη; and ſo on to the laſt day of the *Month*, which was called Δημητριας, *Demetrias*, from Demetrius Poliorcetes; before whoſe time, particularly in Solon's laws, it was called ενη και νεα, *the old and new*; becauſe the new moon falling out on that day, part of it belonged to the old moon, and part to the new. It was alſo called τριακος, *the thirtieth*; and that not only in the *Months* which conſiſted of thirty days, but alſo in thoſe of twenty-nine; for in theſe, according to ſome accounts, the twenty-ſecond day was omitted; or, according to others, the twenty-ninth: But which day ſoever was omitted in computation, the thirtieth was conſtantly retained. Hence, according to Thales's firſt ſcheme, all the *Months* were called *Months* of thirty days; tho', by Solon's regulation, half of them contained only twenty-nine: And the lunar year of Athens was called a year of 360 days; tho' really, after Solon's time, it conſiſted of no more than 354. Vid. *Pott.* Archæol. Græc. l. 2. c. 26.

The names of the *Months* being various in different parts of Greece, it will be ſufficient particularly to conſider thoſe of Athens, barely mentioning thoſe of others that correſpond with them. 1. *Hecatombæon*, this was the firſt *Month* of the Athenian year, beginning on the firſt new moon, after the ſummer ſolſtice, and ſo anſwered to the latter part of our June, and the firſt part of July. It conſiſted of thirty days, and was by the Bœotians called *Hippodromus*, and by the Macedonians *Lous*; but its antient name was *Cronius*. 2. *Metagitnion*, the ſecond *Month* of the Athenian year, anſwering to the latter part of our July, and firſt of Auguſt. It contained only twenty-nine days, and was called by the Bœotians *Panemus*; and by the people of Syracuſe, *Carnius*. 3. *Boedromion*, the third *Month* of the Athenian year, which contained thirty days, and correſponded to the latter part of our Auguſt, and firſt of September. 4. *Mæmacterion*, the fourth *Month* of the Athenian year, conſiſting only of twenty-nine days. It anſwered to the latter part of our September, and firſt of October; and was called by the Bœotians *Alalcomenius*. 5. *Pyanepſion*, the fifth *Month* of the Athenian year: It contained thirty days, correſponded to the latter part of our October, and firſt of November; and was called by the Bœotians, *Damatrius*. 6. *Antheſterion*, the ſixth *Month* of the Athenian year, anſwering to the latter part of our November, and firſt of December. It contained twenty-nine days, and was called by the Macedonians *Dæſion*, or *Deſion*. 7. *Poſidion*, the ſeventh *Month* of the Athenian year, anſwering to the latter part of our December and firſt of January, and containing thirty days. 8. *Gamelion*, the eighth *Month* of the Athenian year; it anſwered to the latter part of our January and firſt of February, and conſiſted of twenty-nine days. 9. *Elaphebolion*, the ninth *Month* of the Athenian year, correſponding to the latter part of our February and firſt of March; it contained thirty days. 10. *Munychion*, the tenth *Month* of the Athenian year: It contained twenty-nine days, and anſwered to the latter part of our March and firſt of April. 11. *Thargelion*, the eleventh *Month* of the Athenian year: It contained thirty days, and anſwered to the latter part of our April and firſt of May. 12. *Scirrophorion*, the twelfth and laſt *Month* of the Athenian year: It contained twenty-nine days, and anſwered to the latter part of May and firſt of June. Vid. *Pott.* Archæol. Græc. L. 2. c. 26. & *Stephan.* Theſ. Ling. Græc. T. 5. p. 223. ſeq.

As the Roman *Months* were the ſame with thoſe now in uſe among the Europeans, we ſhall only refer to the article CALENDS, *Cycl.* and *Suppl.* where the manner of their computation is explained.

MONTIA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants; the characters of which are theſe: The cup is a perianthium compoſed of two oval, hollow, obtuſe and erect leaves, which remain when the flower is fallen. The flower is compoſed of three petals, joined together at their inſertion; theſe are of an oblong oval figure, and the two ſide-ones are larger and placed lower than the others. The ſtamina are three capillary filaments, of the length of the flower: The antheræ are ſmall: The germen of the piſtillum is of a turbinated form; the ſtyles are three, hairy and expanded, the ſtigmata are ſimple. The fruit is a capſule of a turbinated form, obtuſe, of one cell, ſeparated by three valves: The ſeeds are three in number, and roundiſh. *Linnæi* Gen. Plant. p. 21.

MONTIFRINGILLA, in zoology, the name of a bird known in Engliſh by the name of the *bramble*, *brambling*, or *mountain-finch*; and called by the antients *oroſpiza*. It is of the ſize and ſhape of the chaffinch; its beak is large, very ſtrong, and ſtrait, beginning with a large baſe, and ending in a point in form of a cone. Sometimes this is altogether black, ſometimes it is partly black and partly yellow; from the head to the middle of the back it is of the blackiſh colour of the common ſtarling, with a variegation of a greyiſh red from the edges of the feathers being of that colour; the hinder part of the back is white; the throat is of a reddiſh yellow, and the breaſt white. It is common in Italy, and is ſometimes found in England. *Ray's* Ornithol. p. 189.

There are beſide this, two other ſpecies of the *Montifringilla*, or brambling; the one large, of the ſize of the common lark, and having the claw of its hinder toe longer than the reſt, as in the lark; and the other a ſmaller, and ſeeming of a middle nature between the lark and brambling. It is reddiſh on the back, and white on the belly, and variegated with black and reddiſh brown on the wings. Theſe are both common in Lincolnſhire, and ſome other parts of England.

MONTROSE-*Waters*. Steel ſpaws are very numerous in the country about *Montroſe* in Scotland: The principal of theſe are at Aberbrothoc, Kincardin, and Peterhead [a]. That of Aberbrothoc is in greateſt eſteem [b].—[[a] Medic. Eff. Abr. Vol. 1. p. 106, 107. [b] Ibid. p. 111.]

Beſide theſe, there is a well near *Montroſe*, the water of which is of a whitiſh colour, ſoft taſte, and faintly diſcovering the mineral quality. This water is of a different nature from the ſteel-ſprings. The alcali prevails in its ſalt; it reſembles the Scarborough-water, and no ſalts come up to any analogy with thoſe of the *Montroſe* water, and thoſe of Scarborough, but nitre and ſea-ſalt. See Med. Eff. Vol. 3. Art. 8. Abr. Vol. 1. p. 112. ſeq. where various experiments with thoſe waters are enumerated, and a compariſon inſtituted between them and the Scarborough waters.

The water of this *Montroſe* well is univerſally diuretic; being drank from two to three pints, purges; and half the quantity ſucceeds with ſome. It has been found very uſeful in ſtranguries and ſtoppage of urine, ſcorbutic diſorders, flatulencies, ſpaſmodic colic, and ſpitting of blood. In rheums and ſtrains it has been of good uſe by way of cold pump, where perſons could not bear ſuch uſe of ordinary cold water. Med. Eff. Vol. 3. Art. 9. Abr. Vol. 1. p. 122. ſeq.

MONYCHA, an epithet applied by naturaliſts to thoſe animals whoſe hoofs are ſingle and undivided; ſuch are the horſe, and the like.

MOON (*Cycl.*)—It is commonly agreed among philoſophers and aſtronomers, that the *Moon* turns about the earth; but father Alexander ſuppoſes they may be all miſtaken, and that the earth really turns about the *Moon*; and from this extraordinary hypotheſis, he endeavours to account for the flux and reflux of the ſea. See Journ. des Scav. Oct. 1727.

Monſ. Grand-jean de Fouchy endeavours to prove, that there is no matter about the *Moon*, that can ſenſibly inflect the rays of light: And hence, that this ſecondary planet has no atmoſphere whoſe refraction is obſervable. It might indeed have a circumambient fluid, the horizontal refraction of which might amount to 1″ or 2″, and ſome obſervations may ſeem to give ground for admitting ſomething of this ſort. But with reſpect to aſtronomers the *Moon* may be ſaid to be deſtitute of an atmoſphere. See Phil. Tranſ. N°. 455. ſec. 3.

We have ſome obſervations and tables concerning the *Moon's* motion, by Mr. Richard Dunthorn, in the Philoſophical Tranſactions, N°. 482, ſec. 13. where he gives an hundred obſerved longitudes of the *Moon* compared with the tables, *viz.* 25 eclipſes of the *Moon*, taken (except the firſt) from Flamſtead's Hiſtoria Cœleſtis, the Philoſophical Tranſactions, and the Memoirs of the Royal Academy of Sciences; the two great eclipſes of the ſun in 1706, and 1715; 25 ſelect places of the *Moon*, from Flamſtead's Hiſtoria Cœleſtis; and 48 of thoſe longitudes of the *Moon*, computed from Flamſtead's Obſervations by Dr. Halley, and printed in the 1ſt edit. of the Hiſtoria Cœleſtis.

In the Philoſophical Tranſactions, N°. 473. we have a new method of computing the appulſes of the *Moon* to the fixed ſtars and planets; as alſo of eclipſes of the earth, commonly called eclipſes of the ſun, by Mr. Gerſten, profeſſor of the mathematics at Gieſſen.

The full *Moon* appears to the naked eye broader than a circular object ſubtending an equal angle ſeen by perfect viſion. In a *Moon* of three or four days old the illuminated part appears too broad, in proportion to the obſcure part, and likewiſe ſeems to extend more outwards, or to have a greater diameter than the obſcure part. Alſo in an eclipſe of the ſun or *Moon*, the bright part appears too broad in proportion to the dark part, and the eclipſe appears leſs than it really is.

This obſervation was made by Horrox, and is accounted for by Dr. Jurin, in his eſſay upon diſtinct and indiſtinct viſion.

MOON-*Eyes*, in the manege. A horſe is ſaid to have *Moon-eyes* when the weakneſs of his eyes increaſes or decreaſes according to the courſe of the *Moon*; ſo that in the wane of the *Moon* his eyes are muddy and troubled, and at new *Moon* they clear up; but ſtill he is in danger of loſing his eye-ſight quite.

MOON-*Fiſh*, a name given to the fiſh called by authors, *orbis*. See the article ORBIS.

MOP, in ſome counties of England, is the term for what is called the ſtatute in other places; being the time that young people who intend themſelves for ſervants, meet at ſome certain place, in order to be hired into ſervices. *Plot's* Oxfordſhire, p. 207.

MOOR (*Cycl.*)—MOORS, in the iſle of Man, thoſe who ſummon the courts for the ſeveral *ſheadings*; ſuch are the lords bailiffs:

bailiffs: Every *Moor* has the like office with our bailiff of the hundred. *King's* Descript. of the Isle of Man.

Moor-*Cock*, an English name for the red-game, or our lagopus, more commonly called the gor-cock. It is a very delicate bird, larger than a partridge, and common on the hills in Derbyshire and Yorkshire. *Ray's* Ornithol. p. 128. See the article Gor-*Cock*.

Moors-*Head*, in the manege. See the article More's-*Head*.

Moor-*Hen*, *Gallinula*, in zoology, the name of a genus of water-birds; the characters of which are these: The head is small, the body compressed, the beak short and moderately crooked, the wings small and hollowed like those of the common cock and hen kind, the tail very short, the legs long, and the toes remarkably so.

The common *Moor-hen*, called *Gallinula Chloropus* by authors, is a very well known bird, somewhat like the coot in shape, but smaller, and very much flatted in the body. Its feet are greenish, and its breast a lead-coloured blue; its belly greyish. It is common about our rivers, and is a very well tasted bird. *Ray's* Ornithol. p. 233.

Moor-*Land*, or Moory-*Land*, in agriculture, is a black, light and soft earth, very loose, and without any admixture of stones; and with very little clay, or sand.

The uppermost stratum of the fen-lands is usually of this earth, and it usually constitutes a moderately thick or deep bed. Intermixed with water it cannot easily be worked up into a paste; and when with labour worked up into somewhat of a firm mass, its surface appears spongy and porous; and as soon as dry, it easily moulders away to powder.

It is usually soft to the touch, unless it be worked very closely between the fingers, then it shews a mixture of a small quantity of sand, both to the touch and to the eye.

It seems indeed to consist almost entirely of pure vegetable matter, and this lying in such plenty on the surface of the fen-lands, is the cause of their being so very fertile.

The great disadvantage of the places which have this soil, is their being liable to be glutted with wet; and to remedy the inconveniencies arising from thence, the farmers who rent these lands have a custom of burning the soil at proper seasons. It burns very freely and easily, the surface readily catching flame, and a substance somewhat bituminous, usually contained among the soil, helps the burning. *Moreton's* Northamp. p. 36.

Moor-*Stone*, the name of a very remarkable stone found in Cornwall, and some other parts of England, and used in the coarser works of the present builders.

This is truly a white granite, and is a very valuable stone. It is a very coarse and rude, but beautiful congeries of variously constructed and differently figured particles, not diffused among, or running into one another, but each pure and distinct, tho' firmly cohering with whatever it comes in contact with. Its colours are principally black and white; the white are of a sort of marbly texture, and opake, formed into large congeries, and emulating a sort of tabulated structure; among these there are many of a pure crystalline splendor and transparence, and among these are lodged in different directions many small flaky masses of pure talcs of several colours; some are wholly pellucid, others of an opake white, others of the colour of brown crystal, and a vast number perfectly black. *Hill's* Hist. of Foss. p. 498.

It is found in immense strata in some parts of Ireland, but is disregarded there.

It is found with us in Devonshire, Cornwall, and some other counties; and brought thence in vast quantities to London. It never forms any whole strata there, but is found on the surface of the earth in immense and unmanageable masses; and to separate these into portable ones, they dig a hole with a wedge in some part of them, and surrounding it with a ridge of clay they fill it up with water; this by degrees soaks in, and finding its way into the imperceptible cracks so far loosens the cohesions of the particles there, that the day after they drive a larger wedge into the hole, and the stone breaks into two or more pieces. It is used in London for the steps of public buildings; and on other occasions, where great strength and hardness are required.

The people of Cornwall who have this stone in great plenty, use it in their tin-works, and particularly in their tin-kiln, on the good effect of which a great deal depends. This kiln is four-square, and at its top is placed a large block of *Moor-stone*; the usual size of this block is six foot in length and four in breadth; in the middle of this block there is made a hole of about six inches in diameter. This stone serves as a head to cover another like stone placed beneath it; but this under one is not so long as the upper by six inches. The reason of this is, that it must not reach the innermost or back part of the wall, which is the open place thro' which the flame ascends from another place below that, where a very strong fire of furze is constantly kept up; and there is another little hole also on the outside. The forepart is like a common oven, and has such a sort of chimney.

The tin ore is roasted in this kiln, to burn away the mundick, in this manner: The ore is brought in powder, and poured out in heaps on the surface of the top-stone, a man stands there and thrusts it down through the hole in this stone into the kiln, that is, to the surface of the under-stone; a person who stands below spreads this as it falls with an iron rake, and gives notice to the person above when there is enough down, that is when the surface of the lower stone is covered three or four inches thick. When this is done, the hole at the top is covered with green turfs, that the flame may reverberate the stronger; and the heat that the *Moor-stone* acquires helps to roast the ore; while the flame that comes up from the ore is blue, there yet remains mundic among it; but when this is burnt off, the flame is yellow. Philos. Transf. N°. 69.

The miners in some parts of Cornwall use the name *Moor-stone* for a sort of coarse free-stone, which lies very often over the tin ore; this is of a greyish colour, and is somewhat softer than that usually employed in building.

Moor-*Titling*, a commonog English name for the œnanthe, more frequently called the stone-chatter. See the article Stone-chatter.

MOORING (*Cycl.*)—Mooring *a fair Birth at Sea*, is *Mooring* in a place free from any annoyance.

Mooring *a Proviso*, at sea, is to have an anchor out, and a hawser a-shore; then the ship is *moored* with her head ashore. And two cables is the least, and four the best to *moor* by. See the article Anchor.

Mooring *Water-shot*, is to *moor* neither alongst nor athwart the tide, but quartering between both.

MOOSE-*Deer*. The first mention we find of this remarkable animal, is in a tract of Mr. Josselyn's, entitled New-England Rarities. That author says, it is a very fine creature, growing to twelve foot high; the horns are extremely beautiful with broad palms, some of those full grown being two fathom from the tip of one horn to the tip of the other. The same author, in another work, entitled, Two Voyages to New-England, calls this creature a monster of superfluity; and says, that when full grown it is many times larger than an ox. What Neal says of this animal seems copied from Josselyn. But the best account we have of it, is from Mr. Paul Dudley; this gentleman says, that they are of two kinds: The common light-grey *Moose-deer*, called by the Indians *Wampoose*, and the larger black *Moose*. The grey *Moose* is the same animal which Mr. Clayton, in his account of the Virginian quadrupeds, published in the Philosophical Transactions, calls the elk: And this is the creature, described in the Anatomical Discoveries of the Paris Academy, under the name of the stag of Canada. Horns of this creature have been sent from Virginia, and called elks horns: They are wholly the same with those of our red-deer, except in size; weighing about twelve pounds, and measuring from the burr to the tip about six foot long. Phil. Transf. N°. 444. p. 386.

Mr. Dudley says, that the grey *Moose* is like the English deer; and that these creatures herd together thirty or more in a company. The black or large *Moose* has been taken, he says, measuring fourteen spans in height from the withers, which, allowing nine inches to the span, is ten foot and a half.

The stag or male of this kind has a palmed horn, not like that of our common or fallow deer, but the palm is much longer and more like to that of the German elk; but it differs from that in having a branched brow antler between the burr and the palm, which the German elk hath not.

The large horns found fossile in Ireland, have, from their vast dimensions, been supposed to have originally belonged to the black *Moose-deer*; but they, as likewise most other of the large horns found in this part of the world, appear to be the horns of the German elk, having no brow-antlers.

Mr. Ray mentions, in his Synopsis of animals, a pair of extremely large fossile horns, which he saw in a musæum in Sussex; but he mentions no brow-antlers in these, and therefore probably they, as well as most others preserved in musæums, were the horns of the German elk.

It is not agreed by authors what number of young the *Moose* brings forth at a time; Mr. Dudley says but two; but Josselyn, and from him Neal, say three; and these authors add, that they do not go so long with young as our does, by two months.

There is, beside the *Moose*, another animal of the deer-kind, very common in Virginia, and other of the Northern provinces of America. This creature has round horns, not spreading out as in the stag or red-deer, but meeting nearer together at the tips, and bending forwards over the creature's head; and the brow-antlers are not crooked and standing forward, but strait and upright. The skin of this deer is of a sandy colour with some black hairs, and is spotted all over while young with white spots as some of our fallow deer are, and it is about the bigness of our fallow deer when full grown. The *Dama Virginiana* of Mr. Ray was different from this, if the description be exact, and the horns of the palmated kind. This *Dama* of Mr. Ray seems to be what Josselyn, in his Voyages, calls the *Maurouse*; but his description is too short to form any regular judgment from, he only says that the *Maurouse* is like the *Moose*, but that its horns are small, and the creature about the bigness of a stag. Phil. Transf. N°. 444. p. 388.

Josselyn mentions also the buck, the stag, and the rain-deer; but it is very much to be doubted whether they are the same animals

animals that we mean by thofe names. He mentions alfo another fort of American deer, an animal called a *Macarib*, a *Caribo*, or a *Pohano*; but this feems a mere fiction; no fuch animal exifting in nature.

MORBUS-*Comitialis*, the epilepfy, one of the moft terrible difeafes to which human nature is fubject.

The fymptoms of this diforder vary greatly in different perfons; fometimes it feizes them fuddenly, and unexpectedly; at others, it is preceded in every paroxyfm by a train of concomitant fymptoms, fuch as a general laffitude and wearinefs of the whole body, a pain in the head, great perturbation of the fpirits, and an unufual dread and terror; fometimes alfo a ringing in the ears gives notice of its approach, or an inflation of the præcordia or palpitation of the heart and difficulty of breathing. It is common alfo to feel a cold air as it were afcending from the extremities up to the heart and brain; fometimes the joints feel cold, and often rumblings are felt in the abdomen, and fetid ftools are difcharged.

In the fit, the thumbs are ufually faft clenched to the hands, the eyes diftorted, fo that only the white of them is feen, the patient is wholly fenfelefs, and a froth burfts out of the mouth with a fort of hiffing noife; the tongue is often lacerated by the teeth, and the joints ufually feel a violent fuccuffion. But fometimes violent fpafms feize all the limbs, inftead of thefe fuccuffions or tremblings; and they remain forcibly bent, fo as to make the patient refemble a ftatue of wood. In infants the penis is erected; in more grown perfons the femen is often ejected, and the urine difcharged to great diftances. And thefe fymptoms, fometimes fooner, fometimes later, gradually go off.

The paroxyfms, according to the diverfity of caufes, are longer or fhorter, and fewer or more frequent; but they generally return at ftated periods, as on certain days, hours, or months, or on the changes of the moon, efpecially at the new and full moon.

Women are ufually feized with thefe paroxyfms at the time of the return of the menfes; and what is moft obfervable is, that they are frequently occafioned by feemingly flight caufes, commotions of the mind, a colder feafon than ordinary, the ufe of ftrong liquors, clofe application of the mind to any thing, and finally, the ufe of venery, often bring on thefe fits. Infancy and youth are the times of life moft fubject to this diforder; and it more frequently attacks perfons of a nice and delicate conftitution, than thofe of a robuft and hardy make.

The caufe of this terrible diforder appears to be a ftricture of that membrane which furrounds the brain and the fpinal marrow. The caufes are very various, and thence alfo the difeafe varies in its fpecies and appearance. The moft terrible and mortal epilepfies have been brought on by external violence, by blows, wounds, fractures, and depreffions of the cranium. Thefe are generally preceded by pains of the head, and a torpor of the fenfes; and in thefe, after the patient's death, corrupted blood or ferum is always found either between the *dura* and *pia mater*, or between the *dura mater* and *cranium*. Chronical epilepfies, returning at ftated periods, are alfo frequently occafioned by certain acute bony protuberances arifing internally in the bafis of the cranium, and fometimes in the lateral finus. It is eafy to fee that this fpecies of epilepfy is incurable; yet medicine can do great fervice in it, by keeping the brain in fuch a condition, that its preffure on thefe protuberances may not be enough to produce a violent fit.

Polypofe concretions in the jugular veins, and obftructions of the finufes of the *dura mater*, are alfo caufes of incurable epilepfies. The paffions of the mind alfo, as anger, fear, and the like, contribute greatly to bring on epilepfies, as they act immediately upon the nervous parts, and either conftringe or dilate them preternaturally, which cannot be done very often without inducing a bad habit. Infants are often rendered epileptic either from fucking the milk of a nurfe in a violent fit of paffion, or from the violent commotions of mind the mother was fubject to while pregnant. The terror of the fight of one perfon in an epileptic fit, has frequently thrown another into the fame diforder; and it has been often known, that a ftrong propenfity to venery, from a natural redundancy of femen, being fuppreffed by chaftity, has brought on this difeafe. Women have fallen into it from violent love alfo, and have, in that cafe, found their cure in marriage.

In the cure of an epilepfy, the firft intention muft be to correct and expel from the body the remote material caufes of the diforder; fecondly, to mitigate the fpafms of the *dura mater* and nervous parts by medicines of a fedative and corroborating nature; the former, to check and allay the violent motion of the fluids, the other to reftore the due tone and natural elafticity to the parts, the weaknefs of which, occafioned by a former fit, gives frequent occafions for fucceeding ones. Of the firft kind are poppy-feeds or flowers, faffron, nutmeg, and the like; and among the chemical medicines, the *fpiritus nitri dulcis*, when truly prepared. Of the corroboratives to be given in epileptic cafes, rofemary, rue, lavender, cardamom feeds, and ambergreafe. Spirit of hartfhorn, and the oil of hartfhorn, made pure by frequent rectifications, is alfo greatly beneficial. The decoctions of the woods, as guaiacum, faffafras, and the like, are alfo good remedies: And feveral epilepfies have been known to be perfectly cured, by taking half a pint of a ftrong decoction of guaiacum twice a day, with a few drops of fpirit of vitriol in each dofe, and making all the while a weaker decoction ferve for the common drink. It is neceffary, however, if there be a redundance of blood, to begin the cure with frequent bleedings. Cupping on the parts near the head is alfo of great fervice, and fometimes the opening the jugular vein is neceffary, by which alone patients have fometimes been cured.

But tho' thefe are the methods of cure, in fome cafes, yet in others, where the difeafe has had a different origin, very different means are required. When an epilepfy arifes from an impure ferum, lodged in the veffels and membranes of the head; which too often happens from the fudden drying up of old ulcers, ftopping of iffues, or the like means; then the intention of cure confifts in the difcuffion, evacuation, and derivation of the ferum to other parts. For this purpofe cathartics are to be exhibited, and fetons. Iffues and bliftets are of fingular fervice. Nature has been known to cure epilepfies of this kind, by an eruption of pimples all over the body. And there is recorded in Willis a memorable inftance of a girl, fubject to frequent returns of epileptic fits; who, in one of them, happening to fall with her her head into the fire, and fo accidentally cauterifing it, remained well fo long as the ulcers difcharged any thing; but when they dried up, the former fits returned.

In epilepfies arifing from violent emotions of the mind, in which acrid, bilious, and acrimonious humours are conveyed into the nervous fyftem, the ufe of whey, mineral waters, and a proper regimen added to the fweetening powders, ufually produce a cure. Acidulated medicines are alfo highly proper, and fpirit of vitriol, or *fpiritus nitri dulcis*, are of very fingular efficacy. When an epilepfy arifes merely from pain, as that of the ftone, the tooth-ach when violent, or fpafms of the ftomach or inteftines, then clyfters of oil are of very great ufe; and after thefe, bleeding is ufually very proper.

In the epilepfies of infants, arifing from gripes, corrupted milk, or difficult dentition, great benefit is to be had from clyfters of milk with a little Venice foap diffolved in it. A few grains of cinnabar, given internally, often prove alfo of fingular benefit: And mufk is known to be a remedy fecond to none in thefe cafes. When Epilepfies are caufed by worms eroding the inner coats of the inteftines, after the ufe of the common anti-epileptic remedies, the medicines for worms muft be given, and their ufe continued, till, by the fymptoms ceafing, there is reafon to think thefe pernicious animals are deftroyed.

When an epilepfy returns at ftated periods, or at the changes of the moon, the caufe is ufually in the ftomach or duodenum, or its adjacent parts, the biliary ducts and pancreas. In this cafe therefore there fhould always be a clyfter given, and afterwards a vomit, before the expected fit.

In the time of the paroxyfms of epilepfies, people ought to abftain from the ufe of fubftances that are too volatile, fpirituous, fragrant, or fetid; for all thefe fill the head with vapours; nor fhould fuch things be exhibited as promote fneezing or vomiting, fince they derive the humours to the head, and often recall the paroxyfms. The moft ufeful means, in the fit, are to keep the patient in an erect pofture, to rub his hands and feet. In all kinds of epilepfies it is proper to abftain from wine and malt liquors, and to drink only water. Opiates, and too volatile medicines, muft be very cautioufly given to children, and to perfons of tender habits: And when epilepfies return on the flighteft caufes, it is proper to abftain from a load of medicines, and truft to nature and a proper regimen alone. In this regimen the patient muft abftain from all ftrong liquors, from great heat, or exceffive cold, from venery, from feeing any terrible fight, from anxiety of mind, and from bufinefs. Young perfons are to abftain from fruit; and all violent emotions of the mind are carefully to be avoided.

Many phyficians have prefcribed the root of the wild valerian, as a remedy which is alone capable of curing this terrible difeafe.

MORDEHI, an Eaft Indian name for a difeafe, to which the people of that country are fubject. It confifts in a violent diforder of the ftomach. The great heats, copious fweats, and fupervening cold of that country, all naturally tend to weaken the ftomach. Now if the inhabitants eat or drink immoderately at night, the concoction of their aliments can be but very unduly performed. Hence, befide this diftemperature of the ftomach, they are fubject to others of the bowels; and diarrhœas are very common among them, and with difficulty cured. *Hoffman*, de Morb. Endem.

MORDEXYN, or MORDOXI, a name given to a difeafe very frequent among the inhabitants of Goa, which confifts in a naufea, and continued vomiting, and ufually feizes the patient fuddenly and unexpectedly, and often proves fatal.

MORDILAPIS, a name given by fome writers to loaches, a fmall fifh, often found under ftones in fhallow waters.

MORE's-*Head*, in the manege, implies the colour of a *Roan horfe*, who befides the mixture or blending of a grey and a bay, has a black head, and black extremities, as the main and tail. See the article ROAN.

MORELLA, in botany, a name ufed by fome as a common term for all the nightfhades; others have appropriated it to the

lycoperſicon, or love-apple only. Æmilius Macer tells us, that in his time all the plants called by the Greeks *ſtrychna*, were called by the Latins *Morella*.

MORETUM, among the Romans, a kind of ſallad, compoſed of the eight following Ingredients, *viz.* garlic, parſley, rue, coriander, onions, cheeſe, oil and vinegar. *Pitiſc.* in voc.

MORGAY, an Engliſh name for the ſea fiſh called alſo the *rough hound-fiſh*, one of the galeus kind; the *catulus minor* of Salvian, and *muſtelus ſtellaris tertius* of Bellonius.

It is of a pale, and ſomewhat reddiſh grey, and is ſpotted with brown and whitiſh ſpots; the belly is ſilver white, and the body long and round; its ſkin is very rough, and its fleſh very firm, and finely flavour'd. Some ſay it taſtes of muſk, or ſome ſuch perfume. It is the ſmalleſt of all this genus of fiſhes, and ſeldom weighs above a pound and half. *Willughby*'s Hiſt Piſc. p. 64.

It is common in the Mediterranean, and is frequent in the markets in Italy.

MORGII, among the Mahometans, a ſect who lay much ſtreſs upon belief, and ſtand oppoſed to the *Alwaidii*. See the article ALWAIDII.

MORHUA, in zoology, a name uſed by ſome authors for the common cod-fiſh. *Bellon.* de Piſc.

MORIAM, in our old writers, a head-piece called a pot, Stat. 4 & 5 P. & M. c. 2. The word comes from the French *Morion*, or Italian *Morione*, *i. e. Caſſis*. *Cowel.*

MORILLON, in zoology, the name of a ſpecies of duck, ſeeming the ſame with the *capo roſſo*, a ſmall red-headed wild duck. See the article CAPO *Roſſo*.

MORINA, in botany. This plant, in the Linnæan ſyſtem, makes a diſtinct genus, the characters of which are, that the cup is double, and of two kinds, in the ſame plant; the one a perianthium of the fruit, which is monophyllous, cylindraceous, and remains after the flower is fallen off. The rim of this has ten notches in it, two of which have longer ſegments, which ſtand oppoſite to one another. The other cup is the perianthium of the flower, which is alſo compoſed of one leaf, and is of a tubular form, and ſlightly bifid, the ſegments being rimmed at their edges, pointed, and remaining alſo when the flower is fallen. The flower is a ſingle petal, forming a very long tube, a little bent, and wider at top than the bottom. The rim is plain, obtuſe, and divided into two lips; the upper of which is bifid, and the lower trifid. All the ſegments are of a roundiſh figure, and nearly equal in ſize. The ſtamina are too ſlender filaments, laid cloſe againſt the ſtyle, ſhorter than the flower. The antheræ are erect, and applied cloſely to one another. The piſtil has a roundiſh germen, placed under the receptacle of the flower; the ſtyle is of the ſame length with the ſtamina; and the ſtigma is formed into a ſmall head. It has properly no fruit; the ſeed ſucceeding each flower being ſingle, roundiſh, and ſurrounded with the cup of the flower. *Linnæi* Gen. Plant. p. 7.

MORINELLUS, in zoology, the name given by authors to the bird commonly called in Engliſh, the *dotterel*.

The uſual weight of this bird is a quarter of a pound; but the male is ſmaller than the female, and weighs uſually half an ounce leſs. Its Beak is a finger's breadth long. Its head is very beautifully variegated with ſmall black and white ſpots; and has a line of white over the eyes. Its throat is of a greyiſh white, variegated with ſtreaks of brown. Its breaſt and the under part of its wings are of a duſky yellow. The belly is white; and its back and wings are brown, with variegations of a whitiſh and yellowiſh colour. Its rump is grey; as is alſo its neck; and its tail is variegated with grey, black, and white. It is common in Lincolnſhire, and ſome other counties of England; and is a very delicate bird. It is commonly caught in the Night. *Ray's* Ornith. p. 230.

MORINELLUS *Marinus*, the *Sea Dotterel*, a name given by authors to the bird, commonly known in England by the name of the *turnſtone*; and called by Turner, *cinclus*. *Ray's* Ornithol. p. 231. See the article TURNSTONE.

MORINGA, in botany, the name by which ſome authors call the tree which produces the ben nut, or *glans unguentaria*, and whoſe wood is the *lignum nephriticum*, or nephritic wood of the ſhops.

MORION, in botany, a name given by the antients to a kind of nightſhade. The antient Greeks, Theophraſtus, and others, called all the nightſhades in general by the name *ſtrychnos*. Some of theſe they ſaid were poiſonous, and others eſculent. The poiſonous were of two kinds, ſome bringing on ſleepy diſorders, and others making the patient mad.

The eſculent kind was the *pomum amoris*, or love-apple, eaten at this time by the Portugueſe, and many other nations, and by ſome in England. Some after-writers uſed the word *Morion* as a diſtinctive name for thoſe kinds of nightſhade which cauſed ſleepy diſorders; and after theſe, ſome uſed it as the peculiar name of one ſpecies, and others as the name of the male mandrake of Dioſcorides, whoſe fruit, according to that author, was commonly eaten by the ſhepherds; but when taken too largely, threw them into ſleepy diſorders. From this word *Morion* has come, in all probability, the Latin name *morella*, given at firſt to the *pomum amoris*, or love-pple; and afterwards, according to Æmilius Macer, to all the nightſhades; for he expreſsly ſays, that thoſe plants which the Greeks called *ſtrychna*, the Latins called *morella*; and we find that the old Greeks called all the nightſhades *ſtrychna*.

MORION, in the natural hiſtory of the antients, a name given to one of the ſemi-pellucid gems, more commonly called *pramnion*. It is a ſtone appearing externally only of a fine deep black; but when held up againſt a candle, or againſt the ſun-ſhine, giving a very beautiful red, in different degrees, from that of the hyacinth to that of the amethiſt or carbuncle. *Hill's* Hiſt. of Foſſ. p. 471. See the article PRAMNION.

MORISONA, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is one-leaved, inflated, and divided at the top into two lips. Theſe ſtand open; but the neck is contracted, and the whole ſoon withers. The flower conſiſts of four oblong obtuſe petals, which are expanded when they are out of the cup. The ſtamina are numerous filaments. The antheræ are ſimple. The ſtyle is capillary and erect, and is longer than the tube of the flower. The germen of the piſtil is oval. The ſtigma is capitated, and of a plano-convex figure. The fruit is a globoſe berry, with a hard ſmooth rind. It has only one cell, and is ſupported by the ſtyle by way of pedicle. The ſeeds are numerous, and are of the ſhape of the common kidney-beans, but ſmall. *Plumier.* Gen. 23. *Linnæi* Gen. Plant. p. 230.

MORLING, or MORTLING, in our old writers, the wool which is taken from the ſkin of dead ſheep, whether killed, or dying of the rot, 4. Edw. 4. cap. 2. & 3. 27 Hen. 6. cap. 2. 3 Jac. 1. cap. 18. 14 Car. 2. c. 18. *Blount*, *Cowel.* See the article SHORLING.

MOROCHITES, in natural hiſtory, a name by which ſome of the old authors have called the *morochthus*, or French chalk. *Hill's* Hiſt. of Foſſ. p. 22. See the next article.

MOROCHTHUS, in the hiſtory of foſſils, a name of an indurated clay, commonly known among us by the name of French chalk, or marking-ſtone; and its principal uſe with us is the taking ſpots out of cloaths, and the ſerving taylors to mark with, as it makes a much more determinate and a neater line than chalk. The antients, however, had it much in eſteem in medicine, and uſed it as an aſtringent, and in colics and hæmorrhages, and externally in diſorders of the eyes.

It is diſtinguiſhed from all other earths, by being the hardeſt of all, conſiderably heavy, very ſmooth to the touch, and in colour of a greyiſh white, with a conſiderable admixture of green. It is of a diſagreeable brackiſh taſte, and does not ferment with acids. It is dug in Germany, the iſland of Sardinia, and many other places; but no where ſo plentifully as about Brianſon in France, whence it is there commonly called *Brianſon chalk*. *Hill's* Hiſt. of Foſſ. p. 22.

MOROCTES, one of the names by which Pliny, and ſome other of the older authors called the *Morochthus*, or French chalk. *Hill's* Hiſt. of Foſſ. p. 22. See the foregoing article.

MORONA, a name uſed by ſome for the *huſo*, or iſinglaſs-fiſh. *Willughby*, Hiſt. Piſc. See the article HUSO.

MORPHASMUS, Μορφασμος, among the antients, a kind of dance, wherein, by a great many figures, they imitated the transformations of Proteus. *Hofm.* Lex. in voc.

MORRHA, in natural hiſtory, a name given by ſome to the ſubſtance more properly called *murra* or *myrrha*, of which the cups called *murrhina* and *myrrhina* were made. See the articles MURRHINA and MORRHINA.

MORRHINA *Vaſa*, in the writings of the antients, a term very frequently met with, and uſed to expreſs a ſort of cup and vaſes uſed for drinking out of, and on ſome other occaſions.

The word is generally written *myrrhina*, and various conjectures have been formed concerning it, ſome ſuppoſing it to be meant of veſſels made of myrrh, ſome of the onyx, and ſome of a peculiar ſort of ſpotted ſtone. See the article MYRRHINA.

The word, however, is written by all the moſt correct writers *Morrhina*. Pauſanius and many others give us proofs of this. It is evident that there is no ſtone mentioned by the antients under the name *morrha*, nor is this word ever found uſed as a ſynonym for the onyx, or any other ſtone, but always as the name of the matter of which the veſſels were made.

The antients had many things in uſe among them, the nature and origin of which were unknown to them; and this *morrha* ſeems to have been one of that number. Some of them ſay it was a ſtone, and others call it a fluid, condenſed by being buried under ground. And if to this we add the beauty of the poliſh, the tender texture of the ſubſtance, which was eaſily broken by a fall, and the ſize of ſome of the veſſels made of it; for we are told that Heliogabalus had his chamber-pot made of it; it will appear very probable that it was a factitious matter, and was of the nature of our China ware. The antients, not knowing that the *morra* was a factitious ſubſtance, which it does not appear indeed that they did, does not prove it not to be ſuch; for they for many ages wore garments of ſilk, and had that ſubſtance in uſe on many other occaſions, and all the time believed it to be the *lanugo* or down of a tree, dreſſed by combing, &c. and it was not till

the days of Juſtinian that they knew it was ſpun by worms. Their ignorance of the origin of ſilk, however, no more altered its nature, than their ignorance of the fabric of their *morrhina vaſa* did that of the ſubſtance they were made of.

The antients had their moſt elegant and valuable *morrhina vaſa* from India and Carmania; but Arrian tells us, that there was a great quantity of them made at Dioſpolis in Ægypt. This he calls another ſort of *Morrhina* work; and it is evident, from all accounts, that the *morrha* of Dioſpolis was a ſort of glaſs ware, made in imitation of the porcelane or *morrha* of India.

There is ſome difference in the accounts given by Pliny and Martial, of the *Morrhina vaſa*. The firſt author ſays, that they would not bear hot liquors, but that only cold ones were drank out of them. The latter, on the other hand, tells us, that they bore hot liquors very well. It ſhould ſeem, that the moſt credit was to be given to Pliny; but if ſo, their porcelane was greatly inferior to ours in this particular.

MORSE, in zoology, the name of a monſtrous ſea animal, called by ſome the *roſmarus* and *walrus*, and by others, very improperly, the *hippopotamus* and *equus marinus*. See the article HIPPOPOTAMUS.

The *Morſe* is an ill-ſhaped amphibious animal, of the ſize of a large ox, covered with a ſkin like that of the ſeal, and ſomewhat reſembling an ox in the head; for which reaſon ſome have called it the ſea cow, or *vacca marina*, whence it has been erroneouſly confounded by ſome with the *manati*.

It has two large prominent and crooked teeth before, which are as fine as ivory, and are uſed by artificers for the ſame purpoſes. It brings forth uſually but one young one at a time, never more than two. It is a very ſtrong and vigorous animal, and difficultly taken; when it is caught, it is uſually at land, ſeldom at ſea.

Vorſtius, who met with a young one of this creature, has very accurately deſcribed it; whence we have the beſt deſcription extant of the nature of the animal. This young one was of the ſize of a large dog, and in ſhape much reſembled the phoca or ſea calf. Its head was round; its eyes large, and like thoſe of an ox; its noſtrils depreſſed and wide, and opening, and drawing together as the creature pleaſed. It had apertures on the ſides of the head for ears. Its mouth opened round and not very large; and on the upper lip it had a ſort of whiſkers, compoſed of thick cartilaginous briſtles. The lower jaw was of a trigonal form; the tongue ſhort and thick, and the mouth well furniſh'd with broad and flatted teeth. Its fore feet, as well as the hinder ones, were very broad; and the hinder extremity of its body very much reſembled that of the *phoca* or ſea calf. When it walked, the fore feet were directed forwards, the others turned backward. The toes were five on each foot, and theſe were joined by a membrane, which was remarkably thick. The hinder feet had claws, the fore ones had not; and the creature had no tail, and crept rather than walked on the hinder parts. Its ſkin was thick and tough, and covered with a few ſhort grey hairs. It made a noiſe like the grunting of a hog. *Ray's* Syn. Quad. p. 191.

MORT (*Cycl.*)—MORT, among the fiſhermen of ſome parts of England, a name given to the ſalmon while in its third year's growth. *Willughby's* Hiſt. Piſc. p. 189. See the article SALMON.

MORTALITY (*Cycl.*)—*Bills of* MORTALITY. Mr. Simpſon makes the proportion of the number of inhabitants of any place, to the number of births that happen there annually, as 26 to 1. Whereas Mr. Kerſſeboom [a] makes it 35 to 1; which Mr. Simpſon thinks owing to a want of obſervations. But Mr. Kerſſeboom has ſince ſhewn, in 29 tables, that the proportion of 26 to 1 cannot be admitted, and that his own, of 35 to 1, is right. He alſo proves, from Mr. Maitland's obſervations, that children in London, of two years old, continue to live, on a medium, above 37 years; and he obſerves, that by Dr. Halley's table [b], they live $38\frac{1}{2}$.—[a Doctr. of Annuit. p. 127. b Phil. Tranſ. N°. 465. Sect. 3. p. 319.]

Mr. Kerſſeboom ſuppoſes, that out of every 100 children born, five come dead into the world; and that out of every 100 children born alive, near 20 die under a year old. Mr. Simpſon's calculation differs greatly from this, he ſuppoſing that full 32 out of 100 children, die under a year old. Phil. Tranſ. ibid.

There is a ſurprizing diſparity obſerved between the chriſtenings and burials of the city of London; which is chiefly owing to diſſenters of all ſorts baptizing their children without ſending in accounts of their chriſtenings to the pariſh clerk. See Mr. *Maitland* in Phil. Tranſ. N°. 450. Sect. 16.

From the account there given of the chriſtenings and burials in London for ten years, from 1626 to 1635 incluſive, it appears that the chriſtenings exceeded the burials; nor can it be doubted that they do ſo ſtill. This obſervation will ſhew the cauſe of ſome miſtakes of Mr. Kerſſeboom. See Phil. Tranſ. ibid.

Mr. Maitland, in his account of London, ſhews, that at a medium of nine years, there are annually buried in London 29542, and in Paris only 17804; ſo that the number of inhabitants in London exceed thoſe in Paris by nearly in the proportion of 5 to 3. Hiſt. of Lond. p. 540, 548.

MORTAR (*Cycl.*)—The ſalt-petre workers in France uſing the *Mortar* of old buildings for extracting that ſalt, Mr. Petit has thought it worthy a peculiar attention, and has made ſeveral trials, by way of analyſis, of *Mortar*, to determine whether it really and eſſentially contains nitre in it, or whether it be only ſerviceable in that mixture of ſalts from which nitre is produced.

The common managers of the ſaltpetre-works are of opinion, that *Mortar* contains in it all the ſaltpetre they procure from it, and that the wood-aſhes, and other ſubſtances they uſe with it, only ſerve to abſorb the fat or oily parts, and ſo ſet the ſaltpetre at liberty to ſhoot. This they pretend to affirm upon experience; but they do not conſider that tho' they can procure ſaltpetre from the rubbiſh or *Mortar* without the addition of wood-aſhes, yet it is not pure *Mortar* that they make their experiments upon, but ſuch as is taken from their own heaps, upon which they always throw all the reſiduum of their former works, and all that liquor which will ſhoot no more cryſtals, but which they call the mother-water of ſaltpetre.

This gentleman therefore very properly judged, that to make a regular trial of the *Mortar* or rubbiſh alone, he muſt not take it from their ſtores, uſed in the ſaltpetre-works, but pick it himſelf from the ruins of old buildings.

The mark the ſalt-petre workers have to know good *Mortar* for their purpoſe, is, that it taſtes acrid and ſalt when applied to the tongue; but to this it may be alſo added, that it ought to be of a greyiſh colour, and ſuch as when powdered and ſprinkled upon burning charcoal yields ſome ſparks of fire; and the more ſparks it gives, the better it is for the purpoſe. And another character of the goodneſs is, that theſe well impregnated *Mortars* have a certain unctuoſity or fattineſs to the touch, which other kinds have not.

The fineſt of all kinds of *Mortar* for ſalt-petre work. is ſuch as is had from the ruins of old buildings in a low ſituation, and out of the way of much ſunſhine; where there has been no great quantity of fire kept, and eſpecially ſuch as has ſerved for the cements of the walls of ſtables, or the like.

Mr. Petit choſe from ſuch a wall twelve pounds of old *Mortar*; this he had beat to powder, and poured upon it eighteen pints of water; the whole was then ſet over the fire, and ſtirred from time to time for three or four hours, that the water might be well tinctured from the *Mortar*; after this the water was filtred through paper, and was then found to be tinctured to a pale yellow, tranſparent, bitter, and ſomewhat acrid to the taſte.

The impregnation may be made without heat, by only ſtirring the *Mortar* about for nine or ten days in cold water, and the quantity of the ſalts taken up will be according to the goodneſs of the *Mortar* and the quantity of water employed. The common ſpecific gravity of this liquor to water, is as 32 to 31, or thereabouts. Mr. Petit having procured the tincture of fifty pounds of *Mortar* by ſeveral impregnations in ſeventy-two French pints of water, evaporated it ſo far till it appeared highly charged with ſaline particles, taſting very acrid and bitter, and being of a browniſh red colour; and its ſpecific gravity was in this ſtate to water, as 4 to 3, there being more in quantity than about four pints. This was ſtill limpid and of a duſky colour, and was afterwards evaporated over a gentle fire to the conſiſtence of an extract, which as it cooled became much thicker and firmer, reſembling butter. This being left open to the air ſoon relented into a liquor of the conſiſtence of a ſyrup: Its ſpecific gravity was now to water as 5 to 3; but in leaving it open to the air, it continually attracted freſh humidity, and became leſs ſpecifically heavy. Experiments made with this extract ſucceeded in the following manner.

1. It turned the common blue paper to a fine deep red. The impregnations in water uninſpiſſated do this alſo in different degrees according to their ſtrength.

2. Mixed in equal quantities with ſpirit of nitre and with ſpirit of ſea-ſalt, it made no effervefcence or alteration in either.

3. A leaf gold being put into the mixture of this impregnation with ſpirit of nitre was immediately diſſolved, and in an hour or two afterwards the liquor was much clearer than before.

A leaf of gold being put into the mixture of this impregnation and ſpirit of ſea-ſalt, was in the ſame manner diſſolved in a few minutes. It is generally ſuppoſed indeed that ſpirit of ſalt alone will diſſolve gold, but there ſeems an error in this founded on the inaccuracy of the preparation of ſuch ſpirit of ſalt; for Meſſ. Geoffroy and Boulduc have at different times produced before the French Academy ſpirit of ſalt carefully prepared by themſelves, which would not at all diſſolve gold, not even with the aſſiſtance of heat; even ſuch ſpirit of ſalt would however be made to diſſolve gold by mixing this impregnation with it: So that it has the power of diſſolving gold in a great degree.

4. A leaf of ſilver being diſſolved in ſpirit of nitre, and this impregnation of *Mortar* added to the ſolution, the whole became turbid, and a precipitation happened, part of the matter

ter being thrown to the bottom, and part remaining suspended in form of a white cloud, which kept its place without falling.

5. The impregnation being mixed in equal quantities with oil of vitriol formed a coagulum, and made a great effervescence, with copious red vapours, and a strong smell of aqua fortis; and these vapours appeared at any time on stirring the mixture for several days together. If a larger quantity of oil of vitriol be added to this coagulum, it all becomes fluid, but ferments violently; and finally there will be a white matter precipitated to the bottom of the clear liquor; and if a leaf of gold be brought near this mixture it will be dissolved even by the vapour which exhales from it. Spirit of nitre has no effect upon this mixture, either in its state of a coagulum, or when reduced by more oil of vitriol into a clear liquor; but the volatile spirit of urine ferments violently without the least heat with it.

6. Oil of tartar *per deliquium* being added to the impregnation, the liquors would not readily mix, but remained separate, the impregnation sinking to the bottom; but on stirring them thoroughly together, they finally were made to unite into a white substance like butter, with a strong urinous smell. If a small quantity of corrosive sublimate be added to this mixture, the urinous smell ceases; and if oil of vitriol be added, there is a violent fermentation occasioned; and, in fine, a large quantity of precipitate.

7. This impregnation of *Mortar* being mixed with an equal quantity of a solution of corrosive sublimate, there is nothing remarkable produced, though the mixture be ever so much shaken; but if a little oil of tartar *per deliquium* be added to this, the mixture becomes turbid, and, on stirring all together for some time, it becomes white and thick like butter. If to this, more corrosive sublimate be added in solution, it becomes orange-coloured; and, on more stirring, this becomes again white; and finally gives a white precipitate at the bottom, of a transparent liquor.

8. If instead of oil of tartar an equal quantity of lime-water be added, this in the same manner gives an urinous smell, and the whole difference is, that the mixture will not become thick with this, as it will with oil of tartar.

9. The impregnation of *Mortar* produced the same coagulum on mixing with spirit of urine, that it did with oil of tartar *per deliquium*; but it made no coagulation with spirit of sal armoniac with lime; the occasion of this difference is, that the spirit of urine contains a great deal of volatile salt, and the other but little. It is a common error to suppose that the spirit of sal armoniac, which is most pungent, contains the greatest quantity of salt; but this is not the case, for the spirit made with lime is much more pungent than that with salt of tartar, though the last is well known to contain a greatly larger portion of saline particles.

10. If a piece of paper or linnen be wetted in this impregnation, and afterwards dried, it takes fire very violently, and sparkles with the same violence as if it was impregnated with salt-petre.

From these experiments it is abundantly proved, that the impregnation of *Mortar* contains a large quantity of a saline and nitrous ammoniac salt; for a dissolution of sal armoniac and spirit of nitre mixed together are found to produce all the changes in the different bodies before-named, that the impregnation does. On the whole, though it has been supposed by Mr. Tournefort, and others, that *Mortar* contained sal-petre, sea-salt, and a fixed alkali; yet there does not appear any proof of its containing any one of those salts; no fixed alkali can ever be separated from the impregnation of it; and tho' the linnen or paper wetted in the impregnation of it sparkled when on fire, yet it is not nitre, but merely a nitrous sal armoniac, which occasions that phænomenon. The same effect is produced, if the linnen or paper be wetted with a mixture of spirit of urine and spirit of nitre. And the several experiments before recited prove, that there is in *Mortar* a spirit of nitre and a spirit of sea-salt, which with the volatile urinous salts form a nitrous or a saline sal ammoniac. Mem. Acad. Scienc. Par. 1734.

MORTARIOLUM, a word applied by different writers to different things, from their resemblance to a mortar in shape. The chemists express by this name a small mould made for the fashioning their cupells; and anatomists call the sockets of the teeth the *Mortariola* of the jaws.

MORTIFICATION (*Cycl.*)— MORTIFICATION, in religion, any severe pennance observed on a religious account. How antient and how universal the practice of it has been, and for what reasons observed. See the article FASTING.

MORUS, the *Mulberry*, in botany, the name of a genus of trees, the characters of which are these: The flower is of the amentaceous kind, consisting of a great number of stamina, with their apices which arise from a four-leaved cup; these are male-flowers, and the embryo-fruits appear on different parts of the tree, and finally become a sort of compound berry, soft and full of juice, and composed of clusters of succulent squammæ which contain roundish seeds. *Tourn.* Inst. p. 589.

The species of *Mulberry*, enumerated by Mr. Tournefort, are these: 1. The common *Mulberry*, with black fruit. 2. The *Mulberry* with small black fruit, and elegantly divided leaves. 3. The *Mulberry*, with white fruit. 4. The *Mulberry*, with small purplish white fruit. And 5. The *Mulberry*, with small insipid white fruit.

The fruit of this tree, while unripe, is very astringent; but when thoroughly ripe, it is of a contrary quality, rather purgative, cooling, very pleasant, and quenching thirst. Its syrup, which is very pleasant, is the only use made of it in the shops.

The more general cultivating *Mulberry* trees in England might be of greater use than is at present supposed in many respects. In Devonshire they have a way of mixing *Mulberry* juice with their cyder in the making, and thus make the very best of all English vinous liquors. And as to the great article of breeding silk-worms, though a recommendation from the crown could not bring about the planting these trees in sufficient number for it in James the First's time, yet the trees have been found to flourish every where with us when properly planted, and the worms feed very kindly and work very well with us. When this manufacture was first attempted, the people of many parts of England, nay and in some parts of the dampest places in Ireland, tried it, and always with success. The only thing that stopped the progress of so valuable a thing at that time, was the want of a sufficient quantity of *Mulberry* trees, and the scheme has been neglected ever since. Phil. Trans. Nº. 133.

The tree was always esteemed by the antients for its delicious fruit, before the use of its leaves was ever found out. The Romans, in the height of their luxury, preferred it before all the foreign fruits; and Columella, and the other antients are very express in the methods of propagating it.

MORXI, the Indian name of a pestilential distemper, very common in Malabar, and in some other parts of the East-Indies, frequently carrying off great numbers of people.

MOSCH, a name of a sort of roriferous vessels, said to have been discovered by Bilsius, in the kidneys.

MOSCHELÆUM, a name given by authors to a compound, fragrant and aromatic oil, in which musk is a very predominating ingredient.

MOSCHATELLINA, in botany, the name of a little plant common under our hedges in spring, which constitutes a peculiar genus; the characters of which are these: The flower consists of one leaf, and is rotated and divided into several segments at the edge. From the cup of this rises a pistil, which is fixed in the manner of a nail to the middle of the flower; and finally becomes a soft succulent berry, containing flatted seeds. *Tourn.* Inst. p. 156.

MOSCHELAPHUS, in natural history, a name given by some writers to a creature of a mixed nature, produced by the copulation of a stag and a cow. Wagner tells us, that these creatures are sometimes seen in the mountainous parts of Swisserland; as are also the Hippotauri, generated between a bull and a mare; but neither of these ever propagate their species. *Wagner's* Hist. Helvet.

MOSCHIFERUM *Animal*, in natural history, the name of the creature which affords us the perfume called musk.

This creature seems to be neither of the goat nor deer-kind, and it is doubtful whether or not it chews the cud; it has however no *dentes incisores* in the upper jaw, which seems a mark that it does; but it has, according to the observation of Aristotle, exerted teeth or tusks there, in the manner of the boar. His nose is sharp, like that of a greyhound; his ears like a rabbit's, about three inches long, and erect; and his tail or scut, about two inches; his foot is deeply cloven. The hair on the body is about half an inch long, and very thick, and of a brown and white colour. *Ray's* Syn. Quad. p. 140.

The *Musk* bladder or bag is about three inches long and two over, swelling out an inch and half from the belly, and standing as much before the groin. It has no horns, and its tusks by their figure seem intended equally for feeding and fighting.

MOSCHOSITERON, a name given by Myrepsus, and other old writers, to Fœnugreek.

MOSS (*Cycl.*)—These small plants, tho' neglected of many ages, have, by the industry and application of the later botanists, been found a very numerous and very beautiful class of plants; and not without their uses in medicine and mechanics, and to various purposes of human life. Dr. Dillenius, who has studied them with an uncommon care, and given a very valuable history of them, has described more than six hundred species; the greater part of which are found in our own country, though some peculiar to others; and doubtless, there yet remain vast numbers unheeded and unknown in many countries. See Tab. of *Mosses*.

The *Mosses* of Virginia, Pensilvania, and other parts of North-America, are in part the same with ours, and in part different; about two thirds of the number of *Mosses* of these countries hitherto observed being common to our own country also, the rest peculiar to that part of the world. Those of South-America, are almost all wholly different from ours. The *Mosses* of Greenland and Lapland are mostly of the same kind with those of our Welch mountains. And in the moun-

tainous

tainous parts of the world between the Tropics, there are many extremely beautiful fern-like *Moſſes*, unknown in all other places.

Ireland and Scotland yet remain to be ſearched in a great meaſure, and probably will afford great numbers hitherto wholly unknown. It cannot but be acknowledged, that the diſtinctions of theſe little vegetables are ſo minute, and their appearance ſo various in their different ſtates, that very probably ſucceeding obſervations will much retrench the number deſcribed by Dillenius; but as the ſame obſervers will probably add as many new and truly diſtinct ſpecies, as they find occaſion to ſtrike off from the old liſt, there is no doubt but that the number will be found at leaſt as great as it ſtands at preſent with that author.

Uſes of Mosses. Were there no other uſe in theſe minute and beautiful objects than the admiring the wonderful works of the creator, this were enough to make the ſtudy of them worthy of attention; the almoſt endleſs variety of the figure and ſtructure of their leaves, the ſlenderneſs of the ſtalks that ſupport them, and the regularity and nice order in which they are arranged; the minuteneſs of their roots, and the ſlenderneſs of the pedicles which bear the heads, each of which is often ſmaller than the fineſt hair, and the extreme exility of the veſſels through which juices are conveyed along theſe for the nouriſhment of the plant and ſeeds, can never enough be admired; and the various ſtructure of the heads or ſeed-veſſels with their coverings, by means of which the tender ſeeds and farinæ are defended, afford to the microſcopic obſerver an endleſs fund of admiration.

But theſe are not all the uſes they were intended for, many may yet remain unknown; but we at preſent well know that ſeveral of the uſneas are great and valuable medicines, uſed as deſiccatives and aſtringents; that the common cup *Moſs* is one of the greateſt remedies in the convulſive coughs of children, called the chin-cough, is known to every one; and Dr. Mead has ennobled the grey ground-lichen, by publiſhing its virtues in one of the moſt terrible of all diſeaſes, the bite of a mad dog. The common green liverworts are known medicines in diſorders of the breaſt, as are alſo all the ſpecies of polytricha. The ſeeds of our lycopodium are given with ſucceſs in nephritic caſes; and the Indians give one of their ſpecies in many diſtempers, and as they ſay, with great benefit. The common white ground coralloides ſerves the rain-deer of Lapland for food, when all other herbage is loſt; and the confervæ ſerve for food to many of the fiſhes both of the ſea and rivers, and to ſeveral water-fowl. And theſe, as well as the land *Moſſes* afford ſhelter and habitation to many inſects, and their young. Many of the ſpecies of coralloides and lichenoides are found of great uſe in that profitable branch of commerce the art of dying; and doubtleſs many others have alſo the ſame qualities, though not yet diſcovered; and we may be guided in ſearches of this kind by obſerving that many of them tinge the papers between which they are dried, to very beautiful and laſting colours. The *Moſſes* which cover the trunks of trees, as they always are freſheſt and moſt vigorous on the ſide which points to the north, if not only produced on that, ſerve to preſerve the trunk of the tree from the ſeverity of the north-winds, and direct the traveller in his way, by always plainly pointing out that part of the compaſs.

The ſoft marſh and bog *Moſſes* ſerve the poor in many places for ſtuffing their beds, and in the buſineſs of tranſporting plants from other countries; nothing is of ſo great uſe as the ſtalks and leaves of theſe little vegetables: The ſucculent plants coming over in great beauty and vigour when rolled up in dry *Moſs*; and trees and ſhrubs, by having their roots covered with ſuch as is ſomewhat moiſt.

The great quality of the *Moſſes*, which makes them ſo ſerviceable in this caſe, is, that they do not heat and ferment on being moiſtened, as hay and ſtraw would.

Characters of Mosses. What the botanical writers ſtrictly underſtand by the word *Moſs*, is a claſs of plants appearing of an inferior rank, to the common vegetables; the leſs perfect genera of which ſeem to be wholly deſtitute of flower or ſeed or any thing analogous to either, at leaſt as far as our obſervations have hitherto been able to carry us, and to conſiſt of ſimple, ſimilar, and uniform parts; the genera a little above theſe have ſome diverſity of parts, and carry ſomething that looks analogous to vegetation in the common way, having a reſemblance of thoſe parts which ſerve other plants for their fructification. The more perfect genera of the *Moſſes* not only conſiſt of different parts, but have alſo their appropriated organs containing a pulpy matter, which finally becomes dry, and aſſumes the form of a fine and ſubtle powder, compoſed of granules, each of which is either a ſeed or a granule of farina ſerving for the propagation of the ſpecies.

The more imperfect *Moſſes* are diſtinguiſhed from the others by their appearance to the naked eye; they are either in form of a fine lanugo, or down covering the ſurface of different bodies, or elſe they appear as ſlender filaments or foliaceous bodies floating about in the water, or as filaments of a tougher texture hanging down from the branches of old trees, or as little ſhrubs or ſingle horns growing erect on the parched earth of mountains and heathy places; or finally, as broad and foliaceous bodies ſpreading themſelves over the dry barks of trees or rocks, without any pedicle or other ſupport.

The more perfect kinds of *Moſſes* are found in the ſhape of ſmall but regular plants, dividing into ſeveral branches, and clothed with leaves; theſe are of various forms and ſtructures, ſome being broad and thin, others ſlender as hairs; ſome pellucid, others opake; ſome ſmooth, others hairy. From the alæ of theſe leaves in ſome kinds, and from the ſummit of the ſtalks in others, there ariſe heads or capſules of a various figure and ſtructure, but all unicapſular; ſome of theſe are naked, others covered with a calyptra or hood; ſome ſtand on long pedicles, and others are placed cloſe to the ſtalks. Theſe heads are uſually called *capſulæ*, and their pedicles *ſetæ*, in the *mnia*, *hypna*, *brya*, and *polytricha*; but in the *lichenes* and *lichenaſtra* the pedicles are called *pediculi*, and the heads *capitella*.

The *byſſi*, *confervæ* and *tremellæ*, appear to be wholly deſtitute of ſeeds; the ſeveral parts of theſe genera have no difference from one another; and in the *tremellæ*, though there is often an appearance of leaves like thoſe of trees, yet when examined they will be found to differ in this, that the upper and under ſides are no way different.

The *uſneæ*, *coralloides*, and *lichenoides*, all have ſomething which ſeems analogous to a flower or fruit in the perfect plants; and all the other genera of *Moſſes* as the *ſphagna*, *hypna*, &c. have perfect fructifications, and produce the powder before-mentioned ſerving in the place of farinæ or ſeeds, and regularly propagating the plants. The mnia, lycopodioides, and above all others the lichens or liverworts, have perfect and regular fructifications obvious to the eye. The mnia have duſty heads, which appear plainly to be the female part of the fructification.

The lycopodioides has ſeveral capſules containing farinæ, and beſide theſe ſeveral female capſules containing ſeeds, and not farinæ, interſperſed along the ſame ſpikes.

The heads of the lichens or liverworts which contain the farinæ, differ from all the others in that they are polycoccous; in this alſo they differ from the ſeed, bearing heads of the ſame plants or ſcyphi, as they are called, which are ſingle, and contain the rudiments of ſeeds, obvious to the naked eye, which may be daily ſeen to encreaſe; and the propagation of the plant from them is eaſily obſerved through its ſeveral ſtages: This however is very ſingular, and extremely different from that of all other plants, in that the whole operation conſiſts only in the dilatation of the ſeeds, they having no heart or eye, as it is called, in the ſeeds of the larger plants, no place from whence the radicle is to ſhoot, nor any ſeminal leaves, but expanding ſimply into breadth, they become young plants like the parent.

The other genera of *Moſſes* have all capſules for the containing their ſeed or farinæ. Theſe, in ſome, are covered with a calyptra or hood, in others they are naked. Of the firſt kind are the *ſphagna*, *brya*, *fontinales*, *hypna*, and *polytricha*; and of the latter, the *ſelagines*, *lycopodia*, *poroniæ*, *anthocera*, and *lichenaſtra*.

The capſules of the *ſphagna* have no calyptra, becauſe the heads being placed on extremely ſhort pedicles, and the leaves of the plant long, they are covered and defended by them; and having beſide a very rigid and ſtiff operculum, they are in no neceſſity of any other covering; but the *fontinales*, *hypna*, *brya*, and *polytricha*, are all defended in their capſules by calyptræ, leſt the too abundant humidity ſhould deſtroy the ſeeds. The operculum ſlides off from all theſe in a tranſverſe direction; for when the included pulp in the capſule becomes ripened into ſeeds or farinæ, the notched parts of the rim ariſe from the ſurface, and expand themſelves outward, by means of which the operculum is at liberty to fall off, and the ſeeds have liberty to fall out, and propagate the plants.

The *ſelagines*, *lycopodia*, and *lycopodioides*, have neither capſule, operculum, nor calyptra; for the fruits of theſe genera lying immerſed in the alæ of the leaves, they need no ſuch coverings; but they ſtand naked cloſe to the ſtalk, and when mature, they open longitudinally, and throw out their ſeeds. The fruits of the anthocera open in the ſame manner, but they are of a very different figure, reſembling pods, whereas the others are of a kidney-like ſhape.

The poroniæ are very ſingular, in that their capſules are perforated with many holes, thro' which the ſeeds or farinæ are diſcharged when ripe. The heads of the lichenaſtra, when they are ripe, become lucid, and opening into four parts, carry the appearance of a tetrapetalous, or four-leaved cruciform flower.

The ſubſtance with which the heads or capſules of all the *Moſſes* are filled, reſembles either ſeeds, or the ſmall globules of the farinæ of flowers, which all reſemble ſeeds of particular figures in miniature. The fructifications of theſe minute plants ſeem to be either from theſe, as ſeeds falling to the earth; or, according to the opinion of ſome, they ſeem to contain only farinæ in the capſules, which impregnating certain bulbs or nodules in the alæ of the leaves, cauſe them to grow and vegetate, as is ſeen in ſome of the larger plants, as in the bulbs produced in the alæ of the leaves of the dentaria, and of the lillies, and ſome others. The former opinion, of the powder in the heads or capſules, being actually perfect

perfect feeds, is the more probable, as thefe bulbs in the alæ of the leaves are found only in fome of the hypna, and others of a few other genera, whereas the propagation is as quick and certain in thofe which have none of them, as in thofe which have; and the want of female parts of fructification, which makes fo many defiderata in the Linnæan fyftem of botany, is eafily made up, and the whole explained according to the ufual courfe of nature in other vegetables, by allowing the powder in the capfules to be real feeds, and the fmall globules on the pointals furrounding the aperture of the capfule, the farina.

The opinion of the *Moffes* growing only from thefe nodules in the alæ of the leaves, or from the impregnated ends of the branches which had received the powder from the capfules, was originally founded on the obferving, that the trailing or branched hypnums annually grew out into length, from the extremities of all their branches, and annually loft as much of the old ftalk at the root, as they gained of the new at the fummit; but it appears from further obfervations, that they are real feeds which are contained in form of powder in the capfules; fince the bryums, and many others, are found growing from fmall points or fpots, which are affemblages of their minute leaves, propagated on the ground, under the old ones juft where the powder of the capfules has fallen; and tho' it be allowed, that the hypnums and other trailing *Moffes* do grow from the ends of the branches, yet they may alfo be produced in form of new plants, from regular and perfect feeds fhed from the capfules. It is certain that the bryums are by this means propagated and fpread into large tufts, and the other genera may alfo be fo propagated, tho' they have befide a property of encreafing by growth of the ftalk; which feems no other than the property of many of the larger plants to creep at the root, and fhoot out in length greatly from the extremities of their horizontal branches, lying on or under the ground, as thofe fpreading parts may more properly be called than roots, the fibres pufhed out from them perpendicularly into the earth, being properly the roots; and it is well known that thefe plants, tho' they propagate themfelves thus by the root, produce feeds alfo like the others, by which they may be equally propagated; and this analogy is to be carried yet farther; for as thofe plants which creep by the roots, produce fewer feeds than thofe which are propagated only by feeds, fo the hypnums, which are the genus of *Moffes* in which this growth by the ftalk is principally obferved, are very thinly befet with capfules of feed, and many of them produce but very few in a feafon; whereas the brya, and other *Moffes*, which have not this advantage of growing from the ends of the ftalks, are found every year profufely covered with capfules from every tuft; nay, there is fcarce any branch which does not produce its capfule. Now if thefe capfules contained only a farina capable of impregnating the nodules, or the ends of the branches, it is obvious there would be as much of it required for the hypna as for any other kinds of *Moffes*; but if they are real and perfect feeds, it is no wonder that nature has given them profufely, to fuch kinds as are to be propagated only by feeds, and more fparingly to thofe which are propagated alfo by the increafe of the branches.

To this it may finally be added, that the ferns and other epiphyllofpermous plants approach moft of all others to the nature of the *Moffes*; and tho' it has been fufpected by many, that the fine powder at the back of their leaves was not feeds, but only a farina; yet it is now well known that it is true and perfect feed, fince, under many fpecies of them, there are conftantly found new and felf-fown plants arifing in their firft rudiments of leaves and figure, which have plainly grown from the duft or powder fallen from the old plants; and as this is now found to be the cafe in regard to the ferns, probably it will alfo appear the fame in regard to the *Moffes*, when they have been yet farther examined than at prefent. But whether thefe grains of powder have the lobes and radicle by which the feeds of larger plants propagate themfelves, or whether they grow into plants like the parent ones, in the manner of the lichens, by mere expanfion, is a thing that requires farther obfervations to determine.

Some of the *Moffes*, it is evident, approach to the nature of the plants, which have their male and female parts in the fame flower, and to thofe which have them in different ones. The lichens have their leaves notched and jagged like thofe of the perfect plants, and have, in the fame manner, their under furface different from the upper. Thefe have their male flowers or heads on long pedicles; thefe heads contain only farina, and the feeds are lodged in little cups or difhes on the furface of the leaves. The next in perfection to thefe are the lycopodioides, which have flowers with farina, and fruits with feeds, difpofed along the fame fpike. The mnia have heads of two kinds, the one membranaceuus, like thofe of the hypnums and other *Moffes*, and the other dufty, and containing a powder vifible on their furface; the one of thefe plainly contains the farina, the other the feed. The lichenaftra are very feldom found with feeds on them; but they creep greatly by the roots; whence a new propagation by feeds is lefs neceffary. The polytricha are fuppofed to carry only a farina in their heads, and their branches ftellated at the ends, tu carry the feeds which are to be impregnated. This has been the common opinion; but it wants confirmation. Some of the bryums have the fame appearance of a female part, and the young nodules in the alæ of the leaves of the hypnums are generally alfo referred to the fame ufe. But thefe are conjectures; and the much more probable opinion is, that the powder in the heads of all the *Moffes* is true feed, which in general is impregnated with farina from the pointals, over the mouth of the capfule; and in fome inftances, as in the mnia, &c. as in fome of the more perfect plants, from different flowers in a different part of the plant. *Dillen.* Hift. Mufc. Introit.

The manner of feeding of *Moffes* in general may be in fome degree gueffed at by that of one genus of them, which has been traced through all its ftages, and to which moft of the others, though every genus has its diftinct fructification in fome refpects, yet bear a very great general analogy.

The genus already obferved, is that called by Dr. Dillenius, the *hypnum.* The fpecies of this are very numerous and common; but that particular one which was the fubject of thefe obfervations, is the fhort-branched filky kind, common on old walls; and called by that author in his hiftory, *Hypnum vulgare, fervicum, recurvum, capfulis erectis cufpidatis.*

The head of this *Mofs* appears to the naked eye a fmall fmooth brownifh yellow oblong body, of about a ninth of an inch long; this is covered at its upper end with a membranaceous calyptra or hood, in fhape refembling an extinguifher, or a funnel inverted. When this calyptra is taken off, and the head viewed with a microfcope, the furface of it is feen to be ridged with longitudinal ftriæ. The bafis of the head is of a deep orange colour, and more opake than the reft; and the top is bounded by an orange-coloured ring fwelling out fomething beyond the furface of the contiguous parts of the head. Good glaffes fhew that in this head there are not wanting the parts effential to the fructification of what are ufually called the more perfect plants. This ring is truly a monophyllous undulated calyx, within which arife fixteen pyramidal fimbriated ftamina; thefe are of a pale greenifh colour, and are loaded with a whitifh oval farina. The ftamina all bend toward each other from their bafes, and almoft meet in a point at their tops. This is their appearance when the head is nearly ripe; and immediately under the arch formed by thefe ftamina, is a cylindric hollow piftillum, through which the farina makes its way, and is difperfed among the feeds in the head. The fruit is a large capfule, filling every part of the membrane which fhews itfelf on the outfide of the head, and in moft places is contiguous to it. This capfule is filled with perfect and very beautiful feeds; they are round, tranfparent when unripe, but afterwards opake, and of a very beautiful green, which colour they retain even when dried. Philof. Tranf. N°. 478. Sect. 12.

When this head is firft produced fiom the plant, the ftamina are very flender, and ftand erect; the head is fcarce any thicker than the ftalk, and the calyptra covers it all over, to fhield the tender fubftance of the farina from external injuries. As the farina afterwards fwells in the ftamina, the feeds in the head increafe alfo in bulk, and by their increafe the head is more extended in thicknefs, and the ftamina are by this means feparated farther and farther from each other at their bafes, but bend inwards toward their points, fo as to form a kind of arched covering over the ftigma of the piftillum which is fingle; and from hence the farina falls as it ripens into the head, and impregnates the feeds. Id. Ibid.

All the *Moffes*, liverworts, and the other plants of the fame character, poffefs the fame general virtues of drying and aftringency.

Moss *on Trees*, in gardening. The growth of large quantities of *Mofs* on any kind of tree is a diftemper of very bad confequence to its increafe, and much damages the fruit of the trees of our orchards.

The prefent remedy is the fcraping it off from the body and large branches, by means of a kind of wooden knife, that will not hurt the bark, or with a piece of rough hair cloth, which does very well after a foaking rain. But the moft effectual cure, is the taking away the caufe. This is to be done by draining off all the fuperfluous moifture from about the roots of the trees, and may greatly be guarded againft in the firft planting of the trees, by not fetting them too deep.

If trees ftand too thick in a cold ground, they will always be covered with *Mofs*; and the beft way to remedy the fault, is to thin them. When the young branches of trees are covered with a long and fhaggy *Mofs*, it will utterly ruin them; and there is no way to prevent it, but to cut off the branches near the trunk, and even to take off the head of the tree, if neceffary; for it will fprout again; and if the caufe be in the mean time removed by thinning the plantation, or draining the land, the young fhoots will continue clear after this.

If the trees are covered with *Mofs*, in confequence of the grounds being too dry, as this will happen from either extreme in the foil, then the proper remedy is the laying mud from the bottom of a pond or river, pretty thick about the root, opening the ground to fome diftance and depth to let it in; this will not only cool it, and prevent its giving growth to any great quantity of *Mofs*, but it will alfo prevent the other

other great mifchief which fruit-trees are liable to in dry grounds, which is the falling off of the fruit too early. *Mortimer*'s Hufbandry, vol. 2. p 78.

Heath-Moss. See the article Heath.

Silk-Moss, in botany, a name given by Count Marfigli to a fpecies of fea *Mofs*, of a very remarkable finenefs and foftnefs, much more refembling filk than any other of the vegetable productions. It is wholly compofed of a fort of tuft of fine hairs or filaments, and is of a bluifh green colour, and almoft tranfparent. It grows on rocks, ftones, fhells, or any thing elfe that lies in its way, and is found ufually at fmall depths; it is not fo tough and flexible as many other of the fea plants, but is eafily rubbed to powder between the fingers. When examined by the microfcope, the fingle filaments do not appear of the fame equable furface and uniform texture; but they are feen to be jointed and made up as it were of a great number of pieces faftened end by end to one another, in the manner of the beads of a lady's necklace. It is of a fine bluifh green, and perfectly tranfparent before the microfcope, and refembles a ftring of gems, fuch as the aqua marina, or fome other like ftone. *Marfigli* Hift. de la Mer. p. 79.

Sea-Mosses. Thefe fmall plants are very beautiful when viewed by the naked eye; but when examined with the microfcope, they afford a very pleafing variety of ftructure and conformation.

The common kinds afford a great variety of colouring, the different parts of the fame plant often appearing fome brown, fome yellow, fome red, and fome grey. On drying, thefe colours become lefs elegant; but on putting the dried plant again to foak in water, they are in fome degree recovered, and the variations are ufually found to be owing to the joints and knots in the ftalks, which interrupt the courfe of the general colour, and are often themfelves either black, or of a dark and deep brown.

The fummits of their branches are frequently terminated by little tranfparent bubbles; thefe fome have taken for fruit, but very erroneoufly; they are in reality only globules of clear water. Some of them are jointed at feveral diftances, and every joint has its regular fhape and ftructure. This is the cafe in the two great claffes of the corallines and the confervas. Others are elegantly variegated with brown, yellow, and green, and though lefs tranfparent, are not lefs beautiful than the former; thefe are in general of the fucus or fucoides clafs. Others are white and tranfparent, like *Moffes* of cryftal. Thefe are fmall and elegant corallines, and their joints are ufually variegated with black fpots: It is not unufual alfo to fee, at the extremities of the branches of thefe, certain fmall black globules, which appear to be the fruit; but they are in reality no other than globules of water thus tinged by fome juices from the plant.

It is poffible, however, that thefe liquid globules may be fo far of the nature of a fruit, as to contain the feed of the plant. We know that the feeds of the fea fucus's in general are enveloped in a glutinous liquor, and kept at the fummit of the branches of the plant; they are indeed in thofe large plants furrounded with a vifible and fenfible membrane, which is indeed thicker and longer than any other part of the plant; and it is not impoffible that thefe fine and fmall globules may have their covering membrane, too fine and thin to become the object of our fenfes. *Marfigli* Hift. de la Mer, p. 80.

The generical characters of thefe plants are to be feen under their feveral heads of *fucus*, *coralline*, and the reft; but thefe minute plants are often omitted by the writers on botany, though they make fo elegant a figure on being viewed with the affiftance of glaffes.

Moss is alfo a name given by fome to the boggy ground in many parts of England, more ufually called a *fen* and *bog*.

In many of thefe grounds, as well in England and Ireland as in other parts of the world, there are found vaft numbers of trees ftanding with their ftumps erect, and their roots piercing the ground in a natural pofture, as when growing. Many of thofe trees are broken or cut off near the roots, and lie along, and this ufually in a north-eaft direction. People who have been willing to account for this, have ufually refolved it into the effect of the deluge in the days of Noah; but this is a very wild conjecture, and is proved falfe by many unanfwerable arguments. The waters of this deluge might indeed have wafhed together a great number of trees, and buried them under loads of earth; but then they would have lain irregularly and at random; whereas they all lie lengthway from fouth-weft to north-eaft, and the roots all ftand in their natural perpendicular pofture, as clofe as the roots of trees in a foreft.

Befide, thefe trees are not all in their natural ftate, but many of them have the evident marks of human workmanfhip upon them, fome being cut down with an ax, fome fplit, and the wedges ftill remaining in them; fome burnt in different parts, and fome bored through with holes. Thefe things are alfo proved to be of a later date than the deluge, by other matters found among them, fuch as utenfils of antient people, and coins of the Roman emperors.

It appears from the whole, that all the trees which we find in this foffile ftate, originally grew in the very places where we now find them, and have only been thrown down and buried there, not brought from elfewhere. It may appear indeed an objection to this opinion, that moft of thefe foffile trees are of the fir kind; and that Cæfar fays exprefly, that no firs grew in Britain in his time; but this is eafily anfwered by obferving, that thefe trees, though of the fir kind, yet are not the fpecies ufually called the fir, but pitch-tree; and Cæfar has no where faid that pitch-trees did not grow in England. Norway and Sweden yet abound with thefe trees, and there are at this time whole forefts of them in many parts of Scotland, and a large number of them wild upon a hill at Wareton in Staffordfhire to this day.

In Hatfield marfh, where fuch vaft numbers of the foffile trees are now found, there has evidently once been a whole foreft of them growing. The laft of thefe was found alive, and growing in that place within feventy years laft paft, and cut down for fome common ufe.

It is alfo objected by fome to the fyftem of the firs growing where they are found foffile, that thefe countries are all bogs and moors, whereas thefe forts of trees grow only in mountainous places: But this is founded on an error, for though in Norway and Sweden, and fome other cold countries, the fir-kinds all grow upon barren and dry rocky mountains, yet in warmer places they are found to thrive as well on wet plains. Such are found plentifully in Pomerania, Livonia, and Courland, &c. and in the weft parts of New England there are vaft numbers of fine ftately trees of them in low grounds. The whole truth feems, that thefe trees love a fandy foil; and fuch is found at the bottoms of all the *Moffes* where thefe trees are found foffile. The roots of the fir-kind are always found fixed in thefe, and thofe of oaks, where they are found foffile in this manner, are ufually found fixed in clay, fo that each kind of tree is always found rooted in the places where they ftand in their proper foil; and there is no doubt to be made, but that they originally grew there. When we have thus found that all the foffile trees we meet with once grew in the places where they are now buried, it is plain that in thefe places there were once noble forefts, which have been deftroyed at fome time; and the queftion only remains how and by whom they were deftroyed. This we have reafon to believe, by the Roman coins found among them, was done by the people of that empire, and that at the time when they were eftablifhed, or eftablifhing themfelves here.

Their own Hiftorians tell us, that when their armies purfued the wild Britons, thefe people always fheltered themfelves in the miry woods, and low watery forefts. Cæfar exprefly fays this, and obferves, that Caffibelan and his Britons, after their defeat paffed the Thames, and fled into fuch low moraffes and woods, that there was no purfuing them; and we find that the Silures fecured themfelves in the fame manner when attacked by Oftorius and Agricola. The fame thing is recorded of Venutius, king of the Brigantes, who fled to fecure himfelf into the boggy forefts of the midland part of this kingdom: And Herodian exprefsly fays, that in the time of the Romans pufhing their conquefts in thefe iflands, it was the cuftom of the Britons to fecure themfelves in the thick forefts which grew in their boggy and wet places, and when opportunity offered, to iffue out thence and fall upon the Romans. The confequence of all this, was the deftroying all thefe forefts, the Romans finding themfelves fo plagued with parties of the natives iffuing out upon them at times from thefe forefts, that they gave orders for the cutting down and deftroying all the forefts in Britain which grew on boggy and wet grounds. Thefe orders were punctually executed; and to this it is owing that at this day we can hardly be brought to believe that fuch forefts ever grew with us as are now found buried.

The Roman hiftories all join in telling us, that when Suetonius Paulinus conquered Anglefea, he ordered all the woods to be cut down there, in the manner of the Roman generals in England: And Galen tells us, that the Romans, after their Conqueft in Britain, kept their foldiers conftantly employed in cutting down forefts, draining of marfhes, and paving of bogs. Not only the Roman foldiers were employed in this manner, but all the native Britons made captives in the wars, were obliged to affift in it: And Dion Caffius tells us, that the emperor Severus loft no lefs than fifty thoufand men in a few years time, in cutting down the woods, and draining the bogs of this ifland. It is not to be wondered at, that fuch numbers executed the immenfe deftruction which we find in thefe buried forefts. One of the greateft fubterranean treafures of wood is that near Hatfield; and it is eafy to prove that thefe people to whom this havock is thus attributed, were upon the fpot where thefe trees now lie buried. The common road of the Romans out of the fouth into the north, was formerly from Lindum (Lincoln) to Segelochum (Little-Burrow upon Trent), and from thence to Danum (Doncafter), where they kept a ftanding garrifon of Crifpinian horfe. A little off on the eaft, and north-eaft of their road, between the two laft named towns, lay the borders of the greateft foreft, which fwarmed with wild Britons, who were continually making their fallies out, and their retreats into it again, intercepting their provifions, taking and deftroying their carriages, killing their allies and paffengers, and difturbing their garrifons. This at length fo exafperated the Romans, that they were determined to deftroy it; and to do this fafely and effectual-

ly, they marched against it with a great army, and encamped on a great moor not far from Finningly: This is evident from their fortifications, yet remaining.

There is a small town in the neighbourhood called *Osterfield*, and as the termination field seems to have been given only in remembrance of battles fought near the towns whose names ended with it, it is not improbable that a battle was fought here, between all the Britons who inhabited this forest, and the Roman troops under Ostorius. The Romans slew many of the Britons, and drove the rest back into this forest, which at that time overspread all this low country. On this the conquerors taking advantage of a strong south-west wind set fire to the pitch trees, of which this forest was principally composed; and when the greater part of the trees were thus destroyed, the Roman soldiers and captive Britons, cut down the remainder, except a few large ones which they left standing, as remembrances of the destruction of the rest. These single trees however could not stand long against the winds, and these falling into the rivers which ran through the country, interrupted their currents, and the water then overspreading the level country made one great lake, and gave origin to the *Mosses* or moory bogs, which were afterwards formed there, by the workings of the waters, the precipitation of earthy matter from them, and the putrefaction of rotten boughs and branches of trees, and the vast increase of water *Moss*, and other such plants which grow in prodigious abundance in all these sort of places. Thus were these burnt and felled trees buried under a new-formed spungy and watery earth, and afterwards found on the draining and digging through this earth again.

Hence it is not strange that Roman weapons and Roman coins are found among these buried trees; and hence it is that among the buried trees some are found burnt, some chopped and hewn; and hence it is that the bodies of the trees all lie by their proper roots, and with their tops lying north-east, that is, in that direction in which a south-west wind would have blown them down: Hence also it is, that some of the trees are found with their roots lying flat, these being not cut or burned down, but blown up by the roots afterwards when left single; and it is not wonderful, that such trees as these should have continued to grow even after their fall, and shoot up branches from their sides which might easily grow into high trees. Philos. Trans. N°. 275.

By this system it is also easily explained why the moor soil in the country is in some places two or three yards thicker than in others, or higher than it was formerly, since the growing up of peat-earth or bog-ground is well known, and the soil added by overflowing of waters is not a little.

As the Romans were the destroyers of this great and noble forest, so they probably were also of the several other antient forests; the ruins of which furnish us with the bog-wood of Staffordshire, Lancashire, Yorkshire, and other counties. But as the Romans were not much in Wales, in the isle of Man, or in Ireland; it is not to be supposed, that forests cut down by these people gave origin to the fossile wood found there; but though they did not cut down these forests, others did; and the origin of the bog-wood is the same with them and with us. Holingshead informs us, that Edward the First being not able to get at the Welch, because of their hiding themselves in boggy woods, gave orders at length that they should all be destroyed by fire and by the ax; and doubtless the roots and bodies of trees found in Pembrokeshire under ground, are the remains of the execution of this order. The fossile wood in the bogs of the islands of Man and Anglesea, is doubtless of the same origin; though we have not any accounts extant of the time or occasion of the forests there being destroyed; but as to the fossile trees of the bogs of Ireland we are expresly told, that Henry the Second, when he conquered that country, ordered all the woods to be cut down that grew in the low parts of it, to secure his conquests by cutting away the places of resort of rebels.

Moving-Moss. We have an account in the Philosophical Transactions, of a moving-*Moss* near Church-town in Lancashire, which greatly alarmed the neighbourhood as miraculous. The *Moss* was observed to rise to a surprizing height, and soon after sunk as much below the level, and moved slowly towards the south.

Wall-Moss. See the article Wall-*Moss*.

MOSTRA, in the Italian music, a little mark set at the end of each line of a tune, thus  to shew that the first note of the next line is in that place.

If this first note be accompanied with a ♯ or flat *b*, it is right to place those characters with the *Mostra*. Also if in a thorough bass this first note have any cyphers, it would be of use to put the same cyphers with the character, at the end of the preceding staff. Again, if the part change its cleff with the first note, the cleff ought to be marked with the *Mostra* in the same manner. The *Mostra* is of great use, especially in quick motions, as it prepares the player for what is to come. Vid. *Brossard*. Mus. Dict. in voc.

MOSYNÆCUM *Æs*, in metallurgy, a name given by the antients to a white metal made of copper, in great esteem among them.

Aristotle tells us, that it was extremely bright and of a perfect fine white colour; and adds, that it was made of copper by melting it with an admixture of a peculiar kind of earth. Strabo also mentions this; and Theopompus tells us, that it was made of copper and an earth, and that it looked so like silver, that it was generally called *Pseudoargyron*.

Virgil mentions it under the name of *Aurichalcum album*, and seems to give it great praises. We are not able at present to say what it was they used in making it. We know several things that will render copper white, as arsenic, and the like; but none of these can well be supposed to be the thing. For arsenic, and all the things we use to make our factitious metal, debase the copper, and render it brittle; whereas by the accounts of Strabo, and others, their white metal seems to have been better for all uses than the copper itself. As to their telling us that it was a sort of earth which they used on this occasion, very little regard is to be paid to the terms; for they had an inaccuracy of speaking that leaves us much in the dark, in many other things beside this. They called the *calaminaris* stone, which is an ore of zink, by the name of *Cadmian* earth, in their description of the manner of making brass.

It has seemed absurd to some to call this white metal *aurichalcum album*, because they suppose the word *auricalchum* to signify gold-coloured copper; but this is an error. The *aurichalcum* is but a false spelling of *orichalcum*. See the article Orichalcum.

MOTACILLA, the *Waterwagtail*, in the Linnæan system of zoology, the name of a large genus of birds, of the order of the passeres; the distinguishing characters of which are these: The tongue is jagged, and has a rim or margin round it; the beak is strait, and pointed, and the hinder claw is of the same length with the rest, by which alone it is sufficiently distinguished from the lark kind. Of this genus are the wagtail, the red-breast, wren, nightingale, &c. *Linnæi* Syst. Nat. p. 49.

Mr. Ray enumerates three species of *Waterwagtail*, the white, the yellow, and the grey. The first is the most common, and well-known kind. The yellow one is of the same shape and size with that, but is beautifully variegated with yellow and green: this builds among the corn. The third or grey one is of the same size with the others, and is the most clamorous and noisy of them all. It is principally variegated with black and grey, but has some yellowness, especially about the rump. *Ray's* Ornithol. p. 171, 172.

MOTETTO, in the Italian music, a kind of church-music, composed with much art and ingenuity from one to eight parts, with or without instruments, usually accompanied with a thorough bass. When the composer gives a loose to his fancy, without confining himself to any rules, subjects, or passions, it is called *Fantasia*, or *Ricercata*. See the articles Fantasia, and Ricercata.

The word is sometimes used for pieces made to hymns to saints, &c. and whole psalms are often thus called. Vid. *Brossard*. Mus. Dict. in voc.

Field-MOTH. See the article Tinea *Campestris*.

MOTHER-*Wort*, *Cardiaca*, in medicine, is only used in the shops as an ingredient in some of the compound waters, intended against hysteric complaints; and the country people frequently make an infusion of it in the manner of tea, for the same purpose. It is also said to be good in flatulencies, and colics, to give great relief in epileptic cases, and to destroy worms. It promotes urine, and the menses; but its power this way is greatly inferior to that of penny-royal. See the article Penny-*Royal*.

The name *Cardiaca*, improperly given to this plant, has led many into an opinion of its being a cordial; but experience does not shew any such thing. See the article Cardiaca.

Mother *of Vitriol*. See the article Vitriol.

MOTION (*Cycl.*)—*Laws of* Motion. Of three laws of *motion*, which consist in the preservation of 1°. *The relative velocity* in the collision of elastic bodies, that is the difference of the velocities of those bodies moving the same way, and the sum when they move in contrary directions. 2°. The quantity of direction; see the article Direction. 3°. The sum of the product of the masses by the squares of the velocities. Two of these laws being granted, the third follows necessarily. Thus, let A and B be two bodies, their velocities before the shock a and b, and after the shock x and y. Suppose first that before and after the shock the bodies move the same way, the first law of conservation gives $a-b=y-x$; the second $Aa+Bb=Ax+By$: Hence by transposition $a+x=y+b$ and $Aa-Ax=By-Bb$; and these two equations multiplied together give this new one, $Aaa-Axx=Byy-Bbb$, or by transposition, $Aaa+Bbb=Axx+Byy$. And it is plain, that if a or b, as well as x or y, be taken negatively to signify that the bodies A and B move in contrary directions before and after the shock, this supposition will not alter the signs of the equation $Aaa+Bbb=Axx+Byy$. *Bernoulli* Oper. Tom. 3. p. 57.

The preservation of the same quantity of *motion* in the universe, was a principle laid down universally by Descartes; but has been found false, and holds true only in the same direction, which is thus expressed by Sir Isaac Newton: "The "quantity

" quantity of *motion*, which is collected by taking the ſum " of the *motions* directed towards the ſame parts, and the " difference of thoſe that are directed to contrary parts, ſuf-" fers no change from the action of bodies among them-" ſelves." *Newt.* Princip. lib. I.

Some philoſophers, after Deſcartes, have ſuppoſed the preſervation of the ſame force or *vis viva*. See the articles FORCE, and VIS *Viva*.

But this holds only in elaſtic bodies, when there is a ſhock; and hence thoſe philoſophers have been led to maintain, that all bodies were elaſtic, at leaſt in their elements, and that an inflexible body was impoſſible, being repugnant to the law of continuity. See the article CONTINUITY.

MOTION *of the Limbs.* See the article LIMB.

MOTION, in the antient muſic, was uſed to ſignify the tranſition of the voice, from an acute to a grave ſound; or the contrary. This they expreſſed by κατα τοπον κινεισθαι. *Wallis*'s Append. ad Ptolem. Harmonic. p. 153. See the article LOCUS.

Meibomius tranſlates it, *moveri in loco*.

MOTION, in the manege. A horſe is ſaid to have a pretty *Motion*, when he moves and bends his fore-legs with great eaſe and freedom upon the manege. But if a horſe trots right out, and keeps his body ſtraight, and his head high, and bends his fore-legs handſomely, then to ſay he has a pretty *Motion* with him, implies the liberty of action of the forehead.

Muſcular MOTION. Dr. Browne Langriſh endeavours to prove that the blood has no immediate effect in *muſcular Motion*, by experiments of tying the crural and carotid arteries of dogs, who did not thereby loſe the action of any muſcles. He grants however, that when all the blood is intercepted, *muſcular Motion* ceaſes in a few minutes. The chief uſe of the blood towards *muſcular Motion*, is to keep the fibres warm, ſupple, diſtended, and ready for the influx of animal ſpirits into them, and by its *Motion* to aſſiſt theirs.

The muſcular fibres are little hollow cylinders, not divided into cells; the animal ſpirits are near a-kin, or analogous to ſpirit of ſal ammoniac, *&c.* and therefore, whenever they fly from the nerves into the muſcular fibres, they will increaſe the attractive quality of their component particles towards each other, ſo as to make them run nearer together, which will occaſion the coats of the fibres to be both thicker and ſhorter, and the muſcle will be contracted in all its dimenſions. The animal ſpirits are too ſubtile to be fixed, and therefore immediately make their eſcape through the fibres, and leave them in the ſame ſtate they found them in, as ſoon as the ſupply by the nerves is diſcontinued. There is a difference in the mechaniſm of the nerves ſent to the muſcles, which act by the influence of the mind, from thoſe of the muſcles which are ſaid to perform involuntary motions, the latter having no hindrance to the courſe of the animal ſpirits, unleſs ſometimes the parts through which they paſs have influence on them; whereas the nerves, which ſerve the muſcles of voluntary motion, have ſome little conſtrictions at their extremities, or elſewhere, which hinders the courſe of their fluids, except when their reſiſtance is overcome by the momentum of the ſpirits being increaſed by the will. The uſe of the ganglions is to prevent any communication of *motion* from one nerve to another, whereby in a ſtate of health, ſenſation is always performed diſtinctly. Eſſ. on Muſc. Motion.

Dr. Stuart having cut off the head of a frog, obſerved, that upon thruſting a probe into the *medulla ſpinalis*, the muſcles of the body were brought into convulſive contractions. And that the ſame happened to the muſcles of the head, when the probe was thruſt into the brain. From which he concludes, that the brain and nerves contribute to *muſcular Motion* in a high degree. Next he laid bare the crural artery, vein, and nerve of a dog, and placing a thread parallel to them, made two ligatures on them, at four inches diſtance from each other; then cutting the veſſels through, beyond the ligatures, he took them out, and obſerved, that the nerve did not contract, though the blood-veſſels loſt three eighth parts of their length. From whence he infers, that what the nerves contribute in *muſcular Motion*, cannot ariſe from, or be owing to elaſticity, but to the fluid they contain, which can be no other than a pure elementary water. Phil. Tranſ. N°. 424. §. 5.

Rythmical MOTIONS, a phraſe uſed by Voſſius, and other writers on the antient rythm, to expreſs thoſe *motions* which were made uſe of in the Greek and Roman entertainments to convey the ideas of the poet, or to aſſiſt muſic in rouzing the paſſions. Theſe not only had great force when joined with ſounds, but even without any voice or ſound they could move the paſſions in the ſpectators, more than many of the beſt orators of the times could do with their moſt laboured diſcourſes.

Roſcius, the ſtage-player ſo famous in their pantomimes which were all dumb ſhew, was ſo excellent at expreſſion by theſe *rythmical Motions*, or geſtures, that Cicero and he being cotemporaries there were many diſputes between them, which could vary the ſame ſentence moſt; the one uſing all the power of words, the other being confined to geſtures alone.

MOTION, *Moto*, or *Movimento*, in the Italian muſic, has many ſignifications; ſometimes it means only a *Motion* or paſſage from one note to another, at whatſoever diſtance, as a ſecond, third, or any other interval; and is the ſame whether the intermediate degrees (if there are any) be ſounded or only the extremes of them, as the firſt and laſt ſound of any given interval. Sometimes it regards the quickneſs and ſlowneſs of ſuch *motions*, as a briſk, ſlow, lively, or languid *motion*; and in this ſenſe it is uſed with regard to minuets, gavots, ſarabands, *&c.* See each article in its proper place, and MOTION, *Cycl.*

But the moſt common, and indeed the moſt important acceptation of the word, is with reſpect to harmony; thoſe above deſcribed only regarding melody. See the articles MELODY, and HARMONY, *Cycl.*

With regard to harmony, it is the comparing the manner wherein an upper or treble part moves from one ſound to another, with that wherein a lower or baſs-part moves; this is to be done three ways. The firſt is when the upper and lower parts move both the ſame way, either upwards or downwards, and is called *Moto retto*. The ſecond is when in comparing the upper with the lower part, the one aſcends while the other deſcends, or *è contra*, and hence called *Moto contrario*. The laſt is when one of the parts holds out, or continues a ſound, while the other riſes or falls on any note whatſoever; and this is called *Moto obliquo*. Vid. *Broſſ.* Muſ. Dict. in voc.

MOTIVE is ſometimes applied to that faculty of the human mind, by which we purſue good and avoid evil. Thus Hobbes diſtinguiſhes the faculties of the mind into two ſorts, the *cognitive*, and *motive*. Human Nat. p. 4. edit. 1651. See the article COGNITIVE.

MOTOS, (*Cycl.*) in the materia medica of the antients, a name given by Galen and others to a kind of Caſſia bark, the beſt and fineſt that has been uſed at any time. The antients were very fond of this drug, and ranged it according to its different goodneſs into ſeveral ſorts.

MOUCHEROLLE, in zoology, the name of a ſmall bird of the ſize of the ſparrow, and of the ſame colour, but longer bodied; its wings are of a duſkier colour than the reſt of its body; and its head is variegated with very ſmall blackiſh ſpots. Its throat and belly are white, but the throat and the ſides of the breaſt and belly have a faint reddiſhneſs; the beak is black, ſtrait and ridged, ſo as to appear triangular. It feeds on flies and other inſects, and is common in gardens and orchards in many parts of England, though it has no Engliſh name. It is confounded by the common people with the common white throat, but differs from it in that its tail is all of one colour, whereas the white-throat's is variegated. It ſomewhat reſembles alſo the *beccifago*, or petty-chaps, but differs from it in having no greeniſh colour, and in its bill being ridged and triangular. *Ray*'s Ornithol. p. 159. See the article BECCIFAGO.

MOVING *Force.* See the articles FORCE, and VIS *Viva.*

MOULD (*Cycl.*)—MOULDS, in natural hiſtory, are defined to be foſſile bodies compoſed of diſſimilar particles of a looſe ſoft texture, ſomewhat ductile while moiſt, compoſed of argilaceous particles ſeparated by ſand or the gritt of ſtone, and uſually found mixed with the putrified remains of vegetable and animal ſubſtances.

Of this claſs of bodies there are two genera: 1. The thruptomichthes or *Moulds* of a lax friable texture. And, 2. The gloromichthes, which are of a more tough and viſcid texture. *Hill*'s Hiſt. of Foſſ. For the ſeveral ſpecies of vegetable *Moulds*, ſee the articles THRUPTOMICHTHES, and GLOROMICHTHES.

The goodneſs of *Mould*, for the gardeners purpoſes, is known by the ſight, ſmell, and touch.

Thoſe *Moulds* are accounted beſt which are of a bright brown or hazily colour. This is always the colour of the beſt loams, and other natural earths; and this is judged the better, if the earth cut tolerably eaſily, and does not ſtick and cling to the ſpade, but is light, friable, and falls in ſmall clods; and is ſuch as naturally neither chaps and cracks in dry weather, nor turns to mortar in wet. Next to theſe the dark grey and ruſſet *Moulds* are accounted beſt; and the worſt of all are the light and dark aſh-colour; theſe are uſually found on heaths and commons. The clear tawny *Mould* is neither by any means to be preferred; but that of a yellowiſh red is accounted the worſt of all; this is commonly found in wild and waſte places, and ſeldom produces any thing naturally but furz and fern. *Miller*'s Gardeners Dict.

All that lands give us to judge of them by from the ſmell, is, that the beſt after rain, and after digging up, emit a good and pleaſing ſcent: But by the touch they may be judged of with conſiderable accuracy; for by this may be known whether they are too ſandy or too clayey; and whether they be tender, fatty, deterſive, and ſlippery; or more harſh, gritty, porous and friable. What we are to judge beſt by the touch, is the middle nature between the extremes on either ſide, ſuch as will eaſily diſſolve and break, and being made of a juſt proportion of ſand and clay, will not ſtick to the ſpade or fingers after every light ſhower of rain.

To analize *Mould* by means of water, waſh it thoroughly in warm water in large quantities, and filtrate the liquor. Evaporate this to a conſiderable degree of concentration, and it is manifeſtly of a ſaline taſte, but making no alteration in ſyrup of violets; therefore the ſalt it contains is neither acid nor alkaline, but neutral. This analyſis purſued farther, the particles

cles may be disunited and kept separate, and will be found to be a large proportion of sand, a quantity of a light mud, capable of remaining a long time suspended in water, a heavier mud sinking immediately in water. By an analysis of any particular *Mould* by this means, we may find its true constituent particles, and be able to mix up and compound a similar one for the growth of any peculiar plant it produces: But plants have the assistance of heat as well as moisture, in the draining their juices from the earth; therefore it may not be improper to try the effect of fire on the same subject. The common garden *Mould* distilled in a retort in a naked fire, managed in its various degrees, affords a water, and oil and spirit like those yielded by animal subjects, and possibly arising from some extraneous particles mixed with the earth, and a dry *caput mortuum*, or indolent earth remains in the retort.

The particles of animal, vegetable, and mineral substances, floating in the atmosphere, and thence precipitated on the earth, may give some of the properties to garden *Mould*, and those different in different places; as is evident about London, where the *mould* is so impregnated with smoak, precipitated on it from the atmosphere, that it differs much from that of open countries. *Shaw's* Lectures, p. 64.

Moulds *of Coins*, a sort of concave *Moulds* made of clay, having within them the figures and inscriptions of antient Roman coins found in many parts of England, and supposed to have been used for the casting of money.

Mr. Baker having been favoured with a sight of some of these *Moulds* found in Shropshire, bearing the same types and inscriptions with some of the Roman coins, gave an account of them to the Royal Society.

They were found in digging of sand, at a place called Ryton in Shropshire, about a mile from the great Watling-street road. They are all of the size of the Roman denarius, and of little more than the thickness of our halfpenny. They are made of a smooth pot or brick clay, which seems to have been first well cleansed from dirt and sand, and well beat or kneaded, to render it fit for taking a fair impression. There were a great many of them found together, and there are of them not unfrequently found in Yorkshire; but they do not seem to have been met with in any other kingdom, except that some have been said to be once found at Lyons. They have been sometimes found in great numbers joined together side by side, on one flat piece of clay, as if intended for the casting a great number of coins at once; and both these, and all the others that have been found, seem to have been of the emperor Severus. They are sometimes found imprested on both sides, and some have the head of Severus on one side, and some well known reverse of his on the other. They seem plainly to have been intended for the coinage of money, though it is not easy to say in what manner they can have been employed to that purpose, especially those which have impressions on both sides, unless it may be supposed that they coined two pieces at the same time by the help of three *Moulds*, of which this was to be the middle one.

If by disposing these into some sort of iron frame or case, as our letter-founders do the brass *Moulds* for casting their types, the melted metal could be easily poured into them, it would certainly be a very easy method of coining; as such *Moulds* require little time or expence to make, and therefore might be supplied with new ones as often as they happen to break.

These *Moulds* seem to have been burnt or baked sufficiently to make them hard; but not so as to render them porous like our bricks, whereby they would have lost their smooth and even surface, which in these is plainly so close, that whatever metal should be formed in them would have no appearance like the sand holes by which counterfeit coins and medals are usually detected.

Mould-*Warp*, a name given by the people in many parts of England to the mole. See the article Talpa.

MOULDER, in brick-making. See the article Brick-*Making*.

MOUNT (*Cycl.*)—Mount-*Egg*. In the tin-works, after that tin from the burnt ore is melted down, and re-melted, there will sometimes remain a different slug in the bottom of the float; this they call *Mount-egg*; and though of a tin colour, yet is of an iron nature, as hath been found by applying a magnet to it.

MOUNTAIN (*Cycl.*)—The origin of *Mountains* seems to have been from explosions by means of subterranean fires; and it is very probable that they have all vast hollows beneath them; that this might have been the means used at the creation, to make the dry land appear, is no way dissonant to reason, since history proves, that fires have raged in subterranean caverns under the seas, and there is no natural impossibility in fire's subsisting in such caverns, even when the earth was all over covered with water, as at the first creation.

Mountains appear, to many, defects and blemishes in the earth; but they are truly of the utmost use and necessity to the well-being both of man and other animals. Many creatures cannot live but in particular situations, and even the tops of the highest and the coldest *Mountains* are the only places where some creatures as well birds as quadrupeds, will live; of this kind are the ibex and chamois among beasts, and the lagopus among birds.

The *Mountains* alone are able to furnish man with the several metals of so many uses in life; for if these were produced in level ground, it seems very evident that no art could ever keep the mines dry, by which we should get at them; nor could we have springs and fountains, but for the advantage of the height of hills. This seems indeed to be the great design of *mountains*, that their ridges being placed through the midst of continents, might serve to distil fresh water for the use of man and beast; and their heights to give a descent to those streams to run gently down, and be of more benefit to the creation. Thus the more we consider nature, the more we must admire its works; and what seems defect or blemish in them, on a slight view, often proves, on more just observation, a great benefit and beauty. *Ray's* Physico-Theological Discourse, c. 3.

The difficulty of breathing at the tops of high *Mountains* is a thing so plainly felt, that none who has ever been in the way of making the experiment, but is well convinced of the certainty of the fact. Acosta describes what he felt on the tops of the high *Mountains* of Pariacaca very judiciously.

The *Mountains* of Armenia, and particularly that on which Noah's ark is supposed to have rested, have been also made famous by the like accounts; though the snows that lie on the tops of these *Mountains* make it impracticable to ascend their tops; the people who climb as high as they can, always find that they breathe with more difficulty, and are compelled to fetch their breath oftener than when on the plains; and on travellers complaining of this, their guides always tell them, that it is a known thing, and is what every body suffers there.

The *Mountains* in Languedoc and the Pyreneans have the same effect. People of curiosity have sometimes remained hours on the summit of these mountains, and always found the same sort of difficulty in breathing; but it is possible that this may be owing to the exhalations of certain steams from the earth in these places, less loaded with a weight of air than below; and this appears the more probable, as in going up the mountain Teneriffe, if many people are in company, and ascend different ways, some usually bear it better than others; and the very complexions of some are turned yellow by the exhalations which are very plainly perceived by their smell and sharpness, while others who ascend to the same height by different tracts, escape.

The most remarkable *Mountain* in the world in shape, is that called the *needle Mountain*, or the *inaccessible Mountain*, in Dauphiny.

This is a vast hill, placed as it were bottom upwards, or set on its summit on the earth with its broad base elevated in the air; it is but about a thousand paces in circumference at the bottom, and is above two thousand at the top. On the center of the plain at the top there stands another small and very narrow, but very high hill.

It obtained the name of the *needle* as it got the other, by its being supposed impracticable to the ascent of any one, by reason of its projecting so greatly outwards. Some hardy persons however once ventured to climb it, and found at the top a number of the chamois, animals by no means qualified for climbing, and which doubtless had never either ascended or descended the *Mountain*, and which must be supposed to have bred there for many ages, though it be very difficult to account for their first getting to the place. Hist. Acad. Par. 1700.

Chains of Mountains, a term used by geographers to express those continuations of *Mountains* which run in strait ridges along whole countries, and appear disposed in uninterrupted orders wherever they are found. Kircher labours to prove, that these chains are annular, and reach absolutely round the globe of the earth, encompassing it from north to south, and thence to the north again; and in the same manner from east to west, and from thence to the east again; their course only disappearing, by the wise providence of nature, in the bottoms of the sea, that the immense body of waters treasured there might have its motion free and unimpeded in its channel, but appearing again in the same line in every the smallest island that shews itself in the way of their strait course; from the country where the last link of the chain was seen, to that where their first link appears again. He says that these vast hills of earth and stone, serve not only to strengthen and support the fabric of this vast globe of earth, but they have another very great use, not only to man, but to all animals, and even vegetables; which is, that they are the storehouses where the grand reservoirs of fresh water, so necessary to all life, are treasured up, and from whence it is easily poured down upon the lower parts of the globe. In Europe, the great reservoirs of water, that supply whole countries of immense extent, are placed in that vast chain of *Mountains* called the Alps, from which, as from an inexhaustible store, the vast tracts of fruitful land that lie below them are sufficiently watered.

The *Mountains* which compose this part of the great annular chain running north and south round the globe, are called by three different names; the *Cottiæ*, the *Rhætian hills* with the *Vogesus*, and the *Appennines*; from these are poured out the immense rivers which water this fruitful part of the world, the Danube, the Rhine, the Rhone, the Moselle, and an

almoſt infinite number of others, every one of which, after it has ſupplied the inhabitants of a whole tract of vaſt extent, diſcharges ſo much water hourly into the ſea,, that the mind is aſtoniſhed at the account, and would wonder whence only one of them could be ſupplied. Theſe rivers, and a multitude of other ſmaller ones, and beſide theſe a great number of lakes of vaſt extent are all ſupplied by the hydrophylacia or reſervoirs of water treaſured up in the boſoms of theſe hills, and could not have performed their office of watering theſe extenſive countries, had thoſe reſervoirs been placed any where except in ſuch a lofty ſituation in theſe *Mountains*. *Kircher*'s Mund. Subter.

The Alps, though they all ſupply more or leſs of this profuſion of water, yet they are not all equally hollowed for the reception of it, and conſequently do not all contain ſupplies for an equal tract of land; this is provided for by nature by a vaſt number of other ſmaller *Mountains*, which in ſeveral parts of the countries through which this chain paſſes, run from its ſides like leſſer knots, and extend over ſome ſmaller or greater part of the country.

Theſe are a ſort of auxiliary ſupplies, and ſerve for many countries in the place of the original heads; but the rivers propagated from theſe, though ſufficient for the occaſions of the inhabitants of the lower country, yet do not diſcharge thoſe vaſt quantities of waſte water into the ſea that thoſe which derive their origin from the greater *Mountains* do. The Noric *Mountains* in Germany, the Vogeſus, many mountains in Dauphiny, and thoſe in Italy, which run from the ſides of that long chain, which reaches like a ſpine all along that country, are all of this kind, and all leave this benefit to the lower countries. The Pyrenean and Carpathian *Mountains* alſo yield a vaſt number of rivers from their ſides; and the rivers of Spain, of Poland, and of Hungary, all have evidently the ſame origin from theſe high-ſeated reſervoirs, in the chains of *Mountains* which paſs through them. The countries where extended plains are found for vaſt tracts uninterrupted by any of the links or knots of theſe vaſt chains of *Mountains*, are the only places where thirſt and drought are the deſtruction both of animals and plants; and, in general, that country which has moſt and higheſt *Mountains*, is the moſt plentifully, moſt regularly, and moſt conſtantly watered by ſmaller as well as larger ſtreams.

The diſpoſition of *Mountains* on the ſurface of the globe ſeems more regular than is generally ſuppoſed by thoſe who ſee but a few of them in particular countries at a time; they are diſpoſed in reality in ranges or chains, reaching to vaſt extents, and in ſome from pole to pole from north to ſouth.

One grand chain of *Mountains* reaches from Iceland through Scotland, England, and Germany, with a ſtrait courſe to the Alps, which are as it were a vaſt knot in this chain, more cloſely diſpoſed, and more eminent than the others.

Theſe are ſucceeded in the ſame ſeries by the Appennines, which run through the whole kingdom of Italy in the manner of the ſpine of the back in animals, and are continued on in the ſame ſeries by thoſe of Sicily; and from theſe the ſame chain is carried on to Africa, and continues in what are called the *Mountains of the Moon*. From hence another vaſt knot or link of this extenſive chain is carried on to the utmoſt part of Africa, and terminates, as to our view, at the Cape of Good Hope; and there is no reaſon to doubt but that the chain is continued in the oppoſite land, and ſo on to the utmoſt limits of the ſouthern pole. From hence the ſame ſeries makes its way again, and beginning anew as it were from the ſouth pole, is carried on through the little known ſouthern regions to the Magellanic Streights. Here the famous Andes *Mountains* of South America take it up, and along this vaſt tract it is carried through this part of the new world into North America, and thence to the northern pole again, terminating where it began, or joining the other part of the chain where we took up the beginning of our account; ſo that the whole ſeries making a vaſt belt or circle round the globe, has no beginning nor end, but in our imagination, or in our ignorance of the parts of the world through which it is carried in the ſame regularity as in thoſe countries whither commerce has led us, and where maps have ſheen them.

Another vaſt chain of *Mountains* running with the ſame regularity, and in the ſame manner forming a belt round the whole globe of the earth, cuts this at right angles, and is continued in its courſe. This goes through Tartary from a beginning far beyond our reſearches up behind that vaſt country, and continuing itſelf through the middle of Scythia, forms a ſeries that appears in the Eaſt Indies, running along the middle of that vaſt region to Cape Comorin; here the chain dips into the ſea; but if its courſe is exactly marked, it will be found to be continued in the ſame rout through the iſland of Ceylon; hence it is carried under water to its oppoſite point on the limits of the earth, and hence through ſeas and lands not yet known to us, is carried on to the place in the back of Tartary, and from which we have begun the account. We have but very ſmall proofs indeed of its continuation through a vaſt tract of this its courſe; but we are to accuſe for this defect not nature in her diſpoſal, but our own ignorance, whatever little we do know plainly pointing out, that the chain is continued in the ſame regular manner as the other, and placed exactly at right angles with it.

As the continual flux and reflux of that vaſt body of ſeas from the eaſt weſtward, might by its force do ſome miſchief to the compages of the earth, provident nature has contrived for the ſtrengthening the great frame of this globe, certain tranſverſe chains or belts of mountains, which are ſo diſpoſed as to ſtrengthen and keep together the whole machine in the moſt ſtrong and laſting manner. One ſeries of theſe runs directly from the eaſt weſtward from the utmoſt limits of the Chineſe empire, through that whole vaſt country, and where theſe are ſtopped by the boundaries of that country, they are continued through the weſt of Scythia, India, and the Caſpian Sea, America, Aſia Minor, Macedonia, and to the Rhætian *Mountains*, which carry on the chain to the *Mountains* of Narbon, Gaul, and theſe to the Pyreneans; and theſe are carried on weſtward in the ſame direct chain, ſo far as we are able to trace them, and apparently run on toward the point from which the account began, ſo as to form as regular a circle as the others, were every link of it expoſed to our ſight, by our knowledge of the regions through which it paſſes, and many of which are yet left to future diſcoveries.

The haſty judgers of this ſyſtem may ſuppoſe, that it wants due weight, becauſe the chains of *Mountains* here deſcribed do not appear to be regularly carried on through the bottom of the ſea from the laſt link on one land to the firſt on the oppoſite land to it; but the whole chain ſeems broken abruptly at either promontory, and only to be renewed, not continued, at the other; but it is very probable, that though not ſo evident to our eyes, theſe chains of *Mountains* are continued under the bottoms of the deepeſt ſeas in the ſame regular manner as on the openeſt land, though their heads do not appear above the ſurface of the water; but are only ſeen at thoſe places where the ſcattered iſlands happen in their courſe, till they arrive at the main land again. This diſpoſition is not to be ſuppoſed owing to chance or irregularity, but appears contrived by the wiſdom of the great Creator.

The vaſt body of ſeas that ſurrounds the globe with its neceſſary and perpetual flux, required a clear and free bed to roll its immenſe congeries of waters in; and the tops of the *Mountains* appear to have been diſcontinued in the courſe of this fluid, that it might have a free channel, and no ſtops or hindrances in its courſe, to ſpread its waters over the whole earth.

Cock of the MOUNTAIN, *Urogallus*, in zoology. See the article UROGALLUS.

MOURNING, (*Cycl.*) among the antients, was expreſſed various ways, as by tearing their clothes, by wearing ſackcloth, laying aſide crowns; and every other mark of joy. Plutarch, in his life of Cato, relates, that from the time of his leaving the city with Pompey, he neither ſhaved his head, nor, as uſual, wore the crown or garland. Sometimes public grief was teſtified by a general faſt. *Hofm.* Lex. in voc. *Mœſtitia*. See the article FASTING.

Among the Romans a year of *Mourning* was ordained by law for women who had loſt their huſbands.

In public *Mournings* at Rome the ſhops were ſhut up, the women laid aſide all their ornaments, the ſenators their laticlavian robes, and the conſuls ſat in a lower ſeat than uſual. See *Pitiſc.* in voc.

The antients had a remarkable way of *Mourning* for ſoldiers, ſlain in battle. The whole army attended the funeral ſolemnities with their arms turned upſide down, it being cuſtomary for *Mourners*, in moſt of their actions, to behave themſelves in a manner contrary to what was uſual at other times. In thoſe places where it was the faſhion to wear long hair, *Mourners* were ſhaved; and where others ſhaved, *Mourners* wore long hair. Their conjecture therefore is frivolous, who imagine that the ſoldiers turned the heads of their ſhields downwards, leſt the gods, whoſe images were engraven upon them, ſhould be polluted with the ſight of a corpſe; ſince not the gods only, but any other figures, were frequently repreſented on ſhields; nor did the few only near the corpſe, but the whole company held their ſhields in the ſame poſition: Not to mention that other arms were alſo pointed downwards. *Potter*, Archæol. Græc. T. 2. p. 103.

The *Mournings* of the Eaſtern nations of Indians are much more cloſely followed, though of much ſhorter duration than ours. After the death of a near relation they *mourn* fifteen days, during which time they eat nothing but rice and water. They are not to chew betle, or to uſe the common waſhings in this time; but they are to do acts of charity, ſuch as diſtributing food to the poor; and prayers are ſaid, intreating the Almighty to forgive the ſins of the dead perſon, and to aſſign him a good place in the other world. On the ſixteenth day, that is the day after the finiſhing of the time of *Mourning*, they make a ſolemn feaſt according to their abilities, and invite to it all their friends and neighbours. After this they annually, on this day, give food to the poor, and renew their prayers for the happineſs of the dead perſon. Phil. Tranſ. N°. 243.

MOUSE, *Mus*, in zoology. See the article MUS.

Sable-MOUSE. See the article SABLE.

MOUSE-*Ear*, in botany. See the article MYOSOTIS.

MOUSE-*Deer*. See the article MOOSE-*Deer*.

MOUTH (*Cycl.*)—Whether the *Mouth* of a fœtus be neceſ-

fary for its nutrition, has been controverted. The learned Mr. Monro is of opinion it is not: See his reafons, and his anfwers to what has been advanced by many learned men in favour of the contrary opinion, in the Med. Eff. Edinb. Vol. 2. Art. 9. or the Abridgment, Vol. 1. p. 305.

Mr. Monro obferves farther, that the opening of the *Mouth* does not only depend on the motion of the lower jaw downwards, but alfo on the fuperior jaw being raifed up by the mufcles, which extend the head back. He fays any one may convince himfelf of the truth of this, by putting the blade of a knife oppofite to the conjoined edges of the teeth, when the *Mouth* is fhut; and the knife being held unmoved while the *Mouth* is opened, he may, by the help of a mirror, fee the upper teeth raifed remarkably at every aperture he performs. Medic. Eff. Edinb. vol. 1. art. 11.

In the fifh kinds the *Mouth* is very different in the feveral genera and fpecies in its fituation, figure, and proportion, and is by the beft naturalifts made a mark of diftinction among them. In regard to place or fituation, it is, 1. in fome placed in the front or tip of the head; and in this cafe both the jaws are fometimes of the fame length; fometimes the one is confiderably longer than the other. Examples of this fituation occur in moft fifhes. 2. In fome the *Mouth* is placed in the lower or under part of the head under the fnout. Examples of this we have in the ray-fifhes, the fquatina, the petromyza, &c. 3. In fome fifhes it is placed tranfverfely to the body, that is, the opening of the *Mouth* cuts the fite of the back and belly at right angles: But 4. In others it is oblique. The generality of fifhes give us inftances of the firft fituation; and the pleuronecti in general give us examples of the laft.

As to figure, there are alfo very many differences. When the *Mouth* is opened, it is in fome, 1. of an oblong, round, or roundifh fquare fhape; this we fee inftances of in the cyprini, &c. 2. In others it is oblong and wide; of this we fee inftances in moft fifh. 3. It is fpherical, as in the petromyzæ. Thefe are the general diftinctions; but befide thefe there are many leffer diftinctions, which are only degrees of thefe.

The proportion of the *Mouth* to the head is alfo very various; 1. In fome it is much fmaller than the breadth of the head; of this we fee examples in the cyprini, cobites, pleuronecti, and many others. 2. In fome it is equal to the width of the head, or very nearly fo, as in the cotti, filuri, &c. *Artedi*, Ichthyol.

MOUTON *d'Or*, an old French coin. See the article AGNEL.

MOXA (*Cycl.*)—The antient phyficians ufed flax, as the people of the eaftern nations now do their *Moxa* for cauterizing in certain parts of the body. The method of ufing the *Moxa* is this: A fmall cone of the down or *Moxa* is to be made up of about a thumb's breadth long, much after the manner they are for a fuffitus. The bafis of this cone is to be ftuck upon the part with a mucilage of gum arabic, and its top is then to be fet on fire by a candle or burning coal. By this means the whole cone will be gradually confumed, and the part by degrees cauterized. This is ufed in cafes of the gout; and if the pain does not ceafe on the firft operation, it is to be repeated till it does. *Heifter*'s Surgery, p. 319.

MOYNAU, in fortification. See the article MOINEAU.

MUCILAGINOUS *Glands* (*Cycl.*)—The rough unequal depreffion at the bottom of the cotyloide cavity of the offa innominata is filled by a broad flat *mucilaginous* gland, bordered with a fatty fubftance, and covered with a fine membrane. The *mucilaginous* glands of the bones of the leg lie in fmall fpaces, depreffions, and fuperficial notches, near the edges of the cartilages of each joint, and are all covered by the capfular ligaments. In the bones of the foot thefe glands anfwer in number and figure to the depreffions between the *cartilaginous* edges and ligaments.

In the articulations of the fternum, vertebræ, and ribs, the *mucilaginous* glands are very fmall; but they are accompanied by many fatty moleculæ lying round each joint. The inner furface of the ligamentary tube which lines the bony canal of the fpine, is lubricated alfo by an oily or adipofe fubftance. And the true *mucilaginous* glands of the occipital and maxillary articulations in the bones of the head, are all proportioned to the joints to which they belong, and lie between the capfular ligaments and the circumferences of the cartilages. *Winflow*'s Anatomy, p. 125, feq.

MUCILAGO, in botany, a name under which Micheli has comprized fome fpecies of that kind of fungus called *mucor*, confifting of fmall bladders, or veficles with feeds affixed to filaments on the inner part. See the article MUCOR.

MUCOCARNEOUS, an epithet ufed by authors for a fort of abfceffes, which are partly made up of flefh and partly of a thick mucous matter.

MUCOR, in botany, a name given by Micheli, and continued by Linnæus, to a genus of mufhrooms, often comprized by authors among the moffes, and called by the fame Micheli under the fmall varieties of fome of the fpecies, *mucilago* and *lycogala*. Their characters are thefe: They are fungufes confifting of roundifh little bladders, in which are found numerous feeds affixed to hair-like receptacles, placed all over the infide of the bladders.

MUCOSA, in ichthyology, a name given by the Italians to a fpecies of the ray-fifh, called by the old authors, *leioraia*, and *bos marinus*; and by the latter authors, *raja oxyrynchus* and *læviraia*. It is diftinguifhed by Artedi by the name of the variegated ray, with ten prickly tubercles on the middle of the back. See the article RAJA.

MUCOUS (*Cycl.*)—MUCOUS *Fevers*, a term ufed by medical writers to exprefs thofe fevers in which nature is endeavouring to rid herfelf of an abundance of pituitous, mucous, and ferous matter. The catarrhal fevers of all forts are expreffed under this denomination. *Junker*'s Confp. Med. p. 252. See the article FEVER.

MUCRONATED, whatever ends or terminates in a point, like that of a fword, &c.

MUCU, in zoology, the name of a Brafilian fifh of the lamprey kind. It is long and flender; its head is pointed; its eyes black and fmall; and its mouth very fmall; and it has no fins. It is brown all over, only of a dufkier colour on the back than on the belly, and has a number of obliquely tranfverfe lines on the fides, which are black. It is an eatable fifh, and is caught in lakes in Brafil. *Marggrave*, Hift. Braf. p. 96.

MUCUS (*Cycl.*)—MUCUS *of Fifhes*. The bodies of moft of the fifhes called *alepidotes* by authors, from their having either no fcales at all, or only a few fmall ones, are covered in the place of fcales with this *Mucus*. It is a tough and thick vifcous liquor, and fticks firmly to the body, defending the fkin from injuries from ftones, and the like. It is fecreted from certain glands placed about the head, and on moft parts of the body, but particularly in the linea lateralis. *Artedi* Ichthyology.

MUDD, in ichthyology, a name given by the Swedes to the fifh called by Schonefeldt and others, *aphua* or *aphya*.

It is a fpecies of the cyprinus, according to Artedi, and is diftinguifhed by that author by the name of the *red-eyed two-inch cyprinus*, with nine bones in the pinna ani. See the article CYPRINUS.

MUERDEM, among the Turks, an officer belonging to their mofques, who with his voice calls the people to prayers; thereby fupplying the want of bells, which the Mahometans will not ufe. *Hofm.* Lex. in voc. See the aiticles BELL, and MOSQUE, *Cycl.*

MUFFLE, in metallurgy, is an arched cover, refifting the ftrongeft fire, and made to be placed over coppels and tefts in the operations of affaying, to preferve them from the falling of coals or afhes into them; though at the fame time of fuch a form, as not to hinder the action of the air and fire on the metal, nor prevent the infpection of the affayer.

The *Muffles* may be made of any form, fo they have thefe conditions; but thofe ufed with coppels are commonly made femi-cylindrical, or when greater veffels are employed, in form of a hollow hemifphere.

The *Muffle* muft have apertures, that the affayer may look in, and the fore part of it muft be always quite open, that the air may act better in conjunction with the fire, and be inceffantly renewed; for without this, fcarce any fumes are to be produced, and without thefe, the vitrification of lead is fcarce practicable; for when the air is once filled with a certain quantity of vapours, it fcarce admits any more afterwards; and for this reafon a conftant fucceffion of frefh air is neceffary. The apertures in the *Muffle* ferve alfo for the regimen of the fire; for the cold air rufhing into the larger opening before, cools the bodies in the veffel; but if fome coals are put in it, and its aperture before be then fhut with a door fitted to it, the fire will be increafed to the higheft degree, much more quickly than it can be by the breathing-holes of the furnace. Another ufe of thefe apertures is alfo, that the arfenical vapours of lead and antimony paffing through the holes in the back part of the *Muffle*, may not be offenfive to the affayer, who ftands before it.

As to the height, length, and depth of the *Muffles*, thefe muft be proportioned to the fize and number of the veffels they are intended to cover; and care muft be taken in this, that all parts of the inner furface of thofe veffels muft be in the reach of the affayer's eye. The moft frequent fize of the *Muffle* however is four inches high, fix or eight inches long, and four or fix inches broad. The fegments cut off at the bafes, for the leffer holes muft be of fuch a proportioned height, that the leaft veffels put under it, may not be in the way of coals or afhes falling into them, for that always hinders the vitrification of lead, and the deftruction of the other metals and femi-metals, and will fometimes entirely reduce them again when already deftroyed; and the fcoriæ, foftened by afhes, foften and retard the operation.

Wooden moulds of a proper fhape, are moft convenient for the making thefe *Muffles* in, and the matter for making them of is the fame with that of the German clay tefts; that is, either a pure native clay, of a condition to bear the fire, which will be known upon the trial; or fuch clay, hardened by a mixture of the powder of ftones: And in order to the forming of thefe, the mafs muft be made tolerably foft and pliant. Knead a fufficient quantity of this mafs with your hands upon a flat ftone; fpread it out evenly into a thin cake or plate, fomewhat longer and broader than you intend the *Muffle* to be made; and fo thick, that two or more thin plates or lamina, of about two lines thick each, may be cut off from it. This is eafily done by rolling the mafs on the ftone with

a rolling-pin, ſtrewed over lightly with aſhes, or powder of chalk.

When the cake is thus rolled out, with a thin, fine, and perfectly ſtrait braſs wire cut off from the cake one thin plate; this muſt be done with great caution, left it ſhould break; take this up, and rubbing it over with oil or fat, lay it over the mould; then cut out a ſemicircular piece from the maſs, of the ſame thickneſs with the former, and with this cover the back plane, or farther end of the mould, joining the edges of this plate to thoſe of the former, cloſely and perfectly, by wetting them well with water.

Next cut off from the cake another thin plate, to be the bottom of the *Muffle*; this may be either left looſe for the *Muffle* to be placed on it occaſionally, or the bottom edges of the already formed *Muffle* may be joined to it all round by means of water, as the back was before joined to the arched part of the *Muffle*. But whether it be intended that the bottom ſhall be thus fixed on, or left looſe, it muſt be half an inch broader every way than the bottom of the *Muffle*, that this may ſtand the more ſure and firm upon its baſis.

When the *Muffle* is thus made, wet your hand, and rub it carefully all over, that the ſmall and perhaps inviſible cracks and chinks in the plates may be cloſely joined, and the whole matter of it applied perfectly cloſe to the ſurface of the mould.

When the *Muffle* has been ſome time expoſed to the air, and is ſomewhat dried, and hardened on the mould, cut out two or three hemiſpherical pieces on each ſide, to make the holes before deſcribed, at the baſis and back, and then draw away the mould from within it; for if the *Muffle* is ſuffered to dry perfectly on the mould, it always cracks. When the whole is perfectly dry, let it be baked in a potter's kiln, or in the aſſayers oven; but without great care in the latter method, and lighting the fire at top firſt, it is apt to crack; ſo that the potters kiln, where at hand, is much the better way of baking it. See Tab. of Chemiſtry, N°. 1. 2.

If there be adapted to the formerly deſcribed convex mould, another concave one nearly fitting it, only leaving room for the thickneſs of the *Muffle* between, and the clay be placed between them, and formed by this means into its exact ſhape, by a ſtrong and every way equal preſſure, this will make *Muffles* not only with much leſs trouble, but they will be much ſtronger, leſs apt to crack, and more capable of reſiſting the fire, than thoſe made by the hand in the other way.

The only cautions neceſſary for the making theſe, are, that the clay be a little drier than when it is to be worked by the hand; that the ſides, both of the inner or convex mould, and of the outer concave one, be thoroughly oiled or greaſed, and the preſſure on the ſurface of the outer or concave mould, be as ſtrong and as equal as may be. There is no clay better for the making theſe *Muffles* than the *Windſor loam*, an earth well known among the chemiſts and glaſsmen, and always to be ſold in London; and the rubbing the inſides of the mould with black lead in fine powder, very well ſupplies the place of greaſing them, to prevent the matter from ſticking to them.

Theſe are the *Muffles* ordinarily uſed in aſſaying; but when very large teſts are to be covered, they uſe large ſpheroidal *Muffles*, made of caſt iron, or ſometimes of the ſame clay, and wrought in the ſame manner, only made upon proportionably larger moulds. The clay is uſually, for theſe large ones only, laid in a lump on the top of the mould, and with wet hands ſpread all over it to the bottom, and by this means a *Muffle* is made with little trouble. *Cramer's* Art Aſſ. p. 62.

MUGGENT, in zoology, the name of a ſpecies of freſh water wild duck, called by many authors the *muſcaria*, from its catching flies that play on the ſurface of the waters.

It is about the ſize of the common tame duck. The beak is ſhort and broad, and is of a ſaffron colour. It is all over of a mottled colour, like that of the partridge, made up of black, white, brown and grey, ſo oddly mixed together, as to ſhew neither ſeparate. The crown of the head is black, and the feet are yellow. *Geſner* de Avib.

Mr. Ray ſuſpects this not to be different from our common wild duck.

MUGWORT, *Artemiſia*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of ſeveral floſcules, divided into many ſegments at their ends, ſtanding on the embryo ſeeds, and contained in a ſcaly cup. Among the flowers there alſo appear many naked embryos, which terminate in a fine ſmall filament, bifid at the end. Theſe, as well as the embryos of the flowers, finally become ſeeds, in ſhape reſembling thoſe of wormwood.

The ſpecies of *Artemiſia*, enumerated by Mr. Tournefort, are theſe: 1. The common *Artemiſia*, with a purple ſtalk, and purple flowers. 2. The larger *Artemiſia*, with greeniſh-white ſtalks. 3. The *Artemiſia* with leaves variegated with yellow. 4. The red ſea *Artemiſia*. *Tourn.* Inſt. p. 460.

Mugwort has long been famous as an uterine and antiſpaſmodic, and a medicine of great efficacy in all diſeaſes of the nerves. It is evidently aperient and abſtergent; it promotes the menſes, and cleanſes the womb. It is given in decoction, or much more agreeably in a light infuſion, in the manner of tea. The midwives uſe it alſo externally, boiling it, and applying it to the belly, to promote the menſtrual diſcharges, or the expulſion of the ſecundines. It is by ſome much recommended as a cure for the *ſciatica*; and it is to be taken for this purpoſe, either in powder, two drams for a doſe, or the expreſſed juice drank an ounce or two twice a day for ſome months. There uſed to be a diſtilled water, a ſyrup, a conſerve, and an extract of *Mugwort* in the ſhops, and the ſalt was made as that of wormwood; but at preſent theſe are diſuſed, and the dried herb only is kept there, as an ingredient in ſome of the compound waters. *Hill*, Hiſt. Mat. Med. p. 342, ſeq.

MUGIL, the *Mullet*, in ſome degree reſembles the dace or dare in ſhape. The noſe is ſharp; the belly a little bowed; the head plain and flatted. Its ſcales are very large, and cover not only the body, but the membranes of the gills, and a great part of the head. The back is of a duſky bluiſh or greeniſh brown; the belly white, and the ſides are variegated with longitudinal black and white lines running from the head to the tail. It has no teeth; but the tongue is ſomewhat rough. It is ſuppoſed to feed wholly on weeds, and the like; and ſeems indeed to eat no fiſh. It is moſt frequently caught at ſea; but at times comes up into rivers. *Willughby's* Hiſt. Piſc. p. 275.

The *Mullet* is a very well taſted fiſh; and of its ſpawn is made what we call *botargo*. See the article BOTARGO.

Rondeletius, and other authors, have deſcribed three or four different ſpecies of *Mugil*; but they ſeem rather varieties of the ſame fiſh, owing to age, place, and other accidents.

In the Artedian ſyſtem of ichthyology, the characters of the *Mugil* are theſe: The branchioſtege membrane on each ſide contains ſix crooked bones; the upper one being the broadeſt, and being hid under the covering of the gills, ſo that only five are diſcernible. The ſcales are large, and they cover the head; and the opercula of the gills, as well as the body of the fiſh. The head is of a depreſſed figure in its anterior part; and the body is oblong and compreſſed. According to theſe diſtinctions, there is only one known ſpecies of *Mugil*; this is the *Mugil* of Ovid and the antients. It reſembles the thymallus in its external figure. Its jaws are tender and thin, and have no teeth in them. The tail is forked. *Artedi* Gen. Piſc. p. 26.

MUGIL *Alatus*, the *winged Mullet*, a name given by ſome authors to the *hirundo piſcis*, or ſwallow-fiſh, as, excepting its wing-fins, it very much reſembles the *Mullet* in ſhape. *Geſner* de Piſc. See the article HIRUNDO *Piſcis*.

MUGIL *Niger*, the *black Mullet*, a name given by authors to a fiſh of the *Mullet* kind, but all over black, more uſually known by the name of the *portius piſcis*. *Ray's* Ichthyol. p. 276.

MULÆ, a word uſed by ſome medical writers to expreſs puſtules on the ſkin, which are owing to extreme heats, or to cold.

MULA *Herba*, in botany, a name uſed by ſome for the ceterach, or ſmooth ſpleenwort. *Ger.* Emac. Ind. 2.

MULBERRY, *Morus*, in botany, &c. See the article MORUS.

The common *Mulberry*-tree is to be propagated either by ſowing the ſeeds, or by laying down the tender branches, which in two years will be well rooted, and may be cut off from the tree, and tranſplanted into the places where they are to remain. But thoſe plants which are propagated from ſeeds, are uſually the moſt vigorous, and grow the moſt regularly, and with the ſtraiter ſtems; but then there is a great diſadvantage attending this propagation, which is, that the trees are frequently altogether male, producing only catkins, and no fruit; ſo that it is better to do it by layers from a tree, which is known to produce plenty of good fruit; the ſtraiteſt ſhoots ſhould be always choſen for layers; and when they are tranſplanted, they ſhould be tied up to ſtakes to keep them ſtrait. This tree ſhould not be often pruned; but only ſuch branches are to be cut off as croſs and bruiſe one another.

The *Mulberry*-tree thrives beſt in a light ſoil, which ſhould not be too wet, nor over dry; and it ſhould always have an open expoſure; for if planted too near trees or buildings, ſo as to be ſhaded thereby, the fruit ſeldoms ripens well; though it will be to great advantage to have them defended from the weſt and ſouth-weſt winds, by trees or buildings at a diſtance.

The ſoil under the *Mulberry*-tree ſhould always be well dug up every year, and manured, which proves of very great ſervice to the fruit.

The white *Mulberry* is cultivated in France and Italy for the ſake of its leaves, as there is an opinion, that the ſilk-worms ſhould be fed only with theſe; but it is affirmed by perſons who ſeem to know beſt, that the Perſians feed their worms only with the leaves of the black kind.

The trees intended for feeding ſilk-worms ſhould not be ſuffered to grow tall, but kept in a ſort of hedge; and inſtead of pulling off the leaves ſingly, they ſhould be cut off with ſheers together with the young branches; this is not only much ſooner and more eaſily done, but it is leſs injurious to the

the trees. The white sort is propagated either by seeds or layers as the black, and is equally hardy. *Miller's* Gardener's Dict.

MULBERRY-*Cyder*, a name given by the people of Devonshire, and some other parts of England, to a sort of cyder rendered very palatable by an admixture of *Mulberry* juice in the making: They choose for this purpose the ripest and blackest *Mulberries*, and pressing out their juice and mixing it with a full-bodied cyder at the time of the grinding and pressing, giving just so much of it as adds a perceptible flavour. It is very worthy the attention of people who live in other counties, where strong and good cyder is made, that this renders it a sort of wine much more agreeable than any other English liquor, and might be brought into general use, to the great advantage of the dealer. The colour of this liquor resembles that of the brightest red wine, and the flavour of the *Mulberry* never goes off. Phil. Trans. N°. 133.

MULBERRY-*Shell*, a species of *Dolium*. See the article DOLIUM.

MULE (*Cycl.*)—*Mules* are chiefly used in countries where there are rocky and stony ways, as about the Alps and Pyrenees, &c. Great numbers of them are kept in these places; they are usually black, and are strong, well-limbed, and large, being mostly bred out of the fine Spanish mares.

The *Mules* are sometimes fifteen or sixteen hands high, and the best of them are worth forty or fifty pounds a-piece. No creatures are so proper for large burdens, and none so sure footed. They are much stronger for draught than our horses, and are often as thick set as our dray-horses, and will travel several months together, with six or eight hundred weight upon their backs. It is a wonder that these creatures are not more propagated in England, as they are so much hardier and stronger than horses, and are less subject to diseases, and will live and work to twice the age of a horse.

Those that are bred in cold countries, are more hardy and fit for labour than those bred in hot; and those which are light made are fitter for riding than horses, as to the walk and trot; but they are apt to gallop rough, though these do it much less than the short-made ones. *Mortimer's* Husbandry.

They take so much after the mare they are bred from, that they may be procured of any kind, light or strong, as the owner pleases. The general complaint we make against them, is, that they kick, and are stubborn: But this is only owing to our neglect in the breeding them, for they are as gentle as our horses in countries where they are bred with more care.

Mules are of two kinds; the one between the horse and the she-ass, the other between the he-ass and the mare. The first sort are the least valuable. They are commonly very dull, and take after the ass, and are not large; the other breed is therefore what is propagated chiefly in all countries where mules are used. The largest and finest he-ass must be procured for this breed; and in Spain, where *Mules* are greatly esteemed, they will give fifty or sixty pounds for a fine he ass, only to be kept as a stallion. They breed with this creature out of the finest and largest mares they have, giving the ass an advantage of height of ground, and putting the mare into a narrow pit, railed on each side.

Some authors affirm, that in Syria there are a sort of *Mules* which propagate their species; but this is a mistake; for in all the countries where they are common of both kinds, no such thing ever happens.

If the ass designed to be bred on is suckled by a mare, or the mare suckled with an ass, it makes them much more familiar than they would otherwise be; and this may always be done by taking away the colt that belongs to the dam, and putting the other in its place, keeping them in the dark ten days or a fortnight.

MULGRANOC, an English name for a small sea-fish caught in the Cornish and other shores, the *alauda non cristata* of Rondeletius, and the *galeetto* of other authors. *Willughby's* Hist. Pisc. p. 133.

MULIERTY, the being or condition of a *Mulier*, or lawful issue. Co. Litt. 352. *Blount*.

MULLER, (*Cycl.*) in zoology, a name used by some for the fish called in Latin the *Cataphractus*, and in English the mailed fish, or pogge. *Willoughby's* Hist. Pisc. p. 212. See the article CATAPHRACTUS.

MULLET, (*Cycl.*) in zoology, a name by which the people in some counties of England call the *Anas arctica Clusii*. See the article DUCK.

MULLETT, in ichthyology, a name given in England indeterminately to several kinds of fish of different genera; but the proper sense of the word is the same with that of the mugil or cephalus, of the generality of authors; the cephalus of Aristotle and the Greeks; and the cestreus or cestrea of Oppian and others. See the article MUGIL.

MULLUS, in zoology, the name of a fish properly of the cuculus kind, of which there are two species; the one called *Mullus imberbis*, the other *Mullus asper*. The first is a very scarce sea-fish, with a large head, ornamented with several small figures of stars, large eyes, a small mouth of a fine bright red within, and without teeth; the covering of the gills have several prickles pointing toward the tail; the whole body is of a reddish colour, and the gill-fins have near their end some filamentous-fingered appendages. Its belly is white, and there are two rows of pointed bones running from the head to the tail all along the back.

The other, or *Mullus asper*, is a small fish of about the length and thickness of a finger, and of a beautiful red or somewhat purplish colour; and is covered with scales serrated at their extremities, and placed obliquely. *Rondelet.* de Pisc. p. 640.

MULLUS *Barbatus*, in zoology, the name of a fish of the cuculus or the gurnard kind, caught in the Mediterranean, and reckoned an extremely delicate fish for the table. Its usual size is about six or seven inches in length. Its head is flatted and its body considerably thick; and the back flat, not ridged. From the head all the way to the tail, it becomes gradually smaller, so as to resemble an obelisk in figure. Its scales are serrated at the edges, and are easily rubbed off; they are of a brownish olive colour; but the sides, when they are off, look as if tinged with red lead. The eyes stand very high in the head, and it has two very long beards under its chin. It has no teeth in the jaws, and its tail is very forked. *Gesner* de Pisc. p. 285.

MULLUS *Imberbis*, in zoology, the name of a small fish caught in the Mediterranean and Archipelago, and called by many *rex mullorum* and *re de triglia*. Its usual size is about four or five inches in length. It is all over of a reddish hue, and is covered with very large scales. Its belly is also somewhat prominent, by which it is distinguished from all the other mullets. Its eyes are large, its mouth very wide, and its jaws rough like a file. Its tail is forked, and it has no beards. *Willughby's* Hist. Pisc. p. 286.

MULTIBONA, in botany, a name given by some authors to parsley. *Ger.* Emac. Ind. 2.

MULTIFIDUS *Spinæ*, in anatomy, a name given by Albinus to a muscle, the several parts of which he says have been called by several different names by the generality af anatomical writers.

That part of it which is situated in the region of the loins, is called by Vesalius, the *decimus tertius* and *decimus quartus dorsum moventium*, and by some the *tertius dorsi musculus*. That which is situated in the back is called by Vesalius, *decimus quintus* and *decimus sextus dorsum moventium*, and by others, *quintus dorsi musculus*.

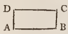
That part which is in the neck is called by Vesalius, the *septimus* and *octavus dorsum moventium*, and by many the *quartus cervicis musculus*; and by Fallopius, *pars tertii paris musculorum dorsi*. That part of it which is in the loins and back is called by Fallopius the *quartum par musculorum dorsi*, and seems to be the *sacer* of Riolanus.

That part which is in the neck is called by Riolanus also a part of the spinatus, and by some the *transversalis colli*: And its distinct portions in the neck are called by Douglass the *intervertebrales*.

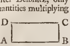
MULTIPLE (*Cycl.*)—MULTIPLE *superparticular Proportion*, is when one number or quantity contains another more than once, and a certain aliquot part; as $3\frac{1}{2}$ to 1.

MULTIPLE *superpartient Proportion*, is when one number or quantity contains another diverse times, and some parts besides; as $4\frac{2}{3}$ to 1.

MULTIPLICATION (*Cycl.*)—Accurately speaking, in every *Multiplication*, the multiplicator must always be considered as a number; and it is easy to conceive a quantity of any kind multiplied by a number. But to talk of a pound multiplied by a pound, a debt by a debt, and a line by a line, &c. is unintelligible. However, by analogy, in the application of algebra to geometry, we meet with such expressions, and nothing is more common than to find $AB \times BC$, to denote the rectangle ABCD, the length of which is AB, and the breadth BC. But this is only to be understood by analogy; because, if the number expressing the measure of the side AB was multiplied by the number expressing the measure of BC, the product would express the measure of ABCD.



The sign of *Multiplication* most commonly used among algebraists, is $\times$. But the Germans, after Leibnitz, only make use of a point placed between the quantities multiplying each other, thus: $a \cdot b$ is the same as $a \times b$ and $AB \cdot BC$, the same as $AB \times BC$, or the rectangle of AB into BC, that is the rectangle ABCD.



When the quantities to be multiplied are complex, they place them between a parenthesis, instead of drawing a line over them, as we commonly do.

Thus they write $(a+b) \cdot (c+d)$ instead of $\overline{a+b} \times \overline{c+d}$, for the product of $a+b$ into $c+d$. Sometimes the point is omitted, thus: $(a+b)\ (c+d) = \overline{a+b} \times \overline{c+d}$.

MULTIPLICATION, in algebra. To multiply algebraic quantities, we must attend not only to the quantities themselves, but also to their signs.

The general rule for the signs is, that when the signs of the factors are like, (*i. e.* both + or both —) the sign of the product

product is +; but when the signs of the factors are unlike, the sign of the product is —.

Then if the quantities to be multiplied be simple quantities, find the sign of the product by the last rule; after it place the product of the coefficients, and then set down all the letters after one another, as in one word.

If the factors be compound quantities, multiply every part of the multiplicand by all the parts of the multiplier, taken one after another, and then collect all the products into one sum; which will be the product required. See *Maclaurin*, *Saunderson*, or any other elementary writers.

The reason of the rule here given for the signs of the product, *viz.* That + by +, or — by — give +, and that + by —, or — by + give —, is apt to perplex beginners. But if it be considered, that in all *Multiplication* the multiplicator is, strictly speaking, a number, the difficulty soon vanishes; for, 1°. When any positive quantity $+a$ is multiplied by any positive number $+n$, the meaning is, that $+a$ is to be taken as many times as there are units in n, and therefore the product is evidently $+na$ or na, the positive sign being omitted.

2°. When $-a$ is multiplied by n, then $-a$ is taken as often as there are units in n, and the product must be $-na$.

3°. As *Multiplication* by a positive number implies a repeated addition, *Multiplication* by a negative implies repeated subtraction; so that when $+a$ is to be multiplid by $-n$, the meaning is, that $+a$ is to be subtracted as often as there are units in n; therefore the product must be negative, being $-na$.

4. When $-a$ is to be multiplied by $-n$, then $-a$ is to be subtracted as often as there are units in n; but by the rules of subtraction, to subtract $-a$ is equivalent to adding $+a$, and consequently the product is $+na$.

The 2*d* and 4*th* cases may be thus illustrated, by the import and meaning of the signs + and —, $+a-a$ must be $=o$. Therefore if we multiply $+a-a$ by n, the product must vanish, or be nothing; because the factor $a-a=o$. The first term of the product is $+na$ by case 1. therefore the second term of the product must be $-na$, which destroys $+na$; so that the whole product must be $+na-na=o$. Therefore $-a$ multiplied by $+n$ gives $-na$.

In like manner, if we multiply $+a-a$ by $-n$, the first term of the product being $-na$, the latter term of the product must $+na$, because the two together must destroy each other, or their amount be o, since one of the factor $a-a=o$. Therefore $-a$ multiplied by $-n$, must give $+na$. See *Maclaurin's* Algebra, Part 1. chap 4. *Saunderson's* Algebra, Vol. 1. p. 57. And *Barrow's* Euclid, Schol. Prop. 1. Elem. 2.

MULTIPLIER, in arithmetic, the number multiplying. See the article MULTIPLICATOR, *Cycl.*

MULTIVALVES, in natural history, the name of a general class of shell-fish distinguished from the univalves, which consist of only one shell, and the bivalves, which consist of two, by their consisting of three or more shells.

Of these there are much fewer species than either of the univalve or bivalve class. A late accurate French author has ranked all the species under six genera, which are these: 1. The *echini* or sea-eggs. 2. The *vermiculi*, or sea-worms. 3. *Balani* or center-shells. 4. The *pollicipides* or thumb-shells. 5. The *conchæ anatiferæ* or goose-shells. And 6. The *pholades*. Hist. Nat. Eclairc. part 2. p. 235. All these see under their several heads.

MULTONES *Auri*, in our antient writers, an old coin of gold, having an *Agnus Dei*, sheep or lamb on the one side, and from that impression called *Multones*. This coin was most common in France, and sometimes current in England. Patent 33 Edw. 1. cited by the learned Spelman. *Blount.*

MULUD, in the materia medica, a word used by Avisenna and Serapio to express a sort of litharge, called by the Greeks *molybdites*, as seeming to partake of the nature of lead alone, not of gold or silver, or any other metal, as they thought the argyrites and chrysites did. This *Mulud* or molybdites was the least in esteem of all the kinds of litharge, and was of a dusky greyish white colour. It seems to be the same that Dioscorides means by *pelia* and *polia*, and sometimes by *lithargyrus Sicilius*, from the place whence it was brought.

MUMMY (*Cycl.*)—There are found at this time in Poland a kind of natural *Mummies*, or human bodies, preserved without the assistance of art. These lie in considerable numbers in some of the vast caverns in that country. They are dried, with the flesh and skin shrunk up almost close to the bones, and are of a blackish colour. In the wars, which several ages ago laid waste that country, it was common for parties of the weaker side to retire into these caves, where their enemies, if they found it out, suffocated them by burning straw, &c. at the mouth of the cavern, and then left the bodies; which being out of the way of injuries from common accidents, have lain there ever since. *Rzaczinski* Hist. Pol.

MUMMY, among the gardeners, is the term used for a sort of waxey composition used in grafting. It is made of one pound of common black pitch, and a quarter of a pound of turpentine, put into an earthen pot with a cover fitted to it; this is to be set in the open air, and the cover being taken off, the matter is to be set on fire, and when it has burned a little while, it is to be quenched by putting on the cover. This is to be repeated till the mixture is of a proper consistence, which is known by pouring a little of it on a pewter plate, on which, when it is enough, it will coagulate immediately. When it is of this consistence, it is to be poured into another pot, and a little yellow wax is to be added to it, and then melting the whole together, it is to be kept for use. *Miller's* Gardener's Dict.

MUNDUS *Patens*, among the Romans, a solemnity performed in a little temple of a round form; and dedicated to Dis, and the infernal gods.

It was opened only three times in a year, *viz.* on the day after the *Vulcanalia*, the 4*th* of October, and the 7*th* of the ides of November, during which days the Romans believed that hell was open; and therefore they never offered battle on those days, listed no soldiers, never put to sea, nor married. *Pitisc.* in voc. See the article VULCANALIA.

MUNDUYGUACU, in botany, a name of the *nux cathartica* of the West Indies, a kind of great ricinus, or palma Christi. *Piso*, 169.

MUNGATHIA, in zoology, the name given by some to a species of Indian ferret, of a reddish grey colour, called also *mungo*.

MUNGO, in zoology, the name of an American animal of the ferret kind, called by authors *viverra Indica ex griseo-rufescens*, or the reddish grey Indian ferret. Some call it also *mungathia*. *Mus.* Leyd. Cat.

MUNITION (*Cycl.*)—MUNITION-*Ships*, in the navy, those which have stores on board, to supply the necessaries to a fleet of men of war at sea.

In the time of an engagement, all the *Munition*-ships and victuallers attending the fleet are to take their places and proper stations in the rear of all the rest, and not engage in the fight, but attend such directions as shall be sent unto them, at all times, by the admiral.

MUNNY *Sheller*, in natural history, a name given by the natives of the East Indies to a species of red orpiment, which they have plentifully there. It is of a glowing colour, and has a great many shining spangles in it. They give this in fevers, after it has been calcined: It first melts in the fire, and then emits copious white fumes, smelling like those of arsenic. These are supppsed to contain the poisonous parts of it, and it then becomes a safe internal medicine, and is given with great success.

MUNTINGIA, in botany, the name of a genus of plants, the characters of which are these: The perianthium consists of one leaf, divided into large pointed segments. The flower consists of five roundish petals, of the length of the segments; of the cup. The stamina are numerous capillary filaments, they are very short; and the antheræ are simple. The germen of the pistil is globose, and is covered with hairs; there is nostyle, and the stigma is capitated and pentangular in figure. The fruit is a globose berry, with only one cell; it is umbilicated by the stigma. The seeds are very small and numerous, and are of a roundish figure. *Linnæi* Gen. Plant. p. 229. *Plumier*, Gen. 6.

MUNYCHIA, Μουνυχια, in antiquity, an anniversary solemnity at Athens, upon the fixteenth of the month *munychion*, in honour of Diana, surnamed *Munychia*. For the origin and ceremonies observed in it, see *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 414. seq.

MUNYCHION, Μουνυχιων, in chronology, the tenth month of the Athenian year. It contained twenty-nine days, and answered to the latter part of our March and beginning of April. See the article MONTH.

It had its name from the festival *munichia*, kept in it.

MURÆNA, in the Artedian system of ichthyology, the name of a genus of fishes, the characters of which are these: They are of the malacopterigious or soft-finned kind. The branchiostege membrane on each side contains ten slender and curved bones; but the skin is so thick, that these are not easily distinguished before that is pulled off. The foramina of the nostrils are two, and are placed in the very summit of the snout, one on each side. The body is long and cylindric; in some species there are three fins, in others two, in others only one.

The species of *Muræna* enumerated by Artedi, are these: 1. The simple-coloured *Muræna*, with the lower jaw longest. This is the common eel. 2. The *Muræna*, with the upper edge of the back fin black. This is the conger, or sea eel. The iris of this fish is white; that of the common eel is red. 3. The *Muræna* with a sharp snout, variegated with white spots, and with the edge of the back fin black. This is the myrus of the antients, and the flat-tailed sea serpent of the later writers. 4. The cylindric-bodied *Muræna*, with no fin at the tail. This is the common sea serpent of authors; it grows to five foot in length. 5. The cylindric, slender, and spotted *Muræna*, with a rounded cuspidated tail, with no fin to it, This is the spotted sea-serpent of authors. 6. The *Muræna* with no pectoral fins. This is the fish which all authors call the *Muræna*, Artedi only extending that word as a generical name to the other species. *Artedi*, Gen. Pisc. 19.

According to *Willughby*, the *Muræna* is a fish of the anguilliform or eel-like class. Its body is broad, and its snout pointed, and of a flatted figure. It is variegated in colour with a dusky brown

brown or tawny, a black, and a gold yellow. Its head is moderately large, and its mouth extremely wide, and has, in the rim of each jaw, a row of very ſmall teeth, and in the middle of its palate, two teeth much larger than the reſt, and moveable inwards. Sometimes there is only one of theſe. At the end of its ſnout there are two ſhort and hollow apophyſes, and over the eyes two more. The former of theſe ſeem to ſerve the creature for hearing, and the latter for ſmell; for the antients all agree, that this fiſh can hear. The eyes are very ſmall, and placed in the middle of the head. It has two round holes at the gills for throwing out the water. The gills are four, and it neither has any fins at the gills, nor on the belly. Near the back part of the head begins a fin, which runs downs the ridge of the back, and ſurrounding the tail, returns up to the anus, and there terminates. This, as in the eel, is covered with the common ſkin. It is caught on the ſhores of Italy, and in other parts of the Mediterranean. Its fleſh is white, tender, and of a fine flavour, and was highly valued by the antient Romans. But there is ſome danger in the eating them. Their bite alſo is very venomous, and often occaſions long pain, and many ill conſequences to people who ſuffer it. *Willughby*'s Hiſt. Piſc. p. 103.

It is to be obſerved, that the dictionaries uſually give us the word lamprey as the Engliſh of *Muræna*; but the *Muræna* and lamprey, called by the Latin authors, *lampetra*, are two very different fiſhes. See the article LAMPETRA.

Muræna is originally Greek, and is derived from the *verb*, *μυρειν*, to flow, or be ſlippery, and expreſſes the manner in which its ſlipperyneſs makes it roll about, and eſcape the catcher, by ſlipping through his fingers.

MURÆNA is uſed by Albertus for the common ſmall lampern, the *lampetra parva fluviatilis* of authors. This is one of the petromyza of Artedi, and is diſtinguiſhed by the having only one row of very ſmall teeth in the verge of the mouth, beſide the large lower ones.

MURELIA, in botany, a name by which Pliny, and ſome other authors, have called the *parietaria*, or pellitory of the wall. *Ger.* Emac. Ind. 2.

MUREX, in natural hiſtory, the name of a genus of ſhell-fiſh, the characters of which are theſe. It is an univalve ſhell, beſet with ſharp ſpines and tubercles, with a rough clavicle exerted near the ſummit in moſt ſpecies, but in ſome depreſſed. The mouth is always expanded, and ſometimes has teeth, ſometimes not; the lip is ſometimes digitated, ſometimes elated or folded, or jagged; and the columella is ſometimes rough, ſometimes ſmooth. See Tab. of Shells, N°. 13.

Notwithſtanding that this is the general character of the *Murex*, and that all the ſpecies have an oblong mouth, and the body covered with tubercles, there are, under this extenſive character, four ſpecific variations of figure, which are very obſervable. The firſt is ſeen in the alated *Murex*, which has no ſpines. The ſecond is in the ſpider ſhell, which has very remarkable ſeries of fingers or hooks. The third is the helmet-ſhell, which is a true triangular *Murex*. The laſt is a furrowed *Murex*, which has no wings, nor protuberances, nor ſpines; but has a flat head, and an oblong dentated mouth. Hiſt. Nat. Eclairc. p. 290. *Aldrovand. Rondelet. Rumphius.* On the firſt examination of ſeveral of the ſpecies of helmet-ſhell, the outer coat of which is ſmooth, it would be natural to refuſe them any place among the *Murex* claſs; but when we ſee the oblong ſhape of the mouth, and find that it is furniſhed with teeth, and afterwards obſerve the rudiments of tubercles which are to be ſeen on the mouth ſide, we ſhall perceive that they are all true *Murices*, though leſs prickly than the others.

The antients were furniſhed with their fineſt purple dye from a fiſh of the *Murex* kind, and therefore expreſſed the purple colour by the word *Murex*. We find in Virgil, *Tyrio ardebat murice lana.* Plumier tells us, that in America the *Murex* is called *piſſeur*, from its readily ejecting the liquor, which gives the purple colour when it is taken from the rocks. And Fabius Columna diſtinguiſhes the *Murex* from the purpura and buccinum, but in a very injudicious manner. He ſays the purpura affords the fine purple colour: the *Murex* is covered with ſpines and tubercles; and the buccinum is known by its ſmooth and long wreath. But he ſhould have known that the affording the purple dye is common to the *Murex* and purpura, and even to ſome of the buccinum kind; and that there are *Murexes* with very few ſpines or tubercles, and buccina which are not ſmooth. The knowledge of the inſufficiency of theſe characters, would have engaged him in ſeeking others more eſſential; and a perſon of his great abilities would then perhaps have prevented half the confuſion that has happened ſince in the world, on occaſion of errors of this kind propagated from his writings, and thoſe of two or three others of his time. *Virg. Æneid.* L. 4. *Fabius Columna*, Aquat. & Terreſtr. Obſerv. p. 55.

The family of the *Murex* being very extenſive, it may be proper to divide them into ſome ſeparate ſeries from the general common marks of certain numbers of the ſpecies. 1. Some have remarkably eminent tubercles and ſpines. 2. Some are nearly ſmooth, but have a rough clavicle, and a crooked beak. 3. Some have digitated lips. And 4. Some have alated and laciniated lips. The ſpecies preſerved in the cabinets of the curious are theſe. Firſt, of the rough or prickly *Murices* we have the following:

1. The *Murex* with a compreſſed clavicle, and with obtuſe black ſpines. 2. The grey *Murex*, with an exerted clavicle, and rows of black ſpines. 3. The *Murex* with a compreſſed clavicle, ſurrounded with bluiſh ſpines. 4. The yellowiſh *Murex*, ſurrounded with four rows of obtuſe ſpines. 5. The whitiſh *Murex*, with two rows of ſpines. 6. The brown and blue *Murex*, with three rows of ſpines. 7. The yellowiſh *Murex*, every where regularly beſet with ſpines. 8. The whitiſh *Murex*, with a purple dentated mouth, and with yellow low tubercles or umbos. 9. The white hedgehog *Murex* with black ſpines, and with a dentated mouth. 10. The muſic *Murex*, with a rugoſe columella. 11. The ruſtic muſic *Murex*. 12. The lightening *Murex*, with a rugoſe columella. 13. The variegated *Murex* with a rough exerted clavicle. 14. The undulated, contabulated and tuberous *Murex*, with an exerted clavicle. 15. The whitiſh ſtriated *Murex*, with a clavicle furniſhed with long ſpines. 16. The yellow coſtated *Murex*, with furrows and tuberoſities on all parts of the ſhell. 17. The ſtriated umbilicated verrucoſe or warty *Murex*, with a reddiſh columella. Hiſt. Nat. Eclairc. p. 290.

Of the ſecond ſeries of the *Murex*, or thoſe which have a ſmooth body, a clavicle ſomewhat rough, and a crooked beak, we have the following ſpecies: 1. The triangular *Murex*, or helmet-ſhell of Rondeletius, with a dentated mouth and folded lip. 2. The red turban *Murex*, with ſeveral umbones, and with both lips folded back and expanded. 3. The helmet-ſhell of Bonani, or the agate helmet-ſhell, with a leſs dentated mouth. The laſt appearance is that under which we uſually ſee this ſhell, it having been commonly poliſhed, and its outer coat taken off, before it is admitted into a cabinet. 4. The yellow variegated helmet-ſhell. 5. The grey ſtriated helmet-ſhell, without umbos. 6. The whitiſh helmet-ſhell, variegated with yellow undulated lines. 7. The agate helmet-ſhell, with regular yellow ſpots. 8. The blue ſtriated helmet-ſhell, with yellow undulated lines. 9. The wavy helmet-ſhell.

Of the third kind, or thoſe which have digitated lips, we have the following: 1. The common ſpider-ſhell or *Murex*. 2. The ſpider-ſhell called by the French the *Murex lambis*. 3. The hooked-clawed or male ſpider-ſhell. 4. The female ſpider-ſhell. 5. The millipede ſpider-ſhell. 6. The cornuted ſpider ſhell of Rumphius. 7. The ſeven-fingered ſpider-ſhell. 8. The five-fingered ſpider-ſhell. 9. The four-fingered ſpider-ſhell. 10. The ſpider-ſhell, with ſix elegant furrows. 11. The ſcorpion-ſhell, with a radiated mouth. 12. The ſtrait-pointed red ſpider-ſhell. 13. The crow-billed ſpider-ſhell, or the blue, white and yellow ſpider-ſhell, with five appendages at the lip. This latter appearance is that under which we ſee the ſhell when it has been poliſhed.

Of the fourth ſeries of *Murexes*, or thoſe which have alated and laciniated lips, we have the following ſpecies: 1. The aſſes-ear *Murex*, with a crooked beak, and a lip red on the inſide. 2. The triangular *Murex* with large ſtriæ and tubercles, called the hogs-eared *Murex*. 3. The *Murex* with a red mouth and black columella. 4. The *Murex* with a ſtriated mouth, black on each ſide. 5. The white and brown-mouthed *Murex*. This, when poliſhed, is the ſpecies called the *turtle Murex* in cabinets. 6. The ear *Murex* of Rumphius. 7. The *Murex* with a reddiſh laciniated and very wide extended lip, and an aculeated clavicle. 8. The red *Murex*, with a laciniated lip and prickly clavicle. 9. The variegated and verrucoſe *Murex*, with a thick laciniated lip. 10. The variegated and verrucoſe *Murex*, with a jagged very thin lip. 11. The yellow *Murex*, with a laciniated lip and gibboſe clavicle. 12. The lead-coloured, bellied *Murex*, with a folded lip. 13. The ſmooth *Murex*, with a thick folded lip, and a dentated columella. 14. The yellow and tuberous *Murex*, with a folded lip, dentated on one part, and ſpotted on the other. 15. The yellow *Murex* with a regular rib, ſpotted, and running tranſverſely from the beak to the middle of the back. 16. The grey coſtated *Murex*, with a wide lip on the ſide of the columella. 17. The white coſtated and contabulated *Murex*. To theſe ſpecies is to be added one of a very ſingular kind, the mouth of which opens the contrary way to all the others. Hiſt. Nat. Eclairc. p. 288.

MUREX, among the antient Romans, a caltrap or iron inſtrument with ſharp points every way, uſed as a defence againſt the enemies horſe. *Pitiſc.* in voc.

MUREX *Mutiani*, a name given by ſome authors to the genus of ſhells, known at this time under the name of *porcelains* and *conchæ venereæ*. See the article PORCELLANA.

MURINA, or MURINES, *μυρινης οινος*, in antiquity, a delicious ſweet wine, medicated with ſpices. It was a kind of hippocras, and the uſual drink of the ladies. *Hofm.* Lex. in voc. See the article HIPPOCRAS, *Cycl.*

MURRA, among the antients, a foſſile ſubſtance found in Parthia and Carmania, of a fine ſmell, and beautiful variety of colours.

It was thought to be ſome humour condenſed in the earth by the heat of the ſun. *Pitiſc.* in voc. See the articles MURRINE and MORRHINA, *Cycl.* and *Suppl.*

Murra was likewife a dry perfume, made of the *Murra* reduced to powder. *Pitisc.* in voc.

MURRE, in zoology, a name given in fome parts of England to the razor-bill. See the article Alka.

MURRHINA, in antiquity, a kind of fweet medicated wine. See the article Murina.

MURRINE, in the writings of the antients, a name frequently given to cups ufed for drinking, and to veffels of a fmall fize, ufed for the preferving perfumes, &c. and called *Murrina* from *murrha* or *myrrha*, the name of the fubftance from which they were made.

There have been many errors among the critics and commentators about this *Murrha*; but the greateft of all is that of Baronius, who fuppofes it to have been myrrh, the gum we now know under that name. The defcriptions and ufe we hear thefe veffels were put to, plainly proves the abfurdity of this opinion. Some have fuppofed thefe veffels to be made of cryftal, but this is contrary to the account of all the antients.

The Greeks had the words κρυσταλλος for cryftal, and Σμυρνη for myrrh, very common among them, and therefore if thefe veffels had been made of either of thefe fubftances, they would in fome places have called them *Smyrnina* or *cryftallina*. On the contrary, the moft correct among them call them *murrhina* or *morrina*. The cups made of cryftal, which were alfo in ufe at thofe times, were called *cryftallina*, and thefe *murrhina* or *murrhæa*, by way of keeping up the diftinction: And Martial tells us, that the ftone they were made of was fpotted or variegated, calling them *pocula maculofæ murræ*. And Statius mentions the cryftalline and *murrhine* cups in the fame fentence, but as different things, not the fame. Arrian mentions alfo the λιθος μοῤῥινα, which his interpreters cenfure as an error of the copies, and would alter into *myrrha*, the name of the gum *myrrh*. See the article Morrhina.

MURROBATHRARII, among the Romans, a kind of perfumers. See the article Murra.

MURUCUIA, in botany, the name of a genus of plants, the characters of which are thefe: The flower is rofaceous, or compofed of feveral petals arranged in a circular form. The cup alfo is compofed of many leaves or fegments. The middle of the flower is occupied by a tube in the fhape of a truncated cone; from this there arifes a piftil, which has a tender embryo fruit, furrounded by three club-fafhioned bodies, with numerous ftamina underneath. The embryo finally becomes a fruit of an oval fhape and flefhy fubftance, unicapfular, and containing many feeds covered with a fort of hoods. See Tab. 1. of botany, Clafs 6. *Tourn.* Inft. p. 241.

The only known fpecies of this plant is the *Murucuia*, with lunated leaves, called by others, the fcarlet-flowered Indian climber, with lunated leaves.

MURZAROLT, in falconry. See the article Falcon.

MUS, the *Moufe*, in the Linnæan fyftem of zoology, makes a diftinct genus of animals, of the order of the glires, and taking in the whole family of the moufe and rat kind. The generical characters are, the having four toes on the fore-feet, and five on the hinder, and their palms made and fafhioned for running. *Linnæi* Syft. Nat. p. 39.

Of this genus there are feveral diftinct kinds: 1. The *common Rat*. This is a too well known animal; its colour is a dufky brownifh grey; its tail is compofed of a multitude of rings, not lefs than a hundred and fixty.

2. The *water Rat*. This is much larger than the common *Rat*, and is of a fomewhat reddifh brown colour; its feet are webbed, or the toes connected by membranes like thofe of a duck; it tail alfo is much fhorter, and all the way of the fame thicknefs, not tapering off, but feeming as if cut off in the middle; its teeth alfo are much longer, and of a pale yellowifh colour.

3. The *mufk Rat*. This is about the fize of our common *Rat*; its hair is long, and very thick fet; its back black, and its fides and belly grey. The head is fmall, and the nofe long and fharp, as if intended, like that of the hog, for digging up the earth. Its mouth does not open very wide; its eyes are extremely fmall, and its jaws adorned with a number of long grey hairs all along the opening of the mouth. Its tail is as long as its body, and is flatted and befet with a few fcattered hairs. Its feet are divided into five toes, the larger ones connected by a membrane to affift the creature in fwimming, and the hinder legs are fomewhat longer than the fore ones. This creature is common in Ruffia, and has a very ftrongly perfumed fmell like that of mufk. *Ray's* Syn. Quad. p. 217.

4. The common *Moufe*. This is too well known to need any defcription; but it is diftinguifhed from the reft of the genus by its fmallnefs, and its prominent large eyes. Its colour is a dufky grey on the back, and a whiter grey on the belly.

5. The *larger Moufe*. This is of twice the fize of the common *Moufe*, and is ufually found in caverns of the earth in the fields, though fometimes alfo in houfes; its back is of a mixed colour of black and tawny; its belly very white; and there is an even line drawn along each fide, which feparates the two colours; the head is longer than that of the common *Moufe*, and the eyes larger and more prominent; the ears are rounder and wider; and the tail very long, and covered with fhort hairs, black on the upper part, and white underneath. The legs alfo are longer than in the common *Moufe*; and there are fix tubercles in the bottom of the foot. *Ray's* Syn. Quad. p. 218.

6. The *great-headed field Moufe*. This is larger than the common *Moufe*, and its head is remarkably large in proportion to its fize. Its nofe is fhort and blunt. Its eyes fmall, and not prominent; and its ears, fhort, broad, and roundifh, and almoft entirely hid in the furr, which is much deeper than that of the common *Moufe*. This has alfo a much longer body, and its tail is remarkably fhort, and is thinly covered with hairs; its legs alfo are very fhort. Its back is of a very deep and dufky brown, with a mixture of yellow; and its belly is of a fort of lead colour, the points of all the hairs being white, and their bottoms black. It is common in dry paftures, and is abundantly diftinguifhed from all the other kinds by the thicknefs of its neck and fhoulders, and the fhortnefs of its tail.

7. The *great long-tailed field Moufe*. This is very nearly of the fize of a rat; its tail is very long, and its ears fhort and round; its head is thick, and the nofe not fharp, as in moft of thefe creatures, but fhort and rounded, and is of a deep brown, with fome mixture of red at the fides; and it has a fort of beard of long hairs between the mouth and the eyes.

8. The *Dormoufe*, or fleeper, called *Mus avellanorum* by many authors, and *forex* by Pliny. Of this there are two diftinct kinds, a greater and a fmaller. See the article Sorex. The other kinds are, 9. *Citillus*. 10. The *Cricetus*. 11. The *Marmotta*. 12. The *Cavia Cobaya*. 13. The *Aguti*. 14. *Paca*. 15. The *Leming*. And 16. The *Glis*. All which fee under their feveral heads. Befide thefe there is alfo another variegated kind, known by the name of the *ftriated indian-tree Moufe*, which is very rare, but is fometimes found in the cabinets of the curious. *Ray's* Syn. Quad. p. 218.

Mus *Alpinus*, in zoology, a name given by many authors to the mountain rat, more commonly known by the name of the *marmott*. See the article Marmotta.

Mus *Araneus*, in zoology, the name of a creature called in Englifh, the *fhrew*, the *fhrew-Moufe*, or the *hardy-fhrew*.

It is of mixt brown, and reddifh tawny colour; the belly is white. Its tail is about two fingers breadth long, and covered with fhort hairs. The whole body of the creature has a rank, offenfive, and poifonous fmell. It body is about three fingers breadth, and its eyes black and very fmall; they are indeed little larger than thofe of the mole, and do not exceed the fize of the head of the fmalleft pin; it is no wonder therefore that the creature is almoft blind. The teeth are very fmall, and differ in their fhape and fituation from thofe of all other creatures in the world; and feem as if nature had in one creature made a fort of mixture of the teeth of the *Moufe* and the fnake kind.

It has two long fore teeth, as all the *Moufe* kind have; but thefe are not fingle, as in *Mice*, but have two or three other fmall and fharp teeth growing out of them: Thefe, to an inaccurate obferver, might either be wholly unfeen, or taken for diftinct teeth; and the anterior long teeth are not feparated from the reft by any gap or fpace, as in the *Moufe* kind, but make one continued feries with the others. The upper jaw in this creature is longer than the under, and the teeth are fharp and ferrated, fome with two, fome with three points; and thefe fo fmall, that they might eafily not be feen, but that the tips of them are reddifh. *Ray's* Syn. Quad. p. 240.

It is very common in many parts of the world, and is met with in almoft all our dry grounds; the cats will kill it, but never attempt to eat it.

It is diftinguifhed at firft fight from the common *Moufe*, in that it is fmaller; its nofe longer, and like a hog's; it has five toes on the hinder as well as on the fore feet; its eyes are extremely fmall; its ears very fhort; its claws are long and whitifh, and its feet fhort.

Mus *Norwegicus*, in zoology, the name given by authors to the Norway rat, commonly called the *leming*. See the article Leming.

Mus *Pharaonis*, *Pharaoh's Rat*, a name given by the people of Ægypt to the ichneumon, a creature of the weafel kind, which they are very fond of for its deftroying ferpents, and keep tame about their houfes as we do cats. See the article Ichneumon.

Mus *Terræ*, in botany, a name given by fome authors to the roots of the *bulbocaftanum* or earth-nut; it was probably at firft *muris terræ radix*, the earth moufes root, and fo called from the *earth-Mice* or *field-Mice* being very fond of them; but the word *radix* being left out, it ftands only *Mus Terræ*.

MUSA, in botany, a large herbaceous plant, approaching to the growth of trees. Almoft all the writers of botany have looked upon the *Mufa* as a tree, on account of its bignefs; it is tender, fucculent, and not at all woody; the ftalk, though very thick, is fo weak as to be unable to fupport itfelf, were it not for a great number of dry cafes or hufks, which are membranous and thick, and defend it from bowing and from the weather. The *Mufa* alfo is an annual plant, which bears fruit only once, and then by degrees perifhes; whereas all trees are woody, perennial, and bear fruit a great many times. It has been by fome writers enumerated among the palmaceous

ous clafs; but this feems very idle, as they are all trees, and have no refemblance with the *Mufa*, except in their having naked ftems. The leaves of the *Mufa* at firft have no refemblance to thofe of the palms, but afterwards as they dry and wither they fplit on each fide into a vaft number of fibres which have fome fort of refemblance with the palm-leaves.

The Indians diftinguifh no lefs than twenty-five fpecies of *Mufa*, which they know from one another principally by the fruit. Philof. Tranf. N°. 410.

MUSADA, a name given by fome chemical writers to fal-armoniac. See the article SAL.

MUSCA, the *Fly*, in the hiftory of infects. See the article FLY.

MUSCA, in antiquity, a defignation given to parafites, buffoons, *&c.* who intruded themfelves into the company of thofe that defpifed them, or found means to be admitted to entertainments where they were not welcome. *Hofm.* Lex. univ. in voc.

MUSCÆ is alfo ufed for officers of the popifh inquifition, who feign themfelves of the fect of the prifoners, in order to draw a confeffion of their opinion from them, and thereby betray them; there being perfons placed to overhear their converfation. *Hofm.* Lex. in voc.

MUSCÆ *Volitantes*, dark irregular veins and fpots, feeming to fly before the eyes of many people, efpecially on looking at bright objects, fuch as white paper, the fky-light, the candle, *&c.* Thefe have often the appearance of flies, fpiders, cobwebs, fometimes that of fmoke, duft, *&c.* The refemblance of many of thefe fpots to flies have given them the name of *Mufcæ Volitantes*, q. d. flies flying about.

This phænomenon is not eafy to account for. Some will have its caufe to lie in the aqueous humor; others in the retina. Monf. de la Hire's account of them is this: They are of two forts, fome permanent, which, in fixing the eye upon a point of an object, appear always fixed in the fame fituation to that point; others feem to fly about, and to change their fituation, though the eye be fixed. The fhapes of both forts are changeable. The firft fort are commonly like a dark fpot upon a white ground; the fecond fort appear like the knots of a deal board; fome parts of them being very clear and furrounded with dark threads; they are alfo attended with long fillets of irregular fhapes, which are bright in the middle, and terminated on each fide by parallel black threads. On fixing the eye upon an object, they appear to defcend gradually; efpecially after fhaking the head fuddenly.

The fpots that appear fixed in refpect to the axis of the eye, muft, for that reafon, be caufed by fome diforder in a correfponding part of the retina, or in fome part of the vitreous humour lying pretty clofe to the retina. For an opacity of the coats or humours in any part remoter from the retina, by intercepting fome part of the rays of every pencil, could only caufe an uniform obfcurity or faintnefs of light in every place of the retina, and not a total defect of it in any particular place. Hence M. de la Hire attributes the caufe of thefe permanent fpots to fmall drops of extravafated blood upon the retina.

But he finds it more difficult to account for the moving fpots. When the rays of the fun are tranfmitted through a piece of bad glafs, and fall upon white paper, the fhadows of the little fands, veins, and irregularities in it, appear not unlike thofe fpots. He therefore imagines the aqueous humour is fometimes troubled with fome little mothery, ropy fubftance; fome parts of which, by the figures of their little furfaces, or by refractive powers, different from the humor itfelf, may caft their diftinct images upon the retina. He fuppofes them in the aqueous humour, rather than in the vitreous; becaufe of its greater fluidity for a freedom of defcent, and becaufe they will then appear to defcend, as being fituated before the pupil, or at leaft before the place of the interfection of the pencils. But if this heterogeneous mother be in the vitreous humor, it muft be lighter than this humor, fo that after a fudden fhake of the head, it may firft defcend a little, and then afcend gradually, to caufe the gradual apparent defcent above-mentioned. La Hire *Differt. fur les differ. accidens de la vue.*

Thefe fpots are obferved to change their figures, fometimes in two or three hours, at other times not in two or three days; and to appear more numerous at one time than another. Id. ibid. and Dr. *Smith*'s Optics in the Remarks, Art. 27. feq.

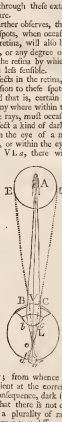
We have an inftance in the Philofophical Tranfactions, N°. 384. of thofe fixed fpots above-mentioned. A woman, who, in looking with the left eye only, at three fhort words in print, could fee the extremes, but not the middlemoft; and, in looking with the right eye only, at the middle between four fhort words, could fee but three of them; one of the two middlemoft being covered with a dark round fpot; but in looking with both eyes fhe could fee them all.

Pitcairn denies the caufe of the *Mufæ volitantes* to lie in the aqueous humour, and fays it is owing to, and a fign of, an internal inflammation of the veffels of the retina. Heifter thinks them owing to fome obftruction of thofe veffels; and both thefe authors, and many others, think them forerunners of a gutta ferena, or a cataract; and propofe a cure by mercurials and decoctions of guaicum. See *Pitcairn*'s Elem. Medic. & *Heifter*'s Compend. Medic. Practic. Plempius has given a defcription of the *Mufcæ volitantes*, in his Ophthalmographia.

Dr. Porterfield, in the Medical Effays of Edinburgh, obferves, that thefe fpots may proceed from fome little extravafations, verrucofe fwellings, or other defects in the retina, which by intercepting the rays will occafion a defect in the picture; and by confequence a fimilar and correfponding defect or fpot in the object. He obferves alfo, that thefe fpots commonly vanifh, or at leaft become lefs fenfible, when the object is brought nearer the eye, and within the limits of diftinct vifion. For, the rays which are now exactly united upon the retina, by being more crowded have their force augmented; by which means a fenfible impreffion is made upon the retina through thefe extravafations. Hence thefe fpots are moft fenfible to thofe who have a fmall pupil, and efpecially to thofe who are fhort, or long-fighted. Hence alfo, in a prefbytical eye, the fpots which were formerly very fenfible, become faint, when the object is viewed through a convex glafs; for by means of this glafs more rays enter the eye, which being united exactly at its bottom, muft ftrike the retina ftrongly enough to make a fenfible impreffion through thefe extravafations, which will render the fpots obfcure.

The learned doctor farther obferves, that what has been faid with refpect to thefe fpots, when occafioned by extravafations or the defects in the retina, will alfo hold when they are occafioned by a callofity, or any degree of paralyfis or infenfibility in fome parts of the retina by which the impulfe received from the rays is made lefs fenfible.

But, befides thefe defects in the retina, there is another caufe which may give occafion to thefe fpots, both in the *myopia* and *vifus fenilis*; and that is, certain fmall opaque marks in the cornea itfelf, or any where within the eye, which, by intercepting fome of the rays, muft occafion a defect in the picture, from which defect a kind of dark fpot will be feen in the object. Thus, in the eye of a myops, if there be any opacity in the cornea, or within the eye which intercepts the rays B*be*, C*cd*, and VL*a*, there will be a defect in the



picture at *e*, *d*, and *a*; from whence alfo the external appearance will be deficient at the correfponding points E, D, and A; where, by confequence, dark fpots will be feen. For it is to be obferved, that there is not one point in the picture which is formed by a plurality of rays which meet at the point, but every ray goes to a different point of the picture, both in myopical and prefbytical eyes; and therefore, when any of the rays are intercepted, that part of the picture to which fuch rays belong will not be illuminated, which muft occafion a correfponding defect in the appearance of the object. But in the perfect fight, where the rays which come from the feveral points of the object, are fo refracted as to meet again at fo many correfponding points in the retina, every point of the picture is formed by a cone of rays, whofe bafe is the pupil; and therefore, though fome of thofe rays be intercepted, yet no part of the picture will be darkened, and confequently no defect will be feen in the object from any fuch opacity in the cornea, or humors of the eye, unlefs this opacity be in the back part of the vitreous humor, where the pencil is narrow, and intercepts the whole pencil. This may be proved from the Camera Obfcura, by fticking fome fmall patches on the glafs. Thefe will not be perceived if the paper is placed at the due focal diftance; but if the diftance be greater or fmaller, the fpots will appear.

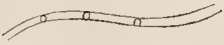
The doctor alfo obferves, that thefe fpots are not all of the fame kind. He thinks that thofe which change not their place with refpect to the axis of vifion proceed from fome defect either in the retina or cornea, or in the vitreous and cryftalline humors. As for thofe which are in conftant motion, he fuppofes them to arife from fome corpufcles floating in the aqueous humor.

Befides thefe dark fpots, there is another kind often met with, more bright and luminous than the object itfelf before which they

they appear. Theſe ſpots appear beſt by looking at diſtant bright objects, and are always of the ſame colour with the object. In the middle their colour is clear and ſtrong, ſurrounded by a dark ſhady border. They are commonly accompanied with certain irregular veins, which proceed from each ſpot, and which as well as the ſpots themſelves change their order and diſpoſition. Theſe veins are alſo of the ſame colour with the object, and being bright and luminous in the middle, are likewiſe terminated by a dark and obſcure edge. Theſe ſpots change their poſition with reſpect to the axes of viſion, according as the eye is differently moved, being ſometimes in the axis of viſion itſelf, and at other times to the right or left of this ſame axis; but when the eye is kept fixed in the ſame direction, they, as well as the dark kind of ſpots firſt mentioned, commonly deſcend gradually.

As to the cauſe of theſe brighter ſpots and veins, it ſeems that, firſt, they muſt proceed from ſome corpuſcles within the eye, which are at liberty to change their place, and which therefore muſt be ſuppoſed to float in the aqueous humor. Secondly, ſeeing theſe ſpots always deſcend when the eye is kept fixed, the corpuſcles from which they ariſe muſt aſcend; and are conſequently lighter than the aqueous humor in which they ſwim. Thirdly, theſe ſpots being more bright and luminous than the object, they cannot be occaſioned by any opaque corpuſcles, which by intercepting the rays would caſt a ſhade upon the retina. What therefore bids faireſt for producing theſe brighter ſpots and veins, is ſome ſmall, oily, diaphanous particles and filaments which ſwim in the aqueous humor before the cryſtalline; for ſuch, by their lightneſs, will aſcend, when left to themſelves; and by their greater refractive power, produce theſe luminous ſpots terminated by dark lines. That oily and ſulphureous ſubſtances, though leſs denſe than water, have a ſtronger refractive power, is evident from the obſervations of Sir Iſaac Newton. From which it follows, that the rays of light, which paſs through theſe oily particles, will meet ſooner behind the cryſtalline, than the other rays. Whence in a preſbytical eye, the rays of light which come from the ſeveral points of the object will not converge to ſo many other points in the retina, but behind it, by which the picture in the retina, will be rendered more dark and obſcure; but the rays which paſs through theſe oily grains, by having their refraction increaſed, will meet nearly at the retina, where they will form ſmall luminous ſpots, ſurrounded with dark borders.

But we muſt here obſerve, that the ſame appearances happen to myopes; and this ſeems difficult to account for from this theory of the learned doctor.

Many medical authors have looked on the *Muſcæ volitantes* as forerunners of a cataract, or gutta ſerena. And we ſuppoſe it cannot be denied, that many who have fallen into thoſe terrible diſorders have had thoſe appearances before their eyes; and hence they might have been taken for prognoſtics. But as it is no leſs certain, that many thouſands have the ſame appearances, and yet preſerve their ſight very well to the laſt, there ſeems to be no great reaſon to be alarmed about them; and far leſs ſhould people be running to quacks, and injuring their ſtomachs and conſtitutions by ill-judged phyſic on ſuch occaſions. St. Yves denies theſe appearances to be at all dangerous, and he thinks them owing to the ſeparation of ſome parts of the retina from the choroid. However, as the diſorder is troubleſome and alarming to the patient, he adviſes purgatives from time to time, and millepedes. We can ſay, from experience, that neither mercurials, nor ſea-water, nor other purgatives, nor millipedes, nor aqua Tunbridge or other chalybeate waters, have had any effect towards removing or diminiſhing theſe diſorders. A greater doſe of wine than uſual has been known tu increaſe it for a little time; and Plempius has made the like obſervation. We ſhall only add, that ſeveral of theſe flying appearances reſemble little globules joined by threads, thus 

and theſe globules appear in different numbers, and at different diſtances.

All authors agree, that theſe appearances change their figure; which is true, in ſome meaſure; but from our own obſervation we can ſay, that though they ſeem on a ſudden looking to the ſky, or other bright object, to vary in their figures; yet when they begin to deſcend, they return in one conſtant figure before we loſe ſight of them. On the whole it ſeems, this phænomenon is not yet fully accounted for. The vaſcular form of moſt of theſe appearances, their reſemblances to ſmall veins or arteries, makes it difficult to conceive them floating in the humors of the eye; and, on the other hand, their ſeeming contortions, and change of figure on ſuddenly looking up, or ſhaking the head, makes it no leſs difficult to conceive them fixed and obſtructed capillaries, as many authors ſuppoſe.

MUSCARI, in botany, the name of a genus of plants; the characters of which are theſe: The flower is liliaceous, but conſiſts only of one leaf, of a ſomewhat globular form, and divided into ſix ſegments at the edge; the piſtil ariſes from the bottom of the flower, and finally becomes a fruit of a ſort of triangular form, which is divided within into three cells, and uſually contains a number of roundiſh ſeeds.

The ſpecies of *Muſcari*, enumerated by Mr. Tournefort, are theſe: 1. The purple-flowered broad-leaved field *Muſcari*, called by authors the great purple boytroide or fair-haired hyacinth. 2. The broad-leaved field *Muſcari*, with white flowers. 3. The great blue-flowered *Muſcari*. 4. The broad-leaved elegant *Muſcari*. 5. The great white-flowered *Muſcari*. 6. The *Muſcari* with bluiſh green flowers. 7. The white-flowered byzantine *Muſcari*. 8. The branched *Muſcari*. 9. The ſmaller branched *Muſcari*. 10. The ſmaller broad-leaved blue-flowered *Muſcari*. 11. The leſſer ruſhy-leaved blue field *Muſcari*. 12. The leſſer fleſh-coloured flowered ruſh-leaved field *Muſcari*. 13. The little ruſhy-leaved field *Muſcari*, with white flowers. 14. The perfumed *Muſcari*, with a dark greyiſh flower. 15. The ſweet-ſcented *Muſcari*, with a browniſh flower. 16. The blackiſh-flowered *Muſcari*. 17. The yellow-flowered *Muſcari*. 18. The early yellow-flowered *Muſcari*. *Tourn.* Inſt. p. 347. ſeq.

We have ſeveral ſpecies of this plant cultivated in gardens: Three or four for the beauty of their flowers, and one with a purpliſh green flower for the remarkable ſweetneſs of its ſcent. In June, when the leaves of theſe plants are decayed, the roots ſhould be taken up, and ſpread upon mats in a dry place for a fortnight, till the bulbs are dried; then they may be packed up, each ſort by itſelf, till October, when they are to be planted in borders for flowering the following ſpring. They ſhould never be ſuffered to remain in the ground more than two years unremoved; for they multiply ſo faſt that the number of the off-ſets greatly weakens the flowering roots, and the flowers are conſequently ſmall. They are eaſily propagated by theſe off-ſets, which are ſo hardy as to grow even if buried a foot under ground; and the common kind propagates itſelf ſo faſt this way, that when it has once got poſſeſſion of a bed it is with great difficulty extirpated. *Miller's* Gardener's Dict.

MUSCERDA, a name by which ſome authors have called mouſe-dung, a thing recommended by many as a purge for infants; and ſaid to be good in alopecias. Given in clyſters it is ſaid to be of ſervice in many diſorders of the bowels; and externally applied, to be of great uſe in condylomata of the anus.

MUSCICAPA, in zoology, a name by which Aldrovand and ſome others have called the *ſtone-chatter*, making that bird, which is properly an œnanthe, one of the ſpecies of that genus or the fly-catchers. *Aldrovand* de Avid. See the article STONE-CHATTER.

MUSCICAPA, or the *Fly-Catcher*, is alſo the name of a ſmall bird of the ficedula kind, and very nearly allied to the beccifago, or petty-chaps. It is called alſo in ſome places, *chivin* and *borin*. It is a little larger than the wren, and has a very ſharp-pointed beak. Its head, neck, and back are of a pale grey, and its throat and belly of a yellowiſh white. Its rump is white; its wings grey; its tail, feet, and legs, are brown; and its claws very ſlender. *Ray's* Ornithology, p. 158.

MUSCLE (*Cycl.*)—Mr. Winſlow, in his treatiſe on the *Muſcles* in his *Expoſition anatomique de la Structure du Corps humain*, ſhews prodigious varieties in the actions of theſe organs of motion, which were never ſo much as hinted at before.

Dr. Waltherus, after comparing the *Muſcles* of the human body with the deſcriptions of them publiſhed by ſeveral authors, particularly by Mr. Winſlow, has made ſeveral accurate remarks on them, which may ſerve as a ſupplement to his *Anatome teneriorum Muſculorum repetita*. Nov. Act. Erud. June 1733.

The *Muſcles* in fiſhes are not placed lancellatim, or one upon another in a longitudinal direction; but they are generally laid either tranſverſely or ſomewhat obliquely one behind another, from the anterior part of the body to the origin of the tail. This ſtructure is beſt ſeen in the ſpinoſe fiſhes.

Theſe *Muſcles* of the ſpinoſe fiſhes may be conveniently divided according to their ſituation into the dorſal, pectoral, and neutral. After theſe, the inferior ones of that part of the body near the tail, are to have their place; and finally, the cephalic, or thoſe of the parts about the head.

The dorſal *Muſcles* have an interſtice in the middle of the length of the back, or are ſeparated longitudinally from one another, and are terminated in the ſides over-againſt the ſpina dorſalis. The pectoral and ventral *Muſcles* take their origin from the baſis of the ribs, and they meet in the middle of the breaſt and belly. The *Muſcles* of the lower part of the body ariſe along the ſpina dorſi, and meet one another in the bottom of the belly. The cephalic *Muſcles* ſerve to the moving the eyes and the jaws, and are principally four: one is placed on each ſide under the eyes, and one on each ſide in the lower jaw. The two former are called the hypophthalmic *Muſcles*, and the two others the maxillary *Muſcles*; they are moſt evident in the gadi, &c.

MUSCLES *of Vegetables*. The *Muſcles* in animal bodies have been the ſubject of numerous diſſertations; but thoſe in vegetables have been leſs regarded. Mr. Tournefort, however, has plainly proved, that many of the veſſels of plants become in the drying fibres capable of tenſion; that in many plants there are great numbers of theſe fibres which have all the ſame direction, and always act all together, and can only

ſhorten or contract themſelves in one particular direction; wherefore the parts compoſed of theſe fibres are very properly compared to the *Muſcles* of animals. By the word *Muſcle* we underſtand a part compoſed of fibres ſo determinately arranged, that by their contraction they can only move the part in ſome certain and determinate manner; and in this which ſeems the received ſenſe of the word, there are many inſtances in which it may be uſed to parts of plants, with the ſtricteſt juſtice.

All the pods of the leguminous plants, as peaſe, &c. are compoſed each of two valves, more or leſs convex on the outſide; theſe are placed evenly upon one another, and faſtened together by means of a great number of very fine veſſels; they are faſtned much more firmly together at the back, than at the fore-rim; and the large veſſels which carry nouriſhment both to the valves and ſeeds, are lodged there, and ſend many ramifications both to one and the other of the valves of the pod.

Each valve is formed of two ranges of fibres; the exterior arrangement is formed into a ſort of net-work, and the threads which compoſe it iſſue from the back of the pod, and are propagated longitudinally and ſomewhat obliquely through the ſurface of the valves, and finally terminate at the edge or fore-rim of the pod, after they have entered into the fleſhy part, with the net-like plexus of veſſels, of which they make frequent anaſtomoſes.

The interior plan or arrangement of fibres croſſes the exterior, in the ſame manner as the interior intercoſtal *Muſcles* in the human body croſs the exterior; and theſe form the inner membrane of the pod: Theſe fibres ariſe like the others from the back of the pod, and run obliquely to the edge. A neceſſary conſequence of this ſtructure is, that the arrangement of exterior fibres muſt become dry before the others, as muſt alſo the fleſhy ſubſtance in which they lie; and the conſequence of this is, that they muſt contract and draw the edge of the valve to which they belong at once upward and outward, and endeavour to ſeparate it from the edge of the other valve, drawing with it the interior arrangement of fibres; this therefore pulls open the pod, and the air which is very hot at the ſeaſon when the ſeeds of theſe plants ripen, inſinuating itſelf into the interſtices of the internal arrangement of fibres which are expoſed to it by the opening of the pod, ſoon acts upon them, and they begin to contract in their turn. Theſe fibres were once the veſſels which conveyed the nutritive juices to the pods and ſeeds; but when that uſe is no longer neceſſary for them, and when no more juices aſcend, after the ſeeds have arrived at their deſtined ſize, they then ſhrink up, and no more perform the office of veſſels, but become mere fibres. As theſe do not all dry up, and ſuffer this change together, but neceſſarily it happens firſt to thoſe which are ſituated at the greateſt diſtance from the pedicle, and conſequently thoſe are the firſt of the interior fibres which act by ſhortening themſelves; this therefore begins at the extremity of the pod, and is continued up to the pedicle, and the effect is that as theſe interior fibres are ſtronger and more numerous than the exterior, which are at this time as far ſhortned as they are capable of, they now draw backwards and inwards the lips of the edge of the pod toward the back. When the warm air acts upon theſe fibres to dry and contract them, it draws nearly equally at both their ends; and therefore if the two arrangements of fibres were regularly tranſverſe, each valve of the pod muſt be drawn by this action into a ſort of tube, or pipe; but as they are placed in an oblique direction, and parallel to one another, the natural effect of their contraction muſt be the drawing the valve into a ſpiral form, which we ſee is exactly the caſe. The lines which form the rim of each valve can make no reſiſtance to this contraction, becauſe they are ſo dried up by the warm air, and want of juices, that they may be crumbled to powder between the fingers, and eaſily break in any part with the ſmalleſt force. This claſs of plants gives numerous inſtances of this ſort of *Muſcles* in vegetables, and they are more obvious than moſt others, being not only common in the hedges but cultivated in gardens for the uſes of the kitchen, &c. The ingenious author of the ſyſtem gives many other inſtances in other plants. Mem. Acad. Par. 1693.

MUSCLE, in ichthyology, the Engliſh name of the *Mytulus.* See the article MYTULUS.

Horſe-MUSCLE. See the article HORSE-*Muſcle*.

MUSCULUS (*Cycl.*)—MUSCULI *capitis acceſſorii*. There is ſometimes found a ſmall *Muſcle* fixed by one end to the extremity of the firſt tranſverſe apophyſis of the neck near the inſertions of the two obliqui, from whence running up obliquely it is again inſerted behind the maſtoide apophyſis. This *Muſcle* is commonly thought to be a third ſmall tranſverſalis, on that ſide where it is found; but it ſeems rather to be an additional *Muſcle* to the obliquus ſuperior. The recti, and other obliqui are alſo found ſometimes double. *Winſlow*'s Anat. p. 238.

MUSCULUS *faſciæ latæ*, a ſmall and pretty long *Muſcle* ſituated a little obliquely upward, and downward on the forepart of the hip. It is fixed above to the outſide of the anterior ſuperior ſpine of the *os ilium*, between the inſertions of the *glutæus medius*, and *ſartorius*. From thence its fleſhy fibres run down a little obliquely backward, forming a very flat body four fingers breadth in length, and two in breadth. This body lies between two lamina of the *faſcia lata*, and is inſerted therein by ſhort tendinous fibres, which diſappear at that place where the *faſcia* adheres to the great trochanter, and tendon of the *glutæus maximus*. The *faſcia* is therefore by no means to be looked upon as a tendinous expanſion of this *Muſcle*. *Winſlow*'s Anatomy, p. 211.

MUSCULUS *Latus*. See the article LATUS *Muſculus*.

MUSCULUS, is alſo a name by which ſome call the common ſea *Muſcle*, more properly called *Mytulus*. See the article MYTULUS.

MUSCULUS *Myſticatus*, in ichthyology, a name given by Geſner and ſome other writers, to the common whale or *balæna edentula* of authors. This is diſtinguiſhed from all the other cetaceus fiſhes by Artedi, by the name of the whale with the fiſtule in the middle of the head, and with the back ſharp toward the tail. See the article BALÆNA.

MUSCULUS, among the Romans, a military machine, under cover of which the ſoldiers approached and undermined the walls of places beſieged, or filled the ditches. *Pitiſc.* Lex. Antiq. in voc.

MUSCUS *Arboreſcens Marinus*, in botany, a name given by Count Marſigli to a very elegant ſpecies of ſea-plant. It grows to the rocks at conſiderable depths under water, and is uſually of about three inches high; and is compoſed of ſeveral thick branches, furniſhed toward the tops with tranſparent leaves. The ſtalks are hollow, and it is all ſoft while in the ſea, but grows ſomewhat rigid when dried.

When examined by the microſcope, its ſurface appears to be granulated or covered with a ſort of ſmall glandules, which ſtand very near one another, and on cutting it tranſverſely the whole ſubſtance is ſeen to be hollow, and that general hollow to communicate with all theſe glandules, ſo that their office plainly is ſeverally to receive the ſea-water, and convey it into this general cavity, where it is diſtributed throughout the whole plant for its nouriſhment and ſupport. The leaves of this plant being rubbed on blue paper, give it a yellowiſh green colour.

Count Marſigli has gone through the analyſis of this plant, and as by it we may be informed of the principles and properties of many other ſea-plants of the ſame genus, it may not be improper to give an abſtract of his obſervations.

Four and twenty ounces of this plant being put into a retort, there came over five ounces of phlegm of a ſweetiſh taſte, and of the colour of oil of almonds. The ſpirit was of a duſky earth colour, of a fixed nature, of an unctuous yet ſomewhat acrid taſte, and leaving a bitterneſs behind it; of this there was twelve ounces, and the remainder in the retort was ſix ounces and three drams. So that the whole produce being twenty-three ounces and three drams, there was only five drams of the whole loſt in the operation. The water does not alter the colour of blue paper, on ſteeping in it; being mixed with the decoction of mallow flowers it turns it to an aſh-colour. The decoction of galls becomes of a bluiſh colour, and a ſolution of copperas of a greeniſh aſh-colour with it: The tincture of turnſol becomes of a bluiſh colour, tending to white. Spirit of nitre being added to it cauſes a ſlight fume, and the decoction of mallow flowers being after this added, a fine red colour is produced. Spirit of vinegar turns this green; and no change at all is produced by any of the following liquors, ſpirit of ſalt, ſpirit of ſal armoniac, lime-water, alum-water, oil of tartar: a ſolution of corroſive ſublimate collects a quantity of white and groſs particles, and precipitates them to the bottom. *Marſigli*, Hiſt. de la Mer. p. 73.

The ſpirit being examined with blue paper makes no change in its colour on being ſteeped in it; the decoction of mallow flowers mixed with it becomes of a pale yellowiſh green; the decoction of galls changes with it to a duſky red; a ſolution of copperas becomes of a dirty yellow, and thick; the tincture of turnſol changes to an aſh-colour. Spirit of nitre being mixed with it, cauſes a moderate fume without any ebullition, and the colour of the mixture is a reddiſh grey; on mixing the decoction of mallow flowers with this, it becomes of a yellowiſh red. Spirit of vinegar added, renders it more fluid and of a leſs duſky colour. Spirit of ſalt changes it to a reddiſh colour. Spirit of ſal armoniac, and oil of tartar, make no change at all; but lime-water renders it more clear and fluid. Alum-water collects a quantity of white matter, and precipitates it; and a ſolution of corroſive ſublimate, in like manner turns it white, and precipitates the groſs parts. The *caput mortuum* yielded one dram and ten grains of fixed lixivial ſalt; the taſte of this is but moderately acrid, and its colour a greyiſh white; being rubbed on blue paper it changes its colour to its own. The decoction of mallows on mixing this ſalt with it loſes its blue colour, and becomes grey; and on frequently ſhaking the veſſel, it finally becomes yellow. Spirit of nitre mixed with this ſalt does not ſo readily or violently effervesce with it, as with moſt other lixivial ſalts; and if a little turnſol be added to this, it becomes of the colour of red wine. Spirit of vinegar diſſolves it very quickly, and becomes thick and turbid with it. Spirit of ſalt diſſolves it very readily, but makes no fume, though a very conſiderable ebullition,

ebullition. Lime-water diffolves it flowly, and carries it to the furface; and alum-water, in like manner, on diffolving it is covered with a thick fcum at the top: Corrofive fublimate added to this, precipitates the falt again, without altering its colour. Spirit of fal armoniac, and oil of tartar, make no change upon it. It is remarkable, that this plant contains no volatile falt.

MUSCUS *Marinus latus*, the broad and flat fea *Mofs*, a fea-plant defcribed by Count Marfigli. It is found in feveral places at different depths, growing to the rocks and ftones. Its upper furface is compofed of a feries of leaves of an auriculated figure, amaffed together in an irregular manner; but its underfide is fmooth and even, except that it is befet with a number of foft points or eminences, which are not eafily diftinguifhed by the naked eye. Thefe, when a microfcope is ufed, are found to be fo many little white tubes of a cylindric figure; thefe are evidently the apertures by which the plant receives its nourifhment; for in this, as in the other fea-plants in general, when the root faftens upon a rock or ftone, it is not to extract nourifhment from it, but only to fix itfelf firm in its place by it; for the whole furface of the plant takes in nourifhment from the circumambient water, and every part acts as a root receiving fupplies for the whole. *Marfigli*, Hift. Mer. p. 73. See the article MOSS.

MUSEAU, in natural hiftory, a term applied by Mr. de Reaumur to a fort of bladder which the infects of the fly clafs are provided with to make their way out of their fhell, after their laft transformation into the nymph ftate.

The word is French, and literally fignifies a fnout or muzzle. The flies to whom nature has given this inftrument, have it only during that fhort ftage of their lives which is between their being enclofed in the membrane which covers them in the nymph ftate, and their firft flying about at liberty. At this time, in order to their getting out of their fhell, nature gives them a power of inflating and fwelling out their head to a great fize, and throwing out this fort of bladder from its anterior part, by which means the cap of the cafe or fhell is thrown off, and the end of it opened by the two longitudinal lines giving way. The creature, after this, as it has no ufe for this fingular piece of mechanifm, fo it has no power to exert it during the remainder of its life. *Reaumur*, Hift. Inf. vol. 4. p. 340. See the article TRANSFORMATION.

MUSEBYTER, in zoology, a name given by fome to the fifh called by authors *Dobula*, a German fifh, found in feveral parts of Germany; much approaching to our common dace. *Willughby's* Hift. Pifc. p. 261.

MUSEIA, Μεσεια, in antiquity, feftivals in honour of the mufes at feveral places of Greece, efpecially among the Thefpians, where folemn games were celebrated every fifth year. *Potter* Archæol. Græc. l. 2. c. 20. T. 1. p. 415.

The Macedonians had alfo a feftival in honour of Jupiter and the mufes, which was celebrated with ftage-plays and games, and lafted nine days, according to the number of the mufes. *Potter*, ibid.

MUSHROOM, *Fungus*, in botany, the name of a genus of plants; the characters of which are thefe. It is a headed vegetable compofed of a pedicle crowned with a broad head, which is convex and fmooth at the top, and hollow, foliated, lamellated or fiftulous on the other fide. See Tab. 1. of Botany, Clafs 17.

The fpecies of *Fungus*, enumerated by Mr. Tournefort, are thefe: 1. The common efculent *Mufhroom*, with a broad round head. 2. The *Mufhroom* with broad and round livid heads. 3. The large fweet-fcented royal *Mufhroom*. 4. The white *Mufhroom*, with a broad orbiculated head. 5. The yellow *Fungus*, with a flat ftalk, and rounded head. 6. The flatted round and hairy-headed *Fungus*. 7. The reddifh brown fmooth orbicular-headed *Fungus*. 8. The large flat orbiculated headed *Fungus*, with rough prominent veins. 9. The great *Fungus*, with a protuberant head variegated on the upper fide, and hairy underneath. 10. The plain-headed brown *Fungus*, with lacerated edges. 11. The broad-headed *Fungus*, with a long variegated pedicle. 12. The round-headed fpring *Mufhroom*. 13. The white-headed meadow *Mufhroom*. 14. The flat round-headed yellow *Mufhroom*. 15. The white and brown furrowed round-headed *Fungus*. 16. The brown bulbofe *Fungus*, with a double head. 17. The brownifh white *Fungus*, with pointed heads. 18. The fmall umbilicated *Fungus*. 19. The variegated navel *Mufhroom*. 20. The orbicular *Fungus*, with the edges bent inwards. 21. The angular *Mufhroom*, with jagged edges. 22. The thick porous *Mufhroom*. 23. The white wood *Mufhroom*, with an acrid pepper-like milky juice. 24. The broad fcarlet-headed *Mufhroom*, with a fweet and well-tafted milky juice. 25. The little milk *Mufhroom*, with very long and flender pedicles. 26. The great all-white efculent *Mufhroom*. 27. The white *Mufhroom*, called bifette. 28. The great-headed *Mufhroom*, with heads brown on the upper fide, and white underneath, and with a fpotted ftalk. 29. The yelluwifh red *Fungus*, with greenifh gills. 30. The great reddifh *Mufhroom*, with a fhort thick ftalk, and white gills. 31. The lamellated *Mufhroom*, with a broad thin and membranaceous head. 32. The yellow and white fmall vifcid meadow *Fungus*. 33. The red fmall vifcid meadow *Mufhroom*. 34. The fmall tender dufty *Mufhroom*, with heads grey on the upper fide, and covered on the under fide with thin black lamellæ. 35. The fmall *Fungus*, with a long pedicle, and a half-round yellowifh head. 36. The fmall *Mufhroom*, with a long tough and firm ftalk, and a head pointed at the top, and fhewing the fhell of the gills on the out-fide. 37. The fmall *Fungus*, with a long ftalk, and a head ftriated on both fides. 38. The very fmall *Fungus*, with a conic reddifh brown head, and a few lamellæ. 39. The very fmall whitifh grey *Fungus*, with a long flender pedicle, and but few lamellæ. 40. The dufky brown *Mufhroom*, with heads pointed at the top. 41. The conic-headed orange-coloured *Fungus*. 42. The yellow *Fungus*, growing in clufters about the roots of trees. 43. The brownifh *Fungus*, growing in clufters on rotten wood. 44. The white fhining *Fungus*, growing many together. 45. The larger fhield-fafhioned *Fungus*. 46. The fmaller fhield-fafhioned *Fungus*. 47. The red orbiculated marfh *Mufhroom*. 48. The fmall yellow funnel-fafhioned *Mufhroom*. 49. The white *Fungus*, with inverted heads. 50. The fmall turbinated clufter *Mufhroom*. 51. The velvety lamellated tree *Mufhroom*. 52. The fmall lamellated *Mufhroom*, growing to alders in the fhape of a comb. 53. The hard white tree-*Mufhroom*, with lamellæ refembling the blood-ftone. 54. The fmall white lamellated *Mufhroom*, with a long flender pedicle. 55. The white hairy tree-*Mufhroom*, lamellated underneath. 56. The orbicular hazel *Mufhroom*. 57. The orbiculated *Mufhroom*, called the toad-ftool. 58. The white infipid *Mufhroom*, with conic heads. 59. The white orbiculated birch *Mufhroom*. 60. The reddifh black orbiculated *Mufhroom*. 61. The flie *Mufhroom*, fo called becaufe it is faid to kill flies. 62. The broad white orbicular *Fungus*. 63. The broad orbicular *Fungus*, with the edges turning inwards. 64. The bulbous-ftalked *Fungus*. 65. The broad *Fungus*, with jagged edges. 66. The *Fungus*, with edges divided into five fegments. 67. The orbiculated autumnal oak *Mufhroom*. 68. The truffle-like *Mufhroom*. 69. The *Mufhroom*, refembling in colour and in fmell the root of fow-bread. 70. The thick conic-headed *Fungus*. 71. The red firr *Mufhroom*, with reflex edges. 72. The common greyifh white clufter *Mufhroom*. And, 73. The fcaly and globofe American fcarlet *Mufhroom*. *Tourn.* Inft. p. 556. feq.

Mufhrooms are plants more perfect than many people imagine; they have a regular root, a ftalk confifting of feveral arrangements of fibres, the interftices of which are filled up with a parenchymatous fubftance, leading from the root to the head or umbel; the under fide of this umbel is full of lamellæ or chives, every one of which is a regular pod or feed-veffel. If thefe lamellæ are examined in their feveral ftates, the feeds in them may be eafily difcovered, and are always found to be of a fize and degree of maturity proportioned to the ftate of the plant at that time; they have each of them alfo a filiquaceous aperture lengthwife, the feeds lying in rows ready to fall through it. The plant is eafily and regularly propagated through thefe, and not only may be raifed from feed, but, like many other plants, may be propagated by roots. The feveral filaments at the root producing tubercles, in the manner of the potatoe; from each of which there will arife new roots, and a new plant. The periods of vegetation in this plant are alfo fufficiently regular; and the common opinion of its fpringing up in a night, and perifhing in a day, has no foundation in reality. For, in the common way of raifing them on hot beds, it is eafy to find, that they often ftand a fortnight or longer from their firft appearance, before they are fit for the table. Phil. Tranf. N°. 472. p. 160.

Notwithftanding that the feeds of fome fpecies of *Mufhrooms* have been difcovered, the accurate Buxbaum is of opinion, that very many plants of this genus propagate themfelves greatly by root, and are truely perennial; and this he fupports by many folid arguments, drawn from obfervations of the feveral fpecies of *Mufhroom*, or *Fungus*, which are obvious and under the eye of every obferver, at many times of the year.

1. There are fome *Fungufes* which, while young, or when firft appearing out of the earth, ftand on a pedicle which is very lightly rooted, or does but penetrate a very little way into the earth; but after the head has expanded itfelf, and is withered, this bottom of the pedicle pierces deeper into the ground, and there acquires a greater thicknefs and becomes a fort of bulb, remaining there in that ftate till the next year, when it brings forth a new plant.

2. There are certain fpecies of *Fungufes*, which grow on the old ftumps of tree; thefe fend their roots deep into the fubftance of the rotting wood, where they alfo remain many years, and annually produce new *Fungufes* at a proper feafon. Of this fort is the clufter *Mufhroom* of old trees, defcribed by Mr. Tournefort; the roots of this, as of the former kind, do not begin to defcend or inlarge in length and thicknefs till the upper part of the plant withers; but they then begin to grow and often force themfelves into the crevices to a great length, and become ftrangely divaricated: To this is owing the erroneous account of fome authors of *Mufhrooms* or *Fungufes*, found fpreading and branching between the bark and the wood of old trees, fuch fuppofed *Fungufes* having been only

only the enlarged roots of some known species, whose upper part is decayed; but which, at a proper season, will be received from these roots. The agarics always grow upon trees, and wherever they are fixed, there is always a callous tubercle in the wood under them, which denotes the passage of the root. Thus what Breynius calls the leather-like blood-red oak *Mushroom*, is no other than the root of the common endive tree-*Mushroom*; and the cylindric tree-*Fungus* or touchwood of Dillenius, is only the root of the common cluster *Fungus* above described.

3. There is a species of *Fungus* which, while young, is round, and seems to have no fibres, or roots; but these at length decaying, become filled with a dry dust or subtle powder, and then they push down very numerous roots into the earth; and among these roots there are placed several globules, which are no other than compleatly organized *Funguses* of the same kind with the other, and ready to appear like it in a succeeding year. The common boletus, and several species of the lycoperdon, shew instances of this. Ray observes the same sort of propagation by roots in that species called *fungus phalloides*, which, he says, creeps a long way under the ground, with white fibrous roots variously interwoven one with another; and to which there are affixed, at certain distances, little globules, which are ripened into more *Funguses* of the same kind in a succeeding year. Acta *Petrop.* vol. 3. p. 265.

The violet-coloured *Fungus*, creeping on wood in manner of a herpes, described by Mr. Ray, is no other than the root of the violet-coloured mesenteric agaric, and the black compressed *Fungus* variously branching between the bark and the wood of trees, is the root of the black-fingered *Mushroom* of Mentzelius, or the plant itself impeded in some accident in its growing.

4. There are *Funguses* which creep with their pedicles, and shoot out roots from them; and now and then young plants, in the manner of the plants of the more perfect kind, which have creeping stalks; of this kind there are several species, which grow on the decayed fruits and leaves of trees, all of which plainly propagate themselves by the root.

In several species of these plants there is placed round the stalk, at a small distance from the head, a sort of ring of a tough matter, resembling the outer covering of the whole *fungus*; this usually catches many of the seeds of the plant in their fall from the head when ripe, in order to the re-producing the species; and hence some have been of opinion, that it was placed there by the author of nature, in order to break the fall of the seeds, and preserve them from the fury of the winds, in their falling from too great a height, in respect to their extreme lightness; but it rather appears, that the seeds often found on this ring, fall there only by accident, and are there detained by a viscosity with which that part of the plant abounds; and that the use of this ring is very different.

Linnæus has classed the *Funguses* in general, together with the fig-tree, the several species of the ferns, the mosses, and some others, under the character of *cryptogamia*; that is, such plants as perform the great work of their fructification in secret, or at least whose flowering and feeding are not observed so easily, as in those plants which we usually call the more perfect ones. In some of these the best microscopes have not yet been able to inform us of the true manner in which this is performed, and many of the *Funguses* or *Mushrooms* are of this number.

Almost all the *Mushrooms* which have thick and fleshy umbels, and fleshy stems, have this sort of ring round their stalk, from which, when the plant is young, and not yet in a flowering state, there arises a membrane which connects the rim of the umbel to the stem, and preserves the under part while in this state; but when this time is over, the umbel, which was before of an hemispherical figure, growing larger, and the membrane not giving way, it is torn off from the rim of the umbel, and adheres only to the stem. Soon after this the seeds ripen, and the umbel then losing its former figure, commences almost a plane. This is the state in which the plant is sold in our markets under the name of *flaps*.

When the umbel is of this figure, the seeds being perfectly ripe, must fall upon the whole space covered by the umbel, and as a part of this space the ring must receive its share of them; but there is no reason to believe that it receives more than are allotted to such a part of the determinate space on which they are to fall.

As to those species of *Mushrooms* whose stems are slender, and their umbels thin, soft, and ductile, they never have this ring at all, and yet their seeds have often farther to fall than those of the other kinds which have it, as they are usually taller plants. The rims of the tender umbels in these kinds clap themselves quite close to the stalks, in the form of a contracted umbrella, and expand as the others do when the seeds are ripe; and the species of *Funguses* of this kind are much more numerous than those of the former, and propagate themselves full as regularly.

The poison of *Mushrooms* has been much talked of by several persons; but there seems to be no certain account of any body's ever having been injured by eating the common *Mushroom*, unless by accident, as from the eating too many at once, and thereby over-loading the stomach; or by their being eaten by persons who had a particular dislike to them, as some persons have to the most innocent aliments, particularly to chese. If these *Mushrooms* had any poisonous quality, it must have been often found out by the physicians in such a place as London, where there are annually such vast quantities of them consumed, yet nothing of this kind is observed; and there seems, upon the whole, to be nothing hurtful in this species; though there may be many others which are truly poisonous. Nor is it any more wonderful, that the different subjects of this class of vegetables should differ in their virtues, than that those of other kinds should. The roots of carrots and parsnips are daily found a very wholesome food, while those of other plants of the same class, such as the water-hemlock, the dropwort, and others of the umbelliferæ are known to be poisonous.

The antients have taken great pains to distinguish the several kinds of *Mushrooms*, that the world might know the hurtful from the safe. The boletus mentioned by Juvenal, on account of the death of the emperor Claudius, is sufficiently described by Pliny. Clusius, among the moderns, has described a vast number of different species, every where distinguishing the esculent and wholesome from the poisonous or pernicious kinds. The several authors who have treated of them since the time of Clusius, have all mentioned the effects of some or other of the poisonous kinds; and there are numerous instances of the mischief done by them at one time or other. Some have been willing to ascribe this mischief to animalcules inhabiting the plant; but this seems erroneous, and particularly from the following instance: We have one kind of *Mushroom* growing in England, called the white acrid *Fungus*. This is so extremely sharp, that it stimulates the tongue, as if it had been touched with spirit of nitre: And Tournefort observes, that if rubbed on blue paper, it turns it red in the same manner as that liquor, or any other of the violent acid spirits would; this caustic quality remains in the plant even after drying; and it is very evident, that we need look no farther than this for the origin of the poisonous quality in this species. There is another kind which is observed to kill the very flies as they settle upon it. It is not probable that such plants as these should be inhabited by any kind of animalcules, nor is it necessary to have recourse to such causes of the mischief which ensues from the eating them, when their own juices seem so very able to have occasioned it. Philos. Trans. N°. 473. p. 54.

Mr. Miller says, that the true eatable *Mushroom* is distinguished from the poisonous and unpleasant kinds by these marks. When young it appears of a roundish form like a button, the stalk as well as the button being white, and the fleshy part very white when broken, the gills within being livid. As they grow larger they expand their heads by degrees into a flat form, and the gills underneath are at first of a pale flesh-colour; but as they stand long, become blackish.

In order to propagate *Mushrooms*, the meadows and pastures should be searched for them in August and September; and wherever they are found, the ground should be opened all about the roots, where there will be found abundance of small white knobs. These are to be taken up with lumps of earth about them. Then some new horse-dung must be procured; and the litter being shaken out, the dung must be laid together on a heap to ferment for eight days. A trench must then be dug, and the dung laid in it a foot thick, and covered over six or eight inches thick with light rich earth; and into this, on each side, should be put in the knobs of *Mushroom* spawn, as it is called, at six inches distance. After this another layer of dung is to be made upon this earth, to six or eight inches thickness, or more, but observing to draw in the sides, so as not to cover the knobs of *Mushrooms* above half an inch; then another layer of earth is to be laid on this, and some more knobs of the *Mushroom* spawn placed on this at the sides, as in the former; then put on a third layer of dung, drawing it in still narrower, that it may not cover the second plantation; and cover this with another layer of earth, drawing this up into a ridge at the top, and planting more of the *Mushroom* spawn in this; but still laying it in sideways as before. When all is thus finished, the whole bed is to be covered half a foot thick with dry litter, to prevent the earth from drying too fast. When the bed has been made a fortnight, it should be carefully looked over, drawing away the litter with the hands, to see whether any young *Mushrooms* appear; and they must be gathered as they grow large; for if suffered to remain, they will rot upon the bed, and destroy all the young spawn that is about them. And when they begin to produce, the bed must be searched every other day all the year round, and every day in August and September, which is the time of their principal increase, to gather such as are fit for use. The manner of gathering them is, to pull them gently out of the ground, so that no part of their stalk may be left behind; but if any part of the spawn is pulled up with the stalk, that must be carefully returned into the bed. As the cold or wet weather comes on, the covering of dry litter over the whole bed must be increased. A bed thus managed, will remain good many months, and produce vast abundance of *Mushrooms*; and the spawn may be at times taken out from it to supply other new beds.

beds. At whatever time of the year this is taken up, it ſhould be carefully laid up in a dry place till the month of July following, which is the proper time for planting it in new beds. *Miller's* Gardener's Dict.

The vaſt variety of known *Funguſes* which are found regularly every ſeaſon in their proper ſoils, are not all that the naturaliſt has to enquire into the nature of; there are others whoſe productions are much more ſurprizing. Theſe are ſuch as are only ſeen once or twice in an age, and that in places where it is very difficult to account for the manner of their production. One of theſe we had ſome years ago, which appeared upon an old piece of wood in a blackſmith's cellar in the Hay-market, and grew to twelve inches or more in height; and, when cut down, appeared again at the ſame time the next year, and ſo on for ſeveral ſucceeding years, as if, contrary to the nature of the generality of theſe plants, it had a perennial root, and grew regularly from the old ſtock. This appeared to us a ſingular production, and a wholly new ſpecies; but ſo long ago as in the year 1692, Mr. Tournefort found ſuch a one growing on an old beam in the abbey at St. Germains. His deſcription of it is very accurate; and its reſemblance with ours as great as could be expected, in ſo looſe a growing plant as an irregular *Fungus*. It was compoſed of a cluſter of five large and thick leaves, and made ſomewhat of the appearance of the tympanum of the capital of a Corinthian pillar, but in a coarſe way; it was about ſix inches high, and nine inches wide; and each leaf or part was about half an inch in thickneſs. They were all very ſolid, and capable of continuing a long time without decay. They all aroſe from the ſame baſe, and forming pedicles ſeparately, they again united, and made a broad and beautiful aſſemblage of joined leaves to the top. They expanded a little above this joining, each into the figure of a deer's horn; and at the edges were ſo cut and ſinuated, that they not unaptly reſembled the leaves of certain cut and curled cabbages, common in our gardens; they were of a pale yellowiſh colour, like that of buff-leather, and had a border of a ſtronger yellow about their outer edge; the internal ſubſtance was white, and very hard and firm, though light, and was pierced in different places with a vaſt number of holes, many of which were large, and reſembled thoſe of a ſpunge or pumice; theſe all had apertures on the ſurface of the leaves; and theſe apertures, when examined with a microſcope, were found to be ſurrounded with a wrinkled rim, covered with a very fine and ſubtil powder, the greater part of the grains of which hung to a fine filament, and might be taken for the ſeed of the plant. The back-ſide of the leaf was more ſmooth and gloſſy than the other. It had ſeveral ribs, which run out into ramifications, that might eaſily be traced by the eye to their extremities at the edges of the leaf; and this part of the leaf was in many places covered with a ſort of tartarous cruſt, which ſeemed to be a ſort of placenta or ovary; but on examination there appeared no rudiments of ſeeds in it. The beam on which this *Muſhroom* grew was very firm and ſound in all other places, but juſt where it was rooted there was a crack out of which moiſture ouzed; and probably the beam was in that part rotten, or worm-eaten within. The ſmell of the plant was like that of others of the ſame kind, and an infuſion of a piece of it turned an infuſion of turnſol to a bright red; ſo that it manifeſtly abounded in acids.

It is not eaſy to account for the appearance of theſe plants which are ſeen ſo rarely, and that in places where no plant could be expected to grow: the only probable ſolution of the point ſeems this, that as the ſeeds of the *Muſhroom* kind are all very minute, and generally in theſe ſpecies which have no lamellated heads, cover the whole ſurface of the leaves, the number of ſeeds produced by one ſuch plant muſt be numerous beyond all account, and at the ſame time light enough to float about in the air. Theſe muſt be at times thrown againſt a thouſand different bodies where there is no proper nouriſhment for them, and muſt therefore periſh; whereas if many accidents are required to concur, to make a ſoil proper for it to grow in, wherever ſuch ſoil happens to be produced, as the air has free acceſs every where, it is not impoſſible but that, at one time or other, one of theſe ſmall ſeeds may happen to be properly depoſited. Mem. Acad. Par. 1692.

The Laplanders have a way of uſing *Funguſes*, or common toadſtools, as we call them, as the Chineſe and Japoneſe do the moxa, to cure pains. They collect the large *Funguſes* which they find on the bark of beech and other large trees, and dry them for uſe. Whenever they have pains in their limbs, they bruiſe ſome of this dried matter, and pulling it to pieces with their fingers, they lay a ſmall heap of it on the part neareſt to where the pain is ſituated, and ſet it on fire. In burning away, it bliſters up the part, and the water, diſcharged by this means, generally carries off the pain. 'Tis a coarſe and rough method, but generally a very ſucceſsful one, eſpecially when the patient has prudence enough to apply it in time, and reſolution enough to bear the burning to a neceſſary degree.

MUSHROOMS *growing out of Flints.* Naturaliſts have of long time obſerved, that there are ſea *Funguſes* of a very different ſubſtance and ſtructure from any of the common kinds, growing on rocks, ſtones and corals, or other ſtrong ſea plants, which ſeem wholly incapable of ſupplying them with any vegetable nouriſhment. Theſe have been ſuppoſed to be as it were all root, and to take in their nouriſhment at every part of their ſurface from the circumambient water: But in the year 1739 Mr. Aleſeld obſerved a like ſort of *Funguſes* growing in places where they had no ambient fluid to afford them nouriſhment, except the air, and yet were fixed upon as unpromiſing a baſis for the ſupplying them with any, as thoſe of the ſea. Theſe were found on common flints on the ſurface of the earth. This gentleman obſerved, that a great many various ſpecies of flints which lay in part buried in the earth, and in part lying above its ſurface, were on this open part covered with a ſort of white duſt. This was in July, and in hot dry weather. Having the curioſity to examine this duſt with a microſcope, every particle of it was found to be a compleat and perfect *Fungus*, all of the ſame determinate figure, and much reſembling the common earth *Muſhrooms*. They were white in colour, and had each a very ſhort pedicle, in many, ſcarce to be ſeen at all; their head was round and umbilicated, and very elegantly and evenly ſtriated on the upper part, the ſtriæ or furrows all running from the center to the circumference; and the rim of each head being a little elevated. Upon the whole, they not unaptly reſembled in miniature a common tea-cup inverted, and the ſaucer inverted alſo, and placed upon it. The ſubſtance of theſe *Funguſes* was of two kinds, the one furniſhed a cortical part or covering, and the other filled up the whole internal ſpace.

The internal part was ſoft and ſpongy, and much like what the inſide of the common *Muſhroom* is: this was white. The outer or cortical part was reddiſh, and rather repreſented a congeries of ſmall grains of ſand, collected into that form by ſome glutinous matter, than any ſolid or continuous body. The thin external coat of this being removed, there were ſeen within it a multitude of ſmall round globules of gloſſy ſurfaces, reflecting the light in manner of ſome of the ripe ſmooth ſummer fruits, ſuch as the cherry, and the like. This was their appearance when freſhly uncovered; but after they had been expoſed ſome time to the air, they became flaccid, fell almoſt flat together, and were umbilicated and marked with rays from a center like thoſe of a ſtar.

Theſe *Funguſes*, if not injured by accidents, remain in their perfect ſtate a long time upon the ſtones. Five months keeping produces no alteration in them; but at length they become flaccid and wither, and in this ſtate are not to be recovered by water, as many of the common land *Funguſes* will, which ſwell, and for a time appear plump on being wetted.

They grate harſhly like ſtony matter between the teeth, and reſiſt the force of acid menſtruums; they bear the great degrees of heat or cold without any injury; but if they are expoſed to a flame, the outer covering of the head burſts and flies off, and theſe red globules come in full ſight, while the reſt of the *Fungus* remains unaltered. The ſame effect is produced by plunging them into hot water; and if they be boiled in water, over a ſtrong fire, the globules are diſlodged and loſt in it. If the flints on which they are produced, are heated red hot, the *Funguſes* are deſtroyed, and wholly diſappear in the places where they were; only the fragments of the outer covering of the head remaining ſcattered, on different parts of the ſtone, like pieces of broken pots or glaſſes: theſe fragments loſe their red colour, and are found grey. On the whole, it appears from theſe experiments, that the cortical part of this *Fungus* is not of the nature of common vegetable matter, but is truly ſtony; ſo that the plant may be properly arranged among a ſet of *lythophyta*, or ſtone plants, properly ſo called. The author of this curious diſcovery obſerves, that he uſually found many ſmall red inſects running about upon theſe ſtones, and among the cluſters of *Funguſes*. Theſe afforded at leaſt a proper retreat or nidus for them, if not food; for it is poſſible the internal part of the *Funguſes* might be eaten by them. Act. Eruditor. Ann. 1739.

Baſtard MUSHROOM. See the article FUNGOIDES.

Pepper MUSHROOM. See the article PEPPER.

MUSHROOM *Galls*, in natural hiſtory, a name given by authors to a ſmall ſpecies of galls very common on the leaves of the oak in September and October, and reſembling the common eſculent *Muſhroom*. They are placed on the upper ſurface of the leaf, and are often in great numbers on the ſame leaf, ſome containing twenty or thirty, and others only three or four. The leaves which have conſiderable numbers upon them, make a very beautiful figure, and appear as if ornamented by art with a number of elegant figures. Theſe galls are uſually about a ſixteenth, though ſometimes a tenth of an inch in the diameter; they are compoſed of an orbicular head, which adheres to the leaf by a very ſhort pedicle, ſo that its edges, which droop a little in the manner of thoſe of the common *Muſhroom*, uſually touch the ſurface of the leaf all round. Theſe little galls are of various colours, according to their different degrees of maturity; they are of a greeniſh white at firſt, after that they become of a yellowiſh tinge, from which they paſs through all the ſhades of orange and flame colour, to a very beautiful red, which is always their colour when perfectly mature. When they are obſerved by the microſcope, their ſurface appears hairy, and the ſeveral

 hairs

hairs all ſtand near one another at their baſes, and diverge at their points, as is the natural conſequence of their ſtanding on a convex body. *Reaumur*, Hiſt. Inſects. vol. 6. p. 194.

The uſe, as well as the figure of this gall is very ſingular. Malpighi and Mr. Reaumur have both deſcribed it, and the former of theſe authors deſcribes a cavity in the center of the head; but this ſeems to have been done at random, and rather ſuppoſed from analogy, than ſeen in fact; for the latter author, who is perhaps one of the moſt accurate obſervers that ever wrote, could never find any cavity in any one of the great numbers he diſſected; but he obſerved what was an uſe of the ſame kind with that of the other galls, in this, though performed in a different manner; they are plainly all deſtined for the lodgment and ſecurity of ſmall animals; and as, in the generality of them, theſe little creatures are contained in their ſubſtance, ſo in this they are ſheltered from injuries by it, though in another manner. For although there are not inſects lodged in the ſubſtance of it, there are always a great number found in the ſpace, encloſed within its circumference, as its edges every where touch the ſurface of the leaf, and the whole forms an arched dome with an upright pillar or pedicle in the middle. Theſe worms perfectly reſemble in figure thoſe of the lime galls, but they are of a yellow colour. There are uſually found a dozen or more of them under one gall, though ſometimes there are only two or three, or but a ſingle one. Theſe are ſo ſmall as not to be diſtinctly ſeen without the help of glaſſes; but they are of the nature of thoſe worms which turn into two-winged flies. Their manner of living is the ſame as that of thoſe contained in the ſubſtance of galls, for they continually ſuck and gnaw the inſide or under ſurface of the gall, and thence it increaſes in growth till they have done eating. *Reaumur*, Hiſt. Inſ. vol. 6. p. 19.

The flies into which theſe worms are finally transformed, have not yet been diſcovered; but this is no wonder, ſince the animals themſelves are ſo minute as to require glaſſes to view them. It is probable that they undergo their change into the chryſalis ſtate in ſome other place, for they are never found in it under the galls; but this is common alſo to many other ſpecies.

Mushroom *Worms*. The various ſpecies of *Muſhrooms* are ſubject to be eaten and deſtroyed by a great variety of inſects. There is however one ſpecies which is more frequent than all the reſt, and which has therefore obtained, among authors, the name of the *Muſhroom worm*. This is a white worm, with a hard ſcaly black head; it has ſome fleſhy tubercles, which it throws out at pleaſure from the under part of its ſeveral rings, and which ſerve it as legs. This is found indifferently in almoſt all the ſpecies of *Muſhrooms*; but in none ſo frequently as in the great wood-*Fungus*, which is porous and greeniſh underneath. Theſe worms have been watched in vain by ſeveral curious obſervers, to know what would be their laſt ſtate; but the difficulty was, that when the *Muſhrooms*, with the worms in them, were put into boxes for their transformation, they ſoon corrupted and ran into water, in which the worms were drowned. The putting earth in the box under the *Muſhrooms*, ſucceeded no better than this, the *Muſhroom* moiſtening all the earth about it too much by its decay, to ſuffer the worms to live in it: At length Mr. Reaumur found the proper method, which is, to put only ſmall fragments of the *Muſhroom* on large beds of earth in large boxes; and in this caſe the worm uſually lives to change into its nymph ſtate, and by this means at length acquires its perfect ſtate, and is found to be a tipula or long-legs of no great beauty, being of a duſky brown colour, and middling ſize.

The other ſpecies of *Fungus*'s have alſo their worms; but there is one of a very ſingular nature, which is found frequently on the agaric which grows on the ſtumps of oak-trees, eſpecially near the roots. This is a long and ſlender worm, ſomewhat flatted, and reſembling a ſmall leech, but that it has a hard and ſcaly head of a blackiſh colour. The body is compoſed of many rings, in the manner of the earth worm, and looks very bright and gloſſy, being always covered with a viſcous liquor. This creature is eaſily found, for it never eats into the ſubſtance of the *Fungus* but only crawls about upon its ſurface; the traces, wherever it has been, are marked with a coat of a ſhining varniſh, and reſemble the places over which ſnails have crept. There is ſomething very ſingular however in this creature's uſe of the viſcous humour it is covered with, which is not obſervable in the ſnail kinds. It is an extremely tender creature; and nature ſeems to have given it this liquid covering as a defence againſt the injuries of the external air, which would otherwiſe ſoon dry it up and kill it. This it defends itſelf from in the following manner: It fixes upon a place where it deſigns to remain ſome time, and then begins to make itſelf an habitation, by extending this viſcous matter, by means of its mouth, over a ſpace of the ſurface of the *Fungus*, which is more than equal to the bigneſs of its body; it doubles the coat of matter ſeveral times, ſo as to form a ſoft bed, on which it lays itſelf down, and then, by drawing its head ſeveral times from the ſides upwards, it extends two other plates of this glutinous matter, which dries into a thin ſkin immediately on being expoſed to the air. Theſe meeting in an angle over the body, form a ſort of covering like the ridge of a houſe, under which the creature lies, and is by this means defended from the air, as much as neceſſary, and yet is at liberty to feed at pleaſure. This ſort of covering is perfectly tranſparent, and is yet ſtrong enough for all the purpoſes it is intended for. This worm has no legs, but its manner of marching forward is by applying its head to ſome diſtant part of the ſurface of the agaric; there it drops a large drop of this viſcous matter, which ſoon hardens, and retains the head ſo firmly, that it is able to draw all the body to it. This is a ſort of motion that anſwers all its purpoſes very well, as it has but a very ſmall ſurface to crawl upon, and needs make but very ſhort journeys even upon that. This creature ſeems never to corrode the ſubſtance, or even the outer ſkin of the *Fungus*, but to live entirely upon the clear and glutinous fluid that covers the ſurface of this kind of agaric.

This worm makes a very beautiful object for the microſcope. When young it is as tranſparent as glaſs, and the motion of its internal parts is very eaſily diſtinguiſhed. It has two brown ſpots near the head, which look very like eyes, and the aperture, out of which the glutinous matter with which it makes its habitation iſſues, is very large, and ſeems the mouth. When this little creature is taken out of its habitation, it very ſoon dies, the air drying up all its liquid covering. The ſpots which reſemble eyes are really the anterior ſtigmata, and there are two others behind. When this creature is to paſs into the chryſalis ſtate, it does not remove from the *Fungus*, but ſpins itſelf a web, and remains upon it. This web is compoſed of the ſame matter with the covering or habitation under which it uſually reſides, but it is thicker, more opake, and of a coarſer ſtructure. The creature begins it by drawing ſeveral longitudinal lines, and other tranſverſe ones, as thick and ſtrong as it can make them; theſe compoſe the beams and raftors, or the open ſhell of the edifice; over and under theſe its ſpreads ſeveral continued plates of this glutinous matter, and theſe all drying in a very little time upon one another, form a fine and ſtrong ſhell, which it makes rough and uneven by farther additions; and finally cloſing the orifice, it works within, and ſtrengthens it yet much more, ſo that it is liable to no injuries from the weather, or from the common deſtroyers of theſe things, which are a ſmall ſort of carnivorous worms, which never attempt to force this covering. The creature remains about a fortnight under this covering, and then comes forth in the form of a fly, which is evidently a ſpecies of tipula. It has very long legs, and a long and ſlender body; the body is brown, and the breaſt yellowiſh; the wings are long and ſlender, and the antennæ are of a very ſingular and remarkable figure; they are broad and flat, and yet terminate in a point. Theſe are compoſed of ſeveral articulations, and make a very beautiful figure when examined by the microſcope. Beſide theſe, this fly has, in the manner of the other tipulæ, a pair of beards placed on the anterior part of the head, which it at pleaſure bends down over the face, and compleatly covers with them the longitudinal fiſſure, which is the mouth, ſituated in this as in the other tipulæ. *Reaumur*, Hiſt. Inſ. vol. 9. p. 23. ſeq.

MUSIC (*Cycl.*)—*Muſic*, among the antients, was taken in a much more extenſive ſenſe than among the moderns. Meibomius [a] from Porphyry enumerates its parts by the names *harmonica*, *rythmica*, *metrica*, *organica*, *poëtica* and *hypocritica*. Alypius [b] alſo and Voſſius [c] make the *harmonica*, *rythmica* and *metrica* to be ſo many parts of *Muſic*. Ariſtoxenus [d] adds the *organica*. Voſſius alſo to the three ſpecies of practical *Muſic*, *harmonica*, *organica* and *hydraulica*, adds a fourth, *orcheſtria*, or dancing. Ariſtides Quinctilianus defines *Muſic*, the knowledge of what is graceful and becoming in ſounds and motions [d]. What we call the ſcience of *Muſic*, was by the antients rather called *harmonica*.—[[a] In. Not. ad *Euclid*. Introd. Muſic. p. 41. [b] Page 1. Edit. *Meibom.* [c] De Scient. Mathem. c. 22. [d] Γνῶσιν τοῦ πρέποντος ἐν φωναῖς καὶ κινήσεσι. V. *Wallis*'s Appendix ad Ptolem. Harm. p. 153.] See the article Harmonica.

Chromatic Music, *Muſica Chromatica*, among the Italians, is uſed to expreſs that kind of *Muſic* in which there are many chromatic ſigns, as flats or ſharps, and intervals, &c. See the article Chromatic.

Diatonic Music. See the article Diatonic.

Didactic Music, *Muſica Didactica*, that part of ſpeculative *Muſic* which only conſiders the quantity, proportions, and different qualities of ſounds.

Dramatic Music, *Muſica Dramatica*, *Scenica*, or *Theatrale*, among the Italians, is uſed to denote ſuch compoſitions of *Muſic* as are particularly made and fitted for theatres. See the article Recitativo.

Enharmonic Music. See the article Enharmonic.

Musica *Ennunciativa*, or *Ennarrativa*, is uſed in much the ſame ſenſe as *Muſica ſignatoria*. See the article Musica *ſignatoria*, infra.

Figurate Music, *Muſica Figuralis*, *Figurata*, or *Colorata*. *Figurate Muſic*, that wherein the notes are of different values, and the motions various, now ſlow, then quick, &c.

Harmonic Music, *Muſica Harmonica*, among the Italians, is uſed for pieces conſiſting of many parts, which, though very different, yet, when played together, make an agreeable whole. This we call *Muſic* in parts.

Hyporchematic, or *Choraic* Music is used by some authors for a sort of *Music* fit for ballads and dancing.

Instrumental Music is used to denote musical compositions made to be executed by instruments.

Melismatic, or *Melodic* Music, is used to denote a song, or single part, merely for a voice or for an instrument. *Brossard*. See the article Melody, *Cycl.*

Melopoetic Music is the science or art of ranging and disposing sounds in succession in an agreeable manner; or the art of making melody. See the articles Melody and Melopoeia, *Cycl.*

Measured Music, *Musica Misurata*, among the Italian authors, a kind of *Music* the notes of which are unequal. It is contrary to *Musica Piena*, or *Chorale*.

Metabolic Music, *Musica Metabolica*, among the Italians, is properly *Music* transposed, as when the piece goes out of its natural mode into a transposed one, the better to express the words, or to distinguish some change in the action, passion, motion, &c.

Metric Music, *Musica Metrica*, is used by Italian authors, to denote the harmonious cadence of the voice, heard when any one declaims, or repeats verses; or it is an air composed to verses.

Modern Music. See the article Modern.

Modulatory Music, *Musica Modulatoria*, among the Italians, that part of *Music* which teaches to compose or modulate, *i. e.* that fixes rules for the use of modes, and teaches either to sing or play well. See the articles Mode, and Modulation, *Cycl.*

Odic Music, *Musica Odica*, among the Italians, is the same with *hyporchematic*, or *choraic*. Vid. supra.

Organic Music, *Musica Organica*, among the Italians, is used to denote musical compositions designed to be performed by instruments only.

Pathetic Music, *Musica Pathetica*, is a moving and affecting kind of *Music*, that causes emotions in the mind, either of love, grief, or pity.

Poetic Music, *Musica Poetica*, is sometimes used for the art of inventing songs, of modulating concords and discords together agreeably, and making what we call compositions, &c.

Recitative Music, *Musica Recitativa*, *scenica* or *dramatica*, a sort of *Music* used in operas, &c. irregular as to time, being a declamation in singing, to express the passions: From its being thus irregular in its time, the Italians often place the phrase *a tempo giusto*, when the recitative ends, and an air, be it minuet, jigg, or any other, follows, to shew that the time is then strictly to be observed.

Rhythmic Music, *Musica Rythmica*, is used for the harmony or cadence of the words in prose; or a song composed to words in prose. *Brossard*.

Scenic Music, the same with *Recitative*. See above.

Signatory Music, *Musica Signatoria*, is used for that part of *Music* which teaches the knowledge of the characters, notes, figures, pauses, and all other signs and marks whatever, used in *Music*.

Vocal Music, *Musica Vocale*, or that composed for the voice, in opposition to organical or instrumental, which is intended to be played on instruments only.

Music *Shell*, in natural history, the name of a species of shell-fish of the murex kind, remarkable for its variegations, which consist of several series of spots placed in rows of lines, like the notes of *Music*.

MUSICAL (*Cycl.*)—Musical *Numbers* are 2, 3, and 5, together with their composites. They are so called because all the intervals of music may be expressed by such numbers. See the article Interval.

This is now generally admitted by *musical* theorists[a]. Mr. Euler seems to suppose, that 7 or other primes might be introduced; but he speaks of this as a matter doubtful and difficult[b]. It is to be observed, that 2 corresponds to the octave, 3 to the fifth, or rather to the twelfth, and 5 to the third major, or rather the seventeenth[c]. From these three may all other intervals be found[d].—[[a] *Euler* Tentam. Nov. Theor. Mus. p. 62, 163. Dr. *Pepusch* in Phil. Trans. N°. 481. p. 267, seq. [b] *Euler*, ibid. p. 163. [c] Phil. Trans. ibid. [d] *Euler* & *Pepusch*. loc. cit.]

MUSIMON, in natural history, the name of an animal esteemed a species of sheep, described by the antients as common in Corsica and Sardinia, and found in no other part of the world. It is much to be suspected, whether the animal described under this name is now any where to be found in the world; not that it is to be supposed that any species of animal once created is become extinct, but that this probably was a spurious breed between two animals of different species, perhaps the sheep and goat, which like the mule not being able to propagate its species, may have failed ever since. Theodore Beza, indeed, gives an account of an animal, which he received from an ignorant countryman of Sardinia; which, he said, was peculiar to that place, and was called *muslo*; that its hide and hair was like that of a deer, its horns wholly like those of a ram, curling back to its ears, and its size that of a middling stag; and that it fed on vegetables, and lived among the rocks. The tragelaphus of Bellonius differs little from the *Musimon*, according to the descriptions of both. *Ray's* Syn. Quad. p. 75.

MUSK (*Cycl.*)—*Musk*, and other perfumes of the same tribe, have been long celebrated as antispasmodics, but were formerly ordered in such small quantities as to have little effect. Practitioners thought four or five grains a large dose. But the Chinese have taught us to be more bold; the tenth part of an ounce is an usual dose among them. The remedy in the east for the bite of the mad dog contains 16 grains of *Musk*, and this they repeat frequently. See the article Madness.

The effects of *Musk* are, ease from pain, quiet sleep, and a copious diaphoresis. Hence it has been found of great use in spasmodic disorders, petechial, malignant, putrid fevers, the goal distemper, hiccoughs, *subsultus tendinum*, &c. For the particular cases we refer to the Philosophical Transactions, N°. 474. §. 18.

It has also been found useful in spasmodic disorders, given by way of clyster, as Dr. Wall observes, in that Transaction.

The operation of *Musk*, in some respects, resembles that of opium; but is in this much preferable, that it does not leave behind it any stupor or languidness, which the latter often does. *Musk* therefore seems likely to answer in those low cases where sleep is much wanted, and opiates are improper.

It is said to be best given in a bolus, and that those who are most averse to perfumes, may take it in that form without inconvenience. For, as Etmuller and others, have long ago observed, the smell of the perfume is often found to be of disservice, where the substance inwardly taken produces good effects, Phil. Trans. ibid.

It is pity that a medicine of this consequence should be so liable to adulterations, and that the criteria of its genuineness are ill settled.

In a paper read before the Royal Society March 17, 174⅞, several cures performed by *Musk* on distempered cows, were mentioned.

When *Musk* begins to decay, it is a practice used in the East-Indies to put it into a bladder or bags, wherein many small holes are made with a needle, and hang it in a necessary house, but not low enough to touch the filth. Others keep it wrapped up in linnen, well moistned with rank urine. *Boyle's* Works abr. Vol. 1. p. 146.

Mr. Boyle says of his own knowledge that *Musk* has greatly contributed to the preservation of flesh. Works abr. Vol. 1. p. 30.

Musk-*Ant*, the name given by Lister and Ray, to a peculiar species of *ant*, which is of the number of the perfumed insects. It is found on dry banks, and is so much smaller than the common ant, that it needs no other distinction. Those of this species which are without wings are of a yellowish colour, and when bruised or crushed emit a sharp and acid smell, as the common ant does; but those which have wings are coal-black, and these, instead of the four smell of the others, emit a perfume not to be endured for its strength. The smell of all the perfumed insects goes off in keeping; and these little creatures, after they have been dead and dry some time, are found to smell less strongly, but much more agreeably. Phil. Trans. N°. 76.

Musk-*Insect*, a term used by some to express the capricorn, or *Musk* beetle; but it is too loose a phrase for that animal, since there are other insects which smell as strongly of that perfume. There is a small kind of bee very frequent in the pastures of Lincolnshire, and several other parts of England, in April. This frequents the ranunculus and dandelion flowers, and has a very strong and fine scent of *Musk*. There is also a hexapode worm, which feeds on the *gallium luteum*, or yellow ladies bedstraw, which has the same perfumed scent in a no less degree. Both these insects, and even the capricorn beetle, lose their perfume when they have been some time dead. Phil. Trans. N°. 76. See the article Capricorn *Beetle*.

Musk-*Rat*, an animal very common in several parts of America, and greatly resembling the beaver in all respects, except size. A full grown *Musk*-rat might very naturally be mistaken for a beaver of about a month old. And Mr. Sarazin, of the Academy at Paris, observes, that the Indians call these the same animals, only distinguishing the beaver by the name of the elder, and the *Musk*-rat of the younger brother. They live in summer on all sorts of plants, and in winter on the great roots of the water-lilly. They live in communities, at least they always do so in winter, and erect themselves certain habitations of different sizes, some suited for the reception of only one family, others for a great number of such. Their great care is employed in the chusing a proper place for these habitations; for it is necessary that they should be not only defended from the injuries of weather, but freely open to the water, and that without fear of inundations; and they must also be in the neighbourhood of large plantations of the roots on which they are to feed. To have all these necessary conveniencies they always build in the steep banks of some river, which has a level bottom, and a wide bed without too much depth; and as such rivers always abound with the roots they

want; they have thus always a dry home, plenty of provisions, and no danger of inundations; for they are prepared for little risings of the water, by having upper stories or rooms, into which they retire when the ground-floor is uninhabitable; and rivers of this great breadth and small current, are not subject to any very high floods. Mem. Acad. Par. 1732.

The size of the room is always well proportioned to the number of the intended family; if it be only for seven or eight, then a room of two foot square does, and it is made proportionably larger as the number is to be greater. When they have laid out the plan of their habitation, they plant a parcel of rushes all around it, which they surround in a very artful manner with clay, pressing it down with their feet, and working it even with their tail, which is like that of the beaver, and serves them for a trowel. They have a passage out of their house, which they go out at daily as long as the weather continues tolerably mild; but when it becomes very severe, they block up this passage, and the whole habitation afterwards often becomes covered many foot deep with snow; in this case they keep within doors, and have wells which supply them with water; other holes which serve to receive their excrements; and they burrow under ground to the river, and seek for the large roots they are to feed upon.

In this season, if they are at some difficulties to get food, they have the advantage however of being out of danger of the huntsmen, who know not where to seek them in the snow; but when the thaws come on, which is usually in March or April, they discover and take great numbers of them; if this season be slipped, however, they generally escape, for soon after this the melting of the snows cause inundations, which happen at no other times, and which drive them out of their habitations into the higher countries; in this time they single one another out for the propagation of the species, and even this is a scene of some danger to one sex, for the huntsmen find the way to imitate the courtship of the female, and will by that noise draw severally many males about them, which they shoot as they come in reach. After the time of copulation is over, and the waters are abated, the females return to their old lodgings, and there bring forth and nurse up their young; the males run about the country till winter, and then retire also to the waters for their winter life; but they usually make themselves new lodgings every season. Mem. Acad. Par. 1732.

MUSK-*Seed*, in the materia medica, the name of the seed of the *alcea Ægyptiaca villosa*, or hoary Egyptian vervain mallow. It is a small seed of about the bigness of a pin's-head, of a greyish brown in colour, and of the shape of a kidney, and when it is fresh has a perfumed smell. It is brought into Europe from Ægypt, and from Martinico. The Ægyptians use it internally as a cordial and provocative; but in Europe it is of very little use, we wholly neglect it in medicine; but the perfumers in France and Italy use it among their compositions. *Lemery's* Dict. des Drog.

MUSKET (*Cycl.*)—MUSKET-*Baskets*, in fortification, baskets of about a foot and a half high, and eight or ten inches diameter at the bottom, and a full foot at the top. They are filled with earth, and set on low parapets or breast-works, or on such as are beaten down, that the musketeers may fire between them at the enemy, and yet be tolerably well secured against their fire.

MUSQUETEERS, *Mousquetaires*, in France, are troopers who fight sometimes on foot, sometimes on horseback; they are gentlemen of good families, and are divided into two troops, the one called the grey *Musqueteers*, because of the colour of their horses; the other the black *Musqueteers*, for the same reason.

MUSSAHIR, in ornithology, a bird mentioned by Arabian writers. It is said, that this creature after having employed the day in seeking its food, spends the whole night in singing; its notes are said to be so melodious, as to banish all thoughts of sleep from them that hear them. *Hofm.* Lex. Univ. in voc.

MUST (*Cycl.*)—MUST *of Rhenish wine*. This is a liquor that, though drank by some, is found extremely to affect the brain; for not having passed the natural effervescence which it would have been subject to, in the making of wine, its salts are locked up till the heat of the stomach setting them to work, they raise their effervescence there, and send up abundance of subtile vapours to the brain. The *Rhenish Must* is of two kinds, being made either with or without boiling. That made without boiling is only put up so close in the vessel, that it cannot work; this is called stumm-wine. That by boiling is thus prepared: they take strong vessels not quite filled, and putting them into a cellar they make a fire mild at first, but increased by degrees; and afterwards they gradually lessen it again, that the boiling may cease of itself. This operation is finished in thirty-six or forty hours, according to the size of the vessel; and the wine-boilers, instead of common candles which would melt by the heat, use thin pieces of split beach-wood. These also serve for a double purpose, not only lighting them, but giving them notice of the boiling being enough; before that time, the quantity of vapours thrown up make them burn dim; but as soon as it is finished, the vapours ascend in less quantity, and the lights burn brisk and clear. About seven or eight days after this boiling, the *Must* begins to work, and after this working it is called wine. They have also another kind of *Rhenish Must*, which is thus prepared: they boil the liquor to half the quantity, and put into it the medicinal ingredients they are most fond of; such as orange-peel, elecampane-root, and juniper-berries, or the like; being thus medicated, the whole works much more slowly, than it otherwise would. If the boiled *Must* by too violent an effervescence cast out its lees, it will on this become vapid and dead, unless this separation is stopped by some fatty substance, such as fresh butter, or the like: They put this in upon a vine-leaf, or else apply lard to the mouth of the vessel. *Portzius*, de Vin. Rhen.

MUSTACEUM, among the antient Romans, a kind of cheese-cake. It was composed of cheese, anniseed, cumin, and suet added to flour, moistened with *mustum*, or new wine. *Pitisc.* in voc. See the article MUST, *Cycl.* and *Suppl.*

MUSTARD, *Sinapi*, in botany. See the article SINAPI.

The common *Mustard* is cultivated in many places, both in gardens and fields, for its seeds. It is propagated by sowing the seeds in spring upon an open place, which has been well dug or ploughed. When the young plants are come up they must be cleared of weeds, and houghed up to about eight or ten inches asunder. They will then grow strong, and when the seeds ripen the whole plant is cut down, and the seeds thrashed out.

But besides this, there is another kind of *Mustard*, commonly known by the name of the white or garden *Mustard*, which is sown for a sallad-herb in spring: the seeds of this are to be sown very thick in drills on a warm border, or a moderate hot bed; they will be fit to cut for sallading in three weeks after the sowing. *Miller's* Gardener's Dict.

Hedge-MUSTARD, *Erysimum*, in botany. See the article ERYSIMUM.

MUSTARD *Vomits*. The powder of *Mustard*-seed may be made into the consistence of a loch with warm water, in which a little sea-salt has been dissolved. Of this a common spoonful, sometimes two, diluted with tepid water, are given on an empty stomach; it operates well as an emetic, and proves an excellent remedy in most nervous disorders, according to Mr. Monro, in Med. Ess. Edinb. Vol. 2. Art. 19. p. 303. not.

MUSTELA, the *Weasel*, in the Linnæan system of zoology, is a distinct genus of quadrupeds, including the ferret, pole-cat, martin, ermin, *&c.* The characters of the genus are, that the creatures of it have a considerable number of paps situated on the belly, feet adapted to climbing, and four *dentes molares* or grinders, on each side of the mouth. See Tab. of Quadrupeds, N°. 24. and *Linnæi* Syst. Nat. p. 36.

The *Weasel*, in some parts of England, is called the *foumart*, or *fitchet*. It is a little creature, smaller than the *pole-cat*; its back and sides are reddish, and its throat and belly white, the whiteness reaching perfectly from the angle of the chin to the insertion of the tail: Its head is something like a dog's, the upper jaw reaches beyond the lower, and is ornamented with some bristles by way of whiskers. Its fore-teeth are six in number in each jaw, and are small and set very close together, like the teeth of a comb; those of the under jaw are much smaller than the others; the dog-teeth are long, large, and strong; the eyes are small and black, the ears short and broad, and covered with very thick-set hairs; and, which is a very remarkable circumstance, they are doubled in their lower part. The inner cavity of the ear is very large, and full of tubercles. The feet are small, but broad, and each divided into five toes; the legs are short. The heart and liver are, in dissecting this creature, found remarkably large. *Ray's* Syn. Quad. p. 195.

MUSTELA *Africana*, in zoology, a name by which Clusius has called an animal, properly of the squirrel kind, and known among others by the name of the Barbary squirrel. *Ray's* Syn. Quad. p. 218. See the article SCIURUS.

MUSTELA, in ichthyology, the name of a genus of fishes, of which there are several species; the most common of which is that called the *Sea-loche*, or whistle-fish. This resembles the common eel in figure, colour, and slipperyness to the touch; but it is not half so long, in proportion to its thickness; and is something flatter, and has a turgid belly. It is covered with extremely minute scales, and its mouth is large, and furnished with sharp teeth, and has several series of very small teeth in many parts of its mouth. At the angle of the lower jaw it has one beard, and at the upper part of the nostrils in the upper jaw it has two. It has two pair of fins under its belly, and on the back, beside the common fin reaching half the length and almost to the tail, it has at some small distance from the head a cavity in which is a membrane edged with filaments.

The different species of this fish are of three colours; one is not spotted, and of the colour of a tench; another is spotted with white; and the third with reddish black spots; and beside these there are the *Mustela vivipara* of Schonfeldt, commonly known by the name of *Aelquappe*, and the *Mustela fossilis*, called *Peisker*, and the *Eel-pout*. *Willughby's* Hist. Pisc. p. 121. All which see under their several heads.

MUSTELA *Fluviatilis*, in ichthyology, a name by which several authors have called the common *lampetra* or *lamprey*. *Bellon.* de Pisc. 1. p. 91. *Gesner*, de Pisc. p. 696.

MUSTELA *Lumpen*, in ichthyology, a name given by Artedi, from Ray and others, to that species of blennus called simply *lumpen* at Antwerp; and by Gesner *galea*.

It is distinguished by Artedi from the other blenni, by a specific name expressing that it has four bifid cirri or beards growing under the throat, and transverse areolæ or streaks on the back. See the article BLENNUS.

MUSTELA *Marina*, in ichthyology, a name given by Bellonius and others to that fish which we call in English the *sheat-fish*, the *glanus* and *glanis* of Pliny and the old authors.

It is distinguished by Artedi by the name of the *silurus*, with four beards near the mouth. By this character it is evidently distinguished from the fish called the *lake*, which, though a genuine species of silurus, has only one beard.

MUSTELINUM *Genus*, in zoology, the name of a class of animals, so called from their general likeness to the weasel in shape; they are all carnivorous animals, and are distinguished from the other quadrupeds of that sort by their smallness, the length of their bodies, and the smallness and narrowness of their heads. Their feet are small, and their legs short, whence they are calculated for running into holes and crannies; their teeth are less numerous than in many quadrupeds; in the dog kind there are forty, and in these but thirty-two. Their intestines are short and simple; they have no colon nor cæcum, nor any distinction of great and small guts. *Ray*'s Syn. Quad. p. 195.

MUSTELUS, in ichthyology, a name given by Gaza and some other writers, to the fish called *galeus asterias*, and *stellatus* by modern authors. This only accidentally differs from the common *galeus lævis*, the smooth or unprickly hound. Both are accounted the same species by Artedi, and are expressed by the same name, the *squalus* with obtuse or granulous teeth. See the article SQUALUS.

MUSTELUS *Lævis*, a name by which Aldrovandus and some others have called the fish, distinguished by others by the name of *galeus lævis*, the smooth hound-fish. *Aldrov.* de Pisc. p. 393. See the article GALEUS.

MUSTELUS *Lævis*, in zoology, the name of a kind of shark, called also the *canis galeus*, and *canosa*. *Willughby*'s Hist. Pisc. p. 51. See the article CANIS *Galeus*.

MUSTUS *Fluviatilis*, in ichthyology, a name given by Bellonius to that species of cyprinus which we know by the name of the barbel. See the article CYPRINUS.

MUSTUS is also a word used by some authors to express the white calx of urine.

MUTABILIS *Lapis*, in natural history, a name given by some to the semi-pellucid gem, more commonly called *oculus mundi*. See the article OCULUS *Mundi*.

MUTATIONES, among the Romans, post stages, or places where the public couriers were supplied with fresh horses.

The *Mutationes* were wholly designed for the use of these couriers, or messengers of state; in which respect they differed from *mansiones*. See the article MANSIONES.

MUTCHKIN, a liquid measure used in Scotland; it contains four gills, and is the fourth part of the Scotch pint. See the articles PINT, MEASURE, &c.

MUTEFERRIRA, a body of horse kept up in Egypt, in the service of the Grand Seignior; these, with the chaouses, were originally the guards of the sultans of Egypt. This is a body of the greatest dignity, as is expressed by the word, which signifies a chosen people. *Pocock*'s Egypt, p. 166.

MUTILUS, in natural history, the name given by some to the common muscle. See the article MYTULUS.

MUTU, in zoology, a name by which some call a large Brasilian bird, of the gallinaceous kind, more usually called *mitu*. *Marggrave*'s Hist. Bras. See the article MITU.

MUZZLE (*Cycl.*)—MUZZLE *of a Gun or Mortar*, the extremity of the cylinder, where the powder and ball is put in. The metal which surrounds the extremity of the cylinder, is likewise called the *Muzzle*.

MYAGRUM, in botany, the name of a genus of plants, the characters of which are these: The flower consists of four leaves, and is of the cruciform kind; and the pistil which arises from the cup, becomes finally a fruit of a turbinated form, unicapsular, and containing one oblong seed, and having two empty cells at the apex.

The species of *Myagrum*, enumerated by Mr. Tournefort, are these: 1. The broad-leaved single-seeded *Myagrum*. And 2. The lesser single-seeded *Myagrum*. *Tourn.* Inst. p. 211.

MYAGRUS *Deus*, in the antient mythology, a name given to Jupiter on certain occasions, as when they sacrificed to him at the olympic games, to drive away the vast quantities of flies which usually infested those rites. The word, though it stands thus in Pliny, and many of the old authors, is yet falsely printed, for this *Myagrus* signifies the mouse-destroyer, not the fly-destroyer, which is properly signified by *Myiagrus*. V. *Apomyos*, supr. and *Myiagrus*, inf.

MYCETITES, in natural history, the name of a species of sea-coral, which is usually of a conic shape and striated texture; always small, and usually found adhering to sea-shells, or large corals. See the article FUNGITÆ.

MYCETITES *Discoides*, in natural history, a name given by Dr. Woodward to those kinds of fossile coralloide bodies which the generality of writers had called, after Dr. Plot, *porpitæ*. These are usually small, and of a roundish, but flatted figure. They are hollowed on one side with a sort of umbilicus, and striated on the other. They are found on the ploughed lands in Oxfordshire, and some other of our midland counties, and in other places buried in the solid strata of stone. They are sometimes yellowish, sometimes brownish, and are from the breadth of an inch to a fourth part or less of that size. When broken, they are usually found to consist of a kind of spar, not unlike that of which the shelly coats of the echinitæ, or the lapides indici, and other spines of echini consist in their fossile state. And in some of them the ridges and striæ are thick set with little knobs and tubercles. The basis in some of these is flat, as it is in others rising in form of a circular elevation from the umbilicus, and others have a circular cavity in the same place. See Tab. of Fossils, Class. 7. *Woodward*, Cat. Foss. vol. 1. p. 114.

MYCONOIDE, an epithet used by some chirurgical writers for some ulcers which are found continually filled with a thick mucous matter.

MYDESIS, a word used by the antient physicians to express a general corruption of any part, from a great redundance of moisture. Galen has appropriated it to the eye-lids.

MYDRIASIS, a name used by authors to express a disease of the eye, consisting in a dilatation of the pupil, and a consequent dimness of sight.

MYDROS, a word used by Hippocrates to express a ball of iron or stone, which was used to be heated in the fire, and thrown into urine, intended as a fomentation.

MYGBAOTH, in the Jewish antiquities, a kind of mitre worn by the priests. See the article CIDARIS.

MYGDONIUM *Marmor*, a name given by the antients to a species of marble much used in their larger buildings. It was white, variegated with black; but that black rather disposed in clouds and spots than veins. It is confounded with the *docimenum marmor* by some writers; but that was always of a pure white, without the least variegation.

MYIAGRUS *Deus*, in the heathen mythology, a name given sometimes to Jupiter, and sometimes to Hercules, on occasion of their being sacrificed to for the driving away the vast numbers of flies which infested the sacrifices on certain public occasions. The word is generally spelt *Myagrus*; but this must be an error, as this word does not express the fly-destroyer, but the mouse-destroyer; and we have it sufficiently testified by the antients, that flies were the only creatures against whom this deity was invoked. Pliny calls this deity also *Myiodes*, and tells us, that the flies which used to pester the Olympic rites went away in whole clouds, on the sacrificing a bull to this god. We find in Athenæus also, that this sacrificing to the god of flies, at the Olympic games, was a constant custom. Some distinguish these two deities, and tell us, that the latter, or *Myiodes*, used to visit the nations in vengeance with a vast multitude of flies; and that, on paying him the due honours of a sacrifice, they all went away again; and this seems to agree with what Pliny tells us in some places. See the article MYIODES.

At the time of the Olympic games, Jupiter was worshipped under the name of the *Apomyos*, or *Myiagrus Deus*, to supplicate the destruction of those troublesome creatures. This happened only once in many years, when the sacrifices were performed there; but the Elians worshipped him continually under this name, to deprecate the vengeance of heaven, which usually sent, as they expressed it, an army of flies, and other insects, toward the latter end of the summer, that infested the whole country with sicknesss and pestilence.

MYIODES *Deus*, in the heathen mythology, a name given sometimes to Hercules, but more frequently to Jupiter, to whom a bull was sacrificed, in order to make him propitious in driving away the flies that infested the Olympic games. See the article MYIAGRUS *Deus*, supra.

MYLASSENSE *Marmor*, in the works of the antients, a name used for a species of marble, dug near a city of that name in Caria. It was of a black colour, but with an admixture of purple; the purple not disposed in veins, but diffused through the whole mass. It was much used in building among the Romans.

MYLE, a word used by some authors as a name for the *patella* or *limpit*, and by others to express what we call a mole, or false conception in the uterus.

MYLO-HYOIDÆUS, a broad thin penniform muscle, situated transversely between the internal lateral parts of the basis of the lower jaw, and lying on the anterior portions of the two digastric muscles. It is made up of two equal fleshy portions, one lying on the right side, the other on the left, both on the same plane, and joined to a small middle tendon, which is inserted anteriorly in the middle of the basis of the os hyoides, and from thence runs directly forward, diminishing gradually in its course. This is therefore a true digastric muscle, and cannot be divided into two. Each portion is fixed by

by fleshy fibres to the internal lateral part of the lower jaw, between the oblique prominent line and the basis under the first four *dentes molares* and the *caninus*; the anterior and greatest part of the other fibres of each portion run obliquely from before, backward to the middle tendon, in which they are regularly fixed, the anterior fibres being the shortest, and a small triangular void space being formed between them and the symphysis of the chin. The posterior fibres of each portion, which make about a fourth part of the whole, run likewise on each side of the os hyoides, and are inserted along the lower edge of its anterior or convex side, and from thence a little upward. *Winslow's* Anatomy, p. 254.

It has its name from the os hyoides, and the Greek μύλαι, the dentes molares.

MYLON, in surgery, is used for the largest tumours of the staphylomatous kind in the cornea and uvea of the eyes. *Heister's* Surgery, p. 423. See the article STAPHYLOMA.

MYOCEPHALUS, a name given by some authors to the distemperature of the eyes, commonly known by the name of a staphyloma. *Heister's* Surgery, p. 423.

MYODES *Platysma*, a name given by some anatomical writers to what is called by others the quadratus genæ; it is a muscular expansion in the neck.

MYOPARO, among the Romans, a kind of ship, which partly resembled a merchant-ship, and partly a ship of war, and was that which pirates mostly used. *Pitisc.* in voc.

MYOPIA. See the article SHORT-SIGHTEDNESS.

MYOPS, *Fly-eyed*, a word used to express a person who is short-sighted or pore-blind.

MYOPS, in natural history, the *Ox Fly*, an insect usually confounded with the breeze fly, but really differing very much from it. This is common in woods and about path-ways, and never fixes on any other creatures except oxen. It has a long and somewhat flat body, and is of a blackish grey in colour.

MYOSOTIS, *Mouse-Ear*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, consisting of several leaves ranged in a circular order. The pistil, which arises from the cup, becomes at length a seed-vessel, of the shape of a bull's horn, open at the end, and containing small roundish seeds affixed to a placenta.

The species of *Myosotis*, enumerated by Mr. Tournefort, are these: 1. The broad-leaved Alpine *Myosotis*. 2. The woolly *Myosotis*, with broad leaves, resembling those of toad-flax. 3. The woolly *Myosotis*, with narrower toad-flax leaves. 4. The hoary creeping *Myosotis*. 5. The Spanish corn *Myosotis*. 6. The hairy field *Myosotis*, with large flowers. 7. The hairy field *Myosotis* with small flowers. 8. The clammy and hairy field *Myosotis*. 9. The smaller hairy *Myosotis*. 10. The knot-grass-leaved field *Myosotis*. 11. The narrow-leaved woolly and viscous Alpine *Myosotis*. 12. The low myrtle-leaved Alpine *Myosotis*. 13. The *Myosotis* with very fine ridged leaves. 14. The large-flowered Portugal *Myosotis*, with toad-flax leaves. *Tourn.* Inst. p. 244.

In the Linnæan system of botany, the characters of the *Myosotis* are these: The cup is an oblong erect perianthium, slightly divided into five segments at the extremity, and remaining when the flower is fallen. The flower is composed of only one petal, in form of a cylindric tube, short, and slightly divided into five at the extremity; the jags being rimmed round, and obtuse; and the opening of the flower closed by five convex prominent scales. The stamina are five very short filaments, placed in the neck of the tube. The antheræ are small, and covered. The pistil has four germina. The style is slender, and of the length of the tube of the flower. The stigma is obtuse. The cup remains, and holds four oval seeds. *Linnæi* Gen. Plant. p. 56.

MYRACOPON, a name used by some authors for an ointment intended to be used to the whole body to prevent lassitude. It is described by Galen.

MYRICA, in botany, a name by which some authors call the plant tamarisk. *Chabræus*, p. 75.

MYRINX, a word used by some to express the membrane of the tympanum in the ear.

MYRIOPHYLLUM, in botany, the name of a genus of plants, called by others, *pentapterophyllum*. The characters are these: It produces both male and female flowers distinct on the same plant. In the male flower the perianthium is composed of four oblong and erect leaves; the exterior one being large, the interior one much smaller. There is no corolla. The stamina are eight capillary filaments, which are longer than the cup. These are of a loose flaccid structure. The antheræ are oblong. The female flowers always stand below the male. The perianthium is divided into a number of segments. The pistil has four germina of an oblong figure. There are no styles; but the stigmata are hoary. The seeds are placed four together, and are of an oblong figure. *Linnæi* Gen. Plant. p. 459. *Ponteder.* Anth. 18. *Vaillant*, Act. Germ. 1719. *Dillen.* Gen. 7.

MYRMECIAS *Lapis*, the *Wart Stone*, a name given by some authors to a stone covered on the surface with wart-like excrescences. It is a name of a very vague signification, some of the stones called by it being mere flints, and others owing their protuberances to coralloide bodies, the wires of asteriæ, or other of the extraneous fossils contained in them, and so lodged, that their ends just stand out.

MYRMECITES, in natural history, a name given by some authors to a small stone, with some imaginary resemblance of an ant in its shape. Others have also made it the name of such pieces of amber as contain an ant, or the legs, wings, or other fragment or remains of that little animal.

MYRMECOPHAGA, the *Ant-Eater*, the name given by Linnæus to the creature called by others, the *tamandua-guacu*, or ant-bear.

The name is derived from the Greek μυρμὴξ, an ant, and φάγω, to eat. The creature is so called because his food is ants, which he eats by thrusting his long tongue into their nests, and drawing it back into his mouth when covered with them.

This, in the Linnæan system of zoology, is a distinct genus of animals, the characters of which are, that they have no teeth; have feet formed not for climbing, but walking, and have eight abdominal paps, six on the belly, and two on the breast. *Linnæi* Syst. Nat. p. 34.

MYRMILLO, among the Romans, a kind of gallic armour used in theatrical shews. But some will have it to be the same that Achilles's *myrmidones* wore; whence it had this name. *Pitisc.* in voc.

MYROBALANS (*Cycl.*)—It is very evident from the writings of the antient Greeks, that what we at this time call the *Myrobalan* was not known to them under that name, and perhaps what they called so is not known to us at this time; our *Myrobalans* being a sort of plums, and theirs being a dry fruit, rather of the nut-kind, and used in perfumed unguents, and other compositions of that kind, to give them a scent. This variation from the original sense of the word is not new, however, and the authors who began it are so far back, that it seems to have been an error of as old a date as any of this kind.

MYROBATINDUM, in botany, a name given by Vaillant to a genus of plants, which, with the *camara* of Plumier, and the *pseudoviburnum* of Rivinus, is included by Linnæus under one general character, by the name *lantana*. *Vaillant*, Act. Germ. 1722. See the article LANTANA.

MYRRH (*Cycl.*)—It is an apophthegm of chemists, derived from Van Helmont, that whoever can make *Myrrh* soluble by the human body, has the secret of prolonging his days. And Boerhaave owns there seems to be truth in this from its resisting putrefaction. He himself, and other chemists before him, have given methods for making solutions of *Myrrh*, but only by means of alcohol. It seems not a little surprizing that such great chemists should never find out that *Myrrh* is soluble in common water. *Pemberton*, Lond. Disp.

MYRRHINA *Vasa*, in antiquity. See the articles MURRINE, and MORRHINA.

MYRRHIS, in botany, the name of a genus of umbelliferous plants, the characters of which are these: The flower is of the rosaceous kind, composed of several unequal petals, which are arranged in a circular order, on a cup which afterwards becomes a fruit, composed of two long seeds, resembling the beak of a bird, which are striated and gibbose on one side, and smooth and plain on the other.

The species of *Myrrhis*, enumerated by Mr. Tournefort, are these: 1. The greater *Myrrhis*, or sweet cicutaria. 2. The annual *Myrrhis*, with smooth striated seeds. 3. The little white-flowered perennial *Myrrhis*, with hairy leaves, and gold-coloured seeds. 4. The yellow perennial *Myrrhis* with daucus leaves. 5. The tuberous or knotty *Myrrhis*. 6. The hoary annual *Myrrhis*, with striated hairy seeds. 7. The broad leaved white flowered marsh *Myrrhis*. 8. The broad-leaved red-flowered marsh *Myrrhis*. 9. The long-seeded daucus-like mountain *Myrrhis*. 10. The hairy-seeded annual Portugal *Myrrhis*, with parsnep leaves. 11. The trifoliate Canada *Myrrhis*, looking like angelica, and called by some the trifoliate American angelica. *Tourn.* Inst. p. 315.

The seeds of the common sweet cicely, or wild chervil, are a very powerful diuretic and promoter of the menses. They are good in jaundices, and beginning dropsies, and in the gravel and stone.

MYRRHITES *Lapis*, in natural history, a name used by many of the antient authors for a semi-pellucid stone of the nature of the agates; and seeming to have been the yellow cornelian of the moderns.

MYRTIDANON, a word used by the old Greek writers on medicine, but in a different sense by different authors.

Hippocrates calls it a round fruit, which the Persians in his time called pepper, and which probably had all the heating qualities of that fruit. Dioscorides expresses it by an excrescence common on the trunk of the myrtle, and which, as he observes, is more astringent than the myrtle itself. *Myrtidanum vinum* also signified wine impregnated with myrtle.

MYRTIFORMIS *Nasi*, (*Cycl.*) in anatomy, a name given by Santorini, and some others, to one of the muscles of the face, called by Albinus, *depressor alæ nasi*, and by Cowper and others, *depressor labii superioris, constrictor alæ nasi*.

MYRTITES, the name of a composition in the antient pharmacy, made of fine honey, and the depurated juice of myrtle berries boiled up together to a consistence.

MYRTLE, *Myrtus*, in botany. See the articles MYRTUS, *infra*, and MYRTLE, *Cycl.*

There are feveral fpecies of this plant preferved in our gardens; they are all eafily propagated from cuttings. The beft feafon for this is July; and the ftraiteft and youngeft vigorous fhoots are to be chofen. Thefe fhould be cut off about eight inches long, and the leaves of the lower part ftripped off to two inches high, and that part of the ftalk twifted which is to be placed in the ground; they are to be planted in pots of light rich earth, at about two inches diftance from each other, obferving to clofe the earth very well about them, and give them a gentle watering. They are then to be removed into a moderate hot-bed, and fhaded and watered once in two or three days till they have taken root. In about a month's time they will be rooted, and will begin to fhoot, and muft then be inured by degrees, to the air; and in Auguft they fhould be removed into the open air, but placed in a warm fituation, and fheltered from the winds; they fhould ftand here till October, and then be removed into a green-houfe, where they fhould be placed fo as to have as much air as poffible. In the March following they fhould be removed into feparate pots of rich earth, and in May fet out to the open air in a warm and well defended place. They will require in the fummer frequent waterings, and the dead leaves fhould be carefully picked off. As they advance in growth, they are to be fhifted at times into pots of a larger fize; and this fhould be done either in April or in Auguft; and toward the end of October, they fhould always be removed into the green-houfe.

MYRTILLUS, in botany, a name by which fome authors have called the black whortle berries. The *vitis idæa angulofa* of other authors. *Dale*, Pharm. p. 294.

MYRTOCHEILIDES, a name given by fome authors to the nymphæ in the female pudenda.

MYRTUS, the *Myrtle*, in botany, the name of a genus of trees, the characters of which are thefe: The flower is of the rofaceous kind, and is compofed of feveral petals arranged in a circular form. The cup finally becomes a fruit or berry of the fhape of an olive, coronated at the end, divided into three cells, and containing kidney-fhaped feeds.

The fpecies of *Myrtle*, enumerated by Mr. Tournefort, are thefe: 1. The broad-leaved Roman *Myrtle*. 2. The broad-leaved Bœtic *Myrtle*, or the bay-leaved *Myrtle*. 3. The bay-leaved *Myrtles*, with leaves growing in clufters. 4. The broad-leaved Belgic *Myrtle*. 5. The common Italian *Myrtle*. 6. The common Italian *Myrtle* with white berries. 7. The narrow-leaved Bœtic *Myrtle*. 8. The wild *Myrtle* with very fharp-pointed leaves. 9. The *Myrtle* with very fmall fharp-pointed leaves. 10. The common fmall *Myrtle*. 11. The common fmall *Myrtle*, with leaves variegated with yellow. 12. The broad-leaved white-berried Spanifh *Myrtle*. *Tourn.* Inft. p. 640.

Myrtle-berries are efteemed cooling and aftringent. They are recommended in gonorrhœas, diarrhœas, dyfenteries, and hæmorrhages of all kinds; but feldom ufed by the faculty.

MYRTUS *Sylveftris*, the *wild Myrtle*, in botany, a name given by fome authors to the *rufcus*, or butcher's broom, from fome faint refemblance of its leaves to thofe of the *Myrtle*. *Ger.* Emac. Ind. 2. See the article RUSCUS.

MYRUS, in zoology, a kind of fea-ferpent, a fifh of the eel clafs, fuppofed by fome to be the male murœna, but erroneoufly. Its fnout is very long and fharp-pointed; its body black, flender, and round, without fcales, and free from fpots. The cavity for the gills is only one on each fide. Near the neck there are fome fmall yellow dots to be feen, while the creature is alive; but thefe are fcarce vifible after it is dead. Its flefh is tender and delicate. *Rondelet.* de Pifc. vol. 1. p. 340.

MYS, in ichthyology, a name given by Ælian, Appian, and many others, to the fifh called *caprifcus* by the later writers; the *capros* and *chærus* of others of the antients. See the article GOAT-*Fifh*.

MYSIA, Μυσια, in antiquity, a feftival in honour of Ceres. For the origin and ceremonies obferved in it, fee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 415.

MYSTERY (*Cycl.*)—Mathematicians have been accufed of introducing *myfteries* into geometry, which ought to have none. See the Analift; and Mr. *Maclaurin*'s Fluxions in the Introduction, and in other places. See alfo the article PARADOX.

MYSTOCEROS, in ichthyology, a name given by Gefner and fome others to that fpecies of the filurus which we call the fheat-fifh. It is the glanus of Pliny, and the reft of the old authors; the filurus of Rondeletius and others. It is diftinguifhed by Artedi by the name of the filurus with four beards under the chin. It is plainly to be known from the fifh called the *lake*, by this character; that having only one beard, it is a genuine fpecies of filurus. See the article SILURUS.

MYSTRUM, among the antients, a liquid meafure, which was the fourth part of the cyathus.

It weighed about two drams and an half of oil; and of water or wine, two drams two fcruples. It was much about our fmall fpoonful. *Danet.* and *Pitifc.* in voc.

MYSTUS *Fluviatilis*, in zoology, a name by which fome writers, particularly Bellonius, have called the common *barbel*. *Willughby*, Hift. Pifc. p. 259. See the article BARBUS.

MYSTUS *Marinus*, the *Sea Barbel*, the name of a fifh caught in the Adriatic, and common in the markets of Venice.

It is of an oblong figure, and in colour of a filvery white, variegated on each fide with ten obliquely tranfverfe black lines. Its belly is very white. Its tail is forked, and its head long. Its back fin has part of its rays prickly, part foft to the touch. Its eyes are not large, and their irifes are yellow. Its lips are prominent, thick, and foft, and only ferrated in the place of teeth; but in the hinder part of its mouth it has feveral rows of fhort and large *molares* or grinders. Its fcales are large, and adhere firmly to the flefh. It is a very well tafted fifh. *Gefner*, de Pifc. p. 144.

MYSTUS *Niloticus*, in zoology, a name given by Bellonius to a fifh of the barbel kind, caught in the Nile. Its body is thick and fhort, and its belly very broad. It grows to fo large a fize as to weigh twenty pounds. Probably this may be no other than the common barbel growing to a larger fize, as we fee many fifh will in fome places more than others. *Bellonius*, de Pifc.

MYTACISM, Μυτακισμὸς, in rhetoric, the too frequent repetition of the letter M, thus *mammam ipfam amo, quafi meam animam*. *Voff.* Rhet. l. 4. p. 46.

MYTIS, a name ufed by fome writers to exprefs the black juice found in the mouth of the fepia or cuttle-fifh, with which it colours the water when in danger of being taken, and by this means often makes its efcape. It is alfo ufed by Hippocrates as the name of a fea-fifh different from the fepia.

MYTTOTON, a word ufed by the antients to exprefs a mixt fort of country food, made of garlic, onions, eggs, cheefe, oil, and vinegar. It was much eaten by the labouring people among the antients, and accounted a very wholefome difh.

MYTULUS, the *Mufcle*, in natural hiftory, the name of a genus of fhell-fifh, the characters of which are thefe: It is a bivalve fhell, of an oblong form, ending in a point, and having its two extremities equal. It is fometimes fmooth, fometimes rough. In fome fpecies flat; in others elate; and in fome has the beak elate. The *Tellina* and *Pinna marina*, of each of which there are feveral fpecies, are properly of this genus.

The three words of *Mytulus*, *Mufculus*, and *Tellina*, may however be made of great ufe in the fubdiftinctions of the genus into certain feries.

In this fenfe the word *Mytulus* may exprefs all the large *Mufcles*, fuch as the *pinna marina*, and other *Mufcles*, which are remarkably much elevated in their fhape, and have pointed beaks. The word *Mufculus* may be ufed to fignify fuch *Mufcles* as are fmaller and more flat; and *Tellina* to exprefs, as it ufually does with authors, a bivalve fhell of the *Mufcle* kind, but thinner and tenderer, and of an oblong figure, but not pointed.

The hinge of thefe fhells is not in the center of the fhells, but toward one end, and they have ufually a kind of little beak at that part.

The *Tellinæ* are attached to the fhell by two ligaments; the *Mufcles* only by one.

The largeft kind of *Mytulus* we know, is the *Pinna marina*; of which fhell we have three kinds, one larger than the reft, which is red within; this often produces pearls, but they are nearly of the fame reddifh colour with the lining of the fhell. There have been found fhells of this fpecies fo large as that the pair have weighed fifteen pounds. The fmall *Pinna*, and the rough echinated *Pinna*, have their fhells thicker near the edge where they open, than at the cardo. Thefe *Pinnæ marinæ* have a fort of filaments iffuing from the body of the fifh, and faftening it to ftones, or any other fubftances. This the antients called *byffus*, and wrought it into gloves and other things of that kind; and in fome places it is to this day put to the fame ufe. The common *Mufcles* have the fame property of forming thefe threads; and Lifter has thence called them *fetiferæ*. The filk of thefe common *Mufcles* is greatly inferior to that of the *Pinna marina* in finenefs and beauty. The *Mufcles* hold themfelves in the fame place, by means of their threads. The *Pinna marina* fticks its fharp end into the mud or fand, and all the reft of the fhell remains at liberty to open in the water. Its filaments, which are propagated from the middle of its body, ferve to draw up the mud and fand about it, on occafion, to defend it againft the motion of the water in tempefts.

The fpecies of *Mufcles*, known at prefent, are thefe: Of the flat kind, which terminate in a point at one end, we have the following: 1. The great ftriated magellanic *Mufcle*. 2. The fmaller ftriated magellanic *Mufcle*. 3. The fmaller variegated magellanic *Mufcle*. 4. The fmooth *Mufcle*. 5. The moufe-throat *Mufcle*. 6. The date *Mufcle*. 7. The large rough *Mufcle*; this is commonly found covered with balani or center-fhells. 8. The fmaller rough *Mufcle*; this is frequently found covered with fea-worms. 9. The blue *Mufcle*, ftriated near the bottom; this is a very rare fhell. 10. The rofe-coloured

loured variegated *Mufcle*. 11. The grey ftriated *Mufcle*. 12. The great Newfoundland *Mufcle*. 13. The great Canada *Mufcle*.

Of thofe ufually known in cabinets, under the name of *Pinnæ marinæ*, we have the following: 1. The common great *pinna*, variegated with grey and red. 2. The fmaller whitifh aculeated *Pinna marina*. 3. The fmall reddifh aculeated *Pinna*. 4. The *Pinna* of the fhape of a ham, commonly called the *ham Pinna*. 5. The larger fpinning *Pinna*, called the *filk Pinna*, becaufe of the great quantity of filk which it fpins. 6. The fmaller *Pinna marina*, called *Pinna tridacna* by Rondeletius. 7. The *Pinnophylax*; this is a large fpecies, fo called by Rumphius, from its often affording a lodging to a fmall crab. 8. The duck-bill *Pinna*.

Of thofe *Mytuli*, which are of a more elate figure and equilateral, we have the following: 1. The white tender *Mufcle*; this, when polifhed, is kept in cabinets under the name of the filver fhell. 2. The black *Pholas Mufcle*. 3. The yellow *Pholas Mufcle*. 4. The light and thin *Mufcle*, open in every part with a trunk. 5. The lefs open *Mufcle*, with a trunk. 6. The dufky-coloured *Mufcle*, from the ifle of Papous; this, when its outer coat is polifhed off, makes a very beautiful figure, and is found to be liniated within the fhell with brown and bluifh fafciæ, and in this ftate is a remarkably elegant fhell. See Tab. of Shells, N°. 19.

Of the *Tellinæ*, which are oblong and flat fhells with equal extremities, we have the following fpecies: 1. The violet-coloured *Tellina*. 2. The violet *Tellina*, with four white zones. 3. The fmooth *Tellina*, elegantly variegated with pale red and white fafciæ. 4. The hairy *Tellina*, of the Mediterranean fea. 5. The larger hairy *Tellina*, of the ocean. 6. The Canada *Tellina*. 7. The *Tellina* of the Azores iflands. 8. The great Newfoundland *Tellina*. 9. The fmall Canada *Tellina*. 10. The Saint Savinian *Tellina*. This laft is often found polifhed in our cabinets, and then is very elegantly variegated with rofe-colour and a filvery white. Thefe are all the known *Tellinæ*, with equal extremities.

But of thofe which have the two ends unlike, we have the following fpecies: 1. The reddifh-beaked *Tellina*, refembling a furgeon's forceps. 2. The yellowifh forceps *Tellina*. 3. The *Tellina* of the fhape of a knife. 4. The long-beaked *Tellina*. 5. The rough *Tellina*, called the cat's-tongue *Tellina*. 6. The fafciated and radiated rofe-coloured *Tellina*. 7. The orange-coloured *Tellina*, doubled on one fide, and dentated at the edge. 8. The leaf *Tellina*; this greatly refembles the leaf of a tree. 9. The white granulated *Tellina*. 10. The reddifh tranfverfely ftriated *Tellina*. 11. The flatted and truncated *Tellina*. 12. The violet *Tellina*, with a ftriated apex. 13. The yellowifh *Tellina*, with a ftriated apex. 14. The reddifh *Tellina*; this is an elegant fhell, though little variegated. Hift. Nat. Eclair. p. 326.

The common fea *Mufcle* has, from its being always found faftened to the rocks, been fuppofed by many wholly incapable of progreffive motion; but this is an erroneous opinion. It is a common practice in France at fuch feafons of the year as do not afford fun enough to make falt, to throw the common fea *Mufcles*, which the fifhermen catch about the coafts, into the brine-pits. They have an opinion that this renders their flefh the more tender and delicate, as the rain which falls at thefe feafons makes the water of the pits much lefs falt than the common fea-water. The *Mufcles* are on this occafion thrown carelefsly in, in feveral different parts of the pits; yet, at whatever diftances they have been thrown in, the fifhermen when they go to take them out, always find them in a clufter together; and as there is no current of water in thefe places, nor any other power of motion which can have brought the *Mufcles* together, it feems very evident that they muft voluntarily have marched from the places where they were at firft, to have met thus together. This progreffive motion is wholly performed by means of what we call the tongue of the *Mufcle*, from its fhape; but, from its ufe in this cafe, appears rather to merit the name of a leg, or an arm, as by laying hold of any diftant fubftance, and then forcibly contracting itfelf again, it draws along the whole body of the fifh; the fame part, when it has moved the animal to a proper place, ferves alfo to fix it there, being the organ by which it fpins the threads which we call its beard, by which it is held to a rock, or to another *Mufcle*. The motion of the *Mufcle*, by means of this part, is juft the fame with that of a man laid flat on his belly, who would draw himfelf along by laying hold of any thing with one hand, and then drawing himfelf to it. Mem. Acad. Par. 1710.

Mufcles are well known to have a power of faftening themfelves very firmly either to ftones, or to one another's fhells, in a very ftrong and firm manner; but the method of doing this was not well underftood, till the obfervations of the accurate Mr. Reaumur explained it.

Every one who opens and examines a common *Mufcle* will find, that in the middle of the fifh there is placed a little blackifh or brownifh body refembling a tongue; this in large *Mufcles* is near half an inch long, and a little more than a fixth of an inch in breadth, and is narrower at the origin than at the extremity; from the root of this tongue, or that part of it which is faftened to the body of the fifh, there are produced a great number of threads, which when fixed to any folid fubftance hold the *Mufcle* firmly in its place: Thefe threads are ufually from an inch to two inches in length, and in thicknefs from that of a hair to that of a hog's briftle. They iffue out of the fhell in that part where it naturally opens, and fix themfelves to any thing that lies in their way, to ftones, to fragments of fhells, or, which is the moft common cafe, to the fhells of other *Mufcles*; whence it happens that there are ufually fuch large parcels of *Mufcles* found together. Thefe threads are expanded on every fide, and are ufually very numerous, an hundred and fifty having been found iffuing from one fhell; they ferve the office of fo many cables, and each pulling in its proper direction, they keep the *Mufcle* fixed againft any force that can be offered from whatever part it come. The filaments are well known to all who eat *Mufcles*, who ever carefully feparate them under the name of the beard; and Mr. Reaumur has found, that while the animal is living in the fea, if they are all torn away by any accident the creature has a power of fubftituting others in their room: He found that if a quantity of *Mufcles* were detached from one another and put into a veffel of any kind, and in that plunged into the fea, they in a little time there faftened themfelves both to the fides of the veffel and to one another's fhells; the extremity of each thread feemed in this cafe to ferve in the manner of a hand to feize upon any thing that it would fix to, and the other part which was ftenderer and fmaller to do the office of an arm in conducting it.

To know the manner of the *Mufcle's* performing this operation, this diligent obferver put fome *Mufcles* into a veffel in his chamber, and covered them with fea-water; he there faw that they foon began to open their fhells, and each put forth that little body before defcribed by its refemblance to a tongue, and at the root of which thefe threads grow; they extended and fhortned this part feveral times, and thruft it out every way, often giving it not lefs than two inches in length, and trying before, behind, and on every fide with it, what were the proper places to fix their threads at: At the end of thefe trials they let it remain fixed for fome time on the fpot which they chofe for that purpofe, and then drawing it back into the fhell with great quicknefs, it was eafy to fee that they were then faftened by one of thefe threads to the fpot where it had before touched and remained fixed for a few minutes; and in repeating this workmanfhip the threads are increafed in number one at every time, and being fixed in different places they fuftain the fifh at reft againft any common force.

The feveral threads were found to be very different from one another, the new formed ones being ever whiter, more gloffy, and more tranfparent than the others; and it appeared on a clofe examination, that it was not as might have been moft naturally fuppofed, the office of the tongue to convey the old threads one by one to the new places where they were now to be fixed, but that thefe in reality were now become ufelefs; and that every thread we fee now formed, is a new one made at this time; and in fine, that nature has given to fome fea-fifhes, as well as to many land-infects, a power of fpinning thefe threads for their neceffary ufes. And that *Mufcles* and the like fifh are under water, what caterpillars and fpiders are at land. To be well affured of this, however, Mr. Reaumur cut off all the beard or old threads of a *Mufcle* as clofe as he could, without injuring the part, and the proof of the opinion of their fpinning new ones at pleafure was now brought to this eafy trial, whether thefe *Mufcles* fo deprived of their old ones could fix themfelves as foon as others which were poffeffed of theirs, and could throw out their threads to as confiderable diftances. The experiment proved the truth of the conjecture, for thofe whofe beards or old threads were cut off, fixed themfelves as foon as thofe in which they were left, and fpread their threads to as great a diftance every way.

When the mechanifm of this manufacture was thus far underftood, it became a natural defire to enquire into the nature of the part by which it was performed: This has hitherto been mentioned under the name of the tongue, from its fhape; but it is truly the arm of the fifh, and whenever it happens to be loofened from its company, or fixed in a wrong place, it ferves the animal to drag its whole body fhell and all along, and to perform its feveral motions. It fixes itfelf to fome folid body, and then ftrongly contracting its length, the whole fifh muft neceffarily follow it, and be pulled toward the place where it is fixed. This is an ufe however that this part is fo rarely put to, that it is not properly to be efteemed a leg or an arm, for this; but, according to its more frequent employment, may much better be denominated the organ by which the threads are fpun.

Though this body is flat in the manner of a tongue for the greater part of its length, it is however rounded or cylindric about the bafe or infertion, and it is much fmaller there than in any other part; there are feveral mufcular ligaments faftned to it about the root or bafe, which hold it firmly againft the middle of the back of the fhell; of thefe ligaments there are four, which are particularly obfervable, and which ferve to move the body in any direction. There runs all along this body a flit or crack, which pierces very deeply into its fubftance,

ſtance, and divides it as it were into two longitudinal ſections; this is properly a canal, and along this is thrown the liquor which ſerves to form the threads; and it is in this canal or ſlit that theſe threads are moulded into their form. Externally, this appears only a ſmall crack or ſlit, becauſe the two fleſhy ſections of the parts almoſt meet and cover it, but it is rounded and deep within, and is ſurrounded with circular fibres. This canal is carried regularly on from the tip of the tongue, as it is called, to its baſe, where it becomes cylindric; the cylinder in this part being no other than a cloſe tube or pipe, in which this open canal terminates. The cylindric tube contains a round oblong body, of the nature of the threads, except that it is much larger; and from the extremity of this all the threads are produced, this ſerving as a great cable to which all the other little cordages diſperſed towards different parts, are fixed. The tube or pipe in which this large thread is lodged, ſeems the reſervoir of the liquor of which the other threads are formed; all its internal ſurface being furniſhed with glands for its ſecretion. Mem. Acad. Par. 1711.

The *Muſcle*, like many other ſea-fiſhes, abounds in this liquor; and if at any time one touch with a finger the baſe of this ſpinning organ, one draws away with it a viſcous liquor in form of ſeveral threads, like thoſe of the caterpillar, ſpider, and the other ſpinning land-animals. The threads fix themſelves with equal eaſe to the moſt ſmooth and gloſſy, as to rougher bodies; if the *Muſcles* are kept in glaſs-jars of ſea-water, they as firmly faſten themſelves to the glaſs as to any other body.

Muſcles, be they ever ſo young, have this property of ſpinning; and by this means they faſten themſelves in vaſt numbers to any thing which they find in the ſea. Mr. Reaumur has ſeen them when as ſmall as millet-ſeeds, ſpin plentifully, though their threads proportioned to their own weight, are much finer and ſmaller than thoſe of larger *Muſcles*.

It is a queſtion yet undetermined whether the *Muſcle* has a power of breaking, or otherwiſe getting rid of its threads, in order to its removing from the place where it is once fixed; but it appears probable that they have not, and that they muſt remain where they have once faſtened themſelves, though their deſtruction be the conſequence of it. Mr. Reaumur tried this experiment in his jars, when they had well fixed themſelves to the ſides of them, he poured off part of the ſalt-water, ſo that it became the intereſt of the fiſh to leave their hold and go lower down, but they ſeemed to have no power to effect this. Mem. Acad. Par. 1711.

The common *Muſcle* affords the curious obſerver a very pleaſing object of examination by the microſcope. The tranſparent membrane, which immediately appears on opening the ſhell, ſhews the circulation of the blood for a long time together through an amazing number of veſſels. And Mr. Lewenhoek, in ſeveral which he diſſected, diſcovered numbers of eggs or embryo *Muſcles* in the ovarium, appearing as plainly as if he had ſeen them by the naked eye, and all lying with their ſharp ends faſtened to the ſtring of veſſels by which they received nouriſhment. The minute eggs, or embryos, are by the parent placed in due order, and in a very cloſe arrangement on the outſide of the ſhell, where by means of a gluey matter they adhere very faſt, and continually increaſe in ſize and ſtrength, till becoming perfect *Muſcles* they fall off and ſhift for themſelves, leaving the holes where they were placed behind them. *Baker*'s Microſcope, p. 242.

This abundance of *Muſcle* ſhells very plainly ſhew when examined by the microſcope, and ſometimes they are in the number of two or three thouſand on one ſhell; but it is not certain that theſe have been all fixed there by the *Muſcle* within; for theſe fiſh uſually lying in great numbers near one another the embryos of one are often affixed to the ſhell of another. The fringed edge of the *Muſcle*, which Mr. Lewenhoek calls the beard, has in every the minuteſt part of it ſuch variety of motions as is unconcievable; for being compoſed of longiſh fibres, each fibre has on both ſides a vaſt many moving particles. *Lewenhoek*'s Arcan. Nat.

MYUTES *Lapis*, in natural hiſtory, a name given by ſome authors to a foſſile body, part of an aſteropodium which they have thought in ſingle joints ſomewhat reſembled the ears of a mouſe. See the article ASTEROPODIUM.

MYXA, or MYXARIA, in the materia medica, a name uſed by ſome authors for the ſebeſtens, a ſort of plum of Ægypt and Aſia. *J. Bauhin*, V. 1. p. 198. See the article SEBESTEN, *Cycl.*

MYXOLYDIAN, in antient muſic, the firſt ſpecies of the diapaſon. See the article DIAPASON.

MYXON, in zoology, the name of a fiſh of the mullet kind, called by others, *Bacchus*.

It much reſembles the common mullet; but its head is leſs pointed, and its body is covered beſide the ſcales with a mucous matter. It has a remarkable irregularity in the manner of its ſwimming, and looks red about the lips and covering of the gills. *Rondelet.* de Piſc. p. 683. See the article MUGIL.

N.

N.

NABATHÆA *filiqua*, in the materia medica, a name given by the interpreters of Avifenna, and other of the Arabian phyficians, to the *jembut*, or *aljembut*, of thofe authors.

It appears, from the accounts they have given us of this drug, that it was a long and flender pod, produced on a thorny tree. It has been generally fuppofed to be the fame wirh the *carob*, or *filiqua dulcis*, but very erroneoufly. The fame authors who mention this *aljembut*, or *Nabathæa filiqua*, mention that alfo under the name of the *alnabati*, or *Syrian filiqua*, as it is interpreted.

The *Syrian filiqua*, they fay, purges, and is good in colics. The *Nabathæan* they recommend to us, as an aftringent in hæmorrhages. It is plainly to be inferred from this, that the *Nabathæa filiqua* is different, in the greateft degree, from the Syrian pod, or *carob* fruit; and by its virtues, and the defcription they give us of the thorny tree which produces it, it feems very probable that it was the pod of fome fpecies of the *acacia*.

What gives the greateft probability to this opinion is, that the fame authors have plainly, in other places, called the *acacia* by the common name of *filiqua*. Ifidore, explaining fome paffages of the old Roman authors on this fubject, fays, that the fhrub *filicon*, which the Latins had improperly called *filiqua*, yields a fruit, the expreffed juice of which is the drug called *acacia* in the fhops.

The Arabian authors who mention this *filiqua Nabathæa*, and call it alfo *feuchi*, and *charnub feuchi*, defcribe the fhrub which produces it, as being prickly, and rifing but a cubit high from the ground; and, they add, that it had crooked, or falcated pods, which contained feeds, and a pulp very much refembling the other *filiqua*, which is the *carob*. Neophytus, and others, tell us, that the pods of the *acacia* were called by the Greeks *ceration*, as well as thofe of the *carob*; and the Arabians call the *acacia*, *alcarad*, a name plainly derived from this *ceration* of the Greeks.

As therefore both the pods of the *carob*, or *filiqua edulis*, and thofe of the *acacia* were called by the fame names *ceratia*, &c. it is plain that when the authors before-mentioned defcribe two kinds of *carob*, or as they exprefs it *ceratia*, differing from one another, and poffeffing, the one the virtues of the *carob* fruit, and the other of the *acacia*, they mean the *carob* by the purging fruit, and the *acacia* by the aftringent.

NABCA, in botany, a name by which fome authors have called the tree more ufually defcribed under the name of *œnoplia*, or the great jujube tree. *Chabræus*, p. 51.

NABECH, in botany, the name given by the Arabian writers to the fruit of the tree *fadar*, which is the *lotus* of Diofcorides, and the *acanthus* of Virgil. The fruit of this, which is round, and like a cherry, only fmaller, was firft called by this name *nabech*, or *nabac*, but afterwards the tree was alfo called by it. See the article SADAR.

NABLUM, in Hebrew, *nebel*, an inftrument of mufic among the Hebrews. The Seventy, and the Vulgate, tranflate it fometimes by *nablum*, and at other times by *pfalterion*, or *lyra*, or even *cithara*.

The *nablum* was a ftringed inftrument, very near of the form of a Δ, which was played upon by both hands, and with a kind of bow. See Calmet's differtation concerning the inftruments of mufic of the antient Hebrews, prefixed to the fecond volume of his commentary upon the pfalms. *Calmet*, Dict. Bibl.

NADIR-*il-kifne*, in the Turkifh offices, the fuperintendant over the wardrobe. *Pocock's* Egypt, p. 188.

NÆVI (*Cycl.*) are excrefcences of flefh in various parts of the body, fuppofed to have been occafioned by frights, difappointments, &c. of the mother, while the infant was in the womb. Thefe tumors arife in all parts of the body; they are of all figures, and of all fizes, and are fometimes of the common colour of the fkin, fometimes black, red, &c. Many of them, both in fhape and colour, refemble fruits of feveral kinds, as mulberries, ftrawberries, and the like; or animals, as mice, or fpiders.

They are to be removed, as warts, by ligature, cautery, or extirpation with the knife. But if they have large veffels near their roots, if they are ftrongly fixed to the bone, or if they feem to have a cancerous difpofition, it is much beft for the furgeon to let them wholly alone; and where they are feated in the neighbourhood of arteries, or large veins, if preffed to extirpate them, he fhould never be without cauteries, ftyptics, bandages, and other neceffary apparatus, in cafe of hæmorrhages. *Heifter's* Surgery. p. 323.

NAGEMULUS, in ichthyology, a name given by fome of the German authors to the fifh called by Willughby and others, the *lucioperca*, or *pike-pearch*. It is truly a fpecies of pearch, and is diftinguifhed from the common pearch, principally by having two long teeth on each fide of the mouth. See PERCA.

NAJAS, in botany, the name given by Linnæus to a genus of plants called by Vaillant and Micheli *fluvialis*. The characters are thefe: it produces male and female flowers diftinct. In the male flowers, the perianthium is compofed of one leaf of a cylindric figure, and truncated at the bafe, growing fmaller at the top, and having at the mouth two oppofite fegments which bend backwards. The flower is compofed of only one petal, and is a tube of the length of the cup; its verge is divided into four fegments, which are rolled backwards. There are no ftamina, but the middle of the flower produces one, oblong, erect anthera. In the female flower there is no cup, nor any petal, but a piftil whofe germen is of an oval figure, and terminates in a flender ftyle; the ftigmata are fimple; the fruit is an oval capfule, containing one oblong oval feed. *Linnæi* Gen. Pl. 443. *Vaill.* A. G. 1719. T. 1 T. 2. *Michel.* 8.

NAIL, (*Cycl.*) in the manege. The different pofition of the *nails* of the bridle, or left hand of the horfeman, gives the horfe a facility of changing hands, and forming his departure, and ftop; by reafon that the motion of the bridle follows fuch a pofition of the *nails*. To give a horfe head, you muft turn the *nails* downwards. To turn the horfe to the right, you muft turn them upwards, moving your hand to the right. To change to the left you muft turn the *nails* down, and bear to the left. To ftop the horfe you muft turn them upwards, and lift up, or raife your hand.

NAILS *of the human body*. Dr. Pozzi endeavours to prove, that the *nails* grow out of the tendons, which are fpread upon the laft phalanx of the fingers and toes. See UNGUIS.

NAKED *ftalk*, or *leaf*, among botanifts. See the articles STALK, and LEAF.

NAKIB, in the Oriental dignities, the name of an officer who is a deputy to the cadilifkier, or, as he may be called, the lord high chancellor of Egypt, appointed by the grand fignior. *Pocock's* Egypt, p. 170.

NAKIR, a word ufed by fome medical writers to exprefs a violent flatulence which paffes from one limb to another, and is always attended with pain.

NAKOUS, an Egyptian mufical inftrument, made like two plates of brafs, and of all fizes, from two inches to a foot in diameter; they hold them by ftrings faftened to their middles, and ftrike them together fo as to beat time. They are ufed in the Coptic churches, and in the Mahometan proceffions. *Pocock's* Egypt, p. 186.

NAL *la appella*, in botany, a name ufed in the Hortus Malabaricus to exprefs an Indian fhrub, or tree, from the roots of which they obtain an oil of a gold yellow colour, and very agreeable fmell, called *appel* oil. It is of a bitterifh and fharp tafte, and is in great efteem among them in pains of the head. Hort. Malab.

NAMANTIA, in ichthyology, a name given by the French to the *manati*, or *fea cow*

NAME (*Cycl.*) — *Generical* NAME. See GENERICAL.

NAMUR *marble*, a name given by our artificers to a fpecies of black marble, which is very hard, and capable of a good polifh, but has no variegations of any other colour. It is common in Italy, France, and Germany, and is the fpecies called the *Lucullean marble* by the Romans. *Hill's* Hift. Foff. p. 466. See LUCULLEUM *marmor*.

NAPELLUS (*Cycl.*) — This plant is poifonous in fome places, and innocent in others Its mortal quality increafes with the heat of the climate, and goes off where that is fmall. In the fouth of France, it is a fatal poifon; in Bretany, they find the roots inoffenfive to the moft tender conftitutions; and farther north, they eat the leaves among their fallad herbs, to get them an appetite, and find them a fafe and wholefome food. *Deflandes* Tr. Phyf.

It is faid the *napellus* may be fo corrected by volatile falt of tartar, as to become innocent. *Boyle's* Works, Abr. Vol. 1. p. 60. Dr. Hill makes the *napellus* a fpecies of aconite. *Hill's* Nat. Hift. Vol. 2. p 483.

NAPESCA, a name given by fome to a fpecies of *jujube*.

NAPHA, a name given by many of the writers in pharmacy to *orange-flower water*.

NAPHTHA, (*Cycl.*) in natural hiftory, the name of a genus of fluid foffils, the characters of which are, that they are of a thin confiftence, bright and pellucid, of a ftrong fmell, very readily inflammable, and, when pure, burning away, without leaving any refiduum.

Of this genus there are only two fpecies, the one commonly known by the name of *naphtha*, the other by that of *petroleum*. The firft is a pure and clear mineral fluid, of a much thinner confiftence than any of the expreffed oils of vegetables; and fome-

ſomething thicker than the finer of the diſtilled ones; it is of a pale yellow, with a faint caſt of brown among it, and is, indeed, of the very colour of the common brown amber uſed by the apothecaries. It is of a briſk, penetrating ſmell, ſomething like that of the chemical oil of amber, but not ſo offenſive. It is extremely inflammable, and is found floating on the waters of certain ſprings which break out at the ſides of hills in Perſia, Tartary, China, and other parts of the eaſt. It ſeems very practicable, by means of this mineral fluid, and a proper acid, to make a ſort of artificial amber, this being only a ſort of fluid amber.

The ſecond kind, commonly known by the name of *petroleum*, is a thin, ſubtle, and penetrating fluid, much thinner than the yellow *naphtha*, and as fine as the cleareſt diſtilled oils of vegetables. It is of a very ſtrong and penetrating ſmell; and is of various colours. It is naturally of a clear, fine, and bright white, and nearly as pellucid as the pureſt ſpring water; but it is more frequently found brown, rediſh, or blackiſh. It is produced in almoſt all parts of the world: England, France, and Germany, afford it in many places, but it is moſt plentifully found in Italy. *Hill's* Hiſt. of Foſſ. p. 419, ſeq.

Naphtha has much the ſame medical virtues with *petroleum*, only in a more remiſs degree. In Perſia, it is uſed externally on many occaſions, and alſo given inwardly in colics, a few drops being the doſe. See PETROLEUM.

NAPLES *yellow*, the common name in the colour ſhops of London, and among our painters, for the ochre called *giallolino*. See GIALLOLINO.

NAPUS, *navew*, in botany, the name of a genus of plants, the characters of which are the ſame with thoſe of the turnep, and which ſcarce deſerves to be made a different genus from it, differing only in its general figure.

The ſpecies of *navew* enumerated by Mr. Tournefort are theſe: 1. The white-rooted, manured *navew*. 2. The yellow-rooted, manured *navew*. 3. The black-rooted, manured *navew*. 4. The largeſt-rooted, manured *navew*. And, 5. The wild *navew*. *Tourn.* Inſt. p. 229.

The ſeeds of *napus* are roundiſh, of a blackiſh colour, and of an acrid and biting taſte. They are accounted deterſive, inciſive, aperitive, and digeſtive, and ſaid to be good in malignant fevers, and the ſmall pox, and are an ingredient in the Venice treacle. The root of the plant is ſaid to be alſo good in coughs, aſthmas, and conſumptions.

Nape oil is made from the ſeed of the *napus ſylveſtris Lobelii*, often called *navette*, and the oil *navetta oil*. *Lemery's* Hiſt. of Drugs. See NAVETTE.

NAPUS, in natural hiſtory, a name given to a ſpecies of *voluta*, approaching to the nature of the famous admiral ſhell, and more commonly known by the name of the *falſe admiral*, or *baſtard admiral*. See ADMIRAL.

NAPUT, in botany, the name given by the Norwegians to a plant whoſe root is an excellent remedy for the colic. It grows plentifully in the northern parts of Norway, and is the conſtant remedy uſed by the miners for their colics, which are particularly ſevere. The taſte is ſaid to be agreeable, being at firſt chewing ſomewhat like a radiſh, but afterwards having the flavour of the garden angelica. Phil. Tranſ Nº 114.

NARCAPHTHON, in the materia medica, the name given by many to the bark called *caſcarilla*.

NARCE, ναρκη, a torpor, ſtupor, or dullneſs of ſenſation; uſed either for a natural ſtupidity, or for that ſtupefaction of the ſenſes brought on by medicines, to alleviate the violence of pains.

NARCISSITES, in natural hiſtory, a name given by ſome authors to a ſpecies of *aſteropodium* from its ſuppoſed reſemblance to the flowers of the narciſſus; others have called ſome of the coralloide fungufes by that name, and others a ſpecies of echinites of the pileated kind.

It is, however, a name that none of them have any title to, ſince the reſemblance will appear very ſmall when nicely conſidered.

NARCISSOLEUCOIUM, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the liliaceous kind, and is compoſed of ſix petals, ſometimes equal, ſometimes irregular in ſize, and is pendulous, and of a ſomewhat bell-faſhioned form. The cup of the flower becomes finally a fruit of a roundiſh figure, divided into three cells, and containing roundiſh ſeeds; to this alſo it is to be added, that the root is bulbous.

The ſpecies of *narciſſoleucoium* enumerated by Mr. Tournefort, are theſe: 1. The common *narciſſoleucoium*. 2. The *narciſſoleucoium* with a white expanded flower. 3. The many-flowered, late, meadow *narciſſoleucoium*. 4. The double, many-flowered, meadow *narciſſoleucoium*. 5. The greater, trifoliate *narciſſoleucoium*. 6. The leſſer, trifoliate *narciſſoleucoium*. 7. The blue-flowered, trifoliate *narciſſoleucoium*. 8. The broad leaved, autumnal *narciſſoleucoium*. 9. The capillaceous-leaved, autumnal *narciſſoleucoium*. 10. The capillaceous-leaved, vernal *narciſſoleucoium*. *Tourn.* Inſt. p. 387.

NARCISSUS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is liliaceous, conſiſting of one leaf made in a bell-like ſhape, and divided at the edge into ſix ſegments, ſurrounding its middle in manner of a crown. The cup grows out of a membranaceous huſk, and becomes at length a longiſh, or roundiſh fruit, ſomewhat approaching to a trigonal form; and opening, ſhews itſelf to be compoſed of three cells, which uſually contain roundiſh ſeeds. See Tab. 1. of Botany, Claſs 9.

The ſpecies of *narciſſus* enumerated by Mr. Tournefort are theſe: 1. The great, pale-flowered *narciſſus*, with hoary leaves. 2. The great, blueiſh, white-flowered *narciſſus*, with a deep, yellow, circle. 3. The white-flowered, ſcented *narciſſus*, with the circle of the flower yellow. 4. The ſnow white, ſweet-ſcented *narciſſus*, with a red circle. 5. The white *narciſſus*, with a yellow circle. 6. The great, white, ſweet-ſcented *narciſſus*. 7. The great, white, oriental *narciſſus*. 8. The middle, white, oriental *narciſſus*. 9. The white, oriental *narciſſus*, with a ſtarry cup. 10. The great, plain, white *narciſſus*. 11. The leſſer, plain, white *narciſſus*. 12. The ſnow-white *narciſſus*. 13. The ſmall-flowered, white *narciſſus*, with the ſmell of jaſmine. 14. The great, white, oriental *narciſſus*, with a yellow cup. 15. The middle, white, oriental *narciſſus*, with a yellow cup. 16. The leſſer, white, oriental *narciſſus*, with a yellow cup. 17. The white, oriental *narciſſus*, with a yellow, double cup. 18. The oriental *narciſſus*, with a round, gold, yellow cup. 19. The pale-flowered *narciſſus*, with a ſaffron-coloured middle. 20. The pale-flowered *narciſſus*, with a gold, yellow middle. 21. The many-flowered, white *narciſſus*, with a deep, yellow circle. 22. The *narciſſus*, with a purple middle. 23. The pale-flowered *narciſſus*, with a ſaffron-coloured middle. 24. The pale-flowered *narciſſus*, with a gold, yellow circle. 25. The white *narciſſus*, with reflex leaves, and a ſhort, gold yellow cup. 26. The elegant *narciſſus*, with double flowers, variegated with yellow, and ſaffron colour. 27. The ſtrong-ſcented, full-flowered *narciſſus*, with a yellow middle. 28. The very large flowered *narciſſus*, with a yellow middle. 29. The ſnow white, fine ſcented *narciſſus*, with a yellow cup. 30. The many-flowered, African, yellow *narciſſus*. 31. The many-flowered, Portugal, yellow *narciſſus*. 32. The great, many-flowered, Conſtantinople *narciſſus*, with double, greyiſh, white flowers. 33. The yellow, Conſtantinople *narciſſus*. 34. The narrow-leaved, all-yellow *narciſſus*. 35. The narrow-leaved, yellow *narciſſus*, with a large cup. 36. The great, white-flowered, narrow-leaved *narciſſus*. 37. The ſmaller, white-flowered, narrow-leaved *narciſſus*. 38. The pale-flowered, narrow-leaved *narciſſus*, with a deep, yellow cup. 39. The little, white *narciſſus*, with a beautiful, purple border. 40. The graſſy-leaved *narciſſus*, with a deep yellow middle. 41. The ruſh-leaved *narciſſus*, with yellow flowers, and long cups. 42. The ſmaller, yellow-flowered, ruſh-leaved *narciſſus*. 43. The ruſh-leaved *narciſſus*, with yellow, variegated flowers. 44. The ruſh-leaved *narciſſus*, with a pale flower, and a deep yellow cup. 45. The ruſh-leaved *narciſſus*, with a round, roſe-like flower. 46. The plain, white flowered, ruſh leaved *narciſſus*. 47. The ruſh-leaved *narciſſus*, with twiſted leaves, and with white flowers, and yellow cups. 48. The white, autumnal *narciſſus*. 49. The ſmalleſt, white, autumnal *narciſſus*. 50. The great, white flowered, broad-leaved *narciſſus*, with a ſhort, yellow cup. 51. The broad-leaved, pale-flowered *narciſſus*, with a large, gold-coloured cup, and a ſtriated ſtalk. 52. The broad-leaved *narciſſus*, with large, pale-coloured flowers, and a yellow cup. 53. The middle, white *narciſſus*, with a ſhort, yellow cup. 54. The great, pale, yellow *narciſſus*. 55. The yellowiſh *narciſſus*, with an hexangular tube. 56. The yellow *narciſſus*, with a round tube. 57. The white *narciſſus*, with a yellow tube. 58. The white *narciſſus*, with a yellow cup, and with the ſmell of the muſcari. 59. The white *narciſſus*, with an oblong, yellow cup. 60. The wild, pale-flowered *narciſſus*, with a yellow cup. 61. The great, all-yellow *narciſſus*, with a very long cup. 62. The plain, yellow *narciſſus*, with the leaves of the flower bent back. 63. The ſmall, plain, yellow *narciſſus*. 64. The white *narciſſus*, with a yellow cup. 65. The white *narciſſus*, with a yellow fimbria. 66. The ſmall, creeping, yellow *narciſſus*. 67. The white, narrow-leaved *narciſſus*, with an oblong cup, and a depending flower. 68. The mountain, ruſh-leaved *narciſſus*, with a yellow cup. 69. The mountain *narciſſus*, with a fimbriated flower. 70. The ſmalleſt, white, mountain, ruſhy-leaved *narciſſus*. 71. The mountain, ruſhy-leaved *narciſſus*, with a gold, yellow cup. 72. The coronated, mountain *narciſſus*. 73. The double-flowered, oriental *narciſſus*, with yellowiſh, white flowers. 74. The broad-leaved, white *narciſſus*, with the yellow middle. 75. The white *narciſſus*, with a double yellow corona. 76. The double, plain, yellow *narciſſus*. 77. The double, purple-middled *narciſſus*. 78. The double, ſnow-white *narciſſus*. 79. The Virginian, double, white *narciſſus*. 80. The double, yellow, wild *narciſſus*, without a cup. 81. The double *narciſſus*, with variegated flowers. 82. The yellow, wild *narciſſus*, with a double, or triple, yellow tube. 83. The paler, yellow, wild *narciſſus*, with a triple tube. 84. The yellow *narciſſus*, with a divided tube. 85. The double, yellow, broad-leaved *narciſſus*. 86. The double, anemone-like, gold-yellow, ruſh-leaved *narciſſus*. 87. The gold-yellow, double *narciſſus*. 88. The ſea *narciſſus*, called by many the little, white *ſquill*. 89. The purple-flowered, ſea *narciſſus*, 90. The liliaceous *narciſſus*. 91. The white-flowered, ſpring, American *narciſſus*. 92. The American *narciſſus*,

narcissus, with double white flowers, smelling like balsam of Peru. 93. The white *narcissus* of Ceylon, with a hexangular sweet-scented flower *Tourn.* Inst. p. 353, seq.

NARCOS, in ichthyology, a name given by Joannes Cuba, and other writers, to the *torpedo* or cramp-fish; a species of raia, distinguished by Artedi by the name of the *raia tota lævis*, the wholly smooth raia.

NARCOSIS, a stupefaction or insensible state, whether brought on by medicines, or happening from natural causes.

NARDINUM *unguentum*, *ointment of spikenard*, an ointment greatly celebrated among the antient writers in medicine. It seems to have been variously prepared, but always with a great number of aromatic ingredients, and always with *spikenard* for the basis.

Dioscorides says, that the *malabathrum*, or Indian leaf, was sometimes an ingredient in it, but that it was also sometimes made without it. It was generally, however, mix'd with the *oleum balaninum*, or *amphacinum*, inspissated with an addition of schænanth; and to increase its fragrancy there were added, costus, amomum, myrrh, and balm of Gilead.

The finest was accounted that which was of a thin consistence, and very fragrant smell. It was said to be attenuating and detersive, but somewhat acrimonious; and was sometimes, for particular uses, reduced to a solid consistence with resin. *Dioscorides*, l. 1. c. 35.

NARDUS, in the Linnæan system of botany, the name of a distinct genus of plants of the grass kind, the distinguishing characters of which are, that there is no calyx; that the flower is composed of two valves; the exterior is very slender, oblong, and ends in a beard or awn, and in some sort receives the other into a cavity in its fore part: the interior is small and strait, and is terminated by a much shorter awn. The stamina are three capillary filaments, shorter than the flower: the antheræ are oblong: the germen of the pistillum is oblong: the styles are two in number, capillary, and reflex and downy: the stigmata are simple. The flower continues firmly attached to the seed. The seed is single, long, strait, pointed at both ends, and narrower in its upper than in its under part. *Linnæi* Gen. Plant. p. 19. See SPIKENARD, *Cycl.*

NARDUS *rustica*, in botany, a name attributed by some authors to the *asarabacca*, and by others to the *baccharis monspeliensium*. *Dale*, Pharm. p. 79.

NARES *piscium*. The *nostrils* in fish are placed so very variously, and have so many differences in number, figure, situation and proportion, that they make a very essential series of characters, for the distinguishing the genera and species one from another. In regard to number; 1. Some fish have them not at all, as the petromyzum. 2. Many fish have one *nostril* on each side, placed in the manner of those of birds and quadrupeds, as the chonepterus, &c. 3. Many have them placed two on each side, as the cyprini, percæ, &c.

In regard to figure, they are, 1. In some round, as all four are in the gadi, and the two anterior ones in the conger, mackrell, &c. 2. Some are oval, as the posterior pair in the conger, &c. and, 3. Many are oblong.

As to their situation, they also differ much: 1. Some are placed very near the snout or rostrum, as the clupeæ; and the anterior tubulose foramina, in the conger or sea eel, are also of this kind. 2. In many kinds of fish they are placed near the eyes, as in the pike, the pearch, and the like: and, 3. In some they are placed as it were at a middle distance between the eyes and the end of the snout, as in the ammodytæ or sand eels, &c.

The *nares* of fish differ also in proportion: in those fishes which have two pairs of these holes, they are, 1. In some very near one another, so as almost to touch: they are thus placed in the cyprinus and clupeæ, &c. 2. They are placed at great distances, which is the case in the conger, the pearch, and many others. According to these variations, the *nostrils*, tho' a part in general very little attended to, yet become of notable use in the distinguishing the species. *Artedi's* Ichthyol.

NARIFUSORIA, a name given by authors to such medicines as were meant to be instilled into the nostrils, for disorders of the head and eyes.

NARINARI, the Brasilian name of a fish of the *aquila marina* kind, called by the Dutch *piilstert* and *sicle*.

It is very large and flat, and the figure of its body is nearly triangular, its sides or wings being very broad, and larger. The head is very large, and has a furrow down its middle: the mouth is somewhat triangular, but rounded at the corners. It has no teeth; but in the place of them, has a bone in the under part of its mouth, in the shape of a tongue, of four fingers long, and a finger and half broad, and a smaller bone of the same shape in the upper part: between these it crushes its prey. The under bone consists of seventeen small pieces, of the figure of the letter V. These are hard and firm, and are held together by cartilages, and under them are the same number of others, much more soft and spungy. The upper bone consists of fourteen pieces, which are each in like manner double, and joined to one another by cartilages. The body is usually a foot and a half long, and the tail four foot. Its flesh is finely flavoured. *Marggrave* Hist. Bras. p. 119.

The bones of this and the like fish's mouths, are the fossile *siliquastra*.

NARIS *externus alius*, in anatomy, a name given by Riolanus to one of the muscles of the nose, the use of which, he says, is to dilate the ala of the nose, without any elevation of the nose itself. It is called by Albinus the *compressor naris*, and by Winslow the *transversalis*, or *inferior nasi*. Cowper calls it the *elevator alæ nasi*, and Santorini the *transversus nasi*.

NARONICÆ *radix*, in the materia medica, a name given by some authors to the iris root. *Ger.* Emac Ind. 2. See IRIS.

NARROW, in the manege. A horse is said to *narrow*, when he does not take ground enough, or does not bear far enough out to the one hand or to the other. If your horse *narrows*, you must assist him with the inside rein, that is, you must carry your hand to the outside, and press him forward upon straight lines with the calves of your legs.

NARROW is also a term among bowlers. See BOWLING.

NARWAL, a name given to a fish of the whale kind, more frequently called the *sea-unicorn*. See UNICORN.

NASAMMONITES, in natural history, a name given by the antients to a stone, which Pliny describes to have been of a blood colour, variegated with veins of black. We know no stone which answers to this character at present, unless it be some of the agates, in a variegated state.

NASCALE, a sort of pessary, made of wool, cotton, or the like, and introduced into the vagina, after being impregnated with proper ingredients.

NASDA, a word used by some medical writers for *naphthæ*, and seemingly a corruption of that word.

NASITAS, a word used by some authors to express a speaking thro' the nose.

NASTOS, in botany, a name by which Clusius and some other authors have called the reed, of which the common walking canes are made, which is the *arundo farcta* of other writers. *Ger.* Herb. p. 34.

NASTURTIUM, *cresses*, in botany, the name of a genus of plants, the characters of which are these: the flower consists of four leaves, and is of the cruciform kind: the pistil arises from the cup, and becomes a roundish flatted fruit, divided by an intermediate membrane into two cells, and containing usually a number of flat seeds. To these marks it is to be added, that the leaves of the *nasturtiums* are divided and cut into segments, by which it is at sight distinguished from the thlaspi.

The species of *nasturtium* enumerated by Mr. Tournefort, are these: 1. The common garden *cress*. 2. The curled-leav'd garden *cress*. 3. The narrow-leav'd garden *cress*, with more curled leaves. 4. The broad-leav'd garden *cress*. 5. The wild *cress*, called by some the umbellated *thlaspi*. 6. The lesser-podded wild *cress*, with finely-divided leaves. 7. The wild *cress*, with extremely fine divided leaves. 8. The oriental *nasturtium*, with the lower leaves like those of yarrow, and the upper ones like those of thorough wax. 9. The wild *cress*, with cristated pods. 10. The alpine *cress*, with finely-divided leaves. 11. The little spring *cress*, called by some the rock *cardamine*. 12. The little rock *cress*, with leaves like those of shepherd's purse. 13. The small procumbent spring *nasturtium*: and, 14. The little spring *nasturtium*, with leaves only at the root. *Tourn.* Inst. p. 213.

Water-cresses are frequently eaten in spring as a sallad. The whole plant is of a very acrid taste, and is a powerful attenuant and resolvent. It is recommended as a kind of specific in the scurvy, and is eaten in great quantities by many with that intent. It is good against all obstructions of the viscera, and consequently in jaundices, and other chronic diseases. It is also a powerful diuretic and promoter of the menses. People have pretended to preserve the virtues of this plant in waters, syrups, and conserves; but the best way of taking it is either to eat it as a sallad, or to drink its expressed juice singly, or mixed with that of the other antiscorbutic plants, as brooklime, &c. which is often done.

NASUS, in zoology, the name of a fresh-water fish, common in the Rhine, the Danube, and most of the large rivers in Germany, tho' unknown in England, and called by different authors the *simus*, *savetta*, and *platyrynchos*.

Its general size is between six and twelve inches in length. In shape and colour it much resembles our chub. Its belly and sides are of a silvery white, and the belly fins and the lower half of the tail are often a little reddish: its head is small, and has a black spot on its hinder part; its belly is flat, and somewhat broad, and its scales large; and its snout or nose stand out beyond the mouth, which is a singularity, and from which it had its name. Its mouth is very small; it has no teeth, and its skull is pellucid. It is a loose and insipid-tasted fish, and very full of bones. They spawn in May, at which time the males are rougher than at any other season, and have their heads speckled with white spots, like the English rudd. At this time also they swim together in immense shoals, and the fishermen have sometimes caught two or three thousand of them in one night. *Willughby's* Hist. Pisc. p. 251.

NATANT *leaf*, among botanists. See LEAF.

NATATIO, *swimming*, in ichthyology. The *swimming* of fishes in general is greatly assisted by their air bladder. Those kinds which have not this bladder, either have regular lungs, and contain air in them, as is the case in the cetaceous fishes; or they have remarkably thin and flat bodies, as the rays and thornbacks, and the pleuronecti; or remarkably long and flexous ones, as the petromyza; and by these means are capable of easy flexuous motions, which, with the help of the fins, thrust them any way at pleasure; tho' their bodies are not so nicely pois'd, as to the

weight

weight of the water, as those of such fish as have the assistance of these air-vessels. It has been supposed by some, that the motion of fish in the water depended principally upon the pectoral fins, but this is easily proved false by experiment; for if the pectoral fins of a fish are cut off, and it be again put into the water, it will be found to move forward or sideways, upward or downward, as well as it did when it had them on. If a fish be carefully observ'd, while *swimming* in a basin of clear water, it will be found not to keep these pectoral fins constantly expanded, but only to open them at such times as it would stop or change its course, this seeming to be their principal, if not their only use. The pectoral and ventral fins, in the common fishes of the cathetoplateous or compressed form, serve in the same manner in the keeping the fish still, and serve in scarce any other motion than that toward the bottom: so that this motion of the fish, which has been generally attributed to their fins, is almost wholly owing to their muscles, and to the equipoise of their air-bladder. That the use of the pectoral and ventral fins is to keep the fish steady and upright in the water, is evident from the consequences of their loss: if they are cut off, and the fish put again into the water, it cannot continue in its erect natural posture, but staggers about, and rolls from side to side. The fins of the back and anus are also of great use to the keeping the creature in its natural position, as is easily seen by cutting them off, and observing the motions of the fish afterwards.

Tho' a great deal depends on the motion of the muscles of the several parts of the body in the *swimming* of the fish, yet the tail, and those muscles which move the lower part of the body, to which it is affixed, are the great instruments by which their swift motions in the water are performed. The moving the tail, and that part of the body to which it adheres, backward and forward, or sideways any one way, throws the whole body of the fish strongly the contrary way; and even in *swimming* strait forward, the motion and direction are both greatly assisted by the vibrations of this part, as may be experienced in the motion of a boat, which when impelled forward, may be firmly guided by means of an oar held out at its stern, and moved in the water as occasion directs. The dorsal muscles, and those of the lower part of the body between the anus and tail, are the principal that are used in the motion of this part, and these are therefore the most useful to the fish in *swimming*. The muscles of the belly seem to have their principal use in the contracting the belly and the air-bladder. They have been supposed of use to move the belly fins; but there are too many of them for such a purpose, and these fins have each its peculiar muscle fully sufficient to the business. The use of the tail in *swimming* is easily seen, by cutting it off, and committing the fish to the water without it, in which case it is a most helpless creature. See AIR-*bladder*.

NATIVO *habendo*, in law, a writ directed to the sheriff, for a lord who claimed inheritance in any villain, when his villain was run away from him, for the apprehending and restoring him to the lord. Terms of Law.

NATIX, in natural history, a name given by some old writers to the *nerita*.

NATRIX, in botany, the name given by Rivinus to a genus of plants, nearly allied to the anonis, and comprehended with it in one genus by Linnæus, under the name of *anonis*. *Rivin.* vol. 4. p. 82. See REST-*harrow*.

NATRIX, in zoology, the name of the common or water snake, called also *torquata*, from the ring about its neck. It is much longer and larger than the viper, and is no water animal, properly speaking, but a land one, which being able to swim very well, often takes the water to hunt about for frogs, which are its principal food. It grows to be much longer and larger than the viper, and does not bring forth live young ones, but great numbers of eggs, which it lays in dunghills, to be hatched by the warmth of the place, or by the heat of the sun.

It is very common in bushy places, and near waters, and in winter finds holes in the banks of ditches, or about the roots of trees, where it lies torpid the whole winter. It has no poison, and may be safely taken up and played with, never so much as attempting to bite. It feeds on many small insects, sometimes on vegetable substances, and oftener on frogs, mice, &c.

Its back is of a sort of dusky earth colour, and its belly variegated with black and a bluish white, but near the head almost wholly white, having only a few small spots of black at the sides, the colour growing darker toward the end of the tail; and near the end, the middle part of all the scales are black, and their extremities only of a bluish white: the whole belly is covered with long parallel scales, placed transversely. The back and sides are covered with small scales, and are variegated with several streaks and spots of black: there are more than eighty transverse black lines running from the back to the sides; and beside these, two other rows of smaller, in form of spots, near the middle of the back. The head is covered with large scales of a duskier colour than those of the rest of the body, and the upper jaw is white on each side, with four or five slight lines of black running across it. Its chain is yellow, and is composed of two large spots of that colour, placed one on each side of the neck, or at each angle of the jaws, between which is placed a large triangular spot of a deep black, with its top directed toward the tail. It has none of those long canine teeth of the viper and other poisonous serpents, by means of which the poison is conveyed into the wound, but only two rows of small serrated teeth, destined by nature for no other use than eating its food.

It may not be judged improper to have been thus particular in the description of this species, as it is well to know what of the snake kind are, and what are not to be feared; and as the apothecaries and others, for want of these characters, often buy this common snake under the name of the viper. *Ray's* Syn. Anim. p. 335, 336.

NATRUM, or NATRON, (*Cycl.*) in natural history, the name of the *nitre* of the antients.

There have been various opinions about the *natrum* of the antients, and some have been of opinion, that our salt petre or nitre was the same substance; but this has been always discountenanced by the more judicious. Dr Hill, who had met with a salt from the same part of the world whence the antients had their *natrum*, and which answered to all the characters they have given of it, defines it to be a salt found sometimes pure, and sometimes fouled with earth, fermenting with acids, and forming flat oblong crystallizations, with four unequal sides, and two truncated ends. These were the characters of that salt, and these perfectly agree with the accounts we have of *nitre* in the earliest ages, tho' we have none sufficiently accurate to take them all in. And whatever may have been the opinion of some, that the *natrum* or *nitre* of the Hebrews was very early lost, a careful examination of the antients proves the contrary, and that this very salt was the *nitre* both of the Greeks and Romans, the *nitrum* and *aphronitrum* of Dioscorides, and the *nitrum* of Pliny. It is found in broad and flat masses of various sizes, but usually small, and when broken, are found to be composed of fasciculi or bundles of small fibres, of an oblong and flatted figure, and laid but loosely together.

It is naturally of a dusky white; but is sometimes found of a brown colour, and sometimes of a fine deep red. This is its purest state; but beside this, it is frequently found in form of powder mixed with dirt, and rising in little hillocks on the surface of the ground. It is of an acrimonious pungent taste, and is more like the alkaline salts produced by burning vegetables, than any of the native salts. It dissolves in a very small quantity of water, and ferments violently with aquafortis, or any other weaker acid menstruum.

It is found in great plenty in Sindy, a province in the inner part of Asia, and in many other parts of the east, and might be had in any quantities. Perhaps it would be worth considering as a branch of commerce, as it would supply the place of pot-ashes in the making soap and glass, as the same author has tried.

The characters recorded of the *nitre* of the antients are, 1. That it would ferment with vinegar; and, 2. That it had an abstersive quality. These we have from the scriptures: and the rest were, that it was of an acid taste; that it was found native in the eastern parts of the world; that it served in the place of soap, and that with sand it would make glass. All these properties this salt has; and it may be added, that no other native salt has them. *Hill's* Hist. of Foss. p. 386 to 389.

It is a very remarkable property of this salt, that tho' in itself an alkali, and fermenting very violently with acids in its native dry state, yet in solution it does not ferment with them at all. If indeed oil of vitriol, or some other acid, be added to the solution of *natrum* while turbid, that is, while some of the particles of the salt remain yet whole in it, the two liquors will ferment violently; but if the solution be set by till wholly clear, the same acid will cause no effervescence in it; but the same solution, evaporated to a third part, will again ferment with that or any other acid, the particles of the salt at that time being got together again, and meeting the acid as in their solid form.

This salt contains a volatile alkali, absorbed from the air, and embodied in it. Its other principle seems a marine salt, which it may receive either from the earth, or from salt springs or sea water, according to the different places where it is found.

Pliny tells us, that the *natrum* of Egypt was only found to be produced at those times of the year when the dews fell. And M. de la Chambre affirms, that in Egypt, three or four days before the Nile begins to overflow, there always falls a certain dew, which has a fermenting quality, and will leaven dough exposed to the air. At the time of the falling of this dew, the *natrum* pits grow full of that salt: and Vanslebius, Sands, and many others, join in affirming, that at this time the air becomes greatly more healthy; and tho' before the falling of this dew, or the inundation of the Nile, people die of the plague to the number of five hundred in a day in Grand Cairo, after this not one dies of that disease. It is easily seen, that the overflowing of the Nile does not produce this effect, but the dews and air, which at that time are full of that volatile alkali, which is one of the principles of the *natrum*. People who have preserved specimens of the *natrum* have also observed, that they would grow much heavier on being exposed to the air at the time of the overflowing of the Nile. Phil. Transf. N° 160.

NA-

NATURAL (*Cycl.*) — NATURAL *history*. The *natural history* only of any one particular place, is a subject very extensive in its materials, and to be set about without great care and circumspection. Mr. Boyle has favoured the world with a list of the heads under which to arrange things, and what to enquire after on such an occasion.

The general heads under which he comprehends the articles of this history, are four; the things which regard the heavens, the air, the waters, and the earth.

Of the first class are the longitude and latitude of the place; the length of the longest and shortest days and nights; the climates, parallels, &c. what fixed stars are seen, and what are not seen there.

About the air may be observ'd, its temperature, as to the first four qualities, and the measure of them; its weight, clearness, refractive power; its subtlety or coarseness; its abounding with or wanting an esurine salt: its variations according to the seasons of the year, and the times of the day: what duration the several kinds of weather usually have: what meteors it is most or least apt to breed; and in what order they are generated, and how long they generally last: what winds it is most subject to; whether any of them be stated or ordinary: what diseases are said to be epidemical, or depending on the state and condition of the air. what other disease it is subject to, wherein the air may be supposed to have some share: what is the usual salubrity and insalubrity of it, and what sorts of constitutions it agrees with, what it does not.

About the waters, it may be proper to observe the sea, its depth, tides, currents, saltness, and other qualities. next, the rivers will come under consideration, their depth, length, course, inundation, and the goodness or badness of their waters, with their gravity, and other peculiar qualities. After these, the lakes, springs, ponds, &c. are to be considered, especially the mineral waters, their kinds, qualities and virtues, and the manner of trying them. The inhabitants of the waters may follow here; and the particular kinds of fish that are found there, whether of the sea or rivers, are to be mentioned, with an account of their stores, bigness, goodness, seasons of perfection, haunts, peculiarities of any kind relating to them, and the manner of taking them, especially when there is any thing singular in it.

The things relating to the earth, are last to be examined: these are, first the earth itself, then its inhabitants, and its various productions, whether external or internal. In the earth itself may be observed, its dimensions, situation east, west, north and south; its figure; its plains and valleys, their extent; its hills and mountains, and the height of the tallest, both in reference to the neighbouring valleys and plains, and to the level of the sea; as also whether the mountains lie scattered, or are disposed in ridges; and if of the latter kind, whether they run east, west, north, or south. What promontories also, and what firey or smoaking hills it has, if any: whether the country be coherent, or much broken into islands: what the magnetical declination is in several places, and the variation of that declination in the same place, and if those be considerable; what may be conjectured as the occasions of them, whether the vicinity of iron-mines, of subterranean fires, or what else. What the nature of the soil is, whether clayey, sandy, or of good mold; and what vegetables, plants and trees best agree with it and succeed in it, what worst. By what particular contrivances the inhabitants improve the advantages, or remedy the disadvantages of the soil; and what hidden qualities the soil may have. The inhabitants of the earth are then to be considered, both natives, and strangers that have been long settled there; and in particular, their stature, colour, features, strength, agility, or defects of these; and their complexions, hair, beauty, and the like; their diet, inclinations and customs, so far as they are not owing to education: the fruitfulness or barrenness of the women; their hard or easy labours: the diseases they are most subject to, and any remarkable symptoms attending them

As to the external productions of the earth, the enquiries are to be these: what grasses, grains and fruit it best produces: the herbs, flowers, and timber trees; and the coppices, groves, forests and woods the country has or wants: what peculiarities are observable in any of them; what soils they most like or dislike, and with what culture they thrive best. Then what animals the country has or wants, both as to wild beasts and birds of prey, and as to poultry and cattle of all sorts; and particularly, if they have any animals that are not common, or any thing particular in those that have. After those, the subterranean stores are to be examined; what minerals the earth affords, and what it wants: then what quarries of stone, and in what manner they lie: what clays and earths are found there; as, clays, marles, fuller's-earths, earths for tobacco-pipes, earth for potter's wares, medicinal earths: what other mineral productions it yields, whether coals, salt mines, or salt springs, alum, vitriol, sulphur, &c. What metals the country yields, with a description of the mines of them; their depths, numbers, situations, signs, waters, damps, quantities of ores, goodness of the ores, and the ways in use for the reducing them to metals.

To these general heads should be added, inquiries into traditions in the country, of any thing relating to it, whether peculiar to it, or only more common there than elsewhere; and where these require learning or skill in the answerer; the utmost care is to be taken to put the people in a way to give their accounts in a satisfactory manner; for a false or bad account of any thing is always much worse than no account at all. Phil. Transf. N° 11.

NATURAL, in music, is applied to a song, the notes whereof move easily and gracefully, giving the performer as little trouble as possible; as when it is not carried too high, or sunk too low, whereby the voice or instrument is in no wise forced or strained. Vid. *Broff.* Mus. Dict. in voc.

NATURAL *harmony*, is that produced by the *natural* and essential chords of the mode. See MODE.

NATURAL *note*, is used in opposition to sharp and flat notes, which are called artificial. See NOTE and SCALE.

The *natural note* ♮, is used to contradict those flats and sharps that are set at the beginning of a staff; and, in such case, you must take the *natural note* as it is in the gamut.

NATURAL *music*, *musica naturale*, among the Italians, is used to signify music formed by the organs of the human voice, unassisted by instruments or other articles.

Natural music is more peculiarly used to denote a song that proceeds in the *natural* order of the notes, without flats or sharps.

NATURALIZATION (*Cycl.*) — By our statutes, foreign protestants are *naturalized* by residing seven years in the British colonies in America. 13 Geo. II. c. 7.

NAVAGIUM, in our old writers, a duty incumbent on tenants to carry their lord's goods in a ship. *Liberi sint, ab omni carriagio*, navagio, &c. *Blount.*

NAVALIA, among the Romans, were docks or ports where ships used to be laid up after building

NAVALIA likewise signified the wharfs or keys at Rome, where the ships used to load and unload their goods, all which were near the Sublician bridge. *Pitisc.* in voc.

NAUCRARI, Ναυκραροι, among the Athenians, a designation given to the chief magistrates of the δημοι, boroughs or townships, which were likewise called ναυκραριαι, because each of them were obliged, besides two horsemen, to furnish out one ship for the public service. *Pott.* Archæol. Græc. l. 1. c. 13. T. 1. p. 78

NAVE (*Cycl.*) — NAVE *of a wheel* is that short thick piece in the center of the wheel, which receives the end of the axle-tree, and in which the ends of the spokes are fixed; it is bound at each end with hoops of iron, called the *nave-bands*: it has likewise in each end of the hole, thro' which the end of the axletree goes, a ring of iron called the *wisher*, which saves the hole of the *nave* from wearing too big.

NAVEL (*Cycl.*) — NAVEL-*string*. It is a method universally received by prudent surgeons and midwives, to make an exact ligature upon the umbilical cord or *navel-string* of the new-born infant, lest it should bleed to death thro' the vessels which compose it. This ligature is to be made, as soon as the infant and after-burthen are delivered, with a strong thread of about an ell long, folded together four times; and having made a knot at one end, it is then to be passed twice round the *navel-string*, at about two or three fingers breadth from the abdomen, and afterwards tied with a double knot: this done, the cord leading to the placenta may be divided with a pair of scissars below the ligature, and the wounded part belonging to the infant dressed with lint, after which it may be left to the nurse till it becomes dry, and falls off of itself.

There have been instances of some children receiving no harm from the cutting the *navel-string*, without the ceremony of the ligature; but as there have also been too many instances of their dying by the omission, and as the operation is so easy, the midwife is unpardonable who omits it. *Heister*'s Surgery, p 22.

Dr. Schulze contradicts the common opinion concerning the umbilical vessels: he endeavours to prove, that the *navel* is not formed by the ligature which the midwives make, or by animals gnawing the *navel-string* of their young with their teeth, but by nature; and that the umbilical vessels separate spontaneously, or with very little force, from the interior surface of the skin; after which, the umbilical vessels within the young creature's body contract and shrivel, their extremity by which they adhered to the *navel* becoming black and pointed, as if they had been burnt, and at last disappear altogether: for, says he, what are commonly described as these vessels changed into ligaments, are no other than the sheaths in which they were formerly contained. From this doctrine he concludes, that it is unnecessary to make any ligature upon the *navel-string* after birth.

In confirmation of this, Dr. Eller relates several instances of the *navel strings* of children being left untied after they were cut, without being attended with any hæmorrhage, or other bad consequence. Commerc. Norimb. 1733. Hebd. 48. §. 2.

Mr. Monro is of opinion, that the fœtus in viviparous animals receives its nutrition from the umbilical vessels alone. See FOETUS.

It has been observed, that in blowing into the placenta by the umbilical vessels, the air and the blood were easily forced out of it, by that surface of the placenta which is affixed to the uterus; but that they could by no means be driven out at the other

other furface which is toward the fœtus. Hence it is to be obferved, that the uterus appears not to be covered by any membrane within, and that the placenta alfo has none on that fide where it adheres to the womb, fo that there is nothing to prevent the blood from readily flowing from the uterus into the placenta, and thence to the child. What we ufually underftand by the word membrane is a covering of fo clofe a texture, as to keep out air, or fluids; and it is very evident to reafon, that the placenta ought to have none fuch on that part where it is to communicate with the uterus; neither can the eye difcover any fuch there, though on the other fide it is eafy to diftinguifh one.

The *navel-ftring*, befide its vein, and its two arteries, is compofed of a fpongy fubftance, in which thefe blood veffels are lodged; this fpongy fubftance is compofed of a number of cellules which communicate with one another, and contain a glutinous liquor, which is ufually found in them in great abundance: if we confider the *navel-ftring* as a cylinder, the blood veffels run in a fpiral round its axis, and are laid one over another, but that differently in different fubjects; hence it is that the *navel-ftring* is tortuous.

When the veffels have run through the whole length of the *navel-ftring* in the fame diameter, they break into a number of branches, and enter the placenta, where they afterwards divide themfelves into capillary ramifications. The diameter of the vein is all the way double to that of both the arteries; fo that it contains twice as much blood as the two arteries together. If the *navel-ftring* were only compofed of thefe three veffels, the fœtus, in moving, might eafily comprefs them in fuch manner, as to ftop the current of the blood, and its inevitable death muft be the confequence of this; but nature having provided this fpongy, or cellular fubftance, for their lodgement, this is able to give way to them, when preffed in any direction, and enables them, therefore, to bear a confiderable force, without the current of the blood being ftopped by them in it; nor is the glutinous liquor, of which thofe cells are full, of little ufe in lubricating thefe veffels. Mem. Acad. Par. 1714.

NAVEL-*wort*, *cotyledon*, in botany, the name of a genus of plants, the characters of which are thefe: the flower is compofed of one leaf, fafhioned into a hell-fhape, with a long tube, and divided into feveral fegments at the end: from the center of the cup there arifes a piftil, which perforates the bottom of the flower, and ripens afterwards into a fruit compofed of feveral fmall fheaths of capfules, collected into a fort of head, and all opening at their tops, and ufually containing an extremely minute feed.

The fpecies of *cotyledon* enumerated by Mr. Tournefort are thefe: 1. The common kind called wall *navel-wort*, and *umbilicus veneris*. 2. The great Portugal kind. 3. The yellow-flowered kind, with a long, tuberofe, and creeping root. 4. The middle-fized *cotyledon*, with a yellow flower. 5. The fhrub, African *cotyledon*, with round leaves, bordered with an edge of purple, ufually called the round-leaved, hoary, African *fedum*, or *houfeleek*. 6. The thick, or cylindric-leaved, African *cotyledon*, with beautiful purple flowers, known alfo to many under the name of a *fedum*, or *houfeleek*. 7. The long-leaved, African *cotyledon*, with fibrofe roots, and umbellated flowers. 8. The fibrofe-rooted, fea *cotyledon*, with houfeleek leaves, and flefh-coloured flowers. Thefe are the genuine fpecies of *cotyledon*, but authors who have lefs accurately examined plants, have ranked under this name feveral which are fpecies of houfeleek, of geum, and of faxifrage. *Tourn.* Inft. p. 90.

The *cotyledons*, when not in flower, may ufually be known by having thick, tuberofe roots, and thick or fatty roundifh leaves. Thefe, however, are found to be no certain characters, as there are plants truly of this genus, which have long leaves, and fibrofe roots.

NAVETTE, the name by which moft of the European nations call the *napus*, or *bunias fylveftris* of Lobel, the plant from the feeds of which the oil which we call rape oil, and the French and others *navette* oil, is expreffed. The plant is cultivated in many parts of England, and in other countries, for the fake of the feed; the oil drawn from this is ufed by many artificers, and is of a fine yellow colour, and the fmell is not offenfive. *Lemery* Dict. of Drugs.

NAVICULA, in natural hiftory, a name given by a late French author to the clafs of fhells called by us the *nautili*. See NAUTILUS.

NAVIGATION (*Cycl.*) — *Sub marine* NAVIGATION, or the art of failing under water, is mentioned by Mr. Boyle as the defideratum of the art of *navigation*. This was attempted, and fuccefsfully, according to him, by Cornelius Drebbel; feveral perfons who were in the boat breathing freely all the time. *Boyle's* Works, abr. Vol. 1. p. 130.

NAVIGATOR, in the fea language, ufually denotes a perfon capable of carrying, or guiding a fhip to any place defired.

NAULIUM, in antiquity, a mufical inftrument otherwife called *nablum*. See NABLUM.

NAULUM, among the Romans, properly fignified freight; whence it is ufed to denote a piece of money put into the mouth of a perfon deceafed, to pay Charon the ferry-man for his paffage: this piece was to be of the current coin of the emperor then reigning; fo that from it the time of the perfon's death may be known. *Danet.* in voc.

NAUPLIUS, in natural hiftory, a name by which fome authors have called the *nautilus*, as well the papyraceous, as the chambered kind. See NAUTILUS.

NAUTICUS (*Cycl.*) — NAUTICUS, in natural hiftory, a name given by fome to the *nautilus*. See NAUTILUS.

NAUTILUS, (*Cycl.*) in natural hiftory, the name of a genus of fhell-fifh, the characters of which are thefe: it expreffes, in general, in every fpecies, the figure of a boat, or veffel, made for fwimming on the water; but in the different fpecies, it is of very different figures, roundifh, or oblong, thin, or thick, furrowed, or fmooth, and fometimes is auriculated, fometimes not. Bonani obferves that this genus of fhell-fifh is very well named from the Greek ναυτίλος, which fignifies both a fifh, and a failor, for that the fhells of all the *nautili* carry the appearance of a boat, or fhip, with a very high poop.

Different authors, among the antients and moderns, have called the *nautilus* by the names of *pompilus*, *nauplius*, *nauticus*, *ovum polypi*, *polypus teftaceus*, and the French call it *le voilier*. It is fuppofed that men firft learned the method of failing in veffels, from what they faw practifed by this creature.

We at prefent know two diftinct genera of *nautilus*, the thin and the thick-fhelled *nautilus*. The firft is called *nautilus papyraceus*, and its fhell feems indeed no thicker, or ftronger, than a piece of paper, when out of the water. This fpecies is not at all faftened to its fhell, but there is an opinion as old as the days of Pliny, that this creature creeps out of its fhell, and goes on fhore to feed. When this fpecies is to fail, it extends two of its arms on high, and between thefe, fupports a membrane, which it throws out on this occafion; this ferves for its fail, and the two other arms it hangs out of the fhell, to ferve occafionally either as oars, or as a fteerage; but this laft office is generally ferved by the tail. When the fea is calm, it is frequent to fee numbers of thefe creatures diverting themfelves with failing about in this manner; but as foon as a ftorm rifes, or any thing gives them difturbance, they draw in their legs, and take in as much water as makes them fomewhat heavier than the fea water in which they fwim, and they then fink to the bottom. The manner of their voiding this abundant water when they would rife again, is by a number of holes, of which their legs are full. Hiftoir. Natur. Eclair. Part. 2. p. 248.

The other *nautilus*, whofe fhell is thick, never quits that habitation. This fhell is divided into forty, or more partitions, which grow fmaller and fmaller as they approach the extremity, or center of the fhell: between every one of thefe cells, and the adjoining ones, there is a communication, by means of a hole in the center of every one of the partitions. Through this hole there runs a pipe, which is of the whole length of the fhell. It is fuppofed by many that the fifh occafionally changes the place of its refidence, by removing from one to another of thefe cells, through this pipe in the little hole; but this is by no means probable, as the body of the fifh muft neceffarily be crufhed to death, if it were poffible to make it pafs through fuch a hole. It feems, therefore, much more probable, that the fifh occupies always the largeft chamber in its fhell, that is, it lives in the cavity between the mouth and the firft partition; and that it never removes out of this, but that all the apparatus of cells, and a pipe of communication which we fo much admire, ferves only to admit occafionally air, or water, into the fhell, in fuch proportion as may ferve the creature in its intentions of finking or fwimming. *Rumphius*, p. 17. fig. b.

Ariftotle has evidently defcribed two fpecies of *nautili*, and fome authors have thought he defcribed three; of this number is Bellonius, whom Rondeletius treats very feverely for the error of this opinion; but it is cuftomary with Rondeletius to be fevere upon Bellonius. *Bonani*, p. 89.

Some authors call this fhell *concha margaritifera*; but this can be only on occafion of the fine colour of its infide, which is more beautiful than any other mother of pearl; for it has not been obferved that this fpecies of fifh ever produced pearls.

It muft be obferved that the polypus is by no means to be confounded with the paper-fhelled *nautilus*, notwithftanding the great refemblance in the arms and body of the enclofed fifh; nor is the cornu ammonis, fo frequently found foffile, to be confounded with the thick-fhelled *nautilus*, though the concamerations, and general ftructure of the fhell is alike in both, for there are great and effential differences between all thefe genera. See the article CORNU *Ammonis*, &c.

The three principal differences of the *nautilus* clafs are, that fome are papyraceous, fome are auriculated, and fome are umbilicated. *Rondelet.* p. 98.

The feveral known fpecies of *nautilus* are thefe: 1. The great, fmooth, and thick *nautilus*. 2. The little *nautilus*, with a fmooth and thick fhell. 3 The fmooth, and thick, umbilicated *nautilus*. 4. The common, concamerated *nautilus*. 5. The furrowed, and empty *nautilus*, with no diaphragms, or feparation within. 6. The thin, and flatted, papyraceous *nautilus*. 7. The auriculated *nautilus*, with a wider fhell. 8. The undulated, and furrowed *nautilus*, with dents on each fide the edge. 9. The *nautilus* with a ridged and ferrated back. This laft fpecies is often found in the cabinets with-

out

out its outer coat, and the shell then looks all over like the most beautiful mother of pearl. Hist. Natur. Eclair Part. 2. p. 249. See Tab. of Fossils, Class 9. and Tab. of Shells, N° 8.

NEALED, at sea, is used when the sounding is deep water close to the shore: it is then said to be *nealed to*; as also when the shore is sandy, clayey, oosy, or foul and rocky.

NEAPOLITAN *disease*, a name given by many authors to the venereal disease; and from hence came the name of the *Neapolitan* ointment, which is a mixture of quicksilver, and other things into an ointment, intended as a cure for it.

NEAR, or *No* NEAR, at sea, a word of command from him that conds the ship, to the man at the helm, requiring him to let her fall to the leeward.

NEBEL, in the Jewish antiquities, a kind of musical instrument See NABLUM.

NEBRITES, in natural history, a name given by the antients to a stone held sacred to Bacchus. It was of the brownish yellow colour of the skin of the young fawn, with some variegations, and was semi-pellucid: it seems to have been the same with some of our agates, with a yellow ground; the antients, however, do not appear to have been very determinate in their accounts of it, for Pliny mentions another kind of it, which was black.

NEBRUS, in natural history, a name given by the antients to the *hinnuleus*, a deer of one year old. In the next year it is called *pattalia*; in the third *dicrota*; and in the fourth *cladii*; the word *ceraste* was used as the name of this animal when of a greater age than this.

NEBULGEN, a word used by some of the chemical writers to express what they call a salt generated by the moisture of the air falling upon stones in the fields, and there indurated by the heat of the sun into the form of a dry salt.

NECESSARIO, in the Italian music. This word is prefixed to certain parts in music, as *a doi violini necessario*, i. e. that must be played by two violins; *canto necessario* is used to signify much the same as *concertante*. See CONCERTANTE.

Every mode has certain chords, which may be called its necessary, or essential chords. Vid. *Bross.* Dict. Mus. in voc.

NECHIASECH, an obscure word coined by Paracelsus, and very frequently used by him, and his followers; he seems to understand by it saline, corrosive, and corroding particles.

NECK (*Cycl.*) — There are several sorts of wounds in the *neck*; sometimes the seat of the wound is only in the common integuments, and muscular flesh; this is attended with very little danger: but the most dangerous, and, indeed, generally incurable wounds, are those of the larger blood vessels in these parts: such are those of the jugular veins, and carotid and vertebral arteries; or where the aspera arteria is wounded, or the gula, the medulla spinalis, the nerves that descend by the *neck*, or when several of these parts are wounded at the same time.

Wounds of the arteries of the *neck* are scarce ever to be remedied. The patient usually bleeds to death, before a surgeon can be had in these cases; but even if the surgeon were present at the instant the wound was inflicted, the largeness of the arteries, their vicinity to the heart, and the impossibility of making a sufficient pressure upon the wounded vessel in this part, give but little hope of relief.

Wounds in the external jugular veins are not of great danger, if a surgeon be applied to in time; but wounds in the internal jugulars are very dangerous, partly from their size, which is of the thickness of one's finger, and, partly from their situation, which is so deep that no proper application can reach them to any advantage. Wounds in this vein are usually esteemed mortal, but it is sometimes possible to save life in this case.

Wounds of the aspera arteria, or windpipe, are usually deemed mortal, where the windpipe is entirely divided, or is wounded in its lower part, within the cavity of the thorax, or joined with a wound of the carotid arteries, or internal jugulars, which is frequently the case: but if the windpipe is only wounded in its fore-part, and the neighbouring vessels remain unhurt, it is usually found curable.

Wounds of the gula, or œsophagus, afford very little hopes of recovery, where it is much wounded, or entirely divided, because, in this case, not only the office of deglutition is cut off; but the part is so situated that it is impossible almost to wound it, without injuring, at the same time, some of the neighbouring nerves, and blood-vessels. But when the gula only is wounded, and the wound small, there is some hope of a recovery.

Wounds in the medulla spinalis, in one part, are very dangerous, but more particularly so when inflicted on that part of it which presses through the neck. It is no wonder, therefore, that scarce any recover after a considerable wound of this kind; which it is impossible should happen without wounding the vertebral veins and arteries at the same time; and the situation of the part is such that it is impossible to convey proper remedies to them. Nor are wounds of the large nerves of the neck less dangerous than these; for, if they are divided, the parts of the thorax and abdomen to which nature has determined them, immediately lose their assistance, and of consequence become unequal to the offices for which they were intended.

For the cure of wounds in the *neck*, the method is as different as the nature of those wounds. Where the integuments, and muscular flesh alone are wounded, the common method of curing slight wounds takes place. Where the external jugular is hurt, the same methods used after bleeding in that vein prove sufficient. When the internal jugular has received a small wound, the hæmorrhage will be easily stopped by filling the wound well with dry lint; or with the puff ball, or dusty mushroom; lodging, over these applications, square bolsters, and securing all with a bandage, drawn as tight as the nature of the part will admit. Where this method does not take place, the surgeon should make a proper pressure on the wounded part with his finger, till the hæmorrhage is entirely stopped. The same methods must be used to the wounds of the vertebral veins; and when the hæmorrhage is once stopped, the dressings applied are not to be removed for three days, and then a vulnerary balsam and plaister applied to heal the wound. In large wounds, or an entire division of the internal jugular, the surgeon, if present in time, should make a firm pressure with his finger on the wounded part, and make incisions, lengthways, above the wound, till he can get at the vessel, and then make a firm ligature upon it, by the assistance of a crooked needle.

In case of a wound of the carotid artery, a surgeon, if present in time, should use the same method as in those of the internal jugular vein. This method is more likely to have success in wounds of the upper and middle part of that vessel, than in those of the lower part of it; and where the wound is not in the trunk of the artery, but in one of its branches near the head, you should fill up the wound with lint dipt in some styptic liquor, and then cover it up with thick compresses, securing all with a tight bandage, and ordering an assistant to make a pressure upon the part with his hand, for some time after: and, in these cases, the dressings are not to be removed till the third or fourth day.

In curing the wounds of the aspera arteria, the surgeon ought to clean the wound, and then endeavour to unite the parts by the help of sticking plaisters; or where the wound is large, by making two stitches with a crooked needle, dressing up the wound afterwards in the usual manner, and enjoining the patient to keep his head in a proper situation, that is, somewhat bending downwards. The wound, thus treated, if it has been made either by puncture, or by the cutting of a sharp instrument, will easily heal; but if it has been made by a bullet, and any part of the aspera arteria is carried away, the suture is to no purpose; wounds of this kind are only to be dressed with the vulnerary balsams. If the aspera arteria is entirely divided, and the lower end of it has shrunk into the cavity of the thorax, so that it cannot be laid hold on, there can be no remedy.

When the œsophagus is wounded, what is taken in at the mouth comes out through the wound, and the patient is usually affected with hiccoughs and vomitings. Where this is entirely divided, there is no remedy; but where it is only perforated or wounded in part, the cure may be attempted by dressing it with the vulnerary balsams, endeavouring to unite it by means of sticking plaisters, and enjoining the patient a strict abstinence for some days, and giving nourishing glysters of broth, milk, &c. If nourishment must be taken at length by the mouth, the wound must be perfectly cleaned every time afterwards, and be dressed daily till it heals. Wounds of the medulla spinalis are best dressed with balsam of Peru, or medicines of a like nature, mixed with a small quantity of honey of roses, and spread upon pledgits, and applied moderately warm. Slight wounds of this kind are sometimes healed by this means; but large ones in this part always bring on certain death. *Heister* Surg. p. 74.

In the Memoires de l' Acad. royale des Sciences, Ann. 1730. we have some curious observations by Mr. Winslow on the motions of the *neck*, as also on those of the head and spine.

NECK, in the manege. See CARRYING.

NECK *of the cascabel*, in artillery, is that part betwixt the breech mouldings, and the *cascabel*.

NECK *of a gun* is that part betwixt the muzzle mouldings, and the Cornish ring.

NECOPHORON, in botany, a name used by Pliny, and other authors for the *smilax aspera*, or *rough bindweed*. *Ger.* Emac. Ind. 2.

NECROLIUM, a word used by some of the alchemical writers to express a remedy almost always capable of averting death, and continuing life to its utmost period.

NECROSIS is used by many of the medical writers for a mortification.

NECTAR (*Cycl*) is used by some of the antients to express honey. This signification of the word was owing to the supposition that honey was the drink of the bees; as they esteemed the yellow matter collected on their thighs to be their food. They called the latter ambrosia. It seems that the antients have been more in the right as to their opinion of the ambrosia than other authors, who have usually esteemed that yellow substance to be true wax. But it appears from experiments that it is not really so; nor can wax be separated from it by any of the known processes of chemistry. It seems rather that the bees eat it, agreeably to the opinion of the antients, and that after having served them as nourishmment, it is converted

in

in their bowels into the ſubſtance we call wax. *Reaumur*'s Hiſt. Inſ Vol. 10. p. 50. See Honey.

NECTARINE, a fruit greatly eſteemed for its delicious flavour, and ſuppoſed to have its name from the nectar of the Gods, in heathen ſtories.

It differs in nothing from the peach, but in having a ſmoother ſkin, and a firmer pulp. See Peach.

We have ten kinds of *nectarine* cultivated by the curious in gardening.

1. *Fairchild's early nectarine*; this is a ſmall fruit of a red colour, and very well taſted, and ripens in July, the earlieſt of all this kind

2. The *Elruge nectarine*; this is a larger fruit, of a purple colour on that ſide which was toward the ſun, and of a greeniſh yellow on the other parts This is a very well flavoured *nectarine*, of a ſoft, melting juice, and parts from the ſtone: it ripens toward the end of July.

3. The *Newington nectarine*; this is a fair large fruit, of a fine red toward the ſun, and of a yellowiſh green toward the wall. It has a very rich juice, but the pulp adheres to the ſtone: this ripens in Auguſt.

4. The *ſcarlet nectarine*; this is of a fine glowing red toward the ſun, and of a pale red toward the wall; it ripens in the end of July.

5. The *Brugnon*, or *Italian nectarine*; this is a fair, large fruit, of a deep red next the ſun, but of a ſoft yellow next the wall. The pulp is firm, and of a rich flavour, but cloſely adheres to the ſtone, and is red in that part: this ripens in the middle of Auguſt.

6. The *Roman red nectarine*; this is a very fair large fruit, of a deep purple toward the ſun, and of a greeniſh yellow next the wall. The pulp is very firm and well taſted, but it is red about the ſtone, and adheres firmly to it: this is ripe in the middle of Auguſt.

7. The *Murry nectarine*; this is a middle-ſized fruit, of a dirty red next the ſun, and of a greeniſh yellow next the wall. The pulp is tolerably well flavoured: this ripens in the middle of Auguſt.

8. The *golden nectarine*; this is a fair handſome fruit, of a ſoft red next the ſun, but of a gold yellow next the wall, and its pulp is very yellow, but of a faint red about the ſtone to which it adheres: it is a very well-flavoured kind, and ripens at the end of September.

9. *Temple's nectarine*; this is a very fine kind: it is of a ſoft red toward the ſun, and of a yellowiſh green next the wall. It parts from the ſtone, and is of a very rich flavour; the pulp is white in other parts, but yellowiſh about the ſtone: this ripens in the middle of September.

10. The *Peterborough nectarine*, called by ſome the late, green *nectarine*; this is a middle-ſized fruit, of a pale green colour toward the ſun, and of a whitiſh green toward the wall; the pulp is firm, and well-flavoured: it ripens toward the end of September.

The pruning, planting, and whole culture of this plant is the ſame with that of the peach. *Miller*'s Gard. Dict. See the article Peach.

NECTARIUM, among botaniſts, expreſſes what is only a part of the corolla, ſometimes, though more rarely the whole. It is a part deſtined for the reception of the honey juice of the plant; and is very various in its figure. Sometimes, it is only a hollow in a petal; ſometimes, it is a little ſquamma; ſometimes a tubercle; and ſometimes a plain tube.

NECUIA, in botany, a name given by the antient Greeks to a ſpecies of *mullein*. See Mullein.

The Greeks and Romans both uſed the ſtalks of a peculiar kind of *mullein*, called *thryallis* by Nicander. For the making the wicks of lamps, we have a kind of *mullein* called *lychnites*, and candle-wick *mullein*, from the λυχνῖτις of Dioſcorides; but it is not certain that ours is the ſame plant.

The antients uſed the ſtalks of many different plants for the wicks of their candles, and lamps. The ruſh ſtripped of its bark was as commonly in uſe with them, as with us, for this purpoſe; and they alſo uſed the nettle, this *mullein*, and many other plants, whoſe ſtalks were compoſed of tough filaments, for the ſame purpoſe; beating them out like hemp, and when dry, dipping them in melted reſin, and other ſuch inflammable ſubſtances. When thus prepared, they were readily inflammable, like our flambeaux, and this *mullein* having ſtalks more long, and large, and more firm than all the others, was uſed to make thoſe lights with which they ſet fire to the funeral pile for conſuming the aſhes of their dead friends.

NEEDLE (*Cycl.*) — Needle, in ſurgery. It is to be obſerved, that *needles* of ſilver pierce more eaſily in ſtitching arteries after an amputation, than thoſe made of ſteel. *Monro*, in Med. Eſſ. Edinb. Vol. 5. Art. 41.

NEGATIVE (*Cycl.*) — Negative *power*, in algebra, is uſed for thoſe powers of a quantity which have a negative ſign. Thus a^{-m} is called a negative power. *Negative* powers ariſe from the diviſion of any power of a quantity, by a greater power of the ſame quantity. Thus, $\frac{a^4}{a^6} = a^{4-6} = a^{-2}$; and in general, $\frac{a^m}{a^{m+n}} = a^{-n} = \frac{1}{a^n}$ for $\frac{a^m}{a^{m+n}} = \frac{1}{a^n}$. See Power, *Cycl.*

Negative *ſign* The uſe of the *negative ſign*, in algebra, is attended with ſeveral conſequences that at firſt ſight are admitted with difficulty, and has ſometimes given occaſion to notions that ſeem to have no real foundation. This ſign implies that the real value of the quantity repreſented by the letter to which it is prefixed, is to be ſubtracted; and it ſerves with the poſitive ſign, to keep in view what elements or parts enter into the compoſition of quantities, and in what manner, whether as increments, or decrements, (that is, whether by addition or ſubſtraction) which is of the greateſt uſe in this art.

In conſequence of this, it ſerves to expreſs a quantity of an oppoſite quality to the poſitive, as a line in a contrary poſition; a motion with an oppoſite direction; or a centrifugal force in oppoſition to gravity; and thus often ſaves the trouble of diſtinguiſhing, and demonſtrating ſeparately, the various caſes of proportions, and preſerves their analogy in view. But as the proportions of lines depends on their magnitude only, without regard to their poſition; and motions, and forces, are ſaid to be equal, or unequal, in any given ratio, without regard to their directions; and, in general, the proportion of quantities relates to their magnitude only, without determining whether they are to be conſidered as increments or decrements; ſo there is no ground to imagine any other proportion of $-b$ and $+a$, (or of -1 and 1) than that of the real magnitudes of the quantities repreſented by b and a, whether theſe quantities are, in any particular caſe, to be added, or ſubſtracted. It is the ſame thing to ſubſtract a decrement as to add an equal increment, or to ſubſtract $-b$ from $a-b$, as to add $+b$ to it: and becauſe multiplying a quantity by a *negative* number implies only a repeated ſubſtraction of it, the multiplying $-b$ by $-n$, is ſubſtracting $-b$ as often as there are units in n; and is therefore equivalent to adding $+b$ ſo many times, or the ſame as adding $+nb$. But if we infer from this, that 1 is to $-n$ as $-b$ to nb, according to the rule, that unit is to one of the factors as the other factor is to the product, there is no ground to imagine that there is any myſtery in this, or any other meaning than that the real magnitudes repreſented by 1, n, b, and nb are proportional. For that rule relates only to the magnitude of the factors and product, without determining whether any factor, or the product, is to be added, or ſubtracted. But this likewiſe muſt be determined in algebraic computations; and this is the proper uſe of the rules concerning the ſigns, without which the operation could not proceed. Becauſe a quantity to be ſubſtracted is never produced in compoſition, by any repeated addition of a poſitive, or repeated ſubſtraction of a *negative*, a *negative* ſquare number is never produced by compoſition from the root. Hence $\sqrt{-1}$, or the ſquare root of a *negative*, implies an imaginary quantity; and, in reſolution, is a mark or character of the impoſſible caſes of a problem, unleſs it is compenſated by another imaginary ſymbol, or ſuppoſition, when the whole expreſſion may have a real ſignification. Thus $1+\sqrt{-1}$, and $1-\sqrt{-1}$ taken ſeparately, are imaginary, but their ſum is 2; as the conditions that ſeparately would render the ſolution of a problem impoſſible, in ſome caſes deſtroy each other's effect, when conjoined. In the purſuit of general concluſions, and of ſimple forms for repreſenting them, expreſſions of this kind muſt ſometimes ariſe where the imaginary ſymbol is compenſated in a manner that is not always ſo obvious.

By proper ſubſtitutions, however, the expreſſion may be transformed into another, wherein each particular term may have a real ſignification, as well as the whole expreſſion. The theorems that are ſometimes briefly diſcovered by the uſe of this ſymbol, may be demonſtrated without it, by the inverſe operation, or ſome other way; and though ſuch ſymbols are of ſome uſe in the computations by the method of fluxions, its evidence cannot be ſaid to depend upon arts of this kind. See *MacLaurin*'s Fluxions, B. 2. ch. 1.

NEGRO (*Cycl.*) — Mr. Boyle has obſerved, that the heat of climates cannot be the true cauſe of the colour of *negroes* For though the heat of the ſun may darken the colour of the ſkin, yet experience does not ſhew that heat is ſufficient to produce a true blackneſs, like that of *negroes*. In Africa itſelf many nations of Æthiopia are not *negroes*, nor were there any blacks originally in the Weſt Indies. In many parts of Aſia, under the ſame parallel with the African regions, inhabited by blacks, the people are but tawny. He adds, that there are *negroes* in Africa, beyond the ſouthern tropic, and that a river ſometimes parts nations, one of which is black, and the other but tawny. *Boyle*'s Works abr. Vol. 2. p. 42, 44.

Dr. Barrere alledges that the gall of *negroes* is black, and being mixed with their blood, is depoſited between their ſkin, and ſcarf ſkin. Diſſ. on the phyſ. cauſe of the colour of *negroes*.

We have a diſſertation on this head by Dr. John Mitchell of Virginia, in the Philoſophical Tranſactions, N° 476. Sect. 4. where he advances theſe propoſitions, and enters into a learned detail to ſupport them.

1°. The colour of white people proceeds from the colour which the epidermis tranſmits; that is, from the colour of the parts under the epidermis, rather than from any colour of its own.

2°. The ſkins of *negroes* are of a thicker ſubſtance, and denſer texture, than theſe of white people, and tranſmit no colour through them.

3°. The part of the ſkin which appears black in *negroes*, is the *corpus reticulare cutis*, and external lamella of the epidermis: all other parts are of the ſame colour in them with thoſe of other people, except the fibres which paſs between thoſe two parts.

4°. The colour of *negroes* does not proceed from any black humour, or fluid parts contained in their ſkins; there being none ſuch in any part of their bodies, more than in white people.

5°. The epidermis, eſpecially its external lamella, is divided into two parts by its pores and ſcales, two hundred times leſs than the particles of bodies on which their colours depend.

This is founded on Leuwenhoek's obſervation that a portion of the epidermis no bigger than what can be diſcerned by the naked eye, is divided into 125000 pores, and theſe pores muſt divide ſuch a portion of the ſkin into as many particles. But the particles of bodies on which their colours depend, are, by Sir Iſaac Newton's Optics, Lib. 2. P 3. Prop. 7. 600 times leſs than theſe which can be diſcerned by the naked eye. Therefore the particles of the ſkin muſt be about 200 times leſs than theſe; ſince $\frac{125000}{600} = 208\frac{1}{3}$. It may alſo be obſerved that ſuch a ſmall portion of the epidermis is diviſible into 250 ſcales, which muſt encreaſe the number of its parts.

6°. From theſe propoſitions, and from Sir Iſaac Newton's theory of light and colours, the doctor thinks he may conclude, that the proximate cauſe of the colour of *negroes* is threefold; *viz.* The opacity of their ſkin, proceeding from the thickneſs and denſity of its texture, which obſtructs the tranſmiſſion of the rays of light, from the white and red parts under the ſkin, together with its greater refractive power, which abſorbs theſe rays; and the ſmallneſs of the particles of this ſkin, which hinders it from reflecting any light.

7°. The influence of the ſun, in hot countries, and the manner of life of their inhabitants, are the remote cauſes of the colour of *negroes*, Indians, &c. And the ways of living in uſe amongſt moſt nations of white people, make their colours whiter than they were originally, or would be naturally.

In ſupport of this propoſition, the doctor obſerves, that the ſkin is deprived of its white colour, by the force and influence of the ſun, four ways. 1ſt. By being rendered opaque, from a diſſipation of its more aqueous, and pellucid juices. 2dly. By a concretion of its veſſels and glandules, from this diſſipation of their aqueous contents; which renders the ſkin both thicker and denſer, or more callous and rigid. 3dly. By a new accretion of many new membranes, which render it thick and opaque. 4thly. By encreaſing thoſe parts or principles, in the compoſition of the epidermis, which have the greateſt refractive power; as the terreſtrial and fixed ſaline; but eſpecially the tenaceous ſulphureous, which refract and abſorb light more ſtrongly than any other ſubſtances; while the more tranſparent and pellucid principles, as the aqueous, ſpirituous, and volatile ſaline, are evaporated by the heat, which cauſes the other more fixed principles to be accumulated; and theſe particles being likewiſe more comminuted by the ſun, will, on this account, be black; as happens to oil when well boiled. Theſe cauſes, with thoſe firſt-mentioned, may, the doctor thinks, by conſpiring make the ſkin quite black; eſpecially if we add another effect of the ſun's power, a peculiar necroſis of the epidermis, occaſioned by the f rcible vibrations, contractions, and exſiccations of its fibres by the ſun beams which cauſe it to turn black, as theſe, or other parts do, by the heat of an inflammation, or a fever, in gangrenes, black tongues, &c.

We cannot pretend to follow the author in all the detail of his obſervations on this ſubject, nor of his anſwer to a material objection already mentioned from Mr. Boyle, that the ſun cannot be the cauſe of the colour of *negroes*, becauſe ſeveral nations, in the ſame latitude with thoſe *negroes*, are not made black by it He ſeems to think the heat of Africa greater than that of other parts of the world. Whether it be ſo, or not, is we doubt, not eaſy to determine; but it would be a ſtrong confirmation of his doctrine, if we could ſee any people, originally white, become black and woolly by tranſplantation, or vice verſa.

NEGRO, in zoology, the name of a large bird approaching to the crane kind, and more uſually known among authors by its Braſilian name *jabiru*. See JABIRU.

NELANJENUM, in natural hiſtory, the name of a curious and peculiar foſſile ſubſtance found in the Eaſt-Indies.

It has much the appearance of ſome of our ſteel-grained lead ores, and is very ponderous, but it does not contain any lead; in this it approaches to the nature of that ſubſtance common in Europe, and called blende, or mock lead; but this laſt is foliated, and reſembles the plated lead ores, whereas this reſembles the cloſe ground ores. It is found in the beds of rivers in many places; they calcine it, and, reducing it to powder, mix it with the juice of herbs, and uſe it in ulcers.

NELLA *corvindum*, in natural hiſtory, a name given by the people of the Eaſt-Indies to a very hard ſtone which they uſe as we do emery.

It is of a talcky nature, being compoſed of flaky ſpangles, and a coarſer matter intermixed. They dig it at the foot of ſome mountains, and in ſome other places. It lies ſo near the ſurface that the rice-fields abound with it; and it is ſeen on ſtirring the ground. It is always found in nodules, or detached maſſes, and is uſually of a ſort of iron colour, though ſubject to ſome variations. It is uſed by the common people to ſcower arms, and other iron works; and by the lapidaries, among them, to poliſh rubies, and other ſtones. For this laſt purpoſe they grind it with ſtick lack, and make it into a ſort of cement, with which they daub over the face of the poliſhing machine.

NELLON, in botany, a name given by ſome to rice. It is an Indian word, and properly ſignifies the grain of rice taken off from the ſtalks, but covered with its proper pellicle. The firſt operation to be performed upon this, is the beating it with large ſtones, or other more manageable tools, till this ſkin flies off. Then it is to be dried in the ſun, and, after that beat a ſecond time, to get off its thin, internal, rediſh coat: when this is done, it is in a ſtate to be uſed, and it is then only that the Indians call it *ariſi*, the word from which we formed our word rice. Obſervations ſur les Coutumes de l' Aſie.

NELUMBO, in botany, the name of a genus of plants, uſually confounded with the nymphæa.

The characters of the *nelumbo* are theſe: The flower is like that of the nymphæa, but the fruit wholly different, not only in ſhape, but in ſtructure, being not divided into ſeveral cells, but having the ſeeds placed irregularly, at diſtances from one another in it

There is only one known ſpecies of this genus, which is the *nelumbo* of the Ceylonefe, called by others the *Indian nymphæa*, and *faba Ægyptiaca*, the *Ægyptian bean*. *Tourn.* Inſt. p. 261.

NENUPHAR. The antient writers on the materia medica, have all mentioned a peculiar ſpecies of this plant, under the name of *nenuphar indicum*. The roots of this they call *fel*, and Aviſenna ſays, that they have the ſame virtues with the mandrake. *Fel* is alſo the name of another very different medicine uſed in thoſe times; a fruit of a climbing plant, of the ſize and figure of a cucumber, as to ſtalks and leaves, but bearing for fruit this *fel*, which was a ſort of nut of the ſize of a piſtachea nut, and covered with a thick ſhell.

This *fel* was of the nature of the *bel* and *ſel*, two other fruits of a like ſort, all heating and drying. Theſe were qualities altogether oppoſite to thoſe of the mandrake; and the ſynonymous uſe of the word *fel* for theſe two things not having been obſerved, the author is accuſed of contradicting himſelf in different parts of his works, when, in reality, he is treating of contrary things, tho' unluckily called by the ſame name; the one a cold root, the other a hot fruit.

NENUPHAR, in botany, is alſo a name uſed by ſome authors for the *water-lilly*. *Ger.* Emac. Ind. 2.

NENUFARINI, a name given by the adepts to a kind of imaginary ſpirits which they ſuppoſe to inhabit the air, and to direct and govern many things on earth.

NEOCORI, Νεωκοροι, among the antients, perſons whoſe buſineſs it was to take care of temples, and other conſecrated places. They were otherwiſe called *æditui*. *Pitiſc.* in voc. See the article ÆDITUUS.

NEOENIA, Νεοινια, in antiquity, a feſtival celebrated in honour of Bacchus, when the new wine was firſt taſted. *Pott.* Archæol. T. 1. p. 416.

NEOMENIA, Νεομηνια, in antiquity. See NUMENIA.

NEOPTOLEMIA, Νεοπτολεμεια, in antiquity, a feſtival celebrated by the Delphians with much pomp and ſplendor, in memory of Neoptolemus, the ſon of Achilles, who was ſlain in an attempt to ſack Apollo's temple, which he undertook in revenge of his father's death, to which that god was acceſſary. *Pot.* Archæol. Græc. T. 1. p. 416.

NEOTTIA, in botany, the name given by Linnæus to the plant called by Tournefort and others *nidus avis*, and by Ruppius *corallorhiza*. *Linnæi* Gen. Pl. p. 434. See NIDUS *avis*.

NEPA, a word uſed by naturaliſts ſometimes to expreſs a *crab*, ſometimes for a *ſcorpion*, and ſometimes for a plant, called by the botaniſts *geniſta Spartium*.

NEPENTHES, in botany, the name of a genus of plants, the characters of which are theſe: the perianthium is divided into four roundiſh ſegments; there are no petals, and ſcarce any ſtamina; but four antheræ are affixed to the ſtylus near its top; the piſtil has an extremely ſlender germen; the ſtyle is pointed, and of the length of the cup; and the ſtigma is obtuſe; the fruit is an oblong, columnar, truncated capſule, faintly quadrangular, conſiſting of four cells, and ma e up of four valves. The ſeeds are numerous, pointed, and of a chaffy ſtructure, and are ſhorter than the capſule. *Linnæi* Gen. Pl. p. 437.

NEPETA, *catmint*, in medicine. See CATMINT.

NEPHALIA, among the Greeks, a feſtival called the feaſt of ſober men, at which the Athenians offered to the ſun and moon, to Aurora and Venus, a drink made of water and honey. They burnt all ſorts of wood on the occaſion, except the vine and fig-tree. *Danet* in voc.

NEPHRITICUM *lignum*, or NEPHRITIC *wood*. See TRANSMUTATION *of colours*.

NEPHRITIS, *(Cycl.)* in medicine, is uſed for an inflammatory affection of the kidneys, owing its origin to a ſtagnatory congeſtion of blood in them, which nature ſeems to have intended to direct to the internal, hæmorrhoidal veſſels, thence to be diſcharged to eaſe her of the load of a plethora.

The ſimple *nephritis* is thus carefully to be diſtinguiſhed from the

the calculofe one; for the former may, for a long time, affect a patient without any thing of a ftone being in the cafe; and, on the contrary, a ftone may be long lodged in the kidneys, without its bringing on any fuch complaint as the *nephritis*.

In the fimple *nephritis* there is always a fenfation of pain and heat about the loins, which is plainly perceived to lie deep within the flefh, but is never very acute. On the contrary, in the calculofe *nephritis*, the pain is violently fharp.

In the fimple *nephritis*, the urine, after it has ftood fome time, fhoots to the fides of the pot pellucid cryftals of a redifh colour. But, in the calculofe, the heavy matter immediately precipitates itfelf to the bottom, and is fabulous and gritty; and the fimple *nephritis* is always greatly relieved by a gentle motion of the body, as walking, or the like; whereas all motion of the body exafperates the calculofe *nephritis*.

The *nephritis* is diftinguifhed alfo from the ifchiatic pains, which fometimes run up to the fame parts, by its being evidently perceived to lie deep within the flefh, whereas thofe pains affect the external mufcles; yet there is fuch a connection and confent of parts in thefe cafes, that not unfrequently the one is taken for the other.

Signs of it. Thefe are a pain in the region of the loins, which does not ufually affect both, but only, or, at leaft, principally, one fide, ufually the left. The pain is at firft tenfive and dull, but afterwards becomes more acute; in the beginning it is often attended with a chillnefs, and general trembling, which is fucceeded by a heat, and acrid gnawing, fcarce to be fupported; and this is ufually attended with a want of appetite, and lofs of ftrength, and a continual, though not violent, thirft. The fleep is unfound, and there ufually is either a dull pain in the head, or a vertiginous complaint, more or lefs violent; and very frequently naufeas, and reachings to vomit, attend the fits, or prognofticate the accefs of them.

The pain never extends itfelf down the whole thigh, nor is that ever wholly numb'd, or rendered torpid by it; and the diforder does not feem continual, but attacks the patient at different times, and thefe after confiderably long intervals, if he live regularly. The bowels are ufually coftive at the time of the fits, and there is a frequent want of making water, though very little is voided at a time, and that thin, when the pain is violent; when it is more obtufe, the urine is commonly thick, and has, as it were, threads in it, of a fort of mucilaginous matter; and to this it is to be added, that fometimes the fpermatic veffels which run to the teftes become hard and tumid.

Men are more fubject to this difeafe than women, and of thofe, fuch principally as are plethoric; and people in the middle and later periods of life, are, in general, more fubject to it than thofe who are younger. In general, young people are not fubject to this difeafe, unlefs it be from an hereditary difpofition, or fome very powerful, and violent, external caufes. Men are much oftener tormented with the *nephritis* than women, and none fo often fall into it as thofe who have omitted the ufual evacuations, and afterwards fall into violent exercifes; and finally, people who have the gout and the fciatica, are ufually alfo *nephritic*.

Caufes of it. Thefe are principally the fuppreffion of natural evacuations; or the omiffion of habitual artificial ones; the abufe of hot medicines of the diuretic kind, fuch as the oils of turpentine, and juniper, and the balfam of fulphur; as alfo the over frequent ufe of venery, and the taking medicines to provoke to it; violent paffions, or great and fatiguing exercifes; external injuries by blows, falls, or the like; and the ufe of a too hot diet, and too much of ftrong liquors.

Prognoftics. The fimple *nephritis* may ufually be cured, if properly treated, but the calculous one fcarce ever can; and tho' all inflammations of the internal parts are juftly accounted very dangerous, yet this is the leaft fo of all others, becaufe the urine continually paffing through the part, abfterges and cleanfes it, and prevents corruption, or gatherings of matter. The greateft danger is in fuch as have a difpofition to generate calculous matter, and to hectics. In thefe cafes the difeafe is apt foon to change from its fimple nature.

It is very rare that both kidneys are feized with this diftemper, but ufually the left alone fuffers by it: the more inflammatory the ftate of the body is, the worfe it is with perfons afflicted with this difeafe, and the more they are fubject to it: thus young people who have often a turgefcence of blood, are more frequently fubject to this difeafe than old perfons, and are with more difficulty cured of it: and it is an obfervation as old as Hippocrates, that the coming on of hæmorrhages from the internal hæmorrhoids cures this difeafe.

Method of cure. In the time of the fit, the firft thing to be done is the opening the belly by a clyfter of the emollient kind, prepared of milk or broth. Simon Pauli exprefly directs, from repeated experience of its good effects, a decoction of the herb veronica, or fpeedwell, with fome oil, and a little falt. After this, powders of nitre, cinnabar, and tartarum vitriolatum, fhould be taken every three hours; and, towards the evening, there fhould be mixed with one of thefe dofes, eight grains of diaphoretic antimony, and four of crab's eyes. Emulfions of the cold feeds in the cooling fimple waters, are alfo of great ufe; and to the common feeds ufed on this occafion, may be added thofe of poppies, and of carduus mariæ. In the mean time external applications may alfo be ufed with fome fuccefs; fuch as bags of chamomile, melilot, and fenugreek feed dry, and heated at the fire; as alfo the fpirits of ferpyllum, and the like, and the foap plaifter: to all thefe may be added the ufe of leeches, which are, indeed, a great relief in all the diftemperatures of the urinary parts; and, finally, during the whole courfe of the cure, refrigerating and diluting liquors are to be drank in large quantities, as barley water, tea, and the like.

After the fit, the neceffary treatment to prevent a return, is to bleed regularly, fpring and autumn; to take, at times, gentle purges of rhubarb, fena, and the like; to keep the hæmorrhoidal difcharges in their proper ftate; and the habitual coftivenefs which ufually attends people in this difeafe is to be taken off by a moift and lubricating diet; and wine, and ftrong liquors, are to be avoided. *Junker's* Confp. Med. p 216, feq.

NEPHROMETRÆ, a name given by fome authors to the mufcles of the loins, called by the generality of medical authors *pfoæ*.

NEPHROTOMY, in furgery, the cutting into the kidneys, in cafe of the ftone being lodged there, and taking it out in the fame way as from the bladder.

This is an operation which has been very little practifed, and ufually fuppofed to be attended with very great danger: few authors who have treated of thefe difeafes have fo much as mentioned this operation, and the few that have named it, have generally condemned it. Sinibaldus fancying that it was an operation antiently practifed, ftrove very earneftly, indeed, to have it revived. He has called in the opinion of Hippocrates to fupport his account of its having been done with fafety, and advifes the furgeons to try their hand on brutes firft, and accuftom themfelves to the operation, and then not to fear it in regard to men.

It is certain that a ftone in the kidney is fo terrible a difeafe, that it is very much to be wifhed that fome fafe operation could be invented to cure it; but it is making too free with Hippocrates, to fay that he countenances or directs fuch an operation in general. His words feem to exprefs only the making an incifion near the kidney; but even if they are to be underftood as directing the cutting into it, it is under fuch reftrictions, that opportunities will very feldom offer; and, when they do, a common furgeon would not fcruple performing all that is directed, without either confulting Hippocrates, or trying his fkill upon brutes. Hippocrates only advifes it in cafe of a fwelling and impofthumation, where there is matter formed, and the tumor manifefts itfelf upon the furface. In this cafe every furgeon would know it was his bufinefs to make an incifion. Phil. Tranf. N° 223. p. 334.

Cafes requiring this are frequent, and that even without a ftone. An inflammation in a kidney degenerates into an abfcefs, and when matter is formed, the furgeon opens the tumor, and the matter is difcharged. Sometimes ftones bred in the kidneys caufe impofthumations; the furgeon opens thefe, and the ftones are brought away together with the matter. Nay, nature herfelf has done the whole for fome people, and the ftones have made their way through the kidney, and through the integuments, &c.

Tulpius gives an account, from his own obfervation, of a man who had a ftone in his kidney, which, after many years, difcharged itfelf through the loins, and occafioned a fiftula in the part, through which the urine was long voided, together with the matter. The attempts of many furgeons to heal this fiftula proved vain, and, at length, one fucceeding fo far as to ftop up the mouth of the ulcer, the matter which ufed to be difcharged from it was thrown into the abdomen, and the man died of a fever. Tulpius gives the death of this perfon as an objection againft the operation of *nephrotomy* in general, as he fuppofes a fimilar fate might attend the wounds made in thefe parts by the furgeon.

From an impartial examination of the works of Hippocrates, it does not appear that the cutting for the ftone in the kidneys was regularly practifed in his time, nor, indeed, for many ages after; for Celfus makes no mention of it, although he is very particular upon the operation of cutting for the ftone in the bladder. Galen is fo copious a writer, that he never miffes any thing practifed either in his own time, or before it, in his accounts of difeafes, yet he mentions nothing of this operation, though he is very long upon the article of the difeafes of the kidneys. Cardan, indeed, mentions this operation as one of thofe of the antients which were practifed in his time. His hafty reading the words of Hippocrates has led him into this error, and he lays the fault of its being now loft, in a great meafure, on Galen's omitting to mention it. It is wrong to accufe Galen of this omiffion, fince neither Celfus, nor Ruffus, who preceded him, nor Aretæus who was his cotemporary, nor, indeed, any of the Greek or Latin phyficians, have named it, though they, as well as the moderns, mention occafionally an abfcefs in the kidneys, and the manner of curing it.

The Arabians, indeed, mention the operation as practifed and countenanced by fome perfons before their time; but they all join in condemning it as a bold and hazardous operation, from which very little good is to be expected, and which fets the life of the patient in the moft imminent danger. Avifenna fpeaks of it as the act of a madman, and, it feems, that it was fometimes

ſometimes practiſed in his time, but by his manner of naming it, ſeems to have been only done by ſome mountebanks, who having no reputation to loſe, ventured boldly, and ſometimes had ſucceſs. The reſt of the Arabians are ſilent about the operation, and it ſeems to have been only practiſed by a few people in the days of this author, and wholly diſcountenanced afterwards, from its bad ſucceſs.

Among the moderns, the firſt who has named it is Rouſſet, in his treatiſe on the Cæſarian ſection. In order to invite men to countenance the Cæſarian operation, he recommends ſeveral other deſperate ones, and among the reſt, this of *nephrotomy*: but he is not able to produce one inſtance of its having been practiſed either in his own, or earlier times, but when there was an abſceſs and an external tumor. Cælius Rodeginus gives indeed a very remarkable inſtance of an operation of this kind being performed by chance, by a woman who, in the agony of her pain from the ſtone in the kidney, ſcratched with her own nails, till ſhe tore thro' the fleſh ſo deep, that eighteen ſtones were diſcharged at the wound.

The general opinion of authors is thus againſt the operation; and the moſt famed among thoſe who have treated of wounds of the kidneys ſay, that any wound which enters into the pelvis is mortal. Yet this opinion, tho' general, is not certain or determinate; and we have an account in the Philoſophical tranſactions of the operation of *nephrotomy* being performed with ſucceſs, by Marchetti of Padua, on Mr. Hobſon the Engliſh conſul at Venice. Phil. Tranſ. N° 223. p. 337.

NEPTA, a name uſed by ſome authors for the *aſphaltum*. It ſeems a corruption of *naphtha*.

NEPTUNE's *cap*, a name given by naturaliſts to a remarkable ſpecies of marine fungus, which is never found affixed to any ſolid body, but always looſe, and rolling about at the bottom of the ſea. Its uſual ſize is about five inches in height, and ſix or ſeven in diameter at the baſe. It gradually becomes narrower from the baſe to the ſummit, where it terminates in a round end, ornamented with cluſters of a foliaceous ſort of ſubſtances, reſembling a cock's comb, but of the ſame matter with the reſt of the plant.

Its internal ſurface is very different from this: it is lightly furrowed down the ſides, and beſet with a number of ſmall protuberances, with obtuſe points. Some of theſe, when ſmall, are found with a pedicle growing to them. This is always of a very brittle ſubſtance, and it is probable that all thoſe found looſe had originally ſuch pedicles, by which they adhered to ſome ſolid body, in the manner of the corals, and other ſea plants; but that its extreme brittleneſs occaſions it to be ſoon broken off, by the motion of the water, after which the plant rolls looſe about, and takes in its nouriſhment at its ſeveral pores, by means of the water which every way ſurrounds it. It is not probable that theſe and the like ſea plants are nouriſhed only by ſea water; but that there is in the ſea a ſort of mud continually formed out of the decayed particles of animals, and the foſter vegetables, which may be ſuppoſed much to reſemble the common vegetable mold in its uſes, as it has much the ſame origin; and this, or at leaſt its finer and lighter parts, may be conveyed by water into the pores of theſe plants, and nouriſh them. Mem. Acad. Par. 1700.

NERANTZIUM, in botany, a name given by ſome of the Greek writers to the citron tree. The antient Greeks were not acquainted with the word, and it ſeems to have been formed in the barbarous ages from the word *narange*, the name by which the Arabian phyſicians called the ſame fruit.

NERFLING, in zoology, the name of a freſh water fiſh of the leather-mouth'd kind, common in ſome of the lakes in Germany, and there called alſo the *erff* or *oorve*, and ſeeming to be the ſame with the common Engliſh rudd. See RUBELLIO. There are two kinds of this fiſh, the fleſh of the one of which, when dreſſed, is white, and that of the other yellowiſh or rediſh. The latter kind is moſt valued. *Willughby*'s Hiſt. Piſc. p. 252. *Geſner* de Piſc.

NERION, *oleander*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is compoſed of only one leaf, and is of the funnel-faſhion'd kind, and divided into many ſegments at the edge. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower: this finally becomes a fruit of a cylindric ſhape, compoſed of two pods, which contain ſeeds winged with down. See Tab. I. of Botany, Claſs 20.

The ſpecies of *nerion* enumerated by Mr. Tournefort, are theſe: 1. The red-flowered *nerion*. 2. The white-flowered *nerion*. 3. The narrow-leav'd Indian *nerion*, with ſingle ſweet-ſcented flowers. 4. The broad-leaved Indian *nerion*, with ſweet-ſcented double flowers. 5. The broad-leaved Indian *nerion*, with ſweet-ſcented, double, variegated flowers: and, 6. The climbing American *nerion*, with tuberoſe briony-like roots. *Tourn* Inſt. p. 654.

NERITA, a genus of ſhell fiſh, of the nature of the ſemi-circular-mouth'd cochleæ, and comprehended under the general term *cochlea ſemilunaris*. See Tab. of Foſſils, Claſs 9. and SEMILUNARIS *cochlea*.

NEROPHIDION, in ichthyology, a name given by Schoneveldt, and ſome others, to that ſpecies of the *acus* or *ſyngnathus* of Artedi, which is called by that author the hexagonal-bodied *ſyngnathus* with the pinnated tail; and by others, the *acus Ariſtotelis*, and *acus ſecunda ſpecies*, and *typhle*; by ſome alſo, *blennus*.

NERVE (*Cycl.*) — The antients found, that by cutting, tying or compreſſing any *nerve*, or any other way intercepting its communication with the brain, the parts to which it belonged were immediately deprived of all ſenſe and motion. One remarkable inſtance of this is, the making an animal dumb by tying the *nerves* near the wind-pipe. We read in Galen, of a boy who became quite dumb by having both the recurrent *nerves* divided.

The experiment of cutting theſe *nerves* in brute animals, was repeated and confirmed by Veſalius; and Dr. Martin aſſures us, he tried it ſucceſsfully on a pig; nor did the animal recover its voice, as ſome have ſuſpected it might. As the voice depends on a proper aperture of the glottis, it ſeems likely that when the recurrent *nerves* are cut, the glottis will always ſtand open, and be incapacitated from being ſhut at the will of the animal. See Med. Eff. Edinb. Vol. 2. Art. 8.

An anonymous phyſician offers what he calls an *experimentum crucis*, in proof of the *nerves* being compoſed of cylindrical canals, containing a fluid: it is the demonſtration of the optic *nerve* inflated and dried, which appears canular to the naked eye. See Preſent State of Rep. Let. Vol. 12. Art 16.

Wounds of the NERVES. Upon the diviſion of a *nerve*, the limb to which that *nerve* was extended becomes inſtantly rigid, void of ſenſation, and withers: ſo that it is no wonder that a man inſtantly expires, upon the diviſion of thoſe nerves which are ſent to the heart or diaphragm: a wound alſo is attended with great danger where the *nerve* is only partially wounded, and not entirely divided; for the wounded fibres contract themſelves, and thoſe which remain undivided ſuffer too great extenſion, which will bring on moſt violent pain, ſpaſms, convulſions, inflammations, and gangrenes, and ſometimes death itſelf. *Heiſter*'s Surg. p. 27.

NERVES *microſcopically examined*. Mr. Leuwenhoek endeavoured by his microſcope, to diſcover the ſtructure of the *nerves* in the ſpinal marrow of an ox: he ſaw there with great delight, minute hollow veſſels of an inconceivable firmneſs, inveſted with their proper membrane, and running out in length parallel to one another, and making up their compoſition: and tho' ſome hundreds of theſe veſſels go to the formation of the leaſt *nerve* that can be examined, he not only diſcerned the cavities in them, which he computed to be three times leſs than their diameters, but in ſome perceived the orifices as plainly as the holes in a pricked paper are to be ſeen when looked at againſt the ſun. It requires, however, great dexterity and expedition to make this examination with ſucceſs; for after a thin ſlice of the ſpinal marrow is placed before the microſcope, in leſs than a minute's time it becomes dry, and the whole appearance vaniſhes. *Baker*'s Microſcope, p. 145.

NERVOSE *leaf*, *nervoſum folium*, among botaniſts. See LEAF.

NESTLINGS, a name given to Canary birds brought up by hand. See CANARY and PASSERES *Canarienſes*.

NET (*Cycl.*) — The taking fowls by *nets* is the readieſt and moſt advantageous of all others, where numbers are to be taken.

The making the *nets* is very eaſy, and what every true ſportſman ought to be able to do for himſelf. All the tools neceſſary to it are wooden needles, of which there ſhould be ſeveral of different ſizes, ſome round, and others flat; a pair of round-pointed flat ſciſſars, and a wheel to wind off the thread. The packthread is to be of different ſtrength and thickneſs, according to the ſort of birds that are to be taken; and the general ſize of the meſhes, if not for very ſmall birds, is two inches from point to point.

The *nets* ſhould be made neither too deep nor too long, for they are then difficult to manage; and they muſt be verged on each ſide with twiſted thread. The natural colour of the thread is too bright and pale, and is therefore to be altered in many caſes, according to the occaſion.

The moſt uſual colour is the ruſſet: this is to be obtained by plunging the *net*, after it is made, into a tanner's pit, and letting it lie there till it be ſufficiently tinged; this is of a double ſervice to the *net*, preſerving the thread very greatly, as well as altering the colour. The green colour is given by chopping ſome green wheat, and boiling it in water, then ſoaking the net in this green tincture till it have ſufficient colour. The yellow colour is given in the ſame manner, with the decoction of celandine: this gives a pale and faint ſtraw colour, which is the colour of ſtubble in the harveſt time, and is juſt what is wanted. The brown *nets* are intended to be uſed on ploughed fields; the green on graſs grounds, and the yellow on ſtubble lands.

Great care is neceſſary in the preſerving of *nets*; and the principal thing to be conſidered in regard to this is, that all wet rots the threads: whenever they have been uſed in dew or rain, they muſt be hung up to dry in the ſun; and if there is any rent or breach made, it muſt be mended as ſoon as it is diſcovered. In the drying, they muſt be hung as far as may be from the walls, that they may be out of the way of mice and rats, which are very apt to deſtroy them. The utmoſt depth that ſhould be allowed to a *net* for fowl, is two fathom, and the utmoſt length ſix fathom.

The places for uſing fowling *nets* to moſt advantage, are the morning and evening haunts where the birds come to feed. The ſportſman is to be at the place at leaſt two hours before the time of their coming, and the *net* muſt immediately be

ſpread flat and even upon the ground, and the two ends faſtened down with ſtakes. At the lower part there is to be a long cord fixed to the upper edge of the *net*, by means of which it may be immediately raiſed, and pulled over. The ſportſman is to hide himſelf behind ſome natural or artificial ſhelter, at the extremity of this line, and ſome cut graſs muſt be ſtrewed all over the *net* as it lies on the ground, to hide it from the fowl; and ſome live bird, that has been taken before, ſhould be ſtaked down before the *net*, by way of a ſtall, to draw in the others.

As ſoon as a ſufficient number of birds are within the compaſs of the *net*, it is to be pulled ſwiftly over them, and the fowler having taken thoſe that are under it, may ſtake down two or three more live ones, and ſpread the *net*, covering it with graſs as before. This ſort of ſport may be continued from as ſoon as it is light in the morning till an hour after ſun-riſe; but after that time, the birds have done feeding ravenouſly, and the ſport is over for that day.

Cinque-port NET, in fiſhery, a name given to a ſort of ſquare *net*, reſembling a cage, and having five entrances into it, from whence it has the name.

It is a very ſerviceable *net* in any pond or river, and is equally good in ſwift or ſtanding water. In order to make this *net*, there muſt be provided four large and ſtrait poles, anſwerable in length to the depth of the water. The ends of theſe muſt be ſharpened in the manner of ſtakes, and there muſt be notches within a foot of the ſharp part to faſten the *net* to, and at a convenient diſtance, on the poles, there muſt be another ſet of notches, for the faſtening the other ends of the *net*.

The bottom of this *net* is four-ſquare, without any entrance. A boat muſt be taken out with this *net*, to place it properly. The four poles muſt be fixed in the bottom in ſuch a manner, that each may anſwer to the other in a direct line; and they muſt ſtand at ſuch diſtances, that the *net* may be drawn out as ſtiff as poſſible between them. If the *net* is to be fixed in a ſtanding water, this method alone will do very well; but if it be a ſmooth ſtream, ſomething more is neceſſary, otherwiſe the motion of the water will keep the *net* playing about, and this will frighten away the fiſh. To prevent this, four ſtrong ſticks are in this caſe to be faſtened along the tops of the others, ſo as to make a ſort of frame, to ſtreighten and ſtrengthen the others, and keep all tight.

When the *net* is perfectly fixed, it repreſents a cage, and the ſides, top, and bottom are kept ſo firm, that the fiſh do not regard them, but ſeem to take them for weeds; but going in at the entrances, there is no returning, and in rich places great numbers are taken.

Crow NET, in birding, a name given to a ſort of *net* contrived for the catching of wild fowl in the winter ſeaſon.

This *net* may be uſed in the day-time, and is to be made of double thread, or of fine packthread, and the meſhes are to be two inches wide. The length of the whole ſhould be about ten yards, and the depth about three. It ſhould be verged on the ſides with a ſtrong cord, and ſtretched out in length very ſtiff upon long poles, prepared for that purpoſe. When this *net* is brought to the place where it is to be uſed, it muſt be opened, and ſpread at full length and breadth: then its lower end is to be faſtened all along the whole length to the ground, ſo that it only can be moved up and down. The upper end of the *net* muſt ſtand extended on the long cord, the farther end of it being firſt ſtaked to the earth by a ſtrong cord, about five yards diſtant from the *net*, and ſtanding in an even line with the bottom of the *net*. The other end of the cord muſt reach at leaſt five and twenty yards, to ſome natural or artificial ſhelter, by means of which the ſportſman is to lie concealed from his prey. The *net* muſt be placed in ſuch exact order, that it will play upon the leaſt jerk of the cord, and that muſt always be given ſuddenly, leſt the prey eſcape. This *net* is principally uſed for crows and pigeons, on new-ſown corn fields, and it may alſo be uſed in ſtubble fields, where the ſtubble will hide the *net* from the fowl. If the meſhes are made ſmaller, it may be uſed at barn-doors and the like for ſmall birds, and a bait of chaff will bring them together under it. But the great uſe of the *crow-net*, is to ſpread it in mornings and evenings where the haunts of wild fowl are, which in hard weather fly in great flocks to and from land, with and againſt the wind, and then fly cloſe to the ground, in open countries and low lands, where there are few hedges. When a whole covey of theſe are within the reach of the *net*, it is to be let go over them, and they will be taken in great numbers at one caſt.

Tunnel NET. See the article TUNNEL.

Wolf NET. See the article WOLF.

NETE, *(Cycl.)* in the antient muſic, was a general name for one of the extreme chords of a tetrachord. Some ſay it was the higheſt, and others the loweſt ſound. But perhaps the truth of the matter is, that it was the higheſt or loweſt ſound, according as the aſcending or deſcending ſcales were conſidered. Vid. Phil. Tranſ. N° 481. p. 269. See HYPATE.

When the *nete* is ſaid to be one of the extremes of a tetrachord, it is to be underſtood of a tetrachord conſidered by itſelf: for, when tetrachords were combined, the *nete* ſometimes took another name, as appears from the Greek ſcale inſerted under the article DIAGRAM. Vid. *Wallis* App. ad Ptol. Harm. p. 158.

NETHINIMS, among the Jews, the poſterity of the Gibeonites, who were condemned by Joſhua to be hewers of wood and drawers of water for the houſe of God. *Hofm.* Lex. in voc. *nethinæi*. *Joſ.* ix. 22.

NETOPION, Νετωπιον, a name given by the antients to a very fragrant and coſtly ointment, conſiſting of a great number of the fineſt ſpicy ingredients. Hippocrates, in his treatiſe of the diſeaſes of women, frequently preſcribes the *netopion* in diſeaſes of the uterus; and in other places he ſpeaks of its being poured into the ears as a remedy for deafneſs, theſe compoſitions, by their attenuating qualities, dividing the viſcous and thick humors The word *netopion* is alſo ſometimes uſed to expreſs the *unguentum Ægyptiacum*, and ſometimes ſimply for oil of almonds.

NETTINGS, in a ſhip, are a ſort of grates made with ſmall ropes, and ſeized together with rope-yarn, and are laid in the waſte of a ſhip, ſometimes, to ſerve inſtead of gratings. See GRATINGS.

NETTING-*ſail*, in a ſhip. See the article SAIL.

NETTLE, in botany. See the article URTICA.

Dead NETTLE. See the article LAMIUM.

NETTLE-*tree*. See the article CELTIS.

NEURADE, in botany, a name given by Linnæus to a genus of plants, called by Juſſieu *tribulaſtrum*. The characters are theſe: the perianthium is very ſmall, and ſtands upon the germen of the piſtil: it is compoſed of one leaf, divided into five ſegments. The flower conſiſts of five equal petals, larger than the leaves of the cup: the ſtamina are ten filaments, of the length of the cup: the antheræ are ſimple: the germen of the piſtil ſtands under the cup, and is of a gibbous figure: the ſtiles are ten in number, and are of the length of the ſtigmata: the ſtigmata are ſimple. The fruit is an orbicular capſule, of a depreſſed figure on the ſurface, and convex underneath, and is every way ſurrounded with prickles. The inner part is divided into ten cells, in every one of which is lodged a ſingle ſeed. *Linnæi* Gen. Plant. p. 185.

NEURIS, in the writings of the antients, the name given to a ſpecies of marble, otherwiſe called *elaphoncſum*, and *proconneſium*. It was much uſed by the Roman ſtatuaries, and was dug in a ſmall iſland that lay between Paros and Cyzicus. It was of a duſky or blueiſh white, and was variegated with fine and ſlender veins of black, often beautifully diſpoſed, and in the bodies of the naked ſtatues reſembling the courſe of the veins.

NEUROBATES, in antiquity, a rope-dancer. See the article DANCE, *Cycl.*

NEUROPHYLLON, in natural hiſtory, a name given by Mr. Lhuyd to a ſpecies of foſſile plant, remarkable for the ridges on the leaf. See *foſſile* PLANT.

NEUTHA, a name given by authors to a pellicle covering the eyes or the ears of a child in the birth, and ſometimes the whole face.

NEVEW, in botany, &c. See NAPUS.

NEWT, or EFT, in zoology. See the article EFT.

The land *newt*, or as naturaliſts often call it, the land *ſalamander*, has ſomething very remarkable in its outer coat. Its ſkin often appears dry, like that of the lizard kind, but often alſo it appears wetted, and as if covered with a fine ſhining varniſh: the change from one to the other of theſe ſtates is uſually performed in an inſtant, and it frequently becomes immediately wet all over on the touching it. It alſo contains, under the ſkin, a ſort of milky liquor, which ſpurts out to a diſtance on preſſing the body of the animal.

The paſſages for this milk are a vaſt number of pores or holes, many of which are plainly viſible to the naked eye; and very probably the firſt-mentioned liquor, which covers the ſkin in manner of a varniſh, may be the ſame with this, its white colour not being diſtinguiſhable when it is ſpread ſo thin over the ſurface of the animal. This milk reſembles very much the milky juice which the tithymals, and many other of the ſucculent plants, afford on being cut or broken. It is of an inſupportably acrid and ſtyptic taſte; and tho' the tongue receives no injury from touching it, yet the ſenſation is ſo violent, that one is apt to imagine there muſt be a wound made in it. This animal, when bruiſed, yields alſo a very diſagreeable ſmell.

It has generally been ſuppoſed, that this animal is of a poiſonous nature; and the famous ſalamander of the old writers ſeems to be of the ſame genus, if not the ſame animal. Mr. Maupertuis, determined to inform the world of the truth in regard to theſe remarkable particulars, cauſed a large number of theſe animals to be brought to him, which the country people, who had caught them about the bottoms of old walls, brought to him with as much caution as if they had been vipers.

The firſt experiment he made, was that of the incombuſtible quality of this animal: to this purpoſe he threw ſeveral of them into a common fire; moſt of them periſhed immediately, but a few made ſhift to crawl out; but theſe could not get away on a ſecond trial, but periſhed like the reſt. It was obſerved, however, that the moment they were thrown into the fire,

fire, the whole quantity of milky juice they contained was driven out at all the pores, and drying in an instant, stood in round globules, like so many pearls, till wholly consumed by the heat.

It is possible that the observing this creature to have a power of throwing out these juices, and covering itself at pleasure with wet, might give rise to the imaginary property of its subsisting by the same means unhurt in the fire.

This trial being made, the next was to be certainly determined whether the creature were poisonous, or not. This Mr. Maupertuis proposed to try two ways; the first by making the creature bite some animal; the other by making some other creature eat the *newt*. But these experiments were attended with more difficulties than might have been imagined, for it was neither easy to make it bite any thing, nor to make any creature eat it. No provocation could make the *newt* bite, and when its jaws were opened by force, its teeth were found so small, and so placed, that they seemed rather intended to saw, or cut things to pieces, than to bite with; and when a chicken was brought to be bit, and the feathers removed from the part, the jaws had no force to make the teeth penetrate, and, when pressed together, the teeth rather broke, or were put out of their places, than entered the animal, so that it was necessary to take off the skin, and the chicken then received several wounds, by forcibly pressing the jaws of the *newt*, together with parts of the raw flesh between: after this the lips, and tongue, of a dog, and the tongue of a turkey, were bitten in the same manner by other *newts*. The animals were let loose, and not one of them received the least injury from the bite.

The following trial was made, whether the flesh of the creature, or its milky juice were poisonous, when received into the stomach. Several animals were kept hungry a considerable time, on purpose to make them eat the animal, but none of them would touch it, so well has nature defended this little creature by the acrid juice under its skin, of which other animals are warned, as by instinct, and refuse to swallow so disagreeable a repast. A dog was at length compelled to swallow a *newt* cut into several pieces, while alive, and a turkey was forced to swallow, in like manner, a small one. The dog's mouth was tied up for half an hour, and half an hour after they were untied, he vomited up the tail and the feet of the animal, and received no injury; nor did the turkey which swallowed the young one. After this, pieces of bread were soaked in the milky juice alone, and chickens were made to swallow them, and wounds inflicted with weapons dipt in the same juice, but no harm ever ensued to the creature from either.

From all these tryals, it appears very evident, that the stories of this creature's being poisonous, are as idle, and groundless, as those of its living in the fire.

One thing remarkable this gentleman observed in his dissections of the animal, which was, that he found in several of the females, at once clusters of eggs, and living young ones. The eggs formed clusters resembling those of the ovaries of birds, and the young ones were contained in two tubes, or long pipes, the coats of which were perfectly transparent, and the young ones were easily distinguished through them, and there were counted in one female fifty-four of these, all living and vigorous. Mem Acad Par. 1727.

NEXI, among the Romans, persons free-born, who, for debt, were delivered bound to their creditor, and obliged to serve him, till they could pay the debt. *Hofm.* Lex. in voc.

NEXT *taker*, among miners, is he that hath the next meer in possession. *Houghton's* compl. Miner in the Explan. of the Terms

NHAMBUGUACU, in botany, a name of the great American *ricinus*, or *palma Christi*. *Marggr.* p. 77. *Piso*, p. 180.

NHAMDIA, in zoology, the name of a fish caught in the rivers of many parts of America, and of a fine taste. It is of the anguilliform kind, and has a long and fat body, becoming smaller toward the tail; its belly is soft; its head flat; and its mouth of a parabolic figure, and armed with small teeth. It is usually of about eight or ten inches long; its eyes are small and prominent; and it has a beard composed of six filaments, four placed below, and two above; the last are much longer and thicker than the other four, and have a long furrow behind each. It has seven fins beside the tail; one of the back fins is thorny; the rest are covered with the common skin of the body, which is soft, and free from scales. Its tail is forked, and its head is covered with a strong shelly coat; this is of a dusky brown. Its back and sides are of a bluish grey; the larger back fin is of the same colour; all the rest are black; and, on each side, there is a red line reaching lengthways from the gills to the tail. *Willughby's* Hist. Pisc. p. 140.

NHANDIROBA, in botany, a name given by Plumier to a genus of plants, the same with the *fevillea* of Linnæus. *Plumier*, Nov. Gen. 27. See the article FEVILLEA.

NHANDUAPOA, the name of a Brasilian bird, called also *jabiruguacu*, but more frequently known by its Dutch name *scurvogel* See SCURVOGEL.

NHANDUGUACU, in zoology, the name of a Brasilian bird of the emeu, or cassowary kind, but smaller than the common, or African cassowary. Its body is considerably large; its neck long and strong; its legs very long and thick; its wings extremely short, and unfit for flying, but assisting it in running; its feathers are grey, and, on the back, are considerably long. It commonly carries its neck bent like a swan; its head is shaped like that of a goose; its back feathers cover the rump, and make a sort of tail; it runs as swift as a greyhound, and feeds on flesh and fruits. *Marggrave's* Hist. Bras.

NHAQUUNDA, in zoology, the name of a small fish caught in the American rivers. Its body is oblong, and every where nearly of the same thickness; its head and mouth are like those of the pike; and its usual length is about four inches. It can extend its upper lip, and round the opening of its mouth. It has no regular teeth, but its jaws are rough like a file. It has two fins at the gills, two on the belly, one long one on the back, but not reaching from head to tail, and one short, and almost square one, behind the anus. Its tail is covered with a hard shelly crust; its body is covered with moderately large scales; and its back and sides are of a silvery grey; its belly white It has on each side a single row of round black spots, of the bigness of a pea, and among these a number of small blue ones. The fins also are all variegated with blue spots, and it has a long streak reaching from the gills almost to the tail, and under the end of that another short one which runs into the substance of the tail; these are both raised above the surface of the rest of the body, and are of a fine gold colour. It is a very well tasted fish. *Marggrave's* Hist. Bras.

NICETERIA *Athenæ*, Νικητήρια Ἀθηνᾶς, in antiquity, an Athenian solemnity in memory of Minerva's victory over Neptune, when they contended which of them should have the honour of giving a name to the city afterwards called Athens. *Potter*, Archæol. T. 1. p. 416.

NICHILIANISTÆ, in church history, heretics who maintained that Christ had no being. *Hofm.* Lex. in voc.

NICOL, in natural history, a word used by the miners in Germany to express a greenish crust, covering several of the species of marcasites and cobalt; it emits fumes that smell of garlick in the calcination, and is very injurious to the workmen, causing contractions of their limbs, and other disorders. It is sometimes found in masses alone, but that more rarely.

NICOMIA, in natural history, a name given by some to a stone called by others *chert* and *ubern*. It is of a greyish, horny constitution, and has veins of red on it. It is very hard and semi-pellucid, much resembling the common agates, and it gives fire readily with steel. It lies in strata in Yorkshire, and many other parts of England: these strata are about three foot thick, and run a vast way among the rocks. It usually lies among lime stone, and is not regular in colour, being sometimes of a dusky or blackish hue, like the common flint. It is so hard that no common tool will touch it, and it breaks irregularly, and without any grain, in the manner of the common flint. *Woodw.* Cat. Foss. Vol. 1. p. 22. See CHERT.

NICOTIANA, *tobacco*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the infundibuli form kind, consisting of one leaf divided into several segments at the edges; the pistill arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower; this afterwards becomes a membranaceous fruit, of a roundish or oblong figure, divided by an intermediate membrane into two cells, which contain a large number of seeds fixed to a placenta. *Tourn.* Inst. p. 117.

The species of *tobacco* enumerated by Mr. Tournefort are these: 1. The great, broad-leaved *tobacco*. 2. The great, narrow-leaved *tobacco*. 3. The great broad, and round-leaved *tobacco*. 4. The small *tobacco*, called *priapeia* by some writers. 5. The white-flowered, thorny, tree *tobacco*.

NIDDUI, in the Jewish customs, is used to signify, separated, or excommunicated. This, according to some, was to be understood of the lesser sort of excommunication in use among the Hebrews. He that had incurred it was to withdraw himself from his relations, at least to the distance of four cubits: it commonly continued a month. If it was not taken off in that time, it might be prolonged for sixty, or even ninety, days. But if, within this term, the excommunicated person did not give satisfaction, he fell into the *cherem*, which was a second sort of excommunication; and thence into the third sort called *schammatha*, the most terrible of all. *Calmet* Dict. Bibl. in voc.

NIDUS *avis*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the polypetalous, anomalous kind, and is composed of six dissimilar leaves, the five upper of which are so disposed, as, in some measure to resemble an helmet; the lower one is headed, and bifid at the end. The cup finally becomes a seed vessel, containing seeds of a very remarkable smallness, and appearing only as dust. The roots are fibrous, and so interwoven together as to resemble a bird's nest.

There is only one known species of this genus, which is the plant called by many *orchis abortiva fusca*, the brown, abortive orchis. *Tourn.* Inst. p. 137.

NIEKE *corondi*, in the language of the Ceylonese, the name of a species of cinnamon. The tree which produces it resembles the *nieke*, another tree very common there. This is

a very bad kind of cinnamon, and has very little tafte or fmell. It is very feldom fold as cinnamon, but is much in efteem among the natives for its medicinal virtues. They obtain a water, and an oil from it, by roafting, which they anoint themfelves with, to preferve them from noxious fumes, and infections of any kind; and ufe the expreffed juice of the leaves to cool the head, and ftrengthen the brain, rubbing it on externally. Phil. Tranf N° 409.

NIGELLA, in botany, the name of a genus of plants, the characters of which are thefe: the flower is of the rofaceous kind, confifting of feveral petals arranged in a circular form, and ornamented with a fort of corolla between thefe and the ftamina, made up of a fort of horn-like bodies. The piftil arifes from the center of the flower, and finally becomes a membranaceous fruit, of a roundifh, or oblong, form, and often divided into feveral parts.

The fpecies of *nigela* enumerated by Mr. Tournefort are thefe: 1. The horned, field *nigella*, called by many authors *melanthium*. 2. The horned, field *nigella*, with blue double flowers. 3. The horned, field *nigella*, with white flowers. 4. The broad-leaved *nigella*, with large, fingle, blue flowers. 5. The narrow-leaved *nigella*, with large, fingle, blue flowers. 6. The narrow-leaved *nigella*, with large, fingle, white flowers. 7. The great, double, blue-flowered *nigella*. 8. The *nigela* with fmall, fingle, white flowers. 9. The *nigela* with fmall, double, white flowers. 10. The Cretic *nigella*. 11. The broad-leaved, fweet-fcented, Cretic *nigella*. And, 12. The *nigella* with fingle, pale, red flowers. *Tourn* Inft. p. 258.

We have feveral fpecies of this plant propagated in the gardens about London: they are all raifed by fowing the feeds in the fpring, on a bed of light earth, where they are to remain; and, when they come up, they are to be thinned to proper diftances, and kept clear from weeds. *Miller's* Gard. Dict.

NIGHT (*Cycl.*) — NIGHT *angling*, a method of catching large and fhy fifh in the night. Trout, and many other of the better forts of fifh, are naturally fhy, and fearful; they therefore prey in the night, as the fecureft time.

The method of taking them on this plan is thus: the tackle muft be ftrong, and need not be fo fine as for day-fifhing, when every thing is feen; the hook muft be baited with a large earthworm, or a black fnail, and thrown out into the river; there muft be no lead to the line, fo that the bait may not fink, but be kept drawling along, upon, or near, the furface.

Whatever trout is near the place will be brought thither by the noife, and motion of the water, and will feize the worm, or fnail. The angler will be alarmed by the noife which the fifh makes in rifing, and is to give him line, and time to fwallow the hook; then a flight twitch fecures him. The beft and largeft trouts are found to bite thus in the night, and they rife moftly in the ftill and clear deeps, not in the fhallow fwift currents. Sometimes though there are fifh about the place, they will not rife at the bait; in this cafe, the angler muft put on fome lead to his line, and fink it to the bottom. Dict. Ruft. in voc.

NIGHT-*fhade*, in botany. See SOLANUM.

NIGHT-*walkers*. See NOCTAMBULATIO, and NOCTAMBULI.

NIGHTINGALE, *philomela*, in zoology. See PHILOMELA.

Virginian NIGHTINGALE, in zoology, the common, but improper, name of a bird of the grofs-beaked kind, called by authors the *coccothrauftes Indica criftata*.

It is a little fmaller than our blackbird; it has a black ring furrounding the eyes, and noftrils; the beak is very large and thick, but not altogether fo large as in the common grofs-beak; and its head is ornamented with a very high, and beautiful creft, which it moves about very frequently. It is all over of a very fine, and lively red, but paler on the head and tail than elfewhere. It is brought to us from Virginia, and is much valued in England, for its beauty, and delicate manner of finging. It is very fond of almonds, and the like fruits. *Ray's* Ornithol. p. 179.

NIGRITIES *offium*, among the antients. See CARIES.

NIL, in botany, a name given by the Arabians to two very different feeds, which are often, by this means, miftaken in their writings, one for the other. Avifenna tells us firft that *nil* is the feed of a creeping plant, of the bindweed kind, and that this plant had blue flowers, like the campanulas, or bell-flowers. But, in another place, he tells us that *nil* is the name of a plant ufed in dying, which feems to be the fame with our *ifatis*, or woad. They fometimes call this plant, and fometimes the paint prepared from it, by the name *nil*. The old interpreters of Diofcorides into the Arabic have every where tranflated the word *ifatis*, or woad, by the word *nil*, or the vegetable of which *nil* was made. The interpreters of the Arabians have been all mifled into errors by the double fenfe of the word *nil*, and have too often tranflated what is faid of the *nil*, as a dye, or paint, to belong to the feed; and what is faid of the feed by authors, is, by them, interpreted fo as to be expreffed of the *ifatis*.

Avifenna ufes the word *ufme*, as a name of the leaf of *nil*: this is to be always underftood as meaning that *nil* which is ufed in dying; and, after this, he has a felect chapter on the *ifatis*, under this name *nil*. It is probable that the convolvulus, or bindweed, called *nil*, obtained this name only from its flowers being of the fame colour with the fine blue pigment obtained from the other *nil*, or woad.

NILACUNDI, in natural hiftory, a name given to a ftone of the gem kind, which is half a fapphire, and half a ruby. See SAPPHIRE, and RUBY.

The word *nilaa* is the Indian name for the fapphire, derived from the word *nil*, the name of indigo, and given to this gem becaufe of its fine blue colour, which approached to the tinge of that pigment. The latter part of the word is not eafily accounted for, without making a little variation in the fpelling, but, with that, is very clear and eafy. *Jacut*, or *ja uti*, and, as fome fpeak it, *ja unti*, is the name given by the Indians to the ruby, and it is only fuppofing the word to be properly *nil-ja unti*, and it expreffes in their own language, exactly what we underftand by it, a ftone, part fapphire, and part ruby.

NILAHUMATU, in botany, a name given by feveral authors to the fmooth fruited *ftramonium* of Malabar. See the article STRAMONIUM.

NILIACUM *mel*, a name by which the antients expreffed the very fineft honey.

NILICANARAM, in botany, the name by which fome authors call the tree whofe fruit is the myrabolan ufed in medicine. Hort. Mal. Vol. 1. p. 69.

NILUFAR, in botany, a name given by the antient writers to the common *water-lilly*. They diftinguifhed this plant by that name from the Indian *nymphæa*, whofe root was of a cold and foporific virtue, like that of the mandrake. This they call always *nenufar*. The word *nilufar* afterwards gave rife to another name *linufar*: this was only formed of the fame letters a little tranfpofed, and was ufed to exprefs all the kinds of the *water-lilly*. The Greeks borrowed the word *nilufar* of the Arabians, and, at firft, wrote it *nilafaran*, but afterwards it became contracted into *noufaran*, and fo it ftands, at this time, in moft of the works of the modern authors of that nation. Neophytus runs into great errors on this account, and confounds together the trifoliate lotus, with the lotus of Ægypt, the leaves of which are like thofe of the *nymphæa*, or the *arum*.

Some writers have fuppofed the *andrafa e* to be a kind of *nilufar*, and to have been defcribed as fuch by the antients, and others have thought the fame of the *ftratiotes*; but all this is without foundation. Thefe plants are wholly unlike both to the *nymphæa*, and to one another, and were never confounded, either together, or with that plant, except in the brain of fuch authors.

NIMBUS, among the Romans, a fcarf embroidered with gold, which women wore on their foreheads.

NIMBUS was likewife ufed for the money thrown among the people, upon any public occafion. *Pitifc.* Lex. Ant. in voc.

NINTIPOLONG, in zoology, the Ceylonefe name of a fpecies of ferpent called alfo *ferpens hypnoticus*. It is a very poifonous fpecies, and its bite brings on a fleep upon the perfon, which terminates in death. It is of a deep, blackifh brown, variegated with fmall fpecks of white. *Ray's* Syn. Anim. p. 332.

NINZIN in the materia medica, a name ufed by fome authors for the famous Chinefe root, commonly called *ginfeng*. See GINSENG, *Cycl.*

NIPPERS, in the manege, are four teeth in the forepart of a horfe's mouth, two in the upper, and two in the lower jaw. A horfe puts them forth between the fecond and third year. See TEETH.

NIPPERS is alfo an inftrument in ufe among fmiths, and farriers, being a kind of pincers, wherewith, in fhoeing an horfe, they cut the nails before they rivet them. It is alfo ufed in taking off a fhoe.

NIPPERS, in a fhip, are fmall ropes about a fathom, or two, long, with a little truck at one end, and fometimes only a wale-knot. Their ufe is to help to hold off the cable from the main, or jeer capftan, when the cable is fo flimy, fo wet, or fo great, that they cannot ftrain it to hold it off with their bare hands.

NIPPLES (*Cycl.*) — The *nipples* of women, in their firft lying in, are frequently fo fmall, and funk into their breafts, that the infant cannot get at them to fuck its nourifhment. The readieft method in this cafe is to apply an infant fomewhat older, and which can draw ftronger; or, if this does not fucceed, to let a woman who has been practifed in the art, attempt to fuck.

When thefe do not fucceed, it is common to have recourfe to a glafs pipe, and the poorer people in fome places ufually make a tobacco pipe ferve the turn. Others apply a fmall cucurbite made of ivory in the form of a hat, which they fuck ftrongly in their mouth. The common fucking-glafs is alfo, when properly applied, of very fignal fervice. To do this, the fmall hole at the fide is to be ftopped with wax, and the glafs heated with warm water; or, by holding it before the fire, fo as to rarify, and in part, expel the air. It is then to be applied to the *nipple*, which, in this cafe, will not only be pulled

out, but will discharge a large quantity of milk, so as to take down the inflammation and tumor in the breast. When the sucking power of the glass is grown weak, the hole at the side is to be opened, and the milk poured out; the glass is then to be heated again, and the hole being stopped again, is to be a second time applied, and so on, till the intention is fully answered. *Heister's* Surgery, P. 2. p. 11.

NIPPLE-*wort*, in botany, &c. See LAMPSANA.

NIQUI, in zoology, the name of a fish of the cucullus kind, approaching to the figure of that species commonly called *draco*, and *araneus marinus*, and in English the *weever*. Its head is large and thick, and its mouth large and without teeth. The under jaw is longer than the upper, and the anterior part of the body is somewhat broad, and flatted; the hinder part, especially toward the tail, is rounded. Its usual length is four or five inches; the eyes are small, but they are placed, like those of the crab, out of the head. It is covered with a mixt colour of brown, black, and yellow on the back and sides, and is white on the belly; it is spotted all over the head, back, and sides, with small black spots as big as poppy seeds. It is common about the American shores, and is eatable when the liver and gall are taken out, otherwise it is said to be poisonous. *Marggrave's* Hist. Bras. See Tab. of Fishes, N° 49.

NIR, in the materia medica, a name given by the Arabian physicians to the pigment, or colour, made from the *isatis*, or woad. The word is derived from the Latin *nigrum*, black. The colour of this pigment is, indeed, not black, but a deep blue; but we find numerous instances of the Greeks and Latins, both using the proper appellatives of black for the same colour, a deep blue. We find Theophrastus calls the fine deep blue oriental sapphires black, μέλανας, and Virgil expresses the deep blue of the violet by the word *nigra*. Many of the Arabians call this plant, and the pigment, or colour, made from it, by the name *nil*, but that is a less determinate name, as they call also the seed of a kind of bindweed with blue flowers by the same name. See NIL.

NISAN, a month of the Hebrews, answering to our March, and which sometimes takes from February, or April, according to the course of the moon. It was made the first month of the sacred year at the coming out of Egypt. *This month shall be unto you the beginning of months, it shall be the first month of the year to you.* Exod xii. 2.

It was the seventh month of the civil year. Moses calls it *abib*. The name *nisan* is only since the time of Ezra, and the return from the captivity of Babylon. *Calmet* Dict. Bibl.

NISSOLIA, in botany, the name of a genus of plants, the characters of which are these: the flowers, and fruit, are the same with those of the lathyrus, but the leaves stand single, and the stalks have no claspers, or tendrils at their ends. There is only one known species of *nissolia*, which is the plant called by some the small, one-leaved *lathyrus*. *Tourn.* Inst. p. 656.

NISUS, in zoology, a name by which many authors call the *accipiter fringillarius*, or sparrow-hawk. *Ray's* Ornithol p. 51. See the article FRINGILLARIUS *accipiter*.

NISUS is also a name used by some old naturalists for the *haliaetus*, or *aquila marina*, called in English the *sea eagle*, or *osprey*. *Willughby*, Ornithol p. 29.

NISUS is likewise a name given by the barbarous writers of the middle ages to *alabaster*.

NITEDULA, in zoology, the field mouse. See MUS.

NITIDUM *folium*, among botanists. See LEAF.

NITRE (*Cycl.*) — NITRE is a salt found immersed in imperceptible particles, in earthy substances, as the particles of metals in their ores, and is discoverable in these bodies by an acrid and pungent taste, and a sensation of coldness with which it affects the tongue: sometimes also it is found native, and pure, in form of an efflorescence, or shapeless salt, either on its ore, or on old walls, and yields, after solution, hexaëdral prismatic crystals.

Many have been of opinion that *nitre* was, in part at least, an animal salt, and that where it was found on old walls, it was owing to the effluvia of animal bodies once inhabiting the place; but we find it now in vast quantities in several of the marly earths of the East-Indies, and some other places, which, however, though they abound with it, when they are in the naked cliffs, exposed to the air in a proper situation, yet when dug up from any depths in the earth, the same substances are not found to contain any of this salt.

This marly earth is frequent in China, Persia, and many parts of the east, and is chosen for working from places where it stands in barren cliffs, on hills facing the northern, or eastern winds. The manner of their separating *nitre* from this earth, is as follows; they dig large pits, which they coat over on the inside with a stiff and firm clay; this they fill half full of water, and into it throw the earth. When the water has stood some days to imbibe the salt, they draw it off into other pits, defended by slight walls on all but the north-east side. Here the sun exhaling the water, the salt which it had imbibed, affixes itself to the sides of the pit in small, brownish, white, hexaëdral, but very imperfect crystals, which are what we receive from the East-Indies, under the name of rough *nitre*.

This is the way the greatest quantity of this salt is made, but it is also procured from divers other materials, and by many other methods. In many of the eastern nations, the ruins of old buildings exposed to the north-east winds, and sheltered from rain, have their walls covered with efflorescences of a nitrous salt, which is usually thrown with the earth into the *nitre* pit. Earths moistened with the excrements of animals as the earths of pigeon-houses, and the like, all afford more or less *nitre*, and, in France, vast quantities are annually made from lime rubbish, and the ruins of old buildings.

By which ever of these methods *nitre* is procured, it is ever in all respects the same salt. Its crystals are of a hexaedral prismatic form, terminated by hexaedral pyramids. It dissolves in a moderate fire, and does not flame, unless a coal, or some other sulphureous body fall in. It requires near seven times its own weight of water to dissolve it perfectly. *Hill's* Hist. of Foss. p. 393, 391, 395.

This salt gives the greatest of all proofs of the effects of synthetical, or recomposing chemistry. It is first separated, or analysed, in the following manner: take two pounds of refined saltpetre in fine powder; pour upon it one third of its weight of oil of vitriol, and distill it in a glass retort, in a strong sand heat, there will be produced a strong acid spirit of *nitre*, which cannot, by any experiment, be found to participate at all of the nature of the oil of vitriol used in its preparation. Then take a pound of fresh *nitre*, melt it in a crucible, and throw into it, at times, pieces of charcoal, till it will no longer keep in fusion with the same degree of fire; then encrease the fire, and melt it, and then pour it into a proper vessel; leave it to cool of itself. This is fixed *nitre*, and is an alkali: now dissolve this fixed *nitre* in water, and exactly saturate that water with the acid spirit of *nitre* before distilled, this compound liquor will, by standing, shoot into true and perfect crystals of *nitre*. And the experiment succeeds as well, if a solution of pot ashes, or any other fixed alkali, be used instead of that of fixed *nitre*. *Shaw's* Lectures, p. 170.

Of all the salts which afford us those strong liquors commonly known by the name of the mineral dissolvents, salt petre, or *nitre*, is the only one which yields red vapours, or whose spirit rises in form of red vapours, as soon as it is separated by means of fire; but the reason of this fact has never been accounted for, till Mr. Hellot explained it to the Academy at Paris, in one of his memoirs.

Of the chemists who have before treated of it, some imagined that the redness of the vapours was owing to some part of the sulphureous substances which the salt had imbibed from the urine and dung of animals where it was formed; others that this colour was owing to particles of fire carried up with the vapours in their ascent. But these are weak conjectures, since, if the first were the case, the mixtures of sal armoniac with common salt of vitriol, ought to yield red vapours in distillation, which never is the case; and, if the latter be supposed, it is not easy to say, why oil of vitriol does not arise in the same coloured vapours; since it requires a more violent, and longer continued fire to raise it.

Vitriol is added to *nitre* in the distillations which yield these red vapours, and it is the first point to be determined in the investigating this phænomenon, whether the vapours owe their colour truly to the *nitre*, or whether they borrow it from the additional vitriol. Baldwin, Stahl, and many others are of opinion indeed, that the red vapours are owing to the vitriol, and essential to it, and call them the *anima nitri*; and they prove the assertion by the known observation that *nitre* melted with a tender white glass, turns it to purple, or some shade of red; whereas neither alum, common salt, nor the fixed alkalis give this colour; and it is probably some portion of an ammoniacal urinous salt, mixed in the *nitre* which gives the colour, since sal armoniac will give the same colour when fused with glass. What is it, however, in the sal armoniac which has this effect? not its volatile alkali, for that is dissipated in the mixture by the first efforts of the fire; neither can it be the acid spirit of sea salt, since experiment proves that it can have no such effect, when employed alone.

A little crocus martis, or any calx of iron, does the same thing to glass, and sometimes even the smoak of the furnace will do it, when woods of too resinous a kind are employed as fuel; many a large quantity of what was meant for pure crystalline glass having been tinged red, or purple, in this manner, and wholly spoiled; and all that we can judge on the whole, as to *nitre*, or sal armoniac tinging them, is, that it is a fatty, or unctuous matter in those salts which produces the colour: and, in all probability, *nitre* contains, beside a quantity of an urinous, or ammoniacal salt, a small quantity of a ferrugineous matter, in extremely minute and imperceptible particles.

Mr. Lemery has proved that all the salt petre made in Europe has been originally an ammoniacal salt; and, indeed, if *nitre* be rubbed for a considerable time in a glass mortar made warm, with a quantity of a fixed alkali salt, it will afford an urinous smell. It is not easy to prove that all sal armoniac contains ferrugineous matter; but when we con-

ſider that iron is always found in the aſhes of vegetables, and that it, therefore, evidently aſcends in extremely minute particles, with the juices of plants; and that ſal armoniac is prepared from a ſoot made of the excrements of thoſe animals which feed on plants, we ſhall find it no impoſſibility that iron ſhould be there; and we well know that iron, in any ſtate, cannot but give that colour to glaſs, which *nitre*, in a ſmaller quantity, and ſal armoniac, in a larger, are able alſo to give. Memoirs Acad. Scienc. Paris. 1736.

All obſervations and experiments would ſeem to prove that the red colour given to glaſs by *nitre*, can only be owing to ferrugineous, or ammoniacal matter contained in it; and it is no very raſh conjecture, to ſuppoſe that the ammoniacal matter contained in the ſalt-petre, rarifying, and extremely dividing the ferrugineous matter, during the time of the diſtillation, may diſtribute them in their disjunct moleculæ, to all that matter, or thoſe particles, which form thoſe vapours, and tinge them red by its diſtribution of them.

It is to be obſerved, however, that the vapour of ſpirit of *nitre*, or of aqua fortis, are not always red, but only are ſo when the fire is great enough to raiſe with the vapours the matter which colours them; for if ſpirit of *nitre* be made with the addition of alum calcined, with dry ſalt-petre, and with filings of zink mixed together, there will be obtained with a ſmall degree of fire, a ſpirit of *nitre*, which does not come over in red fumes.

If the fire be raiſed to a greater degree of violence, there will afterwards be obtained a ſecond ſpirit of *nitre*, which will come over in red fumes; but the firſt of theſe will ſhew the great experiment of taking fire on mixture with oil of turpentine, or the European oils of vegetables, better and more readily than the other.

It is therefore no eſſential character of ſpirit of *nitre* to riſe in red vapours, ſince the firſt riſes without; and this is truly the pure ſpirit of *nitre*; while the ſecond, which riſes in red fumes, is impure, being coloured by ferrugineous, or other foreign matter raiſed in vapour with the reſt, by the great violence of the heat.

It is obſervable, that if vitriol calcined to a redneſs be uſed with the *nitre*, for drawing the ſpirit, the vapours riſe of a perfect blood red. In the common way of diſtilling what is called ſimply ſpirit of *nitre*, the cuſtom is to put into the retort with the ſalt-petre, a very large quantity of a vitriolic earth; and in the making that ſpirit called aqua fortis, green vitriol, or Engliſh copperas is mixed with the *nitre*. This is abundantly known to contain a great deal of iron. Here, therefore, is in each caſe a quantity of ferrugineous matter added; and we well know that this can give a red colour to the vapours, with which it is by violence of fire compelled to riſe. Repeated trials of ſpirit of *nitre*, with mercurial preparations alſo, prove beyond contradiction, that there is ferrugineous matter in that ſpirit. Many of the common mercurial precipitates, when made with aqua fortis, or with plain ſpirit of *nitre*, may have abſolute plain iron ſeparated from them; and the chemiſts know well that this is not to be ſuppoſed to have been lodged in the mercury, ſince it is very difficult to conceive how that metal ſhould become amalgamated with it; but there can be no difficulty of ſuppoſing it ſeparated from the menſtruum, ſince it is evident that there is iron contained in the matters uſed in the diſtillation of it, and even in the ſalt itſelf from which it is originally drawn.

It would be very natural to ſuppoſe that the ferrugineous matter was raiſed only from the additions of pure vitriol or a vitriolic earth; but it is evident from the experiment of *nitre* alone turning glaſs red, that there is certainly alſo ferrugineous matter in that ſalt itſelf; nor is it at all difficult to conceive how iron comes to enter the body of that ſalt; ſince, if we conſider it as made in Europe, from the rubbiſh of old buildings, and the cleanſings of ſtables, &c. it is eaſy to conceive that pieces of iron of ſeveral kinds may have been ruſted away, and conſumed there, and ſo mixed among the matter from which the ſalt was afterwards made. The addition of wood aſhes always uſed alſo in the making it, may have lodged ferrugineous matter among it, ſince it has been often proved that the aſhes of all vegetables contain true iron. Memoirs Acad. Scienc. Par 1736.

It may ſeem a difficult thing to conceive, however, in what manner ſo ſmall a quantity of iron as there can be ſuppoſed to be in *nitre*, is able to colour ſo large a body of vapours as are ſeen to riſe in the diſtillation. But if we conſider the extreme diviſibility of the particles of metals into colouring matter, and the vaſt quantity of water that a ſingle grain of copper is capable of tinging blue, when diſſolved in an alkali, we ſhall be the leſs ſurpriſed at it; eſpecially if it be conſidered alſo that it has been proved already that there is true ſal armoniac in all *nitre*, and it is well known that this ſalt is capable of rarifying, and extremely dividing the particles of that, or any other metal; and if as much ſal armoniac as can be diſſolved in aqua fortis be added to that ſpirit, it is well known alſo that it will make it ſend up vapours much redder than before, which can only be owing to the ſal armoniac raiſing a larger quantity than ordinary of the ferrugineous matter contained in the aqua fortis than would naturally have been raiſed from it.

The moſt ready way of reducing *nitre* to powder, is to diſſolve a quantity of it in as little water as may be, and evaporate the water over a gentle fire, continually ſtirring it till dry, by which means the *nitre* will be found in form of a very dry white powder. This is the method uſed by the gunpowder-makers. *Shaw's* Lectures, p. 389.

The curious, in the hiſtory of *nitre*, and its preparation from vegetables, &c. and the purifying it for gunpowder, and other uſes, may conſult the works of Glauber, Stahl, and Clark, on the ſubject of this ſalt, and compare them with the diſcourſe of the younger Lemery on the origin of *nitre*.

Purified NITRE. See NITRUM *purificatum*.

Spirit of NITRE. See SPIRITUS *nitri*

NITRIUM *ſal*, in natural hiſtory, a name given by many writers to the ſalt ſeparated from the water of the lake Natron in Ægypt, which is the *natrum*, or *nitre* of the antients.

This lake is ſituated in the Nitrian deſart, ſo called from *Nitria*, a very large town there It is ſix or ſeven acres in extent, and lies about thirty miles weſt and by ſouth from Terana, and about the ſame diſtance north from the pyramids: from the bottom of this lake the ſalt called *natrum* ariſes to the ſurface of the water, and is there condenſed, by the heat of the ſun, into the hard and dry form in which it is ſold.

Four ounces of the water of the Natron being examined by evaporation in a glaſs veſſel, placed in a ſand heat, there will ariſe, as ſoon as it becomes warm, a ſort of ſcum to the top; this being taken off, another inſtantly ſucceeds, and ſo on, ſo long as any water remains in the glaſs.

This ſalt, thus ſcummed off, is the ſame in all reſpects with the *natrum*, or the Smyrna ſoap earth; being a fixed alkali, fermenting with acids, and boiling into ſoap with oil. This icy ſcum is the ſame as that called by Pliny *flos ſalis*, and ſeems to be the ſame with that which Herodotus ſays the Ægyptians made uſe of in the preparation of their mummies.

It is ſaid that the water of this lake, though it contains ever ſo large a quantity of this ſalt, will not ferment with any acids, tho' the leaſt particle of the ſalt ſeparated either by a natural, or artificial heat, will ferment violently with any acid What the heat of the ſand furnace does in this experiment, the heat of the ſun does in the lake itſelf; and the ſingular circumſtance of the water of the lake not fermenting with acids, is confirmed by this, that a clear ſolution of the ſalt in common water will not ferment with them.

The antients have attributed great virtues to the ſalt of this lake; and this being called *nitrum*, as a ſhort name for *nitrium ſal*, we have had ſome who have ſuppoſed the ſalt which we call *nitre*, to be the ſame, and theſe people have wondered that they did not find the ſame virtues in our *nitre*.

The mineral waters of all parts of the world ſeem to contain more or leſs of this ſalt, and to owe their virtues in a great degree to it; and, probably, it might be no ſmall improvement to phyſic, to bring it more into the preſent practice. Molenbroch recommends it greatly in the ſtone; and it may be the more probably uſed, as all alkali ſalts are known to be good in that diſtemper. Some add to this, that it ſeems qualified to diſſolve ſtony ſubſtances, it being of ſo piercing and penetrating a ſpirit, that no rock, or ſtone is found about the lake from the waters of which it is procured. Phil. Tranſ. N° 160.

NITROAERIAL *ſpirit*, a term invented by Mayow; and ſince uſed by many others, to expreſs a very active principle in the air, cauſing great changes in the bodies abſorbing it and expoſed to it.

The acid ſpirit of nitre is produced partly by the air, and partly by a terreſtrial matter making up the reſt of the body of that ſalt. Mr. Boyle, in his experiments on flame and air, has abundantly proved this; and that igneous particles of the air reſide in nitre, is as certain a concluſion from the ſame principles: theſe conſtitute its moſt active part, and by theſe the flame of kindled nitre is produced.

The aërial particles of nitre are truly no other than the igneoaerial matter of it, and this aërial matter is evidently lodged in the acid ſpirit of it, not in the fixed ſalt. This acid ſpirit is, according to Mayow, compoſed of a terrene matter, which is flexile and humid, and of etherial particles, which are rigid and dry, active and igneous, and proceeding from the air.

Theſe igneous particles are common to nitre and to air, and are therefore called *nitroaerial*; and the ſpirit of nitre derives, according to this ſyſtem, from theſe particles its active and corroſive quality, which makes it a ſort of potential fire; and on this the form of nitre chiefly, if not only depends.

Now as this *nitroaërial* or igneous ſpirit reſides in the acid ſpirit of nitre, it is thence inferred, that the *nitroaërial* ſpirit is of a nitro-ſaline nature, obtaining rather the nature of an acid than a fixed ſalt; conſidering alſo, that the effects of fire in general anſwer to thoſe of a very ſubtle and corroſive ſalt. Fire in general, on theſe principles, is eaſily proved to depend principally upon the ſaid *nitro-aërial* principle put into motion.

This *nitro aërial* ſpirit makes the moſt active, and, indeed, the principal part of the ſalt which we call *nitre* Its terreſtrial and acid parts make up the reſt of the maſs; and theſe are rather of uſe

ufe to form the whole into a body, and give it form and confiftence, than to add to any of its fat.

NITRUM, is ufed by the poet Martial to exprefs that fort of foulnefs in cryftal, which Pliny, and other of the antient Roman authors, diftinguifh by the name of *fal*. See the article SAL.

NITRUM *antimoniatum*, in chemiftry, the name of a falt procured by evaporating the filtrated waters ufed in making the *antimonium diaphoreticum* to a drynefs, continually ftirring them towards the end of the operation. There, at length, remains from thefe a white faline matter, of a particular tafte, not ungrateful, nor nitrous, but perfectly mild.

Hence we fee that *nitre* is changed into a new falt by detonation with antimony.

This falt is gently aperitive, and, in denfe, inflammatory blood, excellently refolves without violence. It fuccefsfully promotes perfpiration, fweat, and urine; hence it cools, and becomes greatly ferviceable in the fmall pox, meafles, pleurify, and peripneumony. We fee how erroneous has been the opinion of this water being noxious, and how valuable a medicine that opinion had led people for a long time to throw away.

NITRUM *calcarium*, in natural hiftory, a name given by Dr. Lifter to a peculiar fpecies of neutral falt, which he firft publickly defcribed in his book on the medicinal waters of England. He very improperly calls it *nitre*; becaufe it has none of the properties or qualities of *nitre*, but only a fort of general refemblance in its external form. He obferves that this falt, tho' very little known, was abundantly the moft copious of all the forts afforded by the mineral waters in general; and fays its cryftals were long and flender, and confifted of four fides, and were terminated by a point compofed of two triangular planes. He adds, that this falt doubtlefs had its origin from a mixture of the acid of fulphur, and a calcarious earth of an alkaline nature.

This falt is found in almoft all the mineral waters of Germany, and is very juftly obferved by Hoffman to be of the nature of Glauber's falt: that it is not *nitre* is evident from this, that it is not inflammable, nor will yield aqua fortis by diftillation. It feems, indeed, true Glauber's falt, compofed of the acid of vitriol, or fulphur, for this is in both the fame, and of that alkaline earth which is the bafis of fea falt: this is its origin, in the veffels of the chemift, as well as in the bowels of the earth, and probably the figure of the cryftals of that obferved by Dr. Lifter, was the fame in the point, as well as in the body, both being quadrilateral columns terminated by pyramids compofed of a number of triangular planes. *Hoffman* Opera, T. 5. p. 139.

This number in Glauber's falt is four, though Dr. Lifter obferved only two in the falt he examined; but it is frequently feen in the factitious, or common Glauber's falt, which naturally has four planes in the pyramid, that two of them are fo fmall, as fcarce to appear more than flat fparks at the verge of the point; in almoft all the cryftals, one of the four is thus fmall, fo that they feem to confift only of three, while the whole four are truly there. The fame is the cafe frequently in the common rock cryftal, whofe pyramid ought to confift of fix planes, and, in truth, always does fo, but one or more of them are frequently fo fmall, that a hafty obferver would fay it confifted only of four or of five planes.

If this may be allowed to be the cafe, in regard to Dr. Lifter's obfervation of his cryftals, there feems no doubt but that his *nitrum calcarium* is true and genuine Glauber's falt, as much as that of the chemift's laboratory; and, according to his own juft obfervation, it is compofed of the very fame principles with that chemical falt. The mineral waters of Egra abound with this falt, which Hoffman alfo has called, for that reafon, *fal Egranum*, when feparated from them by evaporation; but none contains fo great a proportion of it as the Sedelitz waters, a pint of which, on evaporation, leaves two drams of it.

The medicinal waters in the neighbourhood of Paris contain it alfo in a very confiderable quantity, though lefs than this. It is the opinion of Hoffman, that when any water before impregnated with a vitriolic acid, in its current under ground, paffes over this calcarious earth, it as readily joins a part of it with it, as the vitriolic acid does with the fea falt, or its bafis, in the making the common Glauber's falt, and thence produces a bitter purging falt, of the fame nature with that; and, indeed, if the acid of fulphur be mixed with any alkaline fubftance, a bitter neutral falt is produced, fomewhat analogous to this, and to the Glauber's falt.

NITRUM *nitratum*, in chemiftry, the name of a preparation of *nitre*, made by adding a fufficient quantity of fpirit of *nitre* to a lixivium of pure *nitre*, and afterwards evaporating it to a pellicle, and fetting it by to fhoot. The cryftals formed by this liquor are perfectly nitrous in their figure, but they will be of an acid tafte.

We fee, by this, that it is poffible to alter a falt, and to reduce it into the appearance of a different body, by means of fubftances before feparated from itfelf; and, in this cafe, the alteration is made, in almoft any degree, at pleafure; the falt produced being more or lefs acid, as more or lefs of the acid fpirit is ufed: but it is to be obferved that the more acid there is ufed, the more difficultly the falt dries, and the more difficultly it is kept dry, it being always fubject to run in the air. This preparation of *nitre* is a good medicine in burning fevers. *Boerhaave's* Chem. Part 2. p. 176.

NITRUM *purificatum*, *purified nitre*, is thus prepared: take *nitre*, or common falt-petre, one pound; pure water three quarts and a pint; fet them on the fire together, and diffolve the falt perfectly by boiling: then ftrain the hot lixivium through a double flannel, and fet it over the fire again in an earthern veffel. Evaporate it gently, till on taking out a little of the liquor in a fpoon as it cools, there are feen threads as it were fhooting in it; in this ftate the falt is ready to concrete. Set it in a cool place, putting clean fticks acrofs the veffel, and the falt will form itfelf into extremely pure and beautiful cryftals on the fide of the veffel, but principally on the fticks. Thefe dried in a colander are fit for ufe.

This is the beft of all the preparations of *nitre*, for medicinal ufe, in its native form. It diffolves immediately on entering the body, where it wonderfully cools, and thins the blood, giving it a fine florid colour. In all inflammatory difeafes attended with condenfations of the blood, this falt proves excellently cooling and attenuating. It is given from four or five grains to ten, twelve, or fifteen at a dofe. Some give more at a time, but it is more advifeable to have the dofes fmaller, and oftener repeated. It is alfo good in the fmall-pox, and fuppreffions of urine. It is alfo faid to be given by many in hæmorrhages with fuccefs. If there be any cafe in which caution is required, it is in a confumption where the lungs are ulcerated.

NITRUM *vegetans*, a name given by the chemifts to a preparation of *nitre*, which very readily fhoots out into beautiful cryftallizations. If, in the making Glauber's fpirit of *nitre*, there are ufed four parts of *nitre*, and one of oil of vitriol, and the fpirit be entirely driven off, the white falt remaining dry in the retort, on being expofed to the open air, will foon he covered with a thick and long down, as if it grew; but if this falt be diffolved in water, and there ftrained, and evaporated to a drynefs, in a cylindrical glafs, and kept expofed to the open air, its upper furface will often appear covered with beautiful branching little plants, all which will diffolve away upon the application of heat, and leave the furface even; but upon expofing the veffel again to the open air, in a quiet place, they will grow again as before, thus feveral times exhibiting the refufcitation of plants, as it were, from their own afhes.

Some chemifts have formed feveral fables upon fome fuch bafis as this; and, very probably, the whole fecret of their operations was no more than a concealed fraud of this kind, this having nothing to do with vegetation.

NITRUM *vitriolatum*, a preparation of *nitre* made as follows: Diffolve the mafs left in the retort after diftillation of a fpirit of *nitre*, in about eight times its weight of water; filtrate the folution, and, when perfectly clear, evaporate the liquor to fuch a ftandard, that the falt will no longer be fuftained in it; then fet it in a cool place, and collect the falt as it fhoots, laying it in an earthen colander to dry. This is of much the fame virtues with *tartarum vitriolatum*, and is frequently fold under its name. See TARTARUM *vitriolatum*.

NIVALIS *avis*, the *fnow-bird*, a name given by authors to a bird common in Poland in the fevereft months of the winter, and at no other time. The country people call it *fniegu ka*, which fignifies *fnow-bird* alfo: it is obferved to come with the fnows, and go away again with them. The country people ufe to prefage the mildnefs, or the feverity of the fucceeding winter from their flights in greater or in fmaller numbers, or earlier, or later, in the feafon.

NIURI, in botany, the name of a genus of plants, called by Linnæus *phyllanthus*. Hort. Mal. 10. 27. See the article PHYLLANTHUS.

NOAH's *ark fhell*, in natural hiftory, the name of a kind of fea fhell, which authors were always puzzled about referring to any genus, till a late French author has referred it to a new genus he has made under the title *cordiformis*, taking in the bucardia, and triangular heart-fhells. The cabinets of the curious afford us three fpecies of this fhell; the common kind, a yellow and white kind, with broad irregular lines, and a variegated kind. Hift. Nat. Eclair. p. 333.

Mathiolus and Rondeletius have called the *noah's ark fhell*, *rhomboides*, and *mufculus ftriatus*; and Lifter, who has followed thefe authors, has placed it among the mufcles. Rumphius has placed it among the pectens, and fome have made it a fpecies of oyfter. The impropriety of its arrangement under any of thefe genera is very obvious from the characters of each. It is indeed of a fomewhat different figure from the generality of heart-fhells, as it is from all the other fhells in the world, but it agrees with them in its general character, for it is deeply ftriated, as they all are; and it is of a figure, in fome meafure, refembling that of a heart, though running out into an irregular length at the point.

We have another fhell of this genus which no one ever doubted to belong to it, which yet is of an oblong figure, and fo much refembles the *Noah's ark*, as to plainly fhew they ought both to be reckoned fpecies of the fame genus. This is the oblong bucardium, or ox heart fhell, commonly called the *baftard Noah's ark*.

NOCERIANA *terra*, *earth of Nocera*, in the materia medica, a white

white earth used in medicine in Germany, Italy, and some other parts of the world, but not known in the English shops. It is now dug principally about Macerata, a city in the marquisate of Ancona, in the pope's territories, and is in great esteem in malignant fevers, and against the bites of venomous animals.

It is a dense earth, of a greyish white, very hard, and of an insipid taste, and does not effervesce with acid menstruums. *Hill*'s Hist. of Foss. p. 3.

NOCTAMBULATIO, *walking in the sleep*. This is a very remarkable distemperature of the imagination, and, in different persons, differs greatly in degree. Those who are but moderately affected with it, only repeat their actions of the day, and getting out of the bed, go quietly to the places they frequent at other times; but those who are afflicted with it in the most violent degree, go up to dangerous places, and do things that would terrify them to think of, when awake: these are by some called lunatic *night-walkers*, because fits are observed to return with most frequency, and violence, at the changes of the moon.

Causes of it. The only material cause that can be assigned in this case, is a plethora, or over-fullness of blood, but this is influenced by an immaterial one, that is, by the fancy, which is busily employed in dreams about particular objects.

Method of cure. The primæ viæ are first to be cleared of all their foulnesses by a strong purge; after this it is proper to bleed in the foot, taking away eight or ten ounces; then powders composed of nitre, cinnabar, and crab's eyes, should be taken three or four times a day, and particular regard should be had to the changes of the moon. It will be proper to set a vessel of water by the bed-side, in such a manner that the person will naturally step into it on getting out, and be awaked by that means; and if these things fail, a person should be set up to watch him, and beat him, every time it happens. *Junker*'s Consp. Med. p. 698.

NOCTIBO, in zoology, the name given by the Portuguese to a small Brasilian bird, a species of the *goat-sucker*, or *churn-owl*, more known among naturalists by its Brasilian name *ibijau*. *Marggr.* Hist. Brasil. See the article IBIJAU.

NOCTUA *aurita*, in zoology, a name by which some have called the smaller species of the *horn owl*, more usually distinguished by the name *otus*. *Ray*'s Ornithol. p. 63. See the article OTUS.

NOCTUA *canora*, in zoology, a name given by Nieremberg to a bird of the Spanish West-Indies, called by the natives *chicantli*, and sometimes kept by the Spaniards in cages. See CHICANTLI.

NOCTUA *minor*, in zoology, the name given by Mr. Ray to the *keutzlin*, or, as others call it, the *schaffilt*, a very beautiful little bird of the owl kind, and not exceeding the size of the common thrush. *Ray*'s Ornithol. p. 69. See SCHAFFILT.

NOCTUINI *oculi*, a name given by some to grey eyes, from their resembling those of the *noctua*, or *owl*.

NOCTUOLENT, among botanists, a name given to such plants as smell strongest in the night time. See DOG-*rose*

NODULUS, a word used in pharmacy for a knot tied in a rag, and including some medicinal ingredients to be suspended in any liquor. See NODULE, *Cycl.*

NOERA, a word used by some chemists for the head of an alembick, or the cover of a cucurbit, or any other vessel used in distillation *Castell.* Lex. in voc.

NOFESCH, in natural history, a word of Hebrew origin, used as the name of a precious stone. There has been much dispute among the commentators on the old testament, what stone it was. It seems derived from the root *fuch*, which signifies the ruby, or carbuncle, and, as a derivative of that word, it must be supposed to express a red stone, not one of any other colour As the ruby is signified by *fuch*, this cannot mean the same stone, and therefore probably meant the garnet, they having no other name, that we known of, for that stone, and it being very like the ruby.

NOCHETZLINOPALLI, or NOCHEZNOPATLI, in botany, a name by which some authors have called the *opuntia*, on which the cochineal insect loves to feed. *Jonf.* Dend. p. 56. See OPUNTIA.

NOISETIER, in botany, the name by which the French call the several species of hazel, and filbert-trees. See HAZEL.

NOLA, in botany, a name used by some authors for the *anemone*. *Ger.* Emac. Ind. 2.

NOME (*Cycl.*) — NOME, Νομη, in medical writers, is used for an eating, or corroding ulcer, and is much the same with *phagedæna*. See PHAGEDÆNA, *Cycl.*

The word is Greek νομη: it occurs in Galen. Some later writers, as Forestus, call it *ulcus obambulans*, and *obambulativum*. *Castellus.*

NOME, among the antient Egyptians, a division, or province, into which the whole kingdom was divided. The origin of the *nomes*, according to Diodorus Siculus, was this: the inhabitants being refractory, and much inclined to insurrections, in order to prevent these, the kings divided the whole country into different provinces, or *nomes*, and established the worship of some particular animal in each of them, prohibiting at the same time such animal to be eaten within the bounds where it was worshipped.

Hence, as every province was intoxicated with its own particular form, and object of worship; it entertained the highest contempt for that of its neighbours, and took a pleasure in profaning the animal, which among them had divine honours paid it. This religious opposition had the desired effect; for, all mutual confidence being thereby cut off, there were no more insurrections against the government. Mem. Acad. Inscrip. Vol. 13. p. 52.

NOME is also used for a kind of song, or hymn, in honour of the gods, said to have been invented by Terpander. For a further description of which, see Mem. Acad. Inscrip. Vol. 14. p. 342, seq.

NOMENCLATORES, (*Cycl.*) among the botanical authors, are those who have employed their labours about settling and adjusting the right names, synonyms, and etymologies of names, in regard to the whole vegetable world. *Linnæi* Fund. Bot. p. 2.

NOMOPHYLACES, Νομοφυλακες, among the Athenians, magistrates who were to see the laws executed, being not unlike to our sheriffs. They had the execution of criminals committed to their care, as also the charge of such as were confined prisoners. They had also power to seize thieves, kidnappers, and highwaymen, upon suspicion; and, if they confessed the fact, to put them to death; if not, they were obliged to prosecute them in a judicial way. *Potter*, Archæol. Græc. T. 1. p. 78.

NOMOPHYLACES were likewise officers belonging to the Olympic games, whose business it was to instruct those who were to contend, in all the laws of the games. See HELLENODICÆ.

NOMOTHETÆ, Νομοθεται, among the Athenians, were a thousand in number, and chosen by lot out of such as had been judges in the court *Heliæa*. Their office was not (as their name seems to imply) to enact new laws by their own authority, for that could not be done without the approbation of the senate, and the people's ratification; but to inspect the old, and, if they found any of them useless, or prejudicial, as the state of affairs then stood, or contradictory to others, they caused them to be abrogated by an act of the people. Beside this, they were to take care that no man should plough, or dig deep ditches within the Pelasgian wall; to apprehend the offenders, and send them to the archon. *Potter*, Archæol. Græc. l. 1. c. 13. T. 1. p. 79.

NON (*Cycl*) — NON *assumpsit*, in law, a plea in personal actions, whereby a man denies any promise made, &c.

NON *distringendo*, a writ not to distrain, used in divers cases. *Blount*, *Cowel.*

NON *implacitando aliquem de libero tenemento sine brevi*, a writ to prohibit bailiffs, &c. from distraining any man touching his freedom, without the king's writ. Reg. Orig. 171. *Blount*, *Cowel.*

NON *intromittendo quando breve præcipe in capite subdole impetratur*, a writ directed to the justices of the bench, or in eyre, commanding them not to give one that had, under colour of intitling the king to land, &c. as holding of him *in capite*, deceitfully obtained the writ called *præcipe in capite*, any benefit thereof, but to put him to this writ of right. Reg. Orig. 4. This writ having dependance on the *court of wards*, since taken away, is now disused. *Blount*, *Cowel.*

NON *merchandizando victualia*, a writ to justices of assize to enquire whether the magistrates of such a town do sell victuals in gross, or by retail, during the time of their being in office, which is contrary to an antient statute, and to punish them if they do. Reg. Orig. 184. *Blount*, *Cowel.*

NON-*spissum*, in the antient music. See APYCNON.

NON-*such clay*, a particular sort of earth, which, mixed with another clay brought from Worcestershire, makes a composition very useful for the making the melting-pots used in the green glass making. *Neri*'s Art of Glass, p. 246.

NONUPLA, in the Italian music, denotes a quick time, peculiar to jigs. This species of time is otherwise called *the measure of nine times*, which requires two falls of the hand, and one rise. There are three sorts of *nonupla*. 1. *Nonupla di semi-minime*, or *dupla sesqui quarta*, thus marked $\frac{9}{4}$, where nine crochets are to be in the bar, of which four make a semibreve in common time, i. e. in the down stroke, six, and but three up; it is usually beat *adagio*. 2. *Nonupla di crome*, or *sesqui ottava*, marked thus $\frac{9}{8}$, wherein nine quavers make a bar, instead of eight in common time, i. e. six down, and three up: 'tis beat *presto*. 3. *Nonupla di semi-crome*, or *super setti partiente nona*, thus distinguished $\frac{9}{16}$, in which nine semi-quavers are contained in a bar, whereof sixteen are required in common time, six down, and three up: 'tis ordinarily beat *prestissimo*. See ADAGIO, PRESTO, and PRESTISSIMO.

Beside these, there are two other species of *nonupla*, for which see TRIPLE, *Cycl.*

NOOZE, a name given by sportsmen to a sort of horse-hair springe made to take woodcocks, and very successful, when the proper precautions are taken. The *nooze* is made of several long and strong hairs twisted together, with a running *nooze* at

at one end, and a large knot at the other, which is to be paſſed through the ſlit of a cleft ſtick, to prevent the *nooze* from being pulled away when the bird is caught in it.

The ſportſman, when he knows his buſineſs, does not ſtay to watch theſe ſnares, but ſets them in the morning, and returns again to them at four in the afternoon, when he ſeldom fails of meeting with a ſufficient number taken. The ſticks are to be about the bigneſs of a man's little finger, and are to be made ſharp at one end, that they may fix the better in the ground: to each of theſe is to be fixed one *nooze*. The ſportſman is to take out with him ſeveral dozens of theſe bundled up together, and going into the coppice woods where there lie many leaves upon the ground, he is to ſearch among theſe for the marks of woodcocks frequenting the place; if there come any there, it will be ſoon found out by the leaves, which are ſpread about from ſide to ſide by thoſe birds, in ſearching under them for worms Their dung alſo, which is of a dark grey colour, being found about the place, is a proof of their frequenting it.

When the place is thus pitched upon, the ſportſman is to take a large circle at ſome diſtance from it, on each ſide, in the way where the woodcocks are ſuppoſed to come to the place; he is here to plant a ſmall hedge row of furze, or other buſhes, of a conſiderable extent, and pretty thick, leaving gaps in it here and there. The woodcocks, in making up to their place of feeding, when they come to this hedge, will run along by the ſide of it, till they come to one of the gaps, and then go through, for they hate to take wing, and will run, at any time, a long way under a hedge, rather than fly over it. On this depends the ſucceſs of the ſport.

The *noozes* are to be fixed one in each of theſe gaps thro' which it is known the woodcocks will paſs; the ſtick to which it is faſtened is to be ſtuck firmly in the ground, and the *nooze* to be ſpread wide open on the ground, leaving only ſome dry leaves to ſupport it. The whole gap being occupied by this *nooze*, the woodcock, when he comes, cannot eaſily eſcape being taken by the legs in it, and when once caught he will lie till the ſportſman comes. While a ſportſman is walking about a wood in this view, it is very common for him to find ſpringes, or *noozes*, of horſe-hair, fixed at ſix inches high, in ſeveral places. This may be looked on as a proof that there are partridges in the wood, and theſe are the means uſed by the country people to take them. The woodcocks, though in the day they lie in woods, yet, in the night, they go out, and frequent rivers and brooks, and, in the froſty nights, ſuch ſprings as do not freeze are particularly reſorted to by them.

The ſportſman, when he has ſet his *noozes* in the woods for the day-time, ſhould retire to the watery places near them, and ſearch for the marks of theſe birds coming to them by their dung, and other tokens. As ſoon as a place is found which they frequent, there muſt be a ſmall hedge row built there alſo in the ſame manner as in the woods; and in the gaps, which are to be made at the diſtance of about ſix foot one from another, there are to be placed either the ſame ſort of *noozes* as thoſe in the woods, or the ſpringes made with hazel boughs, and the horſe-hair tied to a packthread. In either caſe, there is no doubt of ſucceſs, for the birds which have once frequented a place, will come to it every night, as long as they remain any where near it; but particularly, if there be any ſpring near a wood, the water not freezing when other waters are iced over, will be ſure to bring the woodcocks together at it, and *noozes* planted properly about this place, will ſeldom fail of ſucceſs. If they have been left a night or two without ſucceſs, the ſportſman is not to deſpair; for though there ſhould happen to be no woodcocks there when they are firſt ſet, theſe birds change place ſo often, that it need not be doubted but ſo proper a rendezvous will be ſoon reſorted to by them.

NOPE, in zoology, an Engliſh name uſed by ſome for the *bull-finch*. See BULL-*finch*.

NORA, a word uſed by ſome of the chemical writers for *lime*, by others for *nitre*, and by others for all ſalts in general, as the word *ſal*.

NORTH (*Cycl.*) — NORTH-*weſt paſſage*. A *north-weſt paſſage* by Hudſon's bay, into the pacific ocean has been more than once attempted of late years, but, hitherto, without ſucceſs. Some greatly doubt of the practicableneſs of ſuch an enterprize, and think the obſervations made by the Ruſſians give us ſmall hopes. But, as they have not yet publiſhed the particulars of their diſcoveries, little can be ſaid about them. Some general things may be ſeen in the Phil. Tranſ. N° 482. Sect. 14. It appears from thence, that the Ruſſians have paſſed between the land of Nova Zembla, and the coaſt of Aſia, and, as the Dutch did formerly diſcover the northern coaſts of Nova Zembla, we may now be well aſſured, that that country is really an iſland.

NOSE (*Cycl.*) — *Bleeding at the* NOSE. An hæmorrhage of the *noſe* is an uſual remedy of nature to relieve herſelf, in caſes of a plethora, and a difficult circulation. It is often wholly ſalutary, and comes on, in ſuch caſes, leiſurely; proceeds without violence, and ſtops at a proper time. But it is ſometimes to be looked on as a diſeaſe coming on haſtily, continuing with violence, and bringing on very bad ſymptoms. Bleedings at the *noſe*, in acute diſeaſes, are ſometimes critical, happening on the days of the criſes, and theſe are uſually copious: ſometimes they are merely ſymptomatic, happening at indeterminate and uncertain times; ſuch are the bleedings from this part in the ſmall-pox, and in petechial fevers: the firſt are ſalutary, theſe rather of bad conſequence.

The lighter hæmorrhages of the *noſe* are often preceded by no ſymptoms, but break out placidly, and go off in the ſame manner. The more violent ones are uſually preceded by a congeſtion of blood about the head, a redneſs of the cheeks, an inflation of the face, a turgeſcence of the veſſels of the temples, and the neck, a noiſe and ringing in the ears, a heavineſs of the eyes, and often a ſparkling of light in them; a vertiginous diſorder of the head, a binding of the bowels, a thinneſs and diminution of quantity of urine, tenſions in the hypochondria, a ſuppreſſion of cuſtomary ſweats, and a coldneſs of the lower parts.

Perſons ſubject to it. Theſe are young people, principally thoſe between the age of fourteen, and one and twenty; and thoſe of plethoric habits. Women are leſs ſubject to them than men. Scorbutic habits uſually throw people into bleedings at the *noſe*; which is not wonderful, ſince the ſcurvy principally owes its riſe to a plethora. Theſe bleedings are brought on by violent emotions either of the mind, or body, by blows on the part, by a too copious uſe of wine, or hot foods, and ſpicey things; by great heat of the weather, or of the room where a perſon remains ſome time; and ſometimes by much lighter cauſes, as barely the waſhing the face, or bending the head too much toward the earth.

Prognoſtics. It is commonly known, that moderate bleedings at the *noſe* relieve people in heavineſſes of the head, and pains and numbneſs in the limbs, and occaſion a more chearful turn of mind. But when this diſcharge is injudiciouſly treated, or raſhly ſtopped by aſtringents, there often ſucceed violent fullneſs and inflations of the veſſels of the head, and dangerous inflammations of the eyes, and other parts. Too frequent bleedings at the *noſe* in young perſons ſometimes preſage conſumptions, for the congeſtions which occaſioned them turning upon the breaſt as the perſon grows up, occaſion ſpitting of blood, and finally a phthiſis. A critical bleeding at the *noſe*, if ſufficient in quantity, often happily carries off a fever. In petechial fevers, ſymptomatic hæmorrhages at the *noſe* are very bad ſymptoms; and, in the ſmall-pox dangerous, though leſs fatal than in this diſeaſe. An habitual hæmorrhage from the *noſe* in grown perſons, is often a ſymptom of ſome diſtemperature in the abdominal viſcera; and, in old people, they often preſage apoplexies, and vertigoes; for when there is a conſtant congeſtion of blood about the head, and this accuſtomed diſcharge is any way impeded, it is often ſeen that theſe diſeaſes are the effect.

Method of treatment. In all bleeding at the *noſe*, if the blood flows moderately, if it ſhews by its fluid ſtate, that it reſults from a plethora; if it is not too great for the age and ſtate of the patient, and if it be habitual, and uſe to be attended with good conſequences, nothing is to be done to impede or ſtop it. But if they be violent, and return often, or if the quantity of blood diſcharged be too great for the ſtrength of the patient to bear, and they are uſually attended with bad conſequences, then the aſſiſtance of medicine is neceſſary. Nitre, mother of pearl, cinnabar are to be given in powder, and decoctions of daiſy roots, comfrey, and poppy flowers in large draughts, with jellies of hartſhorn and ivory; and, if neceſſary, ſome gentle opiate, and a proper diet muſt be preſcribed; the abſtaining from ſpirituous liquors, and high-ſeaſoned foods being abſolutely neceſſary, and the keeping out of great heats, and avoiding violent paſſions, being equally neceſſary. Bleeding and purging are proper after the fit is over, to prevent a return; and to theſe may be added warm baths for the feet, and the common diaphoretics. *Junck.* Conſp. Med. p. 20.

Fracture of the NOSE. In the *noſe* both bone and cartilage are ſubject to fractures, which happen ſometimes on either ſide, and ſometimes in the middle from blows or falls; if either of the bones in the front of the *noſe* are fractured, it produces a flatneſs in the *noſe*, and the air meets with obſtructions in its paſſage through the noſtrils; and if the bone, on either ſide, is fractured, the part becomes hollow. When the cartilage is diſturbed, the *noſe* inclines too much on one ſide. Theſe fractures ſometimes happen without a wound, but more uſually they are attended with a wound of the common integuments. If the injury of the *noſe* is very great, the fracture can never be ſo perfectly cured, but that ſome deformity will remain. The vicinity of this part to the brain alſo, which is frequently injured at the ſame time, renders caſes of this kind often dangerous. A caries alſo, or an ozæna, or polypus, are no uncommon attendants on this diſorder. In order to reſtore the bones of the *noſe* to their proper ſituation, the patient is to be placed in a ſeat oppoſite to the light, and his head held back by an aſſiſtant. The ſurgeon is to raiſe the depreſſed parts with a ſpatula, a probe, or a quill, applying externally the thumb of one hand, and the fore finger of the other. If the bones of the *noſe* are fractured on both ſides,

they are to be raifed on each in this manner, and the cavity of the noftrils is to be filled up with long doffils, to prevent the bones from collapfing; covering the part alfo for this end with fome plaifter, and applying firft the dreffings common in recent wounds. If the bone is fractured into feveral fplinters, they are to be reduced into their proper places by the fingers; but if a fplinter is fo entirely feparated from the bone, that it will not eafily unite with it again, it is to be taken out with the forceps. The bones will unite, when properly replaced, in about fourteen days, if no caries, or abfcefs intervene. If the bone fhould require a ftronger fupport than what has been hitherto mentioned, one may be formed out of ftrong paper, either fingle, or double, and adapted to each fide of the *nofe*, and fupported by bolfters, and the whole muft be kept in its place by a four headed bandage not tied too tight. *Heifter*, Surg. p. 117.

Luxated Nose. It fometimes happens, though not often, that the bones of the *nofe* are feparated from each other, or diftorted out of their natural places, without a fracture. When this cafe happens, the patient is to be fpeedily placed in a high chair, and an affiftant muft ftand behind, and hold his head firm in a proper pofture: the furgeon is then to introduce with one hand a thick probe, a goofe quill, or a fmall ftick fhaped for that purpofe up the noftril internally, by which means the depreffed parts of the *nofe* may be thruft out into their places: in the mean time he is to apply his other hand externally, to guide, and direct the parts which are thus moved from within. This being done, and the bones properly replaced, there is fcarce any thing elfe to be done, but to let a piece of fticking plaifter lie upon the *nofe* for fome time. *Heifter*, Surg. p. 151.

Wounds of the Nose. Wounds of the *nofe* are generally cured by the dry future; but, where the wound divides the cartilage, and penetrates fo deep that the lips of it cannot be kept in contact by the application of fticking plaifters, the true future muft be made through the fkin, on each fide of the wound; and Bleyny affirms that when a part of the *nofe* has been actually cut off, and feparated from the reft, it has been afterwards united, by means of futures. When the nafal bones have been fractured, it is ufual to place fmall tubes of lead, or filver, under them for fome time, left the paffage of the *nofe* fhould be ftopped up by the fhooting of new flefh. Externally fome vulnerary balfam, or glutinous powder, is to be ufed, and covered with fticking plaifters, which muft be kept on by the four-headed bandage. *Heifter*, p. 81.

Nose-*band*, in the manege, called in French *muferolle*, is that part of the head-ftall of a bridle that comes over a horfe's nofe

NOSTOCH, the name of a vegetable fubftance which feems to differ from moft of the other bodies of that kind, in feveral particulars.

It is a fubftance of an irregular figure, of a greenifh brown colour, and fomewhat tranfparent. It trembles at the touch, in the manner of a jelly, but it does not melt when held in the hand. It has therefore fomewhat of the character of a vegetable leaf, but it has neither veins nor fibres.

It is found in all forts of foils, but moft frequently in fandy ones, fometimes on the gravel of garden walks, and moft ufually makes its appearance after rain. It is found only in the fummer months, and retains its humidity and perfect figure fo long as it is a moift feafon, but immediately dries up, and withers away, on the fun, or winds affecting it.

Many people have fuppofed this not to be a plant; it appears all on a fudden, and, as it were, by a fort of miracle, either from the earth or clouds, and fome have called it *flower of earth*; others *flower of heaven*; and the obfcurity of its origin has occafioned its being held in great efteem among the chemifts, who fuppofe that it contains an univerfal fpirit capable of converting other metals into gold. Memoirs Acad. Par 1722.

Mr. Magnol, and Mr. Tournefort, were the firft authors who afferted its true origin, and ranged it among the plants. Its nature, however, was never perfectly difcovered till Mr. Reaumur took it under confideration. This accurate obferver foon found that it was a leaf which naturally imbibed water in a very particular manner; that when it had enough of this liquor in it, it then appeared in its natural flourifhing ftate; and when it loft this again, it became thin, and wrinkled, and was not to be known for the fame fubftance, or, indeed, fcarce to be feen at all. Hence appears the reafon of its fuppofed fudden production, and decay. If it has, ever fo long, lain in the walks of a garden in its empty wrinkled ftate, it is never taken notice of; but, on a fhower of rain, it imbibes the water, and immediately fwells out into this jelly-like ftate, and, on the fun's evaporating that moifture, it falls into its undiftinguifhable ftate again; and thefe changes may affect the fame plant alternately for many days together.

Mr. Geoffroy imagined that he had found roots to the *noftoch*; but Mr. Reaumur pofitively afferts that it has none. He obferved, indeed, at certain times, on the furface of fome fpecimens of this, a vaft number of round tubercles of different fizes, which appeared to be the feeds of the plant: thefe be regularly fowed in earthen pots of mould, and thefe produced young plants like the parent *noftoch*, but even thefe were never difcovered to have any appearance of roots; and, to try farther whether they had any, Mr. Reaumur turned all the plants bottom upwards, and they received no harm from it, but grew juft as vigoroufly as before.

If the *noftoch* has truly no roots, as appears to be very evidently the cafe, it follows that it imbibes its nourifhment in the manner of the fea plants, which imbibe the water by which they are nourifhed at all their pores.

It fhould feem that there are two fpecies of this *noftoch*, the one only a plain flat leaf; the other curled, wrinkled, and varioufly undulated: and it is on this laft, that the fruits which produce the young plants are principally found. It may be, however, that the one of thefe may be the male, and the other the female of the fame fpecies, as in many larger plants; or poffibly the being in the ftate of fructification alone may make the difference.

NOSTRILS (*Cycl.*) — The *noftrils* are fometimes fubject to be preternaturally clofed; though this is a cafe that but rarely happens. It is fometimes owing to a carelefs treatment in the fmall pox, in the bad kinds of which the *noftrils* have been known to clofe, and adhere fo ftrongly to the upper lip, which is found turned back at the fame time, as to leave no poffibility of fhutting the mouth. In this unhappy cafe, the only relief is by the knife, feparating the lip from the nofe, and then opening a paffage through each of the *noftrils*. Thefe are to be kept open, either with tents, or leaden pipes, and the lip preffed downward into its natural pofition by a comprefs and bandage, and this continued till the wounds are ficcatrized. *Heifter*'s Surgery, p. 447.

Nostrils *of fifh*. See Nares *pifcium*.

NOSUS, a name by which fome of the barbarous writers of the middle ages have called *alabafter*: others alfo have called it *nifus*.

NOTHING (*Cycl.*) — Some modern mathematicians have diftinguifhed *nothing* into two kinds. They talk of *abfolute nothing*, and of *relative nothing*; but all this jargon is the refult of confufed notions, and ought to be banifhed out of geometry. See Infinitesimal.

NOTION (*Cycl.*) — This term, and the word *idea*, are often taken in the fame fenfe; but an ingenious author obferves, that we cannot ftrictly be faid to have an *idea* of an active being, or of an action, although we may be faid to have a *notion* of them. I have fome knowledge, or *notion*, of my mind, and its acts about *ideas*, inafmuch as I know, or underftand what is meant by thofe words. What I know, that I have fome *notion* of.

However, if the world will have it fo, the terms *idea* and *notion* may be ufed convertibly. But yet it conduces to clearnefs and propriety, that we diftinguifh things very different by different names. It is alfo to be remarked, that all relations including an act of the mind, we cannot fo properly be faid to have an *idea*, but rather a *notion* of the relations or habitudes between things; but, if in the modern way, the word *idea* is extended to fpirits, relations, and acts, this is, after all, an affair of verbal concern. *Berkeley*, Princip. of Hum. Knowl. Sect. 142. p. 160, 161. See Idea.

NOTONECTA, in natural hiftory, the name of a fpecies of water-infect, approaching to the nature of the cimex. It always fwims upon its back, and is very fwift in its motions. Its belly, which it fhews while in the water, is of a yellowifh white; its legs are long; when taken out of the water it hops. It is indeed a very beautiful, and very nimble little creature; and is common in the ponds of water in Hyde park, and in feveral other places about London. It has four wings, fix legs, and no antennæ; it is eight inches long, three broad, and two and a half thick. The body is black, and of a very particular form, being flattifh at the belly, and rifing to a ridge on the middle of the back; fo that when it fwims, which is almoft always on the back, its body refembles a boat in figure.

The belly is jointed, ftriated, and hairy, and has a large opening at the tail, out of which, when hurt, it thrufts forth fomething refembling a fting. The head and fhoulders are large, hard, and yellow, without any fpots; the eyes are large and red, and are of a fomewhat triangular form. The nofe is a long, green, hollow probofcis, terminating in a hard and fharp brown point; this, in its natural pofture, is kept under the belly, and reaches to the middle pair of legs. The outer pair of wings are of a pale flefh-colour, with fpots of a dead white; thefe are long, narrow, and fomewhat tranfparent: they terminate in a roundifh point, and perfectly cover the whole body. The triangular piece which ftands between the top of the wings, is hard and perfectly black; the inner wings are broader and fhorter than the outer ones; they are thin, and perfectly tranfparent, and are of a pale pearl colour. The legs are green and hairy; the foremoft pair are fhorteft; the middle ones longer than thefe; but the hinder pair are greatly longer than all the reft, fo that they ferve as oars, and are tufted with hair at the end to that purpofe. This creature moftly lives in the water, where it preys on fmall infects, killing them, and fucking their juices with its probofcis, in the manner of the water fcorpion, and many other aquatic infects; and it feizes its prey violently, and darts with incredible fwiftnefs to a confiderable diftance after it.

Though it generally lives in the water, it sometimes, however crawls out in good weather, and drying its wings by expanding them in the sun, takes flight, and becomes an inhabitant of the air not to be known for the same creature, unless to those who had accurately observed it before; when tired of flying, or in danger of an enemy, it immediately plunges into the water. If taken into the hand, it stings, and gives an intolerable pain, but this goes off in a very few minutes. This is the species most frequently met with, but it is not the only *notonecta* we have, three or four other kinds, different in size, and colour, being found not unfrequently in large waters.

NOVACULA *piscis*, the *razor-fish*, in zoology, the name of a sea-fish caught in the Mediterranean, and some other seas, and much esteemed at the tables of the great.

It is of a very singular shape, having a large and flatted head with no snout, or nose; but its mouth, which is very small, is no more than a simple gap, or slit, in the lower part of the head; there are four long teeth in the fore-part of it, and all the rest is furnished with very small, but very sharp ones The eyes are small, and situated in the upper part of the head. It has two large fins at the gills, and two small ones on the belly. Its back is furnished with one long fin, not very high, but reaching from the beginning of the back to the tail The anus is placed nearer the head than the tail; and, from this to the tail, there is another long fin: its tail is large and broad. It is altogether of a flatted form. and is covered with large scales of very beautiful colours; the head and gills have several streaks of a fine blue; the belly-fins, and the tail, are of a cancellated work of green and yellow; the back fin is red spotted with black; and the body of the fish of a fine yellowish red.

It is a small fish, seldom exceeding three or four inches in length, and, in its flat shape, somewhat resembles the faber. It keeps about the shores, particularly such as are stony, and seems never to go into deep water; and is caught on the shores of Majorca Minorca, the island of Malta, and elsewhere, and lives nn small fish. *Salvian*, de Aquat.

NOVACULARUM *lapis*, in natural history, the name given by De Laet to a stone which he describes from Ximenes, who has it under the American name *iztli*.

It is the stone out of which the natives of America made their weapons of war, and tools for other uses of life, before they knew the use of iron.

There are three species of this stone, the one blue, the other white, and the other black; they are all capable of a very high polish, and, when set in gold, or silver, are very highly esteemed by the natives: they reflect the images of things, in the manner of all other highly polished bodies, and the two first are considerably transparent.

There are several quarries of these stones in the neighbourhood of Mexico, whence the Indians used to get them; they naturally split, in the getting out, into angular, and edged figures, and these they afterwards fashioned to the purposes they wanted them for, and polished with the powder of a harder stone.

They still make knives of them, in a very expeditious, and very remarkable manner. They hold the mass of stone between their feet, and, with an instrument prepared on purpose, they cut off pieces of four or five inches long, and about one inch broad, rising to a prominence on each side in the middle, and growing very thin toward the edges: it is wonderful to see with what expedition they finish this odd workmanship. The knives, when made, are sharper than any other instrument in the world; but they are very tender, easily broken, and more easily battered, and notched at the edges. They make also longer weapons of the same shape out of this stone, which they fix into wooden handles, with a sort of gum, and these serve them as swords. They are very terrible weapons for one blow, but they seldom hold together so as to bear a second. They make alsc the heads of their arrows of them, and when these were first found by our travellers they were not supposed to be of human workmanship, but to have fallen from heaven in thunder, and were called by many authors *ceraunia*. *Ximenes* Hist. Ind. Occid. l. 10. c. 13. See Ceraunia.

NOVENSILES, among the Romans, heroes newly received into the number of the gods, or the gods of the provinces and kingdoms which the Romans had conquered, and to which they sacrificed under the name of *dii novensiles*. *Danet*. Dict. in voc.

NOUER *l' eguillette*, in the manege. See Yerk.

NOURISHMENT (*Cycl.*) — Nourishment *of plants*. The antients in general gave to the earth the power of producing plants and animals, and whatever else lives upon, or exists in it; and for this reason they gave it the general title of parent earth, and mother of all things. They supposed that into this common parent all returned again at last; and that after a time of dissolution in its bowels, they returned back again into the formation of more bodies of the same kind. Even those among them who asserted the doctrine of the four elements, yet allowed that the earth was the matter which constituted those bodies, and that the other three, that is, fire, air, and water, served only to convey, and distribute this, as there was occasion; and Thales is only misunderstood, when he is supposed to think differently from this general system of the antients.

But though the antients all gave earth the power of producing animals, and other bodies, the moderns have gone into an opinion that water is the origin of all. Lord acon was one of the first who argued on this principle: he says, that for the *nourishment* of plants water is almost all in all; and that the earth only serves to keep the stalk upright, and to defend the root from over-heat, and over-cold. since the time of this great author many have been yet more express in this opinion, and have asserted that water is the only principle of all natural things, supposing that by some secret process of nature water is transmuted into stones, plants, and other things. Phil. Trans N° 253. p. 193.

Helmont attempted to prove this doctrine by many experiments; and Mr. Boyle who followed him through the whole course of his experiments, seems to assent to his opinion, that water is transmuted by nature into wood and stone, though, in his usual way, he delivers his thoughts with great modesty, and candour. The two principal experiments they build their opinions upon, are, that of mint, and some other plants growing in water; and that of a tree being planted in a small quantity of earth, which being baked to a dryness, and weighed before the tree was set in it, and again baked, and weighed afterwards, will be found to have lost nothing of its own weight, though the tree has encreased to a very great degree, only from the water with which they have wetted this earth from time to time.

It might be objected to the last experiment, that it is not easy to bake earth to the same degrees of dryness twice over, so as to have any hopes of being exact in the weight; but allowing ever so great an exactness in that, the experiment brings no proof with it, unless they can prove that the water which was used in the wetting it was pure and homogeneous, and not charged with any terestrial matter; for, if it were, the plant may, after all, owe its encrease entirely to that earth alone, and the water may only serve, according to the doctrine of the antients, to convey and distribute this grand *nourishing* element, in a necessary and proper manner.

It is true that water often appears so clear and pellucid, that one would scarce suppose any portion of so opake a matter as earth could be contained in it; but we find by chemical experiments, that so opake a body as silver may be dissolved in aqua fortis, so as to give it no colour, nor render it in the least degree less pellucid than before Our water, however, is not so pure in any case, as is vulgarly imagined. The naked eye will often discover particles of earthy matter, though very small, floating in the very clearest we have: and experiment shews, that, when evapor ted, all water leaves behind it a large quantity of opake, earthy matter, which we could not see in it by the naked eye.

This remainder of evaporated water, generally consists of particles of two kinds: the one part are found to be earthy, and such as are fit for the *nourishment* of plants, and these seem so different among themselves, on a nice examination, that they seem fitted either for the *nourishment* of different plants, or for that of the different parts of the same plant; the other particles are of a sparry and crystalline nature, and seem calculated for the production of stones, &c. In some springs, we also meet with many other principles suspended, such as alum, vitriol, nitre, ochre, and other things, and often many of them in the same spring; the water, as it passes through the strata of stone, earth, &c. often washing off, and carrying away, in a state of solution with it, the particles of those bodies in considerably large quantities. These are carried suspended in the water to the mouths of the springs, but they are not so well suspended afterwards. Phil. Trans. N° 2, 3 p. 196.

Vegetable earth, or that kind of mould which is necessary for the *nourishment* of plants, is more light than spar and other minerals, and is both more readily dissolved, and more easily suspended in water than these. Hence the waters of all rivers contain a great quantity of this, though very little of the other particles, they being always found most plentifully in water near its source, and less and less so the farther it has run in the open air. River water contains also more of this terrestrial matter than rain water, as is proved by easy experiments, though that contains some: and it is evident from the whole, that earth is contained in all water, and, therefore, that all water whatever is capable of conveying it into the bodies of plants, and distributing it through their several parts, for their *nourishment* and encrease.

If the clearest water be put into a clean vial, and stopped so as to keep out dust, the earth in it will soon be discovered: the motion of the water, while in its natural state, keeps this earth in small particles, and, therefore, they are less discernible; but, on being set to rest in this manner, these particles get together, and form larger combinations, which become more visible, and finally so many of them will join together, that they will become apparent, in form of small clouds of opake matter floating in the water; and these will become larger and larger, as they have yet more and more fresh matter added to them.

If this earthy matter be of a vegetable nature, it will remain fufpended in the water by means of its lightnefs, and will by degrees acquire a green colour, and this will become every day more and more green, as it acquires more and more matter to it. This colour is not to be wondered at, fince we find how very great a fhare of it is deftined to appear of the fame colour in plants.

When the water fuftains a large quantity of mineral, or fparry matter, this forms its concretions in the fame manner as the vegetable; and being heavier than this light vegetable earth, it fubfides to the bottom, and fometimes not alone, but entangling its particles among thofe of the vegetable kind, it carries them down along with it. It is palpable from thefe, and from a great number of other the like obfervations, that water of whatever kind does fuftain in it the matter of earth, fuch as is neceffary for the encreafe and *nourifhment* of vegetables; and it appears very confonant to reafon, that, in paffing through the feveral fmall veffels of the plants into which it is received, it depofites, and leaves behind it, this earth arranged into a proper form This the ingenious Dr. Woodward has proved by the experiments of plants growing in glaffes of water; an accurate lift of each of which is given at large in the tranfaction referred to in this article.

NOVUS *auris mufculus*, in anatomy, a name given by Fabricius to the mufcle called by Albinus *laxator tympani*, and by others *externus auris*, and *exterior*.

NUAYHAS, the *ague tree*, a name given by the Indians to a fort of bamboe cane, the leaves of which falling into the water, are faid to impregnate it with fuch virtue that the bathing in it afterwards will cure the ague.

They ufe alfo a decoction of the leaves to diffolve coagulated blood, giving it internally, and, at the fame time, rubbing the bruifed part externally with it. It is faid that this plant bears its flowers only once in its life; that it lives fixty years before thefe appear, but that when they begin to fhew themfelves, it dies away in about a month afterwards, that is, as foon as it has ripened the feed.

There feems fomething of fiction in the account of many other particulars of this tree, in the hortus Malabaricus, but it feems certain that the length of the ftalks, or trunk, muft be very great; for, in the gallery of Leyden, there is preferved a cane of it of twenty-eight foot long, and another but little fhorter in the Afhmolæan mufæum at Oxford, which is more than eight inches in diameter; yet both thefe appear to be only parts of the whole trunk, they being nearly as large at one end as at the other.

NUBA, a word ufed by fome writers to exprefs a peculiar fort of manna, or honey-dew, of a rofe-colour. Some chemifts alfo ufe it as a name for *copper*.

NUBECULA, a name ufed by fome authors for the diftemperature in the eye called *albugo*, and *leucoma*, by moft writers, being fpots in the cornea of the eye. *Heifter*'s Surgery, p. 421. See Albugo.

NUBELOSA *linea*, a term ufed by the Latin writers on heraldry, to exprefs a fort of clouded line in certain coats of arms. Our heralds call it *nebule*, and the French *nuance*. It is figured fo as to reprefent clouds at the edge, and was given to the firft of the families who bear it, as a token of their fkill in aftronomy and navigation.

NUBES, in natural hiftory, a word ufed by the antients to exprefs that whitifh foulnefs which we frequently fee in the bottom of the fineft columns of cryftal; we exprefs this by the fame word *cloud*.

The columnar emeralds are fubject to the fame fort of foulnefs at their bottom, and this part was called the root of the emerald properly enough, as it was that end of the column where it grew to the ftone; but the word root of emerald has been fince applied to feveral very different fubftances of a green colour, and fome degree of tranfparence.

NUBIGENUM *æs*, a term ufed by fome hiftorians to fignify copper generated in the clouds, and falling from thence with rain, or in ftorms. They talk alfo of iron, and of ftones produced the fame way, and call them *ferrum nubigenum*, and *lapides nubigeni*

Many of the German hiftorians mention the falling of iron in duft, and in large pieces; and Avifenna tells us fuch things of Italy. Julius Scaliger fays that he had by him a piece of iron which came down in rain in Savoy; and Cardan tells us of twelve hundred ftones falling from heaven, one of which was of an hundred and twenty pound weight, and others thirty or forty pounds apiece; they were all, he fays, of the colour of iron. Dr. Lifter is for fuppofing them to be genuine pyritæ, which, he fays, is foluble into vapour, and thus raifed into the air may there concrete again into its own form, or that copper and iron may concrete from it. Phil. Tranf. N° 156. See *præternatural* Rains.

NUCIFRAGA, in zoology, a name given by many to the *coccothrauftes*, or *grofs beak*, from its breaking nuts, and the ftones of fruits. See Coccothraustes.

NUCULA *terreftris*, in botany, a name given by fome to the *bulbocaftanum*. See Bulbocastanum.

NUDIPEDALIA, among the antients, a feftival in which all were obliged to walk bare-footed.

This was done on account of fome public calamity, as the plague, famine, an intenfe drought, and the like.

It was likewife ufual for the Roman matrons, when any fupplication and vows were to be made to the goddefs Vefta, to walk in proceffion to her temple bare-footed. *Pitifc*. Lex. Ant. in voc.

NUFAR, in botany, the name of the *water-lilly*. This was the original name, and was firft ufed by the Arabians; from them the Greeks borrowed it, and varioufly changed it. The Arabians themfelves added the prefix *nil* to it, to exprefs one particular kind of *water-lilly* of Ægypt; this they called *nil nufar*, or, for a fofter way of fpeaking, *ninufar*, and *nenufar*.

The Greeks borrowed this word, and wrote it firft *ninufarium*, and afterwards, for fhortnefs, *nupharium*. The afterwriters tranfpofed the letters, and made out of it, *nilufar*, *linufar*, a word wholly unintelligible, but by their tracing it back to its original. See Nilufar.

NUHAR, a name ufed by fome chemical writers for *copper*.

NUMERAL (*Cycl.*) — Numeral *figures*. The antiquity of thefe in England has been fuppofed as high as the eleventh century, from an antient date found at Colchefter, at firft thought to exprefs 1090; the figure in the place of hundreds being taken for a cypher, by not attending to the infide ftrokes, which were pretty near defaced; but upon a more accurate view that miftake was difcovered, and the date found to be 1490. See Phil. Tranf N° 439 and 475.

NUMELLA, among the Romans, an engine of wood ufed in punifhing offenders, whofe necks and feet were made faft in it. *Pitifc*. Lex. Ant in voc.

Numella was likewife ufed to denote a rope or cord made of raw ox-hides to bind beafts with. *Pitifc*. in voc.

NUMENIA, Νεμηνια, or Νεομηνια, in antiquity, a feftival obferved at the beginning of every lunar month, in honour of all the gods, but efpecially Apollo, who was called Νεομηνιος, becaufe the fun is the author of all lights; for whatever diftinction of times and feafons may be taken from other planets, yet they are all owing to him, as the original and fountain of all thofe borrowed rays, which the reft have only by participation from him. For the ceremonies of this folemnity, fee *Potter*, Archæol. T. 1. p. 416.

NUMENIASTÆ, Νεμηνιασαι, among the antients, a defignation given to thofe who kept a feftival on every new moon. See the article Numenia.

NUMENIUS, in the Linnæan fyftem of zoology, the name of a diftinct genus of birds, of the order of the *fcolopaces*. The diftinguifhing characters of this genus are, that the feet have each four toes, and the beak is longer than the toes. *Linnæi* Syft. Nat. p. 47.

Numenius is alfo a name ufed by many authors for the curlew, a bird more ufually known by the name of *arquata*. See the article Arquata.

Numenius *Indicus*, the *Indian curlew*, the name given by Clufius to the *guara* of the Brafilians, a very beautiful large bird, of the nature of the curlew, but of the fize of the *platea* or fpoonbill. *Ray's* Ornithol. p. 219. See Guara.

NUMIDICA *avis*, in zoology, a name given by many to the common turkey.

NUMIDICUM *marmor*, in the natural hiftory of the antients, the name of a peculiar fpecies of marble, which was of no great beauty, but fingular in its remarkable hardnefs, and capable of a very elegant polifh.

It feems to have been one of the firft marbles the Romans brought into ufe in pavements. It is a very firm, hard and ftrong kind, of a clofe texture, and in colour of a pale afhcoloured blue. It is found in Italy, Spain, France and Germany, but no where fo plentifully as in the laft country. It is a very durable and ftrong kind; but its want of variety in colour, makes it but little efteemed. *Hill*'s Hift. of Foff. p. 465.

NUMMULARIUS, among the Romans, was ufed to fignify a *banker*, or perfon who deals in money.

It likewife denoted an affayer, or one who eftimated the goodnefs and value of money, as to its weight and finenefs of metal. *Pitifc*. Lex. Ant. in voc.

NUN (*Cycl.*) — Nun, in zoology, the common Englifh name for the *parus cæruleus*, or blue titmoufe, diftinguifhed from the common titmoufe by its fmallnefs, and by its having a blue head, furrounded by a white line. *Ray*'s Ornithol. p. 176. See Parus.

Nun is alfo the name of a peculiar fpecies of pigeon, called by Moore the *columba veftalis*. It is but a fmall pigeon, but fomething larger than the jacobine, and has a very particular plumage, from which it has taken its name, its head being as it were covered with a veil.

The body of this fpecies is all white, the head, tail, and fix of the flight feathers black, red or yellow; the eyes are pearlcoloured, and the hood white: this is a large tuft of feathers on the hinder part of the head, and the more numerous they are, the more the bird is efteemed.

This is a very beautiful fpecies of pigeon, and is very much efteemed. Some of its feathers, however, will vary fome-

times from their true colour. These birds are called foul feathered. But it is a mere accidental variety, the young of such being often as perfect and beautiful as of any others. *Moore's* Columbarium. p 47.

NUNCIATION, *nunciatio*, among the Romans, was particularly used to signify the report which the augur made concerning what he had seen.

This he did to the chief magistrate present, and the magistrate communicated the same to the people, and so dismissed the assembly, which was called *obnunciation*. *Pitisc.* in voc.

NUSIADAT, a name given by some of the chemical writers to sal armoniac.

NUSTAM, a word used by Paracelsus and his followers to express the cream of milk, or the pellicle which in some cases swims upon the surface of wine.

NUT, among botanists, a pericarpium of an extraordinary hardness. See the article PERICARPIUM.

NUT-*hatch*, in zoology, the English name of a bird, known among authors by that of *sitta*; and from its climbing trees in the manner of the wood-pecker, called by some, tho' improperly, *picus cinereus*, the grey wood-pecker. *Ray's* Ornithol. See SITTA.

NUT-*jobber*, in zoology, an English name for the *sitta*, more commonly known among us by the name of the *nut-hatch*. See the article SITTA.

NUTRITION (*Cycl*) — *Defect of* NUTRITION, or ATROPHY. This takes its origin from the infarctions of the glands of the mesentery, and evidently manifests itself in the patient by a successive decay and attenuation of the parts.

An *atrophy* differs from a hectic in this, that there is in it only an infarction of the mensenteric glands, whereas in the other case they are generally ulcerated: and in degree the difference also is manifest, all the symptoms being more violent in the hectic than in the simple *atrophy*.

Signs of it. An *atrophy* is known by a general languor both of body and mind; a depraved and unhealthy look of the face; a light and unsettled sleep; an uncertain appetite, sometimes voracious, sometimes nauseating all things, but usually most desirous of cold foods; a straitness of the breast, and an uneasiness after eating; great internal heat, and dryness of the tongue. The bowels are usually lubricous and moist, and throw out the food half undigested: in some cases, however, they are observed to be dry and costive. The urine often appears to be a chylous matter: the abdomen is tumid and hard in the first stages of the disease, but afterwards it becomes more flaccid, and then on feeling it there may be several nodes and lumps perceived. The body by degrees wastes away, and there is a continual feverishness and thirst, and that especially in the night-time: and these symptoms often increase to that violence, as plainly to resemble a hectic, and bring on an equal loss of strength and spirits.

Sometimes the *atrophy* arises from worms, and then the whole face is always pale; the nostrils are full of a mucous matter, and sometimes become excoriated: the appetite is voracious, and the patient feels an insufferable restlessness when hungry, which goes off, and they generally become inclined to sleep after a full meal. When this is the case in young subjects, the rickets and swellings about the joints usually succeed the other symptoms, and crookedness of the legs, gibbosity of the back, and various distortions of the spine follow it: these often put an end to the *atrophy*; but as they continue, and become lasting deformities, they are a very unhappy remedy.

Persons subject to atrophies. Children, while very young, are most of all subject to this disease, and often fall into it from improper food: the use of heavy and fæculent malt liquors, and of acids, which coagulate the milk, that usually makes a large part of their nutriment. The suppression of their sweats is another frequent cause of *atrophies*, especially when occasioned by large draughts of cold liquors when they are hot in the night, and sometimes by an improper use of astringents to stop those diarrhœas to which they are frequently subject. Youths more grown up are often thrown into an *atrophy* by eating voraciously of crude, thick, heavy and obstruent diet, or from the drinking spirituous liquors: sometimes from their having been injudiciously treated in fevers, and sometimes from their being violently infested with worms in their bowels. Men grown up usually fall into it after being debilitated by other illnesses, and by the remains of the causes of those illnesses being left in the body; and by nothing oftener are reduced to this distempered state than by inordinate hæmorrhages. Persons who are scrophulous, or have infarctions of the external glands, usually also are at one time or other afflicted with this infarction of the internal ones, and few escape it that labour under any other violent concretions of the internal parts.

Prognostics. A recent *atrophy* is not difficult of cure; and even the most inveterate one, tho' stubborn enough, is always much less dangerous and difficult of cure than an hectic. The more complicated this disease is, the more difficult it always is in the cure; and it is hence that grown persons are not so easily or so often cured as children, because with them it is usually complicated with many other disorders; and, in general, that *atrophy* which is brought on by hæmorrhages, or by ill-treated illnesses, is much more difficult of cure than that which arises from a wrong diet. And, finally, in *atrophies* arising from worms, when they are destroyed, the disease usually ceases.

Method of cure. The first thing to be done in this case is, to thoroughly absterge and cleanse the primæ viæ by gentle purges, among which nothing is so proper as calomel, assisted by syrup of rhubarb, or the like, and these purgatives are afterwards to be repeated at different intervals, during the course of the cure. After the first purges, resolvent and attenuating medicines are to be given; and finally, the preparations of steel, decoctions of arum and pimpernel root, with ground-ivy, are very beneficial, as is also the juice of ground-ivy given alone; and the resolvent salts, as tartar of vitriol, nitre, and the like, with some of the aperient tinctures of steel. *Junker's* Consp. Med. p. 112, 214.

NUX (*Cycl.*) — NUX, the *wallnut-tree*, in botany, the name of a genus of trees, the characters of which are these: the flower is of the amentaceous or catkin kind, and is composed of a great number of leaves affixed to an axis, and disposed in a squammose manner: under each of these there is placed a large cluster of apices. These flowers, however, are barren, and the embryo fruit appear in other parts of the tree. These finally become a hard shell, covered by a soft or fleshy one, and easily dividing into two halves, having within it a kernel usually consisting of four lobes, divided by a sort of woody septa.

The species of *wall-nut* enumerated by Mr. Tournefort, are these: 1. The common *wall-nut* 2. The great *wall-nut*, called the French and horse *wall-nut*. 3. The tender-fruited, or brittle-shell'd *wall-nut*. 4. The double-bearing *wall-nut*. 5. The harder fruited *wall-nut*. 6. The jagged-leav'd *wall-nut*. 7. The late ripening *wall-nut*. 8 The *wall-nut tree* with very small fruit 9. The *wall-nut tree* with plain, not ferrated leaves. *Turn.* Inst. p. 581.

NUX *maris*, in natural history, a name given by many writers to a peculiar species of sea shell It is one of the *dolium*, or *concha globosa* kind, and of that genus called *gondola*, and is the first species mentioned under that word. See GONDOLA.

NUX *regia*, the *royal nut*, a name given by some authors to the *walnut* C. *Bauhin*, Pin. p 417.

NYCTICORAX, in zoology, the name of a bird called in English the *night raven* It is of the heron kind, and is called by Mr. Ray *ardea cinerea minor*, or the small grey heron. It is much smaller, and shorter-neck'd, than the common heron; its head and back are black; its neck grey, and its throat and belly yellowish; it has on each side of the head a white streak from the angle of the beak to the eyes; and on the hinder part of its head has a crest made of three feathers, or hairy substances of five fingers breadth long: its wings and tail are grey: it flies principally by night, and makes a very hoarse and disagreeable croaking. *Ray's* Ornithol. p. 204.

NYCTOSTRATEGI, Νυκτοςρατεγοι, among the antients, officers appointed to prevent fires in the night time.

At Rome, they had the command of the watch, and, from their number, and office, were called *nocturni triumviri*. *Pitisc.* in voc.

NYGMA, a word used by some of the medical writers to express a wound by puncture.

NYMPHAGOGI, Νυμφαγογοι, among the antients, an appellation given to those who led the bride from her father's house, to that of the bridegroom. Vid. *Pitisc.* in voc. See BRIDE.

NYMPH (*Cycl.*) — NYMPHS *of flys*, in natural history, is that state of the fly class, which is between their living in the form of a worm, and their leaving that form for that of their parent fly. See Tab. of Insects, N° 29, seq.

In this state, in many genera of the flys, the worm, or maggot, makes a shell of its own skin, which hardens, and becomes brown, or redish, while the whole of its body becomes detached from it; and, after having lain some time in form of an oblong ball, without any visible parts of the creature that is to be produced from it, acquires, by degrees, the form of the fly, and all its limbs, and appears an embryo fly wrapped up in an extremely thin, and fine membrane. This is properly the *nymph* state, and, in these flys, when the parts of this *nymph* are more confirmed, and hardened, it is, in reality, no other than the fly wrapped up in this bag, which is so very transparent that every lineament of the insect it contains may be clearly discerned through it. The wings, however, in this state, appear as if they were not yet perfectly formed, but the truth is, that they are only very nicely, and regularly folded together. The creature, however, in this state, though ever so perfect, seems quite inanimate. When all the parts, however, have acquired their due strength, the creature puts itself into motion, and gets loose from its covering, which is no small difficulty; for though the skin of this is very fine and thin, yet as it serves as a nice case to every part of the animal, the effects by which it is to get rid of it must be somewhat difficult to the creature. A much greater difficulty, however, it will necessarily be imagined to be for the embryo fly to get out of the outer shell, or case, which is usually firm, hard, and rigid; but nature has so ordered it, that no more force shall be required for this great work than the creature is able to exert.

Out of the two forts of fhells of thefe infects, the one in form of an egg, and the other of the worm itfelf, there are two ways for the fly's egrefs.

For the firft of thefe, it is always from the fame end of the fhell, in form of an egg, that the embryo fly is feen to make its way out. This is always that end which is near the head of the fly, and which was, originally, the head of the worm. The head of the fly, however, is provided with no inftrument to make this great opening. The point of the trunk is yet very foft, and, even when at its utmoft hardnefs, it could only make a very fmall, and, in a manner, imperceptible hole. Nature has furnifhed the creature with another means of freeing itfelf from this fhell. The cap at the top of this is made, as it were, of two halves, and they fo loofely attached both to one another, and to the other part of the fhell, that they very readily feparate with a fmall force, and fall off from it. But this is not all; for in every one of thefe fhells, toward the joining on of the cap to the head part, there are two ribs, or prominent lines, diametrically oppofite to one another, and reaching to fome diftance in the fhell. Thefe feem formed to ftrengthen the fhell, but they are, in reality, intended to weaken it, and are the places at which it not only eafieft breaks, but even fplits, and opens, with a fmall force. This, with the falling off of the cap gives fufficient room of egrefs to the fly, and may be eafily difcovered to be intended fo to feparate by nature itfelf; fince in breaking any other part of the fhell, it cracks irregularly, and indeterminately; but here it feparates only at thefe lines.

It is eafy, indeed, for us by a flight force to feparate the two pieces of the cap of the fhell in thefe cafes, and a fmall force does it; but this, though fmall to us, is great in proportion to the ftrength and circumftances of the *nymph*, enclofed as it is on all fides.

The fkull of the fly, it is to be confidered, however, is folid and cruftaceous, and of a conftant and regular figure, as in other larger animals; yet the fly, in this ftate, is able to inflate and contract its head alternately, and, by that means effects much of the great bufinefs of its liberty. This extending the bulk of the head, is affifted by a fort of bladder which the creature, at each of thefe inflations, pufhes out to fome diftance from its head, and which, fometimes, even equals the head itfelf in fize. The air is the only means by which the fly can, in this manner, inflate and fwell its head; and, when neceffary, it fwells its whole body in the fame manner. The inflation of the head, and the throwing out this fort of bladder, which is an operation the fly is never able to do afterwards through its whole life, are evidently meant to diflodge and throw off the cap, and open the fide lines of the fhell. *Reaumur*, Hift. Infect. Vol. 4. p. 332, feq.

NYMPH-*animal*, in natural hiftory, one of the terms ufed by Swammerdam, in his claffing the infects according to their ftates and productions. It expreffes thofe creatures which are produced in their perfect form from the egg, and are fubject to no changes of any kind afterwards. See TRANSFORMATION *of infects*.

NYMPH-*chryfalis*, or NYMPH-*aurelia*, a name given by Swammerdam in his hiftory of infects, to one of the four general claffes into which he has reduced all thofe animals in regard to their changes.

The creatures of this clafs are not hatched from the egg in their proper form, but in that of a worm, or caterpillar, and, after hatching, they obtain their perfection by flow degrees, not as the *nymph* vermicles of the grafhopper do, in a manner obvious to the eye, but under the covert of their fkin, and muft appear chryfalis's before they are perfect flies. The common day and night butterflies, and many other infects are of this clafs. *Swammerd.* Hift. Infect.

NYMPHA *vermiculus*, in natural hiftory, a term ufed by Swammerdam to exprefs one of the four general claffes of the tranfmutations of infects, or, as he more properly ftiles them, their manner of growth.

The animals of this clafs are not produced from the egg in their perfect figure, nor yet in the worm fhape, as the caterpillar of the butterfly, and maggot of the fly, but the parts of the infect are imperfectly fhaped in the egg, and, after hatching, it does not appear properly itfelf, but acquires its perfection vifibly by means of outward food. The locuft, grafhopper, &c. are of this clafs. *Swammerd.* Hift. Infect.

NYMPHA *vermiformis*, in natural hiftory, a word devifed by Swammerdam, and by him ufed to exprefs one of his four great claffes on infects, according to their production.

Thofe of this clafs are not hatched from the egg in their own form, but in the fhape of worms, and differ from the caterpillar kind in this, that they always remain fhut up in the fkin of the worm, till they throw off both fkins at once, and appear in their winged ftate. The common flies, &c. are of this clafs. *Swammerd.* Hift. Infect.

NYMPHÆA, the *water lilly*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the rofaceous kind, confifting of feveral petals arranged in a circular form; the feed veffel arifes from the cup of the flower, and is, when ripe, of a globofe or conic figure, multicapfular, and filled with oblong feeds. See Tab. 1. of Botany, Clafs 6.

The fpecies of *nymphæa* enumerated by authors are thefe: 1. The great white *nymphæa*, or *water lilly*. 2. The great American *water lilly*, with very large rounded leaves, beautifully crenated, and purple underneath, and with large white flowers. 3. The American *nymphæa*, with fmaller rounded leaves, obtufely crenated, green underneath, and with white flowers. 4. The fame fpecies of *water lilly* are known when not in flower, by their large leaves, which float upon the furface of the water. *Tourn.* Inft. p 260.

NYMPHARENA, in natural hiftory, the name of a ftone found in the beds of fome rivers, and having the appearance of a fea horfe's tooth. Doubtlefs it was a petrified tooth of that or fome other fuch animal, fuch things being often found now, though in thefe early ages they were little known or regarded.

NYMPHARIUM, in botany, a name given by the Greek writers of the later ages to the *water lilly*.

The word is formed of *nymphæa*, and is of the fame kind with many other names of plants devifed about the fame time, which feem a fort of diminutives formed on the before received names of the fame plants. Thus *fcillarium* is a name given by Aëtius to the *fquill*, when the roots were fmall. Moft of thefe words were formed of the Arabian names of the things thofe new ones expreffed.

NYMPHARUM *oculi*, in natural hiftory, a name given by fome of the antient writers to the ftone we call *oculus Beli*, and fometimes to the operculum of a fhell-fifh, common on the fea fhores in many places, and called *umbilicus veneris*. We are told of Caligula that he carried his foldiers armed to the fea fide, to pick up the *nympharum oculi*, and fhells. It is certain in this place, the word only means the *umbilicus veneris*, for the other *oculi nympharum* are found only on the fhores, and in the beds of fome particular rivers, not on the fea fhores among fhells.

NYMPHOIDES, in botany, the name of a genus of plants, approaching to the nature of the water lilly, or *nymphæa*, in external appearance, and thence ufually efteemed fpecies of that genus, but improperly.

The characters of this genus of plants are thefe: the flower confifts of one leaf, ufually of a rotated form, and divided into feveral fegments at the edge. The piftil arifes from the cup, and perforates the bottom of the flower, and finally ripens into a foft fruit, or capfule, of an oblong, compreffed figure, having only one cell, and containing many feeds wrapt up in a calyptra. See Tab. 1. of Botany, Clafs 2.

The fpecies of *nymphoides* enumerated by Mr. Tournefort are thefe: 1. The common *nymphoides*, which fwims on waters: this is called by moft other authors the *yellow water lilly*, with fimbriated flowers. 2. The *nymphoides* with leaves beautifully ftained with purple fpots. 3. The Indian *nymphoides*, with white fimbriated flowers, called by authors *nadil ambel*. *Tourn.* Inft. p. 153.

NYSSA, in botany, the name of a plant defcribed by Gronovius, and made by Linnæus a diftinct genus of plants, under the fame name. The characters are thefe: it produces male and female flowers; in the male flower the cup is a five-leaved, expanded perianthium. The flower is monopetalous, but divided into five fegments, of the fhape and fize of thofe of the cup. The ftamina are ten pointed filaments, longer than the flower. The antheræ are double.

In the female flower the cup is of the fame figure as in the male, but it remains upon the fruit. The flower is the fame as in the male; the piftil has an oval germen under the cup; the ftyle is fingle, and flender, and is longer than the flower. The ftigma is oblong, compreffed, and bent. The fruit is a drupa of an oval figure, containing one cell, in which is contained an oval nut, fharp pointed at the ends, and rib'd with longitudinal lines. *Linnæi* Gen. Pl. p. 482. *Gronov.* Virgin. p. 121.

O.

O (*Cycl.*) — It was not, ſtrictly ſpeaking, the letter O, but the figure of a circle ○, or double ○○, by which the modern antients, in muſic, uſed to expreſs what they called *tempo perfetto*, or triple time. Hence the Italians call it *circolo*. This circle was ſometimes pointed, and ſometimes barred, thus

 or thus, 

But theſe equally ſignified a triple time. *Broſſard.*

The ſeven antiphones, or alternate hymns of ſeven verſes, &c. ſung by the choir in the time of Advent, was formerly called *O*, from their beginning with ſuch an exclamation.

OAK, *quercus*, in botany. See the article QUERCUS.

Holm-OAK. See the article ILEX.

OAK-*apples*, a name given to the common galls, uſed in dying. See the article GALL.

OAK-*leaf galls.* Theſe are of ſeveral kinds; the remarkable ſpecies called the muſhroom gall, is never found on any other vegetable ſubſtance but theſe leaves; and, beſide this, there are a great number of other kinds.

The double gall of theſe leaves is very ſingular in that, as the generality of productions of this kind affect only one ſide of a leaf, or branch, and grow all one way; this kind of gall extends itſelf both ways, and is ſeen on each ſide of the leaf, in form of two protuberances, oppoſite the one to the other. Theſe are of differently irregular ſhapes, but their natural figure ſeems that of two cones, with broad baſes, and very obtuſe points, though ſometimes they are round, or very nearly ſo. See Tab. of Inſects, N° 25.

Theſe make their firſt appearance on the leaf in April, and remain on it till June, or longer. They are at firſt green, but afterwards yellowiſh, and are ſofter to the touch than many other of the productions of this kind: they are uſually about the ſize of a large pea, but ſometimes they grow to the bigneſs of a nut. When opened, they are found to be of that kind, which are inhabited each by one inſect only, and each contain one cavity. The cavity in this is, however, larger than in any other gall of the ſize, or even in many others of three times the ſize; the ſides of it being very little thicker than the ſubſtance of the leaf.

It would be natural to expect, in this large lodgment, a large inſect, but what is uſually found is only a ſmall browniſh ſubſtance, of a kidney-like ſhape, looking like the ſeed of ſome plant. This is hard and motionleſs; but is, however, the chryſalis of an inſect which may be found living in the gall, when opened in an earlier ſeaſon, and is a ſmall white worm, owing its origin to the egg of a fly. This creature has a method of depoſiting its eggs within the ſubſtance of the leaf, and the young ones, when hatched, eating on each ſide, form the double tumor.

The life of the creature in this ſtate is but ſhort, and its duration in the chryſalis conſiderably long. The ſhell under which it paſſes this ſtate is not made in the manner of that of moſt other worms, of its own ſkin, but is formed of the woody fibres of the ribs of the leaf, which it gnaws into ſmall pieces, and forms into that ſhape by means of a viſcous humour, ſecreted from its own pores. At length the fly makes its way out of this caſe by breaking off one end of it, and then eats itſelf a paſſage through the gall, and flies at large. The flies hatched of theſe inſects are very ſmall, yet Mr. Reaumur has obſerved them ſo carefully, as to be able to diſtinguiſh three or four kinds of them.

The moſt common fly produced of theſe galls, is a very beautiful ſmall one, of the four-winged kind. Its body and breaſt are black; its wings gawſy, and colourleſs; and its antennæ conſiderably long, and of the conic, granulated kind. The body of this fly is very ſhort. A ſecond ſpecies is very different from this firſt; it is of a brown colour, much longer bodied, and has antennæ of the club kind. There is another which reſembles this in ſhape, but its body is of a fine ſhining green, with an admixture of a gold colour; the wings of this exhibit all the rainbow colours in the manner in which they are ſeen on a bubble of ſoap ſuds.

It is not eaſy to aſcertain the origin of the ſeveral ſpecies of flies, which are, at times, ſeen in this manner to come out of the ſame ſpecies of galls. It ſeems the common courſe of nature, that only one ſpecies of inſect forms one kind of *gall*; yet it may be, that two or three kinds may give origin to the ſame kind. There is, however, another occaſion of our ſeeing different ſpecies come out of different *galls* of the ſame kind; and this is the effect of the enemies of the proper inhabitants.

It might appear that the parent fly, when ſhe had formed a *gall* for the habitation of her worm offspring, had placed it in an impregnable fortreſs: but this is not the caſe; for it frequently happens that a fly as ſmall, perhaps, as that which gave origin to the *gall*, produces a worm which is of the carnivorous kind, as the other feeds on vegetable juices. This little fly, well knowing that where there is one of theſe protuberances on a leaf, there is a tender and defenceleſs inſect within, pierces the ſides of the *gall*, and depoſits her egg within it. This, when it hatches into a worm, feeds upon the proper inhabitant, and, finally, after devouring it, paſſes into the chryſalis ſtate, and thence appears in the form of its parent fly, and is ſeen making its way out of the *gall*, in the place of the proper inhabitant

On opening theſe *leaf galls*, which are properly the habitation only of one animal, it is common to find two, the ſtronger preying upon the body of the other, and ſucking its juices as it does thoſe of the leaf; often it is found wholly employed in devouring its unoffending neighbour at once: this is probably the caſe when its time of eating is nearly over; and, in fine, when we find the *gall* inhabited by only one inſect, or containing only one chryſalis, as it ought in its natural ſtate to do, we are never certain that this is the proper inhabitant, as it may be one of theſe deſtroyers who has eaten up the other, and ſupplied its place. *Reaumur's* Hiſt. Inſ. Vol. 6. p. 197, ſeq.

OAK *puceron*, a name given by naturaliſts to a very remarkable ſpecies of animal of the *puceron* kind. The generality of ſuch animals live on the ſurface of the branches and leaves of trees, and plants; but theſe bury themſelves in the clefts of the *oak*, and ſome other trees, and getting into the crevices, where the bark is a little ſeparated from the wood, they there live at eaſe, and feed to their fill, without being expoſed to their common enemies.

Theſe are the largeſt of all the ſpecies of *pucerons*; the winged ones are nearly of the ſize of a common houſe fly, and the naked, or ſuch as have no wings, though leſs than theſe, are yet greatly larger than any other ſpecies of *pucerons*; the winged and naked kinds in theſe, as well as in the other ſpecies of *pucerons*, are all mothers, and great number of young ones may be preſſed out of the body of either kind, when gently ſqueezed. The winged ones are black, and the others of a deep brown, or coffee-colour; they have the moſt remarkable trunk of any animal in the world; it is more than twice the length of their bodies, and has not its origin at the extremity of the head, as in other inſects, but is fixed into the breaſt near the origin of the firſt pair of legs. When the creature is walking, it carries this ſtrait along the belly, and trailing a conſiderable length behind it, but with the point turned up, that it may be out of the way of accidents, and be ready to ſuck. When the creature has a mind to ſuck a part of the tree that is juſt before it, it draws up, and ſhortens the trunk, till it brings it to a proper length, and direction; but when it ſucks in the common way, it crawls upon the inner ſurface of the bark, and the turned up end of the trunk, which reſembles a tail, fixes itſelf againſt the wood that is behind it, or contiguous to its back, and ſucks there. The extremity of this trunk holds ſo faſt by the wood, that when it is pulled away, it frequently brings a ſmall piece of the wood away with it.

The ants are as fond of theſe as of the other ſpecies of *pucerons*, and that for the ſame reaſon, not feeding upon them, but on their dung, which is a liquid matter of a ſweet taſte, and is the natural juice of the tree, very little altered. Theſe creatures are the ſureſt guides where to find this ſpecies of *puceron*; for if we at any time ſee a number of theſe crawling up an *oak* to a certain part, and there creeping into the clefts of the bark, we may be aſſured that in that place there are quantities of theſe *oak pucerons*.

The mechaniſm by which this trunk of the *oak puceron* is ſhortened, is like that by which we alter at pleaſure the length of our teleſcopes which are compoſed of ſeveral parts running one into another. This trunk is, in the ſame manner, compoſed of three joints, which, at the pleaſure of the animal, are received more or leſs into one another's cavities, and, in all ſtates, are ſo flexile, that the animal can bend, and direct them to any part at pleaſure.

The laſt joint of the trunk, or that which is fartheſt from the body is terminated by a very hard and ſharp point; it is made only to pierce into the ſubſtance of the hard wood, and as, if this had been hollow, it muſt have been both weaker, and thicker, both which are great diſadvantages in regard to its uſe, nature has made it ſolid. In this it departs from the general nature of other trunks of inſects, which are always open at the end: but inſtead of that, this has an oblong ſlit on its upper part, a little above the end; by this means, it is able at once forcibly to enter the wood, and to imbibe its juices. This ſlit is not to be perceived without the largeſt magnifiers, but there is always to be ſeen a drop of tranſparent liquor on the place where it is, if the creature be a little ſqueezed when newly taken off from the wood.

This whole trunk is beautifully tranſparent, and there are two long bodies like hairs ſeen within it. It is hard to gueſs at the

the uses of so minute parts, but, probably, these serve either to assist the motions of that trunk in lengthening, or shortening, or else as pistons, in drawing up the juices for food.

Though the trunk already described appear very singular in this insect, there is something in the mechanism of the parts by which it receives its nourishment still more wonderful, more out of the common method of nature than that: this is, that the creature has, properly speaking, a double trunk, for it has, beside this long one, another which is shorter, being about the lengthened diameter of those of the other insects of this kind, and placed, as they are, at the extremity of the head. The creature can elevate, and protend, this lesser trunk at pleasure, but, in its natural state, it is lodged in a small channel, in the long and large trunk before described, made to receive it. The use of this seems very plain, though very singular; as the creature was to feed upon the juices of a hard and solid wood, it required an organ of peculiar strength to enter its substance; this nature has provided it with in its long trunk, but, as the uses that was destined for required its being placed on the breast, this was a p rt too far distant from the head to be proper for the receiving the juices. This scheme of nature for the nourishment of the animal, seems therefore to have been this; the larger trunk is to receive, and convey to its upper part, the juices of the tree, and the smaller trunk is there to be inserted at pleasure into it, and to suck up from thence the juice into the body, as, in common cases, its office is to do it immediately from the plant itself. *Reaumur*'s Hist. Inf. Vol. 6. p. 64, 78.

The ants are so extremely fond of the juices of the tree, when prepared for them by passing through the body of this animal, that when the *puceron* has a drop not yet evacuated, but hanging only in part out at the passage, an ant will often seize on it there.

The distinguishing characters of the *pucerons* of all kinds, is their having two passages for the excrements on the hinder part of the body, beside what resembles the anus in larger animals; these passages, in most species, are formed into a sort of horns, or short hollow tubes, sticking out from the body of the creature, and serving as a very obvious distinction of it from all other animals: in this, however, and in some other species, these passages are not formed into horns, but are only two round tubercles a little more elevated than the rest of the surface of the body, and placed where the horns in others stand. *Reaumur*'s Hist. Inf. Vol. 6. p. 78.

OAK *snake*, in zoology. See DRYINUS.

OAT, *avena*, in botany. See the article AVENA.

Some physicians have greatly recommended a diet drink made of *oats*, in various distempers. The method of preparing the drink is as follows: take of recent *oats* entire, and well washed, one pound and an half; of the fresh root of succory, cut into slices, one handfull; spring water twelve pints; boil all together in a clean earthen vessel to the consumption of half, and then strain the liquor through a linnen cloth, and add to it six ounces of coarse sugar, and half an ounce of sal prunellæ; let it boil again, and afterwards be taken off the fire, and set by, for a day and a night, in a cool place; then pour off the clear liquor, and keep it in a cellar in vessels close stopped.

Two ordinary cup-fulls of this liquor given twice a day, three hours before, and as many after dinner, are said to do wonders in the cure of all kinds of fevers, colic pains, pleurisies, itches, cutaneous tumors, and hypocondriacal disorders; as also in cleansing the kidnies from sand, and opening the obstructed viscera. The use of it is ordered to be continued thirteen days, and, if the patient be cacochymic, a gentle purge is to be given before it is taken. It is accounted a great preservative against illness, if taken thrice a year, in spring, in autumn, and in the dog days; and the inventor of it, Joannes de St. Catharina, is said to have kept himself alive by it to the age of an hundred and twenty years, without any disease.

Dr. Lower having tried it, and found its good effects, by repeated experience, made it public, and the celebrated Hoffman has written an express treatise about it, in which he recommends it both in intermittent and continued fevers, but advises purified nitre to be used instead of the sal prunellæ, and observes that the two boilings ordered by Dr. Lower are not necessary, but that the sugar and nitre may be added at first. It must be kept carefully in summer, otherwise it soon becomes sour, and unfit for use.

Those who desire to have it coloured may boil in it an ounce of alkanet root, and two ounces of red saunders, which will give it a fine red colour, without at all affecting its virtues.

It is, unquestionably, a very valuable medicine, affording singular relief wherever obstructions of the vessels are to be removed, or salts to be washed out of the habit; where the viscid juices are to be diluted, or a due degree of moisture, and humidity restored. It is also excellent for allaying thirst in fevers, and for stopping hæmorrhages.

Black OATS. These are commonly sown upon an etch crop, or on a lay, which they plough up in January, when the earth is moist, taking care to turn the turf well, and to lay it even and flat. *Oats* are to be sown earlier in the northern parts of England than in the southern.

Oats are sown with a broad cast at twice as they do barley, harrowing it well in; but this must always be harrowed the same way that the furrows lie of a lay, or but very little cross, for fear of raising the turf, but upon an etch, as soon as the land is ploughed on an edge, they sow and harrow it in once; then sow it a second time, the full quantity, and harrow it five or six times over, observing to harrow once or twice across, which breaks the clods, and covers the seed better than harrowing all one way. They commonly sow them upon a broad ridge, which they give the land but one ploughing for.

The usual time of sowing black *oats* is in the beginning of February, or a very few weeks later, sometimes not till the beginning of March: they are a hardy grain, and will bear any thing of wet or cold. Four bushels of seed is the qu ntity for an acre; but they grow best on a moist land, though they will not miss any where. The farmer knows that his *oats* are ripe when the stalk turns yellow, the grain feels hard and the husk begins to open, and shew the seed. After they are cut, they should lie for the dew and the rain to plump them, and make them thrash well; and, if weedy, to kill the weeds: but, if there happen much rain, they must be got in again as soon as dry, otherwise the *oats* will soon fall out of the husks, and great part of the crop be lost.

Red OATS. The red *oat* is a kind of corn very common in Staffordshire, and some of the northern counties; it is a sort of naked *oat*, and is very proper for making oatmeal, because the kernel thrashes out of the hull, without carrying it to the mill, or drying of it. This *oat* is cultivated in the same manner as barley.

White OATS. This kind of *oat* is commonly sown upon an etch, after wheat, rye, or barley: they only give the land one ploughing, and sow them, and harrow them, as they do the black *oats*, except the land is subject to weeds; in that case it is good to plough up the wheat, or rye stubble, in November, which will make it rot the better, and be a kind of winter fallowing. Only if you have a very dry burning ground, which black *oats* will not delight in, in that case, they often sow them upon a lay. March and April are the usual time of sowing white *oats*, and the drier the weather is when they are sown, the better; they grow best upon a dry, gravelly, or sandy land, and they are the best of all to be sowed upon a land very subject to weeds, because, being sowed late, they allow a very late ploughing, and growing very quick after this, they over-top the weeds sooner than any other plant. The reaping of white *oats* is the same with that of the black, and they generally yield about the same quantity, that is, twenty bushels, or thereabouts, from an acre. *Mortimer*'s Husbandry, p. 134.

Wild OAT, in husbandry, a kind of *oat*, or *oat* grass, which comes up of itself, without sowing, and is much hated, and dreaded by the farmers. This, in many counties of England, is the greatest of all hinderances of the good crops of barley, and often of other grain. It is a rough and hairy *oat*, and usually black. In the wetter years, and after much frost, this is found to be most troublesome.

The best remedy the farmer has against this, is to sow the land most apt to produce it with beans, and when they are come up to about three inches high, to turn in sheep upon the ground, about twenty sheep to an acre; these will eat up all the shoots of the wild *oat*, and not touch the beans so long as there is any of the *oat* shoots left. *Morton*'s Northampt. p. 480.

OAT-*snail*. See the article SNAIL.

OBELISCUS *marmoreus*, in natural history, the name of a very remarkable species of shell-fish, unknown to us in its recent state, but met with very frequently fossile in the Swedish stone used for pavements, and in some other kinds, and more accurately named by late authors *polythalamium*, and *orthoceratites*, and by Klein *tubulus marinus concameratus*. *Klein*. de tubul. p. 7. See TUBULUS *concameratus*.

OBELISK (*Cycl.*) — One of the uses of *obelisks* among the antients, was to find the meridian attitudes of the sun, at different times of the year. Hence they served instead of very large gnomons. One of the *obelisks* now standing at Rome, that of St. John's Lateran, is, in height, 108 English feet, without the pedestal; and the other *obelisk*, buried under the *campo Marzo*, wants but little of the same height. Pliny gives us a description of this gnomon, lib. 36. §. 15. From him it appears that there was laid down, from the foot of the *obelisk* northward, a level pavement of stone, equal in breadth to the breadth of the *obelisk* itself, and equal in length to its shadow at noon, upon the shortest day; that is to say, that its length was to the height of the *obelisk*, almost as 22 to 10, and that, under this pavement, there were properly let in parallel rulers of brass, whose distances from the point, directly under the apex of the *obelisk*, were respectively equal to the lengths of the shadow thereof at noon, on the several days of the year, as the same lengths decreased from the shortest day to the longest, and again increased from the longest day to the shortest. Vid. Phil. Transf. Nº 482. Sect. 5. where we also find some remarks by Mr. Folkes on Hardouin's amendment of a passage in Pliny's natural history, lib. 2. §. 74. Edit Parif. 1723. fol. about the length of the shadows of gnomons in different latitudes.

OBEY, in the manege. A horse is said to *obey* the hand and heels, to *obey* the aids, or helps, when he knows and answers them according to demand.

OBLADA, in ichthyology, a name given by ſome to the *melanurus* of authors, a fiſh of the *ſparus* kind, diſtinguiſhed by Artedi by the name of the *ſparus variegated with longitudinal lines, and with a large black ſpot on each ſide near the tail.*

OBLATÆ (*Cycl.*)—Oblata is alſo a word uſed by ſome authors to expreſs a ſort of purging tablet, made of fine flower and ſugar, with ſome purging ingredients.

Oblatæ is alſo uſed to ſignify the conſecrated wafers, or hoſts, diſtributed to the communicants in the maſs or ſacrament of the altar; and ſometimes the cuſtomary treats in religious houſes have been called by the name of *oblatæ*.

OBLIGATO, in the Italian muſic, ſignifies *for*, *on purpoſe for*, or *neceſſary*, as *doi violini obligato*, on purpoſe for two violins; and ſo of other things, as *conſagotto obligato*, that muſt be played with a baſſoon, &c.

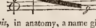
Sometimes it ſignifies confined, or reſtrained, by certain rules, ſubjected to certain limits or laws, in order to perform ſome particular thing, to give ſome particular expreſſion of a paſſion, action, &c. In this ſenſe we ſay, *contrapunto obligato*, *fuga obligata*, &c. We alſo ſay, the baſs is *obligato*, when it is only a ground of a certain number of bars, which are to be repeated over and over; ſuch is the baſs to chacones, &c. and every baſs wherein one is obliged to keep a certain movement, and to perform only certain notes, &c.

OBLIGEE, in law, is the party to whom an obligation, or bond is made. *Blount.*

OBLIGOR, in law, the party who enters into, or executes, an obligation, or bond.

OBLIQUE (*Cycl.*) — Oblique *circle*, in the ſtereographical projection of the ſphere, any circle that is *oblique* to the plane of projection.

OBLIQUO, in the Italian muſic, ſignifies two breves tied together, which make but one body, whence it is named in Italian *nota d' un corpo ſolo*; ſometimes there is a tail, or the right, or left ſide, either aſcending, or deſcending. (See Note, Ligature, and Virgula.) However it be, the two extremes mark the ſound, the middle ſerves only to tie them, thus:



OBLIQUUS *brevis*, in anatomy, a name given by ſome authors to the muſcle uſually called the *obliquus inferior oculi*, the *ſextus oculi* of Fallopius.

Obliquus *externus*, in anatomy, the name of a muſcle of the abdomen, which is broad and thin, fleſhy on its upper and back part, and tendinous on the anterior, and greateſt portion of the lower part. It reaches from half the lateral and inferior part of the thorax, to almoſt half the lateral and ſuperior part of the pelvis: and from the back part of the regio lumbaris to the linea alba. It is fixed by its upper part to the ribs, by its lower to the os ilium, ligamentum Fallopii, and os pubis, and by the fore-part to the linea alba; the poſterior portion next the vertebræ of the loins has commonly no true muſcular inſertions. It is called alſo the *obliquus deſcendens*, *obliquus ſuperior*, and *obliquus major*.

It is fixed to eight ribs by the ſame number of angles, the inſertions in the bony extremities of the ribs are at different diſtances from the cartilages, and the name of digitations, or indentations, have been given to theſe angular inſertions, becauſe they join a like number of the ſame kind belonging to other muſcles, as the fingers of the hands may be locked between each other; theſe digitations appear to be entirely fleſhy, but they are almoſt all truly a little tendinous in their back part; they ſeem to encreaſe in breadth alſo as they deſcend, and often unite with the intercoſtal muſcles, as they paſs over them; there are in theſe muſcles other internal inſertions, covered and hid by thoſe which appear outwardly. The firſt digitation is longer than the reſt, and has about the breadth of two fingers; the ſecond is about an inch in breadth; the third is about three fingers broad; the fourth mixes, by ſome of its anterior fibres, with the ſerratus major, as the firſt does with the pectoralis major, and the ſecond with the ſerratus major; the fifth mixes both with the foregoing, and with the firſt digitation of the latiſſimus dorſi; the ſixth is about two fingers broad, and ſends off a faſciculus of fibres to the ſerratus major; and the ſeventh is of the ſame breadth with the former, and ſome of its fibres are ſent off to the ſerratus poſterius inferior. *Winſlow*'s Anatomy, p. 163.

Obliquus *internus*. This is another name for the *obliquus aſcendens*. It is a broad thin muſcle like the former, with nearly the ſame extent and inſertions, that is in the lower ribs above, in the criſta of the os ilium, and ligamentum Fallopii below, and in the linea alba before; but it differs from it in this, that the lower part of it is more fleſhy than the upper. One portion of its lower extremity, which is intirely fleſhy, is fixed by very ſhort tendinous fibres in the middle ſpace between the two labia of the criſta of the os ilium, from the back part of the tuberoſity of that criſta, near the ſymphyſis of the os ſacrum, almoſt all the way to the ſuperior, and anterior ſpine of the os ilium; ſo that its inſertion reaches farther back than that of the obliquus externus. The fleſhy fibres thus fixed run up firſt from behind, obliquely forward, and then this obliquity encreaſes proportionably, as the fibres lie more anteriorly, and they croſs thoſe of the fleſhy portion of the external obliquus, being afterwards inſerted exteriorly in the lower edges of the cartilages of all the falſe ribs, and thoſe of the two loweſt true ribs, reaching to the extremity of the cartilago enſiformis. *Winſlow*'s Anatomy. p. 165.

Obliquus *capitis ſuperior*, a muſcle ſituated laterally between the occiput, and firſt vertebra, and nearly of the ſame figure with the two recti. It is fixed to the end of the tranſverſe apophyſis of the firſt vertebra, from whence it runs upward, and very obliquely backward, and is inſerted in the tranſverſe line of the os occipitis, almoſt at an equal diſtance from the criſta, and the maſtoide apophyſis between the rectus major and the complexus minor, which it covers a little. *Winſlow*'s Anatomy, p. 237.

Obliquus *capitis inferior*, a muſcle ſituated in a contrary direction to the obliquus ſuperior, between the firſt and ſecond vertebræ of the neck, and reſembles the ſuperior in every thing but ſize. It is fixed below to one branch of the bifurcated ſpinal apophyſis of the ſecond vertebra, near the inſertion of the rectus major, from whence it runs obliquely, upward and outward, and is inſerted in the end of the tranſverſe apophyſis of the firſt vertebra, under the lower inſertion of the obliquus ſuperior. *Winſlow*'s Anatomy, p. 237.

Obliquus *capitis inferior* is alſo the name given by Albinus to a muſcle called by Winſlow *obliquus major*; and, by Veſalius, and the old authors, *ſextus capitis movVentium*. Fallopius makes it the *ſeptimus capitis*, and Euſtachius, in his treatiſe, *De motu capitis*, calls it *parvus muſculus a ſecundæ vertebræ ſpina in proceſſum tranſverſum ſpinæ obliquè inſixus*.

Obliquus *ſuperior oculi*, in anatomy, a name given by Albinus, and others, to the muſcle called *obliquus major*, and *tertius palpebrarum*, by others.

Obliquus *naris muſculus*, in anatomy, a name given by Winſlow to the muſcle ſince called by Albinus the *levator labii ſuperioris alæque naſi*.

OBLONG *leaf*, among botaniſts. See Leaf.

OBNUNCIATION, *obnunciatio*, in Roman antiquity. See Nunciation.

OBOE, or Oboi, in the Italian muſic, is uſed to ſignify an *hautboy* or *hoboy*, or that a part is to be played on that inſtrument.

OBRANG, in botany, the name given by the people of Guinea to a very ſingular and remarkable plant, the virtues of which they greatly praiſe. They boil it in water, and uſe the decoction by way of a fomentation to take down ſwellings of the teſticles. Its leaves have ſome faint reſemblance to thoſe of our liquorice, whence Petiver has called it *glycyrrhizæ folio ſingulari frutex Guineenſis ſpinis gemellis*. Phil. Tranſ. N° 232.

OBRIZUM, in antiquity, a kind of gold. Pliny ſays [a], that they call the gold that has been ſeveral times purified in the fire, *obrizum*. *Auri experimento ignis eſt ut ſimili colore rubeat quo ignis*; *atque ipſum* obrizum *vocant*. *Abriz* in Arabic, or Perſian, ſignifies fine gold without mixture, which the Greeks and Latins call *obrizum* [b]. — [[a] *Plin.* l. xxxiii. c. 23. [b] *Calmet*, Dict. Bibl.]

OBSIDIANUS *lapis*, in the natural hiſtory of the antients, the name of a ſtone which they have alſo deſcribed under the name of the *Chian marble*. It is a very ſmooth and hard marble, extremely difficult to cut, but capable of a fine poliſh, and was uſed among the antient Greeks for the making reflecting mirrors. See the article Chium *marmor*. The later writers have ſuppoſed the name *obſidianus* derived from ſomebody of the name of *Obſidius*, who was the inventor of this uſe of it; but it ſeems only a falſe ſpelling of the word *opſianus*, ἀπὸ τοῦ ὄψεως, from ſeeing the images of things in it. *Hill*'s Hiſt. of Foſſ. p. 460.

OBSTITA, among the Romans, a term uſed to ſignify places that had been thunder-ſtruck, which were otherwiſe called *bidentalia*. *Hofm* Lex. Univ. in voc. See Bidental.

OBSTRUCTION *of the bowels*, *obſtructio alvi*, in medicine, the name by which authors expreſs what we call *coſtiveneſs*, that is, a retention of the ſtools a longer time in the bowels than they ſhould be kept there, from whatever cauſe that retention happens.

An *obſtructio alvi* is ſometimes idiopathic, where there is no other diſeaſe concurring to it; ſometimes it is ſymptomatic, and depends entirely on other diſeaſes, as on fevers, congeſtions, and the like.

Signs of Costiveness. The firſt, and moſt obvious, of theſe is, the not going to ſtool in the ſpace of twenty-four hours; this is uſually ſucceeded by a dizzyneſs, and vertiginous diſorder of the head, painful congeſtions of blood about the head, flatulencies, oppreſſions of the ſtomach, and ſtraitneſs and anxiety about the præcordia. *Junker*'s Conſp. Med. p. 590.

Perſons ſubject to Costiveness. Men of ſedentary, and idle lives, are more ſubject than others to this complaint, eſpecially when ſubject to commotions of the blood, and of a dry choleric temperament, and ſuch as are ſubject to hypocondriac

condriac affections, and to the gout, or to nephritic complaints, and to acute fevers.

Causes of COSTIVENESS. These are observed by writers to be of two kinds, the active, and the passive. The active cause is a certain stricture which comes on in the rectum in many different disorders; as in the stone, in nephritic complaints, and in general, in all the congestions of blood toward the upper parts of the body. What is called the passive cause of *costiveness*, is that occasioned by a sort of sluggishness in nature, which leaves the peristaltic motion of the guts too languid, on occasion of which the fæces are easily indurated in the bowels. The occasional and accidental causes which contribute to this induration of the fæces are the following: a neglecting the usual time of going to stool; and checking the natural tendencies, and motions toward it; an extraordinary heat of the body, and copious sweats; a larger quantity of solid food taken into the stomach than is proper for the quantity of fluids swallowed, and a common use of such food as is dry and hard of digestion.

Prognostics in COSTIVENESS. It is the origin of a great many disorders; and, in particular cases, is often attended with imminent danger. In choleric habits, in which persons are subject to large quantities of bilious matter being lodged in the primæ viæ, *costiveness* is usually attended with colics, and violent heats. The indurated excrements also, when they press upon the veins in the guts, very often prevent the circulation, and, by that means, bring on dangerous inflammations in the parts; and, in general, whatever disease is attended with *costiveness* is rendered worse and more violent by it.

Method of treatment in COSTIVENESS. An idiopathic *costiveness*, when grown into a habit by long sufferance, is best cured by means of drinking more liquids than usual, and giving the body a greater share of motion; but this motion must, by no means, be violent, for that always encreases the disease, but when placid and easy, it tends greatly to the restoring the peristaltic motion of the bowels to its proper state. To this it is to be added, that many people have restored themselves from this distemperature to a good state, only by going to the close-stool every day, at a certain hour, and only endeavouring for some time, but without great violence, to force a stool; the consequence of a continual practice of this, for some weeks together, has brought nature to expect it, and, in fine, to be prepared for it, and always to have fæces at the time ready to be discharged. The eating a small piece of bread with a large quantity of butter spread over it every day before dinner and supper is also a good custom; and purges taken every spring and autumn are a method of bringing nature into a proper course. When the case is violent, and calls for the assistance of medicine, there is always more benefit obtained from clysters, than from purging medicines given internally. These last, when given, must never be violent.

In a symptomatic *costiveness*, the primary disease is always to be first regarded, and this is, generally, not a little relieved by a proper removal of the *costiveness*. In chronic cases, the same rules are to observed as in the cure of the idiopathic *costiveness*; but, in acute cases, recourse is to be had to clysters, and large draughts of warm, and weak fluids, such as barley water, and the like.

When *costiveness* is attended with no other complaint, but people enjoy their perfect health with it, there is no occasion for medicines, nature being in some constitutions habituated to it, and doing well with it. There are many persons who, in general, do not go to stool oftener than once in three days; some once in a week; and there have been instances of people, who, while they have enjoyed a perfect health, and eat very heartily, have not gone above once in three or four weeks. When habitual *costiveness* is to be cured by motion, and drinking more fluids, these must be always used together; for otherwise drink alone more relaxes the bowels, and motion alone dissipates the already too little humidity. Thus either of them alone must add to the disease, which, when given together, they cure. The common method of attempting to cure *costiveness* by repeated doses of purges, brings on a great many inconveniencies, particularly they always leave the bowels more bound than before, and by that means add to the complaint they were meant to relieve, and even the gentlest purging medicines have this effect. *Junker's* Consp. Med. p. 391.

In cases of this kind, Dr. Huxham recommends a medicine prepared with salt of hartshorn, saturated with spirit of vinegar, which not only takes away the fœtid smell of the oil of the salt, but changes it into an agreeable aromatic. Obs. de aere, et morb. epid.

OBTUNDENTIA, a word used by some authors to express such medicines as are given to obtund, or edulcorate the acrimony of the humors.

OBTURATOR (*Cycl.*) — OBTURATOR *externus*, a small flat muscle, which fills up the foramen ovale of the os innominatum exteriorly, and reaches from thence to the great trochanter of the os femoris behind the neck of that bone. It is fixed by fleshy fibres to the outer, or anterior side of the os pubis, all the way to the foramen ovale, to the edge of that hole next the small ramus of the ischium, under the acetabulum, where a tendon is formed, which continues its course behind the neck of the os femoris toward the great trochanter, and is inserted between the gemelli, and quadratus, in a small fossula, between the apex of the great trochanter, and the basis of the collum femoris. *Winslow's* Anatomy, p. 211.

OBTURATOR *internus*, a flat muscle, almost triangular, situated in the bottom of the pelvis; it covers the foramen ovale, and almost all the inside of the os pubis and ischium. It is fixed to the internal labium of all the anterior half of the foramen ovale, a little to the neighbouring part of the *obturator ligament*, and also both above and below the foramen. It is likewise fixed to the upper half of the inside of the os ischium, from the upper oblique notch in the foramen ovale, to the superior part of the great posterior sinus of the os ilium.

From all this extent, the fleshy fibres contracting in breadth, run down below the spine of the ischium, where they go out of the pelvis through the posterior notch in the ischium. The inside of the body of this muscle, or that turned to the cavity of the pelvis, is pretty uniform; but the outside, or that turned toward the foramen ovale, and which touches the bone, has four middle radiated tendons, which uniting at the posterior notch of the ischium, run over it from behind forward, as over a pulley, each tendon sliding in a particular cartilaginous channel. Afterwards the four tendons having got out of the pelvis, are pretty strictly united in one large flat tendon, which, crossing over that of the pyriformis, unites with it, having first received on each side, some additional fleshy fibres from the two gemelli. The great tendon slides freely, in a sort of membranous vagina, formed by these muscles, and is inserted in the middle of the superior part of the cavity of the great trochanter, adhering closely to the capsular ligament of the joint, and being united to the tendons of the glutæus minimus, and pyriformis. *Winslow's* Anatomy, p. 209.

OBTURATOR *ligament*. This is one of the proper ligaments of the ossa innominata, and fills up all the great foramen ovale, except the oblique notch at its upper part. It is fastened precisely to the edge of the circumference of that hole, from the anterior part of the oblique notch, all the way to the symphysis between the os pubis, and os ischium. From thence to the posterior part of the inferior notch, it is fixed to the internal labium of the edge of the circumference, forming a kind of small channel with the external labium; and afterwards it is fixed to the common edge of the foramen ovale, and cotyloide notch. By this disposition, an opening is left between this ligament, and the superior oblique notch, and immediately below this common opening, there are two small perforations in the ligament alone. *Winslow's* Anatomy, p. 124.

OBULARIA, in botany, the name given by Linnæus to a genus of plants, the characters of which are these: there is no cup to the flower, but, in the place of one, there stand two leaves of the plant. The flower is composed of only one leaf; the tube is of a bell shape, inflated, and pervious, and the edge is divided into four segments, which are shorter than the tube, and are of a bifid figure. The stamina are four subulated filaments, arising from the segments of the flower, and two of them are somewhat smaller than the others. The antheræ are small. The germen of the pistil is oval, and compressed. The style is cylindric, and of the length of the stamina; and the stigma is oblong, bifid, and remaining. The capsule is of an oval, compressed figure, and contains numerous seeds, in form of a fine powder. *Linnæi* Gen. Plant. p. 297.

OCCATION, a term in the antient husbandry, by which they expressed what we do by harrowing, though they performed it with a different instrument, a kind of rake.

With the teeth of this instrument, they levelled the ground, and broke the clods, and, with the hand, strewed the corn over this level ground. Then they brought on the plough, and ploughed it in; so that the grain was sown in furrows, as we express it, and usually came up, as we see it does at this time with us, in the same case, in the lower parts only. After it had got a few leaves, they went over the ground again with the same instrument a second time, to clear away the weeds, and move the earth about the roots of the young plants. If they did this lengthways of the furrows, the earth being somewhat hardened, there fell but little of it among the corn; but if they did it crossways of the furrows, a great deal fell down upon, and among, the young plants, and, in a manner, buried them; they were usually observed to grow the better for this cross harrowing, except in cold places; and the husbandmen thought the vigour of the plants was owing to the burying them with new earth; but this was really rather prejudicial to them, and the advantage they had arose from the more deep stirring of the ground. *Tull's* Husbandry.

OCCHIO, in glass-making, the hole in the floor of the tower of the leer. *Neri's* Art. of Glass. p. 243.

OCCIDENS, an affected name given by some of the chemical writers to *vinegar*.

OCCIDENT, in geography, the westward quarter of the horizon, or that part of the horizon where the ecliptic, or the sun therein, descends into the lower hemisphere.

Equinoctial OCCIDENT, that point of the horizon where the sun sets, when entering *aries*, or *libra*.

Estival OCCIDENT, that point of the horizon where the sun sets at his entrance into the sign *cancer*, when the days are longest.

Hybernal OCCIDENT, that point of the horizon where the sun sets, when entering the sign of *capricorn*; at which time, the days, with us, are shortest.

OCCIPITAL (*Cycl.*) — The *os occipitis*, or *occipital bone*, is situated in the posterior and lower part of the cranium; it represents a kind of lozenge, irregularly indented, and is convex without, and concave within. It sometimes, but very rarely, is found to consist of two pieces, being divided, in that case, by the continuation of the coronal suture. It consists of an external, and internal side, of the upper, lower, lateral, and middle parts; the first four of which may be looked upon as so many angles; and has four edges, the two superior of which are indented, the two inferior are more or less unequal in different subjects. Near the middle of the convex outside of this bone, the *occipital* protuberance, or rising, is observable; under this protuberance are two superficial transverse arches; these are more remarkable in some subjects, than in others, one superior, and larger, the other inferior, and less, and both reaching to the mastoide process on each side: the inferior arch is cut at right angles by a perpendicular line, called the external, *occipital* spine, or crista. Under the superior arch are two rough planes, one on each side of the spine; and between the extremities of the two arches are two other such planes, one on the right hand, and the other on the left. We see likewise two condyles, or condyloide apophyses, crusted over with cartilages, gently convex, of an oblong oval figure, and situated obliquely; their posterior extremities being at a greater distance from one another than their anterior. Also a large, cuneiform, production, which, from the condyles, is directed upwards, and, in adults, is often joined inseparably to the os sphenoides. This may be termed the apophysis basilaris, or the great apophysis of the *occipital* bone. Lastly, there are some unequal tubercles on the lower part of this apophysis, and two little angular productions in the edge of the bone, over against the condyles.

There are likewise in this bone two large notches under the lateral angles, which receive the posterior apophyses of the ossa temporum, two small notches, or portions of the jugular fossæ, and of the foramina lacera; each of these is often divided by a small bony production: also the great *occipital* hole, on the anterior edge of which there is an impression for the insertion of a ligament, two anterior, and two posterior condyloide fossulæ, two anterior condyloide holes for the ninth pair of nerves, which are sometimes double, and two posteior condyloide holes for small veins, which are sometimes wanting. The upper part of this bone is thick, as being much exposed to blows, and other injuries; the lower part is thinner, but is well guarded by muscles. It forms the back part of the head; serves for the articulation of the head with the trunk; contains a part of the brain, and almost all the cerebellum; and gives passage to the medulla oblongata, and a great many of the nerves, and vessels; and insertion to a great many of the muscles. *Winslow's* Anatomy, p. 25.

OCCUPIERS *of walling*, a term in the salt works for the persons who are the sworn officers, that allot, in particular places, what quantity of salt is to be made, that the markets may not be over-stocked, and see that all is carried fairly and equally between the lord and tenant. These persons always appoint how many houses shall work at a time; and, when, there is salt to be made, these appoint a cryer to proclaim it to all the workers, that they may put to their fires at the same time; and a like proclaiming of the time when they shall leave off; and those who continue to work after this prohibition, are to have their salt spoiled, or destroyed. *Ray's* English Words, p 173.

OCELLATI *lapides*, in natural history, a name given by the antients sometimes to express certain stones, found on the shores, and in the beds of rivers, and naturally marked with the figure of an eye; and sometimes for small round stones of the shape of the globe of the eye, made by art for children to play with, and of the nature of what we call marbles. Suetonius tells us, that Augustus Cæsar used to divert himself sometimes with playing *nucibus et ocellatis*.

The word *lapidibus* is understood after the last word, and the meaning of the author plainly is, that he played, like a boy, with nuts and marbles. The word *ocellatus*, therefore, here, as in many other passages of the antients, plainly expresses those little round stones, formed by art, of little or no value, and intended only for boys to play with. But we have abundant testimony among the antient naturalists of the word having been used also as the name of the gem which we now call *oculus beli*, and all those other stones of the agate, or other semi-pellucid kinds, which had the figure of an eye naturally impressed upon them, that is, a round spot of a different colour, in the center of a small roundish stone. These were scarce among the antients, because they had none but the true *oculi beli*, or such stones as were of a particular species, and were found naturally of the shape and size of an eye; but we have them much more common, because our jewellers, whenever they find a natural spot in an agate, surrounded with a white circle, cut it out from the rest of the stone, and sell it as a natural *oculus beli*.

The name *ocellati lapides*, is not, by any means, a strange, or unnatural one for the genuine stones thus shaped, and marked with the resemblance of a pupil; for the antients used the name of the eye in a much larger sense, expressing by it any thing that appeared rounded and protuberant. Pliny, speaking of the Callais, or Turquoise stone, says, that it protuberated from the rocks in the form of an eye, and means no more by it, than that the masses of it were round, and prominent, as we see those of copper oreturquoise at this day.

OCHNA, in botany, the name of a genus of plants, the characters of which are these: the cup is a perianthium, composed of five small leaves, of an oval, but pointed shape, standing expanded, and falling with the flower. The flower is composed of two roundish petals, with very obtuse ends, and with ungulæ of the length of the leaves of the cup. The stamina are a number of fine slender filaments, converging at the ends. The germen of the pistil is oval, and terminates in a pointed style, which is erect, and longer than the stamina. The fruit is a very large, and fleshy receptacle, of a roundish, truncated form, in either side of which there is lodged a single berry, of an oval figure. The seeds are single, and of an oval figure also. *Plumier*, 32. *Linnæi* Gen Pl. p 819.

OCHRA, or *gallinula* OCHRA, in zoology, the name of a species of moorhen. It is all over of a dusky, and obscure, yellowish green, and is browner on the breast, and belly, than on the back, yet with the same yellowish green predominant. The head, neck, breast, and wings, have several white spots; and the face is in part white; the beak is part black, and part red; and the legs are of a yellowish colour. *Aldrovand.* de Avib. l. 20. c. 48.

OCHRA *vitrioli*, in natural history, a name given to that yellow earth, or *ochre*, which is one of the principles, or constituent parts of all vitriol. This is separated from it by solution in water, and falls to the bottom of the vessel; and the yellow substance that tinges the sides of fountains, and springs of chalybeat waters, in many places, is the same substance, and shews that they are only solutions of vitriol, which, as such, must needs deposit that earth, which, though retained imperceptibly in the vitriol, yet cannot be sustained in water so well as while that salt was solid.

Basil Valentine tells us, that repeated solutions of the same quantity of vitriol, will, at length free it from all its earth; and that then it will be found a very different substance from what it was before, and fit for several wonderful experiments, which he describes. This separation of the earth of vitriol has been tried in vain, by twenty repeated solutions; but there is a much shorter way of effecting it, which is this: Powder a good quantity of Dantzick, or Hungarian vitriol; put it into a high and narrow cucurbit, and add to it a considerable quantity of water; keep a fire under it for four days, and the earth will, in a very great quantity, subside from it, when cold, in much greater quantity from this one operation, than from several repeated ones of the common kind.

Another method, which separates more than its earth from it, is this: Let the vessel containing the powdered vitriol, without any addition of water, be placed in a balneum Mariæ, and kept hot in the same manner for four days; the vitriol will, in this case, melt as if water were put to it. While it continues in this fluid state, the *ochre*, or earth, and not only that, but with it, the metalline parts, and the gross sulphur, will in a great measure subside, and become a hard cake, the vitriol continuing fluid about it Let this be poured off, and when cold, it will crystallize, leaving only a small quantity of a liquamen behind. This operation may be repeated two or three times, and the vitriol then becomes a very different substance from what it was before, and is fitted for several operations, which it would not otherwise succeed in. Many have tried to effect this separation by liquation, by means of a dry heat, placing the vessel in sand, in filings of iron, or over the flame of a lamp, burning spirit of wine, or oil; but it never will succeed this way, though the vitriol be ever so long kept in a state of liquation. Phil. Trans. N° 103.

The *ochra vitrioli* may be obtained also in a great proportion, though in another form, if, after a long, and intense calcination, the vitriol is freed from its salt by an ablution of warm water often repeated The far greater part of the remaining colcothar, thus dulcified, is earth, with an admixture only of a small quantity of some metalline parts.

Another way of obtaining it, is dissolving vitriol in common water, and adding to the solution filings of zink, or salts of tartar, or some other alkali. See the article VITRIOL.

A great proof of the earth called *ochra vitrioli* being contained in large quantity in that salt, is, that it requires no earth beside to be mixed with it in distillation: whereas common salt, nitre, and the other salts, require a great quantity of common earth to be added to them, to prevent their fusion.

Alum,

Alum, and vitriol alone, require no such additions, the first of these containing a very large quantity of an alkalious, white earth, as the other does of an ochreous yellow one.

OCHRES, in natural history, the name of a large genus of earths, used principally by the painters. The most common kinds are either yellow, or red, though there are brown, blue, and green *ochres*, and a number of distinct species of all these colours. Of the yellow *ochres*, Dr. Hill, in his history of fossils, describes eleven species. Of the red, the same number. Of the brown two. Of the blue, and green, one species each; and of the black, two.

The greater number of these are, or have been, at one time, or other, in use in painting, in different parts of the world. Some, however, there are, especially of the yellow and red kinds, which that author has, himself, discovered in different parts of our own, and other kingdoms, which are worthy the tryals of the persons concerned in that branch of trade, as they have already been proved, at his request, in small quantities, and found to answer very well. *Hill's* Hist. of Foss. p. 51.

The species of the yellow *ochres* are these: 1. The *ochra levissima, friabilis, pallidissime flavescens*; or very light friable pale yellow *ochre*. An earth found of late years in Pensylvania, Virginia, and some other of our American plantations, which has been tried both in water, and oil, and makes a very pale straw colour in the former, and a fine yellow, though somewhat deeper, in the latter; but making no good colour, when burnt.

2. The *ochra ponderosa, dura, pallide flavescens*; the hard, heavy, pale, yellow *ochre*. This is found in Germany, Saxony, France, and England, and is well known to the painters, and much used by them for a pale yellow. They call this French *ochre*; but it is dug in considerable quantities in Dorsetshire. This makes but a dull colour, when burnt, and is, in its native state, much inferior to the common kind.

3. The *ochra levissima, flava, friabilis*; the light, crumbly, yellow *ochre*. This is frequently thrown out at the mouths of chalybeate springs, and, sometimes, from such as are not manifestly impregnated with the particles of that metal; and is found in great abundance on Hampstead heath. This is not used by the painters, but is a bright yellow, and very fine, and is, therefore, worth trying.

4. The *ochra levis, aurea, friabilis*; the light, friable, gold-coloured *ochre*. This was the *ochre* of Theophrastus, and of the earliest ages we have accounts of. It is common in our gravel pits, in large loose lumps. The painters of the present age are not acquainted with this; but it is a very valuable substance, making a fine strong yellow in its native state, and a very bright, and beautiful red, when burnt. *Hill's* Hist of Foss. p. 52.

5. The *ochra crocea, laminata, levis*; the light, plated, saffron-coloured *ochre*. This was also well known to the antient painters, though not so early as the former, and is the Attic, or Athenian, *ochre* of Dioscorides. It is, like the former, common in small plated masses, in our gravel pits, and, though not known to our present painters, has been tried, and proves a very fine yellow, both in water, and oil, in its native state, but does not make a bright red, on burning. *Hill's* Hist. of Foss. p. 53.

6. The *ochra ponderosa, flava, friabilis*; the heavy, friable, yellow *ochre*. This is common in England, and is well known, and very much used in its native state among the painters. It is dug in Buckinghamshire, Somersetshire, and Oxfordshire, but is greatly inferior to the two former kinds. *Hill's* Hist. of Foss. p. 54.

7. The *ochra argillacea, ponderosa, lutea, dura*; the hard, heavy, clayey, yellow *ochre*. This is dug in Buckinghamshire, Yorkshire, and some other counties, and is sent up to London, and used by the painters, making a very lively yellow in its native state, and a pleasant, though not a strong red, when burnt. *Hill's* Hist. of Foss. p. 55.

8. The *ochra durissima, ponderosa, flava*; the stony, hard, and heavy, yellow *ochre*. This is well known to the painters, and much valued by them. It is dug in Buckinghamshire, Staffordshire, and Yorkshire, but most plentifully in Oxfordshire, whence it is continually sent up in great quantities to London. It makes, in its native state, a fine yellow, and, when burnt, a very beautiful red, and is the sort used for burning into red *ochre* in the colour-shops.

9. The *ochra argillacea, sordide flavescens*; the dull, dusky, yellow, clayey *ochre*. This is dug in Buckinghamshire, Staffordshire, and Oxfordshire, and is sent up to London, and used in the coarser mixtures at the colour-shops, in its native state, but, when rightly managed, it burns to a very fine valuable red. This, and the former, and some other of the before-mentioned, contain in them a considerable quantity of a genuine clay, and thence are more compact and stiff than the more pure kinds.

10. The *ochra argillacea, luteo-fusca levis*; the brownish, yellow, light, clayey *ochre*. This is common in Buckinghamshire, Northamptonshire, and many other counties, and though not so florid in its colour as many other *ochres*, yet makes a very pleasing paint, and has what the painters call a good body. This is not yet known among the painters, but is worth their being acquainted with. *Hill's* Hist. of Foss. p. 56.

11. The last is the *ochra ponderosa, friabilis, aureo-crocea*, commonly called *giallolino*, and by our painters *Naples yellow*. See the article GIALLOLINO.

The species of the red *ochres* are the following: 1. The *ochra rubra friabilis ponderosa, quæ sil Syricum antiquorum*; the red, heavy, friable *ochre*, the Syrian *sil* of the antients. See the article SIL.

2. The *ochra purpurea friabilis alkalina, quæ almagra recentiorum, sil Atticum antiquorum*; the friable, purple, alkaline *ochre*, the *almagra* of the moderns, and Attic *sil* of the antients. See the artcles SIL, and ALMAGRA.

These are both used at this time in painting, and the latter also in medicine. The first of them is common in many parts of England; the latter seems peculiar to Spain.

3. The *ochra purpurea ponderosissima dura*; the hard, heavy, purple *ochre*. This is well known among the painters, and called by them *Indian red*, and by Lemery *terra persica*. It is dug in the island of Ormuz, in the Persian gulph, and thence is dispersed over all the East-Indies. There is also some of it dug about Bombay. It is used both there, and with us, as a fine red in painting. *Hill's* Hist. of Foss. p. 58.

4. *Ochra friabilis floride rubescens*; the bright red, friable *ochre*. This is much esteemed in painting in many parts of the world, but is less known in England than in any other of the European nations. It is dug in vast quantities in the country above Bengall, and is used by the painters in France and Germany, as a fine red. It would be worthy our traders in these commodities better acquaintance. *Hill's* Hist. of Foss. p. 59.

5. The *ochra friabilis pallide rubescens, quæ bolus Veneta vulgo*; the pale red friable *ochre*, commonly called *Venetian bole*. See the article VENETA *bolus*.

6. The *ochra friabilis levis, pallide rubescens, alkalina*; the light, friable, alkaline, pale, red *ochre*. This is a very fine, and valuable earth, at present unknown in painting, but very easy to be had, and worthy the bringing into use. It is thrown up in digging in our American plantations, and proves, on tryal, to be a bright and fine colour in oil. *Hill's* Hist. of Foss. p. 60.

7. The *ochra argillacea pallidissime rubescens*; the pale red, clayey, *ochre*. This is a substance yet unknown to the world, but produced in great plenty in Pensylvania, and Virginia, and will, at least, supply to those countries all the purposes of the English reddle.

8. The *ochra purissima levis purpurascens*; the fine, light, purple *ochre*. This is a substance common in many parts of England, but not yet universally known among our painters. They often use it, indeed, without knowing what, or whence, it is; some considerable quantities of it having, at times, been sent to London, from the forest of Dean in Gloucestershire, and one or two of the colour-men engrossing it to themselves, and selling it, when prepared, under the name of *Indian red*, the third species of red *ochre*, to which it is, at least, equal in beauty of colour.

9. The *ochra purpurea ponderosa purissima, quæ rubrica sinopica antiquorum*; the fine, heavy, purple *ochre*, the *rubrica sinopica* of the antients. See SINOPICA *rubrica*.

10. The *Ochra argillacea indurata rubra, quæ Creta rubra auctorum*; the indurated, clayey *ochre*, called *red chalk*. See the article CHALK.

And the 11th, and last, the *ochra saxea rubra, quæ sil marmorosum antiquorum*; the red, stony *ochre*, the marbly *sil* of the antients. *Hill's* Hist. of Foss. p. 62. See the article SIL.

The species of brown *ochres* are only two; the first is, what the painters call *umber*; and the second what they call *Cologn earth*. See the articles UMBER, and COLOGN *earth*.

The blue, and green, are the substances called *lapis armenus*, and *bergruen*, which see under the articles ARMENUS *lapis*, and BERGRUEN.

Of the black *ochres* there are, lastly, two species; the first of these is the *ochra friabilis, ponderosa, nigrescens*; the heavy, friable, black *ochre*. A very fine, and valuable earth, worthy to be brought into use among the painters, though, at present, unknown to them. It is found in perpendicular fissures of the strata of stone in Leicestershire, and some other counties of England, and would make a very fine black, either in water, or oil. *Hill's* Hist. of Foss. p. 65.

The second is the *pseudo ochra levis, nigrescens, quæ Creta nigra pictorum*; the light, black, bastard *ochre*, called *black chalk*. See the article CHALK.

These are the several species of *ochres* at present known; and it is very plain, from this short account of them, that both our own country, and our plantations abroad, contain many treasures of them, the value of which is yet unknown.

Dr. Lister observes, that ochreous earths are separated in greater or less quantities, from all the medicinal springs of England, and it is to these, and the nitrous and muriatic salts, that they all owe their virtues. The *ochre* they contain is usually of the nature of that which our painters, to distinguish it from the yellower kind, call *brown ochre*. This is produced from the iron ores that are met with in the way of the current of

these

these waters; and, among the rest, the pyrites affords a great deal of them. All kinds of the pyrites, and all the lime-stones of England, when they are subject to be much moistened under ground, will, in time shoot out their salts, and part with their earths. *Lister* de Font Med. Angl.

The earth of the pyrites is *ochre*, and the salt of the lime-stone is the calcarious nitre, an alkaline salt of the nature of the natrum of Ægypt; and from these two substances, and a small portion of common salt, which the waters take up in their passage through the earths that contain it, all the virtues of them are owing. The salt of the pyrites being green vitriol, it might be expected that this should be found in the waters impregnated by that substance; but Dr. Lister observes that though there are many springs in England which are well known to receive their virtues from this fossile, yet there is no such thing as vitriol to be obtained from any of them; and this is not wonderful, since we know that the pyrites will not yield its vitriol when newly taken out of the earth, but must be exposed a considerable time first to the air; so that the *ochre* only is the sensible thing that it receives from this substance, and, perhaps, with it some saline matter which is the basis of vitriol, and would be vitriol in time, on a due exposition to the air.

OCHROPUS *gallinula*, in zoology, a name by which many authors have called a bird more usually known by the name of *tringa*. *Gesner* de Avib. See the article TRINGA.

OCHROPUS, or *gallinula* OCHROPUS, the *yellow-legg'd moorhen*, a species of the *gallinula*, or *moorhen*. It is of the size of the common kind; its beak, as well as its legs, is yellow, or of a sulphur colour; its back is of a redish brown; the tips of its wings of a very fine red; it has white variegations on its head, and in the middle of its wings, and on its belly; the longest feathers of its wings are black; and there are also spots of black on the back in several places. The edges of its eye-brows are of a deep saffron colour; and it has, beside all these colours, a great deal of grey in the wings. It has no hinder toe. It builds in thickets, in watery places, among rushes and high grass. *Aldrovand.* de Avibus, l. 20. c. 48 *Gesner* de Avib.

OCHRUS, in botany, the name of a genus of plants, the characters of which are these. The flower is of the papilionaceous kind. The pistil arises from the cup, and finally becomes a pod, which is usually of a rounded, or cylindric form, and contains a number of roundish seeds. To this it is to be added, that the leaves are sometimes single, sometimes of the conjugated kind, and terminating in tendrils.

The species of *ochrus* enumerated by Mr. Tournefort, are these: 1. The *ochrus* with undivided leaves, sending out tendrils from their ends, and with yellowish seeds, called *ervillia* by some authors. 2. The *ochrus* with undivided leaves, terminated by tendrils with brown seeds. 3. The *ochrus* with undivided leaves terminated by tendrils, with black seeds. And 4. The yellow-flowered, woolly, American *ochrus*. *Tourn.* Inst. p. 396.

OCIMUM, in botany. See OCYMUM.

OCNUS, in zoology, a name by which Aristotle, and other of the antients have called the *bittern*, or *butter bump*. See the article BITTERN.

OCOB, a name given by some chemists to *sal armoniac.*

OCREA, (*Cycl.*) among the antients, a kind of military shoe, or short boot, which was made of white tin, and ornamented with gold, or silver, about the ankles. Its use was very antient, the Greeks were so well provided with them in Homer's time, that he thence gives them the appellation of ἐυκνήμιδες Ἀχαιοὶ. Among the Romans, none were allowed to wear the *ocreæ*, but the two upper classes of the people, or such whose estate exceeded 7500 drachms. See *Hofm.* Lex. Univ. in voc.

OCTAETERIS, Ὀκταετηρὶς, in antiquity, a cycle, or term, of eight years, at the end of which three entire lunar months were added This cycle was in use till Meton, the Athenian, reformed the calendar, by finding out the golden number, or cycle of nineteen years. *Potter*, Archæol. Græc. T. 1. p. 460. See CYCLE, and CALENDAR, *Cycl.*

OCTANDRIA, in botany, a class of plants with hermaphrodite flowers, and eight stamina, or male parts in each. See Tab. 1. of Botany, Class 1.

The word is formed of the Greek ὀκτὼ eight, and ἀνὴρ male. The plants of this class are the maple tree, heath, &c.

OCTAVE (*Cycl.*) — *Diminished* OCTAVE, in music. See DIMINISHED *octave*.

OCTAVINA, in the Italian music, a kind of small spinnet, easily moved, having only one row of keys, and those not to the usual number, perhaps not to above three octaves, the common ones going to four, or more. See SPINET, *Cycl.*

OCTOPHORUM, among the antients, a carriage with eight wheels.

It also signified a chair, or litter, *lectica*, carried by eight chair-men, which kind of chair was mostly used by the women. *Pitisc.* in voc.

OCTUNX, a word used by some dispensatory writers to signify eight ounces.

OCULATA, in zoology, a name given by many to the fish more usually called *melanurus*. It has the name *oculata* from the remarkable largeness, and fine golden iris of its eyes. *Willughby's* Hist. Pisc. p. 310. See MELANURUS.

OCULATUS *lapis*, the *eyed stone*, a name given by Mercatus, in his Metallotheca Vaticana, and by many other writers, to what we call the *pudding stone*, a stone formed of a great number of pebbles, of a small size, immersed, and formerly bedded, in a flinty cement, little less hard than the stones themselves, and in some species not at all so. The resemblance of these round pebbles, when the mass was cut, to the eyes of animals, probably gave origin to this name. It is easy to conceive that at the time when these stones were formed the matter of the cement was soft as mud, while the stones which are bedded in it were hard, and perfectly formed, otherwise they could never have had admission into it. It is also natural to suppose, that as these stones are placed very irregularly in the mass, the ends and sides of many of them must be prominent above the rest, and above the surface of the cement; and this we usually find to be the case: but in some places we find large lumps of this stone, whose surfaces are naturally smooth, as if wrought by art; the external pebbles being thus cut off, as it were, down to the level of the surface, and their internal lineations appearing. We find several stones rounded and smoothed on the surface in this manner, by long lying on the shores of the sea, and being there washed about among other hard bodies by the tides. But these masses are also found in gravel pits, and those such as have evidently been so ever since the formation of the crust of the earth after the deluge, and have never been disturbed, or removed, since that time. As a hurry, and violent motion of the water, alone can have occasioned the wearing down of these pebbles on the surface of the *pudding stone*, and as they have never been in the way of such a motion of water since the time of their subsiding from among the waters of the deluge, it must have been at that time that they were thus rolled about, and rounded; and this is one great proof of the Woodwardian system of things at that time; and that the waters, in departing from off the surface of the earth, ran with great violence, and carried stones, &c. a long way in their current, in which course they suffered all that the dashing, and rolling about in the waters of the sea, could do to such stones in a long period of time. See Tab. of Fossils, Class 5. *Mercati* Metall. Vat. p. 139. *Woodw.* Cat. Foss. Vol. 1. p. 46.

This *pudding stone* is not the only instance of this effect of the rapidity of the waters of the deluge in running off from the face of the earth, for there are found in many places great numbers of stones which have been parts of strata, or larger masses, and which have been broken off, and rolled into the form of pebbles at that time. And among what we commonly understand by the name pebbles, we find many which have prominent ridges running round them, which have been veins harder in their matter than the rest of the stone; and therefore, while the rest has been worn away, these have remained less worn, and consequently standing higher than the other parts.

OCULIPETA, in zoology, a species of serpents. See the article TEXMINANI.

OCULUM *aperiens*, in anatomy, a name given by several authors to a muscle of the face, called by the generality of writers *aperiens palpebram*, and *aperiens palpebram rectus*; by Albinus, *levator palpebræ superioris*.

OCULUS *beli*, in natural history, the name of one of the semi-pellucid gems of the genus of the *hydrophanæ*, and called by Dr. Hill *hydrophanes albido-cinereus, flavo-variegatus, nucleo centrali nigerrimo*, or the greyish white *hydrophanes*, variegated with yellow, and with a black, central, nucleus. See Tab. of Fossils, Class 5.

It is a very elegant, and beautiful gem. Its basis, or ground, is a whitish grey, variegated with yellow, and sometimes with red, and a little black, but that more rarely, and is found in small masses from half an inch to an inch in diameter; of a rounded figure, and thickest in the middle, tapering away gradually to the sides. The outer part of the stone, or that toward the edges all round, is ever of a whitish grey, more or less variegated with yellow, &c. and its central nucleus is always of a deep and fine black, surrounded by a broad circle, of a pale yellow, and representing very beautifully the pupil and iris of the eye; these are enclosed in the matter of the stone, and are often surrounded by other very fine concentric circles, of a pale flame colour; but more frequently there is only the black pupil, surrounded by the yellow iris, and that placed in the body of the stone which represents the white of the eye: the shape of the stone also favours its resemblance of an eye, and the whole is very elegant. It is of the hardness of the agate, and takes a tolerable polish; when thrown into water, it has, in a great measure, the property of the oculus mundi, the whole stone becomes greatly more bright, and lucid, and the grey part becomes of a plainly yellowish cast.

There are many things improperly called *oculus beli* by our jewellers, but the genuine species is very rare. Nothing is more common than to find in the agates little circular veins of different colours round a central spot; these the lapidaries frequently cut out, with a proper quantity of the stone about them, and call them *oculus beli*. They are not peculiar to the agate, but are common also in the cornelian, and stand sometimes,

times single, sometimes two or three together, and according to the colours of the circles, represent the eyes of various animals. *Hill's* Hist. of Foss. p. 470.

OCULUS *cati*. See the article ASTERIA.

OCULUS *leporinus*, a distemperature of the eyes, called also *ectropium*. *Heister's* Surgery, p. 432. See ECTROPIUM.

OCULUS *marinus*, the *sea eye*, a name given by some authors to the *umbilicus marinus*, from its resemblance to the shape of an eye. See UMBILICUS *marinus*.

OCULUS *mundi*, in natural history, the name of one of the semi-pellucid gems of the genus of the *hydrophanæ*. It is of one plain and uniform colour, which is a whitish grey, and has no veins, or other variegations. It is found in small masses, of the shape of our common flints, and pebbles. It has but a very obscure degree of transparence, and is not capable of a fine polish. This stone, however, though of little beauty, has this very singular property, that, when thrown into a bason of water, in the space of half a minute, it begins to change its appearance, and, very soon, instead of a pale grey, becomes of a very bright, and considerably pellucid, pale yellow, like that of amber, or the yellow cornelian; this it retains as long as it remains in the water, but as soon as taken out, and dried, it resumes its grey colour, and becomes as opake as before. It is found so far as is yet known, only in China; but the shores of some of our own rivers afford us stones coming up to its qualities in some degree, though not so beautifully transparent in water as the oriental. *Hill's* Hist. of Foss. p. 468.

OCULUS *Veneris*, a name given by some to the *umbilicus marinus*.

OCYMOPHYLLON, in botany a name given by Buxbaum to a new genus of plants, the characters of which are these: the flower is of the staminenous kind, having no petals; this stands upon the embryo fruit, which afterwards becomes an oblong quadrangular seed vessel, divided into four cells, and containing roundish, and very small, seeds. Its leaves are like those of the common ocymum, or basil, whence its name; and its place of growth is in damp marshes. Boccone has described it under the improper name of *glaux*, calling it the great, green-flowered, *marsh glaux*. Act. Petropol. Vol. 4. p. 421.

OCYMUM, *basil*, in botany, the name of a genus of plants, the characters of which are these. The flower consists of one leaf, and is of the labiated kind. The upper lip is erect, roundish, and crenated, and is larger than the under one, which is curled up, and lightly indented. The pistil arises from the cup, and is fixed, in the manner of a nail, to the hinder part of the flower, and surrounded by four embryos, which afterwards become as many seeds, of an oblong figure, to which the cup of the flower serves as a capsule. This cup is divided into two lips, the upper of which is erect and bifid, and the other divided into several segments, by slight notches.

The species of *basil* enumerated by Mr. Tournefort are these: 1. The clove *basil*, or *acinos*, of Columna. 2. The great *basil*, with fimbriated leaves, resembling those of endive. 3. The broad-leaved, spotted, and curled *basil*. 4. The green *basil*, with bullated leaves. 5. The green leaved, fimbriated *basil*. 6. The common large clove *basil*. 7. The largest clove *basil*. 8. The large black *basil*, with a strong smell of rue. 9. The citron-scented *basil*. 10. The anise-scented *basil*. 11. The common, or middle *basil*. 12. The white-flowered, common *basil*, with deep, blackish green, leaves. 13. The blue-flowered, common *basil*, with deep, blackish-green leaves. 14. The middle-sized, curled *basil*, with a short, conglomerated spike. 14. The small, serrated, narrow-leaved *basil*. 16. The small, narrow-leaved *basil*, with bullated leaves. 17. The three coloured *basil*. 18. The smallest *basil*. 19. The least *basil*, with purplish black leaves. *Tourn.* Inst. p. 203.

OECOMENIUM, in botany, a name given by the antient Greeks to a plant called also *thapsia*, and *cymene*. See THAPSIA and CYMENE.

OECONOMICAL *chemistry*. See CHEMISTRY.

OEDEMA (*Cycl.*) — The persons most subject to *œdematous* tumors, are people of a phlegmatic habit, and such as have had suppressions of some natural evacuations. Men who have had the hæmorrhoidal discharges stopped upon them, and women labouring under suppressions of the menses, are more than all others subject to them. Persons somewhat advanced in age, are, in general, more subject than young ones, and women with child, particularly during the more advanced state of their pregnancy, are often afflicted with them. The long holding the legs in cold water, will sometimes alone occasion them, and, among the poorer country people, the women who make a custom of standing in the water to wash their cloaths are often affected with these swellings in one or both knees. People who have received large wounds, and have had them treated rashly, with cold applications, are also sometimes thrown into danger of these swellings. The repelling tumors of other kinds, and sometimes the striking in an erisipelas, or other cutaneous eruption, will also occasion them; and sometimes people who have been treated with too hot a regimen in acute fevers are subject to swellings in their feet, which though they appear red, and are hot at times, yet, when strictly examined, appear to be truly *œdematous*.

Prognostics in this case. *Oedematous* swellings are always very obstinate, and tedious in their cure; but they are the more so when their causes are the more complicated, and more things than one conspire to their origin. None of these swellings are so easily cured, as those which arise from external injuries, or simple refrigeration; and those which arise from cutaneous humors struck in, are often found very easy of cure, provided that they are not of very long standing: and, in general, such as are very cold when out of bed, and always very hot when in it, are more difficult of cure than others. But this is to be observed, that there is great difference between a cure of these tumors, and the only striking them in; the latter case being very often attended with much worse complaints than the tumors themselves, the too frequent consequences of such retropulsions being inflammations of the abdomen, and præcordia, and absolute dropsies.

Method of cure. The first step towards a cure must be the correcting the mucous and viscid state of the humors: this is best done by the neutral salts, as tartarum vitriolatum, and the like; and by gum ammoniacum, the roots of pimpernel, and woods of sassafras, guaiacum, and the like, with the warm aromatics, as ginger, and the spices, and carminative seeds. The matter, when thus attenuated, is to be evacuated by purges of a strength proportioned to the constitution of the patient, and, after this, the true tone of the parts is to be re-establish-ed by chalybeates, and the part to be secured from a relapse with a large bandage, and with warm and strengthening fomentations. It rarely happens that these swellings ulcerate, but when they do, there is no application so proper as the liquor of myrrh. *Junker's* Consp. Med. p. 410.

The method of treating *œdematous* tumors is very different according to the different causes to which they owe their rise. The external method of treating these tumors in the legs and feet is usually to have recourse to frequent frictions with warm cloths; these are to be repeated every night and morning, and the parts to be rubbed each time till they appear very red, and are hot; the limb is then carefully to be preserved from the injuries of the cold air, and it is a very proper method to wear stockings made of some warm furr, and to lie with hot bricks, wrapped up in cloths, near the legs and feet, to divide, and attenuate the blood: a proper bandage is, after these methods, to be applied, which is to ascend gradually from the feet up to the knees; this strengthens the limb, and prevents a stagnation, and collection, of the blood in any part of it. Proper strengthening internal medicines must be given during all this time; and, after the trying what has been already directed, strengthening remedies are to be attempted externally also: to this end the limb may be placed over burning rectified spirit of wine, wrapping it up in cloths in such manner that it may receive the steam; this will encline the stagnating fluids to escape through the skin, or else render them fit to return into the circulation, and at the same time will do much toward restoring the proper tone of the limb. In many families it is a secret to apply the herb great celandine, bruised in manner of a pultice, either alone, or mixed with the persicaria acris or water pepper, and great benefit is sometimes obtained by these herbs, for they are very active medicines, and powerful resolvents. Others apply also for the same purpose, the lepidium, or pepper-wort, and horse-radish root, scraped, and moistened with white wine; but the most excellent remedy of this kind is the cataplasm made of pidgeon's dung, mixt with common salt and vinegar, and applied warm, and often removed. A fomentation of no small use is made also of a lee made of oak ashes, mixed with smith's forge water, adding a little spirit of wine, and a small quantity of alum. This may be applied with stuphs or the legs may be bathed in the liquor, as warm as it can well be borne, twice a day. Spirit of wine also, either alone, or mixed with lime water and alum, or lime water alone, are good fomentations; and another from which great benefit has been received is this: take spirit of wine, and common vinegar, of each a pint; crude alum an ounce and half; vitriol an ounce; mix all together, and use it as the foregoing. Great care must always be taken after the using these, or the like fomentations, that the limb be well covered with bandages and stockings; the patient must also, during the time, drink sparingly, and use moderate exercise frequently. The medicinal waters, especially the sulphureous, often do service in these cases, but they do not always succeed. Dr. Harris relates, that he has cured the most dangerous of these cases, with a mixture of the aperient saffron of steel, and the bark. Others speak of having performed cures with the bark alone; but there are not wanting some who declare this to be a very dangerous method. *Heister's* Surgery. p. 232.

OEDICNEMUS, in zoology, the name of a bird called also *charadrius* by Gesner and Aldrovand, and in English the *stone curlew*. It is a considerably large bird, weighing eighteen ounces. Its beak is about two fingers breadth long, and is strait, pointed at the end, and partly black, partly yellow. It has a naked, yellowish, green membrane under its eyes; its legs are long, and yellow; and it has only three toes, having no hinder one. Its thighs are naked half the way up, as

in other water birds. Its breast and thighs are white. Its throat, back, and neck, of a mixture of reddish brown and black, much like the colour of the curlew; whence the English have very improperly called it the *stone curlew*. The under part of its tail is reddish. It breeds very late, the young being often found callow at the latter end of October. It lives principally in watery places, and flies in the night, making at that time a very remarkable shrill noise. *Ray's* Ornithol. p. 227.

OENANTHE, *water dropwort*, in botany, the name of a genus of umbelliferous plants, the characters of which are these: the flower is of the rosaceous kind, composed of several heart-shaped petals, which are irregular in size, and are disposed in a circular form, on a cup, which afterwards becomes a fruit composed of two oblong gibbose striated seeds, which are flatted and smooth on their inner side, and end in a sort of prickles, the middle one of which is longer and stronger than the others. The species of *œnanthe* enumerated by Mr. Tournefort, are these. 1. The parsley-leaved *œnanthe*. 2. The sea *œnanthe*, with blackish-coloured, parsley-like leaves. 3. The Portugal *œnanthe*, with the leaf and the smell of parsley. 4. The chervill like *œnanthe*, or poisonous, hemlock *dropwort*. 5. The staphylinus-leaved *œnanthe*. 6. The common water *œnanthe*. 7. The rue-leaved, water *œnanthe*. 8. The proliferous, water *œnanthe*. 9. The *œnanthe* with black and long roots. And, 10. The Portugal *œnanthe*, with a thick globose seed. *Tourn.* Inst p. 312.

One of the species of this plant, distinguished by its yellow juice, and by its growing near waters, is a very terrible poison. Many accounts have been given of people dying by it, but none which sets its terrible effects in so just a light, as one which happened very lately to some French prisoners with us, and which is recorded in the Philosophical Transactions. Eleven French prisoners had the liberty of walking in, and about, the town of Pembroke; three of them being in the fields a little before noon, found, and dug up, a large quantity of this fatal plant, with its roots, taking it to be wild celeri, in order to eat it with their bread and butter, after dinner; and, when they had washed it, they all three tasted, or eat a small quantity of it, in the fields.

As they were entering the town, one of them, without any previous notice of sickness at the stomach, or disorder in the head, was immediately seized with convulsions; the other two ran home, and sent a surgeon to him, who attempted to relieve him by bleeding, but in vain, for he died in a very little time. The other two prisoners, wholly ignorant of the cause of their comrade's death, and of their own danger, gave the roots they had brought in to the other eight prisoners, who all eat more or less of them with their dinner. A little while after dinner, the two remaining persons who had gathered the roots, were seized in the same manner as the first, and one of them died, but the other recovered, having been blooded, and a vomit having been, with great difficulty, forced down his throat, as his jaws were, in a manner locked together. The other eight were all immediataly bled, and vomited, and all recovered.

It is observable that none of these persons had those comatose symptoms which are well known to attend those who have eaten the common cicuta, or hemlock.

This root is well known in all that part of England under the name of the *five-fingered root*, and is in frequent use externally with the common people, for the felon, or worst sort of whitloe. The Frenchmen eat only the root, and none of the leaves, or stalk.

It is extremely necessary that this dangerous plant should be well known, as it grows very plentifully with us all about the banks of the Thames; and Mr. Watson has caused a fine drawing, both of this, and of another poisonous plant which it is often confounded with, the cicuta aquatica, or water hemlock of Wepfer, to be prefixed to that number of the transactions where this account is given: and this seems the more necessary, as the plant seems to have been mistaken in a manner by all the world, not only the common people, but the more versed in plants, having mistaken it at times for several very different things. The same gentleman informs us from various authors, that eight lads in Ireland had been poisoned by it, mistaking it for the root of the water parsnip; two men died by mistaking it for the Macedonian parsley; and Wepfer, who wrote an exprefs treatise on the poisonous nature of the water hemlock, has confounded this plant with it, saying, that Lobel had described the water hemlock, under the name of this *œnanthe*, or *dropwort*; and the generally accurate Hoffman, when treating of the vegetable poisons, makes no mention of the difference between these two plants.

Neither the roots of this *œnanthe*, or those of the cicuta aquatica, or water hemlock of Wepfer, have any disagreeable flavour to deter those who taste of them from eating, and they both occasion violent convulsions, and death, if not timely prevented. The intention of cure seems in both the same; first by emptying the stomach and intestines as soon as possible, and then causing the patient to drink largely of oleaginous fluids; there is great difficulty, however, of getting the patient to swallow any thing, the jaws being fastened together by the spasm; after the stomach has been freed from this pernicious vegetable, the symptoms have generally abated by degrees, and the patient has recovered.

Threlkeld mentions this plant as growing in Cumberland, where the people call it *dead tongue*, and use it as a pultice to the galled backs of their horses. The German botanists do not mention it as growing among them, nor Haller in his *Enumeratio stirpium Helvetiæ*, whence it seems to be seldom met with, except in England, Holland, and some parts of France. Phil. Transf. N° 481.

OENANTHE, or *dropwort*, in botany, is also a name originally given by the antient Greeks to the flowers of the wild vine. It was afterwards made to express also the flowers of the common manured vine, and the young grapes while small, and just appearing from the flowers. These, with the tendrils, and small leaves of the vines, were sometimes used for the making garlands, and ornamenting other things; and after this, another plant of a very different nature became used on the same occasions, and called by the same name.

Pliny supposes that the umbelliferous plant *œnanthe*, was so called from its flowers having the smell of grapes; but we find this to be a mere imaginary notion, for Meander, and many other of the Greek writers, declare the flowers of the *œnanthe* to have no smell at all; but suppose that they were called *œnanthe* from their growing in clusters like those of the vine.

The herb *œnanthe* became famous in the ointments of the Greeks, which were intended to rub the body with, to give strength, and to take off lassitude, or weariness. Many have doubted whether the *œnanthe* used in these compositions was the flower of the vine, or the plant *œnanthe*; but Theophrastus clearly decides this in favour of the plant, and says, that not only the flowers, but the leaves of it, were used for this purpose; but then he distinguishes the plant into two kinds. His account is, that the Cyprian *œnanthe* was very sweet-scented, and grew upon the mountains, and in other dry and barren places; and that the *œnanthine* ointment was made with its leaves and flowers, but that this could not be made with the Grecian *œnanthe*, because that had no smell. Dioscorides runs counter to this; and says, that the *œnanthine* ointment was made of the flowers of the wild vine, and that that was always esteemed the best which smelt most strongly of the flowers of that shrub. It appears therefore that there were two different ointments of this name in use among the Greeks.

Pliny, that he may lose nothing in his description of the *œnanthe*, copies both Theophrastus and Dioscorides in their accounts of this plant; and, in consequence, has put together a wholly confused, and unintelligible relation of the nature and virtues of this plant.

OENANTHE, in zoology, the name of a genus of birds of the smaller size, of which there are four species: 1. The common *œnanthe*, called the *fallow-finch*, or *wheat ear*. 2. The *œnanthe* called *anthus*, and *florus*; and in English, the *whinchat*. 3. The *œnanthe* called *rubetra*, and in English the *stone-chatter*, or *moortitling*. 4. The American *œnanthe*, or *guirarhu nheengeta*. *Ray's* Ornithol. p. 169, 170. See the articles WHEATEAR, WHINCHAT, &c.

OENARIA, a name given by the antients to ashes prepared from the leaves, tendrils, and young stalks of the vine. They were accounted highly diuretic.

OENOGALA, a word used by Hippocrates, and other of the Greek authors to express a mixture of milk and wine for immediate drinking. Others have used it to express wine alone heated, so as to be just as warm as new milk.

OENOMANTIA, Οινομαντεια, in antiquity, a species of divination by wine, which is done by making conjectures from the colour, motion, noise, and other accidents of the wine of libations. *Potter*, Archæol. T. 1. p. 319.

OENOS, in zoology, the name used by authors for the *stock-dove*, or *wood pigeon*, called also by some *vinago*, somewhat larger than the common pigeon, but of the same shape and general colour. Its neck is of a fine changeable hue, as differently opposed to the light; and its breast, shoulders, and wings are of a fine purplish hue, or red wine colour, from whence it has its name *vinago*. Its legs are red, and feathered a little below the joint. *Ray's* Ornithol. p. 136.

OENOSTAGMA, a name given by some of the chemical writers to *spirit of wine*.

OEPATA, in botany, a name by which some authors have called the tree which produces the fruit called *anacardium orientale*, or the Malacca bean. Hort. Mal. Vol. 4. p. 95.

OESTROMANIA, a name given by some authors to the uterine disorders which sometimes affect young women, and is commonly called *furor uterinus*.

OESTRUM (*Cycl.*) — OESTRUM, in zoology, the name of a species of fly, called also sometimes the *gad-fly*, *breeze-fly*, and *asylum*. It is a very troublesome creature to oxen, but is not so common as some suppose. It is never found, except in the neighbourhood of waters: the head is green; the body yellowish; the eyes are very large; and the trunk long, and remarkably strong. It flies very swiftly, and without noise. Mouffet mentions, beside our English kind, two others, the one from Virginia, the other from Muscovy; the first very large, having a great head, and a white streak down the shoulders; the latter remarkable for having wings of a silvery colour, reaching beyond the body.

OESTUM *Veneris*, a name given by some anatomical authors to the *clitoris*.

OETHODES *ulcus*, a term used by the Greek writers for such ulcers as had tumid, and callous lips; and as such ulcers are usually very difficult to heal, the word became afterwards appropriated to all sorts of ulcers difficult to cure.

OFF-*set-staff*, in surveying, a rod, or staff, of any convenient length; for instance, of 10 links of the chain. This staff is divided into 10 equal parts. Its use is for the ready measuring the distances from the station line of things proper to be represented in a plan. See CHAIN.

OFF-*ward*, in the sea language, the same with contrary to the shore; thus they say, *the ship heels off-ward*, when, being aground, she heels towards the water side; *the ship lies with her stern to the off-ward, and head to the shore-ward*, when her stern is towards the sea, and head to the shore.

OFFA *alba*, (*Cycl.*) in chemistry, a concretion produced by a due mixture of spirit of urine, or spirit of sal armoniac with the spirit of wine. Some call it the *offa alba* of Paracelsus [a], others of Van Helmont, whence it is sometimes called *offa Helmontiana*; but Van Helmont was not the inventor of it, but Raim. Lully, says [b] Boerhaave.

The manner of making the *offa alba* is described in this last author [c], who observes it to be difficult, as it requires both liquors to be perfect, and some nice circumstances to be observed. — [[a] *Boyle's* Works, abridg. Vol. 1. p. 32. [b] *Boerh.* Chem. Vol. 2. proc. 122. [c] Id. ibid.]

Van Helmont [a] endeavours to account for the formation of the stone in the bladder, from this experiment; but, as Boerhaave [b] observes, the *offa alba* has nothing in common with the stone. — [[a] *Boyle*, loc. cit. [b] Ibid.]

Boerhaave recommends this mixture as a good deobstruent, taken in Canary fasting. Ibid.

OFFENCE, *delictum*, in law, an act committed against the law, or omitted where the law requires it. *West*, Symbol.

Offences are distinguished into two kinds, viz. such as are capital, and such as are not. Capital *offences* are those for which the offender is to lose his life. Those not capital, where the offender may forfeit his lands, and goods; be fined, or suffer corporal punishment, or both, but not lose his life. *Hale*, P. C. 2. 126, 134. Under capital offences are comprehended high treason, petit treason, and felony: and offences not capital include the remaining part of the pleas of the crown, and come under the title of misdemeanours.

Some *offences* are punishable by the common law, but most of them by statutes.

OFFICIARIIS *non faciendis, vel amovendis*, a writ directed to the magistrates of a corporation, requiring them not to make such a man an *officer*, or to put one out of the *office* he hath, until enquiry is made of his manners, &c. Reg. Orig. 126. *Blount*, *Cowel*.

OFFION, a name used by some of the medical writers for *opium*.

OIL (*Cycl.*) — The use of *oil* in stopping the violent ebullition of various substances, may be very great in many occasions of life. It is well known that if a mixture of sugar, honey, or the like, be boiling on the fire, and in danger of rising over the sides of the vessel, the pouring in a little *oil* immediately makes it subside. In many cases the marking a circle round the inside of a vessel, in which a liquor of this kind is to be boiled, with a piece of hard soap, shall, like a magic ring, confine the ebullition to that height, and not suffer it to stir any farther. This is wholly owing to the *oil*, or fat contained in the soap: but there is, beside these, another very important use of *oil*, on a like occasion, which is the pouring a little of it on any metallic solution, while making; this restrains the ascent of the noxious vapours; preserves the operator from danger; and, at the same time, by keeping down the evaporating matter, gives redoubled strength to the menstruum.

Animal OIL, *oleum animale*, in medicine, the name of an essential *oil* distilled by a retort from blood, and recommended as a powerful remedy in epilepsies, the gout, and other obstinate diseases.

It was originally used in Germany in these intentions, and has become of late much used in England, but should not be given too freely as an internal. As an external, it may probably be of good service in removing fixed pains, removing hard tumors, &c. for it is extremely penetrating. *Shaw's* Lectures, p. 147.

OIL *of camphor*, a name given by the chemists to a solution of camphor in spirit of nitre. It is used to exfoliate carious bones, and on other the like occasions It is observable, that camphor, which is soluble in this acid, in the proportion of one half its quantity, is not at all soluble in spirit of vitriol, spirit of alum, or distilled vinegar; and that it is the only known vegetable resin that is soluble in this menstruum. See CAMPHOR.

Chemical OILS, a name given by some to the essential *oils* of plants, and other substances separated in distillation, and swimming on the surface of the water, where the alembic is employed. They are distinguished by this title from the expressed *oils*, such as those of almonds, linseed, olives, and the like, which are made by so simple a process as mere squeezing. See *essential* OILS, infra.

To procure this chemical principle pure and unmixed from the matter distilled from a vegetable body, the unctuous matter obtained from the process, may be washed from its adhering salts, and grosser earth, in warm water, barely by shaking them in a glass together, then separating the *oil* from the water by means of the common separating glass; in which, if the *oil* be specifically heavier than the water, it sinks to the bottom, and may be suffered to run out first, by means of the pipe of that glass which has its insertion at the bottom; if specifically lighter than the water, it may be kept behind, as it floats on the top of the water, while all that is poured off, and has carried the gross fæculent parts with it. *Shaw's* Lectures, p. 150.

Connecting OIL, in chemistry, a term used by Boerhaave, and his followers, to express a certain *oil*, found in all vegetable substances, but wholly differing from, and independent of, their essential *oil*. This is not possessed of any of their virtues, or qualities, but seems the same in all plants, and is the means of their consistence and solidity, giving tenacity to their earth, which, without it, falls to dust, and the plant exists no more.

This *oil* is not separable by boiling water, as the essential *oil* is, but only by fire: when a plant has been boiled, and distilled, its essential *oil*, salt, &c. are all carried off, and what remains is only the earth connected by this *oil*. This being exposed to the fire, the *oil* discovers itself in a thick, black, stinking smoak, and finally, taking fire, it burns away, and leaves only the earth which was the basis of the plant, retaining its form, indeed, if the process have been carefully made, but falling into a shapeless powder only on being roughly breathed upon.

This great author, therefore, establishes it as a rule, that there are three sorts of *oils* in plants. 1. An *oily* froth. 2. The *essential oil*, dissolved in decoction. And, 3. This *connecting*, or *consolidating oil*, separable only by a naked fire. *Boer.* Chem. Part 2. p. 20.

Essential OIL. There is found in every plant analysed by distillation, an *essential oil*; but this is very different from the same plant, both in its quantity and in its qualities, as it is managed in the operation.

If a plant be thrown into a retort, and distilled with a violent fire, it is known to yield less *oil*, than if the fire were more moderate: if the plant be fermented, especially if it be of the aromatic kind, it always yields much more *oil* after this operation, than it does without it.

It is plain from hence, that there are methods of obtaining more *oil* from the same plant, than would be yielded by it in the common way; and it is as certain, that according to all the methods in common use, there is ever left a large quantity of the *oil* behind; and therefore, that a way may possibly be invented of drawing yet more from the same plant than is yet known to be done. We all know, that when the residuum in the retort, after the distillation of the plant, is burnt in the open air, it loses half, or often three fourths of its weight, and the matter evaporated in this burning to cause this great diminution can be only the remainder of the *oil* of the plant, which would not be separated from its earth in a close vessel.

It may be observed also, that the *oil* of a plant, in the distillation by the retort, never comes over till toward the end of the process, and drops from the neck of the vessel at the same time with the acid spirit of the plant, and while the urinous volatile salt is also rising; so that the three principles are, in a manner, all separated from the plant together: when there is a large portion of acidity in the plant, and but a small quantity of urinous salt, it is also constantly observed, that there is a larger quantity of *oil*, and that this *oil* is more fluid, and that the caput mortuum diminishes less in burning. This particular is remarkably observable in the analyses of mallows, prunella, melilot, and southernwood. On the contrary, such plants as yield but a small quantity of acid spirit, or volatile salt, always afford but little *oil*, and that *oil* is always thick, and the caput mortuum of these plants diminishes greatly in burning; that is, a great quantity of the *oil* was entangled in the earthy matter, and could not get loose, otherwise than by burning the plant in the open air. Instances of this sort are found in the analyses of the *caltha palustris*, &c.

Hence it appears, that the acid and volatile salt in plants are greatly instrumental to the disengaging their *oil*, and giving it separate in distillation Hence when a plant does not contain acid enough in itself to disengage its *oil*, it appears no ill method to try to assist the separation by the addition of another acid of the vegetable kind.

To try this, Mr. Homberg first distilled a certain quantity of fennel-seed in the common way, and afterwards distilled the same quantity of the same seed, in the same manner, except that he added for every pound of the seed four ounces of spirit of salt to the water in which it was put for distillation This last distillation yielded one third more *oil* than the first Both the *oils* were equally clear, and strong-scented of the seeds, but the last seemed to smell less of the fire than that obtained by the simple distillation in the common way. There is no doubt but that the spirit

rit of falt in this procefs not only encreafed the natural ferment in the liquor, which is neceffary to the feparation of the *oil*, but that it alfo attenuated the particles of the *oil* in the feed, and made them much more eafily feparate themfelves, and rife with the heat, than they would otherwife have done. What not a little confirms this opinion alfo, is the known experiment of rendering camphor liquid by means of acid fpirits. Mem. Acad. Par. 1700.

The modern chemifts have not looked upon the *oil* as one of the genuine principles of the plant it is drawn from, as has been the cuftom among writers of earlier date. They know that thefe *oils* are themfelves mixed bodies, and capable of another analyfis, by which they are feparated into falt, phlegm, and earth. Thefe three principles conftitute all *oils*; but thefe differ greatly in different plants, and that perhaps, more from their manner of admixture than from their different quantities. That bodies of the fame kinds, varioufly mixed, may have thefe different appearances, is in nothing more evident, than in the mixture of quickfilver, and fulphur; if this be done only by grinding, the refult is a black powder; but, if they are fublimed together, they form a red, bright, compact body, formed of feveral congeries of ftriæ, called cinnabar. And, in the fame manner, the fame principles, phlegm, falt, and earth, may, according to the different manner of their mixture, form *oils* of very different natures one from another: nor is this all the fource of their difference, for, by our own management of them, we make them appear in very different forms, in the fame fpecies. Thus the *oil* naturally contained in a feed is produced from it, according to our different management, in three different forms. To inftance this: in the *oil* of anifeed if we heat and prefs this feed, we draw what is called an *oil* by expreffion, a fattifh fubftance, of the nature of *oil* of olives, almonds, and the like, and with only a moderately acrid tafte; if we diftil it with water in an alembic, we obtain the *effential oil*, or common *oil* of anifeed; and if we diftil it dry by the retort, we obtain a fetid, thick, and empyreumatic *oil*. The *oil* in the feed is evidently the fame, but it puts on thefe forms according to our pleafure. Mem. Acad. Par. 1707.

Expreffed oils, as well as balfams, and refins, when applied to the animal bodies, increafe putrefaction, and are the moft effectual fuppurants and incarners. *Monro*, in Med. Eff. Ed. Vol. 5. Art. 24.

It may be eafily feen from this, that little knowledge of the nature of the *oils* of plants is to be obtained from the common analyfes; the way to truly underftand them, is to mix them with different fubftances, and to digeft them alone, and, in mixture with thofe fubftances, to try the different events.

Mr. Geoffroy made a multitude of experiments on the *oil* of thyme with this view, and, from the events of thefe, has made feveral very fair deductions as to the caufes of the different colours of the flowers of plants.

A large quantity of dried thyme being diftilled with water, in earthen cucurbits, yielded him a pure deep yellow *oil*; this he rectified by diftilling it again, with a great quantity of water; and, by this means, obtained a pale yellow *oil*, which he ufed for all his experiments.

He divided the *oil* into feveral parcels, and with one he mixed diftilled vinegar; with others the acid fpirits of nitre, vitriol, and fea falt, feverally reduced by a mixture of water to the ftrength of common vinegar, which is about the ftandard of the acidity found in the juices of plants. All thefe mixtures were fet in digeftion, and the *oil* became of a deep faffron colour. If the acid fpirits had been ufed in their native ftrength, they would have immediately burnt up the *oil*. Another parcel of the *oil* was digefted with fpirit of fal armoniac made with lime. This paffed all the degrees of yellow, of red, and of purple; and finally became of a true violet-blue. Spirit of urine, and that of fal armoniac with falt of tartar, produced alfo the fame changes, except that the degrees of colour differed.

On the contrary, the fixed alkali of *oil* of tartar digefted with the fame *oil*, only changed it to a deep brown. *Oil* of tartar added to the *oil* with fpiris of fal armoniac, when it is yet only of a fine purple, turns it to a deep blue; and diftilled vinegar mixed with it in the fame ftate, turns it to a deep blackifh colour; this mixed with fpirit of wine, tinges it to a greyifh colour; and a little *oil* of tartar being then added, it becomes green, and that colour does not go off. If diftilled vinegar be added to this mixture, it deftroys at once the alkali, and the green colour which was owing to it, and gives the *oil* its original yellowifh hue.

Oil of thyme which has been made blue by means of *oil* of tartar, being mixed with fpirit of wine, the whole appears grey, and, on adding more *oil* of tartar, it becomes blue; diftilled vinegar takes off this blue colour, leaving the liquor redifh; and more *oil* of tartar makes it blue again.

It appears from thefe laft experiments, that *oil* of tartar acts differently on the *oil* of thyme, according to its different ftate; turning it blue or green, according as it is rarified, or concentrated. It fhould feem alfo, that the fpirit of wine contained a latent acid, fince all its effects on the *oil* of thyme are overpowered by a mixture of *oil* of tartar.

Mr. Geoffroy was at the pains of trying this whole courfe of experiments on feveral other *effential oils*, as thofe of lavender, juniper, turpentine, and others; but they did not produce the fame effect on all. Hence it appears that there is great difference between the *effential oils* of different plants, in regard to the effects of other bodies on them.

The fame courfe of experiments he tried on other *oils*, not of the vegetable kingdom, and, among thefe, he found none, except that of yellow amber, which at all approached to the nature of *oil* of thyme.

This *oil*, mixed and digefted with fpirit of fal armoniac, acquires a purple colour; *oil* of tartar mixed with this, does not change its colour, but when fpirit of wine is added to this mixture, the *oil* of tartar becomes blue, while the *oil* of amber continues of its purple colour.

There feems to be a certain degree of denfity neceffary in an *oil* to render it capable of all the changes of colours; this denfity feems perfectly hit in the *oils* of thyme and amber, and all the changes of the colours that are given to them, feem only the effect of rarifying, or condenfing them. If they are rarified to the utmoft, by being mixed with fpirit of wine, they become colourlefs and tranfparent; and, if condenfed in the higheft degree, as in the experiment with the diftilled vinegar, they become blackifh. Thefe are the two extremes, and all the other colours are but degrees and fhades approaching to, or receding from, one or the other of thefe. The *oils* naturally more rarified, fuch as *oil* of turpentine, and the like, have naturally no colour, nor can receive any from thefe proceffes; only if the mineral acids be mixed with them in their full ftrength, they burn them up to a fort of refin, and, finally, to a black mafs, refembling charcoal. But, perhaps, future attempts may teach us an art of fo modifying the particles of thefe *oils* as to render them fufceptible of all the changes that *oil* of thyme is.

The colours of the leaves and flowers of plants are of the fame nature with thofe produced in the *oil* of thyme, in thofe proceffes; and, as chemifts, in general, agree that all colours are the refult of fulphurs differently acted upon by falts; perhaps, great light may be given into their nature and origin from thefe experiments. Mem. Acad. Par. 1707. See the article *Colours of* FLOWERS.

The *effential oils* of vegetables may be divided into two claffes, according to their different fpecific gravities, fome floating upon water, and others readily finking to the bottom thereof. Thus the *effential oils* of cloves, cinnamon, and faffafras, readily fink, but the *oils* of lavender, marjoram, mint, &c. fwim upon the water. The lighteft of all the *effential oils*, is, perhaps, that of citron peels, which even floats on fpirit of wine; and the heavieft of them feems the *oil* of faffafras.

For the obtaining the full quantity of the more ponderous *oils* from cinnamon, cloves, faffafras, &c. it is proper, 1. To reduce the fubjects to fine powder. 2. To digeft this powder for fome days in a warm place, with thrice its quantity of foft river water made very faline with the addition of fea falt, or fharp with *oil* of vitriol. 3. To ufe the decoction left in the ftill, inftead of common water, for a frefh digeftion. 4. To ufe alfo, for the fame purpofe, the water of the fecond running, after it has been cleared of its *oil*. 5. Not to diftil from too large a quantity of the fubject at once. 6. To leave a confiderable part of the ftill empty. 7. To ufe a brifk fire, or a ftrong boiling heat at firft, but to flacken it a little afterwards. 8. To have a low ftill-head; with a proper internal lodge, and current, leading to the nofe of the worm. And, 9. To cohobate the water, or pour it back upon the matter in the ftill, after feparating its *oil*, and repeating this once or twice more. *Shaw's* Lectures, p. 141.

Effential oils, when applied to the human body, ftimulate, erode, refift putrefaction; and, mixed with the blood, raife fome degree of fever. Med. Eff. Edinb. Vol. 5. Art. 24.

The vegetable world affords vaft variety of *effential oils*, moft of them very odorous, and of great virtues.

The *effential oils* of many of the plants ufually diftilled have their peculiar refervoirs in the plant. Mr. Geoffroy perceiving this, determined to fearch for them through the different parts of the plants, and enquire into the reafon of feveral precautions which are always found neceffary, in order to fucceed in the diftillation of them. See OIL-*bladders*, infra.

From what has been faid above, it appears, that the *oils* in common ufe are of three different kinds. The firft are mere *oily*, or fatty bodies, extracted either by expreffion, or by decoction: of the firft kind are thofe of almonds, linfeed, nuts, olives, and the like; and of the other, that of bay berries, and the like, which are procured by boiling the fubftance, on which the *oil* collects itfelf on the top of the water.

The fecond kind of *oils* are thofe extracted from vegetables, by common diftillation by the alembic, with the help of water; thefe contain the *oily* and volatile part of the plant, and carry, by way of pre-eminence the name of *effential*, or *etherial oil*.

The third fort of *oils* are the fetid ones, which are, in like manner, produced by diftillation, but by means of a different diftillation in a naked fire, and without the affiftance of water.

It seems to follow from this account, that the *ethereal*, or *essential oils* are the volatile exalted sulphurs of those plants; and as sulphurs are the basis of all smells, it is easy to be presumed, that all sweet-scented plants have an *essential oil* in some of their parts The balsams, and resins, which we find in many vegetables, seem to have their origin from the *essential oils* of the trees or plants they belong to, and which are usually found greatly to abound with them. Indeed, in the balsamiferous trees, the liquor which flows out on wounding the trunk, may very properly be esteemed a sort of *essential oil* of a harder consistence than the common ones. Of this nature are the balsam of Capivi, of Gilead, and the rest; and these very *oils*, farther indurated, furnish us also with the scented resins, such as benjamin, myrrh, and the like.

All *essential oils* become thick and resinous on being mixed with any foreign acid; they also acquire the same consistence of themselves in long keeping, and that partly from the same principle; their subtler parts evaporating give room for the acid salt, which they naturally contain, to display its power; and being then in an over-proportion to the rest, it does not fail to act upon the whole in the same manner that any other acid would. Thus the *oil* remains no longer what it was, but becomes a resinous substance, of a smell resembling turpentine.

Chemistry is not, however, without its resource on this occasion; for this thickened *oil* being mixed with a large quantity of water, and distilled in a balneum mariæ, a great part of it will come over with all its wonted fluidity, limpidity, and odour; but even this new distilled *oil* is not exempted from the same change again. This disadvantage in the keeping the *essential oils* distilled in the common way, has occasioned Mr. Geoffroy to contrive another method of making them. This renders them more limpid and fluid than in the common way, and they are never subject to grow thick; but the medium not being water, so much of the *oil* cannot be procured from the subject, because some is absorbed and stained in the medium. The instance this gentleman gives of his new method is in the essence of citron, and is this:

A common alembic is to be filled with the thin pared, external rinds of the fruit; a sufficient quantity of spirit of wine is to be poured on these, and the vessel being well closed, the whole is to stand some time in digestion; during this time, the spirit charges itself with a vast quantity of the *essential oil* of the bark, and being carefully distilled in balneo mariæ, it brings over with it a great deal incorporated in itself, but, beside that, there is a large portion swimming on the surface of the spirit, and easily separable from it in the common way: this is as clear, pellucid, and thin, as the spirit itself, and is, in all respects, superior to the essence made by any other means. The spirit of wine may be saved for a second operation of the same kind, and there will then be no loss from it; for being already sated with as much of the *oil* as it naturally absorbs, it will take in no more by the same means, and therefore may serve for ever so many new distillations, without loss. If all the *oil* be finally desired to be separated from the spirit, it may easily be obtained by mixing the spirit with a large quantity of water, as is done in making the *oil* of spike. The *oil* will then swim at top, and the spirit may be separated again from the water by distillation.

Some of the *essential oils* are so abundantly charged with salts, that, in long keeping, they will actually deposit plain concretions of the saline kind. This is frequently observed in *oil* of turpentine, which, though ever so well rectified, will yet affix long crystals like needles to the sides of any vessel in which it has been long kept; the *oils* of marjoram, and feverfew, do the same; as also several of the others. All the other *oils* also suffer great changes in keeping; that of juniper becomes thick like turpentine, in a short time; and those of sage, and of rosemary, after some keeping, are not distinguishable from one another. The age and state of the plant may also make great difference in the smell of the *oil*, and there have been many instances of the *oil* of sage becoming wholly like camphor in keeping. The distilled *oils* of some plants vary also at times in their colour. The *oil* of rue, and that of wormwood, sometimes come over green, and sometimes brown; the *oil* of chamæmile in Italy is always blue, but Mr. Geoffroy says, that he could never get a blue *oil* from the chamæmile of France by a simple distillation; and as to those *oils* which sometimes are green, they all become of the common clear yellowish colour of the other *oils*, if rectified by distilling them over again in a balneum mariæ.

In dry seasons wormwood affords but little *oil*, accompanied with a bituminous matter, or a genuine resin; and, in these seasons, if the young shoots only are distilled, the *oil* is almost constantly found to come over green; but in moist years the wormwood yields a much larger quantity of *oil*, and it is then always brown. Wormwood which has grown on dry sandy soils is always more white, and woolly, on the leaves, and always affords an *oil* of some tendency to a greenish colour; while, on the contrary, such as grows in rich moist ground, has larger, and less woolly leaves, and yields a brown *oil*. The season, and degree of heat, added to this difference of soil, may also make greater changes than could be imagined in the *oils* of plants. Mr. Geoffroy assures us, that he once made, in a dry season, from a quantity of thyme which had grown in a dry soil, an *oil* as pure, as limpid, and as sweet and high-scented, as that of the hotter countries, whereas the *oil* of thyme made in France is usually much poorer, and of an obscure colour, and coarse earthy scent.

The *oils* of plants have not always the same tastes with the plant they are distilled from, or, at least, not in the same degree. Nothing is more bitter than wormwood, yet the *oil* of wormwood has no remarkable bitterness. Anise, which is of a sweet taste, yields, on the contrary, an *oil* infinitely more sweet than the seed; and pepper, which is so remarkably hot and acrid, affords an *oil* no way remarkable for its pungency. Thyme, which is in itself very acrid and pungent, conveys that property, in a yet greater degree, to its *oil*; there is, indeed, no *essential oil* so acrid and firey as that of this plant. The fetid *oils* drawn in dry distillation by the retort, in an open fire, no way differ from these but by the damage the fire has done them, and may always be converted into these by repeated distillations. Nay, the very fat *oils*, such as that of almonds, may be attenuated so far as to become as fine, and as subtile, as the *essential oils*. This is to be done by means of quick lime; and several repeated distillations of this *oil*, or any other of a like kind, with fresh lime to every distillation, will reduce it to be volatile, penetrating, and capable of being raised, and distilled, by means of water, which is the great test of the *essential oils*. The bituminous, and fetid *oils*, may also, in the same manner, be reduced by repeated distillations, to the state of the *essential* ones, and to be equally fluid, and limpid, and equally penetrating. Memoirs Acad. Par. 1721.

Adulterations of essential OILS. Many of the *essential oils* being dear, it is a very common practice to adulterate, or debase them, several ways, so as to render them cheaper both to the seller and the buyer. These several ways seem reducible to three general kinds, each of which has its proper method of detection. These three ways are, 1. To adulterate them with *expressed oils*. 2. With alcohol. And, 3. With cheaper *essential oils*.

If any *essential oil* be adulterated with an expressed *oil*, it is easy to discover the fraud by adding a little spirit of wine to a few drops of the suspected *essential oil*, and shaking them together; for the spirit will dissolve all the *oil* that is *essential*, or procured by distillation, and leave all the expressed *oil* that was mixed with it untouched.

If an *essential oil* be adulterated with alcohol, or rectified spirit of wine, it may be done in any proportion, up to that of an equal quantity, without being easily discoverable either by the smell, or taste. The way to discover this fraud is to drop a few drops of the *oil* into a glass of fair water, and if the *oil* be adulterated with spirit, the water will immediately turn milky, and by continuing to shake the glass, the whole quantity of spirit will be absorbed by the water, and leave the *oil* pure at top. *Shaw's* Lectures, p. 145.

Finally if an *essential oil* be adulterated by a cheaper *essential oil*, this is commonly done very artfully: the method is to put fir-wood, turpentine, or *oil* of turpentine, into the still, along with the herbs to be distilled for their *oil*, such as rosemary, lavender, origanum, &c. and, by this means, the *oil* of turpentine distilled from these ingredients comes over in great quantity, and is intimately blended with the *oil* of the genuine ingredient. The *oils* thus adulterated always discover themselves in time, by their own flavour being over-powered by the turpentine smell; but the ready way to detect the fraud, is to drench a piece of rag, or paper, in the *oil*, and hold it before the fire; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine scent behind.

Fern OIL. See the article FERN.

Green OIL, *oleum viride*, a form of medicine prescribed in the late London pharmacopœia, and made in the following manner. Take leaves of bay, rue, marjoram, sea wormwood, and chamæmile, each three ounces; *oil* of olives a quart. Boil the herbs in the *oil* till they are crisp, and then strain off the *oil*, and when it has stood for the fæces to subside, put it up for use. *Pemberton's* London Disp. p 350.

Red OIL, in the porcelain manufacture, a name given to a peculiar colour used on the China ware, or to those pieces of the ware which are coloured with it. It is a very elegant ornament, and would be worthy our attempting to imitate in England, on our better sorts of wares. They do it in the following manner: they mix the red colour called *tam-lan-hum*, or the copperas red, before described under the article of COLOURING *of china*; this they mix with *oil* of stone, (see OIL *of stone*.) and with another *oil*, as they express it, of the same kind, made of a whitish sort of pebble, or agate, found on the shores of their rivers, and the place of which might probably be supplied with us by common chrystal. The powder is to be thoroughly mixed with these liquors, and the vessel dipt carefully into the mixture, or some parts of it only covered with it in figures: after this, it is to be set by to dry, and, when thoroughly dried, it is to be baked in the common way. The general method is that of covering the vessel all over, both inside and out with this red; and it comes out of the most bright and brilliant colour imaginable, but it will

not ring when struck upon, as our common china ware does. We seldom see this in any degree of perfection, but it is very elegant when fine. Observ. de l' Asie.

OIL *of the earth*, *oleum terræ*, in the materia medica, the name of a thick mineral fluid of a dusky brownish black, with a faint cast of purple, and of the consistence of a thin syrup, very little transparent, and of a strong penetrating smell, like that of common *oil* of amber. It ouzes out of the cracks of rocks, in several parts of the island of Sumatra, and some other parts of the East Indies, and is much esteemed there in paralytic disorders; but it is seldom imported into England, what our East India surgeons and captains usually bring over under this name, being only a vegetable *oil* impregnated with the virtues of certain of their fossils by boiling. *Hill's* Hist. of Foss 470.

OILS *inflammable with acids*. See INFLAMMABILITY.

OIL *of olives*. The *oil of olives* having been publickly declared in England to be a certain remedy for the bite of a viper, the person who made the discovery having suffered himself to be dangerously bitten, and recovered not only himself, but several animals bitten at the same time, by this remedy alone, and that before a number of persons of the greatest eminence in medicine, the royal academy at Paris were determined to give the *oil* a number of fair trials, and determine, beyond controversy, a point of so great importance, as whether this *oil* was, or was not, a remedy for this terrible poison.

These experiments they have related in their memoirs; to these they have added the state of the bodies of animals, when opened, after they had died of these bites; and to these they have subjoined some very useful reflexions. They occasioned several pigeons, some young chickens, two cocks, a goose, a turkey, two cats, and eight dogs, to be bitten by vipers; in examining the wounded part, there usually appeared at first only two little red spots, though sometimes a small quantity of blood, and very soon afterwards there began to appear a tumor, which, by degrees, encreased and extended over the neighbouring parts. The creatures were bit in the thigh, or leg, and the whole limb soon after became livid, and the swelling, and colour, extended thence over the lower part of the belly; and this was commonly followed by vomiting, and convulsions. The birds often bent their necks forward as if to vomit, and threw up only a quantity of phlegm, and death usually soon followed these symptoms.

Of four pigeons which were bitten by four different vipers at the same time, and to which nothing was done to prevent the effect of the poison, they all died in a quarter of an hour, half an hour, or at the utmost, a little more than an hour. Two other pigeons were bitten, and about three minutes afterwards the parts wounded were rubbed with *oil of olives* warmed; but notwithstanding this, they both died, the one in twenty-five minutes, the other in an hour and half. Two other pigeons were bitten after this, and the wounded parts immediately rub'd with *oil of olives*, made very hot, without heating the part; the one of these died in fifteen minutes, and the other in an hour and half. These had all been bitten on the thigh. They next caused a pigeon to be bitten on the wing, and applied the *oil* immediately, but the bird died in five minutes.

After this, eight pullets were bitten on the thigh. No application was made to any of these, they all shewed the marks of being bitten, yet two of them escaped alive. Of the others, one lived an hour; two that had been bitten, both by the same viper, perished; that which was first bitten, in an hour, the other in an hour and a quarter; and the other three, which were bitten by a viper which had, before that, bitten another animal, perished; the first in an hour, the second in about seven hours, and the third in an hour and half.

Eight other pullets were afterwards bitten by vipers, and the hot *oil* was applied to the wounded part at different times afterwards, but none were suffered to remain longer than ten minutes without it. Of these animals, three were saved; the others died in a very little time: notwithstanding the application of the *oil*, one of them only excepted, which lived to the day after, but then died.

Six other pullets were first rub'd over with *oil* on the part intended to be bitten; and, after the bite, the *oil* was carefully applied hot to the part several times; but notwithstanding this, they all died. One of them lived six hours, but the others all perished in a very short time after they received the poison.

Two large cocks were next bitten; to one of them the *oil* was applied soon after he received the wound; but he, notwithstanding, died in three hours. The other cock had not the *oil* applied, but an actual cautery was brought near the wound, and held there about three minutes; this creature perished also in about two hours.

A goose was next bit by a viper, and the bite seeming doubtful whether it had penetrated farther than the skin, another viper was made to bite it a second time; the *oil* was applied immediately afterwards to the wound, and the application continued a long time with frequent repetitions; but, notwithstanding this, the usual symptoms appeared, and the creature died in two hours and a quarter. A large turkey was next bitten, and the two first bites appearing dubious, he was wounded a third time; the *oil* was applied in time, and repeated many times; but, notwithstanding this, the usual symptoms appeared, but after about three hours they abated, and the creature continued out of order for three days, and finally recovered. Eleven days afterwards the same turkey was again bitten by a viper, and no application was made; he was sick again for about two days, but at the end of that time he recovered.

A young kitten was bit on the nose by a viper; the *oil* was applied, and the creature was well the next day. A grown cat was bitten by four vipers, and the *oil* was applied; the creature made her escape, but she was seen alive afterwards. Eight dogs were bitten, some on the thigh, some on the nose, and others under the belly. Three of these had no application made to them; a tumor, and lividness succeeded the bite, but they all recovered, as well as the other dogs who were rub'd with the *oil*; one of these was a young puppy. The last dog that was bitten was of the Danish breed, and was very large, though but two months old; he was bitten by several vipers, and that in several parts, and the application of the *oil* was not made till after an hour and half. The tumors on the bitten parts growing very large, there were scarifications made in them, and hot *oil* poured into them. The creature shewed many signs of convulsions; his breath grew hard, his limbs failed him, he vomited, and purged, and, in fine, he died about eight-and-forty hours after the biting, notwithstanding this close application of the *oil*.

From these experiments, there is little credit to be given to this boasted remedy. The pigeons which were bitten by vipers all died, notwithstanding all that could be done by it; the article of the pullets is not at all more favourable to it; some having escaped to which it was applied, and others died; and of those which were bitten, and had no application made to them, some also lived; and the *oil* was found to produce no good effect in a great many others in the same circumstances. The turkey which lived with the application of the *oil*, we find could live also without it; and though some dogs lived which were bathed with *oil* after the bite, some also lived to which nothing was applied, and the *oil*, with all favourable circumstances, we see, could not cure the Danish dog: so that, upon the whole, if the *oil* be a remedy for the bite of a viper, it is, at least, a doubtful one, and far from the infallible cure it was supposed to be.

The great instance of the man's being recovered who was bitten on purpose to try the experiment, is far from proving the *oil* an infallible remedy, since he had other remedies administered to him, and there have been several instances of men being cured by these without the application of the *oil*. And it is to be observed, that the bite of a viper is not always certain death to a man, if he use no remedies at all, but that many have recovered, notwithstanding that the symptoms which affected that person have appeared upon them. We see very plainly by the before recited trials, that of several animals of the same kind, bitten at the same time by vipers, some have recovered, and others have died, and this equally when this supposed remedy was, or was not, applied to them And, in the same manner, it may happen to men, that of numbers who have been bitten, some would recover, and others die, whether any means were used, or not. Memoires Acad. Scienc. Par. 1737. See the article POISON.

OIL *of sassafras*. Many of the vegetable *oils* obtained by distillation, will be found, under certain circumstances, to approach to camphor. The *oil* of thyme may be crystallized, according to a process of Mr. Newman's, who calls it, in that, *camphora thymi*. Phil Transf. N° 479. p. 379.

The *oil* of sassafras is peculiarly liable to crystallization in certain circumstances, and that into the most beautiful forms. Mr. Maud gives an account of a quantity of this *oil*, which having stood exposed to the air in a very frosty night in an open vessel, was in the morning found changed three parts in four of it into very beautiful and large crystals: they were of an hexagonal form, very transparent, and of three or four inches in length, and half an inch in thickness. These crystals subsided in water, and were indissoluble in it; they were readily inflammable at the fire, and were reduced by heat to their pristine fluid state: hence it is evident that they still retain the natural qualities of an *oil*, though they appear under so very different a modification of their parts. What is most remarkable in this change, is, the metamorphosis of a fluid to a solid body, of so determinate and regular a figure, and that these crystals should be perfectly clear and colourless, though the liquor from which they froze, was of a yellowish colour, not unlike that of Madeira wine.

This seems to afford a new instance of crystallization, which is generally accounted for by the particles of a fluid, or those of any other body suspended in a fluid, being brought nearer by cold, and, at length, coming within the sphere of each other's attraction, unite together into an immediate contact. This *oil* being a very heavy fluid, much heavier than water, is the more likely thus to unite, as its parts are nearer together. This may be a hint to the curious to discover wherein consists the difference of solidity and fluidity; and it likewise shews how

how much the colour of bodies depends upon the mechanical situation of their parts.

OIL *of stone.* In the manufacture of the Chinese porcelain, they use a liquid matter of a white colour, which they call by this name, on which their great mystery of finishing their work depends; yet this has been less enquired into by the imitators of that ware in Europe, than many other articles of less consequence. The stone of which this *oil* is made, is of the same degree of hardness with that which the petunse is prepared of. They procure it from quarries, and chuse such as is of a good white colour, and has many dark green spots in it.

These spots are of the colour of the leaves of cypress. Sometimes a stone is chosen which has a brown ground, variegated with spots and blotches of a reddish colour. They first carefully wash this stone; then laying it in a clean place, they break it to pieces with iron instruments, and afterwards grind these to a perfectly fine, and impalpable powder, by rubbing them in large mortars, with pestles of stone faced with iron, and turned either by the labourers, or by water. When the whole is thus reduced to a fine powder, they throw it into a vessel of water, and stirring it briskly about, they let the coarser part subside to the bottom, and there swims a fine thick matter like cream, for two or three inches depth, on the surface. This they carefully scum off, and putting it into another vessel of clear water, they let it throw down any coarse matter it may yet contain; and, finally, taking off the thick surface again, they mix this with some fresh water in another vessel, and leave it to subside; then pouring off the clear water, they take out the remainder at the bottom of the vessel, which is perfectly fine, and resembles a thick cream. To every hundred pounds of this, they add one pound of a substance of the nature of which we are not yet perfectly informed. It is said to be a mineral resembling alum. They calcine this first, and then beat it to a fine powder, and this being added to the cream, or *oil*, as it is called, serves to keep it always in the same liquid state. This substance, when finished in this manner, has very little title to the name of an *oil*; it is rather a varnish, and is always used in mixture with another varnish, which is called at this time fern *oil*, and used to be called lime *oil*; it is prepared in the same manner with the other after burning. See FERN-*oil*.

OIL *of vitriol.* See the article VITRIOL.

OIL *of wax.* See the article WAX.

OIL *bladders*, in plants. — It is a discovery, partly of Mr. Tournefort, and partly of Mr. Geoffroy, that the essential *oils* of all plants are contained in their perfect and pure state, in the plants themselves, while growing; they have, in different vegetables, different parts assigned for their reception; in some the flower; in others, the flower cup only, as in rosemary, and the like; in others the bark; in some, the parenchyma of the root; and in others, the wood.

Wherever they are lodged, they are always contained in these vesicles, or capsules, which require only to be broken, or burst open, in order to set them loose; this is effected by the boiling water in the common distillations, and the natural subtilty and lightness of the *oil* then makes it easily rise in vapour, and its oleaginous quality rendering it incapable of mixing with the water, it swims at the top, and is easily separated.

These vesicles are most usually placed in, or about, the flower, and it is in many plants a very easy matter to trace them to their several places of principal residence. Mr. Tournefort has observed that these *oil bladders* in the fraxinella taking their origin at the root, thence ascended to the fruit or covering of the seeds. This plant has a very remarkable variety in its *oil* in the different parts. The flower is sweet-scented; the vesicles placed along the stalk contain a very sharp and acrid *oil*, somewhat resembling the essence of lemons, when kept a long time. The leaves have scarce any sensible odour, but the root has a scent peculiar to itself, and different from that of all the rest of the plant. *Geoffroy*, ap. Memoires Acad. Paris 1721.

The essential *oil* of cinnamon has also a difference of the same kind, which is owing to the different fluid contained in the vesicles in different parts; the bark of the root yields an *oil*, which, after keeping some time, always yields a pure and genuine camphor; whereas the *oil* of the bark from other parts of the tree has nothing of this property.

It is also easy to observe, that the capsules of certain fruits have more odour than the fruits themselves. The coat which covers the pistachia nut, contains much more essential *oil* than its kernel; and the bark which surrounds the amomum, and cardamoms, has much more smell than the kernel of the seed. The first bark of the nutmeg is well known to have a more fragrant smell than the nutmeg itself, being the mace; yet there is, within this, another covering of that fruit, which has no scent at all.

Most of the seeds of the umbelliferous plants, which usually pass for aromatics of the first and most eminent kind, have, in reality, no smell at all in themselves; the *oil bladders* which yield their virtues being placed in their outer covering, the kernel within the seed usually containing a fat *oil* of the olive or almond kind, and wholly different from the essential. The *oil* of aniseed made by expression is fluid, of a green colour, and of a fatty nature, but is highly scented with the *oil* which it has taken with it from the covering; on the contrary, the essential *oil* procured from the same seed by distillation, is thin, not fatty, of a much more clear and penetrating scent, of a pale colour, with no admixture of greenness, and readily concretes into a mass like butter on external cold. In coriander seed, the kernel carefully separated from its membranes has no smell, and contains only a fatty *oil*, like that of the olive, while the vesicles are all ranged in the rind, and therefore in that alone is the aromatic smell. These vesicles in the skin of fruits are the occasion of the sweet flavour of many; as of the strawberry, raspberry, and the like; in these they are too small to be distinguishable, while, in the thicker rinds of the orange and lemon kind they are easily discerned, and, on the least pressure, burst, and throw out their contents, which make what we call the *zest*, and which is separated in this manner in greatest quantity in hot countries, and where there are plenty of the fruit, is preserved under the name of *bergamot*, and other essences of a like kind.

There is, however, no subject in the vegetable world in which these vesicles are more plainly perceived than in the berries of the juniper, a fruit very well known, and in constant use with us. These berries are at first green, afterwards of a reddish brown, and finally black, and they are two years in coming to maturity. The berry is formed at the top, in the manner of a bud of the rose, or piony, which is just ready to open; and it sometimes does open into four or five parts, according to the number of seeds it contains. It contains, beside these, an acrid, a sweet, and an aromatic juice, which leaves a sensible bitterness behind it in the mouth.

In order to account for these so different tastes in the same fruit, Mr. Geoffroy attributes its acrid quality to the skin, or husk, and in some berries, indeed, to the unripeness of the whole, for want of a due heat of the weather; the sweet taste is from the juice of the fruits which is properly a saccharine or melleous liquor, and the aromatic flavour is wholly owing to the *oil* which is lodged in the vesicles expanded over the whole inner substance of the fruit. These substances are indeed so determinately marked in the berry, that it is possible to separate them; but these are not all the differences of taste and matter in this little fruit, every kernel of which has in it five or six vesicles, lodged each in a peculiar, and appropriated cavity, in the external part of the seed. These are easily separated from the rest of the fruit, and, when that is dry, are found to contain an absolute resin; they are of a dusky colour, and each drop of resin in them is of an oval figure, and is very bitter to the taste; hence therefore is the remarkable bitterness that affects the mouth, when the berry is thoroughly broken by the teeth.

The knowledge of this may be of great use to the apothecary in his medicinal preparations of juniper berries of several kinds. When he wants only the extract, which is the melleous juice of the berries alone, they ought not to be stamped or bruised, to dislodge this resin, which has no business there, but should be only boiled, and the decoction inspissated. But when the essential *oil* is required, the whole berry must be bruised, and that in a thorough manner, that all its kernels be broken. The cells, or vesicles of *oil*, now indurated into a resin, burst open, and the whole dispersed in such a manner that water may affect it. Memoires Acad. Par. 1721.

In order to discover what are the parts of a plant in which the *essential oil* most abounds, it will be proper to examine what part yields the most smell; and this will be found different in different plants. In some the seat of odour occupies the whole body of the flower; in others only some particular part of the flower has it, and in some; it is principally lodged in the covering; and in some it is dispersed every way, thro' the body of the fruit. In some instances it is found lodged in other parts of the plant, and sometimes it is equally strong in every part of it.

This principle of the *essential oils* varies also not only in regard to the place where it resides, but in the different scents it yields in different places; or in the same parts of the plant in different seasons. Thus the leaves, stalks, and roots of the violet have no smell, while the flowers have a great deal. All parts of the jasmine tree are without scent in like manner, except the flowers, which are very sweet. And the case is the same in the tuberose, the jonquille, &c. in all these plants the *essential oil* is very volatile, and in very little quantity; their reservoirs are so obscure, that we cannot find the least trace of them; and, instead of an *essential oil*, all that can be obtained from them by distillation, is a sweet-scented water, and even this loses its smell in a very little time. Of this sort also are the flowers of the lime tree, the lilly, and the clove julyflower; in these there is no part scented but the extremities of the flowers, and then not till they are thoroughly opened; and, for this reason, if we would obtain a sweet scented water from these, we are to use no part but the flower, and that not till perfectly expanded on the extremities

tremities of the petals; and, with all the caution that can be taken, the water distilled from these will have but very little smell, if the season chance to prove rainy.

This is not the case in the wallnut tree flowers; these contain a large quantity of *essential oil*, and, consequently give a very strong-scented water; but this water very often varies from the smell of the flower, acquiring in the distillation the smell of the bitter almond: the reason of this is, that the embryo fruit is contained in the flowers, and it is that which is the principal source of the *oil*, and the *oil* it yields is wholly analogous to the fruit of the bitter almond.

Peach blossoms afford a very sweet-scented water, and their young leaves have a smell like that of bitter almonds, and in general, the same observation may be extended to all those plants which have bitter kernels in the fruit. It is observable, that among the radiated flowers, such as that of colts foot, and the like, the flower itself has little or no smell, but whatever scent we perceive in it, arises from the cup, whose scales, or constituent leaves, have either a velvety down, or a series of vesicles which contain all the *essential oil*, and, consequently, all the odour When flowers of this kind are to be distilled for their *oil*, they must, therefore, be used before they are blown open, as the vesicles are then in their finest state. These vesicles are so large and numerous in hot seasons, in the cup of the marygold, the sun-flower, and some other such plants, that they are easily distinguished by the naked eye.

Balm has very little *essential oil*, and if it be not chosen for distillation in a very favourable time, its water will have scarce any scent at all. The most favourable time is, when the plant is fullest of vesicles, and that usually is when it is about six or eight inches high; its leaves appearing somewhat reddish, and being but of about half the bigness they are to grow to. This observation extends also to most of the plants of the same class, nay even to the woody ones, except that they are more aromatic; that is, that they contain a number of vesicles of an odorous resin, which is wholly owing to the closer and firmer texture of the wood.

Sage, while young, when its stalks are not yet grown woody, is all over odorous, even its stalks, as well as every other part, being full of these vesicles of sweet scented matter, which may be expressed on pressing them. When the *essential oil* of sage is to be drawn, the plant is always to be chosen in this state, and the more woody ones which have stood through a whole season, are always found to have lost the greatest part of their odour in distillation. The woody part of this plant has no smell; the outer bark, indeed, has some scent, but that very little.

The flowers of rosemary, sage, and lavender, and others of the same kind, though in the whole they yield a very sweet scent, yet the aromatic essence is not lodged in them where it might most naturally be supposed; that is, in the petals, for if we pull these clean out of the cup, as in the violet and clove we ought to do, the separated petals have very little smell, and that little is not essential to the petals, but is wholly owing to the breaking of some of the vesicles which are placed in the furrows of the cup, in which all the smell is contained, and which, being burst in the violently drawing away the flower, leave a little of their contents on it. Indeed, if these cups are observed with a microscope, or, but attentively, by the naked eye, they will all be found full of small bladders, which contain a pure *essential oil*, of a very high and aromatic scent.

Thyme and lavender should either have their tops cut off, and those distilled immediately, or else they should be gently dried, and both flowers, tops, and young leaves, be distilled, since those are endued with a very aromatic scent at their first shooting.

Among the trees, very many have sweet-scented leaves and flowers, while the wood has not the least odour; to draw the *oil* from these the young shoots are to be taken, since the vesicles which contain the *essential oil* are all lodged in these, and are at this time in their best state, the heat of the sun exhaleing afterwards their most volatile parts. Even the young wood of these shoots is capable of affording some *oil*, since in it, these vesicles are placed between the outer and the inner bark, but these are all perfectly destroyed before the wood hardens: this is the case in the orange tree, the myrtle, the bay, savin, and the like.

It is to be observed in the sweet scented woods, that the place where the resin is collected in greatest quantities, is in the knots from which young branches are to rise; this is very easily observable in the firs and juniper. This is not, however, the case in all the resinous woods; for some of these abound so in resin, that their several woody beds, or layers, are all connected to one another by beds of resin; as is the case in guaiacum, in the calambac wood, and that of aloes. And this is more peculiarly remarkable in the last; for in the finest wood of this kind sent from the East-Indies, the woody parts are stript away, and only these resinous beds are left remaining; and, consequently, while the coarser and cheaper sorts burn like our woods to a charcoal, this precious kind melts upon the fire like a true resin, and is the finest-scented substance imaginable.

In all the resinous woods, the young shoots of the tree are to be preferred for the extraction of the *essential oil*. This is well known to those who traffick largely in this way: And even the liquid balsams, of which enough cannot be obtained by incision, may be thus procured: they boil the tops of the branches, and the young shoots, in water, and collect from the surface of that liquor, the fluid balsam which the boiling has separated from the shoots, and which cannot mix with it.

Beside the parts of trees, and plants, already mentioned, as containing their *essential oils*, it is to be observed that nature has enveloped the young eyes, or buds, with numerous coverings, thick spread with the same resinous matter, the use of which is to defend them from the injuries of the air, and from the severities in particular of the winter. Some of these are filled with a soft and fine cottony down which encloses both the young leaves, and young flowers, as is the case in the horse chesnut; these are all externally covered with a number of thick and strong scales, laid closely one over another, and cemented down, as it were, with this resinous matter. These make a covering which spirit of wine easily breaks open, by dissolving the resin, but which water cannot affect, and which, therefore, is impenetrable to rains. This resin has its particular reservoirs also in the bark of the tree into which it rises with the sap. The young buds, or eyes, in the black poplar are of the same kind; they have the same downy substance for their lodgment, and the same natural balsam, as it may well be called from its sweet scent, for their defence. When the leaves of this tree grow larger, these scales fall off, and the leaves have then no more smell. The resin, or balsam, mixing itself with the sap which still remains somewhat aromatic.

It is not only the stalks, the cups, and the scaly eyes of plants, which contain their *essential oils*; for even the aromatic roots are not without their share of it. Rhubarb is no aromatic root, and yet the assistance of glasses will shew many lucid specks in it, which are truly small parcels of resin; and the florentine iris, and calamus aromaticus, contain great numbers of such lucid specks, or parcels of pure resin.

The stalk of angelica has a very aromatic smell, and the seeds have a very different one; the root also is very aromatic, its parenchyma being all filled with the vesicles which contain the balsamic essence. The plant of the elecampane has scarce any smell, while the root is very aromatic, almost all the vesicles of balsam being contained there. The seat of these resinous, or oily particles, is usually the whole parenchymatous substance of the root, especially in those roots which have no woody substance in the middle; such as rhubarb, and the like; and those which have woody matter in their middle, contain this aromatic substance in their bark; such are the roots of fraxinella, and the like, of which we therefore use in medicine, only the outer bark.

Thus we have traced the several reservoirs of the *essential oils* in plants, and, as for the manner of separating them from the subjects, it has been delivered above. See *Essential* OIL.

OIL *dregs*. See the article DREGS.

OISEAU, in conchyliology, the name of a peculiar species of oister, of so remarkable a figure, that it represents a bird with its wings expanded, and has a small protuberance at the hinge, representing a head, and a long process at the opposite end, which very well represents a tail. It is of a dusky reddish colour on the outside, and of a fine pearly hue within. When the outside of this shell is taken off, and it is nicely coloured, by cutting it down to a proper depth in every part, it is of a fine reddish yellow, and is the aurora shell of collectors.

OISTER, in zoology. See OYSTER.

OKE, an Egyptian weight, consisting of three rotolos, each of twelve ounces, at twelve drachms to the ounce, and sixteen carrats to the drachm. *Pocock's* Egypt, p. 178.

OKELA'S, in Ægypt, and some other of the Eastern countries, are a sort of indifferent buildings round a court, and commonly appropriated to the merchants of some particular country with their goods; as at Cairo, there is one for the merchants of Nubia, and the black slaves, and other goods they bring with them; and another for white slaves from Georgia. *Pocock's* Egypt, Vol. I. p. 37.

OKER, in natural history. See OCHRE.

OLD (*Cycl.*) — OLD-*works*, in mining, are such that are either fallen in, or stand unwrought. *Houghton's* compleat Miner, in the Explanation of the Terms.

OLDENLANDIA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The cup is a perianthium divided into four pointed segments, which are inserted on the germen of the pistil, and remain when the flower is fallen. The flower is composed of four petals of an oval figure, spread wide open, and twice as long as the segments of the cup The stamina are four simple filaments. The antheræ are small. The germen of the pistil is roundish, and placed below the receptacle of the flower. The style is simple, and of the length of the stamina. The stigma has a rim round it. The fruit is a

globose skinny capsule, composed of two cells, each containing a number of small seeds. *Linnæi* Gen. Plant. p. 49.

OLEA, *oils*. See the article OIL.

OLEA, the *olive tree*, in the Linnæan system of botany, makes a separate genus of plants, the character of which is, that they have a perianthium composed of one single leaf, small, and tubular; indented at the extremity into four divisions, placed erect, and falling with the flower. The flower is composed of one single petal, which is a cylindraceous tube, of the same length with the perianthium; its margin equal, but divided into four segments, each of them something indented in the middle. The stamina are two filaments, short, pointed, placed opposite to one another, and terminated by erect antheræ. The pistil is composed of a roundish germen, with a single stylus, which is very short, and terminated by a thick stigma, which is bifid, and has fringed edges. The fruit is smooth, and somewhat oval, having but one cell, and containing for its seed, one longish, oval, scabrous, and striated nut. *Linnæi* Gen. Plant. p. 2.

The characters of this genus, according to Mr. Tournefort, are these: the flower is of one leaf, and of the funnel-fashioned kind, and usually divided into four segments at the edges. The pistil arises from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower. This finally becomes a soft and juicy fruit, of an oval figure, containing an oblong stone, in which there is a kernel of the same shape.

The species of *olive* enumerated by Mr. Tournefort are these: 1. The large-fruited *olive*. 2. The *olive* with smaller oblong fruit. 3. The *olive* with oblong, blackish-green fruit. 4. The white fruited *olive*. 5. The *olive* with small, roundish fruit 6. The *olive* with larger, oblong, fruit. 7. The large-fruited *olive*, with a very thick pulp. 8. The great *olive*, with oblong, and angular, almond-shaped fruit. 9. The *olive* with oblong fruit, of the shape of the cornel-berry. 10. The great, round-fruited *olive*. 11. The green, middle-sized, round-fruited, *olive*. 12. The early, middle-sized, round fruited *olive*. 13. The clustered, small-fruited, round *olive*. 14. The small-fruited, blackish-red, round *olive*. 15. The small, round *olive*, with fruit variegated with black and red. 16. The small, Lucca *olive*, with sweet-scented fruit. 17. The wild *olive* tree, with hard leaves, hairy underneath. 18. The Spanish wild *olive*, with hard leaves, hairy underneath, and with obtuse, pointed fruit. *Tourn.* Inst. p. 599.

OLEA is also the name of a stone described by Ludovicus Dulcis, and some other such authors, who attribute great virtues to it, and say it was variegated with several colours, as yellow, black, white, green, &c. It seems to have been some one of the common agates, to which their ignorance had prompted them to give a new name

OLEA *Bohemica*, in botany, a name by which some authors have called the *zizypha* or *zizyphus*, the wild *jujube* tree. *J. Bauhin*, Vol. 1. p. 27.

OLEANDER, in botany. See NERION.

OLEARIA, in natural history, the name of a genus of round-mouthed sea snail, or *cochlea lunaris*. It is of a very large size, capable of holding two quarts, and had its name *olearia* from its being antiently used in families, as the vessel in which they kept *oil*.

OLEASTER, in the materia medica, the name of the *sallow thorn*, or *sea buckthorn*, the *rhamnoides salicis folio* of botanical authors. *Dale*, Pharm. p. 282.

OLEUM, *oil*. See the article OIL.

OLEUM *medicum*, in the writings of the antients, a name given to a famous *oil* which had a quality of burning under water, in spite of all that could be done to quench it. It was called *Medicum*, because of its being produced among the Medes, and some have called it *oleum Medeæ*, because it was supposed to be that substance with which Medæa anointed the crown of her rival. Ammianus Marcellinus tells us, that if an arrow was anointed with this *oil*, and shot out of a bow against any inflammable substance, the whole immediately took fire, and, if any one attempted to quench the flames by water, they only burnt the more fiercely for it. The *venenum Pharicum* of Nicander is supposed to be the same thing with this *oil*, and to have been so called from Pharai, a town, not the name of a man, whom some imagine the inventor of it. Pharai is a town in Crete mentioned by Stephanus, and we find by the antients, that this poison was sometimes had from Crete. Nicander and Procopius are of the number of those who mention the violent and terrible effects of the *oleum Medeæ*, and all that they say is equally applicable to the *oleum Medicum* of others; so that they seem the same liquor Some tell us of a plant that produces this *oil*, but Pliny says that it was a liquid mineral bitumen, of the nature of naphtha, which is very probable; for some of these mineral *oils* are the most inflammable of any substances that we are acquainted with. Babylon is celebrated by many authors as the country which produced this terrible liquor, and all agree that Babylon is a place where naphtha is more common than in any other part of the world. Strabo tells us, that there is a white kind common there, as well as the foul or black sort. This white one may probably be the same with the *oleum Medicum*, and *oleum Medeæ*; but then it is to be observed, that the virtues attributed to it are too far exaggerated, as is very common with the antients in their accounts of strange things

OLEUM *Medeæ*, a name given by the antients to the mineral fluid, more generally known by that of *naphtha*. See OLEUM *Medicum*, supr. and NAPHTHA.

OLEUM *vitri antimonii*, in medicine, a name given by Basil Valentine, and others, to a famous preparation of antimony, which they keep as a secret, or, at least, declare in such terms as are unintelligible, and boast of, as the universal medicine. The learned Kerkring has given the process for making this red *oil* of the glass of antimony, but that in so enigmatical a manner, that he seems himself not to expect any body to understand him; and only says, in his own justification, that he has given it in plainer terms than any body had done before him. The author relates many wonderful things of this diaphoretic *oil*, on his own experience; particularly, the curing a confirmed dropsy, by throwing off the water by sweat; so that the patient, in a manner, swam in it, and the drops run through the bed, in all parts, to the floor. It were well if we could understand the process. *Kerkring* on Basil. Valent.

OLIGACTIS, in natural history, a name given by Linkius, and others, to a genus of star fish, consisting of those which have fewer than five rays.

OLIGAEDRA, in natural history, the name of a genus of crystals. See CRYSTAL.

The word is derived from the Greek ὀλίγος, a few, and ἕδρα, a plane, or side; and expresses a crystal which is composed of only a few planes.

The bodies of this class are crystals of the imperfect kind, being composed of columns affixed irregularly to some solid body at one end, and, at the other, terminated by a pyramid; but the column and pyramid being both pentangular, the whole consists only of ten planes, not, as the common kind, of twelve. See Tab. of Fossils, Class 3.

Of this genus there are only three known species. 1. A whitish one, with a short pyramid, found principally in Germany, and sometimes brought over to us, among parcels of common crystal. 2. A bright and colourless one, with a longer pyramid. This is found in Germany, and in some parts of England, as in the tin mines of Cornwal, and on Mendip hills. And, 3. A brown one, with a scabrous crust. This is produced only in the East Indies, and is well known by our lapidaries by its rough coat, and is esteemed the finest of all brown crystals. *Hill's* Hist. of Foss. p. 184.

OLIGOTROPHEROS, among the Greeks, a name given to the finer sort of bread made of the finest flower. They called it by this name because of the little share of nourishment it conveyed; and, by way of distinction from it, called the brown bread *polytropheros*, or much nourishing.

OLIVARIA *corpora*, a name given by some anatomical writers to two oblong processes of the medulla oblongata, thus called from their resembling an olive in shape.

OLIVE, *olea*, in botany. See OLEA.

OLIVE-*oil*. See OIL *of olives*.

OLIVE-*gum*. See the article GUM.

OLOC, in natural history, a name given by the people of the Philippine islands, to their *quail*. It is like ours in all respects, but much smaller.

OLOCENTROS, in natural history, a name given by the old Greeks to a small animal of the spider kind, whose bite was accounted mortal. It is the same with the *solipuga*, so called from its stinging, or biting most violently, in places, or seasons, where the sun had the most power, as Africa, &c. The name *solifuga* was a corrupt way of writing that word, and this seems also a false way of writing the word *heliocentros*, which signifies the same as *solipuga*. See HELIOCENTROS.

OVALIDIA, in botany, a name given by some authors to *chamæmile*. *Ger.* Emac Ind. 2.

OLY, a word used by some chemical writers to express the oily part of metals, seen, in some circumstances, swiming upon the surface of their solutions

OLYRA, a name given by many botanical writers to the *spelt corn*, the *zea*, and *triticum amylæum*, or *starch corn* of other authors. This is a sort of grain cultivated in many parts of Germany. It comes to a ripeness toward the latter end of autumn, and is used for the common food of the poorer sort of people. It is like the spelt wheat, but is somewhat less nutritive. Vid. *Dale*, Pharmac.

OMAGRA, a name given by some medical writers to the *gout*, when seated in the articulation of the humerus with the scapula.

OMBRIA. See the articles BRONTIA, and CERAUNIA.

OMBROMETER, a machine to measure the quantity of rain that falls. We have the description and figure of one in Phil. Transf. N° 473. p 12. It consists of a tin funnel, whose surface is an inch square, a flat board, and a glass tube set into the middle of it in a groove. The rise of the water in the tube, whose capacity, at different times, must be measured, and marked, shews the quantity of rain that has fallen.

OMELYSIS, a word used by Hippocrates, and others of the antients, to express the meal of barley, crude, or not parched. It is recommended, when reduced to the form of a pultice, by boiling in wine and oil, for curing all tumors of the tonsils. It is also recommended, mixt in water, to be drank in hæmorrhages of the uterus. Authors of later date have made the word *omelysis* stand for all sorts of meal, or flower, and some for an equal mixture of the meal of barley, linseed, and fænugreek seed, in equal quantities; a medicine used for horses. And Cœlius Aurelianus uses it frequently for a cataplasm made either of meal, or bread and water.

OMENTA, a word used by some anatomical writers to express the membranes of the brain.

OMENTUM (*Cycl.*) — *Falling down of the* OMENTUM. On large wounds of the abdomen, the *omentum* will frequently protrude itself through the wound, either alone, or with some portion of the intestines. When this is the case, the first business is to enquire whether the protruded part preserves its heat, moisture, and natural colour: if it is not found faulty in any of these circumstances, it must be gently returned, but when the straitness of the wound forbids this, the protruded part must be taken off close to the wound, and the wound healed according to the common form. The *omentum* in this case will adhere to the internal part of the wound, without bringing on any disorder, or inconvenience to the patient. But where the intestines fall out at the same time, the *omentum* is to be fomented by an assistant with warm milk and water, till the intestines are returned.

If any part of the protruded *omentum* be cold, dry, livid, putrid, or corrupted, the mortified part must be entirely cut off before the rest is returned, lest the neighbouring parts should be brought into consent, which would inevitaby prove fatal to the patient. The corrupted part is to be taken off in this manner: pass a waxed thread two or three times round the sound part of the *omentum*, near the place where it is injured, and fasten it with a knot, to prevent any hæmorrhage from ensuing after the reduction of it; when you have made a secure ligature, take off the corrupted part with the knife, or scissars, and return what is sound, leaving, at least, the length of a foot of the ligature hanging out of the wound of the abdomen, till it slips off from the sound part of the *omentum*. The wound must be dressed in the common way, the depending part of it being kept open by a large tent: and, at every dressing, the ligature must be pulled a little gently forward, till it has, at length, entirely slipped off from the sound part of the *omentum*. *Heister*'s Surg. p. 66.

OMER, in the Jewish antiquity See CORUS.

OMNES, in the Italian music, a Latin term which we sometimes find used for *tutti*, all, or altogether. See TUTTI.

OMOPLATO HYOIDÆUS, a muscle called also *coracohyoidæus*, and *ornohyoidæus*. It is a very long and slender muscle, much narrower than the sterno-hyoidæus, and situated obliquely on the side of the neck, or throat, between the scapula, and the os hyoides; it is a digrastic muscle, being divided into two fleshy portions, joined endwise to a short, middle tendon. It is commonly fixed in the lower extremity to the superior costa of the scapula, between the small notch, and the angle, and sometimes very near the angle, and, from thence, some anatomists have called it the *costohyoidæus*; from thence it passes over the coracoide apophysis, adhering sometimes to it by a kind of aponeurosis, or membranous ligament; and, from this adhesion, the name *coracohyoidæus* was given it before its main insertion was discovered. It is also very often fixed to the clavicula by ligamentary, or fleshy fibres, and sometimes inserted in the whole middle portion of that bone, being inseparably united with the sterno-hyoidæus: having past the clavicle, it is bent forward, and runs between the sterno-mastoidæus, and internal jugular vein, the small middle tendon being situated in this place; from thence it runs up to its insertion in the inferior lateral part of the basis of the os hyoides near the corner, and insertion of the sterno-hyoidæus, which it covers a little. *Winslow*'s Anatomy, p. 255.

OMPHACITIS, a name given by naturalists to a small sort of gall of the oak.

OMPHACIUM. See OMPHACION, *Cycl.*

OMPHACOMELI, a sort of *oxymel* made of the juice of unripe grapes, and honey.

OMPHALODES, in botany, the name of a genus of plants, the characters of which are these: the flower consists of one leaf, and is rotated, and divided into segments at the edge. The pistil arises from the cup, and is fixed, in the manner of a nail, into the middle of the flower, and afterwards changes into a fruit composed of four capsules, containing flattish seeds affixed to a placenta, which forms a quadrilateral pyramid.

The species of *omphalodes*, enumerated by Mr. Tournefort, are these: 1. The Portugal *omphalodes*, with leaves like those of flax 2. The taller, Portugal *omphalodes*, with hound's-tongue leaves. 3. The little, spring, comfrey-leaved *omphalodes*, called by some *borrage-comfrey*, and *creeping*, *dwarf comfrey* *Tourn.* Inst p. 140.

OMPHALOMANTIA, a word used by some authors to express a sort of divination pretended to by the midwives and old women, of telling how many more children a woman is to have, by examining the number of knots on the umbilical cord.

OMPHALOTOMY, Ὀμφαλοτομια, the operation of cutting the navel-string of new-born infants. See UMBILICAL, *Cycl.*

OMPHALUS, (*Cycl.*) in natural history, a term used by the antients to express what they at other times called *umbunculus* in stones; that is, a small round and prominent spot, in the center of the stone.

The *zmilampis*, which was a kind of oculus beli found in the Euphrates, had usually a blue prominent pupil, and this was called *omphalus*, and *umbunculus*, indifferently, and so in other stones. The words have both the same origin, and are used to express its being like the button, or prominent piece, in the middle of a shield, called by the Greeks *omphalos*, and by the Latins *umbo*. See the articles ZMILAMPIS, and UMBUNCULUS.

OMPHAX, in the natural history of the antients, the name they gave to a gem of the pellucid kind, and of a disagreeable greenish colour, with a mixture of yellow. Pliny and some other old writers, make this a kind of the aqua marine, calling it the *beryllus oleaginus*; but the earlier writers very justly determined it not to be of the beryll kind, but properly a distinct species of gem; and, therefore, very properly called it by a peculiar generical name. *Hill*'s Theophrastus, p. 80.

OMOPLATÆ *octavus*, in anatomy, a name given by Spigelius, and others, to a muscle called by Winslow *the upper portion of the rhomboidalis*, but by Albinus, the *rhomboides minor*. What Winslow calls the lower portion of the rhomboidalis, he calls the rhomboidæus major.

ONAGER, in natural history, the name given by authors to the *wild ass*, a creature common in Syria, and some other places, and differing very little more from the common ass, than as creatures in their native wildness do from those of the same species kept in stables, and brought up to be domestic animals. The skin of this creature is very robust, and durable, and makes the common chagrin leather used by our case-makers, &c. its surface being rough with small tubercles. *Ray*'s Synop Quad. p. 63.

ONAGRA, in botany, the name of a genus of plants, the characters of which are these: the flower is of the rosaceous kind, consisting of four leaves, disposed into a circular form, and standing on a cup; from the upper part also of this cup, which is hollow, there arises a pistil which finally becomes a cylindric fruit, which, when ripe, splits open in four places, and is composed of four cells, each containing a number of angular seeds, which are affixed to a placenta.

The species of *onagra*, enumerated by Mr. Tournefort, are these: 1. The broad-leaved, yellow-flowered, American *onagra*, called by authors the *yellow*, *podded willow-herb*. 2. The broad-leaved, American *onagra*, with paler, yellow flowers. 3. The large-flowered, broad leaved, American *onagra*. 4. The small, narrow-leaved, Canada *onagra*. 5. The red-stalked, small-flowered, narrow-leaved *onagra*. 6. The betony-leaved, American *onagra*, with rough fruit. 7. The American *onagra*, with large leaves, like those of arsmart, and with small yellow flowers. 8. The American *onagra*, with narrower, arsmart leaves, and large yellow flowers. 9. The shrubby, American *onagra*, with large yellow flowers, and leaves like the oleander. *Tourn.* Inst. p. 302.

ONAGRIUS *lapis*, a name by which some call the *asinius lapis*. See ASINIUS *lapis*.

ONCOS, Ογκος, in antiquity, was used to signify an ornament for the head, peculiar to those who offered sacrifice. Mem. Acad. Inscrip. Vol. 3. p. 134.

ONDEGGIARE, in the Italian music, signifies to return the hand beating time, not directly, but by degrees; as *ondeggiare la mano*, to keep it wavering in the air, or giving it two motions, before it is quite lifted up to end the bar, and thence to fall it to beat a first, second, or third time, of that, or another measure.

ONEIROGMOS, a word used by the antients to express *venereal dreams*.

ONEIROPOLI, Ονειροπολοι, in antiquity, persons whose business it was to make predictions from *dreams*. *Potter*, Archæol. T. 1. p 304.

ONEIROSCOPI, Ονειροσκοποι, in antiquity. See ONEIROPOLI.

ONION, *cepa*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the liliaceous kind, and composed of six leaves; in the center of it there stands a pistil which finally becomes a roundish fruit, divided into three cells, and containing roundish seeds. To this it is to be added, that the flowers are placed in spherical heads, and that the leaves, as well as stalks are tubular

The species of *onion* enumerated by Mr. Tournefort, are these: 1. The common, red-flowered *onion*, with red coats to the root 2. The common, white-flowered *onion*, with white coats to the roots 3. The *onion* with a turbinated root. 4. The oblong-rooted *onion*. 5. The scallion *onion*. 6. The fissile *onion*, or *cib ule*. 7. The great African sweet-rooted *onion*. 8. The perennial, rush leaved, sectile *onion*. 9. The fine-leaved, Alpine, marsh *onion*. 10. The smallest, Portugal *onion*, with capillaceous leaves, and purple flowers.

11. The fine-leav'd, bicomated *onion*, with dusky colour'd flowers. 12. The little rush-leav'd, purple flowered *onion* 13. The purple-flower'd, globular-headed, fine-leaved *onion*. *Tourn.* Inst. p. 382.

Onions are much eaten, and it would be well if they were yet more so; they attenuate tough humours, cleanse the stomach, and excite appetite, and in some degree promote the menses. But they are apt to breed flatulencies, and, if eaten too largely, to affect the head and disturb the sleep afterwards. An *onion* boiled to a perfect softness, is recommended by many as a cataplasm for ripening pestilential buboes. A fresh cut *onion* rubbed on the part till it become red, and itch, is said to be a cure for baldness. A mixture of equal parts of juice of onions and spirit of wine, is esteemed a cure for deafness, a few drops being put at times into the ears: An *onion* cut in two, and macerated an hour in the same spirit, is a good application for the head-ach. A cataplasm of roasted *onions* and butter is an excellent application for the piles.

The three sorts of *onions* propagated for the sake of their roots for winter use, are the Strasburg onion, the red Spanish *onion*, and the white. These are to be propagated by sowing their seeds in the latter end of February, in a dry, and somewhat sandy soil, yet rich: in about a month's time the plants will appear, and, in a fortnight after that, they will be forward enough for hoeing, which must be done with a very small hoe, cutting up all the weeds, and leaving the *onions* two inches asunder; this should be done in a dry season, and the ground will then be clear of weeds for a month. At the end of this time, they must be hoed again, and cut to three inches apart; and a month after this, to four inches, at which distance they will thrive well, and grow very large. Toward the latter end of July, the *onions* will have arrived at their full growth, which is known by their leaves hanging down, and shriveling; and they must at this time be pulled up, and spread on a dry place, and turned every day, to prevent their striking fresh roots; in a fortnight's time they will be dry enough to house, and should be wiped clean, and spread thin in an upper loft, or garret.

The differences between these species are not essential, they often degenerating into one another; and even the large Portugal *onion*, after a few years, with us, will lose itself so far that no one would imagine it came of that race. *Miller's* Gardener's Dict.

Welsh ONIONS, a sort of *onions* propagated by gardeners, for the use of the table in spring; they never make any bulb, and are therefore only to be eaten green in fallads. They are propagated by sowing their seeds toward the end of July in beds of a dry, but rich soil; and in three weeks after sowing, they will appear above ground: they must be kept carefully cleared from weeds. About October all their leaves die away, which has ocasioned some to think the whole plantation lost, and to dig up the ground for some other use; but if they are suffered to stand, they will shoot up again very strong in January, and from that time will grow very vigorously, and resist all weathers, and will be fit to draw for young *onions* in March, and are extremely green and fine, and more valued at market at that season than any other kind; but they are much stronger than any other *onions*, and have very much of the taste of garlick. Id. ibid.

ONION-*shell*, in natural history, a name given by authors to a peculiar kind of *oister*, which is of a roundish figure, and very thin, and transparent, and represents very exactly a piece of the peel of an *onion*. See OSTREA.

ONISCUS, in ichthyology, a name given by Athæneus, and others of the Greek writers, to the *accipenser*, or *sturgeon*. See ACCIPENSER.

ONISCUS is also the official name of the *whiting*. *Dale*, Pharm. p. 372.

ONISCUS, in zoology, is also a name used by some to express the common *millepedes*, called in English *wood lice*, and *sows*. *Aldrov.* de Inf. p. 632.

ONOBRYCHIS, *cock's-head*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the papilionaceous kind, and its pistil finally becomes a short pod, of a crested form, and in some species echinated; this contains a kidney shaped seed. To this it is to be added, that the flowers grow in a dense spike.

The species of *onobrychis* enumerated by Mr Tournefort, are these: 1. The great, vetch-leaved *onobrychis*, with bright red flowers, and an echinated fruit. 2. The great, vetch-leaved *onobrychis*, with pale red flowers, and echinated fruit 3. The great, vetch-leaved *onobrychis*, with echinated fruit, and with white flowers. 4. The stone *onobrychis*, with long, and narrow, vetch-like leaves. 5. The lesser *onobrychis*, with echinated fruit. 6. The lesser *onobrychis*, with a very large, and remarkably echinated fruit. *Tourn.* Inst.

ONOCENTAURUS, a fabulous animal, supposed to be a compound of a man and an ass. Ælian [a] speaks of *onocentaurs*. It was half man, and half ass, as the centaur was half man, and half horse [b]. — [[a] Lib. 7. cap. 9. [b] *Calmet*, Dict. Bibl.]

ONOCROTALUS, in zoology, the name of a very remarkable bird, commonly known among us by the name of the *Pelican*. It is of the size of a goose, or larger; and is of a greyish white all over, except that the neck looks a little yellowish, and the middles of the back feathers are blackish. The bill is remarkably long, and hooked at the end, and has under it a lax membrane extended also to the throat, and makes a bag or sack capable of holding a very large quantity. Its feet are web'd, as in the duck, and goose, all the toes being joined by the membrane. There is one very singular thing in this bird, which is, that its bones are solid, containing no marrow, and are all pellucid. *Ray's* Ornithol. p. 246.

ONOS, in ichthyography, a name given by some authors to the *æglefinus*, or common *haddock*. *Willughby's* Hist. Pisc. p. 170. See the article ÆGLEFINUS.

ONOS is used by Athæneus, and many other of the Greek writers, to the fish which we call the *hake*, the *asellus minor* of authors; called by Bellonius, Gesner, and some others, the *merlucius*.

ONYX, (*Cycl.*) in natural history, the name of a genus of the semipellucid gems; the characters of which are, that they have variously coloured zones, but none of red, these making them sardonyxes; and that they are formed of chrystal debased, but by a very small admixture of earth, and composed either of a number of flat plates, or of a series of coats made by incrustation round a central nucleus; the different coloured ones being covered with a coat of the basis or common matter of the stone, and separated from one another by, and alternately variegated with, thin veins of that matter, in form of other zones.

As there have been many disputes about what were properly the gems of the antients, the *onyx* has not been less perplexed than the rest. The characters here assigned them will distinguish them, however, from all other stones; and will not let the careful observer easily be deceived, when he sees a stone in its rough and native state; but they will not so well serve the less nice enquirer from being imposed upon in purchasing *onyxes* when cut and wrought. Our lapidaries seem to have had a design of banishing the distinctions of the agate and *onyx* out of the world; for as the zones are the most obvious character of the *onyx*, they have found an easy way to make pieces cut properly out of masses of agates resemble them. Agates, though never plated or formed of regular zones, are frequently veined in strait narrow lines, and a piece of one of these agates cut perpendicularly to the site of these veins, gives the very figure of the zones of an *onyx*. The white Gambay agate is what they usually choose for this purpose; such pieces of this stone as have the black dendritæ in them, when properly cut out from the rest of the mass, are their Mocoa stones; but other parts of the same stone, which have not these delineations, but have strait close veins are cut out in a proper direction, and sold for *onyxes*. These may always, however, be distinguished by their wanting the proper degree, purity, and transparence; and by this, that the common pale auricular *onyxes*, which are the kind these most resemble, have always a peculiar blueish cast, which is not found in these counterfeits.

We have four species of the *onyx* now in use among our lapidaries. The first is a blueish white one, with broad white zones. This was the true *onyx* of the antients, and is composed of a blueish white *onyx*, variegated with white and brown zones. It is sometimes found composed of flat and even plates of these, laid closely on one another, and sometimes is in form of a pebble, composed of a central nucleus of pure chrystal, or nearly pure, surrounded with those crusts which form the zones. It is very common in the East-Indies, and is found also in New Spain, and sometimes in Germany and Italy, tho' of much smaller value, and less brightness, hardness, and transparence.

The second is a very pure *onyx*, with snow white veins, which is exceeding bright and transparent, and tho' composed only of two colours, is inferior to very few of the *onyxes* in beauty. It is always found in the form of a roundish pebble, usually about the size of an egg, and composed of several coats of a blueish white, and a fine and pure white, laid evenly round a central neucleus of pure, but shattery chrystal; the whole is very bright, and the blueish part very little less transparent than pure chrystal; the nucleus is generally of an angular form, and the coats or zones being all exactly of the same shape, make a very beautiful appearance. It is found only in the East-Indies, and is very much esteemed in Italy, but with us is not so much regarded as it deserves.

The third species is the *jasponix*, which, see under its proper head.

The fourth is the brown *onyx*, with blueish white zones. This is a very clear and pure stone, but is so much less beautiful than the other kinds, that tho' very common in the East Indies, it is very seldom seen or regarded among us. *Hill's* Hist. of Fos. p. 490.

ONYX, in conchyliology, the name given by the curious to a species of voluta, found in cabinets, but never met with in that state on the sea shores. The true account of this is, that the shell in this elegant form owes its appearance to art, having been polished, and having had its outer coat taken off. With this outer coat which is of a dusky yellow, it is often kept in the same cabinet under another name, being then

then called by the French, the cierge, or wax-shell. See Voluta.

Onyx, in zoology, a name by which Pliny, and many other of the antient writers, have called the *solen*. See Solen.

Onyx *indicus*, in the materia medica of the antients, a term used by the Greek writers to express what is usually called *unguis odoratus*, or the sweet hoof. Some call it *onychus indicus*, as particularly Myrepsus in his antidote of fifty species. The same author mentions the *blatta bizantia*, and tells us that it is not the same thing with the *onyx indicus*, but that the Italians called by this name the *os nasi* or bone of the nose of the purple fish. What he means by this is probably the bony tongue of that animal, nature having given it such a weapon to pierce the shells of those fish on which it is to feed. We frequently find the chamæ, and other shell-fish, with holes bored through the upper shell as exact as if it were done with an instrument: this has been done by the purple fish, to get at the flesh of the animal within for food; and the bony tongue with which this fish performs this, is called by the Italians of those times *blatta Byzantia*. Actuarius translates the blatta Byzantia of all the earlier writers by the phrase *os nasi purpuræ*; and the interpreters of the Arabian writers give the same name to what they call *unguis odoratus*, or *onyx indicus*, for the Arabian name exactly expresses this.

The word *blatta* among the earliest Latin writers, means a bubble of mud. Paulus Ægineta quotes Festus for many instances of the word being used originally in this sense: after this, it became used for the grumes, or clots, into which the red part of the blood concretes, after it is out of the vessels; and, after this, it became a name for the sanies, or foul matter, concreting in lumps, when the purpura, or purple-fish, was exposed to the air. The purple colour was finally called by the same name, and from this, any thing dyed purple was said to be dyed with blatta. The blattæ of the Turkish dominions were the purple fish of that part of the world: these were more excellent than those of any other known part, and were therefore most employed. The word blatta Byzantia signifies no more than purpura Byzantina, and when the purple colour had been taken out, the tongues, or other parts of the shells of these fish, were used in medicine, under the same name of blatta Byzantia. Thus Myrepsus is found to be in the right. The *onyx indicus* of the Greeks was, however, very different. This, though it was also a shell, or part of a shell, was collected not at Constantinople, but in the lakes of the East-Indies. Dioscorides plainly makes it different from the purpura, by comparing the shell to that; he says, it is part of a shell fish, in many respects resembling the purpura. Some have supposed that Dioscorides understood the whole shell of the fish by the word *pama*, which he has used on this occasion; but this is not the case, for the Greeks had many other words to express a shell by, and no other author countenances the use of *pama* in that sense. Besides, Dioscorides says afterwards, that the whole shell of the fish which produced the *onyx* being burnt, had the same virtues with the shell of the purpura, and other the like fish. The Arabians seeing by this, that Dioscorides did not mean the whole shell by this word, have expressed his meaning by a phrase which signifies not a whole shell, but a fragment, or part of one. The word *pama* properly signifies operculum, and, as all the shell-fish of the buccinum kind, to which this purpura belongs, have opercula, or thin shells, to cover the orifice when the fish is retracted in, it is plain enough that the antients meant this by the word *pama*; and this they might very well call *onyx*, or *unguis*, from its being thin, and flat, and not unaptly resembling in size and shape, the human nail. This operculum, when taken from the purpura, as it seems to have been among the Romans, who had that fish from Constantinople, was properly called blatta Byzantia, being the only part of the fish used in medicine; but whether this, or the bony tongue, were so called, it is certain that this is no proper name for the true *onyx indicus* of the Greeks, which was not any part of the blatta, or purple fish; but, as Dioscorides expressly says, of another species of shell-fish, somewhat like it.

OOSCOPIA, Ωοσκοπια, in antiquity, a species of divination, wherein predictions were made from eggs. *Potter*, Archæol. Græc. l. 2. c. 14. T. 1. p. 319.

OOST, in husbandry, a name given by the people who manure hops, for the kiln in which they dry them after they are picked from the stalks. This is a square room, built up of brick, or stone, ten foot wide, more or less, and having a door on one side. In the midst of this room is a fire-place, about thirteen inches wide, and as much high; and, in length, reaching from the mouth so nearly to the back part of the kiln, that a man has just room to go round it. This fire-place is called a *herse*, and the fire is let out into the room by several holes in the sides, in the same manner as in malt-kilns. Five feet above this, is laid the floor on which the hops are to be laid to dry, and this must have a wall round it of four feet high, to keep the hops from falling out. At one side of the upper bed must be made a window by which to push out the hops as they are dried into a room prepared for them. The beds must be made of laths an inch square, placed at a quarter of an inch distance from one another, and supported by beams underneath. The hops are to be poured on this bed with a basket, till the whole is covered half a yard thick with them; when this is done, lay them even with a rake, and let a fire be made in the fire-place below. Some recommend a wood-fire, but experience shews that nothing does so well as charcoal; let the fire be kept at the mouth of the furnace, for the air will be carried all the way through; and thus let the hops lie, never stirring them till they are thoroughly dry; when they rattle under the rake, and the inner stalks are brittle, they are sufficiently dried, and are to be pushed out, and a fresh parcel laid in the *oost* in their place.

Some people dry their hops in a common malt-kiln, spreading them on a hair-cloth about six inches thick, and now and then turning them till they are all thoroughly dried, then laying them in a heap, till they are to be put in the bags. But both these ways are liable to some inconveniencies; the *oost* generally over-drys the under ones, by the time that the uper ones are dry enough; and the hair-cloth, and the turning in the other way breaks and shatters them, and spills many of the seeds. See Tin-*floor*.

OPAL (*Cycl.*) — The *opal* is a gem of a very peculiar kind, and has been esteemed by many, in all ages, of very great value; though, at present, it is of less price, in proportion to its size, than any other of the finer gems. The Romans esteemed it the fourth gem in value; and its singularity, as well as beauty, seem very well to entitle it to at least that rank; it is softer than any other of the gems, and is with difficulty polished to any degree of nicety. Its most frequent size is between that of a pea, and a horse-bean, but it is found as small as the head of a large pin, and up to the size of a wallnut. Its figure is very various, and uncertain, but it is never found in a columnar, or crystalliform state. Its most usual figure is an irregularly oblong, flatted at the bottom, and convex at the top, and dented with various sinuosities on the sides. There have been found some of the regular shape of a kidney, and others almost perfectly round, and, not unfrequently, it is met with in thin flat pieces. It is often found loose among the earth of mountains, sometimes on the shores of rivers, and not unfrequently bedded in the coarser kinds of jasper, ten or twenty *opals*, of different sizes and colours, being frequently found in one stone.

It is naturally of a smooth surface, and fine gloss, and many of the finest *opals* that have been seen, have been worn with their native polish. Its colour, as it appears in a fine specimen, is of so mixt a nature as not to be easily described, but is best expressed by comparing it to the finest sort of mother of pearl. It differs, however, greatly from that in its superior lustre and brightness, and in being so pellucid that one may see deep into the stone. As it is variously turned about, it shews the colours of all the other gems, yellow, red, blue, green, purple, and a milky grey. The last of these colours is the native dye of the stone, and it has many of the others in a superior beauty even to the gems to which they naturally belong, particularly the fire-colour of the carbuncle, which seems in the *opal* to lie deep in the body of the stone. It is the most difficult to counterfeit of all the gems; and this is done by a very fine, and well chosen piece of some pearly shell. It is sometimes found wanting one or more of the colours, and sometimes of a deep blueish black, with no other colour visible on changing the light, but a deep red, which is very strong and glowing, and makes it a very beautiful stone; sometimes it has also a general yellowish cast, and sometimes a greyish one, which greatly impair the reflexions of the other colours, and injure the stone.

It is found in Ægypt, and Arabia, and in some parts of the East-Indies, and in Europe. The oriental ones are the finest, but those of Bohemia are often very beautiful. *Hill's* Hist of Foss. p. 600.

Counterfeit Opal. To imitate this gem in natural crystal, use the following method: take yellow orpiment, and white arsenic, of each two ounces, crude antimony, and sal armoniac, of each one ounce; powder all these, and mix them well together; put this powder into a large crucible, and lay upon it small fragments of crystal, and, upon these, other larger pieces of crystal; fill up the crucible with these, and lute on to it another crucible inverted, with a hole at the bottom as big as a small pea; when the lute is dry, set the vessels in a quantity of charcoal in a large chimney, covering them up with coals to the middle of the upper crucible; so long as the materials fume out at the hole, keep up a strong fire; when that is over, let the fire go out of itself; and then unlute the crucibles; the greatest part of the crystal will be found tinged to the colours of various gems; not only the *opal*, which will be very fair, and beautiful, but the topaz, and ruby colour will be seen in others. *Neri's* Art of Glass, p. 119.

OPEN (*Cycl.*) — *Self*-Opens. See Self-*opens*.

OPERATION (*Cycl.*) — *Hermit*-Operation. See the article Stone.

OPHICARDELON, in natural hiftory, the name of a gem mentioned by Pliny, which, he fays, was a black ftone covered at top and bottom with white: this feems, without all doubt, to have been the *camea* of our jewellers.

OPHIDION, in ichthyology, the name of a fifh of the eel kind, and refembling the common eel, and conger, in fhape, but that it is fhorter in proportion to its thicknefs, and more flatted, and of a paler colour. It feldom exceeds eight inches in length, and the back is grey, and the fides of a bright filver colour. It is cloathed with fmall fcales, which are long and narrow, and are not placed like tiles hanging over one another, as in other fifhes, but only fcattered here and there, and laid in no order. The mouth is large, and the jaws are furnifhed with very fmall teeth, and, befide thefe, with three fmall eminences fet with the like teeth; the one on the roof of the palate, the others lower on each fide. The eyes are large, and it has one pair of fins near the gills. It is a very delicate fifh, and is caught in great plenty in the Mediterranean, and fold at Venice, and other places. *Willughby's* Hift. Pifc. p. 112. *Aldrov.* l. 3. c. 26. *Gefner*, p. 104.

The name *ophidion* is given by Artedi to a genus of fifhes, the characters of which are thefe: they are of the malacopterygious, or foft-finned kind; the body is oblong, and of a cylindric figure, and has three fins. The fpecies of this genus are properly only two, diftinguifhed by the cirri, or beards. The firft is the *ophidion* with four cirri growing from the lower jaw: this is the *ophidion* of authors. The fecond is the *ophidion* without cirri: this is found in the Baltic. *Artedi*, Gen. Pifc. 20.

OPHIOBORUS, in natural hiftory, a name given by the antients to a fpecies of carnivorous fly, which feeds on the bodies of beetles, or other flies, or on the flefh of dead ferpents. Its wings are of the colour of polifhed brafs, whence it was alfo called by the Greeks *chalcomuca*, the *brafs fly*.

OPHIOGLOSSUM, *adder's tongue*, in botany, a genus of plants, no part of the fructification of which is vifible, except the fruit. This is an oblong, double, or diftichous capfule, divided by a great number of tranfverfe articulations, into many cells, each of which, when mature, opens tranfverfely, and is found to contain a great number of fmall feeds of a fubovate figure.

Cafpar Bauhine defcribes what he calls three fpecies of this plant. 1. The common *ophioglofſum*, with a fingle leaf, of an ovated figure, having no vifible nerves, or veins in it, very thick and flefhy, and of a beautiful bright green. This fpecies is a native of England, and common in deep paftures. 2. The angular-leaved *ophioglofſum*. And, 3. The roundifh-leaved *ophioglofſum*. Mentzal defcribes three fpecies alfo befide the common one; but all thefe are only varieties of the common *ophioglofſum*, the capfule or fpike of which is often bifid, and the leaves vary greatly in length and breadth.

All Europe, fo far as yet known, affords only one fpecies of *ophioglofſum*; but, in America, are found two diftinct fpecies, befide the common European fort. 1. The reticulated, heart-fhaped-leaved, *ophioglofſum*. And, 2. The palmated *ophioglofſum*.

Tournefort makes eight fpecies of *ophioglofſum*, which are only the varieties of the common European kind, mentioned above. Vid. *Hill's* Hift. Plant p. 134, feq.

This is a fpring plant, and is only to be found in April, and May. It is not uncommon in wet meadows, and is eafily diftinguifhed among the other fpring plants by its fpike, or tongue.

It is efteemed one of the beft vulnerary herbs this nation produces; but it is more in ufe among the common people than in the fhops. They gives its juice internally, and ufe the herb bruifed, or an ointment prepared from it, with lard, or May butter externally at the fame time. *Dale's* Pharmac.

OPHIOMANCY, Ὀφιομαντεία, in antiquity, the art of making predictions from ferpents. Thus Calchas, on feeing a ferpent devour eight fparrows with their dam, foretold the duration of the fiege of Troy. And the feven quoils of a ferpent that was feen on Anchifes's tomb, were interpeted to mean the feven years that Æneas wandered from place to place before he arrived in Latium. Thus, Virgil. Æn. l. 5. v. 85.

Septem enim gyros, feptena volumina traxit.

The word is Greek, compounded of ὄφις, a ferpent, and μαντεία, divination. *Hofm.* Lex. in voc.

OPHIOMORPHITES, in natural hiftory, the name given by fome authors to the foffils called more ufually *cornua ammonis*; which are compofed of feveral wreaths, rolled in a fpiral form over one another, and refemble a fnake when rolled up. Thefe are found of prodigious fizes, fome not lefs than the fore-wheel of a chariot. They are evidently formed from fome fea-fhell, the fhelly matter remaining on fome of them, and all being compofed of feveral cells, communicating with one another by means of a fiphunculus, in the manner of thofe of the nautilus. See CORNU *ammonis*.

OPHIOPHAGI, in natural hiftory, a name given by fome to the *eagle vulture*, and fome other birds of prey which are fometimes feen to feed on ferpents.

Pliny gives the name *ophiophagi* to a certain people of Æthiopia, whom he defcribes as very barbarous and favage, going always naked, and feeding on ferpents, whence the appellation. Solinus, who generally copies Pliny, but imperfectly, has perverted his meaning ftrangely in this paffage, having placed the *ophiophagi* in Arabia Felix, inftead of Æthiopia.

OPHITES, the *ferpentine marble*, in the natural hiftory of the antients, a name given to fuch of the marbles as had their variegations not in form of veins, but of fmall fpots ufually of an oblong figure, and thence imitating in fome degree, fpots on the back of a ferpent.

The antients knew three fpecies of this kind, which they called the black, the white, and the grey *ophites*, and this laft alfo frequently *tephria*; and allowing thefe fpotted variegations to be the characters of an *ophites*, we have, befide thefe, two others known at this time.

As to the *ophitæ* of the antients, the uncertain accounts they have given us of them have been the occafion of many unlucky miftakes, about what they meant by the names. Some have imagined that they meant a black, others a white marble. A more accurate furvey of their works together, will fhew, however, that they, in reality, were very diftinct in their meaning, though they feem obfcure, becaufe fhort; but they ever diftinguifhed between their three *ophitæ*; and it is plain from them, that the black and white *ophitæ*, as they call them, were both marbles whofe ground was green, and only were diftinguifhed by their variegations, and their different degrees of hardnefs; and what they mean by the black and white, was only the black fpotted, and the white fpotted *ophites*. *Hill's* Hift. of Foff. p. 483.

Black OPHITES is a very beautiful, and confiderably hard marble, of a very fine green, aad elegantly variegated with fmall black fpots and irregular lines, and fometimes with an admixture alfo of white ones. Thefe are frequently feen together in the fame block, and make a fort of white fpotted, and black fpotted kinds; but the diftinctions of the antients were not founded only on thefe, but on the effential character, the hardnefs of the ftone, the white kind being greatly fofter, as we find by all their accounts.

The antients found this fpecies in Ægypt, and knew of it in no other place. We have it now in many parts of the world: the defarts of Arabia abound with it; it is common in the iflands of the Archipelago; and has often been found in Wales. *Hill's* Hift. of Foff. p. 484.

White OPHITES is alfo a very beautifully variegated mafs, of a fine and even texture, moderately heavy, and, when pure, is of a very elegant pale green, not unlike that of the malachites, and elegantly variegated with fpots, clouds, and lines, of a fine deep black, an extremely pale green, and often with very large variegations of pure white. It is very foft, and eafily fcratched, even with a pin, but is capable of a good polifh, and looks very beautiful and bright, when wrought.

The antients had it in great repute; it cut eafily, and without much trouble, was made into elegant veffels for their tables; and in Germany, it is ftill in common ufe on the fame occafions, and is by fome recommended as a medicine againft venemous bites. The antient writers have well diftinguifhed this from the black kind, not by its whiter fpots, which were common to both, though more frequent and numerous in this, but by its foftnefs. They had it only from Ægypt, but we find it in France, Italy, Germany, and fome other places.

Grey OPHITES, called alfo *tephria*, was not, like the other fpecies, diftinguifhed by its fpots, but by its ground colour, which is a very lively and beautiful afh-colour, or pale grey. It is a very fine, even, and fmooth marble, and is variegated with a multitude of black fpots of irregular figures; but, in general, all much of the fame fize, and that not exceeding the fixth part of an inch in length: it is confiderably hard, and takes an elegant polifh. The antients had this with their bafaltes from Æthiopia. Ægypt alfo afforded it, and does fo to this day: in Germany alfo we find it in large quantities. It has been celebrated from the earlieft times for its virtues againft venomous bites, and is in many parts of the world worn as an amulet, to this day.

The other two *ophitæ*, which feem not to have been known to the antients, are 1. A greyifh brown one, with green fpots. The ground of this is of a dufky afh-coloured brown, and the fpots are of a lively and beautiful green, ufually fmall, and of an oblong figure; and the whole is very hard, of an even ftructure, and capable of a fine polifh. It is frequent in Ægypt, and Arabia, and is faid to have been dug in England. The 2. is a pale grey one, with green fpots and veins. This is a fmooth and fine marble; its ground is a beautiful pale grey, in fome places flightly tinged with red, and in others approaching to white. Its ground has all thefe varieties in colour, fometimes in the fame, fometimes in different blacks, and it is variegated with a very beautiful pale green, difpofed with not much lefs variety, for it is fometimes in fmall fpots, fometimes in thin uneven veins, and fometimes in thicker. It is very hard, and capable of an elegant polifh. It is frequent in Germany, and tables are made of the larger pieces, and vafes of the fmaller ones. It is faid alfo to be found in England. *Hill's* Hift. of Foff. p. 486, feq.

OPHRIS, or OPHRYS, in botany, the name of a genus of plants, called in English *twyblade*, the characters of which are these: the flower, which has no perianthium, consists of five oblong petals. The nectarium is dependent, longer than the petals, bifid, and marked with a deticulation on each side of its base. The stamina are two very short filaments. The antheræ are erect, and covered by the inner margin of the nectarium. The germen of the pistil is oblong and contorted. The style adheres to the inner side of the nectarium. The fruit is an oval capsule, containing a multitude of dust-like seeds. Vid. *Linnæi*, Gen. Plant. p 434.

The species of *ophris* are; 1. The ovated-leaved *ophris*, or the common *twyblade* 2. The bulbous-rooted *ophris*. 3. The creeping-rooted marsh *ophris*. 4. The least, or triangular-leaved *ophris*. Vid. *Hill*'s Hist. of Plants, p 592.

OPILIO, in natural history, the name given to a peculiar genus of spiders. The distinguishing character of which is, that they have but two eyes. Their legs are usually very long, and their skin hard and firm. They do not spin webs like the common spiders, for the catching their prey. Their head seems to grow to the middle of their shoulders: their forceps is terminated by two claws like those of the leg of a crab. They differ from the common spider also, in the nature of their excrements; those of this kind being hard and solid, the others liquid.

Of these there are four principal kinds: 1. The grey crested *opilio*. This is the largest spider of this kind. Its body is greyish or brownish, and its legs very long and slender; and it has on the back part of the head, a sort of crest formed of a double row of spines, and there is a rhomboidal crown spot on the middle of the back. This species is common in the fields about August. 2. The redish brown not crested *opilio*. This is of a middling size, and has the longest legs of any kind. 3. The small wood *opilio*, variegated with black and white spots, with a very elegant crest. This is very small, and has a remarkably little head Its legs are remarkably long. It is found in woods in April. 4. The small scarlet spiders, commonly called the *tant*, or *taint*. This is supposed to be very poisonous. *Ray*'s Hist. of Insects, p. 29. See the article TANT.

OPIMATORES, among the Romans, military men, who had the direction and management of the provisions, and were to take care that the army wanted nothing. *Pitisc.* Lex. Ant in voc.

OPISTHODOMUS, ὀπισθόδομος, among the Athenians, the public treasury, so called from its being situated on the backside of Minerva's temple Here, besides other public money, a thousand talents were laid in store, against any very urgent occasion; but if any man expended them upon a trivial account, he was to put to death. Also the names of all that were indebted to the commonwealth, were entered in a register in this place. The tutelar gods of this treasury, were Jupiter Σωτὴρ, or the Saviour, and Plutus, the god of riches, whom they represented with wings, and placed next to the statue of Jupiter the Saviour; which was unusual in other places. *Petter*, Archæol. Græc. l. 1. c. 8 T. 1. p 31.

OPISTHOGRAPHUM, ὀπισθογραφὸν, among the antients, a waste book, or schedule, on which were writ, extemporary things that wanted to be revised and corrected afterwards. *Pitisc.* in voc.

The word is compounded of ὄπισθε, *i. e.* afterwards, or on the backside, and γράφω, I write; because it was writ over again on the backside of every page, which was left blank for that purpose.

OPIUM (*Cyl.*) — Dr. Charles Alston, professor of botany and the materia medica, in the university of Edinburgh, has given us a dissertation on *opium* in the medical essays of that place, vol. 5. art. 12. This gentleman is of opinion, that notwithstanding the authorities of Lemery, Savary, Monsieur de la Condamine, in the Mem. de L'Acad. des Sciences for 1732, mentioned in the Cyclopædia, all which would lead us to conclude we have nothing but the meconium, or the expressed juice or decoction of the plant, our *opium* is neither an extract, nor an inspissated expressed juice of poppies, but the milky juice drawn by incision from poppy heads. To shew this, the doctor, according to the directions of Dioscorides, on a dry day before noon, cut off the crown of white poppy heads, so as to avoid penetrating into the cavity of the fruit, and collected the milk with a silver spoon in a China cup. The juice being exposed to the open air, in a few days thickened to the consistence of *opium*, and was of a fiery, hot, bitter taste, and soporiferous smell, and more so than the common *opium*, of a dark yellowish brown colour on the outside, somewhat higher within, and appeared as if composed of drops: after ten years keeping, its colour and taste remained. This agreed with the account Bellonius, lib. 3. obs 15. gives of the best *opium*. That which was gathered from the papaver vulgare, or wild poppy, was somewhat of a lighter colour; but Dr Alston thinks this but accidental, as the milk soon turns black on the knife. He also slightly scarified some poppy heads after the Persian manner. When the juice was thickened, he scraped off the *opium*, and obtained more of it than by the other method. To procure the tear in its utmost perfection, he cut off the star from several heads, and bending them down, let the milk drop into a cup. It grew solid as *opium*, and being formed into a lump, appeared uniformly white; nor was there any difference in the juices of different poppies.

Secondly, the Doctor observes, that the extract and inspissated juice scarce any way resemble *opium*; nor is their taste and smell like it. The extract appears black when dried, and so does the juice, but when diluted, the first is brown, and the latter green. The extract is tough and adhesive, the juice rough and friable, and grows mouldy a day or two after expression. *Opium* may possibly be mixed with either of these; and the greenish brown *opium* may have some small portion of the juice in it. Its penetrating smell is certainly owing to the mixture of some aromatic substance.

Thirdly, *opium* contains more rosin than either the inspissated juice, or extract. One third of *opium* appears to be rosin, while the juice and extract scarce yield one tenth part.

Fourthly, if *opium* was not the tear of the poppy, there would be no occasion for sowing so many fields with poppies in Egypt, and other places. Nor would it be so powerful a medicine, for its anodyne virtues depend chiefly on the milky juice.

The objection drawn from the low price of *opium*, is of no force; for even in this climate, where the heads are small, the Doctor observes he could, in an hour, collect a dram of *opium* without the Persian knife, or that dexterity which is acquired by practice. From all these considerations he concludes, that the greatest part of *opium* is the tear of the poppy.

It has been controverted whether *opium* be got from the white or black poppy. Dr. Alston thinks it of no consequence, with respect to the medicine, which be chosen; the juice of both having the same effects.

As to the sophistication of *opium*, the Doctor is of opinion, that only an innocent liquid is mixed with it, or a milky juice of the same nature with that of poppies, otherwise it would not be so strong as what is made here. As the wild lettice, or *lactreca silvestris od re virosa*, C. B. *Pin.* 123. abounds with a milk of the same taste and smell with *opium*; it may possibly be mixed with it, and without detriment; since the milk of the common lettices is anodyne and somniferous.

Many learned men among the moderns, have been of opinion, that *opium* was the nepenthes of Homer. Dr. Alston forms some objections against this, and thinks that some of the antient physicians, who were neither strangers to Egypt nor Homer's works, would have made the discovery long before the sixteenth century.

Opium is acrid, bitter, and strongly odoriferous. On attentively tasting it, a nauseous bitterness is first perceived; then a pungent heat affects the tongue, next the palate, and last of all the lips. The heat continues some time, the bitterness longer, provoking a plentiful discharge of saliva. It also heats the nose, and produces an inclination to sneeze. *Opium* is certainly diaphoretic, and has stimulating qualities, which strongly refute the notion of its being refrigerating; it is certainly a hot medicine, tho' in many cases it diminishes preternatural heat.

Opium consists of five parts of gum, four of resin, and three of earth, not dissolvable either in watry or spiritous menstruums. Supposing that the resin of *opium* is as good, or as much wanted as the gum, or the mucilaginous part, brandy will be found the best menstruum.

Frider. Hoffman thinks the narcotic virtue of *opium* depends on its volatile sulphur, (*vaporosum sulphur*.) Geoffroy in his *Materia Medica*, will have this virtue owing to a thick rarefiable sulphur, (*sulphur crassum ad modum rarefcibile*) a kin to that of saffron, castor, &c. But Dr. Alston thinks both these opinions insufficiently supported. *Opium* is rather alcalescent than acescent, yet it is not an alcali. From the abovementioned gentleman's experiments, it seems that the solution of *opium* gave more appearances of an alcali, than of an acid; contrary to the account given by Geoffroy, Mat. Med. Tom. 2. p. 691. From these experiments it also appears, First, that the essential salt of *opium* is ammoniacal; Secondly, that *opium* contains a very small proportion of an acid; Thirdly, that it is astringent, or makes the same change on Chalybeats which vegetable astringents do.

The most active principles of *opium* are very fixed; for it keeps well, and, when forty years old, remains hard, solid, and retains its taste; and it seems that the practice of toasting *opium*, in order to correct it, by divesting it of its narcotic part, is of no service; and *opium* affords little or nothing by distillation.

Upon a chemical analysis *opium* yields phlegm, urinous spirit, oil, a volatile and a fixed salt, and some earth; but little of the virtues of *opium* can be investigated, or explained, from its analysis, since simples extremely different as to their effects on human bodies, afford the same principles on distillation, as Homberg has shewn by the analysis of the deadly night-shade, and cabbage. See Mem. de l'Acad. des Sciences. An. 1701. The curious may find the analysis of *opium* in the abovementioned dissertation by Dr. Alston.

The effects of *opium* on other animals are not much different from its effects on men. Dr. Alston put a few drops of a solution

lution of *opium* into a frog's ſtomach, and the circulation of the blood of the animal being examined by a microſcope, no alteration was perceived in the blood, as to its conſiſtence, colour of the ſerum, magnitude, figure, or colour of the red globules, but its velocity was ſurprizingly diminiſhed. In about half an hour, the blood regained its common celerity, and the frog its vigour. On giving the creature a ſecond doſe, the blood moved ſlower than it did the firſt time, and its velocity gradually decreaſing, ſtagnated firſt in the ſmaller, then in the larger veſſels, and in a quarter of an hour the frog expired. It is remarkable, that, notwithſtanding the diminution of the velocity of the blood, the pulſe was not leſs frequent, and that even when the circulation ſtopt in the foot, the pulſe remained viſible by an undulatory motion. On opening the frog, its ſtomach was found full of a clear mucus, tinged with the *opium*, and every thing alſo ſeemed perfectly natural. This experiment was repeated ſeveral times, with the ſame appearances.

A dog being killed by an injection of a ſolution of *opium* into his crural vein, on opening his thorax, the lungs were found ſound, but very ſmall, and white, without any blood in them. The heart was big, and all its great veſſels diſtended with blood; but nothing preternatural was obſerved in the brain or abdomen.

Opium, externally applied, is diſcutient, anodyne, and ſoporiferous, and has almoſt the ſame effects as when taken inwardly; but, that it can make any part inſenſible of pain is not evident. Wedelius declares he never could obſerve any ſuch effects. One inconvenience following the immoderate application of *opium*, mandragora, and hyoſciamus for pains of the eyes, taken notice of by Galen, is the mydriaſis, or a preternatural dilatation of the pupils. Mr. Ray gives a notable inſtance of this kind, ariſing from the application of a leaf of the deadly night ſhade to a cancerous ulcer a little below the eye. The uvea, in a night's time, entirely loſt its muſcular force, and was ſo relaxed, that the pupil, in the cleareſt light, remained four times bigger than that of the other eye.

Opium rather coagulates, than attenuates the blood. See Dr. Friend's Emmenolog. cap. 14. This favours what is affirmed by ſome authors, that the blood has been found congealed, or frozen, as they expreſs it, about the heart of thoſe who have been killed by *opium*. See Wedel. Opiolog. l. 1. §. 1. c. 5.

Uſe makes the quantity of *opium* ſafe, and even beneficial, which would otherwiſe prove poiſonous. Daily experience confirms this; and they who habituate themſelves to *opium*, find it as neceſſary as ſpirituous liquors to tiplers. A few grains will deſtroy a perſon unaccuſtomed to it, but ſome diſorders, as madneſs, enervate its force. Among the Eaſtern nations, a dram of *opium* is but a moderate doſe. Garcias mentions one who took ten drams every day, and tho' ſhe appeared ſtupid and ſleepy, yet ſhe diſputed very readily and learnedly on any ſubject. It is remarkable that, notwithſtanding this exceſſive uſe of *opium*, the Turks are generally long liv'd, if we credit Bellonius, lib. 3. obſ 14, 15.

The action of *opium* is very analogous to that of wine or vinous ſpirits; the good and ill effects of both differ little. See Wedelius in his *Opiologia*, and Geoffroy's materia medica. Platerus affirms that wine is narcotic, and Sydenham that *opium* is the moſt excellent cordial in nature.

The virtues of *opium*, internally taken, depend chiefly on its action on the ſtomach. There are many inſtances of terrible ſymptoms, and death itſelf cauſed by narcotics, before they went out of the ſtomach, and without inflaming it, or cauſing any viſible change in it, far leſs vitiating the maſs of blood; and alſo of the ſame ſymptoms being removed, and death prevented by vomiting. Dr. Alſton is alſo of opinion; 1mo. That the anodyne and hypnotic virtues of *opium* do not depend on its action on the brain or on the blood. 2do. That it affects firſt and principally the nerves to which it is applied; next ſuch as more immediately communicate with them; then thoſe which ſerve for ſenſation and voluntary motion; and laſt of all, by conſent the whole nervous ſyſtem. 3tio. That this impreſſion on the nerves differently affects the ſenſorium commune and the mind according to its degree, and the nature and function of the nerves primarily acted upon. 4to. That the primary or firſt obſervable effect of the mechanical impreſſion of the narcotic part of *opium* on the nerves, is the relaxation of their fibres. Now as this relaxation of the nerves, and conſequently of the moving fibres, demonſtrates *opium* to be more than a palliative remedy in a great many diſeaſes; ſo it is not difficult by it to account for its bad as well as good effects. For by relaxing to a certain degree, it may prove anodyne, cordial, diaphoretic, hypnotic, &c. or cauſe ſtagnations, deliriums, lethargies, apoplexies, and death.

It does not appear that *opium* rarefies the blood, or that the operation of this medicine depends on ſuch a rarefaction. If it were, it ſeems likely that bleeding might be a remedy for the ſymptoms occaſioned by the abuſe of *opium*; but ſome authors affirm that veneſection is mortal even the day after a narcotic has been taken. See Dr. *Alſton*, loc. cit.

We have an account in the Memoirs of the Academy of Sciences at Paris, of the death of a young man at Cairo, from his being decoyed into taking a very large doſe of this medicine. Among a number of young people in that city, who frequently drank together, there was one who always boaſted of his ſuperior power to bear a large quantity of liquor and his companions, determined to get the better of him for once, diſſolved, without his knowing of it, a dram of liquor in the liquor he was to drink; the conſequence was, that, inſtead of falling aſleep, as they expected he would, he fell into violent deliriums, and afterwards into a profound and dead ſleep.

The next morning his comrades went to ſee him, and triumph in their victory, but found him dying, looking livid, without pulſe, and with his mouth cloſed. They ſent for aſſiſtance, but in vain. After the death of the perſon, the body, arms, and thighs, became covered with livid tumors as big as the head of a young child, and theſe emitted an intolerable ſtench, almoſt as ſoon as the corpſe was cold. There is one very ſingular accident in regard to this caſe, which is, that this ſtench allured all the cats from the neighbouring houſes, who came with great eagerneſs, and were hardly prevented from devouring the body.

Dr. Smyth, while at Smyrna, took pains to obſerve, what the doſes of *opium* taken by the Turks, in general, were. He found that three drams in a day was a common quantity among the larger takers of it, but that they could take ſix drams a day without miſchief. A Turk eat this quantity before him, three drams in the morning, and three in the evening, with no other effect than its giving him great cheerfulneſs. But the taking it thus habitually greatly impairs the conſtitution; the perſons who accuſtom themſelves to it, can by no means live without it, and are feeble and weak; their legs are uſually thin, and their gums eaten away, ſo that the teeth ſtand bare to the roots; they are often alſo of a yellow complexion, and look much older than they really are. The Turkiſh meſſengers, when ſent upon buſineſs of haſte, always carry *opium* with them, and take largely of it when tired; they ſay it immediately gives them ſtrength and ſpirits to proceed, taken with proper precaution. Phil. Tranſ. N°. 223.

When *opium* affects the head, or lungs, by its volatile æthereal oil, or ſpirit, acids, eſpecially foſſile acids, are the proper correctors. And, when it produces ſickneſs, nauſeas, vomitings, ſpaſms, flatulent colic pains, and ſuch like ſymptoms, by the action of its ponderous, ſtimulating, and adheſive oil, the warmeſt alexipharmics muſt be uſed. *Morgan*, Mecan. Prac. Phyſ. p. 271.

Opium given too ſoon, to ſtop the operation of emetics, has been known to produce dangerous effects. See Medic. Eſſ. Edinb. Vol. 4. Art. 6. or its Abridgment, Vol. 1. p. 160.

The reſinous part of *opium* being noxious in Mr. Godfrey's opinion, he propoſes to make liquid laudanum, by digeſting an ounce and a quarter of *opium*, in half a pint of diſtilled water twenty-four hours, ſhaking the veſſel frequently; then filtres it, and adds three ounces of ſpirit of wine; after which, the other ingredients may be added at pleaſure. Miſc. vere util. p. 59.

OPIUM *Cyreniacum*, in the materia medica, a name given by ſome of the writers of the middle ages to *aſſa fœtida*. This was the *ſcordolaſaron* of the Greek writers of thoſe times, and was called *Cyreniacum* from the place whence it was principally brought. Aviſenna tells us, that, in his time, it was brought principally from Kirvan, and that is Cyrene.

OPLITODROMI, Ὁπλιτοδρόμοι, among the Greeks, a deſignation given to thoſe who run in armour, at the Olympic, and other games. *Potter*, Archæol. Græc l. 2. c. 21. T. 1. p. 442.

The word comes from the Greek ὅπλον, *armour*, and δρόμος, *a race*.

OPOBALSAMUM, (*Cycl.*) in the materia medica, a name given by ſome authors to the true *balſamum judaiacum*, or *balm of Gilead*. *Dale*, Pharm. p. 282.

OPOPIA, a name given by ſome anatomical writers to the bones which form the receptacle of the eyes.

OPORICE, a name given by the antients to a medicine compoſed of the autumnal fruits, and extolled for its great virtues againſt weakneſſes of the ſtomach and dyſenteries.

It was compoſed of five quinces with their ſeeds, as many pomegranates, a pint of ſervices, a pint of Syrian ſumach, and half an ounce of ſaffron; all theſe were put together into a gallon of muſt, and boiled over a very gentle fire to the conſiſtence of honey, with great care to avoid burning. Vid. *James* Med. Dict. in voc. & *Pliny*, l. 24. c. 14.

OPOS, a word uſed by the old medical writers, to expreſs the juices of plants, whether flowing ſpontaneouſly, or by means of inciſions. It is uſed by Hippocrates to expreſs the juice of ſilphium, which was called ſimply the juice, by way of eminence, as we call the quinquina bark ſimply the bark. Others have made it ſignify the juice of the fig-tree, and the caprificus, which they had in frequent uſe to curdle their milk.

OPOSSUM, or POSSUM, in zoology, the name of a very remarkable American animal, deſcribed by various authors, under the names of *maritacaca*, *carigoi*, *ropoza*, *carigueya*, *jupatuma*, *tlaquatzin*, *ſarigoi*, and *ſemivulpa*.

It is a creature of the ſize of a large cat. Its head is ſhaped like that of the fox; its noſe ſharp, and its upper jaw longer than the under; its teeth are ſmall, but like thoſe of the fox

and it has two long ones, like the hare, in the front of the mouth; its eyes are very beautiful, small, round, and vivid; its ears long, smooth, and very soft, placed erect, like those of the fox, and very thin and transparent. It has black whiskers, like those of a cat; and has other hairs of the same kind on the other parts of its face, and over its eyes; its tail is round, and a foot long, and is of great service to it, as it uses it to twist round the branches of trees, hanging itself to them by that means. The tail is hairy near the insertion, but naked all the other part, and is partly black, partly of a brownish white; its hinder feet are considerably longer than the fore ones, and each has five toes; they much resemble hands, and the nails are white and crooked, the hinder one being as in the monkey kind, the longest. Its head, and legs, as Hernandez observes, something resemble those of the badger. It has a broad, longitudinal, black streak, on the face; it is of a blackish colour with a mixture of a brown and grey on the back and sides, and has somewhat of a faint yellowish cast on the belly. *Ray's* Syn. Quad. p. 183.

What distinguishes this creature, however, from all the other animals of the world, is, that it has a bag or pouch into which it receives its young as soon as deliver'd; this is a sort of open uterus, and is placed under the belly near the hinder legs; in this the young are shelter'd till they are able to shift for themselves, and when they begin to be strong enough they frequently run out and return in again. The creature is of a stinking smell like our fox or martin. It feeds on sugar canes, and some other vegetables; but not wholly on these, for it frequently preys on birds which it catches on the trees, and often plays the fox's trick of stealing poultry.

The *Opossum* has been called *Marsupiale* by some authors, from the *Marsupium* or pouch for the receiving its young. This pouch is a membranous body, not very thick, though consisting of several coats. It has four pair of muscles, serving to contract and distend, as also to open and shut it at the mouth, and there are two bones in this part of the body peculiar to this animal, and serving only for the insertion of these muscles. The pouch itself is to be rang'd among the vesiculous parts of the body, which seem to be part muscles, part glands, and to perform the office of both motion and secretion. The hollow part of this pouch is lightly colour'd with hairs, but these are not placed so thick but that the skin is seen between them. These hairs are usually matted together in several places with a tough, yellow, and glutinous matter arising out of several glands there. This substance is of a very nauseous and offensive smell. Mr. Ray, and others, have observed that this animal, while alive, stinks like a pole-cat, or even worse than that animal. This stink is principally owing to the matter contain'd in this bag; and yet so nearly is this matter ally'd to that contain'd in the scent-bag of the civet-cat, and other animals, that when exposed to the air for some days, it loses its offensive smell, and becomes a very grateful perfume like them. The same observation holds good of the scent bag of our weazel, and pole-cat, which (particularly in the last animal) are very offensive while fresh, but when exposed to the air and dry'd, become only a perfume resembling that of civet.

John Faber relates out of Lerius, that the *opossum* or *serigoi* stinks so that the barbarous Indians refuse to eat it; but that if the kidneys be taken out, the stink goes off in a great measure, and the creature becomes eatable, and his flesh very well tasted; but it is very probable that Lerius, who had seen the operation performed, but examined only in a cursory manner, mistook the seat of the offensive smell, and that the person who performed it, cut deeper than he was aware, and took out this bag or pouch as well as the kidneys. The kidneys, and the fat about them, have no ill smell at all.

The pouch of the *opossum* has, beside its glandular coat, a muscular one, which serv'd to contract or distend the whole substance of it together, as its muscles did its particular parts; beside this, also, it has a vascular coat, in which the blood vessels are dispofed in very great abundance.

The male *opossum*, as well as the female, has this kind of pouch under its belly, and takes upon himself, at times, the care of carrying and preserving the young in case of any impending danger. Phil. Trans. N°. 239. p. 123.

OPTIO, among the Romans, an assistant or lieutenant belonging to every centurion.

They were called *optiones* from *opto*, I choose; because it was in the option of the centurion to choose whom he pleased for this employment; though at first it was otherwise, the *optio* being chosen by the tribune or chief commander of the legion. *Pitisc.* in voc.

The *optiones* were not peculiar to the camp, but were used also in many other offices of life. id. ibid.

OPULUS, the *water-elder*, in botany, the name of a genus of trees, the characters of which are these: The flower consists of only one leaf, but puts on a various form in the different ones. Some are rotated and pierced at the bottom by a pistil; these are barren. Others are hollowed into the shape of a basin, and pierced in the same manner at their bottom by the pointall of the cup: In these the cup finally becomes a soft juicy berry, containing a flatted and heart-fashion'd seed. See Tab. 1. of Botany, Class 20.

The species of *opulus* enumerated by Mr. Tournefort, are these: 1. The common *opulus* or *water-elder*. 2. The *opulus* with globose flowers. *Tourn.* inst. p. 607.

OPUNTIA, in botany, the name of a large genus of plants, the characters of which are these: the flower is of the rosaceous kind, or consists of several leaves disposed in a circular form. The cup, after the flower is fallen, becomes a seed-vessel of a fleshy substance, umbilicated, and unicapsular, fill'd with seeds usually of an annulated appearance.

The species of *opuntia* enumerated by Mr. Tournefort, are these: 1. The common *opuntia* or Indian fig. 2. The middle seed *opuntia*, with oblong leaves. 3. The *opuntia* with small roundish and compressed leaves. 4. The largest *opuntia* with long, broad, and thick leaves. 5. The smallest, round-leaved, Indian *opuntia*. 6. The small American *opuntia* with long and very slender spines. 7. The little, narrow-leaved, American *opuntia*. 8. The tall tree *opuntia* of America, with cereus leaves, and white flowers. 9. The tall tree *opuntia* of America, with articulated leaves and yellowish flowers. See Tab. 1. of Botany, Class 6.

We have several species of this plant, propagated in the gardens of the curious; they are all early raised by cutting off their branches at the joints during any of the summer months; these cuttings are to be laid by for a fortnight, in a dry, warm place, that the wound may heal up, otherwise they are very subject to rot, as are also all the other succulent plants. The proper place for planting these, is one third part common pasture land, one third sea land, and one third more of an equal mixture of lime rubbish and rotten tanner's bark. This mixture should be made three or four months before it is to be used, and the larger stones and clods separated, and laid at the bottoms of the pots, and the rest filled up with the finer part; the cuttings are to be planted in these pots, which are then to be plunged into a hot bed of tanner's bark, where they must be gently watered, and when they begin to shoot they must have as much air as possible; and, finally, removing them into the stove, they must be placed near the glasses, and have as much air as may be: they may be exposed to the open air in the summer months, but they succeed much better when they are kept continually in the stove. *Miller's* Gard. Dict.

ORACH, *atriplex*, in botany. See ATRIPLEX.

Stinking *orach* is a powerful medicine. The very smell of it will sometimes recover patients out of hysteric fits, when all the common means fail; and a decoction of the plant is an excellent medicine in the same cases. A decoction of it, made very strong, and given in a glyster, in hysteric cases, is also excellent; and a conserve of the leaves, one of the best forms it can be given in, has the same virtues in a very high degree, alone; and is a good medium to bring other medicines into the form of an electuary for the same purposes. A syrup of it is sometimes kept in the shops, and is not without its merit, though a great deal of the virtue of the plant be lost in such a form.

ORANGE, *aurantium*, in botany, the name of a genus of trees, the characters of which are these: the flower is of the rosaceous kind, being composed of several petals, arranged in a circular form; the pistil arises from the cup, and is surrounded by a number of little leaves, which terminate in the stamina. This pistil finally becomes a fruit of a roundish figure, covered with a thick and fleshy rind, and divided within into several cells, which are full of juice and vesicules, and contain several callous seeds. To this is to be added, that the leaves are heart-fashioned at the bottoms.

The species of *orange*, enumerated by Mr Tournefort, are these: 1. The common sweet *orange*. 2. The common-sharp-tasted *orange*. 3. The winter *orange*, with a less juicy fruit. 4. The sharp-tasted wild *orange*. 5. The *orange*-tree with curled leaves. 6. The stellated rose-*orange*. 7. The variegated *orange*. 8. The variegated, narrow-leaved *orange*. 9. The corniculate *orange*. 10. The narrow-leaved corniculate *orange*, with smaller fruit. 11. The striated *orange*. 12. The foetiferous *orange*. 13. The manyfold foetiferous *orange*, with one fruit, including two or three others. 14. The Lisbon *orange*. 15. The China *orange*. 16. The large-fruited *orange*. 17. The manyfruited *orange*. 18. The *orange* with very narrow spear-pointed leaves. *Tourn.* Inst. p. 620.

ORANGE-*flowers*. These flowers are very justly esteemed one of the finest perfumes. The water distilled from them is accounted stomachic, cordial, and carminative. Some also speak of it as a sudorific.

There are a very great variety of *orange*-trees in the gardens of the curious. The manner of raising them from seeds is this: When you purpose to raise stocks for buding, they should be raised from citron seeds, taken out of the rotten fruit in spring; for the stocks of this kind are preferable to any other, both for their quickness of growth, and their readily taking buds either of *oranges*, lemons, or citrons.

A good hot bed must be prepared, either of horse dung or tanners bark. The last, where it can be had, is much the best;

beſt; the ſeeds muſt be ſown in pots of rich earth, and theſe, when the bed is of a due temper, muſt be plunged into it. The pots muſt be watered frequently, and the glaſſes of the hot-bed ſhaded with mats in the heat of the day, and at times raiſed to give air.

The ſeeds will come up in three weeks, and a month after this the plants will be fit to tranſplant into ſingle pots. The bed muſt be now renewed, and ſome pots of about five inches over at the top, muſt be filled half full with freſh earth, mixed with very rotten cow-dung Place one plant in the middle of each of theſe pots, and then fill it up with the ſame earth; then place theſe pots in the new hot-bed, and water the plants every day. By July, the plants will be two foot high, and muſt then be hardened by degrees to the air, by raiſing more and more the glaſſes of the hot bed. In September they muſt be taken into the greenhouſe; in the winter ſeaſon they muſt have frequent ſmall waterings, and in ſpring their heads muſt be waſhed, to cleanſe them from filth. In ſpring, they muſt have again a gentle hot-bed, but in June they muſt be hardened again; and in Auguſt they will be fit to bud.

At this time you are to make choice of cuttings from very thriving and fruitful trees; chuſing ſuch buds as are round. When the ſtocks are budded, they muſt be removed into the greenhouſe, to ſhelter them from wet, turning their buds from the ſun, but letting them have as free air as poſſible, and refreſhing them often with water. They muſt remain in the greenhouſe all winter, and in the ſpring muſt have another bark hot-bed; then cutting off the ſtocks about three inches above the buds, obſerve to give them as much water as they require.

The buds with this management will be by July three feet high, and they muſt then be hardened by degrees, that they may bear the greenhouſe in the winter; and as this will be a ſufficient height for the ſtems, it is proper at this time to ſtop the leading branch to force out lateral ſhoots. This firſt winter they will be tender, and muſt be taken great care of, and after this they require no more care than other full grown trees.

It is a regular and certain way of ſupplying a greenhouſe with *orange*-trees, but there is a much more expeditious one, which is the purchaſing ſuch trees as are brought over every year from Italy. Theſe are as large when we receive them, as thoſe of our own produce will be in ten or twenty years growth; and tho' they have but ſmall heads then, will be brought to have very good ones in three years, and to produce very fine fruit.

In the choice of theſe trees, thoſe which have two buds in ſtock are preferable to thoſe which have only one; and the ſtraitneſs of the ſtem, freſhneſs of the branches, and plumpneſs of the bark, are greatly to be regarded. When you have purchaſed a proper number of theſe trees, each of them is to be ſet in a tub of water, with its head and half its trunk above the ſurface; they are to ſtand in this three days, then they are to be taken out, their roots picked, and bruſhed clean, and the tops of the branches cut off, and they are to be planted ſingly, in pots juſt large enough to contain their roots, in a mixture of freſh earth and rotten cow-dung. Theſe are to be ſet in a moderate hot tanners bark-bed, and ſome potſhreds muſt be always put at the bottom of the pots, to keep their holes from being ſtoped, and give a free paſſage to the water. They are to be moderately watered at proper times, and by the month of June they will ſhoot out pretty long ſhoots, which muſt be ſtoped, in order to produce the lateral branches. They muſt now be hardened by degrees, and in the middle of July muſt be brought into the open air, in ſome warm ſituation, defended from winds and from the too great heat of the ſun. In September they muſt be removed into the greenhouſe, and watered gently during the winter. In the ſucceeding ſummer, the branches muſt be ſtopped from growing to their lengths, to furniſh a good head; and they muſt be frequently watered. And after this, they will require no farther management, but to be new potted every year; which ſhould be done in April, and the earth prepared for it a year beforehand, of cow-dung and freſh earth. The roots ſhould be ſoaked a quarter of an hour in water, and afterwards ſcrubed very clean, before they are put into the new pot.

If old *orange*-trees have bad heads, the way to mend them is to cut them moſtly off, and proceed with them in the ſame manner as with the trees brought from Italy.

All *orange*-trees require frequent waterings, but theſe ſhould not be large; there muſt always be a paſſage for the water to run off at the bottom of the pot or tub; they muſt have as much freſh air in winter, as the ſeaſon will allow, and they ſhould not be placed too near each other in the greenhouſe. In ſummer they ſhould be placed where they may have the morning and evening ſun, without too much wind; and they ſhould not be houſed till October. The ſhaddock and citron are much tenderer than the *orange*, and ſhould therefore be houſed ſooner.

In the Philoſophical Tranſactions, Nº 114, there is a very remarkable account of a tree ſtanding in a grove near Florence, having an *orange* ſtock, which had been ſo grafted upon, that it became in its branches, leaves, flower, and fruit, three-formed; ſome emulating the *orange*, ſome the lemon, or citron, and ſome partaking of both forms in one; and what was very remarkable, was, that theſe mixed fruits never produced any perfect ſeeds; ſometimes there were no ſeeds at all in them, and ſometimes only a few empty ones.

The ſeeds of the *orange* kind ſeem different in their nature from thoſe of all other plants In the generality of others, the ſeed is only a ſort of nidus, and bed of a nouriſhing matter, for the young plant contained in ſome one part of it, and called the plantula ſeminalis; and however minute the ſeed itſelf may be, this plantula is but a very ſmall part of it: but the ſeeds of the *orange*, though contained in the inſide of a pulpy fruit, and in all reſpects, ſeeming of the nature of the common ſeeds, yet, when examined nicely, are found to contain, not a ſimple plantula ſeminalis, but each of theſe ſeeds or kernels, contains within it another compleat ſeed. Both in the *orange*, and lemon kinds, on opening what we call the ſeeds, when the ſkin, or membrane, is ſtripp'd off, there are frequently found two ſeeds encloſed in that membrane, that is, under the ſkin, and without ſide of the kernel, there is a ſmall ſeed, the like of which does not appear in the ſeed of any other fruit.

It is true, indeed, that in hazel nuts, as alſo in almonds, and in peach and apricot kernels, we often find a double ſeed, or kernel, but then each of them is ſeparately encloſed in its own membrane, and has no communication with the other, but is only placed in ſimple contact with it; and each has its diſtinct ſtalk, or ſtring, by which it ſeverally receives its nouriſhment; and, in theſe, the containing of two kernels ſeems only an accident, a kind of ſuperfœtation, as in the twin births of animals, which, naturally, bear only one.

When one of the *orange* or lemon ſeeds is ſtripp'd of its outer membrane, there appears a little ſtring, which lying under it, cauſes a protuberance in the firſt ſkin; and from this ſtring not only the ſeed, but the plant within it receives its nouriſhment; and the firſt and hard ſkin, which is eaſily ſeparated, ſeems only given to it for the defence of the inward parts; whereas nuts, almonds, peach-ſtones, and the like, have a much harder and firmer coat given them for the ſame purpoſe. The ſtring which appears through the firſt membrane extends its ſmall veſſels alſo through the ſecond membrane near the ſeat of the plantule; but theſe are ſo extremely fine, that we loſe them before they enter it, no microſcope being able to ſhew them farther than where they grow extremely ſmall, and fine, near the entrance into this part. It is an amazing thought, but it is alſo an evident truth, that this ſmall ſtring, which runs in this manner under the coat of this ſeed, contains in it as many diſtinct veſſels as are to be found in a full grown *orange*-tree; for if all theſe veſſels were not in the young plant, while involved in its matrix, whence ſhould they come afterwards? When this ſtring is cut tranſverſely, and examined before a good microſcope, ſomething of this appears, for there are ſeen in it the ſections of ſeveral veſſels, and the ſmall quantity of pulpy matter between them is encloſed in a ſeemingly thick and tough membrane, together with them, in order to keep the whole together: if the ſeed, or kernel, be itſelf cut acroſs, it appears to be only a congeries of a great number of globules of a ſoft matter, preſſed together. Within this ſeed thus cut, and under all its membranes are ſeen the two regular, and perfect ſeeds, lodged together, and not ſeparated by any membrane, as the accidental double kernels of nuts, &c. always are; ſometimes, indeed, there is only one ſuch obſerved, and ſometimes there are three. Theſe are not always of the ſame ſize, but one is often larger than the others. Each of theſe is, however, a true perfect, and diſtinct ſeed, and is divided naturally into two lobes, and theſe ſeem only to have been united at firſt, juſt where the young plant lies, ſo that this whole kernel ſeems to have been deſtined by nature for no other end, but to foſter and cheriſh the young plant, till it become able to ſhoot up and live above ground. In the heart of this inner ſeed is found the plantula ſeminalis, which is not larger than a ſmall grain of ſand, to the naked eye. The wonderful conformation of this ſtructure, cannot but ſtrike any one who is uſed to examine ſeeds, with great amazement. It is plain that the ſeed contained within the other ſeed, can only receive its nouriſhment from the veſſels contained in the ſtring above deſcribed But it is amazing, that theſe ſhould not be, as uſual, immediately diſtributed from that general cord, or congeries of them, to the ſeed itſelf, but to another that is the center ſeed, and can only come to the inner ſeed, after having paſſed thro' this, and been in it devaricated into other veſſels too fine for the eye to trace.

Signior Franciſco Lana, in his prodromus to ſome philoſophical diſcoveries, tells us, that there is a way of producing *oranges*, without ſowing or planting the trees, only by infuſing the flowers in oil of almonds; for that this oil will, every year afterwards, at the proper ſeaſon, produce both flowers, and ripe *oranges*. See the whole proceſs at large, under the article FRUITS, as atteſted by the author and his friends.

Sea ORANGE, in natural hiſtory, a name given by Count Marſigli to a very remarkable ſpecies of ſea plant. It is tough and firm in its ſtructure, and, in many things, reſembles the com-

common fucus; but, instead of growing into the branched form, the generality of those plants have, it is round and hollow, and in all respects, resembles the shape of an *orange*. It has, by way of root, certain very fine filaments, which fasten themselves to the rocks, or to shells, stones, or any thing else that comes in the way. From these their grows no pedicle, but the body of the *orange*, as it is called, is fastened by them to the rock, or other solid substance. The *orange* itself, is usually of about three or four inches in diameter; and while in the sea, is full of water, and retains this when taken up. In this state, it frequently weighs a pound and an half, but when the water is let out, and it is dryed, it becomes a mere membrane, weighing scarce any thing. It is best preserved, by stuffing it full of cotton, as soon as the water is let out of it, and hanging it up to dry in this form. Its surface is irregular and rough, and its colour a dusky green on the outside, and a clearer, but somewhat bluish green within; and its thickness is about an eighth part of an inch. When viewed by the microscope, it is seen to be all over covered with small glandules, or indeed, composed of them; for they stand so thick, one by another, as to leave no space between, and seem to make up the whole substance: so that it appears very like the rough chagrin skin used to cover toys. These are all so many hollow ducts, thro' which the sea-water finds a passage into the globe formed by this skin, and by this means it is kept always full and distended; on cutting it with a pair of sciffars, the water immediately runs out, and the skins collapse: but there is something farther remarkable, which is, that the whole substance, near the wounded place, is in motion, and seems as if alive, and sensible of the wound. The glandules are found full of water, and resembling small transparent bottles; and what goes to the structure of the plant beside these, is an assemblage of a vast number of filaments, all which are also hollow, and filled with a clear and transparent fluid.

There is another plant of this kind, described by Count Marsigli, Triumfetti, and others, and called the *ramose*, or branched *orange*. This is very much of the nature of the former plant, but instead of consisting of one round globule, it is formed of several oblong ones, all joined so together, that they represent the branches of some of the fucus's, but that they are shorter; and these are all hollow and full of water, in the same manner as the single globes of the common kind. This has, by way of root, certain fine and slender filaments, which fasten it to the stones or shells near which it is produced; and it is of a dusky greenish colour on the surface, and of a fine bluish green within. The surface viewed by the microscope, appears rough, as in the other, and the glandules are of the same kind, and are always found full of a clear water. *Marsigli*, Hist. de la Mer. p 81.

ORANGE-*dew*, a sort of dew which falls in the spring-time, from the leaves of *orange* and lemon trees, and is extremely fine and subtile. Mr. De La Hire observing this, placed some flat pieces of glass under the leaves to receive it, and having thus procured some large drops of it, was desirous of finding out what it was. He soon found that it was not a merely aqueous fluid, because it did not evaporate in the air; and that it was not a resin, because it readily, and perfectly mixed with water: it was natural here to suppose it a liquid gum; but neither did this, on examination, prove to be the case; for being laid on paper, it did not dry as the other liquid gums do. Its answering to none of these characters, and its being of the consistence of honey, and of a sweet-sugar-like-taste, gave a suspicion of its being a kind of manna; and whatever in the other tryals had proved it not a resin, a gum, &c. all equally tends to prove that it is this substance.

ORARIUM, in ecclesiastical writers, the same with *brandeum*. See the article BRANDEUM.

ORATORIO, in the Italian music, a sort of spiritual drama of dialogues, containing recitativos, duettus, trios, ritornellos, chorusses, &c.

The subjects of these pieces are usually taken from the Scriptures, or from the life of some saint, &c.

The music for the *oratorio* should be in the finest taste, and most chosen strains. These *oratorios* are greatly used at Rome in time of lent; and of late in England.

ORBICULAR *leaf*, among botanists. See LEAF.

ORBICULARE *os*. See the article OS.

ORBICULARIS, (*Cycl.*) in anatomy, a name given by Riolanus, and some others, to the muscle called by Albinus *orbicularis oris*, and by Cowper and others, *constrictor labrorum*.

ORBICULARIS, in botany, a name given by some authors to the *artanita*, or *cyclamen*, called in English *sow bread*. Ger. Emac. Ind. 2. See CYCLAMEN.

ORBICULARIS *intestini*, in anatomy, a name given by Vesalius, and some others, to the muscle now known by the name of the *sphincter ani*.

ORBIS, in zoology, the name of a genus of fishes, of which there are a great many species: that, however, which is usually meant by the word *orbis* above, is the species called *orbis primus*, by Rondeletius, and *orbis ægyptiacus* by Salvian, because frequently caught in the ostia of the Nile. Excepting the tail, this fish is of a round figure. It has no scales, but is covered with a firm and hard skin all over, full of small prickles, which render it very rough. Its mouth is small, and has four broad teeth. It has only one hole on each side for its gills, and a fin under each. It has another fin near the tail on its under part, and another answering to it in its upper. The tail is one broad and flat fin. It is not eatable, for the whole fish is head, or if you would rather call it so, belly. *Willughby's* Hist. Pisc. p. 143. See Tab. of Fishes, N° 18, 63.

There is an opinion, that when this fish is dryed and hung up by the tail, it will always turn its mouth to that quarter from whence the wind blows.

The other species of this genus are, the *orbis lagocephalus*, *orbis scutatus*, *orbis muricatus*, *orbis ranæ rictu*, *orbis spinosus Clusii*, *orbis muricatus alter Clusii*, and the *orbis oblongus testudinis capite*. *Rondelet*, *Gesner*, *Aldrovand*. and *Salvian*.

ORBIS *magnus*, in astronomy, the *orbit* of the earth in its annual revolution round the sun.

ORCHESOGRAPHY, the art of noting all the steps and motions used in dancing. See DANCE, *Cycl.*

ORCHIS, in botany, the name of a genus of plants, the characters of which are these: the flower is of the polypetalous anomalous kind, consisting of six leaves irregular in shape and size. The five upper of which are so disposed, as in some degree, to resemble a helmet. The lower leaf is of various shapes in the different species; it has usually a head, and often a tail, and resembles the body of a fly, a bee, a man, or other animal. The cup of the flower finally becomes a fruit, which is pervious by three fenestræ, to each of which there adheres a valve. The seeds are extremly small, and resemble a fine dust. To this it is to be added, that the roots are fleshy, with fibres propagated from them, and are in some species roundish, and resemble the testicles of an animal, and in others divided into several segments, resembling a hand and fingers. See Tab. 1. of Botany, class 11. *Tourn.* Inst. p. 431.

The species of *orchis*, enumerated by Mr. Tournefort, are these: 1. The broad-leaved great *orchis*, with a gaping hood. 2. The smaller-flowered broad-leaved *orchis*, with a gaping hood. 3. The broad-leaved *orchis*, with a compact spike of flowers. 4. The narrower-leaved *orchis*, with a gaping hood. 5. The great soldier *orchis*. 6. The middle soldier *orchis*. 7. The lesser soldier *orchis*. 8. The mountain soldier *orchis*, with a red conglomerated spike. 9. The tall meadow soldier *orchis*, with variegated flowers. 10. The lower meadow soldier *orchis*. 11. The sweet-scented purple mountain *orchis*. 12. The sweet-scented dusky purple *orchis*. 13. The globular-flowered *orchis*. 14. The dwarf alpine mossy-leaved *orchis*. 15. The common male *orchis*, with spotted leaves. 16. The common male *orchis*, with shorter spotted leaves. 17. The common *orchis*, with drooping leaves, not spotted. 18. The common *orchis*, with drooping plain leaves, and with small white flowers. 19. The common female *orchis*. 20. The common female *orchis*, with rose-coloured flowers. 21. The female *orchis*, with white and changeable-coloured flowers. 22. The common little male *orchis*, with spotted leaves. 23. The male man *orchis*. 24. The female man *orchis*. 25. The monkey *orchis*. 26. The male Portugal man *orchis*, with an aromatic smell. 27. The Portugal man *orchis*, with a small green flower with a purple edge. 28. The bearded or goat *orchis*, with short and broad leaves. 29. The goat *orchis*, with longer and narrower leaves. 30. The smaller goat *orchis*. 31. The smaller goat *orchis*, with a purple spike. 32. The common purple spiked stinking *orchis*. 33. The white sweet-scented *orchis*, with spiral flowers. 34. The two-leaved *orchis*, with very broad leaves. 35. The narrower-leaved bifoliate *orchis*. 36. The smaller bifoliate *orchis*, with white flowers, with long spurs. 37. The greater trifoliate *orchis*. 38. The smaller trifoliate *orchis*. 39. The butterfly *orchis*, called by some the *frog orchis*. 40. The greater bee *orchis*, with the upper leaves white and purple. 41. The bee *orchis*, with greenish flowers. 42. The bee *orchis*, with ferrugineous flowers. 43. The bee *orchis* with blue flowers. 44. The bee *orchis*, with spotted flowers. 45. The bee *orchis*, with white flowers. 46. The bee *orchis*, with wholly purple flowers. 47. The bee *orchis*, with variegated flowers. 48. The greater fly *orchis*. 49. The lesser fly *orchis*, with green wings and a green head. 50. The yellow fly *orchis*. 51. The narrow-leaved *orchis* 52. The *orchis* resembling an expanded butterfly, with green flowers. 53. The butterfly *orchis*, with spotted leaves. 54. The narrow-leaved white flowered butterfly *orchis*. 55. The spider *orchis*. 56. The Italian mountain *orchis*, with a ferrugineous flower with an oblong tongue. 57. The spotted-leaved Italian *orchis*, with long tongues. 58. The broad leaved handed meadow *orchis*, with long spurs. 59. The broad-leaved palmated meadow *orchis*, with fresh coloured flowers with long spurs. 60. The broad-leaved palmated meadow *orchis*, with snow-white flowers with long spurs. 61. The great narrow-leaved palmated meadow *orchis*. 62. The palmated meadow *orchis*, with spotted leaves. 63. The white-flowered spotted-leaved palmated meadow *orchis*. 64. The spotted leaved palmated meadow *orchis*, with variegated flowers. 65. The greatest

greateſt meadow-palmated *orchis*. 66. The leſſer palmated *orchis*, with long ſpurs to the flowers. 67. The ſmall narrow-leaved ſweet-ſcented palmated *orchis*. 68. The clove-ſcented palmated *orchis*. 69. The white-flowered palmated *orchis*, with the ſmell of elder. 70 The purple-flowered palmated *orchis*, with the ſmell of elder. 71. The palmated frog *orchis*. 72. The caſtrated *orchis*. 73. The broad-leaved marſh palmated *orchis*. 74. The narrower-leaved palmated marſh *orchis*. 75. The common palmated marſh *orchis*, with very narrow leaves. 76. The palmated marſh *orchis*, with ſpotted leaves. 77. The palmated marſh *orchis*, with red leaves and flowers. 78. The green-flowered palmated *orchis*. 79. The largeſt palmated *orchis*, with a bright-red ſweet-ſcented flower. 80. The greateſt palmated mountain *orchis*. 81. The narrower leaved great palmated mountain *orchis*. 82. The white-flowered palmated mountain *orchis*, with ſpotted leaves. 83. The narrower-leaved palmated alpine *orchis*, with a black flower. 84. The narrow-leaved palmated mountain *orchis*, with roſe-coloured flowers. 85. The narrow-leaved palmated mountain *orchis*, with white flowers. *Tourn.* Inſt. p. 443

ORCHIS-*root*, in the materia medica, is otherwiſe named *ſalep*, vulgarly called *ſaloop*. See the article SALEP.

ORCHIS, in ichthyology, a name given by Geſner, and ſome others, to the fiſh, commonly called *orbis*, and by Artedi the ſpherical *oſtracion*, with four teeth, and ſmall ſpines all over it. See the article OSTACION.

ORCHOTOMY, a word uſed by ſome chirugical writers for the operation of caſtration.

ORCYNUS, in zoology, a name by which ſome authors have called the fiſh commonly known by the name of the tunny or thynnus. *Willughby*'s Hiſt. Piſc. p. 176. See THYNNUS.

ORDER, in rhetoric. See DISPOSITION, *Cycl.*

ORDINARY (*Cycl.*)—ORDINARY *Court of Chancery.* See PETTY *bag*.

ORDINATE (*Cycl*)—To find the greateſt and leaſt *ordinates* to curves. See MAXIMUM, *Cycl. & Suppl.*

ORE (*Cycl.*)—Some *ores* are ſo kindly as to melt readily of themſelves, without any aſſiſtance from the common fluxes; theſe are of great value to the owners Other are more intractable and require the aſſiſtance of various fluxes, and others ſo very obſtinate as not be work'd in the larger way, where there can be no very conſiderable expence allow'd for fluxes. On this account many mines remain at this time unwrought, as being untractable in the large way without great charges; hence the improving the buſineſs of fluxes ſerves to render them at once both cheap and effectual, and muſt be of great ſervice to metallurgy.

Some of the cheapeſt and moſt powerful fluxes now in uſe are dry'd wine lees, dry'd cow-dung and horſe-dung, dry'd river-mud, fuller's-earth, iron filings, common ſalt, potaſh, and ſandiver. Theſe may be uſed in the larger works, as nitre, tartar, borax, ſal armoniac, and mercury ſublimate in the leſs: as for compound fluxes they are very numerous, almoſt every operator having his particular noſtrum; and it is plain that ſome fluxes are better adapted to the *ores* of ſome metals than others; but certainly a few general ones might be fixed upon, one or other of which would anſwer all the operator's expectations.

The following three preparations are all very general, very powerful, and not expenſive. 1. Take of nitre, prepared by long boiling in lime water, of ſea-ſalt melted in the fire, of ſandiver, and of dry wine lees, each one part; glaſs of lead three parts, and powdered glaſs eight parts; mix them all well together, and uſe them in an equal weight with ſtubborn *ores*. 2. For a ſtill ſtronger flux take equal parts of white tartar, common ſalt, and nitre prepared as above; calcine all together to a white powder, and mix with it its own weight of glaſs of lead: of this flux add two parts to one part of the moſt ſtubborn ores. 3. For every powerful ſaline flux, take of the ſtrongeſt ſoap-boiler's lees four pounds, of white tartar and common ſalt, melted in the fire, each one pound, boil theſe together, with four gallons of human urine, to a dry ſalt. This flux is particularly ſerviceable where ſulphur and cobalt abound, and render the *ore* very refractory. *Shaw's* Lectures, p. 257.

The *ores* of the richer metals, as gold and ſilver, uſually contain a very conſiderable portion of ſulphur, and Alonſo Barba tells us, that the moſt expert mineraliſts in Peru, always eſteem abundance of ſulphur a ſign of a rich *ore* in the neighbourhood. Among the richeſt *ores* of the mountain of Potoſi, there are ſuch quantities of native brimſtone, that the cavities in the mines are often filled with a blue flame, on only bringing a lighted candle into them ſo as to touch their ſides. It has been wondered at, that where there is abundance of ſulphur in theſe mines, there ſhould be no vitriol found, that being only a metal diſſolved by means of ſulphur; but this objection ceaſes, when we conſider the denſe and compact nature of theſe two metals, which renders them not ſoluble by means of ſulphur, as the others are. Wherever there is ſtore of ſulphur, or of pyrites, or other ſtones which contain ſulphur in the mines of copper and iron, great ſtore of vitriols are always found there alſo, being formed by the corroſion of the *ores* of thoſe metals by ſulphur, which renders them ſoluble in water, from which they again concrete in form of ſalts. Chemiſtry is able to imitate the operations of nature on this occaſion ſeveral ways; for copper, or iron, being formed in thin plates, and either rubbed over with the acid ſpirit of ſulphur, or calcined with powder of common ſulphur, become ſoluble in water, and afford cryſtals of true vitriol wholly analogous to the natural ones, and either blue or green, as iron, or copper are the metals employed; but theſe proceſſes not being able to produce cryſtals of ſalt, or vitriol, from either ſilver, or gold, it is not wonderful that nature is not able to form them by the ſame means.

The general formation of ſulphur from the ores of metals yet lying in the bowels of the earth, is, probably, after this manner. An acid, ſaline, ſulphureous ſteam, or vapour, ſuch as common ſulphur is eaſily reduced to, by heat not greater than that within the bowels of the earth, inſinuating itſelf either through the pores of ſtones, or through their cracks, which are always frequent about the veins of metals, penetrates into the bed of *ore*; ſuppoſe of copper. The vapour is continually ſupplied with freſh quantities from below; and as it blends itſelf with the metal, corrodes it as the fume of brimſtone will the ſame copper in plates. The metal, thus corroded, being ſoluble in water; as we find by experience, it is neceſſary, that the *ore* muſt, under the ſame management, be ſo too; and, in this caſe, the water, which is continually pervading all the ſtrata of the earth, waſhes off the diſſolved metal; and whereever it happens to be ſtayed in ſmall quantities afterward, whether within the vein of the metal, or at a diſtance from it, it cryſtallizes the ſalt it contains, and common blue vitriol is produced, if the metal in the vein be iron. The ſame proceſs is obſerved, and the event is the ſame in all reſpects, when copper is the metal corroded, except that the vitriol, inſtead of blue, is green; this plainly accounts for the obſervation of the workers in copper-mines, that vitriol and brimſtone are uſually found together, the one being a natural conſequence of the other. Sulphur is, indeed, often found where there is no vitriol, but vitriol is very ſeldom found without ſulphur; it being not a diſtinct principle, but a genuine production of ſulphur. Phil. Tranſ. N° 104.

Dreſſing of ORES. See the article DRESSING.

Iron ORE. See IRON.

Gold ORE. See GOLD.

Firm, *Pottern*, and *Steel* ORE. See LEAD *ore*.

OREILLARD, in the manege. See WIDE-*eared*.

OREJUELAS, in botany, a name uſed by ſome authors for the *flos auriculæ*, a flower growing in New Spain, and uſed there in making chocolate. *Dale*, Pharm. p. 339.

OREON, a name given by the antients to a kind of *horſe-tail*, which they found growing on the mountains in wet and damp places. It is to this ſpecies that many authors have attributed the principal virtues of the genus; and this ſeems to have been the ſame with our great water *horſetail*. Neophytus ſays, that it roſe up with a ſingle ſtalk, reſembling a young reed, and that this was compoſed of ſeveral points, which, in the manner of cups, were inſerted one into another; and that from theſe joints the leaves grew, and that they reſembled thoſe of the pine-tree. The branches are what this author calls leaves, and they do pretty well reſemble the leaves of the pine-tree. They are long and ſlender, and of a bright green. Our great *horſetail* loves the heads of ſprings in hilly countries, and is always moſt plentiful in ſuch places.

OREOSELINUM, *mountain-parſley*, in botany, the name of a genus of plants of the umbelliferous kind, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular order on a cup, which afterwards becomes a fruit compoſed of two large, oval, flattiſh, ſtriated, and marginated ſeeds, which ſometimes depoſit their covering. To this it may be added, that the leaves are like thoſe of parſley, or hemlock.

The ſpecies of *oreoſelinum* enumerated by Mr. Tournefort are theſe: 1. The great, parſley-leaved *oreoſelinum*. 2. The leſſer, parſley-leaved *oreoſelinum*. 3. The hemlock-leaved marſh *oreoſelinum*. 4. The ſhrubby, aniſe-leaved, African *oreoſelinum*, which produces the *galbanum* of the ſhops. This is called by many *ferula galbanifera*. *Tourn.* Inſt. p. 319.

OREXIS, *appetite*. The appetite, when exceſſive, or otherwiſe vitiated, is diſtinguiſhed by medical writers into ſeveral kinds, and deſcribed under ſeveral names, according to its difference in degree, and other particulars.

The firſt kind is the *addephagia*: this is the name given that ſpecies in which the food is not only eaten in too large a quantity, but is ſwallowed in a particularly ravenous manner.

The ſecond is the *orexis canina*: in this caſe the patient is continually eagerly longing for food, and if it is not ready ſo ſoon as he deſires, he is ſubject to fainting fits after the recovery, from which he does not feel the ſame craving appetite.

The third is the *pica*, or *ſitta*: this is the caſe when the patient has an eager appetite to things not fit for food, ſuch as chalk, cinders, tobacco-pipes, and the like.

The fourth is the *malacia*: this is diſtinctively made the name of that ſpecies of *exceſſive appetite* in which the patient

ent has a great desire for some particular things, but those of the nature of common food, and usually of the nicer, and more delicate kind.

Signs attending it. An over-large eating is usually attended with cardialgias, anxieties, and straitness of the breast; after this, with nauseas, eructations, and not unfrequently with a vomiting, or a diarrhœa; often a dizziness of the head follows, and sometimes very violent pains in it, with a lassitude and pains in the limbs, and pains and rumblings in the abdomen; finally, sometimes fevers, sometimes suffocations, and sometimes convulsions, are the consequence.

Persons subject to it. The *excess of appetite*, in its different kind, affects different sets of people. The *addephagia* is usually the case with boys who are just come to distinguish good taste, and feed as their parents do; and sometimes with women who have more sensation than judgment. People in general of sanguine and sanguineo-phlegmatic habits, eat more food than others; and choleric persons often eat, and usually swallow their food, quicker than others. Persons of melancholic habits, are usually of all others, the least eaters. Finally, people, in general, eat heartily, and even excessively, when they come, from a coarse and homely diet, to a more elegant and agreeable one; and this *excessive appetite* becomes a symptomatic complaint with people who are troubled with worms, and with hypochondriac complaints, with quartans, and often with epilepsies.

The *malacia* seems particularly to affect women during the time of their being with child. The *pica* is common to women with child; to young women before the first eruption of the menses; with those who are emaciated by a too violent flux of that discharge; and, finally, sometimes, though more rarely, to persons in epilepsies, and in quartans.

Causes of it. *Excessive appetite* is generally occasioned by a too great love to agreeable tastes, which generally degenerates into a custom of devouring things of agreeable flavours greedily; and, finally, into an habitual and almost necessary desire of them. In infants who are over-much fed by their nurses, the fault is not in the will, but even this also, in fine, becomes habitual, and not to be overcome easily.

Prognostics in it. *Excessive appetite* does great mischief among men, and is a very common complaint, inasmuch that there are ten thousand who err in eating more than nature requires, for one who eats less. It is common for persons recovered from illnesses to have an *excessive appetite*; but, if this be indulged to the extent, it usually brings on either a return of the same disease, or, at least, one equally bad. People, after long hunger, have also the same sort of *excessive appetite* as after diseases, but there have been frequent instances, that those who indulged it freely have died upon the spot. In general, the consequences of *excessive appetite* indulged, is diseases of many kinds, particularly obstructions of the viscera, cachexies, and atrophies. When the *pica* attends a quartan, it very often happens, that all medicines are vain in the attempt of a cure, till that unnatural *appetite* has been perfectly sated. When young girls fall into a *pica* from a want of the menses at a due time, they are always relieved from it by the appearance of that evacuation; but in persons who fall into it from inordinate profluvia of that discharge, it is usually very difficult of cure, and the same difficulty always attends it when hereditary.

When people have eat to an immoderate degree by reason of any of these kinds of *excessive appetite*, the best method of relieving them, is by giving them large draughts of warm water, till they vomit; or, if the stomach will not be brought to discharge its contents by this means, a few grains of emetic tartar are to be given, or a small dose of ipecacuanha. After this the bowels are to be gently relaxed; but this is by no means to be done by any violent medicines, the stimulus of which would bring on violent and dangerous pains. After the mischief of a monstrous repletion is, by this means, got over, the best preservative for the future is abstinence, and gentle exercise. There have, however, been instances of people being cured of this disease, by palling the *appetite* by large draughts of oil, regularly taken, three times a day. The good women have a way of curing the *pica* in girls, by making the chalk, and other such things which they are to eat, bitter, or of some other disagreeable taste; when a girl has been once tricked in this manner, she will often have as violent a distaste to these unnatural eatables, as she before had an inclination for them; and, in like manner, grown persons who have violent *appetites* to certain particular foods, have been cured by conveying into them an infusion of tobacco, or some other such thing as will provoke vomiting, so disguised as not to be tasted, while eaten. When the stomach and bowels, over-loaded by these meals, are, of themselves, discharging their abundant contents, by vomit, or stool, it is a very rash and dangerous practice to give any thing to stop those emotions till the whole is thoroughly carried off. *Junker's* Consp. Med. p. 605, seq. See the articles Canine, Bulimy, &c.

ORFUS, in zoology, the name of a fresh water fish, common in Germany, and called there the *orst*, the *oerve*, and the *nersling*; seeming by the descriptions of Gesner, and other authors, to be the same with our *rudd*, or *rubellio fluviatilis*. See Tab. of Fishes, N°. 43. *Willughbgy's* Hist. Pisc. p. 252.

ORGANO, in the Italian music, is used to signify the thorough bass. It is usually scored with figures over the notes, for the harpsichord, bass-viol, and lute.

ORGUES, (*Cycl.*) are preferable to herses, or porteullises, because these may be either broke by a petard, or they may be stopped in their falling down; but a petard is useless against an *orgue*; for if it break one or two of the pieces, they immediately fall down again, and fill up the vacancy; or if they stop one or two of the pieces from falling, it is no hindrance to the rest; for being all separate, they have no dependance upon one another.

ORICHALCUM, or Aurichalcum, *brass*. See the article Brass, *Cycl* and *Suppl.*

It is to be observed, that zink is the metal which has the power of giving a yellow colour to copper. We long supposed, from calamine's answering the same purpose, that two different substances could do this; but it has been since found that they are the same, and that calamine is no other than the ore of zink. See the article Calamine.

It is evident from all accounts, that the *orichalcum* of the antients was a fictitious substance, not a natural metal. They made it on the same basis that we make brass at present; but they had several ways of doing it, and distinguished it into several kinds. They had a white sort in frequent use and great esteem; and even the yellow they distinguished into two principal sorts, under different names. The *orichalcum* and *æs flavum*, brass and yellow copper, are with us synonymous terms; but with them they were used to express different combinations of the ingredients. Pliny tells us indeed of a natural mine of this metal found somewhere, and that the metal produced from it was in very great esteem. He says, that the making of brass was first found out in Cyprus, and that it was an artificial metal, but that this natural kind was greatly superior to it, and was the only kind in esteem, so long as the mine yielded any of it, but that at last it was exhausted. This account is unquestionably erroneous; but yet it has taken so much footing in the world from the authority of this author, that many suppose it truth, and think that we have not at present the metal called *orichalum* by the antients. They who suppose, according to Pliny, that there was once a vein or mine of this metal, which was afterwards lost again, certainly err, and there is sufficient proof of the truth of the contrary opinion by all the Greek writers, declaring the manner in which *oricalum* was made, which was with copper and calaminaris-stone, as brass is made at this time. Some indeed have somewhat perplexed the matter, by adding the word pseudoargyron, as a part of the composition. Among these is Strabo, but by that author in other places we find, that all that he means by this name is, the calamine found in silver mines, which resembled, as the common calamine does, some kinds of silver ore; so that the two accounts come to the same thing.

Orichalcum, or Aurichalcum *album*, *white brass*. This was a metal well known among the antients, and celebrated by Aristotle and by Strabo, and others, under the name of κραμα λευκον. It was made by mixing an earth with copper while in fusion; but what that earth was, we are not informed.

There have been many objections made to the name *aurichalcum album*, as a contradiction in terms. The epithet white being by no means allowable with a word which is generally supposed to express gold-coloured brass; but this is an error. The truth is, that *aurichalcum* is an error in orthography; the true word being *orichalchum*, Ορειχαλκον, mountain copper. The Romans changing the *o*, in a Greek word into *au*, when they adopted it into their own language, is common; and we daily see so many instances of it, that this custom alone might justify it, were the word always written *aurichalchum* by the Romans; which, however, it is not, Virgil, and several others expresly calling it *orichalchum*, according to the original or proper orthography: there was, therefore, no idea of gold, nor any other denomination of colour intended in the word *aurichalchum*; all that was expressed by it was, mountain copper; and this term was made to express a mixed metal, made of copper and of some earth, stone, or other mineral. In this sense, the mixture of copper with that of earth, whatever it was that turned it white, was as properly called *orichalchum album*, as that with calamine was *orichalchum flavum*, or simply *orichalchum*. We know several ways of turning copper white, one of which was much practised some years ago, and spoons and other utensils made of it, had the name of *alchymy* things; but this was done by means of arsenic; a thing not known to the antients: this, therefore, could not be the same with their white brass, and indeed, none of our methods seem to be the same with theirs, since the metal is debased by all ours, and becomes brittle; whereas, in their management, according to their own accounts, it seems not to have lost any thing of its ductility, tho' it acquired a peculiar brightness.

ORIENTAL, (*Cycl.*) in astronomy. A planet is said to be *oriental* when it rises in the morning before the sun.

Hybernal ORIENT, that point of the horizon where the sun rises when in the first degree of Capricorn. See OCCIDENT.

ORIGANUM, *wild marjoram*, in botany, the name of a genus of plants, the characters of which are these: the flower consists of one leaf, and is of the labiated kind, the upper lip is erect, of a roundish shape, and bifid, the lower is divided into three segments. The pistil arises from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and surrounded with four embryos, which afterwards become many seeds, and ripen in the cup of the flower. To these marks, it is to be added, that the *origanums* all bear their flowers in a sort of scaly ears or spikes.

The species of *origanum* enumerated by Mr. Tournefort are these: 1. The common *origanum*. 2. The common *origanum* with variegated leaves. 3. The white wild *origanum*. 4. The low, woolly, procumbent *origanum*. 5. The heracleotic *origanum*, or *cunila gallinacea* of Pliny. 6. The *origanum* of Crete, called *pot-marjorum*, the genuine hyssop of the antients, according to Lobel. 7. The round-leaved *origanum*. 8. The *origanum* with the smell of pennyroyal. 9. The broad-leaved, smooth, low *origanum*. 10. The Canada *origanum*, with umbellated flowers. 11. The broad-leaved woolly cretic *origanum*, usually known by the name of *dittany of Crete*. 12. The *origanum* of mount Sipylus. 13. The slender-headed Canada *origanum*. 14. The woody *origanum* of Syracuse, with large umbels of flowers. *Tourn.* Inst. p. 199.

Origanum is a very pleasant aromatic. An infusion of the plant, drank in the manner of tea, is of great service in disorders of the stomach; it absterges the viscous matter apt to lodge there, and thereby promotes an appetite and assists digestion. It also dispels flatus's, and is esteemed good in jaundices, and all other chronic cases occasioned by obstructions of the viscera.

ORIGINARY, *originarii*, among the Romans, an appellation given to slaves born in their master's houses, who were otherwise called *vernæ*. *Hofm.* Lex. in voc.

ORIOLUS, in zoology, a name by which several authors have called the *galbula*, a very beautiful yellow bird of the thrush kind, remarkable for its manner of hanging its nest. *Albertus.* See the article GALBULA.

ORITES, in natural history, the name of a stone described by the antients, and celebrated by the writers of the middle ages for its wonderful virtues. Pliny says, that it was round, and remained unhurt in the fire, and that some called it *Sideritis*. To this the later writers have added, that there are three kinds of it; the first round and black: this rubb'd over with oil of roses was famous for the bites of venomous beasts. The second was green, variegated with veins and spots of white: this was to be carried about people, to preserve them from many sorts of injuries. And the third was composed of parallel plates, and said to have the virtue of causing abortion, if only carried in the pocket.

ORITORIUS *lapis*, a name given by Ludovicus Dulcis, and some other authors, to the *ochreoferreous ætitæ*, or eagle stones; particularly to a species of them common in Germany, and used in the shops there, and in some other places, under the name of *eagle stones*. These are of a brownish colour and smooth surface, and are easily broken, being only composed of a thin crust of ferrugineous earth, enclosing several small lumps of a greenish marle, which rattle in it when shaken.

ORIZEUS *color*, a term used by authors to express the yellow colour in the eyes and urine of persons afflicted with a jaundice. See JAUNDICE.

ORKNEY-*beans*, in natural history, a name given by authors to a sort of fruit found on the shores of the *orkney* islands near Scotland. These are of several distinct species, and are none of them the produce of those islands, nor of any places thereabout, but are probably of American origin, many of them being plainly natives of Jamaica.

They are found principally on those coasts which are most exposed to the waves of the great ocean, and are on these so plentiful, that they might be gathered in large quantities, if of any value; but the only use they are put to is the making snuff-boxes out of them. Sir Robert Sibbald, and Mr. Wallace, in their accounts of Scotland, have both named them under the title of *Molucca beans*. See MOLUCCA *beans*.

ORLEANA, in the materia medica, the name of the *arnotto*, or *uruca*. *Dale*, Pharm p 388.

ORMENA, among the antient naturalists. See ASPARAGUS.

ORNICUS *lapis*, a name given by some authors to the *sapphire* of the antients, which is a peculiar species of our *lapis lazuli*, in which the gold-coloured matter is not dispersed in veins, but in separate spots of the form of a star. It was first called *o inificus*, and *orinus*, by corruption from *aurinus*, golden, and thence came, at length, the word *ornicus*.

ORNITHIÆ, a name given by the antients to certain winds, which usually blew in spring, at the time when the birds of passage came over to them Pliny says, that these winds lew from the West, and that, by some, the Etesian w inds ere called by this name. Others suppose that they b lew from the North, or North-West.

ORNITHOGALUM, *star of Bethlehem*, in botany, the name of a genus of plants, the characters of which are these: the flower is liliaceous, being composed of six petals, arranged in a circular form. The pistil stands in the center of the flower, and finally becomes a roundish fruit, or seed-vessel, divided into three cells, and containing a number of oblong seeds; to this it is to be added that it has a bulbous or tuberous root, in which it differs from the phalangium, which has a fibrous one.

The species of *ornithogalum* enumerated by Mr. Tournefort are these: 1. The great Syrian *ornithogalum*, with umbellated flowers. 2. The great, narrow-leaved, *ornithogalum*, with umbellated flowers. 3. The broad-leaved, middle-sized, white *ornithogalum*, with umbellated flowers. 4. The narrow-leaved, middle-sized, white *ornithogalum*, with umbellated flowers. 5. The lesser white *ornithogalum*. 6. The umbellated *ornithogalum*, with bluish white flowers. 7. The greatest, broad-leaved, Alexandrine *ornithogalum*. 8. The Indian, broad leaved, *ornithogalum*. 9 The great, narrow-leaved, *ornithogalum*, with greenish white flowers. 10 The great, narrow-leaved, *ornithogalum*, with flowers in spikes. 11. The spiked *ornithogalum*, with snow-white flowers. 12. The great, white-spiked, French *ornithogalum*. 13. The great, white-spiked, Byzantine *ornithogalum*. 14. The spiked *ornithogalum*, with greenish-white flowers. 15. The Spanish white-flowered, spiked *ornithogalum*. 16. The pale, blue-flowered *ornithogalum*. 17. The *ornithogalum* with a large flower growing on a smaller. 18. The great, pale yellow *ornithogalum*. 19. The yellow *ornithogalum*, with larger flowers. 20. The tuberous-rooted, African, yellow *ornithogalum*, with onion-like leaves, and sweet-scented flowers. 21. The common, wild *ornithogalum*. 22. The lesser, wild, yellow *ornithogalum*. 23. The narrow-leaved, bulbiferous, *ornithogalum*. 24. The yellow-flowered, Portugal *ornithogalum*, with capillaceous leaves. 25. The Indian *ornithogalum*, with yellowish-green flowers. 26. The African *ornithogalum*, with green flowers, growing one out of another. 27. The one-leaved, spiked *ornithogalum*, with a snow-white, sweet-scented flower. 28. The blue-flowered, two leaved, German *ornithogalum*. 29. The trifoliate, German *ornithogalum*, with deep blue flowers. 30. The bifoliate, German *ornithogalum*, with flesh-coloured flowers. 31. The bifoliate, German *ornithogalum*, with white flowers. 32. The narrow-leaved, white, late-flowering, *ornithogalum*. 33. The blue-flowering *ornithogalum*, with yellowish green stamina. 34. The purple-flowered *ornithogalum*. 35. The spiked *ornithogalum*, with grey flowers. 36. The blue-flowered, Constantinople *ornithogalum*. 37. The Constantinople *ornithogalum*, with bluish purple flowers. 38. The Constantinople *ornithogalum*, with a white flower. 39. The Constantinople *ornithogalum*, with dusky, bluish flowers. 40. The borrage-flowered, Constantinople *ornithogalum*. 41. The blue *ornithogalum*, with striated flowers. 42. The Spanish, deep-blue, *ornithogalum*. 43. The great, purplish, blue *ornithogalum*. 44. The summer *ornithogalum*, with flowers standing alternately on the stalks. 45. The great, autumnal *ornithogalum*, with pale, purple flowers. 46. The great, autumnal *ornithogalum*, with white flowers. 47. The lesser, autumnal *ornithogalum*, with purple flowers. 48. The lesser, autumnal *ornithogalum*, with blue flowers. 49. The little, spring *ornithogalum*. 50. The blue-flowered, Portugal *ornithogalum*. 51. The broad leaved, Portugal *ornithogalum*, with violet-coloured flowers. 52. The broad-leaved, Portugal *ornithogalum*, with flesh-coloured flowers 53. The broad-leaved, Portugal *ornithogalum*, with greyish flowers. 54. The broad-leaved, Portugal *ornithogalum*, with white flowers. 55. The Peruvian, eriopherous *ornithogalum*. 56. The oriental, eriopherous *ornithogalum* 57. The *ornithogalum* of the sea shores, commonly called the *red-rooted squill*. 58. The white-rooted, maritime *ornithogalum*, commonly called the *white-rooted squill*. 59. The maritime *ornithogalum*, with an esculent root, called the *esculent squill*. *Tourn.* Inst. p. 378.

The several species of this plant produced in our gardens are all propagated with great ease by the off-sets which the roots produce in very great abundance. The best time to transplant the roots is in the beginning of July, when the leaves are decayed. They should have a light, sandy soil, which, if it be over-dunged, will decay, and rot the roots: they continue flowering a long time, and are a very great ornament in gardens, but they ought to be transplanted once in two or three years, otherwise the roots grow luxuriant in off-sets, and the flowers are weak. *Miller's* Gard. Dict.

ORNITHOPODIUM, in botany, the name of a genus of plants, the characters of which are these: the flower is of the papilionaceous kind, and its pistil which arises from the cup finally becomes a hooked, or falcated, jointed pod, of a flattish and undulated form, and containing, in each joint, one roundish seed. To this it is to be added, that the pods of this plant usually grow four or five together; and by that means in their shape resemble a bird's foot.

The species of *ornithopodium* enumerated by Mr. Tournefort are these: 1. The great *ornithopodium*. 2. The little *ornithopodium*. 3. The *ornithopodium* with roots composed of knotty tubercles. 4. The scorpioides *ornithopodium*, with flatted pods.

pods. 5. The Portugal, scorpioide *ornithopodium*, with undulated pods. 6. The purslain-leaved *ornithopodium*. *Tourn.* Inst. p. 400.

ORNITHOSCOPI, ὀρνιθοσκόποι, in antiquity, diviners, or soothsayers, who made predictions, and drew omens, from birds. They were likewise called *ornithomantes*, and *orneoscopi*, &c. *Potter*, Archæol. Græc. l. 2. c. 15. T. 1. p. 321.

OROBANCHE, *broom rape*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the personated kind, divided into two lips, the upper of which is galeated, and the lower divided into three segments. The pistil arises from the lower part of the cup, and finally becomes an oblong fruit, consisting of only one cavity, which usually contains extremely minute seeds.

The species of *orobanche*, enumerated by Mr. Tournefort, are these: 1. The great large flower'd *orobanche*, smelling like cloves. 2. The great stinking *orobanche*. 3. The great Portugal *orobanche*, with purplish flowers. 4. The small flowered *orobanche*. 5. The bluish flowered *orobanche*. 6. The branched, purple-flowered *orobanche* 7 The blue-flowered, branched *orobanche*. 8. The whitish-flowered, branched *orobanche*. *Tourn.* Inst. p. 175.

OROBO, a name given by the chemists to any sort of metallic glass.

OROBOIDES, a name given by Hippocrates, and other authors, to a furfuraceous sediment in the urine of persons who have the jaundice: it is usually of a redish brown colour; and is not peculiar to that disease, but is found in some others.

OROBUS, *bitter vetch*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the papilionaceous kind; from the cup there arises a pistil, which is covered with a membrane, and finally becomes a membranaceous pod of a cylindric figure, usually containing oval seeds. To this it is to be added, that the leaves grow in pairs on a middle rib, which terminates in a point.

The species of *orobus*, enumerated by Mr. Tournefort, are these: 1. The purple-flowered, spring *orobus* of the woods. 2. The vernal, wood *orobus*, with a pale red flower. 3. The broad-leaved *orobus*, with small purple flowers. 4. The broad-leaved *orobus*, with small pure white flowers. 5. The narrow-leaved, asphodell-rooted, wild *orobus*. 6. The vetch-leaved, wood *orobus*. 7. The red-stalked, vetch-leaved, wood *orobus*. 8. The Italian, narrow-leaved *orobus*, with variegated flowers. 9. The wood *orobus*, with oblong smooth leaves. 10. The English, wild, wood *orobus*. 11. The Pyrenæan *orobus*, with nervous leaves. 12. The American *orobus*, with scarlet fruit, marked with a black spot, by some called the *phaseolus* of America, and the *abrus*, and scarlet Indian pea *Tourn.* Inst. p. 393.

OROCONITES, in the materia medica, a name given by Hippocrates, and others, to a bulbous root that is recommended as a rich food. It has the name from the Greek, ὄρος, a mountain, and κωνιτις, of a conic figure. This shews that it was a root of such a shape, found growing in mountainous places; but the learned have been puzzled in their attempts to find out what it was.

Guillandinus is of opinion, that the *oroconites* of Hippocrates is the *trasi*, or sweet *cyperus* root, but there are many arguments against this opinion, though the two circumstances expressed in its name, that is, the place of growth, and the shape of it, are sufficient to throw this to the ground. The *trasi* grows in low marshy grounds, near waters, and its roots are small tubera of the shape of a hazel-nut, whence the Spaniards, who are very fond of them, have called them *avellanda*. The Arabians have a root which they call the bulb, by way of eminence. This seems, indeed, to be the same with the *oroconites* of Dioscorides; and they give the same account of its virtues, and tell us, that it grew far from waters on the mountains of Syria, near Damascus, and elsewhere, and that it was of the size and shape of a pear; this may very well be called a conic shape in a root.

ORONTIUM, in botany, a name given by some authors to the *antirrhinum*, called in English *calf's snout*, or *snap-dragon*. *Ger.* Emac. Ind. 2.

OROSPIZA, in zoology, a name by which the antient naturalists called the *brambling*, or *mountain finch*.

The word is Greek, and expresses *mountain-chaffinch*. See the article MONTIFRINGILLA.

ORPELLO, a preparation of brass used in the glass trade, and prepared in this manner: cut plates of brass into small pieces, and place them in a luted crucible, in a strong fire, but not so violent as to melt it. Let it stand in this manner for four days, in which time it will be well calcined; when cold, powder, and sift it, and finally grind it on a porphyry. This will be a black powder; spread this on tiles, which place on burning coals in the leer, near the hole, for four days; take off the ashes that may fall into it, and finally powder and sift it fine for use It is known to be nicely prepared, when, on mixing with the melted metal in the glass furnace, it makes it swell and boil.

The colour it gives is a very elegant sky-colour, and a sea-green, or a mixt colour, between them, according to the quantity, and degree of calcination. *Neri's* Art of Glass, p. 35.

ORPHAN (*Cycl.*) — Among the Athenians, the *orphans* whose fathers had lost their lives in the service of their country, were under the guardianship of the *polemarchus*, who was to provide them with a competent maintenance, out of the public treasury. See POLEMARCHUS.

ORPHANUS, in natural history, a name given by some authors to a poor species of *opal*, called by some *pseudo-opalus*: it has no other colours beside a milky white, and purplish red. This stone is frequent in Germany, and Hungary.

ORPHEOTELISTÆ, ὀρφεοτελεσταί, in antiquity, persons initiated in the Orphic mysteries. They assured all that were admitted into their society of certain felicity after death; which when Philip, one of that order, boasted of, Leotychidas, the Spartan, replied, Why do not you die then, you fool, and put an end to your misfortunes, together with your life? At their initiation, little else was required of them besides an oath of secresy. *Potter*, Archæol. Græc. T. 1. p. 497.

ORPHEUS, in zoology, the name of a fish caught in the Archipelago. It is of a broad and flat figure, and of a fine purple colour; its eyes are large and prominent, and its teeth serrated; it has only one fin on the back, and the anterior rays of that are prickly, the others soft to the touch. Its anus is small, and it is said to have no passage for the semen.

This was the fish called *orpheus* by the antients, but the modern Greeks call another fish by that name. This is of a flat figure, but very thick, has a small mouth, and is covered with small, but very rough scales, which adhere very firmly to the flesh; the tail is not forked; it has fleshy lips, and very small teeth; its back and sides are black; its belly white; it has a large black spot at the root of the tail Its head is reddish, and its fins are very elegantly diversifyed with various colours; it has only one back fin, and that has the anterior ray prickly, the hinder ones not at all so. It grows sometimes to twenty pound weight, and is much esteemed among the modern Greeks. *Gesner* de Pisc. p. 752.

ORPIMENT, (*Cycl.*) *auripigmentum* — *Orpiments* are inflammable fossile substances compofed of numbers of thin flakes, like the talcs, which easily split, and are separated from one another, and are flexile, and not elastic, soluble in oil, fusible in a moderate fire, and yielding in burning an offensive smell like that of garlic.

These, like the talcs, are, in some of the species, composed of large plates, or flakes, each making the whole surface of the mass, and, in others of small flakes lodged in extraneous matter, or cohering alone into a mass in form of spangles.

Of this genus of fossils, there are only three known species: 1. A broad-flaked, gold-coloured kind, well known among the antients, as is plain from the description of it left us by Dioscorides, and much esteemed at present by our painters. This is found in several places, as in the islands of the Archipelago, in the mines of Goffelaer, in Saxony, in some parts of Turky, and the East-Indies, and in its utmost purity about Smyrna; this makes the finest of all yellows in painting. 2. The small-flaked, yellow kind, which is the common *orpiment* of the shops, and is a fine colour, though greatly inferior to the former. This is found in many parts of the Turkish dominions, and in Germany. And, 3. Red *orpiment*. This has been a name given by the more judicious to sandarach, and, by the vulgar, to red arsenic, but is to be restrained only to this fossile, which is of a fine bright red, and of the regular texture of the *orpiments*, and answering all their characters. This is a very beautiful substance of a fine bright red, very glossy, and a little transparent, and is found in the Turkish dominions, in the islands of the Archipelago, and even in our own country, Dr. Hill having lately received some of it from Cornwall, under the name of red mundic.

The English druggists are guilty of an unpardonable piece of ignorance, in that, in general, they know no difference between yellow *orpiment*, and the yellow factitious arsenic, which they regularly sell under its name; the *orpiment* is known to be a safe internal medicine, and the thing they sell under its name is a very terrible poison. The colour-men, however, who sell both are well acquainted with the difference. *Hill's* Hist. of Foss. p. 204.

ORRHAGOGA, a name given by the antients to such medicines as operated violently, as purges, and evacuated serous and watery humours.

ORRHOPIGION, a word used by anatomical authors, sometimes to express the extremity of the spine, but more frequently the line or seam which runs from the penis along the middle of the scrotum to the anus.

ORRHOPISSA, a name given by the antients to the thinner or more fluid parts of tar.

ORRICE, a name given by the vulgar to the *iris-root*. See the article IRIS.

ORRUS, in botany, a name by which many of the antients called the cultivated pine tree, from its being remarkably full of juice.

The first person who has given us the name is Theophrastus; but he is followed in it not only by the other Greeks, but also by the Latins, who have called the same tree for the same reason *sapinus*, a contraction or abbreviation of the word *sapapinus*, the juicy pine. Pliny tells us, that this last was the name of the manured pitch tree; but in this he errs, for Vitruvius, and others, tell us that the pine nuts, *nuces pineæ*, which were eaten and

and ufed in medicine, were the fruit of the *fapapinus*, or *fapinus*; and it is evident, that thefe muft be the produce of a pine tree, not of a pitch tree, or any thing of the fir kind.

ORTHOCERATITES, in natural hiftory, a name by which fome late authors have called a fpecies of fea fhell, found frequently foffile, but not known at prefent in its recent ftate; called by others *polythalamium* and *tubulus marinus concameratus*. It is ufually ftrait, but fometimes its end is twifted like the *cornu ammonis*. See TUBULIS *Concamerati*.

ORTHODOXI, in botany, fuch fyftematic writers as have formed their methods on the true natural foundation, and divided the plants under their confideration into claffes and genera, according to the characters of their parts of fructification. Thefe are either the *univerfales*, or *particulares*; by the firft are meant, thofe who have thus ranged the whole vegetable world; and by the latter, thofe who have undertaken only fome one clafs of plants, as the umbelliferous, &c. *Linnæi*, Fund. Bot p. 2.

ORTHODROMICS, that part of navigation which teaches the art of failing in the arch of fome great circle.

The word is Greek, ορθοδρομικα, derived from ορθος, *rectus*, ftreight, and δρομος, curfus, run or diftance; *q. d.* the ftreight or fhorteft diftance; and this can only be in the arch of a great circle.

ORTHRAGORISCUS, in zoology, the name ufed by Rondeletius, and fome other authors, for the fifh more commonly known by the name of the *mola*, and called in Englifh the *fun fifh*. *Willughby's* Hift.Pifc. p. 151. See the article MOLA.

ORTYGOMETRA, in zoology, the name of a bird called in Englifh the *daker-hen*. It is fomewhat larger than the quail. Its body, in fhape, refembles the common hen. It has two dusky lines on the head: its breaft and belly are white: its throat of a dusky brown: its back feathers are black in the middle, and of a tawny colour at their edges: its thighs are variegated with tranfverfe-white ftreaks. It is common in Ireland, and in fome of the northern counties of England, particularly in Northumberland. The noife it makes is only *crex, crex*, whence the antients have called it by that name. The Italians call it *re edelle quaglie*, or the *king of the quails*. It is a very delicately tafted bird. *Ray's* Ornithol. p. 122.

ORVALA, in botany, the name given by Linnæus to a genus of plants, called *papia* by Micheli. The characters are thefe: The perianthium is compofed of one leaf, it is tubulated and dilated at the mouth, and is crooked and divided into five fegments; the lower two being fhorter than the reft. The flower is compofed of one petal, and is not of the labiated kind; the tube is of the length of the cup. The limb is erect, long, and divided into four fegments. The upper of which is oblong, convex, and falcated, and lunated at the point. The lower is oblong, and is alfo lunated at the point, and the fide ones are oblong and pointed, and divided each into three fegments. The ftamina are four filaments of the length of the flower; they are placed under the upper fegments of the flower; the antheræ are two in number. The germen of the piftil is divided into four; the ftyle is fimple, and of the fame length with the ftamina; the ftigma is bifid, and acute. The feeds are four, and of an oval kidney-like fhape. *Linnæi*, Gen. Plant. p. 278.

ORVALA, in botany, is alfo a name ufed by fome authors for the *horminum*, or *clary*. *Ger.* Emac. Ind. 2.

ORYCTOGRAPHY, is that part of natural hiftory wherein foffils are defcribed. *Wolfm.* Difc. Prælim. Logic. §. 81.

ORYCTOLOGY, is that part of phyfics which treats of foffils, or it is the fcience of foffils. Under this head comes the doctrine of falts, fulphurs, ftones, gems and metals. *Wolfm.* Difc. Prælim. Logic. §. 81.

ORYGMA, ὄρυγμα, among the Athenians, a name given to the pit, more ufually called *barathron*; (See BARATHRON) whence the public executioner received the appellation of ὁ ἐπὶ τῷ ὀρύγματι. It was a dark noifome hole, and had fharp fpikes at the top, that no man might efcape out; and others at the bottom, to pierce and torment fuch as were caft in. From its depth and capacioufnefs, it came to be ufed proverbially for a covetous mifer, or voracious glutton, that is always craving, and can never be fatisfied; and fuch a one the Latins called *barathro*. *Potter*, Archæol. Græc. l. 1. c. 25. T. 1. p. 134, feq.

ORYX, in zoology, an animal mentioned by Ariftotle and Pliny, with only one horn. Pliny makes it a fpecies of wild goat; but Columella thinks it was a kind of deer. It is faid, that this creature was of great ufe in Africa, to relieve the fcorched inhabitants from thirft, there being always found in its body vefieles full of a very wholefome and pleafant liquor. *Hofm.* Lex, in voc.

ORYZEUM, a name given by many of the chemical writers to gold.

OS (*Cycl.*) — Os *argenteum*, in natural hiftory, the name of a fpecies of fhell fifh, of the round mouthed fnail, or *lunaris cochlea* kind. It has a very elegant filver colour in the round opening, or mouth of the fhell. See LUNARIS *Cochlea*.

Os *aureum*, the golden mouth, in natural hiftory, a name given to a fpecies of cochleæ of the lunar kind, or of that genus which have a round mouth. This, in the *os aureum*, is of a fine yellow. See LUNARIS *Cochlea*.

Os *calcis* (*Cycl.*) — This is the largeft bone of the foot, of which it makes the pofterior part, and in fome meafure the bafis. It is oblong and very irregular, and may be divided into a body and two apophyfes, one great and anterior, the other fmaller, lateral and internal. The body of the *os calcis* has fix fides; one pofterior, one anterior, one fuperior, one inferior, and two lateral. The pofterior fide is broad, unequally convex, and as it were divided into two portions, one fuperior, fmall and polifhed, the other inferior, much larger, unequal, and rough, which, in children, is an apophyfis, and may be termed the *tuberofity* of the *os calcis*. The lower part of it is bent downward, and terminates in two tubercles or obtufe points, which belong rather to the inferior than the pofterior fides of the bone. The upper fide may be divided into two parts, one pofterior and unequal, having a fmall depreffion; the other anterior, convex, and cartilaginous, proportioned to the great inferior cavity of the aftragalus. This fide is turned obliquely forward, and by this obliquity becomes part of the forefide, the remaining part of which is loft in the anterior apophyfis. The lower fide is narrow, and behind it lies the two tubercles already mentioned, of which the internal is the biggeft; they both ferve for the infertion of the aponeurofis in the fole of the foot, but chiefly the biggeft. The two lateral fides are continued over the anterior apophyfis, the external is gently convex and unequal, covered only with the common integuments and ligaments; the internal is hollow and depreffed. The greater anterior apophyfis lies in the fame direction with the body, being a continuation thereof. It has five fides or remarkable parts, and were it not for the body would have a fixth. The upper fide has an irregular and unequal depreffion, which, together with that in the apophyfis of the aftragalus, forms a confiderable foffula. And its anterior extremity has a fmall cartilaginous furface, anfwering to one of thofe in the apophyfis of the aftragalus. The anterior fide of the apophyfis is broad, oblique, cartilaginous, partly convex and partly concave, and is articulated with a like furface of the os cuboides: this is the forefide of the whole *os calcis*, when confidered without any divifion. The outfide of the apophyfis is very rough, being a continuation of the outfide of the body, with a tubercle or eminence of the place where the two fides meet. This, however, is not found in all fubjects. On the lower part of this tubercle is a cartilaginous furface for the paffage of the tendon of the *peronæus longus*: fometimes we fee only fome fmall veftiges of this eminence, and often none. We fometimes alfo meet with a cartilaginous furface, fmall, lower down, and more forward, near the anterior extremity of the apophyfis, for the paffage of the fame tendon. The lower fide is a tuberofity continued from the fide of the body, and defigned for the infertion of mufcles. The lateral apophyfis is almoft common to the body, and to the great anterior apophyfis, and increafes the cavity on the infide of the *os calcis*. On its upper part it has a very fmooth cartilaginous furface, articulated with one of the inferior furfaces of the aftragalus. This apophyfis is very low down, and its inferior part is fmooth for the paffage of tendons. *Winflow's* Anatomy, p. 97, feq.

Os *calcis luxated*. It fometimes happens, that the *os calcis* above, and no other bone of the foot, is difplaced or luxated by fome external force; and this happens fometimes toward the external, fometimes toward the internal fide of the foot. When this accident happens, it is eafily difcovered by the violent pain it occafions; and by the inequality of the part; that is, there is a cavity plainly obfervable in one part, and a tumor in the other, on the place. The reduction of this diflocation is very eafy. The patient is to be placed on a bed, and while two affiftants extend the limb in the oppofite directions, the furgeon replaces the diflocated bone with his fingers, and the preffure of the palm of his hand, and then there is no more than a proper bandage and reft required to the cure. *Heifter*, Surg. p. 174.

Os *cuneiforme*. This in the carpus is the third bone of the firft row. It has its name from the Latin *cuneus*, a wedge. Its figure much reprefenting that of a wedge fticking between the two rows. It has a rough furface with a fmall tubercle upon it, which forms the greateft part of the cubital edge of the carpus; and four articular fides of which one is convex, which compleats the articular convexity of the carpus, one orbicular and internal, or on the concave fide of the carpus, on which the os pififorme is fet; and two others, which make an angle between them, one for the os femilunare, and the other for the os unciforme. *Winflow's* Anatomy, p. 83.

The *offa cuneiformia* of the tarfus are fituated before the os fcaphoides. The firft of them is the largeft, and the third the leaft; with the os cuboides, thefe form a fort of arch, which on the fide next the other foot is high, and low on the oppofite fide. In each of thefe bones we may diftinguifh the bafis, the apex, and four fides, one pofterior, one anterior, and two lateral; whereof one is internal, the other external. The firft bone is like a wedge contorted and bent. Its bafis is low down, unequally rounded, like an oblong tuberofity, ferving for the infertion of a tendon; the internal lateral fide, or that which is turned towards the other foot, is unequally convex, and rough, for the infertion

tion of ligaments. The external lateral side, or that next the second bone is unequally concave, and cartilaginous toward the superior and posterior edges. The largest portion of this side is articulated with the second bone. The rest toward the anterior edge is joined laterally to the second bone of the metatarsus. The backside is the least; it is cartilaginous and almost triangular, suited to the first of the three triangular surfaces of the os scaphoides. The anterior side is cartilaginous, large, and semilunar, the convex edge being turned toward the other foot, and by this the first *os cuneiforme* is articulated with the first bone of the metatarsus. The angle is turned upwards, and the obliquity of it occasions the anterior side to be the highest, and the posterior lowest. The second *os cuneiforme* has the basis upward, and the angle downward, and resembles a wedge more than the first: this basis is short and rough, for the insertions of ligaments. The backside is cartilaginous, and perfectly triangular, suited to its articulation, with the middle surface of the convex side of the os scaphoides. The anterior side is also cartilaginous, a little more oblong and articulated with the basis of the second metatarsal bone. The two lateral sides have, toward their superior and posterior edges, oblong cartilaginous surfaces, by which they are articulated with the first and third *ossa cuneiformia*; the rest of these two sides is a little depressed, and there, by small interstices, void spaces are left between the bones: this is every way the straitest bone of the three, its angles hid between the two other bones of the same name, and does not reach so low as theirs, which makes this part of the foot a little hollow. The third *os cuneiforme* has likewise its basis upward, and its angle downward. The basis is longer than that of the second, almost flat or very little convex, and rough for the insertion of ligaments; the angle runs down lower than that of the second bone. The backside is cartilaginous and triangular, that is of the same figure with the third surface of the convex side of the os scaphoides: the anterior side is, likewise, cartilaginous and triangular, but a little oblong, being articulated with the basis of the third bone of the metatarsus. The internal lateral side is broad, with two cartilaginous surfaces, one toward the posterior edge, the other toward the anterior; the first is for its lateral articulation with the second *os cuneiforme*; the second for its lateral articulation with the basis of the second metatarsal bone. The external lateral side is likewise broad, and toward its posterior edge has a large cartilaginous surface for its articulation with the os cuboides towards its anterior edge. There is a sort of void space for the passage of vessels, and sometimes a little cartilaginous corner for its lateral articulation with the fourth bone of the metatarsus. *Winslow's* Anatomy, p. 100.

Cartilages of the Os *femoris*. No part of the *os femoris* is covered, except the uniform convexity of the head, and the articular portion of the lower extremity. The trochanters have no true cartilage, what appears like it being only the remains of tendinous insertions; the cartilaginous substance, which to a certain age unites the apophyses to the body of the bone, does not belong to these, because it is only found in the time of youth, and in adults is converted into a bone. The cartilaginous matter, by which the head of the *os femoris* is cemented, deserves, however, to be observed here, because that apophysis has been separated by violent falls. The convexity of the head of the *os femoris*, all the way to its symphysis with the neck, is covered with a very smooth, shining cartilage. A little below the middle of this convexity, and something toward the back part, there is a depression in the shape of a crescent, the cartilage being here interrupted by the insertion of the internal articular ligament of the head of the *os femoris*. The cartilage which covers the lower extremity of this bone is exactly fitted to the semi-oval convexity of the inferior surface of each condyle, and to the pulley formed by their union. *Winslow's* Anatomy, p. 126.

Ligaments of the Os *femoris*. The *os femoris* is connected by its upper extremity to the os innominatum, and by the lower to the bones of the leg, by means of several ligaments. The ligaments of the upper extremity are two in number, one which surrounds the whole articulation thereof, with the cotyloide cavity, and one contained in the articulation. The first is termed the orbicular ligament of the head of the *os femoris*; the other the internal ligament; and to these may be, though but improperly, added a third, which is of the nature of a capsular ligament. The orbicular ligament is the most considerable, the largest, and the strongest, of all the articular ligaments of the human body; it is fixed quite round the border of the cotyloide cavity, and is made up of several sorts of fibres, and is much stronger and thicker in some parts than in others; the other, or internal ligament of the head of the *os femoris*, resembles a flat cord, and is composed of a bundle of flat fibres, closely interwoven. The ligaments of the lower extremity of the *os femoris*, by which this bone is connected with the leg, are six in number, one posterior, two lateral, two middle, or crucial, and the capsular. The crucial ligaments lie within the joint, and are fixed by one end to the back part of the notch, or opening, which parts the two condyles: these are surrounded by the capsular ligament, but all the rest lie on the outside thereof, being closely joined to it. Of the two lateral ligaments, one is internal, and broad, being fixed to the tuberosity of the internal condyle; the other is external, and narrow, and is fixed to the tuberosity of the external condyle. The posterior ligament is broad and thin, and being fixed a little above the convexity of the external condyle, it thence descends obliquely behind the great notch, and internal condyle. The capsular ligament is, as it were, glued to the three former, and is fixed quite round the inferior extremity of the *os femoris*; at a small distance above the anterior, lateral, and posterior parts of the cartilage, and above the posterior part of the great notch; and from the cartilage and notch, through the small space upward already mentioned, it covers the bone, and afterwards is inverted downward, to form the capsula for the mucilaginous liquor of the joint. *Winslow's* Anatomy, p. 126.

Os *frontis*. This is situated in the anterior part of the skull, and forms that part of the face which is called the forehead, from whence it has its name. Its figure is symmetrical, resembling a large shell almost round. Tho' this has always been looked upon as one bone, it is to be observed that it is sometimes found divided into two equal parts by a continuation of the sagittal suture; and this division is equally common to both sexes. Considered as one bone it may be divided into an upper part, which belongs to the crown of the head, a lower part which belongs to the basis of the skull, an anterior part which is the forehead, and two lateral parts at which the temples begin. Its two sides are the one external, which is in its greatest part convex, and forms the forehead; the other internal, which is concave in proportion. On the outside are observed the following eminences: Two superciliary arches, which form the upper edge of each orbit, or the supercilia; three risings not always equally apparent, one between the two arches, and the other two above them; which may be called the knobs of the forehead: five apophysis, one at the extremities of each arch, one between the orbits, which sustain the ossa nasi, and which in some subjects makes a part of the bony septum of the nose. This last may be called the nasal apophysis, the other four the angular apophyses. The external cavities are these two orbitary portions or vaults forming the upper portions of the orbits: a remarkable depression in each of these vaults above the external angle, which contains the lachrymal gland: a small depression above the internal angle, to which is fixed the cartilaginous pully of the great oblique muscle of the eye; two portions of the temporal fossæ; two little cristæ which form the anterior extremity of the great semicircular plane of the temples, on each side, at the edge of the superciliary arches, near the external angle; two superciliary foramina, which are sometimes double, and sometimes only notches; and, lastly, two holes or portions of holes, called the internal orbitary holes.

On the inside of this bone we see a sharp perpendicular eminence, called the frontal or coronal spine, directly opposite to the middle rising on the outside already mentioned; above this spine, a portion of the groove for the longitudinal sinus, which when the spine is wanting, runs down lower; below the spine a considerable opening, called the ethmoidal opening, because it contains the os ethmoides; the sides of this are always more or less cellular. Between this opening and the coronal spine, a blind opening, which in some subjects is wholly in the *os frontis*, in others, common to that bone and to the os ethmoides, and which seems to open into the frontal sinuses near the nose. The anterior fossæ of the basis of the skull, which receive the anterior lobes of the brain, and which, by juting out forwards, form the risings on the outside, before taken notice of: toward the lower part they are uneven, answering the inequalities of the lobes, and they are also a little raised, to make room for the orbits, sulci or furrows of the arteries of the dura mater, and sometimes other indeterminate depressions. Tho' this bone is in general composed of two tables, and a diploe, yet the orbitary vaults are very thin, and without any diploe. About the middle of the lower part of the bone, where the middle rising is commonly situated, the two tables are parted, to form two cavities called the frontal, or superciliary sinuses, and the separated portions are here each of them composed in some measure of two tables, or at least have two surfaces, which make in all four surfaces of each of the two tables.

The frontal sinuses are extended on the edge of the superciliary on each side, more or less, all the way to the superciliary perforations; below they are open, and communicate with the cells of the os cribrosum. They are commonly parted by a bony septum, which is often more or less uneven; sometimes also it is perforated, and sometimes part of it, sometimes the whole is wanting.

In different subjects these sinuses are observed to vary extremely both in extent and form; in some they are very small, and often very irregular, and their disposition cellulous; sometimes also they are entirely wanting, and in such subjects the cavity of the nose is larger than ordinary; one of them does not open into the nose but only communicates with the other.

The *os frontis* is articulated by suture with seven other bones, the ossa parietalia, os ethmoides, os sphenoides, ossa lacrymalia, ossa nasi, maxillaria, and the ossa malarum. It contains

tains the anterior lobes of the brain, and a portion of the longitudinal finus, and forms the forehead, the upper parts of the orbits, and a portion of the temples. *Winflow*'s anatomy, p. 21.

Cartilages of the Os *humeri*. The cartilage by which the hemifphere of the head of the *os humeri* is covered, is gradually thicker toward the middle, and thinner toward the edges. The four furfaces of the tuberofities, which appear cartilaginous in dry bones, ferve only for the infertion of the tendons of four mufcles, which move the *os humeri* on the fcapula. The channel, or finus, between the two tuberofities is partly covered by a thin cruft, which appears rather ligamentary than cartilaginous, and partly by a tendinous ftratum. The trochlea and fmall head of the lower extremity of the *os humeri*, are covered with a common cartilage, in which the fame proportion of thicknefs is obfervable, as in that of the upper extremities; and this holds indeed pretty generally of the convex articular cartilages: and the foffulæ near the pulley and fmall head, are covered with a thin cartilaginous and ligamentary varnifh.

Ligaments of the Os *humeri*. The capfular, or mucilaginous ligament, loofely furrounds the whole articulation of the fcapula with the head of the *os humeri*. The true ligament of this joint feems to be made up of two forts of ligaments clofely united together, *viz.* of a capfular ligament, which furrounds the whole articulation, and of feveral true ligaments which run over, and clofely adhere to the former at different diftances. On the body of the *os humeri* there are two particular ligaments, which may be termed the intermufcular, or lateral ones: they are long, flat, thin, but ftrong and narrow, fixed by one edge along the two lower thirds of the bone, and reaching to both condyles; they are broad, pretty tight, and are very narrow at the upper part, but broader toward the condyles.

The lower extremity of the *os humeri* is joined to the bones of the fore arm, by two fafciculi of ligamentary fibres, one fixed to the internal condyle, the other to the external. Each fafciculus is compofed of fibres clofely joined together near the condyle, but afterwards parting in diftinct bands like a goofe's foot. The capfular ligament is fixed to the condyles, and then covers them, and is afterwards fixed round both fides of this lower extremity above the foffulæ. The foffulæ are flightly varnifhed over alfo with a cartilaginous fubftance. This capfula feems to be ftrengthened by a ligamentary wall, the fibres whereof crofs one another in different directions, and appears larger and loofer when the mufcles are feparated from it, than when clofely united to them in its natural ftate. *Winslow*'s Anatomy, p. 139.

Os *humeri fractured*. Fractures of the *os humeri* are leaft dangerous when near its middle, and much worfe when near its upper or lower head. It fometimes happens, that the fractured ends of this bone keep their places, but much more frequently they are found flipped one over another; by which means the fractured limb is made fhorter than the found one: fometimes alfo, tho' much more rarely, it happens, that the divided ends of the bone recede from one another, by reafon of the weight of the arm, and by that means the fractured limb becomes longer than the found one. In fractures of this bone, where the ends of the divided bone have fliped one over another, as is ufually the cafe, there is required both force and fkill to reduce them, efpecially if the patient has tenfe nerves and larger mufcles, as is ufually the cafe in ftrong men. To extend the arm on this occafion, the patient muft be feated on a high ftool, and an affiftant muft lay hold of his arm firmly above the fracture, keeping his elbow gently bent; then the lower part of the arm beneath the fracture, is in like manner to be taken hold of, and the arm is to be gently extended forward, by endeavouring to remove eafily each part from the other, in a right line. The furgeon is then to take hold of the fractured part of the arm, and with both his hands reduce the fractured bones into their proper places, while the arm is kept in a proper ftate of extenfion by the affiftants; and when they are replaced, the limb is to be rolled up with the proper bandages. *Heifter*'s Surg. p. 127.

Os *hyoïdes*. Mr. Du Vernoy obferves, that the right fide of the *os hyoides* is fhorter than the left. Comment. Acad. Petrop. Tom. 7.

Cartilages of the Ossa *innominata*. Thefe are not fo numerous as might be imagined, on examining the bones in a dried fkeleton, where we are apt to think we fee the dried remains of cartilages on the crifta of the os ilium, on the tuberofity of the os ifchium, and on the grooves and notches which give paffage to the tendons of mufcles; but none of thefe incruftations are true cartilages, but for the moft part tendinous, aponeurotic or ligamentary, which fubftances being dryed, look more like cartilages than the true cartilages themfelves in the fame ftate. The true cartilages of thefe bones in adults are properly five in number, three of which are common, and two proper. The firft and principal common cartilage, is that which makes the fymphyfis of the offa pubis. This forms a kind of arch, which is more confiderable in men than in women; the two others join the offa ilium to the os facrum, but are thinner than that of the offa pubis. The proper cartilages are thofe which line the cotyloide cavities, in the edge of each of which there is a notch or opening between the anterior or inferior parts, and in the cavity itfelf there is a broad and fhallow depreffion, reaching from the notch beyond the middle part of the cavity; all the reft of the acetabulum is covered with a very white, fhining, fmooth cartilage, which terminates precifely at the edge of the cavity. *Winflow*'s Anatomy, p. 122. See Ilium.

Ligaments of the Ossa *innominata*. Thefe are of two kinds, common and proper: the common ligaments are thofe which go between thefe and the neigbouring bones, of which there are a confiderable number: One fuperior, inferted by one end in the internal labium of the pofterior part of the os ilium; one inferior and anterior, fixed by one end in the inner fide of the crifta of the os ilium, and by the other in the fuperior and anterior part of the firft falfe tranfverfe apophyfis of the os facrum. Several inferior and pofterior, fixed by one end along the internal labium of the tuberofity of the crifta of the os ilium, and by the other in the firft three falfe tranfverfe apophyfes: and to this muft be added the ligaments by which the os femoris is joined to the *os innominatum*. The principal proper ligaments are four: the two facro-fciatic, the obturator, and the inguinal, which fee under their proper heads; but befide thefe, there is another fmall, flat, and very ftrong ligament, which runs tranfverfely between the two angles of the cotyloide notch, and may be termed the proper, or tranfverfe ligament thereof. The elaftic border of the cotyloide cavity may likewife be reckoned among the ligaments: it is a fort of additional piece, ftrongly united to the edge of the cavity, but eafily yielding any way, on preffure. The two ligaments by which the os femoris is connected to the *os innominatum*, are alfo inferted in this bone; one of thefe ligaments furrounds the whole articulation, and the other is contained in it: the firft is called the orbicular ligaments, the other, tho' very improperly, the round ligament: the orbicular is very ftrong, and unequally thick, and furrounds the whole convex circumference of the fupercilium of the cotyloide cavity. The ligament which lies in the joint is not round, but is a flat cord, broad at one end, and narrow at the other, and is in fome degree of a triangular fhape. *Winflow*'s Anatomy, p. 122.

Os *innominatum fractured*. A fracture of this bone very feldom happens; but when it does, it is readily difcovered by the injury and fymptoms in the neighbouring parts, and is the more particularly dangerous, when the patient difcharges a brown bloody matter. In reftoring this bone, the patient muft lie down on his found fide; the bone muft be replaced with the hands, covered with compreffes, dipt in fpirit of wine, and kept on by the fpica bandages. Afterwards bleeding, with cooling and relaxing medicines, muft be ufed, and a thin diet obferved. *Heifter*'s Surg. p. 126.

Os *orbiculare*. This, in the carpus, is the fourth bone of the firft row. It has its name from the roundnefs of its figure, and is, for the fame reafon, by fome called *os pififorme*, and *os lenticulare*; it is, however, not perfectly, or regularly round; it has but one cartilaginous fide, which is irregularly orbicular, and the border, a circumference of which reprefents a kind of narrow collar. The reft of the bone is rough, convex, and irregularly round, making one of the four eminences, on the concave fide of the carpus. This bone, and the os cuneiforme, may be fuppofed to make a third row, diftinct from the other two. *Winflow*'s Anatomy, p. 83.

Nafi Ossa. See Nasi *offa*.

Palati Ossa. See Palati *offa*.

Parietalia Ossa. See Parietalia *offa*.

Pectoris Ossa. See Pectoris *offa*.

Os *facrum* (*Cycl.*) — As this bone is the bafis by which the whole fpine is fupported, it has by fome been called *os bafilare*; its figure comes near that of a long triangle, with the bafis upward, and apex downward. Anatomifts, in its defcription, divide it into the upper part, or bafis, the lower, as it is fituated, or apex; two fides, the anterior, or concave, and the pofterior, or convex; and two lateral parts, or edges. The pieces of which it is compofed in infants, called falfe vertebræ, are five in number, and are united together by cartilages, which in time almoft difappear, leaving only little ridges, or lines, more or lefs prominent in their places. The firft of thefe is much larger than any of the true vertebræ, but their fize diminifhes by very great degrees as they defcend; fo that the loweft which makes the point of the *os facrum*, has fcarcely the appearance of a vertebra. At the bafis, or upper part, of the *os facrum*, are two articular apophyfes, anfwering to the inferior ones of the laft vertebra of the loins. Below each of thefe apophyfes laterally is a large notch, and between them, we fee diftinctly enough the body of this firft falfe vertebra, which is like that of the lumbar vertebræ, being very much inclined backward; fo that the body of this firft falfe vertebra, as well as that of the laft true one, is longer before than behind; and from this obliquity it is that the *os facrum* and laft lumbar vertebra, form at their connection, a very confiderable angle. The lateral parts are broad at top, forming on each hand a large, irregular, cartilaginous furface, in the figure of a great S, and fometimes of a bird's head.

head. By these two sides the *os sacrum* is connected to the ossa innominata, by a cartilaginous symphysis. Between each of these lateral sides and the nearest posterior holes, there is a large rough depression, and under that another not so large. These depressions are often pierced by several holes, which lose themselves in the substance of the bone. *Winslow*'s Anatomy, p. 60.

Os *sacrum fractured*. When this bone is found to be fractured, the fragments are to be reduced into their proper places with the fingers; and if any part of it be depressed inwards, a finger dipp'd in oil or butter, and with the nail close cut off, must be introduced up the anus in order to thrust the depressed fragment into its proper place, to which it is to be directed externally by the other hand. This being performed, a sticking plaister is to be applied, and compresses dipped in spirit of wine over it, to be kept on by the T bandage, or the plaisters may be let alone, and only the compress and bandage applied. The patient must keep his bed a fortnight, lying on his sides; or if he will needs sit up, it must be on a chair without a bottom, that the bones may not be displaced by touching the seat. *Heister*'s Surg.

Os *sepiæ*, the cuttle-fish bone. See SEPIUM, *Cycl.*

OSSA *temporum*. See TEMPORUM *Ossa*.

Os-*tincæ*. The sides of the os-tincæ have been known to open together in women with child, and have been divided by incision, in order to extract the child. See Med. Ess. Edinb. Vol. 3. Art. 19.

OSSÆI, or OSSENI, a name sometimes given to the Jewish sect of religion called *Essenians*. *Hofm.* Lex. Univ. in voc. See ESSENIANS, *Cycl.*

OSCHEALIS *hernia*, a term used by some writers for a hernia of the scrotum.

OSCILLA, in antiquity, small images of wax or clay, made in the shape of men or women; which were consecrated to Saturn in order to render him propitious. *Hofm.* Lex. Univ. in voc.

OSCINES, among the Romans, an appellation given to such birds, from whose chattering or notes, omens and predictions were drawn. *Hofm.* Lex. Univ. in voc.

OSLEOM *iron*, in the wire-works, a particular sort of bars of iron wrought on purpose for the manufacture of iron-wire. These are small and square, and the first thing done with these, toward the making them into wire, is, the straining, or drawing them at a furnace to small rods, of the thickness of one's little finger; these they bow round, and deliver them to the wire-drawers. *Ray*'s Engl. Words, p. 132. See WIRE.

OSMERUS, in ichthyography, the name of a genus of fishes, of the malacopterygious, or soft-finned kind, the characters of which are these: The branchiostege membrane contains seven or eight bones on each side. The back and belly fins are placed at the same distance from the top of the snout; by which it is distinguished from the coregoni and salmons. The teeth are large, and are placed on the tongue in the palate and in the jaws.

The species of *osmerus*, enumerated by Artedi, are these: 1. The *osmerus* with seventeen bones in the pinna ani: this is the smelt or eperlanus of authors. 2. The *osmerus* with eleven bones in the pinna ani.

This is the little fish called *saurus* by Salvian, and by the people of Rome, named *tarantola*. It is about a span long, and somewhat thicker than a man's thumb. The scales are moderately large, and the pinna dorsi has twelve rays. *Artedi*, Gen. Pisc. 8.

OSMONDS, in our old writers, a kind of iron antiently brought into England. It is mentioned in Stat. 32. Hen. VIII. c. 14 *Blount*, *Cowel*.

OSMUNDA, in the Linnæan system of botany, the name of a genus of plants, of the fern kind, the characters of which are: That the seeds are produced in globose capsules which stand distinct, but are collected in a cluster on the branch, and open horizontally when ripe. The seeds are small, oval in figure, and very numerous: according to this character, that species of the fern kind usually called the *sensible polypody* of Muntingius, and ranked among the polypodies is, an *osmund*; for it produces clusters of globose capsules so large, that they are scarce to be conceived to belong to any thing of the fern kind. These also stand on particular stalks, not on the back of the leaf, which is also the case in the other species of *osmund*, as our common English kind evidently shews.

The characters of *osmunda*, according to Mr. Tournefort, are these: The flowers are not discovered, but the seeds are collected into clusters. The capsules in which they are enclosed, are of a spherical figure; and when ripe, they burst by the contraction of the fibres. The leaves resemble those of the fern's.

The species of *osmund*, enumerated by Mr. Tournefort, are these: 1. The common, or marsh *osmund*. 2. The *osmund* with lunated leaves, commonly called *moonwort*. 3. The *osmund* with multifid leaves, called *branched moonwort*. 4. The larger branched *osmund*, with lunated leaves. 5. The feverfew-leaved *osmund*, or *moonwort*. 6. The *osmund* with adiantum leaves. 7. The hairy lonchites-leaved *osmund*. 8. The great fern leaved *osmund*. 9. The lesser fern-leaved *osmund*. 10. The hart's-tongue-leaved *osmund* 11. The cut-leaved *osmund*, with broad dents. 12. The deeply jagged, and lightly hairy *osmund*. 13. The asphodel-rooted *osmund*. 14. The verticillated *osmund*. 15. The spear pointed lightly serrated *osmund*. *Tourn.* Inst. p 547.

OSOSOR, a word used by some authors as a name for opium. See the article OPIUM.

OSPRION, a word used by some authors for a bean, which is its proper and determinate signification; but by some authors it is extended to all sorts of pulse.

OSSA. See the article Os.

OSSELET, in the manege, is a very hard excrescence, resembling a little bone, on the inside of the knee, (and never on the outside) appearing to be of the same substance with the rest of the knee, and only distinguishable from the knee by its descending a little lower.

OSSERVANZA, in the Italian music, is used for singing or playing with care; that is, executing a piece of music justly and exactly as it is marked, without adding or diminishing. *Broff.* Dict. Mus. p. 22.

OSSICULA *auditoria*, in anatomy, are four little bones contained in the cavity of the tympanum, or barrel of the ear, and assisting to the hearing; they are denominated from things they have been supposed to bear a resemblance to, the malleus, incus, stapes, and os lenticulare, called by others the *os orbiculare*; each of which see under their proper heads.

OSSICULA *musculorum*, in ichthyology, a name given by authors to those oblong and slender bones which are situated in the flesh of some kinds of fish between the muscles; these, in the anterior part, and especially near the head, are of a forked shape; but in the hinder part of the body, they are usually simple and slender. These sorts of bones are found in the following kinds of fish: 1. In all the cyprini. 2. In the esoces. 3. In the clupeæ. 4. In the eels 5. In the coregones. 6. In the osmerus. 7. In the salmon kind. 8. In mackrell. And 9. In the ammodytes or sand eel. In the five last, these bones touch the spine at one end, but in the others they no where come near it.

The use of these loose bones seems to be, to strengthen and support the muscles, that by this means they may be able the more forcibly to move the body, and turn it about: they are peculiar to fish, no land animal having them. *Artedi*, Ichthyol.

OSSIFICATION (*Cycl.*) — Dr. Nisbet's opinion of *ossification* is, that in the blood, or a fluid secreted from it, there is an ossifying juice consisting of particles which are not apparent: that whenever nature designs an *ossification* between membranes, or within a cartilage, she occasions a more than usual afflux of this fluid; which so much distends the vessels which were before invisible, as to make them capable of receiving the red globules of blood, which is always to be seen near to the place where *ossification* is begun. In this blood, gritty bony particles are to be felt by the point of a knife; which have been formed by the attraction and cohesion of the particles of the ossifying juice obstructed, along with the other grosser fluids, in the beginning of the vessels prepared to receive refuent juices. The blood being capable of forming fine membranes, the membranous parts of a bone, which act as a gluten to keep these particles and fibres together, if there be any such, that do not arise from the coats of its vessels, are produced by a cohesion round the cretaceous particles of a part of the fluid, in which they were generated and contained. Thus the membranes of cartilages serve as a bed between, or within which the bony particles are deposited, or shoot; but without any intermixture of the particles of the bone and cartilage, or continuation of the fibres of the one substance to those of the other, as is evident in cartilages containing bones kept long enough in water, and then slit; for the bone will, as soon as the large vessels that enter its substance are divided, slip as easily, if not easier, from it, than an acorn does out of its cup: and there is a smoothness and polish of the parts of both cartilage and bone, which shew there is no conjunction of the fibres of the two substances While the bones are encreasing within cartilages, the cartilages are extended and spread out; by which, with the pressure which they suffer, and the great influx of various fluids, and the nutricious matter being hindered to flow freely into them, they decrease continually; and at last may truly be said to be entirely destroyed. Med. Ess. Edinb.

Dr. Buddeus endeavours to prove, that the preternatural *ossifications*, which are commonly said to be formed in different parts of the body, do not deserve that name; for that these hard substances have scarce any other properties of bone, except whitenefs and hardness. *Misc.* Berol. Tom. 5. pars 2. §. 1.

OSSIFRAGUM, in botany, a name given by Bartholine, and some other writers, to a peculiar kind of grass, growing in some parts of Norway. It comes up early in the spring, before any other grass, and the cattle are tempted to eat it; but it emaciates them, and makes them sickly; their back bones become protuberant if they feed any time on it, and their legs so weak that they can hardly go. The remedy among

among the country people is a very odd one. They collect the bones of different animals, and break them into small pieces. The cattle greedily devour this sort of food when offered them in this disease, and there follows a sort of driveling at the mouth for a considerable time, after which they become well It is possible there may be much error in this story. The kingdom of Norway is full of mines, and the effluvia of these may be the occasion of the cattles illness, and the ceasing of these effluvia their cure; for it is not probable that either of these effects should be owing to the grass or the bones. *Barthol.* Act. Med.

OSSIPAGINA, in botany, a name given by Arnobius and some other of the old Greek writers to the consolida-major, or greater comfry. It had this name from its supposed quality of agglutinating broken bones on being taken internally. The Greek writers have sometimes called this plant *pecte*.

OSTEOCOLLA, (*Cycl.*) a substance used in Germany in cases of fractures, giving it inwardly to bring on a callous; but so inaccurately described by authors, several different species of the crustaceous spars having been described under its name, that it is not easy to ascertain what it truly and regularly is. Dr. Hill, from the inspection of what is now universally received in Germany as such, which answers very well to the accounts given of the substance by those who have first recommended it in medicine, has ascertained the name to a peculiar species of crustaceous spar of the terrene kind, which he has described under the name of *cibdeloplacium crassius, exalbo pallide fuscum, durum, superficie scabra*, or hard, pale brown, thick crustaceous spar, with a rough surface.

This is found in long, thick, and irregularly-cylindric pieces, which are usually hollow, but are sometimes filled up with a marley earth, and sometimes contain within them the remains of a stick, round which the *osteocolla* had been formed: but tho' it is plain from hence, that many pieces of *osteocolla* have been formed by incrustation round sticks, yet the greater number are not so; but are irregularly tubular, and seem formed of a flat cake, rolled up into a cylindric shape. The crusts of which these are composed do not form regular concentric circles round the internal cavity, as must have been the case had they been formed by incrustation, but shewing plainly that they were once so many thin strata, composing a flat surface, which has afterwards been rolled up as one might do a paper three or four times doubled, into two, three, or more spiral lines; in which case, each single edge of the paper would be every where a regular part of a continued spiral line drawn from a given point; but they would by no means be so many detached concentric circles.

The *osteocolla* is found of various sizes, from that of a crow-quill to the thickness of a man's arm. It is composed of spar and earth, and is found, both in digging and in several brooks, in many parts of Germany and elsewhere. *Hill's* Hist. of Foss p. 359.

Osteocolla is called *hammosteus* in many parts of Germany. It has this name in these places from the observation of its always growing in sand, never in clay, or any solid soil, nor even in gravel. Where a piece of it any where appears on the surface, they dig down for it and find the branches run ten or twelve feet deep. They usually run streight down, but sometimes they are found spreading into many parts near the surface, as if it were a subterraneous tree, whose main stem began at twelve foot depth, and thence grew up in a branched manner, till met by the open air. The main trunk is usually of the thickness of a man's leg, and the branches that grow out from it are thickest near the trunk, and thinner as they separate from it. The thinnest are about the size of a man's finger. The people employed to collect this *osteocolla* when they cannot find any mark of it on the surface, search after the specks of white, or little lumps of whitish soft matter, which they find lying in different parts on the top of the sand. These always lead them either to a bed of perfect *osteocolla*, or to some in the formation. If they miss of the substance which they seek after, they still find a substance like rotten wood; which, when traced in its course, is found to proceed from a main trunk, at the depth of that of the *osteocolla*, and to spread itself into branches in the same manner. The diggers call this substance the flower of *osteocolla*, or *hammosteus*.

The *osteocolla* found in the earth is at first soft and ductile, but in half an hour's time, if exposed to the air, it becomes as hard as we find it in the shops. The method to take up a perfect piece for a specimen, is to open the ground, clear away the sand, and leave it so for an hour or thereabouts: in this time it will harden, and may be taken out whole. It is certain, that the *osteocolla* is produced at this time; for, if a pit be cleared of it, there will more grow there in a year or two, but with this difference, that it will be softer and will not harden so easily in the air as the other. What the rotten substance resembling the decayed branches of trees is, it is not easy to say, unless it really be such: but the opinion of the common people, that it is the root of something, is absurd; because its thickest part always lies at the greatest depth, and the branches all run upwards. The *osteocolla* is a marley spar, which concretes round this matter; but what it is that determines it to concrete no where in the same ground but about these branches, is not easy to say. The rottenness of this substance which forms the basis of the *osteocolla*, renders it very liable to moulder and fall away; and hence it is that we usually see the *osteocolla* hollow. Sometimes it is found solid, but in this case there will be found to have been a vegetable matter serving as its basis, and instead of one branch, it will be found in this case to have concreted about a number of fibres, the remains of which will be found in it on a close examination. *Phil.* Transf. N. 39.

OSTEOCOLLA-*flower*. See the article FLOWER.

OSTEOCOLLA-*roots*. See the article ROOT.

OSTEOCOLLON, in botany, a name given by some authors to the great comfry. *Ger.* Emec. Ind. 2.

This name was given by some of the old writers to the symphytum, or comfry, from an opinion that its agglutinating quality reached to the bone, and that it was of great service taken internally in cases of fractures.

OSTEOGONY. See the article OSSIFICATION.

OSTEOLOGY (*Cycl.*)—There are properly two kinds of *osteology*, one of which is to be learned from bones dried and prepared by boiling, and the other from the bones of a dead subject, as they are naturally connected with each other. Both these methods are very necessary for the practice of physic, and for the exact knowledge of the human body. By examining dry bones, however, we can only learn their exterior forms, their situation, and the connection which they may have with one another; but when we consider them as joined together in a dead body, we are in a condition to observe many other things in regard to them, very useful in physic: because their connections with one another by cartilages and ligaments, and by the diversity of articulation, are sometimes very different in the dry from what we see them in the fresh bones; there are, for instance, in dry bones, certain cavities which appear to be cotyloide, because they are divested of their cartilages; but in fresh bones, they are found to be glenoide, their cavities being filled with cartilages. And, on the other hand, some cavities appear to be glenoide in the skeleton, which are cotyloide in the body, their cavities being augmented by cartilaginous supercilia.

The exterior form and qualities of bones are much better demonstrated also from fresh subjects, than from prepared bones; because they loose a great many things in boiling, such as the cartilaginous bodies, the periosteum, the mucilaginous substance found between them, and the marrow contained in their cavities; all which may be shewn in a fresh body, but cannot be seen in a skeleton. *Riolan.* Encheiridion Anatomicum.

OSTINATO, or *Contrapunto* OSTINATO, in the Italian music, is much the same with *Perfidia*. See PERFIDIA, *Cycl.*

OSTRACION, in the Linnæan system of zoology, the name of a large genus of fishes of the general order of the branchiostegi. The characters which distinguish the fish of this genus, are, that they have no belly-fins, and their skin is always hard and often prickly. Of this genus, besides the *ostracion*, commonly singly so called, are the orbis, hystrix, atinga, &c. *Linnæus's* System. Naturæ, p. 52.

The characters of the *ostracion*, according to Artedi, are these: there is no branchiostegi membrane; the figure of the body is particular, being globose, or spherical, or roundish, oval or oblong and square, or finally conic; the skin is very hard, and usually beset with rigid and hard spikes, either on the whole body or on some part of it, but in some species it is wholly smooth; there are no belly-fins; the number of the others is five, there are two pectoral or lateral fins, two others are on the back, the other at the anus and the tail; the mouth is small; the teeth are large; and the eyes are covered with the common skin of the head; there are on each side two foramina for the nostrils, near the eyes; the lips may be drawn back, but in their natural state they cover the greater part of the teeth. *Artedi*, Gen. Pisc. 39.

The species of this genus are these. 1. The oblong square *ostracion*, with four large tubercles on the back: this is the piscis quadrangularis maximus of Ray. 2. The oblong square *ostracion*, with a gibbous back: this is covered all over the body with beautiful hexagonal figures. 3. The oblong square *ostracion*, with a sharp snout, and with several spots on the back and head; there is a specimen of this in the cabinet of Sir Hans Sloane. 4. The square *ostracion*, variegated with a great number of spots: the spots of this are rounded, and are of various colours. 5. The triangular *ostracion*, with two spines on the head, and two more on the lower part of the belly: this is covered with hexangular and other radiated bodies instead of scales. 6. The triangular *ostracion*, with two spines near the head, and one long one on the upper part of the body near the tail: this is very beautifully spotted. 7. The triangular *ostracion*, with two spines in the lower part of the belly, and covered with hexagonal bodies, with prominent edges: this is the piscis triangularis of Clusius and other authors. 8. The triangular *ostracion*, spotted all over and covered in many places with tubercles, having two spines in the lower part of the belly: the spots of this fish are of various colours, and they are larger than the tubercles. 9. The triangular *ostracion*, with hexagonal and radiated tubercles, and with

with two spines in the lower part of the belly. This is smaller than most of the others. 10 The triangular *ostracion*, covered with innumerable small tubercles, and having no spines.

The species hitherto enumerated, have all a considerable number of teeth, the following species have only four: 1. The round *ostracion*, with four teeth, covered every where with small spines. This is the orbis of some authors. 2. The spotted *ostracion*, covered all over with small and very thick-set spines. This is the orbis asper of authors. 3. The oblong and compressed *ostracion*, with a roundish belly, and with spines only on that part. This is the orbis lagocephalus of Grew. The following species of *ostracion* have no teeth at all, but have bony jaws: 1. The sphæric *ostracion*, covered all over with thick-set three cornered spines. This is the atinga orbicularis of authors; and is about the size of a goose's egg. 2. The roundish *ostracion*, covered every where with flat and short spines, but with the belly smooth. This is the orbis spinosus of Clusius. 3. The roundish *ostracion*, covered with short three-cornered spines, set at distances from each other. This is the orbis reticulatus of Lister. 4. The oblong roundish *ostracion*, with tubercles on each side, and with a very long back fin. 5. The roundish *ostracion*, with numerous thick-set spines of a three-cornered figure at the base. 6. The conic oblong *ostracion*, with long cylindric spines on all parts of the body, but principally on the sides. This is the histrix piscis, or porcupine fish of authors. 7. The oblong *ostracion*, with long and cylindric spines covering all parts of it, but principally the head and neck. 8. The oblong smooth *ostracion*, with a long head, and with a body adorned with various figures. This is the orbis testudinis capite of Ray. 9. The compressed roundish rough *ostracion*, with horizontal pectoral fins, and with four foramina in the head. This is the fish called by authors the *mola*, or *sun-fish*. *Artedi*, Gen. Pisc p. 39.

Willughby uses the word *ostracion* for a fish caught sometimes in the river Nile. It is very thick in proportion to its length, and of a somewhat pentangular form. It is usually of about a foot long, and is covered with a shelly coat or skin, not less strong and hard than many of the shell-fish kind. It has a strait, not forked tail, two fins a little above it, and two more higher up the body. Its eyes are white; its mouth small; and it is all over of a pale whitish hue. *Willughby's* Hist. Pisc. p. 148.

OSTRACITES, (*Cycl.*) in natural history, a name given by authors to the fossile *oisters*, common in many parts of England. These are of various shapes and kinds; and the name is by some authors made to signify, the shell itself, when preserved in its native state and condition; as is the case with those found about Woolwich and Blackheath; and by others, the stones cast or formed in those shells, or in cavities from whence they have been washed away and dissolved: in both these cases, the stone carries the exact resemblance of the shell, even in its nicest lineaments; in the first case, carrying every mark of the inside; in the other, of the outer surface. *Hill's* Hist. of Foss.

We have this stone in great plenty in many parts of England; and it is very famous, in some places, for its virtues in cases of the gravel, and the like complaints, as mentioned in the *Cyclopædia*. See Tab. of Fossils, Class 9.

This virtue of a fossile, not generally known, may make it necessary to add such an account of it, that it may not be mistaken by those who are willing to try it. It is the *ostracites maximus rugosus asper*, the greatest rough and uneven *ostracites*, excellently described by Lister. It burns to lime as the spars and selenitæ do, and yields no volatile salt on a chemical analysis. The common oister shells fresh taken and used, do not afford more than half a scruple of a liquor moderately urinous, from a quarter of a pound of the shells; and probably, on being long exposed to the weather, they would loose even that, and yield no more, on trial, than the *ostracites*.

These fossile oister-shells are more beaked at the part where the hinge is, than the common oister; and in their specific gravity, they are heavier than fresh oister shells, and approach to the nature of the selenites.

It is to be observed, that all the fossile shells, and particularly the *lapides judaici*, or Jew's stones, which have been the spines of sea echini, have been esteemed diuretics, and good in the stone and gravel. Among the antients, Dioscorides, Pliny, and all the rest recommend them highly. Phil. Transf. Nº 251.

OSTRACODERMATA, a term used by Aristotle, to express that class of shells which we call *testaceous*, in opposition to the crustaceous animals, or malacostraca. The definition Aristotle gives of this class of animals is, that they are soft within, but hard without; that their shells may be bruised or broken; but their parts cannot be torn from one another, as they can in the crustaceous kind, such as the lobster; whose shells covering the legs, body, tail, &c. being so many distinct pieces of shell, and only joined by membranes, may be torn asunder by pulling till those membranes give way. The echini marini, or sea urchins, have been generally allowed to be testaceous animals; and even Aristotle himself, the author of the distinctions, as well as later writers, have arranged them in this manner; but it is plainly erroneous; for they have all the characters of the crustaceous kinds, when strictly examined; and their shells are, as in the lobster, made up of several pieces connected by membranes, and divisible one from another, by tearing or pulling without breaking; and every one of the spines is a sort of leg, moveable every way upon its socket, and joined in the same manner only by a membrane: Gesner ranks them among the testaceous fishes, tho' he acknowledges that Rondeletius, whom he usually follows, classes them among the crustaceous kinds; reckoning them after lobsters and crabs. Pliny also is of this opinion, and differs in it from most others of the antients: yet the place of these fishes has scarce yet been ascertained. A shell is properly enough the name of the covering of these, as well as of the other, or testaceous fishes; and in the testaceous kinds, may be defined to be a hard substance, covering an entire animal, or at least one whole side of one without joints or ligatures: and, on the other hand, a crust may be defined to be such a hard substance as covers only one particular joint of the enclosed animal; so that in the whole crustaceous fish, there are as many shells, if we may be allowed to use that word in the general sense, on every animal, as there are joints in that animal. The scalops, oysters, wilks, &c. give us familiar instances of the first kind or shells, properly so called; and the crabs and lobsters, of the latter kind or crusts. The first, therefore, are properly testaceous animals; and the latter crustaceous: and in this case, whoever examines the sea echini in their exact and perfect state, will find that they evidently belong to the crustaceous, not to the testaceous class.

The echini, lobsters, &c. may be called *multi testaceous*, or many-shelled; and the others *simply testaceous*, *bitestaceous*, and by other terms, expressing the characters of those few genera which have more shells than two: and as in the scaly fishes, every separate scale has its separate muscle, to which it is answered by a particular tendon; so all the crustaceous animals have particular muscles, which are separately inserted one into every crust; and all these crusts are also connected to each other by common membranes, which are in a particular manner necessary, as they do not lie one upon another as the scales of fishes do, and by that means secure and strengthen each other. Phil. Transf. Nº 219. p. 199.

OSTREA, the *oister*, in natural history, the name of a very large genus of shells, the characters of which are these: It is a bivalve shell, of a coarse external structure, and dirty appearance; each shell being composed of a great number of laminæ not nicely closed down upon one another. It is in some species smooth, in others striated, tuberous, or prickly; usually flat, but sometimes globose, plicated, and wrinkled into sinuses. The lower shell being always deeper than the other. Aldrovand supposes this genus of shell fish obtained the name *ostreum*, from the Greek ὀστέον, a bone, as they are of a bony hardness. See Tab. of Shells, Nº 17.

Most authors have confounded the two genera of *oisters* and chamæ together, tho' there is an obvious and invariable distinction. The *oister* is rough, and has a sort of beak; and notwithstanding the roughness of both shells, it always shuts very evenly and firmly: add to this, that one of its shells is flat, the other convex; and is thus absolutely distinguished from the chamæ. Hist. Nat. Eclair. p. 313.

Oisters in their growth become fastened to every solid substance which they happen to come into contact with; and rocks, small stones, wood, sea-plants, and a thousand other things are found at times with *oisters* adhering to them, whose shells have fitted themselves to the form of the thing itself, and left their natural shape. The people who fish for, and trade in *oisters*, pretend to distinguish two kinds; one which is fecund and will breed; the other which is barren. They say, they distinguish these by a little black fringe, which always surrounds the good breeding *oisters*.

The way to make *oisters* green is, to put them into small pits where the water is about three foot deep, and where the sun has great power; in these they become green in three or four days.

The species of *oisters* being very numerous, they may be better understood by being arranged under some general heads.

I. Some *oisters* are plane and smooth.

Of these we have the following species: 1. The common *oister*. 2. The naturally green *oister*. 3. The oriental *oister*. 4. The pearl *oister*, or beiberis; this is by many authors described as a peculiar genus, under the name of *concha margaritifera*; but it is a true species of *oister*. 5. The green-onion-rind *oister*. 6. The rose-coloured-onion *oister*. 7. The yellow-onion *oister*. 8. The amber-coloured-onion *oister*. 9. The striated-onion *oister*. 10. The saddle *oister*. 11. The violet-coloured saddle *oister*. 12. The pintado *oister*, whose spots resemble those of the pintado, or guinea hen. 13. The pond *oister*. 14. The red-striated japan *oister*. 15. The swallow *oister*.

II. Some *oisters* are smooth, yet foliated on the surface.

Of these we have, 1. The malleum, or brachiated *oister*; called *the mallet-headed oister*. 2. The small plicated *oister*, called *the cocks comb*, or *the hog's ear oister*. 3. The hedge-

hog

hog *oiſter*: this has its ſhells round, with tubular ſpines. 4. The leaf *oyſter*. 5 The tortuous *oiſter*, called by many the leg *oiſter*. 6. The thigh *oiſter*.

III. Some *oiſters* are of a globoſe form, and carry ſpines on their ſhells.

Of theſe we have the following ſpecies: 1. The round-ſpined *oiſter*. 2. The *oiſter* with flat ſpines. 3. The fire-coloured *oiſter*, with large ears. 4. The white-pointed rock *oiſter*: this is uſually found adhering to ſtones. 5. The bridge *oiſter*: this alſo is uſually found affixed to ſtones or pebbles, in ſuch a manner as to repreſent a bridge; the ſeveral ſmall ſtones its ſhell ſpreads over making the piers. 6. The furr and roſe-coloured *oiſter*, with flat white ſpines. 7. The coral *oiſter*. 8. The medal *oiſter*, ſo called from the place near Bourdeaux, where it is found. 9. The *oiſter* with red and blue ſpines. 10. The cluſter *oiſter*, with variegated ſhells.

IV. Some *oiſters* are of a globoſe figure, and jagged with high raiſed laminæ.

Of theſe we have the following ſpecies: 1. The great foliated *oiſter* of Rumphius, called by ſome the Placenta foliacea. 2. The ſtriated orange *oiſter*, from the Baltic. 3. The ſquammoſe or ſcaly *oiſter*, called Scandebec by Rondeletius. 4. The ſquammoſe *oiſter*, with tubular ſpines. 5. The yellow ſquammoſe foliaceous *oiſter*: this ſpecies is often found adhering to the ſeveral kinds of coral, and is not unfrequently itſelf covered with balani or center ſhells.

V. Some *oiſters* are oblong and umbonated.

Of theſe we have the following ſpecies: 1. The ſmooth ſpondylus or aſs-foot *oiſter*. 2. The rugoſe but not ſpinous *oiſter*. 3 The white-plated *oiſter*, with a digitated edge covered with roſe-coloured ſpines. 3. The yellow-plated *oiſter*, variegated with red and white. 5. The gaidaron *oiſter* of Rondeletius. See OYSTER.

OSTRICH, *ſtruthio*, in zoology. See STRUTHIO.

OSTRUCIUM, a name given by the Latin writers of late ages to the plant called ſmyrnium and oluſatrum. Macer calls this plant caulis ſylveſtris, and has given to it the virtues attributed by the antients to the ſtruthion, ſuppoſing theſe to be the two names of the ſame plant; but this is evinced to be an error by the writings of all the antient Greeks. Theophraſtus in particular ſays, that the ſtruthion is a prickle or thorny plant. This alone is ſufficient to prove it can have no relation to the *oſtrucium* of the later authors, or Alexanders, which is a ſmooth umbelliferous plant.

This inaccuracy of the writers who collect their accounts from the ancients, is ſometimes of bad conſequence; ſince thoſe who are unable to have recourſe to the original authors, are miſled ſo far as to ſuppoſe the virtues of one plant may be found in another. See the article SMYRNIUM.

OSYRIS, in botany, the name given by Linnæus to a genus of plants, including the caſia of Tournefort, and other authors. The characters are theſe: it produces both male and female flowers. In the male flowers the perianthium is one leaved and hollow, and is divided into three ſegments, which are all of the ſame ſize, and of an acute oval figure. There are no petals, and the ſtamina are three ſhort filaments. The antheræ are ſimple. In the female flowers the cup is of the ſame figure as in the male, but is very ſmall and ſtands upon the germen of the piſtill, and remains on it a long time. There are no petals. The germen of the piſtill is roundiſh, the ſtyle is very flat, and the ſtigma roundiſh. The fruit is a round berry, having one cell, in which is contained a ſingle bony ſeed. *Linnæi* Gen. Plant. p. 472. *Tourn.* 448.

OSYRIS is alſo uſed by ſome authors for the linaria or toad-flax. *Ger.* Emac. Ind. 2.

OTAPULLI, in botany, a name given by ſome authors to the tree which produces the *gamboge*, or *gutta gamba* of the ſhops. Hort. Malab. Vol. I. p. 41.

OTENCHYTES, a name given by ſome authors to a ſyringe made for injecting into the ears

OTHOMAN. See the article OTTOMAN.

OTHONE, *ὀθόνη* & *ὀθόνιον*, among the antients, a kind of linnen garment worn by women. *Pitiſc.* in voc.

OTHONI, a word uſed by chemical writers for what they otherwiſe call the *mercury of the philoſophers*, or *philoſophic ops*.

OTHONNA, the name given by ſome authors to a ſtone found in Ægypt, and deſcribed to be always in ſmall pieces, and of the colour of poliſhed braſs: probably it is ſome ſpecies of the *pyrites*.

OTHONNA, in botany, a name given by ſome authors to the *african marygold*. *Ger.* Emac. Ind. 2.

OTIS, in zoology, the name of a large bird, ca'led in Engliſh the *buſtard*. The *otis* is called *tarda* and *otardes* by ſeveral authors. See Tab. of Birds, N° 28.

In the Linnæan ſyſtem of zoology, the *otis* makes a diſtinct genus of birds of the order of the Gallinæ; the diſtinguiſhing characters of which are, that the feet have only three toes each, and thoſe all placed before, and the head is not adorned with a creſt or any other ornament. *Linnæi* Syſtem Nat p. 47.

It is of the ſize of the common turkey, its beak is like that of the common gallinaceous fowls; its head and neck are grey; its belly white, and its back variegated with tranſverſe ſtreaks of red and black; it has no hinder toe, by which, and by its ſize, it is eaſily diſtinguiſhed from all the reſt of the gallinaceous kind. It feeds on herbs, and eats very greedily the leaves of dandelion, and particularly on the ſeeds of hemlock, which ſeems a very ſtrange food It is frequent in many parts of England, where there are large heaths and plains: they are very bad fliers, and very difficultly raiſe themſelves up from the ground; but they are extremely ſhy, and if they ſee a man at a very great diſtance, they immediately eſcape as faſt as they can Their fleſh is eſteemed. *Ray's* orinthology, p. 129.

OTITES-*digitus*, the *ear-finger*, a name given by authors to the finger next the little one.

OTOMO, in zoology, the name of a bird of the lagopus kind, called alſo *colmeſtre*, and by the Germans, *ſteinhun*, that is, *ſtonehen*. It is of the bigneſs of a tame pigeon; its belly and wings are white, with only a very few browniſh feathers; its head, neck, and breaſt are variegated with brown feathers, and the upper part of the neck with black and white; its beak is very ſhort and black, and it has fine red granulated membranes over its eyes; its tail is principally black, but is variegated with brown and white; and its legs and feet are feathered to the ends of the toes. *Geſner* de Avibus.

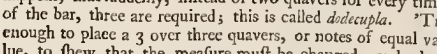
Mr. Ray is of opinion, that this is the ſame ſpecies of bird, with the common white *lagopus*, it being no way different but in colour, and thoſe birds being ſaid to change colour in the ſummer months. It is caught on the mountains of Germany, and is a very delicate bird for the table.

OTTER, in zoology. See the article LUTRA.

OTTERPIKE, in zoology, the name of a large ſpecies of the *draco-marinus*, or *ſea-dragon*, called in Engliſh the *weaver*: it is not greatly larger than the *weaver*, but is of a great variety of beautiful colours; and inſtead of the yellow ſide-lines which that fiſh has, this has rows of large black ſpots. *Willughby's* Hiſt. Piſc. p. 288.

OTTOMAN, or OTHOMAN, an appellation given to the empire of the Turks, or rather to their emperors, from *Othomannus*, or *Oſmanhus*, the firſt prince of the preſent family. See *Hoffm.* Lex. in voc.

OTTUPLA, in the Italian muſic, ſignifies *octuple*, or the meaſure of four times; it is marked with a ſemi-circle, C; and ſometimes thus:  when it is to be played very quick. In this time, eight quavers are contained in a bar. But it often happens, that ſuddenly, inſtead of two quavers for every time of the bar, three are required; this is called *dodecupla*. 'Tis enough to place a 3 over three quavers, or notes of equal value, to ſhew that the meaſure muſt be changed; and when this three is omitted, it ſufficiently demonſtrates the meaſure to be *ottupla* again: this makes what is called by the Italians *ottupla è dodecupla*, thus:



ottupla. *dodecupla.*

Corelli, in the laſt movement of his tenth ſonata, opera terza, very often uſes an 8 after the *dodecupla*, to ſhew, that the triple there is changed to common time.

OTUS, in zoology, the name of the common *horn-owl* of the ſmaller kind, in many reſpects different from the great *horn-owl* or *eagle-owl*. It is a moderately large bird; its beak is black, and its face ſurrounded with a double circle of feathers, the outer of which is variegated with fine black, white and brown lines, and the place where both circles join is all the way black; its belly and the feathers on its legs are brown; its throat and breaſt are covered with feathers black in the middle, with white and brown edges; its long wing feathers are ſpotted with black; its horns, or feathers that riſe up from its ears, are black in the middle and variegated with brown and white at their edges; and its tail is grey above and yellow underneath, and is variegated with ſeveral tranſverſe black ſtreaks; its feet are hairy down to the toes. It is common in Italy, and is ſometimes caught in ſome parts of England, and generally fixes its abode in mountainous places. *Ray's* Ornithol. p. 64.

OVA (*Cycl*)—The ingenious Dr. Kerkring was the firſt who advanced the generation of all animals to be from *ova*, and that even man himſelf was produced out of an egg. The ſyſtem occaſioned great raillery at the time, and the author found himſelf under a neceſſity of publiſhing all his obſervations by way of juſtification. The *eggs* which he found in the teſticles of all females countenanced his opinion, and he gave figures of the parts in their natural ſituation, and of the eggs which he found in women from the age of eighteen to more than forty, in his different diſſections. Among the other creatures he examined, he found many ſmall eggs in the teſticles of cows, and other creatures of the viviparous kind. He gives an account of one *egg* which he had an opportunity of opening about four days after it had fallen into the matrix of a woman, and in this he could perceive the marks of the little embryo, the head of which was diſtinctly to be ſeen from the body. Another *egg*, which he had an opportunity of opening at about a fortnight after conception, afforded him a ſight of a little fecundine. The membrane chorion divided in four places, and the amnion d vided in the ſame manner the navel ſtring, by which the child was faſtened to the ſecundine;

cundine; and in the child itself, the face at this time began to be formed, and the features were distinguishable, and the principal parts of the body easily traced. At longer periods from the time of impregnation, the features and lineaments of all the parts appear more and more strong; and the author has given accurate descriptions of the progress of the fœtus toward perfection, and figures of it at three, four, five, and six weeks after conception, at which last time all is very fair and plain.

The *ova* in which these lineaments of the fœtus are found after conception, are themselves formed without such lineaments, not only in married women, but in maids who have had no commerce with men at all; and it is the same in creatures naturally oviparous. The pullet will even lay her eggs without any intercourse with the cock, but then they will have none of the lineaments of the young fowl, which are found in the eggs laid after treading, and enlarging every day after the beginning of the incubation.

The eggs found in the testicles of unmarried women are generally of the size of a pea, round, and containing a glutinous liquor, which will harden, on boiling, in the same manner as the yolk and white of a common egg. The taste is rather unpleasant than insipid, and they are inveloped in two skins, which after they are fallen into the womb become two membranes, called the amnion and chorion, which enlarge as the contents enlarge.

Fallopius observed these eggs in women before the time of Kerkring, but it was this author who carried on the conjectures of the other into a sort of certainty, and added proofs to what he had first hinted from a number of experiments; and Wharton, in his account of human generation, is of opinion, that the semen penetrates into the testes of the female by means of the Fallopian tubes; in which case, the impregnation is in this instance performed exactly as in others of the oviparous creatures, and the whole difference amounts to no more than this, that in some the impregnated matter loses its figure of the *egg* before it is excluded the parent; but in others, it retains it till it is not only put forth out of the body, but hatched by its genial heat afterwards.

The egg being impregnated by the semen admitted this way, descends into the womb, and there becomes, in a few days, of the biggness of a cherry; and afterwards increases, as we have already observed. This author having an opportunity of opening the body of a woman who had died suddenly about four days after the end of one of the menstrual discharges, found in the womb an egg, of the biggness of a black cherry: he asked the husband carefully, whether he had lain with his wife since the time of the menses; and was informed that he had. This egg was evidently the produce of that impregnation; and tho', at the utmost, it could be no more than four days old, the fœtus was plainly distinguishable in it, on an accurate inspection; and the head in some sort found: the rest of the body seemed an unformed mass of flesh. In such another case, where there was reason to believe the embryo about fifteen days old, the eyes, nose, ears, and mouth, were easily distinguishable in the head; and the body was so far fashioned, as to be easily known by its shape, and the rudiments of legs and arms appeared very plainly from it. The bones, as they are afterwards to become, are at these young periods mere gristles, and harden by degrees afterwards; but they soon acquire that degree of firmness, that the flesh may be taken off and they preserved as skeletons.

At about three weeks from the time of the conception, the fœtus has its cartilages for bones so perfect and so firm, that with due care in the management of so tender an object, the flesh may be separated, and a skeleton preserved of this small size. The head is very large at this period, in proportion to the body; but what is afterwards to become the skull, is only a membrane inflated with wind. The arms and hands are seen distinctly, and even all the fingers are formed. The number of the ribs may be easily counted, and the toes are as distinct as the fingers; but they are all so minute and tender, that a very nice hand, and very great art are necessary for the displaying them. After another week, that is, when the fœtus is a month old, the bones are so well formed, that the whole figure preserves its form, and is able to support itself. The jaw bones appear; the clavicles are formed; and all the ribs are very fair and distinct, except the first and last; and these two, even after another month, do not acquire the consistence of bones. At this period of one month, the joints of the arms, and those of the legs, are all very distinctly seen.

On examining a fœtus at two weeks beyond this period, that is, at six weeks from the time of conception, the inferior jaw bone has in it somewhat very remarkable; for it is plainly seen to be composed of six little bones; whereas, in the younger periods this is not observable; and when the child is born they are all joined together, and make but one bone.

These are the proportions of growth in fœtus's, which have continued regularly growing to the time of the death of the parent, and have been taken out by dissection afterwards: much less is to be judged from abortions, where the regular process of nature in the growth and formation of the fœtus is perverted, and the child has, perhaps, been dead some months before it is excluded, or has been sickly, and therefore not capable of taking nourishment, and growing as it should have done. For these reasons it not unfrequently happens, that an abortive fœtus of four months is not larger than one of these regular fœtus's of six or eight weeks; nor the parts any thing more advanced in their state and solidity, or if at all, but very imperfectly and irregularly.

Mr. Dennys has added some observations on this system of Kerkring; he agrees that these eggs, in which the rudiments of the fœtus are first to be discerned, are generated in the testicles of the female, and made to descend thence by the spiritous effect of the male-semen, making its way thither thro' the tubes; and adds, that they are of very different forms and sizes in different women. The same woman often has, in her testicles, eggs of very different sizes; and as to the proportion in size, between different animals, no regard seems paid in it to their bulk, since not only those of a cow, are much smaller than those of a woman, but those of a duck, or a hen, are vastly larger than either. The first beginnings of things do not always bear a proportion to their state and increase, in the animal or vegetable world: beans are a much larger seed than that of the apple or pear, tho' the latter raises a large tree, while the former only furnishes a small plant. The reason why the eggs of fowls are proportionably larger than those of the human species, or of quadrupeds, is, that they are to contain not only the young animal, but also the food for it to live on in the first part of its life. *Dennys*, in *Kerkring*, de Ovo.

Monsieur Gaulois observes, that the vesicles or eggs, in all sorts of females, are to be observed in three sorts of state or condition: First, while they are fastened to the place where nature has lodged them, as in a repository. Secondly, when they are loosened from the place. And Thirdly, when they inclose the embryo.

In the first of these states, they are common to all females in the animal world; and authors of long standing have observed, that there were in all the female animals, vesicles fastened to certain parts of their bodies. It is also certain, that after conception, that which incloses the fœtus is very like an egg; but this is no new doctrine neither, for even Hippocrates and Aristotle have advanced it: Harvey also, of later times, has treated very much at large on this subject. The whole matter, in the doctrine of Kerkring that is new, and that deserves a further enquiry is, whether these vesicles, which were always known to be fastened to the bodies of females, are at all loosened from them; and whether that kind of egg, wherein the embryo is found, be, or be not one of these vesicles loosened?

The system of Kerkring is founded on the answering this question in the affirmative; but those who are of the contrary opinion, who are not a few, think, that the bladder resembling an egg, in which the fœtus is formed, comes not from elsewhere, but is formed in the place of the conception; and Harvey pretends to explain in what manner it is formed there; and they all agree, that the vesicles, called eggs in females, are so fastened that they never can be removed; and even if they were, that there is no passage large enough for them to descend by from the place of their formation into the womb. Some pretend also, that if these are eggs then men have eggs also; for that the vesicles found in clusters at the sides of the *vasa deferentia*, which anatomists from their figure compare to a cluster of grapes, are truly and exactly of the same kind with those vesicles called eggs in females. See Eggs.

Ova, among the antients, a kind of verses, wherein the verses were reduced to the form of an egg. *Hofm.* in voc.

OVAL-*leaf*, among botanists. See Leaf.

Foramen OVALE. See Foramen *Ovale*.

OVARY, *ovarium* (*Cycl.*)—Ovarium of fishes. All fish have *ovaria*, but they, as well as the eggs they contain, differ greatly in the different kinds, in number, situation, figure, and structure. In the cetaceous, the cartilaginous, and most of the other kinds of fish, the *ovarium* is double, or there are two *ovaria*; but in some fish, as in the *osmarus*, the *perca fluviatilis* of Bellonius, and perhaps in some others it is single. As to its situation, it generally occupies the whole length of the abdomen, as in most of the spinose fishes; and in the petromyzum and accipenser. In many of the cartilaginous fishes it occupies only the upper part of the abdomen; and finally, in the cetaceous fishes it is placed at the corner of the uterus. As to its figure, it is generally oblong and compressed, as is seen in most of the spinose kinds: in those fish which have it single, it is oblong and cylindric, and in the cetaceous fishes it is round.

The eggs themselves are also very different in number and structure. In regard to number, they are in some fishes very few, as in the cetaceous kinds. In the cartilaginous kinds they are somewhat more numerous, amounting to fifty or a hundred; and in other kinds of fish they are so numerous, as to be beyond account.

In regard to their size and structure, they also differ considerably: in some fish they are large, and resemble a hen's egg in their contents; having a white, and yelk, and cicatricula,

tricula, all diſtinct in them, as in the cartilaginous fiſhes of many kinds. In others, as in the cetaceous kinds, they are very ſmall and ſimple, and have no diſtinct appearance either of white, yolk, or of the cicatricula. Hence it is evident, that the fœtus of cetaceous fiſhes, while included in the egg, receives its nouriſhment from the womb itſelf; but in the others, as the cartilaginous, and other fiſh, the white of the egg ſerves as nouriſhment to the fœtus while it remains in it. Finally, in the generality of other fiſhes, the eggs are very ſmall, and probably do contain a white, and yolk, tho' their ſize makes it not eaſy to ſee their parts diſtinctly. All the ſpinoſe fiſhes have theſe ſmall ſorts of eggs, and among the cartilaginous ones, the accipenſer and petromyzum. It has been ſuppoſed by ſome, that the eggs of theſe fiſhes were ſimple bodies, and only anſwered to what Harvey, and other authors on theſe ſubjects call the *cicatricula*; but this cannot be the caſe, for if ſo, the young fiſh muſt periſh; for the ſemen of the male fiſh is only ſcattered over the eggs while they lie in the water, and ſerves only to the rendring them prolific. The figures of all the eggs of fiſhes, ſo far as is yet known, is round. *Artedi*, Ichthyology.

OVATED-*leaf*, among botaniſts. See LEAF.

OUCH, in our old writers, a collar of gold, or ſuch like ornament, worn by women about their necks. Stat. 24 Hen. VIII. c. 13 *Blount*, *Cowel.*

OVEN, or *Aſſaying* OVEN, in metallurgy, is the particular ſort of furnace, uſed by the aſſayers in their operations on metals.

It is moſt conveniently conſtructed in the following manner:

Make with iron plates a hollow quadrangular priſm, eleven inches broad, and nine inches high, ending at top in a hollow quadrangular pyramid of ſeven inches in height; this priſm muſt be cloſed at bottom with ſuch another iron plate, which ſerves as a bottom to it. Near the bottom make a door three inches high, and five inches broad, to lead to the aſh-hole. Above this door, and at the height of ſix inches from the baſis, make another door of the figure of the ſegment of a circle, four inches broad at its baſis, and three inches and a half high in the middle; then faſten three iron plates on the forepart of this furnace; let the firſt of them, which muſt be eleven inches long, and half an inch high, be placed with its lower edge againſt the bottom of the furnace, and faſtened there with three or four rivets in ſuch a manner, that there may be, between the upper edge of the ſaid plate, and the ſide of the furnace, a groove ſo wide, that the ſliders of the lower door may be put into it, and freely move backward and forward therein: theſe muſt be made of a thicker iron plate.

The ſecond iron plate eleven inches long, and three inches high, muſt be placed perfectly parallel to the foregoing plate; and in the ſpace between the two doors in ſuch a manner, that both the upper and lower edge of it may, with the ſide of the furnace, form a hollow groove: one of theſe grooves which looks downward, ſerves to receive the upper edges of the ſliders that ſhut the lower door; and the other that looks upward, is to receive the inferior edges of the ſliders of the door above.

The third plate, which is to be of the ſame dimenſions with the firſt, muſt be riveted cloſe above the upper door, in ſuch a manner, that it may form a groove looking downward, and contiguous to the upper edge of the upper door. In order to ſhut both doors, you muſt adapt to each of them two ſliders made of iron plates, that may move within the above-mentioned grooves; but the two ſliders belonging to the upper door, muſt have each a hole near the top; that is, one a ſmall hole a fifth of an inch broad, and an inch and a half long; and the other a ſemicircular aperture, one inch high, and two inches broad: beſides this, let each ſlider have a handle, that it may be laid hold of when it is to be moved.

Beſide theſe, let five round holes, each of an inch in diameter, be bored in the furnace; two of theſe muſt be made in the fore part of the furnace, two in the back part of it, but all at the height of five inches from the bottom, and three inches and a half diſtant from each ſide of the furnace: and, finally, a fifth hole muſt be made at the height of one inch above the upper edge of the upper door. The inſide of the furnace muſt be lined throughout with iron hooks, ſtanding out about half an inch, and placed at about three inches diſtance from one another, to hold on, and faſten the matter of the lute, with which the whole inner ſurface of the furnace is to be coated.

Let an iron moveable hollow quadrangular pyramid, of three inches in height, be next adapted to the upper aperture of the furnace; this muſt be ſeven inches broad at the baſis, and end upwards in a hollow tube three inches in diameter, two inches high, and nearly cylindrical, but a little convergent at the top: this prominent tube ſerves to ſupport a funnel, or flue, which muſt be nearly cylindrical, hollow, and two foot high, and made of iron plates. This, when a very ſtrong fire is required, muſt be put perpendicularly upon the ſhorter tube, in ſuch a manner, that it enters cloſely and evenly into it an inch and a half, or two inches deep; and may be taken off at pleaſure when the fire is not required to be ſo very violent. This pyramidal cover muſt, however, have beſide, two handles fitted to it, that it may conveniently alſo be taken off or put on at pleaſure; and that this when put on the aperture of the furnace may not be ſubject to be eaſily thrown down, let an iron plate be riveted to the right and left upper edge of the furnace, and be turned down toward the inſide, ſo as to make a furrow open before and behind, into which the lateral edges of this cover may enter, and be faſtened, and at pleaſure moved backward and forward when it is to be put on or removed.

Laſtly, let a ſquare ledge, made of a thick iron plate, be faſtened on the top of the upper edge of the lower door, which will conveniently ſupport the grate and the lute; but this muſt be made of two pieces, that it may eaſily be introduced into the cavity of the furnace; and thus will you have an *aſſay oven* compleat, and ready for a great variety of operations.

When this is to be uſed, that the fire may be the better confined, and the iron not be deſtroyed by growing red-hot, the whole inſide of the furnace muſt be covered over with lute, a finger, or a finger and a half thick. The matter for the making the aſſaying metals, &c. or a mixture of clay with ſand, powder of calcined flints, or broken crucibles, either mixed with water, or with blood diluted with water, will ſerve very well for this purpoſe: but the moſt ready of all lutes, and at the ſame time one of the beſt in the world, is the coarſe earth called Windſor loam: this muſt be mixed up with water pretty ſtiff, and preſſed on the inſide of the furnace, firſt wetted alſo with water; and when this lute begins to dry, it muſt be beat down cloſe to the ſides with a wooden mallet; and then the unevenneſſes and cracks, filled up with clay ſomewhat moiſter, ſo as to be made ſmooth and even with a trowel, and then left to dry gently; and if any cracks happen, they muſt again be filled up. If any pieces of this lute are broken off by the fire, let it be quite cold, and wet it after the operation is over, and the edges of the old lute and freſh clay will unite very well, and fill up the holes. If the crack is but ſmall you may uſe the furnace again immediately, even before the freſh clay is dry.

This is the method of coating the *aſſay furnace* or *oven*; but before this is done there muſt be put within the furnace ſmall iron bars, equal in length to the diameter of the oven; theſe muſt be priſmatical in ſhape, quadrangular, and half an inch thick: their extremities will be ſupported by the ledge before deſcribed within the oven; and they muſt be placed at three quarters of an inch diſtance from one another. Theſe muſt alſo be ſo placed, that their flat ſides may be oblique with regard to the tranſverſe ſection of the furnace, and that the two oppoſite angles may look one upwards and the other downwards. The bars being thus not laid flat, but edgeways, you hinder the aſhes of the fuel of the fire from being detained too long between the interſtices of the bars, and from making any obſtruction that would oppoſe the free draught of the air. After the placing theſe, the furnace being coated over with lute, and dried by a gentle heat, is fit for uſe.

When an operation is to be performed in this, two iron bars of an inch in thickneſs, and ſomewhat more than the diameter of the furnace in length, muſt be put thro' the four holes before deſcribed, ſtanding oppoſite to one another; and the ends of the bars muſt jut out a little beyond the edges of the holes on each ſide; theſe ſerve to ſupport the muffle with its bottom, in which the coppel or teſt, with the matter to be worked on is to be placed: theſe are then to be introduced thro' the upper aperture of the furnace, and ſet on theſe bars in ſuch a manner, that the open foreſide of the muffle be contiguous to the inward border of the upper door. The fuel is to be introduced thro' the top of the furnace, and the cover on this account muſt be moveable, and not too heavy. The beſt fuel is charcoal made of hard wood, and broken into pieces of an inch big, that the muffle may be covered regularly over ſome inches high; large pieces of coal are to be avoided at this time, becauſe they cannot fall into the narrow interſtices between the ſides of the muffle and thoſe of the furnace; and cannot of courſe ſurround every way this circumference of the muffle; for which reaſon if ſuch were uſed, there muſt be ſome places void of fuel, and the fire, conſequently, either not ſtrong enough, or unequal: and if, on the other hand, the pieces of coal were too ſmall, they would fall immediately thro' the interſtices of the grate into the aſh hole, and the tendereſt particles of them turn too ſoon into aſhes, and increaſe the heap of aſhes, and obſtruct the free draught of the air.

Scotch coal, or Kennel coal, but not Newcaſtle or ſea coal, broken into ſmall pieces, may be mixed with an equal quantity of charcoal; or if any ores require long roaſting, the fire may be firſt kindled with Scotch coal alone, but the operation muſt be finiſhed with charcoal alone. *Cramer's* Art of Aſſ. p. 75. ſeq.

OVER (*Cycl.*) — OVER-*blow*, in the ſea language. They ſay it *over-blows* when the wind blows ſo very hard that the ſhip can bear no top ſails.

OVER-

OVER-*done*, in the manege, in French, *outré*. A horse is said to be *over-done*, or *outré*, when his wind and strength are broke and exhausted with fatigue.

OVER-*flowing of lands*. The farmers of England having long observed how great an advantage it was to meadow and pasture land, to be sometimes *over-flowed* by the sudden rise of brooks, rivers, or the like, which brings the soil of the uplands upon them, and makes them need no other mending or manuring, tho' constantly mowed, have found an artificial method of working the same effect, and by it producing the same good effect in many of their grounds without any ill one. The benefit of the natural *over-flowings* of meadow lands, which lie in the way of floods, is in some sort taken off, by their being subject also to these inundations at improper times; and when a winter flood has caused a fine crop of grass, a summer flood sometimes comes and destroys it all before the hay-making season.

There are some lands so advantageously situated, that with the assistance of art they may be laid under water or left dry, at the pleasure of the farmer. These are the most valuable of all grass lands, and it is upon these that the farmer practises his artificial *over-flowings*; improving them in winter by letting in the floods to have their soil for manure upon them, and keeping them dry in summer when the grass is long.

The artificial *over-flowing* of lands is commonly effected by directing the streams of rivers, brooks, springs, or land floods, or some part of them, out of their proper channel; but where the streams lie so low as to be incapable of *over-flowing* the lands, they are made use of to turn such engines as may raise a quantity of water sufficient to do it. The best and cheapest engine for effecting this, is that called the Persian wheel; which may be made of any size, according to the height the water is to be raised to, and the strength of the stream by which it is turned. This wheel is placed so, that its bottom only is immersed in the stream; and there are open boxes at its cogs; these are all filled one after another with water, which is raised with them to the upper part of the wheel's circuit, and then naturally empties itself into a trough which carries it to the land.

Where there are not streams to turn this wheel, the farmers have recourse to pumps, and other engines, moved by wind. Lands that lie near brooks give more frequent opportunities for these practices, than those which are near rivers; the brooks having greater falls, and the rivers running more slow and level: but when it can be effected by the water of large rivers, the land is yet more enriched by it, these waters being more fruitful than the others.

When the water is, by this engine, thrown into the trough, it is to be conducted by it to the highest part of the land; and when that is sufficiently flooded, the water is to be let into a large but not deep trench, several small ones running out of which to all parts of the land, may convey it every where, and every part may be enriched by it. It is always proper to contrive this matter so, that the *overflowing* may be often repeated, and the water quickly carried off; for when it is suffered to lie long upon the land in winter, it is apt to breed rushes and other coarse plants in the ground.

Some farmers graze their lands till Christmas, and some longer; but as soon as fed bare, from Allhallows till spring, that the grass is not too high, is the properest time of *overflowing*, except that it prove a dry time in April or May. If this happen, *overflowing* the lands at this time will be of singular advantage; for the grass will grow three times as fast after it, in hot weather, as it would in cold. Land-floods are the best to *overflow* with in winter, and warm fattening springs in summer; only it must be observed, that the water of one operation is dried in before any more is let on. It is always best also to do it at night, that the moisture may be soaked into the ground before the heat of the day; for otherwise the land is often burnt. The washings of towns and of public highways is of great improvement to lands, as is also the washings of lands where sheep feed.

All waters are not proper for this purpose of *overflowing* of lands to enrich them, the waters of coal mines and other places where there is any sulphureous mineral mixed among them, being apt to destroy and kill the grass where-ever they come. These waters are easily known from the healthful spring, by their leaving a reddish mud or sediment behind them where-ever they have passed; but it is possible, that even these may have their use when properly applied. They seem to contain a vast quantity of salt of some kind, and we know that urine, dung, and many other things, that are most fit of all others to enrich land, will burn up and destroy plants, if improperly laid on in large quantities: the case may be the same in these, and very probably these waters abounding in salt would do great good if they were properly blended with common water, and let in upon the lands with floods of sweet water. The farmers have gone so far towards the proving the truth of this, that they have found some of these springs, when more distant from their source, not only more innocent than before, but beneficial.

Cold clay lands, and other strong lands that lie flat, will only be improved by *overflowing* them with land floods, and that only in summer, when the season is very dry. These lands will not bear water in such quantity at any other time, because it will not soak into them easily; and it is for the contrary reason, that the light and spungy lands are always most improved by *overflowing*. *Mortimer*'s Husbandry.

OVER-*grown*, in the sea language. When the waves of the sea grow high, the sailors call it *rough sea*; but when the surges and billows grow vastly high, then it is an *overgrown sea*.

OVER-*hale*, in the sea language. A rope is said to be *overhaled*, when drawn too stiff, or haled the contrary way.

OVER-*hale the runner*, in the sea language. See RUNNER.

OVER-*hale the sheet*, in the sea language. See SHEET.

OVER-*ride*, in the manege, the same with *over-done*. See the article OVER-*done*, supra

OVER *set*, or *overthrow*, in the sea language. A ship is said to *over-set* when her keel turns upwards; which misfortune happens either by bearing too much sail, or by grounding her, so that she falls upon one side.

OVER-*worked*, in the manege, is the same with *over-done*. It is called in French, *estrapasser*. See OVER-*done* and ESTRAPASSER.

OVER-*laying of children* may be prevented by a machine called *arcuccio*. See ARCUCCIO.

OVIEDA, in botany, the name given by Linnæus to a genus of plants, called by Plumier *valdia*. The characters of which are these: the perianthium is a short and broad one-leaved cup, lightly divided into five erect and pointed segments, and remaining after the flower is fallen. The flower consists of one petal, and is of the labiated kind. The tube is extremely long and slender, and stands upon the germen of the pistil. It is somewhat thicker at the top than at the base, and the upper lip is hollow and emarginated; the lower is divided into three segments. The stamina are four filaments longer than the flower. The antheræ are roundish. The germen of the pistil is globose, and stands between the cup and the flower. The style is capillary, and of the length of the stamina; and the stigma is bifid and acute. The fruit is a globose berry, placed in the cup, which grows larger to receive it, and is of a campaniform shape. The seeds are oval, and are two in number. *Linnæi* Gen. Plant. p. 295. *Plumier*, Gen 24.

OVILE, among the Romans, a name given to the enclosures in which the comitia met to create magistrates. See the article COMITIA, *Cycl.*

OVIPAROUS (*Cycl.*)—The distinction between *oviparous* and viviparous creatures, seems, in the insect world, to be much less fixed and determinate than is supposed. It is evident, that some flies, which are naturally *oviparous*, if they are kept from the finding a proper nidus for their eggs, be it meat, or any thing else, will retain them so long beyond their due time of exclusion, that they will hatch into worms in the body of the parent, and be afterwards deposited alive on flesh, or in the manner of the young of the viviparous insects. Bartholine gives an account in his Medical observations, of a hen, which, instead of eggs, brought forth no less than five living chickens; but she died of it

This story of Bartholine is countenanced in a great measure by a thing which happened in this kingdom; where, in the county of Norfolk, some years after his publishing this history, there was a hen, which, tho' big with eggs, could not lay, but after a time died; and people being curious to open her afterwards, there was found in the ovarium, a chicken disclosed from the shell, and perfectly formed in all its parts; and probably had this been excluded in this state, more would have followed, after being hatched in the same unnatural manner. We have in some authors instances given of the same accident in the serpent kind, which puzzle the distinction between the *oviparous* and viviparous kinds.

OVIS, the *sheep*. The character of this genus of animals, given by naturalists, is, that the covering is wool, not hair; the mouth proportionably smaller than in the ox kind; the horns crooked, wrinkled, and often spiral, and the papillæ only two.

The wool of these animals is only a congeries of very long and slender hairs, oddly twisted and contorted, and variously interwoven with one another. This is a cloathing peculiar to the sheep kind, so far as is yet known, no other animal having been seen to possess it: it is not, however, the cloathing of all the species of sheep, some of the distant nations having short hair, like that of the goat.

We at present know five species of this animal: 1. The common *sheep* of our own pastures. 2. The *ovis laticauda*, famous for the enormous size and breadth of its tail, which often weighs thirty pounds. See the article PLATYCERCOS. 3. The *ovis strepsichoros*. See STREPSICHOROS. 4. The *ovis Africana*, or African *sheep*, which instead of the wool of the *ovis*, has short hair like that of the goat; we have these often brought into England, and they seem no way different from ours but in their covering. And 5, the *ovis Guineensis*, commonly called the *Angola sheep*. This is of the size of our *sheep*, but the hinder part of its head is more prominent, and its ears hang down. Their scrotum is very large, and their penis placed in the middle of the belly, the horns small, and bending down to the eyes; and the neck adorned with a large mane.

mane. The hair of the reft of the body is fhort, and they have a dewlap under the throat like our bulls. *Ray's* Syn. Quad. p 73.

To thefe are ufually added the *pacos* and *mufmon*; the firft of which properly belong to the camel clafs, not the *fheep*, and the latter an animal fufpected not to be found any where at this time.

In the Linnæan fyftem of zoology, the *fheep* makes a diftinct genus of animals, of the order of the *pecora*. The characters by which the creatures of this genus are diftinguifhed from the reft of that order, are thefe: their horns are hollow, bent backward, wreathed and crooked, and fcabrous, not fmooth on their outfide. *Linnæi* Syftem. Nat. p. 43.

OUMIEN, a name given by the Chinefe to a peculiar fort of porcelain, of which they are very fond. It is black, ornamented with gold. They fometimes alfo call the blue and gold, which is made in the fame manner, by the fame name. They colour it with three parts of the azure, and feven parts oil of ftone, and lay on the gold afterwards. If they would have it bluifh, they add lefs of the azure, and fome cerufs white. Obferv. de l'Afie.

OUNCE (*Cycl.*) — The *ounce averdupois* weight, is about $37\frac{1}{2}$ grains *troy*. See POUND.

OUNCE is alfo the Englifh name of the lynx, or *lupus cervarius*, a very fierce beaft of prey. See LYNX.

OURISSIA, in zoology, a name by which Clufius and fome other authors have called the *humming-bird*, or *guainumbi*. *Cluf* Exot. l. 5. c. 7. See the article GUAINUMBI.

OUROLOGY, in medicine, a name given by authors to a treatife or difcourfe on the fubject of urine. The chemifts have given us treatifes on the analyfis of urine, and the preparations of it, fuch as the phofphorus, &c. under the name of *ourologies*: and medical writers have, under the fame name, given us treatifes on the prognoftics from the urine, and its various appearance in different difeafes.

The firft ftep towards judging by the urine, is to fix fomething as its ftandard in a healthy ftate, all the deviations from which, in whatever refpect, are to be judged fignals of diftempers or diftempered habits. This ftandard is beft taken from the urine of a perfon in health, of between thirty and forty years old, and it is of a citron colour and moderate confiftence, of a due and fomewhat ftrong fmell, and made in a confiderable quantity. This, when it has ftood a proper time, is alfo to depofit a natural fediment. By being well acquainted with all the ftages and changes of this, the difeafed urine will be eafily judged of by their feveral peculiarities in difference from it. Phil. Tranf. N°. 100.

It is faid by fome, that people often die with good and healthful urine; but this is only faid by thofe who are not fkilful in urine: for it is as impoffible for the urine to be healthful at the approach of death in difeafes, as for the blood to be fo.

The time of infpecting the urine, and the time that the urine is made that is to be infpected, are alfo circumftances of great confequence. The urine by which the beft judgment is to be formed, is that made after the firft fleep in the night; and the time of judging of this is not immediately when it is made, but about two hours after, when it has had time to fettle. It muft in the mean time be fet to fettle in a moderate air, neither too cold nor too hot. The firft hinders the fettling, and the latter rarifies the colour; and if very great, it caufes an ebullition, which deftroys what fhould fwim upon the furface of the urine. The urine muft not be judged of in the fun, nor by candle-light; for either of thefe lights will give falfe colours: but the proper place is, when there is a moderate, not glaring light; and when it is firft received, it muft be held very ftill and fteady; afterwards it will be proper to fhake it, to fee the whole that fwims in it, and will feparate from it. *Eygel.* de Urinis.

The colour of the urine is the moft precarious of all its appearances, and to be judged of with the greateft caution. What is taken to be the mark of a difeafe in this cafe, is often only the effect of medicines or the food: rhubarb or faffron will make the urine yellow, and a common fallad will make it greenifh; but thefe tinctures go off after a few hours from the time of taking the things which occafion them. People who live in a hot air, and thofe who ufe violent exercife, ufually make more high coloured urine than others. The fubftance, the quantity, the qualities, and the contents of the urine, will always difcover to the attentive view the nature, caufe, and fymptoms of the perfon who made it. What is moft to be obferved as to the fubftance of the urine is, whether it be thick or thin, clear or turbid, oily or not oily. The copioufnefs of it is only to be judged of by comparifon of the quantity voided within the twenty-four hours by the patient, with that he ufed to void in health, or that quantity which at a medium a man in health does ufually void. Among the qualities of the urine, the principal is the fmell. This is affected not only by difeafes, but by medicines taken for them. The urine is on many occafions rendered fœtid; and there are fome things which communicate an agreeable fmell to it, fuch as turpentine and many of the diftilled oils. Among the things which render the urine fœtid, the principal are ulcers and purulent matter. The tafte of the urine alfo declares its qualities. It is naturally of a faltifh and fulphurous tafte, but this goes off, and a fweetnefs or infipidity is obferved in it. The principal colours of the urine in its various ftates, as inflamed by difeafes, are white, yellow, reddifh, and black; to one or two of thefe, differing in degree or to mixtures of two or more of them, in different proportions, may be referred the other lefs common colours of pale citron, high-red, green and blue, which laft two, in any perfect degree, are very uncommon. The moft dangerous of all urines are the blue and the black, particularly the laft: the antients, however, judged too feverely of it. Galen fays, he never knew any one recover who made black urine; but we meet with fome inftances of children efcaping after this fymptom.

The contents of the urine are of three kinds: the fediment or matter fubfiding to the bottom; the matter hanging in the middle; and the matter fwimming at the top. Thefe differ according to their degrees of weight, and in all thefe the phyfician is to obferve, the fubftance, colour, uniformity and likenefs. For example: the beft fediment is that which is moderate in fubftance and quantity, white, uniform, and alike both for matter and time. We are not to expect a fediment in the urine in all difeafes, and in fome a thinner, in others a thicker fediment, is the beft fymptom. Among all the appearances of the middle and top of the urine, the worft is that of a fort of clouds forming themfelves in the urine, and rifing to the top entirely. Thefe are the figns of light-headednefs, and often of death itfelf.

Befides thefe, which are the general contents of urine, there are particular ones; fuch as mealy matter, fcales, coagulated blood, purulent matter, afhes, flime, pieces of feeming flefhy matter, fmall hairs, woolly filaments, flying duft, tough ftuff adhering to the fides of the veffel, and refembling the webs of fpiders, bladders, froth, fat or cream-like fubftances, and finally fandy or ftony matter. This laft is the moft frequent of all, and is of two kinds; the one found in the body, the other only feparated from the urine after it is difcharged. It is of great confequence to know thefe, as they give great light into the nature of nephritic complaints. The fandy matter generated in the body always precipitates itfelf to the bottom in the urine, as foon as it is made, and remains loofe in it; but the other only feparates from it in the pot, and adheres to the fides of it in form of a fort of cruft. It has been fuppofed by many, that prefages of the ftone may be made from thefe feparations from the urine, but there is no certainty in it; only this, that thofe who have been ufed to void grains of fand, if they fuddenly leave it off, and from that time begin to make a whitifh and thin urine, they then may be fufpected to have a ftone breeding within them.

The nature of the fand voided at times by people afflicted with the ftone, may ferve as a guide to judge of the nature of the difeafe. When it is hard and red, the ftone is likely to be fituated in the bladder; if hard and white, the kidneys are likely to be the feat of the diforder. We have inftances of very particular matters voided by urine, befide thefe: fome wholly erroneous; others certain, tho' very ftrange. Plempius gives an account of a woman who voided a yellow fatty matter with her urine for feveral months after the going off of a quartan ague, and tho' fhe difcharged great quantities of this, was not at all the better for it. Phil. Tranf. N°. 100.

OUT, OUTSIDE, or WITHOUT, in the manege, is the contrary of *in*, *infide*, *inner*, &c. See IN, INNER, &c.

OUTIN, in zoology, a name by which fome call the fifh known among authors by the name of *oxyrynchus*. *Willughby's* Hift. Pifc. p. 187. See the article OXYRYNCHUS.

OUTLICKER, or OUTLIGGER, in a fhip, a fmall piece of timber, three or four yards long, as occafion ferves, made faft to the top of the poop, and ftanding right out a-ftern: at the outmoft end of it is a hole, into which the ftanding part of the fheet is received, and made faft through the block of the fheet; and then again received through another block, which is feized to this *outlicker*, hard by the end of it. This is feldom ufed in men of war, or in great fhips; and whenever it is made ufe of, it is becaufe the mizen maft is placed fo far aft, that there is not room enough within board to hale the fheet flat.

Outligger feems the true orthography of the word, which appears to be derived from the Dutch *uitlegger*, q. d. *outlier*.

OUTNESS, is ufed by fome for that relation of things by which one appears out of, or at a diftance from another.

Dr. Berkeley, in his effay on vifion, makes ufe of the word *outnefs*; and obferves, that we form no notion of *outnefs* from the fenfe of feeing merely, but only from motion.

OVUM (*Cycl.*) — OVUM-*Anguinum*, a name given by many authors to a foffil, fuppofed by the vulgar to be the petrified egg of a ferpent, but being really like the brontiæ and ombriæ, fpecies of the *echinites*. See ECHINITES.

OVUM-*polypi*, in natural hiftory, a name given by fome of the earlier writers, to the papyraceous, or thin-fhelled nautilus. The refemblance of the body and arms of the fifh which inhabits this fhell, with thofe of the fea-polypus, gave occafion to their fuppofing this creature the fame animal, not yet got out of the egg. The fhell of this fpecies being very thin,

and looking like an egg-shell, gave farther countenance to this error in less knowing ages.

Ovum *rumphii*, in natural history, the name of a species of *porcelane shell*, of the oblong kind, called an *egg*, from its shape, by that author. See Porcellana.

OUZELL, or *Brook* Ouzell, in zoology, an English name for the *rollus aquaticus*, more usually called the *water rail*. See the article Rollus.

Ouzell, or *Ring* Ouzell, an English name for a bird of the *merula* or *blackbird* kind, remarkable for a white ring about its neck, and thence called by authors *merula torquata*; it is more commonly called in English, the *ring amzell*. *Ray's* Ornithology, p. 144. See Amzell.

OUZEL, or *Water* Ouzel, the English name of the *merula aquatica*. See Merula.

OWL, in zoology. See the article Bubo.

Churn Owl. See Caprimulgus.

Horn Owl. See Horn.

Owl *fish*, or *sea* Owl, in ichthyography, an English name for the *lumpus*, more frequently called the *lump-fish*; and by the Scotch the *cock-paddle*. *Willughby's* Hist. Pisc. p. 208. See the article Lumpus.

Owl *pigeon*, the name of a particular species of *pigeon*, called by Moore the *columba bubo nominata*. It is a small and short-bodied *pigeon*. It has a short round head, and has a series of feathers that separate and open two ways upon the breast: but its most remarkable character is its beak, the upper chop of which is bent, and hooked over like an owl's: this is the occasion of its name. It is of various colours, as white, blue, or black, but is always of only one colour, never pied. *Moore's* Columbarium, p. 54.

OX, *bos*, in zoology. See the article Bos.

The *ox* is a very serviceable animal, in many respects; but his nature depends wholly on that of the bull and cow, from which he is bred. Derbyshire and Lancashire are said to have the best *oxen* in England. Wales, and the island of Anglesea, afford a kind that are very valuable to the farmers, as they will fatten upon middling land; and the Scotch *oxen* are yet hardier than these. The long-legged short-horned cow, of the Dutch breed, is the best for milk; but then this kind needs to be very carefully kept. This sort of cow will often yield two gallons of milk at a time.

When these creatures are intended to breed, the better the land is the larger sort of beasts are to be chosen, and the greater will be the profit. But of whatever sort the breed is, the bull should always be of the same country with the cow, otherwise it never succeeds so well. The bull should be chosen of a sharp quick countenance, his forehead broad and curled, his eyes black and large, his horns long, his neck fleshy, his belly long and large, and his hair smooth and like velvet; his breast should be large, his back strait and flat, his buttocks square, his thighs round, his legs strait, and his joints short. This sort of bull is the best for breed, and makes the best *oxen* for draught as well as for fattening.

The cow ought to have a broad forehead, black eyes, great clean horns, the neck long and thin, the belly large and deep, the thighs thick, the legs round, and the joints short; a white large and deep udder with four teats, and large feet. The size must be proportioned to the goodness of the land. The largest cows, in general, give the greatest quantity of milk; and it is always a good rule to take the cattle from a worse ground than that on which they are to be kept; for if from a better they are apt to degenerate. The best time of a cow's life for breeding of calves, is from three years old till twelve: the black cows are usually chosen to breed out of.

The largest *oxen* are to be chosen for work, and for feeding, but then it must be where there is land rich enough to maintain them. When they are to draw, care must be taken to match them well, both for height and strength; for if one be stronger than the other, the weakest will soon be destroyed. They must never be driven beyond their natural pace, for the beating them throws them into surfeits, and many other diseases. The time of putting *oxen* to work, is at three years old; they must be worked gently the first year, especially in hot weather, and fed with a large quantity of hay: this will enable them to bear their labour better than grass; and they should be always kept in a middle state, neither too fat nor too lean. They may be worked till they are ten or twelve year old, and then sold.

It is observed, that meat and fair treatment, succeed much better with this animal than blows. The best way to break a young one to the yoke, is to put him to it with an old tame *ox* of about his own height and strength. If he prove unruly after this, he must be kept hungry, and made to feed out of the driver's hand. *Oxen* are much more profitable to keep than horses, there being no loss in them; and an old wrought *ox* fattening as well as a young one, and being as good meat. Their keeping also is cheaper, for they eat no oats: their harness and their shoes also are considerably cheaper, and they are not so subject to diseases. They must always indeed have good grass and good hay, and they are not so serviceable as horses, when there is much working in carts, and where the ways are good; but for winter plowing, where the ground is heavy, an *ox* will do as much work as a horse. Every farmer who can keep two teams, would do wisely to have one of them of horses, and the other of *oxen*; it is much better to yoke them together by the necks and breasts, than by the horns as some do; and where a man keeps an *ox* team, he should raise two *oxen* and two cow calves every year to keep up his stock; for it is better for a farmer, in all necessary things, to be a seller than a buyer. Chalky land spoils the feet of *oxen* more than any other. *Mortimer's* Husbandry, p. 233.

Stealing Oxen, or creatures of the *ox* kind, old or young, whether bull, cow, *&c.* strictly so called, steer, bullock, heifer, or calf, is now felony without benefit of clergy; as is likewise killing any of these, with an intent to steal any part of their carcases. Stat. 15 & 16. Geo. II. c. 34. & Stat. 14. Geo. II. c. 6. See Cattle.

Diseases of Oxen. As scarce any creature is more useful to man than the *ox* kind, nothing is more worthy consideration than the nature and origin of their diseases, and the remedies for them. The same distemper that has of late years carried off such vast numbers of these cattle with us and elsewhere, has at other times raged in Italy. In the year 1710, and the succeeding one, there was a great mortality amongst the horned cattle there, and the occasion of it was evidently the unnatural season preceding. The whole autumn before had been wet, and at the time of the winter solstice there were continual cold winds, and small, but lasting rains. The spring that succeeded, was also cold and rainy, and the defect of heat and abundance of moisture, made a change in the whole face of nature: the medicinal springs had not their wonted effect; and the fruits of the earth could not appear at their proper seasons, nor in their due perfection. The grass was injured by this, and the ground rendered continually damp and unwholesome; and to this was evidently owing the malignant and contagious disease that raged among the cattle afterwards. It was supposed at that time with them, as of late with us and elsewhere, that the contagion was brought in among their *oxen* by strange cattle coming from infected places, but this proved to be an error; for if an *ox* was removed to ever so distant a pasture, he never escaped the better for it: the whole earth and its productions were vitiated throughout the country, and there was no safety in any part of it. *Michelotti* de Morbis Boum.

The use of this observation must be, the keeping the cattle in succeeding years out of the way of those things which occasion their sicknesses in such as these. If the autumn or winter be extremely cold and wet, remove the cattle out of the low grounds, and put them to feed in sandy dry soils on the high grounds; give them water from such places where the sun has most power, and it is less chilling cold than in others; and in cases of imminent danger, always mix some salt in it. If the bad weather continues, let them always have clean straw to lie on, and a dry covering; and in cases where the contagion is already begun, the fumigating the houses where they are kept with bay-leaves and eleutherian bark, is judged convenient. As to remedies, when they are once seized with the distemper, it is hard to understand what intention to prescribe in, and how to ascertain the doses; and as the late practice, in attempting to cure, has been of very little service, the cautions for the preserving and preventing the disease, ought to be redoubled, to prevent an almost incurable misfortune.

The diseases of *oxen* are much less frequent than those of the human species; but where-ever they appear, they usually become more violent after a time, and generally are very contagious. In Italy in the year 1711, there appeared a disease among the *oxen*, which carried off as great numbers as the late distemper among us has done. Some acrid and caustic salts in the blood, seem to have been one of the principal causes of this disease; as when the blood was let out at the ear of the dying cattle, and fell upon the ground, there were always found, as it dried up, certain concretions of salts sparkling like so many crystals.

In many of the creatures which were opened, after dying with this disease, the insides of the stomach and intestines were found covered with tubercles like the pustules of the small-pox: the common people supposed this the cause of the disease; but upon farther enquiry, it appeared only one of the effects of it; for such beasts as died very suddenly of this disease, when opened, had their intestines sound; so that these pustules on their surface appear to have been only a symptom of the disease in a very advanced stage. All medicines were found vain in this disease; and such of the creatures as recovered, had always pustules of this kind on their skin, which oozed out a bloody ichor.

From the whole it appears, that this disease was an acute fever in these creatures, of a malignant kind; and that the texture of the blood was always broke in it; and that its cause was to be attributed to various salts taken in from the air, or in eating or drinking. Many had called it a plague among the cattle, but it appeared rather what we understand by the name of a contagious pestilential fever, than an absolute plague; and a peculiarly humid season, joined with exhalations of mineral substances out of the earth, for some reason which we cannot comprehend, more frequent than usual

usual, brought it upon these creatures, whose noses being continually near the ground, gave these exhalations immediate entrance
The method of cure seems to consist in two intentions; the first of abating the fever; the second of restraining the acrimonious malignity of the salts.
Purges of all kinds are cautiously to be avoided; and bleeding in the beginning is always necessary, and must be more largely admitted in the more robust creatures. The common medicines given as febrifuges and cephalics, all do harm; the fumigations of diverse kinds, all are idle or mischievous; and most of these things intended as reliefs, tend plainly to the increasing the disease, as they add to the accelerated motion of the blood, and break its texture more than before. The most rational method of treatment is this:
As soon as a beast is seen to be affected, let him be separated from the rest and kept warm. When his mouth begins to be sore, let a clyster be given; and if this does not work, then a gentle emollient may be given by the mouth, made of lenitive electuary and cream of tartar, dissolved in a large quantity of water-gruel; this is the more necessary if the creature be fat: if a lean beast be seized, bleeding is the first thing to be done; after this, a seton must be made in the neck, and the parts about where the vein was opened should be scarified. If the fever does not abate on these methods, the creature should be blooded again: then, instead of the great quantities of watry liquors, which are usually given, the creature should have something strong, such as a mixture of wine with its liquor, and that in considerable quantity. When the fever abates, he is to be allowed but little drink for the three first days, and that should be a decoction of mallows with a mixture of lemon juice, or some other such acid. In cases where the seton does not discharge kindly, a blister must be applied over it. When by this means the creature begins to recover, elm leaves and olive leaves, are to be mixed with the hay it eats; the creature must be walked out a little, and its litter changed for fresh: this should be done every day, in cases where the creature is weak and poor.
For the preservation of cattle from the disease, nothing is so proper as the taking great care that they drink only clean and pure water, and that they eat only dry food till some hours after sun-rise: they must be carefully kept out of infected places, and their stables fumigated, by burning in them frankinsence, juniper berries, and the like ingredients; or by firing off small quantities of gunpowder at several times, or sprinkling vinegar and camphor on a red-hot iron. The creatures mouths should be washed at times with lemon juice, and their ears with vinegar or urine; and no hogs, sheep, or other animals should be suffered to feed among them. *Gazola* de Peste Boum.
These were the sentiments of Gazola on this fatal disease, which he had carefully attended to in all its stages Lancisi, however, dissents from this author in some particulars. He says, that the distemper was a true plague among the cattle; and observes, that this very plague among the *oxen*, was well known among the antients. It was first brought into Italy from Hungary, and infected the cattle by the breath, by the pores of the skin, or by any other passage that it found open. He prescribes for the preservation, the taking great care that they have perfectly good food and drink; and advises the washing their mouth and nostrils with a mixture of vinegar, garlick, sulphur, salt, and juniper berries; and both he and Gazola agree in advising the rubbing the creatures over with sweet oil. This author condemns all medicines, and even bleeding, but greatly recommends setons, cauteries, and blisters. He advises these to be used as soon as ever the creature is perceived to be sick, and that not only on the neck, but on the shoulders, the hips, and any other part. *Lancisi*, ap. Acta Eruditor. Ann 1715. p. 463.
Franciscus Fantasti published a treatise on the same subject, about the same time; and by his writings it appears, that the *oxen* were seized differently, and affected with different symptoms in different places, tho' the cause of the distemper was evidently the same in all.
Some of the cattle, he observed, voided great quantities of blood by the urinary passages. These usually died, and on opening them the blood was always found fluid, and the brain was often decayed, or full of a fœtid matter; and the marrow in their bones was found dried up and wasted, and all the humors were found evidently tending to a state of corruption.
This author rejects bleeding in all periods of the disease, as a practice that could be of no use in a case where the blood and humors had all lost their due state, and were tending to corruption. He commends scarification and cauteries; he also greatly recommends the trepaning the horns to the medullary part, and the making setons in the ears, on their necks, and in their breasts; the only internal medicine he prescribes, is a mixture of the theriaca diatessaron, two ounces; discordium, one ounce; powder of peruvian bark, two ounces. This dose is to be given every day for three successive days, dissolved in three pints of the juice of brook lime, water cress, and scurvy grass, with the addition of a pint of strong white wine. John Baptist Mazzini, wrote in another part of the world at the same time, on the same subject; with him we find, that the *oxen* which were seized with the disease, continually had a running of a mucous matter from their nose, and a weeping at the eyes; and that when the corners of these creature's eyes were washed with wine, in which sage leaves had been infused, there came out several clusters of small and slender worms twisted one among another, and forming little bundles of twenty and more. He observes also, that these creatures, when affected, usually carried their heads upward, not bending to the earth as usual. This author advises every thing to be done to promote perspiration: he prescribes contrayerva and angelica root, in white wine, in large doses once or twice a day warm, and recommends the fumigating their stalls with juniper and bay berries. The washing their mouths and nostrils with wine and sulphur, is also prescribed in his treatise: a decoction of rosemary, fennell, and sage, with white wine, vinegar, and salt, is also recommended as a drink to be often given; and he prescribes the holding their heads forcibly in a depending posture, that they may give opportunity to the saliva to run out, and the washing their mouth with vinegar and salt to cleanse it of the foulness. *Mazzini*, Litter. ad Vallisnier. de Peste Boum.

Ox-*eye*, in the sea language, a name given by the seamen to those dreadful storms that are sometimes met with on the coast of Guinea; for at first it appears in the form of an *ox's* eye, and not much bigger; but it descends with such celerity, that in a very little space of time, and often before they can prepare themselves for it, it seems to them to overspread the whole hemisphere; and at the same time forces the air with so much violence, that the ships are sometimes scattered several ways, some directly contrary, and sometimes are sunk down right.

Ox-*eye*, *certhia*, in ornithology. See Certhia.

Ox-*fly*, in natural history, a species of two-winged fly, bred from a fly-worm, hatched under the skin of oxen, from the egg of the parent fly lodged there.
The female of this fly makes a number of small wounds in the backs of horned cattle, and in each of these deposits an egg; which is afterwards hatched by the warmth of the creature's body. As soon as hatched, the young worm finds itself in a very convenient lodging, and in a way to be furnished with all the necessaries of life.
The places were they lie are easily discovered, as there is ever a tumor about them, like that on the foreheads of children from falls; within this, and under the thick skin of the creature, is the worm lodged. The country-people know very well that a worm is contained within each of these tumors, but they are something mistaken as to the fly it comes from; the gad-fly being the most busy about these creatures, and giving them most vexation, they naturally enough have supposed this the produce of the egg of that fly; but this is an erroneous opinion: Mr. Vallisnieri seems the first who understood the true state of the case, and he has given a very full and excellent account of it.
Every one of these tumors on the ox has within it a cavity proportioned to the size of the worm, and both the internal cavity, and the external tumor, always increase gradually as the inclosed worm grows larger. In the middle of May these tumors are seen of their full size, and are then an inch high, and an inch and a half broad at their base.
The greater number of these tumours are always found on cattle of about three years old. The number of tumors on the creature are uncertain, and are according to the number of eggs which have succeeded from the laying of the fly; sometimes only three or four, sometimes twenty or thirty, or more, are found on the same creature. They are not regularly placed, but are usually on the back about the spine, tho' sometimes on the legs and shoulders. Sometimes they stand very close to one another; sometimes they are more distinct and separate. It is observed also, that the oxen which feed on open plains are much less subject to them than those that are kept in the neighbourhood of woods.
At the time when the worm has obtained its full growth, and is about to leave the tumor, there is a perforation in it sufficiently plain to eyes accustomed to observations of this kind; nor is it indeed only at this time that this hole may be observed; it is distinguishable at all times, if properly sought after, and is evidently the hole made by the parent fly to introduce its egg, which has never closed, but, on the contrary, has opened more as the tumor increased, and the inclosed worm grew; but toward the end of the time that the worm is inclosed, it enlarges much more quickly than at any other period.
The hole is placed in various parts of the tumor, but very rarely on or near its top, more frequently near some part of its circumference. But these often, tho' near the circumference while the tumor is small, become situated at its top, when it is grown to its utmost size, from the irregular growth of its several parts. This hole is of very signal service, and indeed of absolute necessity to the life of the animal inclosed; since it is by means of this that it holds a communication with the external air, and its posterior stigmata are placed as those of the rest of the fly-worms, near the hinder extremity of the body, and that part were they are is always placed directly against this hole in the tumor. When the tumor is of a considerable size, these may be seen by the naked eye; and when

when ſmaller, the help of glaſſes will always diſcover them; the place where they are ſituated being rendered the more conſpicuous and obſervable by two brown creſcents placed round them.

Theſe worms may be properly enough ſtiled the inhabitants of animal galls, ſince the tumors which contain them are truly analogous to the galls of the oak and other the like vegetable excreſcences.

The hole in theſe tumors is not only uſeful to the animal for a breathing place, but it has another not leſs neceſſary uſe; which is to let off a quantity of abundant matter formed in the tumor, which would, if confin'd there, occaſion a large abſceſs, and choak and deſtroy the animal.

If theſe worms were endued with the qualities of thoſe of the common fleſh-fly, and had hooks at their head-part, to tear and pull the fleſh in pieces, the creature who had thirty or forty of theſe gnawing devourers in its back, preying upon its fleſh at once, would be in a very miſerable ſtate: but this is by no means the caſe, the creatures have no organs to tear its fleſh with, they only live on the matter found in the abſceſs, and give the creature no great pain; being only like ſo many tents kept in a wound neceſſary to be preſerved open, or ſo many peas in iſſues.

The worms may at any time be diſlodged from theſe tumors by a moderate preſſure, and made to come out at the hole of the tumor. This, tho' it appear conſiderably too little, yet anſwers the purpoſe; as the body of the worm well enough bears preſſure, and it is only neceſſary, in order to get them out whole, to renew the force upon the tumor, for the puſhing out every ſeparate ring of its body.

While theſe worms are young, they are white, like thoſe of the common fleſh-fly; but when they grow towards their full ſize, they become ſomewhat brown They are of different ſizes, as is uſual with the worms of other flies; thoſe which are to give the female fly being always the larger, and thoſe which give the male the ſmaller. The larger of theſe are conſiderably more than an inch long, and more than half an inch thick in the fulleſt part of their bodies.

They have nothing very remarkable in their ſhape; their anterior part is ſomething ſmaller than their poſterior, and they have no legs. They are compoſed of eleven rings, counting that for one where the mouth is placed; and of theſe the eighth is the largeſt. Theſe rings are not quite circular, being ſomewhat flatted on one ſide; but what is moſt remarkable is, that the flatter ſide is the back, and hence the creature is, contrary to the uſual cuſtom of theſe inſects, hollow, as it were, on the back, and convex on the belly: and there is a good reaſon for this, ſince, as all the other worms which are deſtined to crawl upon a flat ſurface ought to have their bellies flat, that they may touch it in as many points as may be, and the creature be by that means kept ſteady, ſo this creature which inhabits the concave ſurface of a cavity, ought, in order to have its belly touch in as many points as may be, the ſurface it has to crawl upon, to have it, as it is found, tolerably convex.

The worm has ſix longitudinal furrows on its back and ſides, which interſecting the channellings of the rings, make its ſurface very rough and uneven: but beſides this, the whole intermediate ſpaces appear chagrined, and when examined by the microſcope, are found to be covered with yellowiſh prominent triangular bodies.

As this worm has no legs, it is eaſy to determine, that theſe innumerable ſmall protuberances were allotted it, in ſome ſort, to ſupply the place of them, to fix itſelf by to any place, and to aſſiſt it in moving; and may, beſides this, ſerve to the continual irritation of the inſide of the tumor, and keep up the ſeparation of a matter neceſſary to the creature's life. When the worm has attained its full growth, and is to make its way out of the hole in the tumor, this, as yet, appears much too ſmall to give it paſſage. Nature, however, has inſtructed this worm to do what our ſurgeons practiſe on a like occaſion; when they are to open the orifice of a wound, they often do it by means of large tents; the creature incloſed in this tumour makes the hinder part of its own body ſupply the office of a tent on this occaſion: for three or four days before it is to make its way out, it forces its hinder part into the orifice, and keeps it there a long time; then takes it back, and afterwards thruſts it thither again, and continues without intermiſſion repeating this operation; and when, by this means, the hole is ſufficiently enlarged, it crawls out ſlowly, with its hinder part backward.

As ſoon as it is out of its habitation, it falls to the earth, where it crawls ſlowly about till it finds a place where it may reſt, to go through its ſeveral changes, under a ſtone, or in any quiet place.

Stags and ſome other animals are ſubject to theſe worms in the ſame manner as oxen, and the ſeveral ſtages they go through in the tumors on theſe animals are the ſame with thoſe of the ox.

When they have fixed upon a place to reſt in for their changes, they loſe all motion, and their ſkin becomes black and hard, and makes a ſhell for their remaining in through their ſucceeding changes.

When the time of the egreſs of the fly is come, it appears a two-winged one indeed, but ſo extremely like the humble-bees of a middling ſize, that it is not eaſily to be diſtinguiſhed for what it is: one humble-bee cannot be more like another, than theſe flies are to that ſpecies of them; their bodies are as ſhort, all of the ſame colours, and are even more hairy.

This fly, cloſely examined, appears to be of the ſecond claſs, and to have a mouth without teeth or lips, and its mouth very ſmall. The antennæ are ſhort, rounded at their ends, and of a gloſſy hue. The reticular eyes are of a deep cheſnut colour.

The female has, in the under and hinder part of her body, a cylindric tube, which ſhe can thruſt out at pleaſure, and which is the inſtrument with which ſhe pierces the ſkin of the animal, to depoſit her egg. *Reaumur* Hiſt. Inſect. Vol. 4 p. 503, ſeq. to 537.

OX-*gang*, or OXENGATE. A term uſed in Scotland for a portion of arable land, containing 13 acres. Tr. Pract. Geom. P. 86.

OXALME, in the materia medica of the antients, the name of a compoſition of vinegar and brine, made by a ſolution of ſea-ſalt in water. This was uſed externally in ulcers, and ſuppoſed of great ſervice againſt the bites of venomous animals; and for the curing childrens ſcabby heads. It was alſo uſed as a ſtyptic poured into wounds, and was ſometimes given warm in clyſters; but theſe were always followed by thoſe of milk.

OXELÆUM, a word uſed by many authors to expreſs a mixture of vinegar and oil, for outward application, in caſes of bruiſes and other injuries.

OXUCIÆ, in natural hiſtory, the name of a genus of foſſils of the claſs of the *ſelenitæ*, but of the columnar not the rhomboidal kind. The word is derived from the Greek ὀξὺς ſharp, and κίων a column; and expreſſes a body of a columnar form, and pointed or ſharp at the ends. The *ſelenitæ* of this genus conſiſt of ſix equal planes, having their top or bottom no broader or more depreſſed than the others; and in this differing from the *iſchnambluces*, or flatted columnar *ſelenitæ*, as they do from the *iſambluces* or *cryſtaliform*, but broken ended ones, by having their ends naturally tapering off to a point. See Tab. of Foſſils, Claſs 2. *Hill's* Hiſt. of Foſſils, p 121.

The bodies of this genus, like thoſe of the other genera of the columnar *ſelenitæ*, are liable to a longitudinal crack in their middle; and this ſometimes includes a little clay, in form of an ear of graſs. See SELENITES.

Of this genus there are only two known ſpecies: 1. A fine kind, with thin flakes and tranſverſe filaments, found in the clayey banks of the river Neu, near Peterborough, in Northamptonſhire; and, 2. A dull kind, with thick plates and longitudinal filaments. This is not uncommon in Yorkſhire, and lies ſometimes in a yellow, ſometimes in a blue clay. *Hill's* Hiſt. of Foſſ. p. 141, 142.

OXYA, in botany, a name by which many authors, eſpecially the Greeks, have called the *fagus* or *beech-tree*. *J. Bauhin*, Vol. I. p. 117.

OXYBLATTA, among the antients, is uſed to denote a bright and gloſſy kind of purple colour. *Hoffm.* Lex. in voc.

OXYCEDRUS, in botany, a name given by ſome authors to the *cedrus folio cupreſſi*, or the *berry-bareing cedar*. *Chabræus*, p. 72.

OXYCOCCUS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form; the cup finally becomes a roundiſh fruit or berry, which is divided into four cells, containing roundiſh ſeeds.

The ſpecies of *oxycoccus* enumerated by Mr. Tournefort, are theſe: 1. The common *oxycoccus*, or *moor-berries*; and, 2. The broad-leaved *oxycoccus*. *Tourn.* Inſt. p. 655.

OXYGARUM, a word uſed by the antients to expreſs a mixture of vinegar and *garum*, which is a pickle for the preſerving fiſh, or a ſimple mixture of ſea-ſalt and water.

OXYGLUCA, a word uſed by the antients to expreſs a liquor made of a mixture of honey, water, and vinegar. The common way of making it was by macerating the combs, after the honey was preſſed out, in water; and then adding a ſmall portion of vinegar, to give it a tartneſs. It was ſometimes made without the addition of the acid, and made a weaker ſort of mead, uſed as a common drink in hot weather. Galen ſays, it was the ſame with the *apomeli*.

OXYLIPES, a word uſed by ſome authors as a name for bread, which has a mixture of vinegar in it; intended ſometimes for eating, ſometimes for medicinal uſes.

OXYMYRSINE, in botany, a name by which ſome authors have called the *ruſcus*, or *butcher's broom*.

OXYPHŒNICON, in botany, a name uſed by ſome authors for the tree whoſe fruit is the *tamarind* of the ſhops. Mant. Exot. p. 10.

OXYPYCNI, ὀξύπυκνοι, in the antient Greek muſic, was a name given to ſuch chords as formed the higheſt ſounds of the *ſpiſſa*. There were five *oxypycni* in the ſcale. See the articles PYCNI and SPISSUM.

OXYREGMIA, a word uſed by the antients to expreſs acid eructations.

OXYRYNCHUS, in zoology, the name of a fiſh of the truttaceous kind, called by ſome *hautin*, and *outin*. It is caught frequently in the Engliſh and other ſeas, and is frequently carried to market in Holland among the whitings. It is very much of the ſhape and figure of the trout, but a little flatter, and is covered with large white ſcales. The back is of a ſomewhat duſky colour, and the lines on the ſides a little bent near their origin. The tail is forked; but the mark by which it is moſt readily diſtinguiſhed from all other fiſh of this genus, is the figure of its ſnout, or upper jaw, which runs out beyond the under, and goes off rounding and tapering to a point, making in the whole a ſort of conic figure. The head is ſomewhat tranſparent. It has no teeth, but a conſiderably rough tongue. *Aldrovand.* de Piſc. l. 5. c. 24.

OXYS, in botany, the name by which authors call *wood-ſorrel*. The characters of this genus of plants are theſe: the flower conſiſts of one leaf formed into a bell, and wide open at the mouth, where it is alſo divided into ſeveral ſegments. From the cup of the flower there riſes a piſtil, which is fixed like a nail into the bottom of the flower, and ripens into an oblong membranaceous fruit, uſually divided into five cells, opening outward from the baſe to the apex, and full of ſmall ſeeds, which uſually fly out forcibly on the touching the ſeed-veſſel, by means of the elaſticity of ſome of its parts. *Tourn.* Inſt. p. 89.

The ſpecies of *oxys* enumerated by Mr. Tournefort, are theſe: 1. The common white flowered one, called by authors *trifolium acetoſum*, and *alleluja flore albo*. 2. The purple flowered kind. 3. The blue flowered kind. 4. The common yellow one. 5. The upright American yellow flowered one. 6. The fibroſe rooted American one, with red flowers. 7. The yellow ſhrubby American *wood-ſorrel*, having the appearance of the ſtinking trefoil. 8. The ſcaly rooted purple *wood-ſorrel* of Virginia. 9. The bulboſe-rooted African *oxys*, with roundiſh leaves and with purple ſtalks and large purple flowers. 10. The bulboſe-rooted round-leaved African *oxys*, with green ſtalks and large purple flowers. 11. The Æthiopian bulboſe-rooted *oxys*, with heart faſhioned leaves, and large purpliſh white flowers. See Tab. 1. of Botany, Claſs 1.

The ſeveral ſpecies of this plant are uſually diſtinguiſhable even when they are not in flower, by their having their leaves growing regularly three at the top of every ſtalk; and being each uſually of the figure of a heart at cards, and theſe are generally of an agreeably acid flavour. See SORREL.

OXYSAL-*diaphoreticum*, the name of a compound medicine greatly recommended by ſeveral authors, and invented by Angelus Sala. The manner of preparing it is this: take fine ſalt of carduus benedictus, put it into an earthen pot, and pour upon it gradually ſome ſtrong wine-vinegar, or ſpirit of ſugar; continue to pour this on till the ebullition ceaſes and an agreeable ſmell ariſes, and the matter has an agreeable tho' ſomewhat acid taſte; let all the humidity from this mixture be evaporated over a gentle heat, and after this, let all the ſalt be again diſſolved in water, and ſet in digeſtion in balneo mariæ for eight days: a liquor of a beautiful and pellucid colour is there produced, which, when poured carefully off into another veſſel, is to be again evaporated to a dryneſs with a very gentle heat, and the remaining matter, which is the ſalt, is to be collected together, and kept in a phial carefully ſtopt; for it is ſubject to run, if left to the acceſs of the air, like the common alcali ſalts.

OXYSCHŒNOS, in the materia medica, the name of the *juncus acutus capitulis ſorgli*; or *hard pricking large ſea-ruſh*. *Dale*, Pharm. p. 258. See JUNCUS.

OXYTOCHA, in medicine, a term uſed by many authors to expreſs ſuch medicines as are given to promote delivery.

OXYTRIPHYLLUM, in botany, a name uſed by ſome authors for the *trifolium bituminoſum*, or *ſtinking trefoil*. *Chabræus* p. 110.

OYSTER, or OISTER, *oſtrea*, in zoology. See the article OSTREA.

The *oiſter* affords the curious in microſcopic obſervations a very pleaſing entertainment. In the clear liquor many little round living animalcules have been found, whoſe bodies being conjoined, form ſpherical figures, with tails not changing their place otherwiſe than by ſinking to the bottom, as being heavier than the fluid; theſe have been ſeen frequently ſeparating, and then coming together again. In other *oiſters*, animalcules of the ſame kind were found, not conjoined, but ſwimming by one another, whence they ſeemed in a more perfect ſtate, and were judged by Mr. Lewenhoek, to be the animalcules in the row or ſemen of the *oiſter*.

A female *oiſter* being opened, incredible multitudes of ſmall embryo *oiſters* were ſeen, covered with little ſhells, perfectly tranſparent, and ſwimming along ſlowly in the liquor: and in another female, the young ones were found of a browner colour, and without any appearance of life or motion.

Monſieur Job'ot alſo kept the water running from *oiſters* three days, and it appeared full of young *oiſters* ſwimming about nimbly in it; theſe increaſed in ſize daily, but a mixture of wine, or the vapour of vinegar, killed them.

In the month of Auguſt *oiſters* are ſuppoſed to breed, becauſe young ones are then found in them. Mr. Lewenhoek, on the fourth of Auguſt, opened an *oiſter*, and took out of it a prodigious number of minute *oiſters*, all alive, and ſwimming nimbly about in the liquor, by means of certain exceeding ſmall organs, extending a little way beyond their ſhells; and theſe he calls their beards. In theſe little *oiſters* he could diſcover the joinings of the ſhells, and perceived that there were ſome dead ones, with their ſhells gaping. Theſe, tho' ſo extremely minute, are ſeen to be as like the large *oiſters* in form, as one egg is to another.

As to the ſize of them, he computes, that a hundred and twenty of them in a row would extend an inch; and conſequently, that a globular body, whoſe diameter is an inch, would, if they were alſo round, be equal to a million, ſeven hundred and twenty-eight thouſand of them. He reckons three or four thouſand are in one *oiſter*, and found many of the embryo *oiſters* among the beards; ſome faſtened thereto by ſlender filaments, and others lying looſe: he likewiſe found animalcules in the liquor five hundred times leſs than the embryo *oiſters*. *Lewenhoek* Arcan. Nat. T. 4. p. 513.

It is not very uncommon to ſee on *oiſter* ſhells, when in a dark place, a ſhining matter or bluiſh light, like a flame of brimſtone, which ſticks to the fingers when touched, and continues ſhining and giving light for a conſiderable time, tho' without any ſenſible heat. This ſhining matter being examined with a microſcope, was found to conſiſt of three ſorts of animalcules: the firſt, whitiſh, and having twenty-four or twenty-five legs on a ſide, forked, a black ſpeck on one part of the head, the back like an eel with the ſkin ſtripped off. The ſecond ſort, red, reſembling the common glow-worm, with folds on its back, but legs like the former; a noſe like a dog's, and one eye in the head. The third ſort, ſpeckled, with a head like a ſoal, with many tufts of whitiſh hairs on the ſides of it. Some much larger and greyiſh might be ſeen, having great heads, two horns like a ſnail's, and ſix or eight whitiſh feet; but theſe did not ſeem to ſhine. Philoſ. Tranſact. N. 279.

As the bodies of lobſters, and ſome other ſorts of fiſh, tainted fleſh, rotten wood, and other ſubſtances, are ſometimes found to ſhine with a light like that on *oiſter* ſhells, may it not very probably proceed from the ſame cauſe? Some alſo have gone ſo far as to imagine the willow-wiſp, ſo common in fenny countries, to be only a collection of flying inſects, which emit light from ſome part of their body, as the glow-worm and lantron-fly do; and the place, motion, and ſome other circumſtances of that lambent flame, as it is called, ſeem, indeed, not a little to favour that conjecture. *Baker's* Microſcope, p. 241.

Foſſile-OYSTERS. The greateſt bed of *foſſile-oiſters* any where known of, is that near Reading, in Berkſhire. They have the entire ſhape, figure, and are of the ſame ſubſtance with the recent *oiſter* ſhells, and yet muſt have lain there for a long time, the oldeſt hiſtories that mention the place giving an account of them. They are extended over no ſmaller a ſpace than ſix acres of ground, and juſt above them there is a large ſtratum of a greeniſh loam, called by ſome writers a green earth, and by others a green ſand. It is compoſed of a crumbly marle, and a very large portion of ſand. Under them there is a thick ſtratum of chalk. They all lie in a level bed, and as the ſea comes no where near this part of the kingdom, it ſhould ſeem, that the deluge only could give place to them here. It has been idly imagined by ſome, that the Roman ſoldiers once quartered there, threw away theſe ſhells from the *oiſters* they fed on in vaſt quantities, but this is anſwered by obſerving, that the ſtrata above the ſhells are natural, and have never been dug thro' till the time of finding the ſhells.

The *oiſter* ſhells and green earth together, make a ſtratum of about two foot thick; and over this, a much thicker ſtratum, of a bluiſh and very brittle clay, but this has never been dug through, except where we find the ſhells. The people call this *piercy-clay*, and ſay it is fit for no uſe. This bed of clay is about a yard deep, and above it is a ſtratum of fuller's earth, about two foot and an half deep. It is of a very good kind, and is uſed by the clothiers. Over this there lies a ſtratum of a fine white ſand, unmixed either with the clay or fuller's earth: this is near ſeven foot deep, and above this there is a ſtratum of a ſtiff red clay, of which they make tiles in the place. This is covered with a little vegetable mould, and the depth of this ſtratum of tile-clay cannot be aſcertained, becauſe of the unevenneſs of the hill.

Theſe *oiſters* are ſometimes found whole, but more uſually in ſingle ſhells. When they are in pairs, there is uſually ſome of the green ſand found within them: they ſeldom ſtick very faſt together, ſo that unleſs very carefully taken up, it is not eaſy to get them in pairs. Phil. Tranſ. N. 261, p. 484.

OYSTER-*ſhells*. Theſe are an alcali of a more powerful kind than is commonly ſuppoſed, and probably are in reality much better medicines than many of the more coſtly and pompous alkalies of the ſame claſs. The proof of alkalies is in their ſolution by acid ſpirits; and Mr. Homberg found, that they diſſolved much more eaſily in the acids of nitre and ſea-ſalt, than pearls, coral and the reſt; which he ſuppoſes owing to their containing in the body of the ſhell a conſiderable portion of ſal-ſalſus, which is eaſily perceived upon the tongue, and which keeps the whole ſubſtance of the ſhell in a ſort of half diſſolved ſtate. Theſe ſhells are found to produce very great effects on the ſtomach, when injured by acid humours; and Mr. Homberg is of opinion, that this their eaſineſs of ſolution is one great reaſon of their good effects, and that the quantity of ſal-ſalſus

which it contains, contributes not a little towards it, ſince we are not to look upon that as a mere ſalt, but a ſalt of a peculiar kind, formed of ſea ſalt by the organs of the animal, and the ſeveral fermentations it undergoes in the body of it, in the ſame manner as the nitrous and other ſalts of the earth ceaſe to be nitrous, &c. as ſoon as they have been blended with the juices of plants, and form with them a ſalt peculiar to that plant; and this is plainly the caſe in regard to this ſalt, ſince it is evidently of a more penetrating taſte, and of a different ſmell, from the ſalt left by the ſea water between the ſeveral external ſcales, or flakes of the ſhell.

As *oiſter* ſhells were found by Mr. Homberg to be a very valuable medicine, and as one of the common methods of preparing them is by calcination, which he obſerves cannot but much impair their virtues, he gives the following method of preparing them for taking inwardly, which was what he always uſed:

Take the hollow ſhells of the *oiſters*, throwing away the flat ones as not ſo good; waſh them perfectly clean, and then lay them to dry in the ſun; when they appear dry, beat them to pieces in a marble mortar, they will be then found to contain yet a large quantity of moiſture; lay them again in the ſun till perfectly dried, and then finiſh the powdering them, and ſift the powder thro' a fine ſieve. Give twenty or thirty grains of this powder every morning, and continue it three weeks or a month. Mem. Acad. Par. 1700.

OYSTER-*worm*, in natural hiſtory, a name given by writers to a kind of ſmall worm found in *oiſters*, which ſhines in the dark, in the manner of the glow-worm; but with an univerſal light, and not in a peculiar part only, like this animal.

The firſt obſerver of theſe *oyſter-worms* was Mr. De Lavoye, who communicating his obſervations to Mr. Auzout, gave occaſion to a very diſtinct account of them from this author.

The firſt thing that preſents itſelf on the opening the *oiſters* which contain theſe worms, is only a ſort of ſhining clammy moiſture, which appears like a ſtar of a blueiſh colour, and being drawn out, will extend itſelf to near half an inch long, and ſhine as much for that whole length as in the contracted ſtate: it will alſo ſhine for ſome time after it is taken out of the *oiſter*.

On a ſtricter obſervation, theſe ſhining ſubſtances are found to be real living worms, and there are indeed three diſtinct ſpecies of them. One ſort is whitiſh, and has twenty-four or twenty-five feet on each ſide: there is a black ſpeck on one ſide the head, and the back exactly reſembles that of an eel, when the ſkin is ſtriped off. The black ſpeck in the head is certainly an eye, and it is remarkable that the creature has but one. The ſecond ſort of theſe worms, is red: this alſo has but one eye: its body is made up of ſeveral rings; its noſe is like that of a dog, and it has the ſame number of feet with the former. The third ſort is very different from the other two; it is ſpeckled, and its head is like that of a ſoal, and has a tuft of hair on each ſide. There are other worms found alſo in the *oiſter*, particularly a large greyiſh one with two horns, a great head, and ſeven or eight whitiſh feet; but theſe do not ſhine. The two firſt ſorts are eaſily miſtaken for ſhining moiſture only, their ſubſtance being ſo tender, and eaſily reſoluble, that on the leaſt ſhaking or touching, they turn into a viſcous jelly. This, however, has the property of ſhining as much as the living worm, and when taken from the ſhell, will ſhine on the obſerver's fingers for twenty or thirty ſeconds; and if any part of this matter be let to fall to the ground, it ſhines as long, and exactly reſembles a piece of burning brimſtone. Sometimes when ſhaken off nimbly, it becomes a ſhining line, which diſſipates itſelf before it comes to the ground. The ſhining matter in this caſe, is in ſome whitiſh, in others reddiſh; but yet in both caſes it gives a violet appearance to the eye. The white ones are the tendereſt of all: theſe ſo eaſily burſt, and become a mere lump of jelly, that if it were not for the feet which are ſeen among it, one would ſcarce imagine that they were ever worms, or any thing living. When they are large and robuſt, they move their heads and tails about, and this is a great addition to the luſtre of their ſhining; every motion of this kind giving a flaſh of light brighter than the reſt. On forcibly ſhaking the *oiſter* in the dark, the whole ſhell is ſometimes ſeen full of lights, which are now and then as big as the finger's end; after this, a great deal of this clammy matter, both red and white, may be obſerved; ſo that it is probable great numbers of the worms are burſt in their holes. In the ſhaking it may be diſtinguiſhed, that their holes run into, and communicate with one another, like the holes made by worms in wood. This light occurs more frequently in large, than in ſmall *oiſters*. there are few of theſe large ones that do not yield it in the ſhells, and in ſome it is ſeen in the *oiſters* themſelves.

Thoſe ſhells which are viſibly pierced by the worm, more frequently emit the light than thoſe which are not; and the convex ſhell more than the flat one. The worms are not apt to give light when irritated, but if they do, it laſts only a little time; but when they are at reſt, the light they give uſually laſts ſeveral hours. The outſide of the ſhell being a little ſcaled, the communication of the holes may be ſeen; the form of the worms is generally deſtroyed in doing this, but there is the jelly like moiſture left, and this ſmells like the *oiſter* liquor. Journal de Scavans, 1666.

OZE, a word uſed by ſome writers to expreſs a *fœtor*, or *ill ſmell of the mouth.*

OZEMAN, a word uſed by ſome of the chemical writers for the white of an egg.

OZO, a word uſed by ſome of the chemical writers for *arſenic*, or *ratsbane.*

P.

PABOS, in botany. See CAAMINI.

PACA, in zoology, the name of an American animal of the Guinea-pig kind, having the general characters of the rat kind, and the voice and hair of the hog.

This is the largest of all the animals of this kind, being of the size of a small pig, and usually very fat. Its head is like that of a rabbit, and its beard long, and resembling that of the hare: its ears are naked, and a little pointed; its nostrils very wide and large; the upper chop is longer than the under one, and the hinder legs than the fore ones. Its feet have all four toes a-piece; its hair is hard and harsh, like that of a hog, and of a dusky brown colour: it has several grey spots disposed in a longitudinal direction along the sides, and its belly is white. It does not use its fore feet in the nature of hands, as the other species do, but eats it on the ground in the manner of the hog. It is usually fat, and the flesh very well tasted. *Ray*'s Syn. Quad p. 226.

PACAMO, in zoology, the name of a long-bodied fish of the mustela kind, caught among the rocks, and of a very well-tasted flesh It is usually about eleven fingers long, and grows narrower and smaller toward the tail. Its head is large, broad, and thick. Its mouth is of the shape of a half-moon, and has very solid, but not sharp teeth. Its eyes are small, black, and placed very close together. Behind the gills are two fins soft and skinny; and lower on its belly, two more. Its back and belly fin, which runs from the middle of the back to the anus, is very soft and skinny also; the tail fin is more than a finger long, and is skinny like the rest. The skin is smooth, and has on each side four rows of white spots running from the gills to the tail. Its skin easily slips off from the body like that of an eel. *Marggrave*'s Hist. Bras. p. 113.

PACHODECARHOMBIS, in natural history, the name of a genus of fossils, of the class of the selenitæ.

The word is derived from the Greek παχυς thick, δεκα ten, and ῥομβος, a *rhombus*, and expresses a thick rhomboidal body, composed of ten planes. See Tab. of Foss. Class 2.

The characters of this genus are, that the selenitæ of it consist of ten planes; but as the top and bottom in the leptodecarhombes, or most common kind of the selenitæ, are broader and larger planes than any of the rest, the great thickness of this genus, on the contrary, make its four longer planes in all the bodies of it, meeting in an obtuse angle from its sides, its largest planes. *Hill*'s Hist. of Foss. p. 120.

Of this genus there are only four known species: 1. A very pellucid one, with slender transverse striæ. This is frequent in the clay-pits of Northamptonshire, and some other counties; and the ordinary people have an opinion, that it is good to stop hæmorrhages; whence it has acquired among them the common name of *staunch*. 2. A dull-looking kind, with very fine transverse filaments. This is found in the clay-pits of Northamptonshire, Staffordshire, and Yorkshire. 3. A fine and beautiful kind, with very slender longitudinal filaments. This is common in Yorkshire, and seems almost peculiar to that county; it is not only found there in digging, but frequently lies on the surface of the earth. And 4. A brown pellucid kind, found very frequently in Germany, and sometimes in England. *Hill*'s Hist. of Foss. p. 130—133.

PACHUNTICA, a term used by some medical writers to express incrassating medicines.

PACOS, in zoology, the name of a species of camel, usually, but very improperly accounted a species of sheep; and known among many by the name of the *Indian sheep*, or *Peruvian sheep*.

It very much resembles that species of camel usually known by the name of *glama*, and found in the same countries; but this is much smaller, and is much less tractable, and a very obstinate animal.

The reason of this creature's having been accounted a sheep, is, that its hair is so long as to resemble wooll, and it is cloathed prodigiously thick with it. Its head and neck alone, have more wooll on them than the whole body of our largest sheep. Its body is cloathed in the same proportion with a woolly hair, equally fine. It is a much weaker creature than the glama, and is never used for carrying burthens, but is kept as our sheep for the sake of its wooll and its flesh, which is very well-tasted, and is a rich food. *Ray*'s Syn. Quad. p. 147.

PACQUING, in natural history, a name given by the people of the Philippine islands to a small bird of the sparrow kind, but very beautifully variegated. It feeds on the seeds of grass.

PADDLE, in glass-making, the name of an instrument with which the workman stirs about the sand and ashes in the calcar. *Neri*'s Art of Glass, Appendix.

PÆCILIA, in ichthyology, a name given by Schoneveldt [a], and some others [b], to the fish called by most authors the *mustela fossilis*. It is properly a species of *cobitis*, and is called by Artedi the *bluish cobitis*, with five longitudinal black lines on the body.—[[a] *Schoneveldt* de Pisc. [b]*Willughby*'s Hist.Pisc.p. 124.]

PÆDARTHROCACES, in surgery, is a disease of the bones, raising them into tumors near the joints, and differing from the spina ventosa, in that it is not attended either with violent pains, or erosions of the bone and adjacent parts. The word is derived from the Greek παις a child, αρθρον a joint, and κακον an evil, signifying that it is a disorder of the joints, to which children are principally subject; which is the case, because the bones of children being softer than those of adults, are therefore the more easily distended by humors, and more frequently raised into tumors: these are hard in this case, and the adjacent soft parts are not inflated, and are free from redness, inflammation and pain. It is, however, to be observed, that this disorder, tho' at first very different from the spina ventosa, is sometimes known to degenerate into that disorder. *Heister*'s Surg. p 261.

PÆDEROTA, in botany, a name by which Linnæus has distinguished a plant nearly related to the veronicæ or speedwells, and called *bonarota*, by Micheli. This, in the Linnæan system of botany, is also a distinct genus of plants, the characters of which are, that the cup is a perianthium, divided into four segments, and remaining after the flower is fallen. The several segments are strait and pointed; the flower is composed of a single petal, which forms a cylindric tube, nearly of the length of the cup, placed erect at its extremity, and divided into two labia; the upper of which is long, hollow, and narrow; the under expanded, but somewhat erect, broadest in its upper part, lightly divided into three segments, and those all equal. The stamina are two filaments bent downward, and of the same length with the cup: the antheræ are somewhat erect: the pistil has a roundish germen, a thread-like style of the same length with the stamina, and a truncated stigma. The fruit is a flatted capsule of an oval figure, but bifid and pointed at the top, consisting of two cells with four valves. The seeds are very numerous, oblong, and obtuse, and adhere to a columnar receptacle. *Linnæi* Genera Plantar. p. 4.

PÆDEROTA, among some of the old botanical writers, is also a name given to the *acanthus*, or *bear's-breech*. *Ger.* Emac. Ind. 2.

PÆDOTHYSIA, Παιδοθυσια, in antiquity, an inhuman custom that prevailed among the antient Heathens of sacrificing their children. Thus it is related in the Scriptures, that the king of Moab being besieged by the Israelites in his capital, and reduced to great straits, took his eldest son that should have reigned in his stead, and offered him for a burnt offering upon the wall, on which the siege was raised. 2 *Kings* iii. 27.

From Phœnicia this cruel practice passed into Europe, and Africa, and spread itself far and wide: and it is reported, that the Mexicans are, at present, guilty of it. *Hofm.* Lex. in voc.

PÆNULA, among the Romans, a thick garment fit for a defence against cold and rain. *Pitisc.* Lex. Ant. in voc.

PÆONIA, *piony*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, consisting of several petals disposed in a circular form. The cup is also composed of several leaves, and from it arises a pistil, which finally becomes a fruit, composed, as it were, of several capsules collected into a head: these all bend downwards, and are usually hoary; they split open longitudinally when ripe, and contain roundish seeds.

The species of *piony*, enumerated by Mr. Tournefort, are these: 1. The common male *piony*, with a shining blackish flower. 2. The male *piony*, with flesh-coloured flowers. 3. The white-flowered male *piony*. 4. The male *piony*, with larger segments to the leaves. 5. The great male *piony*, with flesh-coloured flowers. 6. The late flowering male *piony*. 7. The common female *piony* 8. The narrower-leaved female *piony*. 9. The broader-leaved female *piony*. 10. The dwarf rose-flowered winter *piony*. 11. The purple-flowered *piony*, with finely divided leaves, hoary underneath. 12. The whitish-flowered *piony*, with leaves hoary underneath. 13. The aquiline-leaved *piony*. 14. The orange-coloured *piony*. 15. The *piony* with variegated flowers. 16. The *piony* with very deep-red flowers. 17. The Constantinople *piony*, with pale-red flowers. 18. The large-flowered double deep red *piony*. 19. The smaller-flowered double deep red *piony*. 20. The common *piony*, with double large pale red flowers. 21. The common *piony*, with smaller double pale red flowers. 22. The smaller-flowered whitish double *piony*. *Tourn.* Inst. p. 273. See PIONY.

PÆONITES, in natural history, a name given by some writers to the stone called by others *pæanites*, and esteemed of great use

ufe to women in labour. It feems to have been called *pæonites*, from Pæonia in Macedonia, where it was found.

PAGANELLUS, in ichthyology, the name of a fifh of the fea-gudgeon, or rock-fifh kind, called by authors *gobius maximus marinus flavefcens*. This name, however, which was given it by Rondeletius, is a very erroneous one, fince it is fmaller than the common kind, which it much refembles; it is alfo of a paler colour, and has a fine yellow line furrounding the edge of its firft back fin, and has but a flight furrow on its back, whereas that has a much larger one. Its head alfo is fhorter, and its jaws more tumid; and its belly fins more regularly connected into the fhape of a funnel. It is common in the Mediterranean and other feas, and is frequently brought to market at Rome, Venice, &c. *Willughby*'s Hift. Pifc. p. 207. See the article GOGET.

PAGANINA, an Italian word ufed by fome authors to exprefs the firft excrements of children: thefe dried and reduced to power, are efteemed by fome a very great and powerful medicine againft epilepfies. It is to be taken in fmall dofes every day, for fome time.

PAGEL, in ichthyology, a name given by the Spaniards to that fifh which authors in general call the *erythrinus*, or *rubellio*, and fome the *xathus* and *pagrus* It is properly a fpecies of the *fparus*, and is diftinguifhed by Artedi from the reft of that genus, by the name of the *filver-eyed red bodied fparus*. See the article SPARUS.

PAGOYUM, a word ufed by Paracelfus and his followers, to exprefs an imaginary being which prefides over, or is the occafion of difeafes, whofe caufes are lefs known, and which have been fuppofed to arife from inchantment. Such is the doctrine of this ftrange writer, and on this fubject he has written a treatife called *Pagoyus*.

PAGRUS, in ichthyology, the name of a fea-fifh, known in Englifh by the name of the *fea-bream*. It is a confiderably large fifh, growing fometimes to ten or twelve pounds weight. It is very broad in proportion to its length, and is alfo confiderably thick; its head is flatted at top, and at the bafis of the gill fins, it has on each fide a large black fpot. Its gill-fins are large and long, and the extremities of all its fins are hid, and as it were involved in fkin, which is a very fingular circumftance in regard to this fifh. The eyes are large, and their hairs white, and the mouth is frequently of a fine red within; it has broad teeth in the forepart of its mouth, and rough tubercles in the place of teeth in the hinder. Its tail is forked, and it has one long back-fin; the nerves, or rays of the anterior part of which are fharp and prickly, and thofe of the hinder part foft and fmooth to the touch. It is caught in confiderable plenty in the Mediterranean, and is common in the markets of Italy. Some account it a very delicate fifh, but many think it eats too dry. See Tab. of Fifhes, N. 58. *Aldrovand* de Pifc. l. 2. c. 7. *Rondelet.* de Pifc. l. 5. c. 15. p. 142. *Gefner* de Pifc p. 173.

PAGRUS is alfo ufed by Joannes Cuba, and others, for the fifh commonly called *dentex*, the *fynodon*, and *fynagris* of the Greeks. It is a fpecies of the fparus, and is accurately diftinguifhed by Artedi, by the name of the *variegated fparus*, with a fharp back, and with four large teeth. See SPARUS.

PAGRUS is alfo a name given by Paulus Jovius, and fome other authors, to the fifh called *erythrinus* and *rubellio*, and by Appian, *xathos*. It is of the fparus kind, and is diftinguifhed by Artedi, by the name of the *filver-eyed red bodied fparus*. See PAGAL.

PAGRUS *indicus*, a name by which fome authors have called the Eaft Indian fifh, more ufually known by the name of *brama faxatilis*. *Ray*'s Ichthyology, Append. p. 1. See the article BRAMA *faxatilis*.

PAIN *d'abeiles*, a word ufed by fome to exprefs the yellow fubftance found concreted in lumps on the legs of bees, and fuppofed by the generality of the world to be real wax

Experiments made by Mr. Reaumur and others, have fufficiently proved that this fubftance is not wax, nor has it any of the properties of wax; but it alfo appears, that it is the matter out of which wax is finally made.

In tracing this fubftance up to its origin, we find that the bees collect the farina of flowers, which when moulded by their feet into a lump, makes this matter. It is very probable that they feed on this matter, and that after paffing thro' certain changes in their bodies, it becomes wax. This was an opinion fo old as the days of Pliny; fome of the authors he quotes calling this fubftance *ambrofia*, or the food of thefe little deities; but late obfervations overthrow this opinion, till it again got credit under the more accurate examinations made by Mr. Reaumur, on the ftructure and parts of the bee.

Swammerdam exploded this notion, from the orifice of the trunk of the bee being infinitely too fmall to give admiffion to this matter, the feveral particles of which always retained, in the lumps, their original form and fize; and the opinion eftablifhed by this author, of the bees receiving nourifhment only by its trunk, made it neceffary to fuppofe, that only honey, or the faccharine juices of vegetables, could be the food of this creature; fince nothing folid could poffibly be received thro' that minute orifice: but Mr. Reaumur has fufpected even the exiftence of any fuch orifice, or any aperture at all in the trunk, and has plainly proved, that the bee has a real mouth, and that large enough to receive folid food. This mouth is fituated in the anterior part of the head, very near the origin of the trunk, and by means of this, the yellow matter collected on the thighs may be eafily received into the body, and thence evacuated again in form of wax; all the parts of its compofition having been received as nourifhment by the animal, except this indiffoluble fubftance. The poffibility of the bees feeding on this matter, is not, however, all the argument we have in favour of this opinion; for it is evidently feen on diffecting them, that they really do feed on it, their ftomachs being ufually found filled with it, and that in its proper form, the figures of the globules not being deftroyed.

This is a food not only eaten occafionally by the bees, but neceffary to their fupport, and is found ftored up in their hives againft a bad feafon. The combs have their different cells made for different purpofes; and befide that, fome are deftined for receiving honey, and fome for the young worms which are hereafter to become bees; there are fome alfo which ferve to contain this yellow matter, collected on the legs of thefe infects. In fine weather, when more of this matter is collected than is eaten for immediate nourifhment, the bees fcrape off the lumps of it from their legs into fome of the holes, or cells of the combs, where others following their example, there finally become large referves of it; which are eaten on fuch days as they cannot go out in fearch of more.

When one bee has depofited her load of this matter in a cell, and is flown out to work again, another always enters immediately head foremoft into the cell, and flats and preffes down the matter into the bottom of the cell; others afterwards depofit more of it, and others ftill repeat the work of preffing it down; and as they prefs it, they break and bruife it with their teeth, and pour in fome of their honey upon it, and by this means they finally compleat the magazine of food, by rendering the mixt mafs in condition to keep, and to be taken out with great eafe upon occafion. It is evident from all this, that the yellow matter collected on the thighs of bees, and ufually fuppofed to be wax, is really a fubftance which ferves for the food of the bees, and that after it has been divefted of the nutritious matter it contained, it is again thrown out of the body in form of wax. It might be naturally fuppofed from this, that the wax was an excrement voided by way of fæces thro' the anus; but this is by no means the cafe, what is voided by that paffage is true fæcal matter, of no farther ufe or fervice to the animal; and the wax in its perfect form is voided out of the body by the fame paffage by which it was taken in while in its rough ftate, that is, by the mouth; and is, on being thus voided, immediately worked into cells, &c. by the teeth of the animal. This was a difcovery in the œconomy of this little animal referved for that excellent naturalift Reaumur.

Swammerdam, who had ftudied the creature's operations very accurately, had been in no condition to obferve this particular, for want of the advantage of glafs hives; and Maraldi, tho' he had thefe, yet had them fo ill conftructed, that they could not give him an opportunity of feeing with fufficient accuracy.

The teeth of the bee, tho' the principal part concerned in the working the wax, are not, however, the only part; the tongue of the creature is very greatly affiftant on the occafion: it is darted with incredible velocity on the feveral parts of the work, and feems to do great matters toward the forming it. Befide this, the bee has a method of rendering the wax fit for receiving any form, in a manner we do not know any thing of. In order to manage this fubftance, we are obliged to heat it, and it fo becomes ductile; but this is not in the power of the bee, and muft be of very deftructive confequence to the whole if it was, fince the circumjacent parts muft be heated, as well as that on which it was at work, and then they would burft with the load of honey they contain, or break under the weight of the bees at work on them: as this would be a deftructive method, nature has given the animals another; fhe has furnifhed them with a liquid, with which, when the wax is properly wetted, it becomes as foft as a gum, and as ductile as the filaments of filk when fpun from the caterpillar.

The bee collects this yellow matter, which is the prime conftituent of the wax, from whatever flowers happen to be moft plentiful about the hives; and tho' generally yellow, as the farina of moft plants is fo, yet it is fometimes feen in red, or green lumps on their thighs; but whatever be its natural colour, it is always turned yellow before it is difcharged from the body of the animal; and when the ftomach of any of them is diffected, after the feeding on a red fubftance collected from flowers, the farina of which is of that colour, the change is found to be made as to colour in this part, for the whole is found there in form of a yellow jelly. This matter, if taken out of the ftomachs of feveral bees and dryed, is found to be of a difagreeable fmell, like fermented matter, and of a pungency fomewhat refembling that of the volatile falts. Mr. Reaumur was hence induced to try the effect of the volatile falts in turning the bees bread, or rough wax, into perfect wax by digeftions, continued a long time, but in vain. If we may give credit, however, to the German

man Ephemerides, there is a much more eafy way of reducing this matter, while yet contained in the apices of the plant, into true wax; and that without the affiftance of the work of the bees. Mr. David Maja gives an account in thofe papers, that the perfons he employed in beating rofes into conferve, always obferved in the pounding of the rofes, before the fugar was put to them, that a piece of folid but foft matter was found adhering to the peftle of the mortar, which, on a ftrict examination, proved to be true and genuine wax. It appeared from this experiment, that the juice of the petals or leaves of the rofes, was able, by the affiftance of beating, to convert into true wax the farina contained in the apices of that flower. Mr. Reaumur tried what effect the juice of rofes would have on the yellow matter collected on the legs of the bees and on the farina of plants, but no treatment he could give thefe fubftances was ever able to produce wax.

Mr. Reaumur brought it to an abfolute proof, that the bees eat the rough wax or bees bread, by obferving the bees of a certain hive to come home loaded with it every day, feveral times over, during the month of April and a great part of May; and after this, opening and examining the hive they belonged to, there were found no new combs, nor were the old bees enlarged in fize: it is true, that there were fome cells found, filled with magazines of this matter, but as the far greater part was brought to no fort of account, it feems very plain that they had eat it. It is to be obferved, that the bees have their feveral periods of going out in fearch of this matter and of honey: it would be too fatiguing for them to be always thus at work, and to avoid this there is always a very large part of them, even more than half the hive, found at reft within it; thefe are fuch as have worked till they are tired, and the others in turn take this manner of refting, and fend thefe out to work again. *Reaumur*'s Hift. Inf. Vol. X. p. 68. See WAX.

PAINTED *lady*, among the florifts, a term for a particular fort of carnations, the flowers of which have all their petals red or purple on the out fide, and white underneath.

PALA, in botany, a name by which fome authors have called the *nutmeg-tree*. *Pifo*, Mant Arom. p. 173.

PALA, in zoology, a name ufed by fome authors for a fifh of the truttaceous kind, more ufually known by the name of *ferra*. *Willughby*'s Hift. Pifc. p. 185. See the article FERRA.

PALÆSTE, the name of a Greek meafure of length, being the fame with the *dochme* and *doron*, and containing four finger-breadths, or digits.

PALALACA, in natural hiftory, the name given by the people of the Philipine iflands to a bird common among them, and fomewhat refembling the *upupa*. It has a very coarfe and harfh voice; its head is brown, and has a comb or creft of feathers like the *upupa* or *hopoe*; its beak is as ftrong as iron, and in the building feafon it cuts its way with this into the firmeft part of trees, and builds its nefts in the holes it makes in this manner; it is of the fize of a common hen, and is of a very beautiful green colour, fometimes variegated with other colours, fometimes plain. This is the defcription Father Camelli gives of this bird, and it feems very plainly to be a fpecies of *woodpecker* of a very large and beautiful kind. They have got an opinion there, that if the opening into this creature's neft be ftopped up with a large iron pin, the bird knows a plant which has the effect of foftening iron; and that it procures this plant, and applying it to the iron foon makes its way in. A ftory fomething like this the common people of England alfo have of the *woodpecker*.

PALALIA, in botany, a name ufed by fome authors for the *cyclamen* or *fowbread*. *Ger.* Emac. Ind. 2. See CYCLAMEN.

PALAPARIJA, in zoology, the name of a fpecies of Eaft India ferpent, found in the ifland of Ceylon. It is a large kind, and beautifully variegated in colour, with a great deal of red about it. It is one of thofe fpecies which naturally live under ground. *Ray*'s Syn. Anim. p. 33.

PALARIA, among the Romans, a kind of excercife performed at a ftake by the foldiers.

The ftake being fixed immoveable in the ground, and fix feet high above it, the young undifciplined foldiers advanced againft it armed with a hurdle and cudgel, inftead of a fhield and fword, and went through all the rules of attack and defence, as if actually engaged with an adverfary. Sometimes they ftood at a diftance, and attacked it with miffive weapons, at the fame time ufing all the requifite motions for defending themfelves, and warding off what might be thrown againft them. *Pitifc.* Lex. Ant. in voc.

PALATE (*Cycl.*)—Wounds of the *palate* and other parts of the mouth are only to be healed by being anointed with honey of rofes, either alone or mixed with balfam of Peru, or with oil of myrrh *per deliquium*. *Heifter*'s Surg. 81.

Bones of the PALATE. There are two bones fituated in the pofterior part of the arch of the *palate*, between the *pterygoide apophyfis* and the *offa maxillaria*, and running up on the fides of the *nafal foffæ* all the way to the bottom of each orbit. The figure of thefe bones is not fquare, as has been faid by thofe who have only feen that portion of them which belongs to the *palate*, and from thence have named them *offa palati*. The entire bone is crooked, hooked, pointed and uneven, tho' of a fmall fize. Each of thefe may be divided into four portions, one fuperior, one middle, and two lower; whereof one is the anterior, the other the pofterior.

The lower and anterior portion, to be called properly the *portio palatina*, is the bafis or body of the bone, and the only part of it which the antient anatomifts, except Vidus Vidius, have obferved. It completes the arch of the *palate*, and the bottom of the *nafal foffa*; the inner edge of it is raifed, and that, joined to the like edge of the other bone, forms a groove which receives part of the *feptum narium*, in the fame manner as the other part of it is received in a like groove of the *offa maxillaria*. The pofterior edge is gently floped, and ends inward in a point, which joins a like point in the other bone.

The lower and pofterior portion, to be called properly the *pterygoide*, is pointed and hollowed on each fide, to join the *pterygoide apophyfis*, of which it completes the *foffa*, being fixed like a wedge in the irregular notch of that procefs. Exteriorly it is uneven, the better to be connected with the *os maxillare*. This portion is diftinguifhed from the *portio palatina*, and alfo from the middle portion, by an oblique half canal, which with the half canal in the maxillary tubercle, forms an entire canal, the lower end of which is the pofterior *foramen palatinum*.

The middle portion, properly to be called the *nafal*, is very thin, and is fituated laterally. The internal fide of it is a little concave, the outfide a little convex; the concavity is turned toward the nares, and at the lower part of it there is a tranfverfe eminence or bony line, which diftinguifhes this portion from the *portio palatina*. The convex outfide partly covers the opening of the maxillary lines. At the lower part of it is a tranfverfe groove, anfwering to the eminence on the other fide, and moulded, as it were, by the tranfverfe exterior eminence of the *os maxillare*.

The upper portion, properly called the *orbitary portion*, is diftinguifhed from the *nafal portion* by a notch, which, together with the *pterygoide apophyfis* of the fpheroidal bone, forms an opening more or lefs confiderable, which may be called the *foramen fpheno-palatinum*, or *pterygo-palatinum*. This portion has five little fides, three of which are rather cavities. One fuperior, which completes the extremity of the bottom of the orbit, and is more or lefs flat, very fmall, fmooth, and triangular. One anterior, which is a little hollow, covering the upper part of the maxillary tubercle, and by a fmooth raifed edge compleating the *fiffura fpheno-maxillaris*. The third fide is likewife anterior, more hollow than the former, and joins the back part of the labyrinth of the *os ethmoides*. The fourth is pofterior, and more or lefs hollow, anfwering to the fphenoidal *finus*. The fifth is lateral and external, covering the pofterior and upper part of the maxillary *finus*. Thefe fides and cavities, however, fometimes vary; being in fome fubjects found fingle, in others complex: there is very little diploe in thefe bones, except in the *palatine* and *pterygoide* portions. They are joined to each other by the *portio palatina*; to the vomer by the common groove, formed by their raifed edges; to the maxillary bones before and laterally; and behind to the fphenoidal bone; to the inferior fhells of the nares by their tranfverfe eminences; and laftly, by their orbitary portions, to the *os ethmoides*. *offa maxillaria*, and *os fphenoides*. They complete the arch of the *palate*, the *pterygoide* and *nafal foffæ*, and the orbit. They affift alfo in fupporting the vomer and the *conchæ narium inferiores*. *Winflow*'s Anatomy, p. 37.

PALATO-*ftaphylinus*, in anatomy, a name given by Douglafs to the mufcle called by Morgagni *columellæ mufculus teres*, and by Albinus and fome others, the *azygos uvulæ*, and by fome the *epiftaphylinus*.

PALINCOTOS, a term ufed by Hippocrates to exprefs fuch difeafes as are wont to return with all their violence upon the patient, after their feeming to have left him, whether for a longer or a fhorter period of time.

PALINDROMIA, a term ufed by Hippocrates and many other writers to exprefs a preternatural running of the peccant matter of difeafes to the more noble parts.

PALINGENESIA, is ufed among chemifts for the reproducing a mixed body from its afhes.

This has been pretended to by many, as well as the philofopher's ftone and other wonderful powers; but as to the *palingenefia*, or refufcitation of plants, the inftances produced are no more than fome of thofe artificial vegetations which the learned Monf Homberg has obferved and defcribed many times. See *Homberg* in Mem. Acad. Sciences, 1710; and *Boyle*'s works abridg. Vol. I. p. 69.

PALINGMAN, in our old ftatutes, feems to be a merchant-denizen, one born within the Englifh pale. Stat. 22. Ed. IV. c. 23. and 11 H. VII. c. 22. *Blount*, *Cowel*.

PALINIDRYSIS, a word ufed by Hippocrates to exprefs the fubfiding of a tumour by the difperfion of the matter that occafioned it without its breaking.

PALIRRHŒA, a word ufed by the old Greek authors to exprefs the reflux or retrograde courfe of the humours, as in cafes of the cholera morbus, where people vomit up their ftools.

PALIURUS, *Chrift-thorn*, in botany, the name of a genus of trees, the characters of which are thefe: the flower is of the rofaceous kind, and is compofed of feveral petals arranged in a circular form; from the cup of the flower there arifes a

piftil,

pistil, which finally becomes a clypeiform or shield-like fruit, containing a roundish stone, divided into three cells, in which there are three roundish kernels. *Tourn.* Inst. p. 616.

There is only one known species of the *paliurus*, which is the common *Christ-thorn*.

PALLAS, in astronomy, a name given by some to the first satellite of Jupiter. *Lowthorp*'s Abr. Phil. Transf. Vol. I. p. 407.

PALLAX, a name given by some of the affected chemical writers to an imaginary factitious stone, composed of the heaven and earth, of the moon or silver, with an equal weight of the sun or gold. This is their own explication of it.

PALLET (*Cycl.*)—PALLET, in ship-building, is a room within the hold, closely parted from it, in which, by laying some pigs of lead, &c. a ship may be sufficiently ballasted, without losing room in the hold; which, therefore, will serve for stowing the more goods.

PALLIUM (*Cycl.*)—PALLIUM-*ducale*, in natural history, a name given by writers on shells to a kind of *pecten* or *scallop*, of a large size and beautiful appearance, tho' simple colour: there are two species of this, a red and a yellow one. See the article PECTEN.

PALLIUM-*purpureum*, a name given by Basil Valentine, and others of the affected writers in chemistry, to a powder of a purple colour, prepared from gold. It is made by preparing an amalgama of gold and mercury, and after the mercury is driven off by the retort, the remaining matter is mixed with sulphur, and calcined by a well regulated fire till reduced to a purple powder. This is called also the *solar powder*, and has, like the other preparations of this metal, many imaginary virtues ascribed to it.

PALMETTO-*royal*, a name given by Ligon to a tree of the palm kind. Its trunk is very tall and streight, and hollowed regularly in the center; yet so tough, that it is never blown down, nor destroyed by storms. It is recommended for the making long telescopes for celestial observations.

PALM (*Cycl.*)—The famous cabbage-tree of Barbadoes is a kind of *palm*: it grows to the height of three hundred feet, and tho' the sprouts of one year's growth are so tender, that they are eaten as cabages, yet the tree itself is one of the most durable woods we are acquainted with, and will not rot on any account, but is so firm, that it is scarce possible to make a nail enter it. Phil. Transf. N. 36.

PALM-*tree*. The several species of this tree may be all raised with us from the seeds, which must be sown in pots of light earth, and plunged into a bark hot-bed. When the young plants come up, they must be transplanted into single pots, and preserved in the stove. The soil th y succeed best in is made of one third pasture land, one third sea sand, and the other third rotten tanner's bark, or rotten horse-dung; and they must be planted in pots, in proportion to their size, but these should not be too large. They will require to be removed once a year, but this must be done with great care. *Miller*'s Gard. Dict.

PALMARIS *cutaneus*, a muscle commonly known by the name of the *palmaris brevis*. It is a small thin plane of fleshy fibres, situated transversely, or more or less obliquely, under the skin of the large eminence in the palm of the hand, between the carpus and the little finger; its fibres adhering to the skin, and being in some measure interwoven with the *membrana adiposa*. These fibres are fixed along the edge of the *aponeurosis palmaris*, from the large ligament of the *carpus* toward the little finger: and they run in for some space on the plane of the *aponeurosis*, but without any connection with the bones of the *metacarpus*. Near the *aponeurosis* these fibres are more or less tendinous, and some of them often cross each other. They are sometimes so thin and pale, as hardly to be sensible; and in some subjects the muscle seems to be divided into several parts. *Winslow*'s Anatomy, p. 193.

It is a doubt with some authors whether the *palmaris cutaneus* or *brevis* be a distinct muscle. Fallopius calls it, *caro quædam quæ musculorum effigiem habet*; a portion of flesh which has the appearance of a muscle. And Douglass calls it, *caro quadrata*; a square portion of flesh: tho' he adds the name *palmaris brevis*, given it, on its supposition of being a muscle, by another author.

PALMATED-*roots*, are tuberose-roots of a flattish shape, and divided into several oblong and slender branches, resembling so many fingers. Of this sort are the roots of some of the orchis kind, called hence *palmated*.

PALMATED-*leaf*, among botanists. See LEAF.

PALMATED-*stone*, *palmati-lapides*, in natural history, a name given by the antients to a sort of stones which were always found of the shape of a hand with its fingers. They were frequent in Spain, and some which were found of a fine black were reputed to be a kind of marble. The greater number were white, and were composed of the matter of one of the softer and less beautiful quarry-stones.

PALMIPEDES, *web-footed*, in zoology, the name of a genus of birds living about waters, and furnished by nature with feet for swimming. The general characters of these birds are these: they have all short legs, excepting only three, the *flamingo*, *corrira*, and *avosetta*, which are singular and of a peculiar genus. Their thighs are feathered to the joint; their hinder toes, if any, are short; their rumps are less prominent than in other birds; and they have in general broad beaks, and have an appendage on the extremity of their upper chap. *Ray*'s ornithology, p. 241.

PALMIPES, among the Romans, a long measure, containing a foot and a *palm*, or five *palms*; and was less than the cubit by one *palm*. *Pitisc* in voc.

PALMITES, in botany, a name given by some authors to the *palma humilis*, or *dwarf palm*, called by others *chamærops*. Gen. Herb. 1335.

PALPÆBRA (*Cycl.*)—PALPEBRÆ *superioris primus*, in anatomy, a name given by Cosserius and some others to one of the muscles of the face, whose office it is to lift up the upper eye-lid, and by that means open the eye: it is hence called by Cowper and Douglass, *aperiens palpebram*; by some, *aperiens oculum*; and by Albinus, the *levator palpebræ superioris*. See APERIENS, *Cycl.*

PALPITATION *of the heart*, (*Cycl.*) a term used by medical writers to express a spastic contraction of the heart, when it leaps and beats violently at different intervals.

This is sometimes idiopathic, or a disease in itself, and attendant on no other; but that rarely happens, and it is usually symptomatic, and merely an attendant on other disorders. In general we are to distinguish a *palpitation of the heart* thus considered as a disease, or at least as a symptom of one, from those commotions of the heart which we occasionally bring on by running or any other violent exercise, which throw the blood into commotions.

Signs of it. The evident and obvious symptom of this complaint, is the vehement pulsation of the heart against the solid parts of the breast, which is often so great, that it may be seen or even heard by the persons who stand by. To this there are usually joined an anxiety of the *præcordia*, which throws the person into a sweat, a languor and lassitude of the limbs in general, a paleness of the face, a difficulty of respiration and cardialgia, with frequent faintings; and finally, there is usually a costiveness and flatulences of the abdomen attending on it.

Persons subject to it. It is a complaint that chiefly affects persons of sedentary lives, and of a plethoric habit of body Scorbutic, hysteric, and hypochondriac persons are also frequently subject to it; and such as have obstructions of the menses. Those people who have been used to regular bleedings, and have afterwards neglected them, are also subject to this complaint; and those who are subject to sudden passions, and frequently suppress them. Sleeping in the open fields has also been known to bring it on; and persons of a melancholic habit are usually more than others subject to it. Young women, whose menses have not appeared, or who have had them suppressed by some accident, and in whom nature is labouring to bring them on again, are also very subject to violent *palpitations*; and such as have acute or intermittent fevers coming upon them. Persons of plethoric habits are often seized with *palpitations of the heart* in their sleep, and when they wake they feel them for some minutes afterwards. Finally, persons who have polypuses of the heart are always grievously afflicted with *palpitations* attended with difficulties of breathing.

Causes of it. Besides what has been already observed, it is to be remarked, that the passions of the mind very frequently occasion this disorder; thus, sudden terror, fear, a suppression of anger, and the like, will at any time bring on a *palpitation*, without any other cause A high diet and ease, with a sedentary life, also often occasion them; and in young people, not arrived at puberty, they are often found to be occasioned by worms in the intestines

Prognostics in it. The beginnings of complaints of this kind, and slighter cases, when they continue so, are attended with no great danger; but when the disorder grows into a habit, it is not only very troublesome, but very dangerous. When more causes than one conspire to produce it, it is not only more violent, but the patient is more subject also to relapses; and in the end, inflammations, spittings of blood, polypuses of the heart, and infarctions of the viscera come on: not unfrequently also are left fevers, which become dangerous. Sometimes also convulsions and other affections of a like kind, even palsies are brought on by these disorders. Finally, when an habitual *palpitation of the heart* has been brought on by terror alone, it always proves very difficult of cure, whatever means are used.

Method of cure. The primæ viæ must be first cleansed by infusions of rhubarb and sena, and other gentle purges: after this it is proper to bleed in the foot; but it is to be observed, that if the orifice be not large, nor the blood taken away in sufficient quantity, it is of not the least effect in this case. After this the blood is to be attenuated by drinking plentifully of warm and weak liquors, and by moderate exercise. After this, some of the gentle alexipharmics are to be given, and the spring juices of brook-lime, water-cress, and the like. Finally, there are to be given such things as promote an equal distribution of the blood and humors: mixtures of volatiles and alcalies, as of spirit of hartshorn and tincture of salt of tartar, and gentle anodynes, if necessary. Besides these, clysters will often do great good, as will also the frequent washing

ing the feet with warm water, and the hanging camphor near the part, and ſpirit of caſtor, ſaffron, and the like, do well to be rubbed on the breaſt.

Bleeding muſt never be omitted in this caſe, for without it no medicines will be able to take effect. In caſes when a hypochondriac habit conſpires in the cauſe of this complaint, the attemperating powders of nitre, cinnabar, and the like, always prove of very great ſervice. In caſes of a chloroſis with this complaint, bitters and chalybeates uſually prove a remedy; and when a ſuppreſſion of the menſes, or hæmorrhoids is the cauſe, the bringing them to their priſtine regular ſtate is a cure. It is never proper to allay the motion till the plethora, which occaſions it is removed, unleſs in caſes of its coming on merely by the paſſions, without any antecedent cauſe in the blood; in this caſe, gentle opiates may be given without danger. Steel medicines and the volatile ſalts, when they are given in an imprudent manner, always make the diſeaſe worſe, inſtead of doing any thing toward a cure. Finally, a change of a ſedentary life, into a moderately active one, will do more than any medicines. *Junck.* Conſp. Med. p 626, ſeq.

Monſieur de la Hire was cured of a chronical *palpitation* of the heart, by a quartan ague. See *Fontenelle*, in his Eloge.

PALSY (*Cycl*) — Among other remarkable caſes of this terrible diſeaſe, we have, in the philoſophical tranſactions, one of a periodical *palſy*. The author quotes two inſtances of a like kind, by way of countenance to that which he relates. The German Ephemerides mention a young paralytic man who ſpoke only one hour in every four-and-twenty, and that always at a regular time, beginning between twelve and one at noon every day, and his power of ſpeech ceaſing always between one and two: this continued twelve years upon him. The other caſe is not recorded in books, tho' well atteſted.

The caſe in the tranſactions, is of a ruddy ſanguine young woman who fell into a *palſy*, in which ſhe loſt her voice and the uſe of her legs. This was at firſt carried off by medicines, but afterwards returning again at times, at length became regularly periodical, ſeizing her on the Tueſday of every week, and going off again on the Friday. This courſe it obſerved very regularly for the firſt year, except twice.

After this, on taking proper medicines for ſome conſiderable ſpace of time, ſhe became ſo well, that her fits laſted only a day and a half, coming on always on a Tueſday morning, and going off again on a Wedneſday. In this manner ſhe continued to have them ſeveral months, but ſhe was at length perfectly recovered. Phil. Tranſ. N° 242. p. 60.

This diſtemper, according to Dr. Cheyne, may be cured by a total cow-milk diet. He thinks the medicines commonly preſcribed in ſuch caſes may retard the progreſs of the diſtemper, but that it is never to be eradicated if the ſtroke be deep, or life far ſpent, but by cow-milk only. See Nat. Method of curing, p. 265.

Mr. Boyle gives an account of an *hemiplegia*, or *palſy* of one ſide, occaſioned by a ſmall ſplinter of a bone preſſing on the dura mater. The patient in leſs than five hours after the bone was taken out, found himſelf able to move his finger, and within two or three days to lift his arm, which had been reduced to ſkin and bone, but ſoon recovered its proper ſize. Works Abr. Vol. 1. p. 37.

Hofman diſtinguiſhes *palſies* into ſerous and ſanguineous. In the firſt kind, raiſing an artificial fever by hot, acrid, nervous, and volatile medicines, by ſtrong exerciſe, and hot bathing, often effects a cure. But in the ſanguineous kind, accompanied with febrile motions, ſuch remedies ought not to be applied. Oper. T. 3. p. 198. §. 26.

There is a kind of *palſy* called *beriberii*, to which the natives of the Eaſt Indies are peculiarly ſubject.

The word in the Indian language ſignifies a ſheep; and Bontius ſuppoſes it was attributed to this diſeaſe, becauſe the perſons afflicted with it thruſt out their knees, and lift up their legs ſo much in walking, as in ſome ſort to imitate the gate of ſheep. It is a kind of tremor, or *palſy*, in which the uſe of the hands and feet are in a great meaſure taken away; and ſometimes it extends itſelf to the whole body.

The principal cauſe of this diſeaſe is ſaid to be a thick viſcous humor, which in the night ſeaſon, eſpecially in the rainy time, which holds inceſſantly from November to May, falls upon the nerves, while people fatigued with the heat of the day, throw aſide their cloaths and ſleep without any covering; by which means the phlegmatic humor which before generated principally in the brain, eaſily ſeizes upon the nerves; for the nights in theſe countries, compared to the days, are very cold The conſequence of this is, that the joints become lengthened, the pituitous humors inſinuating themſelves between the junctures, ſo as to relax the nerves and ligaments. Tho' this diſeaſe for the moſt part comes on very gradually, and by ſlow advances, yet ſometimes it ſeizes a perſon all at once, as when any one being very much fatigued and hot, drinks a vaſt quantity of any cold liquor. And thus we ſee, even in our own country, that when any one has been violently heated by exerciſe, and drinks an immoderate quantity of a cold liquor, it often throws him into the utmoſt hazard of his life.

The ſymptoms of this diſeaſe are always manifeſt, even to the ſight. There is ever an univerſal laſſitude of the whole body. All motion, but particularly that of the hands and feet, becomes vitiated and depraved; and the ſame ſort of throbbing and titillation is felt as we feel in our fingers and toes in cold weather, only the pain is leſs acute; and ſometimes the voice is ſo far affected, that the patient can ſcarce ſpeak articulately.

Bontius himſelf was once afflicted with this diſtemper, while in the Eaſt Indies, and had this particular ſymptom of it in ſo great a degree, that for a whole month thoſe who ſat cloſe by him could not, without great difficulty, hear what he ſaid. Theſe are the common ſymptoms of the diſeaſe; but beſide theſe, it is at times attended with all thoſe others which may be ſuppoſed to ariſe from a cold cauſe.

The cure is uſually very tedious; for theſe cold humors are very ſlowly, and with difficulty diſcuſſed. The diſeaſe is not naturally mortal, however, unleſs it affects the breaſt; in which caſe it ſometimes wholly ſtops the breath. In order to a cure, the patient is of all things to avoid confining himſelf to his bed; walking, riding, and all ſorts of exerciſe are uſeful; ſtrong and ſmart frictions are alſo very uſeful, and the Bengal ſervants are uſed to theſe, and are very dextrous in the uſe of them.

There is alſo great relief had from fomentations made of decoctions of the herb *lagondi*, which has all the virtues of our chamæmile and melilot, but in a much greater degree. The leaf of this plant is like that of our perſicaria or arſmart; and its ſmell very aromatic The hands and feet are alſo to be anointed with oil of cloves, or mace mixed with oil of roſes. But more than all theſe, there is relief found in a kind of naphtha, which is very common in Sumatra, and is called *miniac tarnoh*, or *oil of the earth*. This is of a ſtrong, but not very nauſeous ſmell, and is ſo great a remedy, that being rubbed on the hands and legs, it is always an almoſt immediate relief. The Barbarians know as well as we the value of this precious balſam; and the king of Achin, who is the moſt powerful prince in that iſland, has forbidden its exportation, under the pain of death; ſo that the inhabitants can only bring it off by ſtealth in the dead of the night, to the Dutch and Engliſh ſhips which happen to lie in the way.

Theſe are the things which give temporary relief; but as the diſeaſe is of the chronic kind, the cure is to be performed by long courſes of the decoctions of the roots of China, and ſarſaparilla, and guaiacum wood, which by their gentle heat diſcuſs the cold humors which are the root of the diſeaſe, and carry them off by perſpiration or urine. Purging at proper intervals is alſo highly neceſſary; and the cathartics moſt in uſe there in this caſe, are, aloes and gamboge. Bleeding is by all means to be forbid; and the relicks of the diſeaſe are uſually very happily carried off by Venice treacle, and other ſudorific and nervous medicines, and gentle exerciſe is the beſt remedy to prevent its return. *Bontius* de Medicina Ind.

PALUM *ſanctum*, in botany, a name by which ſome authors have called a ſpecies of the *guaicum tree*, called the *lignum ſanctum*, or *holywood*. *Park.* Theatr. p. 1587.

PALUMBARIUS *accipiter*, the *goſhawk*, a ſpecies of hawk of the ſhort-winged kind It is larger than the common buzzard, and is brown on the back, and very white on the belly, with tranſverſe ſtreaks of browniſh black; theſe are of an undulated figure, and laid very near one another. Its legs and feet are yellow, and its beak black, with a yellow membrane covering its baſe Its wings, when cloſed, do not nearly reach to the end of its tail; by which, and by its ſize it is eaſily diſtinguiſhed from all other hawks. Its tail is long and of a browniſh grey, with three or four tranſverſe ſtreaks on it, placed very diſtant from one another. It will ſeize on pheaſants, geeſe, and even hares, but its moſt common prey is the partridge. *Ray*'s Ornithology, p. 51.

PALUMBES, the *ring-dove*, in zoology. See RING-*dove*.

PAMBŒOTIA, Παμβοιωτια, in antiquity, a feſtival celebrated by all the Bœotians who aſſembled near Coronea, at the temple of Minerva, ſurnamed Itonia. *Potter*, Archæol.Græc. l. 2. c 20. T. 1. p. 419.

PAMMACHION, Παμμαχιον, a name by which the exerciſe *pancratium* is ſometimes called, whence the combatants were likewiſe called *pammachi*, Παμμαχοι. *Potter*, Archæol. Græc. l. 2. c. 22. T. 1. p. 444.

PAMUCHLEN, in zoology, a name by which ſome call the ſpecies of *cod-fiſh*, commonly named by authors *aſellus ſtriatus*. *Willughby*'s Hiſt. Piſc. p. 172.

PANACIA, Πανακεια, in antiquity, a feſtival in honour of Panace. *Potter*, T. 1. p 422.

PANALETHES, a name uſed by many authors for a plaiſter ſuppoſed to be of the greateſt virtues. It is deſcribed by Aëtius. Tetrabib. 4. Serm. 3. cap. 2.

PANAMA-*ſhell*, a ſpecies of *dolium*. See DOLIUM.

PANARITIUM, a word uſed by ſome authors to expreſs a *whitlow*, or *paronychia*.

PANCALA-*aurea*, a name of a famous antidote, compoſed of many ingredients, deſcribed by Myrepſus.

PANCARPIA, the name of a ſort of cake much uſed at Alexandria,

andria, and usually covered with paper for the sake of its keeping the longer.

PANCH, or PANTCH, in the sea language. See PAUNCH.

PANCHRESTARII, among the Romans, those who prepared the *pancrest*, or *universal remedy*. *Pitisc.* in voc. See the article PANCHREST, *Cycl.*

PANCHRUS, the name given by some of the antient writers on natural history to a gem which they say has all colours: probably the opal.

PANCLADIA, Παγκλαδια, in antiquity, a festival celebrated by the Rhodians when they pruned their vines. *Potter*, Archæol. Græc. T. 1. p. 419.

PANCRASIUM, in the materia medica, a name used by some authors for the *squill*, of the root of which the oxymell of squills is made. *Park.* Parad. p. 133.

PANCRATIASTES, in antiquity, a combatant in the exercise called *pancratium*. *Potter*, Archæol. Græc. T. 1. p. 444. See PANCRATIUM, *Cycl.*

PANCRATIASTES was also applied to one who had gained the victory in all the kinds of exercise used in the *pancratium*. *Pitisc.* in voc. See PANCRATIUM, *Cycl.*

PANDEMON, Πανδημον, in antiquity, the same with the festival Chalceia and Athenæa. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 422.

It was so called from the great concourse of people that used to meet at this solemnity. See CHALCEIA and ATHENÆA.

PANDIA, Πανδια, in antiquity, an Athenian festival in honour of Jupiter. For the origin of this solemnity, see *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 422.

PANDROSOS, Πανδροσος, in antiquity, an Athenian festival in memory of *Pandrosus* the daughter of king Cycrops. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1 p. 423.

PANDURIFORM-*leaf*, among botanists. See LEAF.

PANDYSIA, Πανδυσια, in antiquity, public rejoicings when the season through its coldness and intemperance forced the sailors to stay at home. *Potter*, T. 1. p. 423.

PANEGYRIS, Πανηγυρις, among the Greeks, a fair, or festival day, on which the people used to meet together. It exactly corresponded to the Nundinæ of the Romans. *Pitisc.* in voc. See NUNDINÆ.

PANELLENIA, Πανελληνια, in antiquity, a public festival celebrated by an assembly of people from all parts of Greece. *Potter*, Archæol. Græc. T. 1. p. 423.

PANEMUS, in chronology, the Bœotian name of the Athenian month *metagitnion*, which was the second of their year, and answered to the latter part of our July and beginning of August. See METAGITNION and MONTH.

PANEROS, the name of a beautiful stone dedicated to Venus. It was called also by some *pausebastos*, and was probably one of the beautiful agates.

PANGONIA, in natural history, the name of a genus of crystal. See Tab. of Fossils, Class 3.

The word is derived from the Greek πᾶς, numerous, and γόνυ, an angle, or bending, and expresses a crystal, composed of many angles.

The bodies of this genus are single-pointed, or imperfect crystals, composed of dodecangular or twelve-planed columns, terminated by twelve-planed pyramids, and the whole body, therefore, made up of twenty four planes.

Of this genus there are only three known species: 1. A brownish-white one, with a long pyramid. This is found in Silesia and Bohemia; sometimes in mountains, and sometimes on the sides of rivers, and is esteemed a very valuable crystal. 2. A yellowish-brown one, with a short pyramid. This is often brought over to us under the name of *Saxon topaz*, among the other crystals commonly known by that name. And 3. A clear colourless one, with a very short pyramid. This is a very valuable crystal, and is produced in the East Indies, being often brought over among the Indian ballast. *Hill's* Hist. of Foss. p. 187.

PANICASTRELLA, in botany, the name by which Micheli has called a genus of plants named by Linnæus *cenchrus*. See the article CENCHRUS.

PANICUM, in the Linnæan system of botany, the name of a distinct genus of plants, of the grass kind, the distinguishing characters of which are, that the calyx is composed of several leaves, and contains only one flower; the leaves of it are capillary and unequal in their insertions. The glume is made of two valves, and contains only one flower: the valves are oval and pointed, and are both small, but one more so than the other. The flower is also composed of two valves, both oval and pointed, but the one smaller and flatter than the other. The stamina are three short capillary filaments. The antheræ are oblong. The germen of the pistil is roundish; the styles are capillary and two in number, and the stigmata are feathered. The flower surrounds and incloses the seed, and never opens to drop it out. The seed is single and roundish, but something flatted. *Linnæi*, Genera Plantatum, p 17.

PANIONIA, Πανιωνια, in antiquity, a festival in honour of Neptune, celebrated by a concourse of people from all the cities of Ionia.

One thing is remarkable in this festival, that if the bull offered in sacrifice happened to bellow, it was accounted an omen of the divine favour; because that sound was thought to be acceptable to Neptune. *Potter*, Archæol. Græc. T. 1. p. 423.

PANIS-*dæmonum*, in natural history, a name given by authors to a sort of coarse stone, common in Sweden, and some other places, and usually found in roundish, but somewhat flatted masses, resembling a loaf in form.

PANNEL, in the Scotch law, denotes the prisoner at the bar, or person who takes his trial before the court of justiciary, for some crime.

PANNONICA-*bolus*, in the materia medica, a name by which Kentman, and some others, have called the earth more usually known by the name of *bolus toccaviensis*. *Kentman's* Nomenclator Foss p. 7. See the article TOCCAVIENSIS.

PANOCHIÆ, a name by which some chirurgical authors call *bubos* in the groin.

PANOMPHÆUS, Πανομφαιος, in antiquity, a designation given to Jupiter, because he was looked upon as the original author of all sorts of divination, having the books of fate, and out of them revealing either more or less, as he pleased, to inferior dæmons. *Potter*, T. 1. p. 263.

PANOPSIA, Πανοψια, in antiquity. See PYANEPSIA, *Cycl.*

PANSAPAN, in botany, a name by which some authors have called the tree whose wood is the logwood, used in dying, and in medicine. *Herm.* Mus. p. 42.

PANTARBE, in natural history, a name given by authors to an imaginary stone, the virtues of which were similar to those of the magnet; but exerted upon gold as those of the loadstone upon iron. The antients as well as later writers, seem to have all had an opinion, that there was such a stone as this, and the *amphitane* of Pliny is described as possessing this remarkable quality; but neither they nor we, ever found reason from any experiment to believe, that there was any such stone.

PANTER, in the sea language. See SHANK-PANTER.

PANTHERA, in zoology, a name by which many have called the *leopard*, more properly called *pardalis*. See PARDALIS.

PANTHERA-*lapis*, in natural history, the name of a species of stone found in Egypt, and the East Indies, and described to be of a yellowish colour, variegated with dusky spots of the colour of those on the skin of the panther. The writers of the middle ages have attributed many absurd properties to it: it seems to have been a species of agate.

PANTHERINE *tables*, *pantherinæ mensæ*, among the Romans, tables made of citron wood, which were held in such high esteem, as to equal the value not only of silver and gold, but likewise of pearls. They had this name from their being spotted after the manner of panthers. *Hofm.* Lex. in voc.

PANTICES, a word used by some medical writers to express the intestines.

PANTOMIME, Παντομιμος, among the antients, a person who could imitate all kinds of actions and characters by signs and gestures, without speaking.

The *pantomimes* made a part in the theatrical entertainments of the antients; their chief employment was to express in gestures and action, whatever the chorus sung, changing their countenance and behaviour as the subject of the song varied. They were very antient in Greece, being derived from the heroic times, according to some; but however this may be, they were certainly known in Plato's time. In Rome it was so late as the time of Augustus before they made their appearance. As to their dress, it was various, being always suited as near as possible to that of the person they were to imitate. The crocota was much used among the Roman *pantomimes*, in which and other female dresses they personated women. *Pitisc.* in voc. See MIME, *Cycl*

PANTON-*shoe*, in the manege, a horse-shoe contrived for receiving narrow and hoof-bound heels. Its spunges are much thicker on the inside than on the outside; so that the part which rests upon the horn or hoof, runs slope-wise to the end, that the thickness of the inside of the shoe may bear up the heel, and throw or push it to the outside.

Panton-shoes are likewise proper for horses that have false quarters.

PAPAN, in natural history, the name given by the inhabitants of the Philippine islands, to a species of duck common in their lakes and marshes. This is very large and beautiful, and is called by Father Camelli *anas regia*, or the *royal duck*: it is not so common, however, as a little kind which they call *salagasir*; this is not larger than a man's fist. See SALAGASIR.

PAPAVER, *poppy*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, consisting usually of four leaves, disposed in a circular form. The cup is composed of two leaves, and from it there arises a pistil, which finally becomes a seed vessel, of a sort of oval oblong figure, and adorned with a head or covering; under which, in many species, there are a chain of apertures. Within the head or fruit, there are numerous lamellæ, to which the seeds adhere in the manner of placentæ. The seeds are usually small, and of a roundish figure See Tab. 1. of Botany, Class 6.

The species of *poppy*, enumerated by Mr. Tournefort, are these: 1. The white *poppy*, or garden *poppy*, with white seeds.

2. The

2. The white-feeded garden *poppy*, with pale purple flowers. 3. The garden white-feeded *poppy*, with greyifh flowers with purple bottoms to the petals. 4. The garden *poppy*, with flowers of a fair white, variegated with red, and with yellow feeds. 5. The garden *poppy*, with black feeds; the wild *poppy* of Diofcorides, and black *poppy* of other authors. 6. The garden *poppy*, with double flowers of a deep violet colour. 7. The garden *poppy*, with double flowers of a pale violet colour. 8. The hoary-feeded *poppy*, with apertures in the heads. 9. The red-flowered *poppy*, with brown feeds. 10. The crefted *poppy*, with white flowers and white feeds. 11. The crefted *poppy*, with red flowers and black feeds. 12. The crefted *poppy*, with variegated red and white flowers. 13. The fingle flowered crefted *poppy*, with purple petals with bluifh grey bottoms. 14. The double flefh coloured garden *poppy*. 15. The double purple *poppy*. 16. The double bright red *poppy*. 17. The double filver white *poppy*. 18 The double white *poppy*, with red edges 19. The fnow-white double *poppy*. 20. The double deep purple *poppy*. 21. The blood-red double *poppy*. 22. The violet coloured double *poppy*. 23. The fmall white many flowered *poppy*. 24. The double flowered black *poppy*. 25. The double *poppy*, with variegated and jagged flowers. 26. The jagged flowered *poppy*, with bluifh and whitifh bottoms to the leaves. 27. The common wild red *poppy*. 28. The greater wild red *poppy*, with variegated flowers. 29. The common wild corn *poppy*, with white flowers. 30. The red corn *poppy*, with white bottoms to the petals. 31. The wild corn *poppy*, with flefh-coloured flowers. 32. The double flowered corn *poppy*. 33. The corn *poppy*, with a double red lead coloured flower. 34. The corn *poppy*, with double fiery red flowers. 35. The double corn *poppy*, with fiery red flowers with white edges to the petals. 36. The double purple flowered corn *poppy*. 37. The double red corn *poppy*, with white bottoms to the leaves. 38. The common fmaller corn *poppy* 39. The corn *poppy*, with oblong hairy heads. 40. The longer hairy-headed corn *poppy*. 41. The very long fmooth headed corn *poppy*. 42. The corn *poppy*, with undivided leaves. 43. The yellow flowered pyrenæan *poppy*. 44 The coriander-leaved alpine rock *poppy*. *Tourn.* Inft. p 237. feq.

PAPAYA, in botany, the name of a genus of plants, the characters of which are thefe: the flowers are of two kinds; the one fort is tubulated and divided into fegments, like the rays of a ftar, at the end: the flowers of this kind are the barren or male ones. The others are of the rofaceous kind, being compofed of feveral petals arranged in a circular form; from the cup of thefe flowers there arifes a piftil, which finally becomes a flefhy fruit, of the fhape of a melon, containing ftriated feeds covered with hufks.

The fpecies of the *papaya* enumerated by Mr. *Tournefort*, are thefe: 1. The *papaya* tree, with a fruit like the melopepo, or melon pompion, called the platanus-leaved *papaya*, and by fome the male mamolla. 2. The *papaya*, with very large fruit, of the fhape of the pompion 3. The *papaya* with oblong or melon-fhaped fruit. *Tourn.* Inft. p. 659.

PAPER (*Cycl.*)—Mr. Boyle tells us, that *paper*, befides its common ufes, may be made into frames for pictures, fine embofled work, and other parts of furniture. For this purpofe, a convenient quantity of the beft white fort may be fteeped for two or three days in water, till it becomes very foft; then reducing it by the mortar and hot water into a thin pulp, it is laid on a fieve to draw off its fuperfluous moifture; then putting it into warm water, wherein a confiderable quantity of frefh glue, or common fize, has been diffolved, it may afterwards be put into moulds to acquire the defigned figure; and when taken out may be ftrengthened, as occafion requires, with plaifter or moiftened chalk, and, when dry, painted or overlaid. *Boyle*'s works abr. Vol. I p. 149.

Another ufe of *paper* is to ftop up cracks or fiffures in wooden veffels, to hold water; for, in this cafe, it will forcibly dilate, and fill the place wherein it is to lodge.

PAPER-*office*, an antient office within the palace of Whitehall, wherein all the public papers, writings, matters of ftate and council, letters, intelligences, negotiations of the king's minifters abroad, and generally all the papers and difpatches that pafs through the offices of the two principal fecretaries of ftate, are lodged and tranfmitted, and there remain difpofed in the way of library. *Blount.*

PAPER-*office* is alfo the name of an office belonging to the court of King's-bench. *Blount.*

PAPHIS, in zoology, a name by which fome have called the gar-fifh. *Willughby*'s Hift. Pifc. p. 231.

PAPIA, in botany, the name of a genus of plants, called by Linnæus *orvala*. It has a monopetalous flower, fucceeded by four feeds. *Micheli*, 17. See ORVALA.

PAPILIO, *butterfly*. For the feveral parts of the *butterfly*, fee the articles ANTENNÆ, WING, TRUNK, &c.

Their arrangement into genera and claffes are in a great meafure taken from thefe feveral parts, and from the great ufes which they make of them. The general diftinction is that which divides them into the day and night kinds; we have among the birds fome few that fly abroad only by night, but thefe bear only a fmall proportion in number to the day-fliers: on the contrary, the number of *butterflies* which we fee fluttering about the fields and gardens, are fcarce fo many as thofe which fly abroad only by night. We often meet with thefe even in our houfes, flying about the candles, and the hedges fwarm with them: in the day-time we find them hid under the leaves of plants, and often, as it were, in a torpid ftate. In this condition they remain till evening, but they are fo cunning in hiding themfelves at this time, that it is difficult to fee one even in places where there are a great number. The way to difcover them is to beat and difturb the bufhes, or fhake the branches of trees in places where they are fufpected to be, and they will often be driven out in fwarms. In this cafe, they never fly far, but fettle again upon the firft tree or bufh they come to; and in fummer, if any one goes out into the fields or gardens, with a candle, in a calm and ftill night, there will numbers of different kinds of them almoft immediately gather about it. Thefe are called by naturalifts *night-butterflies*, *phalenæ*, and *moths*. *Reaumur*'s Hift. Inf Vol. I. p. 1. 330.

The feveral kinds of *butterflies* that have thofe various inclinations, have alfo external characters by which they may be diftinguifhed; all thofe which have buttoned *antennæ*, or *club antennæ* are of the diurnal kind, and are never feen flying about candles in the night. There are other forms of the *antennæ* alfo, which are peculiar to the day *butterflies*; and the night ones are diftinguifhed by their having the plumofe, the prifmatic, or the conic ones. See ANTENNÆ.

Thofe which fly about our candles are always of one of thefe three kinds. It is not, indeed, to be wholly affirmed, that no one of thefe kinds is ever feen flying by daylight, fince in woods and thickets we often fee them fluttering about without having been difturbed; but all that are thus caught flying are males, and are that time feeking after the females to couple with them, thefe being all fixed immoveably under the leaves and on the branches of trees.

The common kinds that we fee fly about from flower to flower are all of the day kind: a few fpecies of the *phalenæ* fometimes flutter about the thiftle flowers, and feem to fuck them; but thefe are feldom feen; and among the moths, or night kinds, as we call them, there are a great many that never fly about by night any more than by day, and, indeed, make no ufe of their wings at all.

It is alfo a fingular obfervation, that the moths which fly about our candles, whether in the houfe or abroad in the gardens, are all males: the females never do it. The male of the glow-worm flies in the fame manner at a candle, thinking it the light of his female; and it is poffible, that the female moths may, in the night, yield a light that affects the eyes of the male of the fame fpecies, tho' it be infenfible to our view. See Tab. of Infects, Nº 10.

The great general diftinctions of the *butterflies* into day and night kinds being made, it is neceffary to have recourfe to numbers of other fub-diftinctions, in order to arrange them in any method; and thefe can by no means be taken from them in their prior ftate of caterpillars, many of them being in that ftate alike in all their general characters, tho' of different genera in their flying ftate.

As the *antennæ* ferve for diftinctions of the *butterflies* into claffes, fo do their trunks into genera; but thefe are only capable of diftinguifhing a few, the flat and the round being their principal diftinction. Mr. Reaumur has obferved, that the day *butterflies* all have thefe trunks, but that many of the night kinds want them. The wings, however, give the greateft variety of generical characters among thefe animals. The fhape of thefe, and the manner in which thefe creatures carry them, when walking and at reft, ferve as great and effential diftinctions. *Reaumur*'s Hift. Inf. Vol. I. P. 1. p. 334.

The inferior wings, in fome certain pofitions of the animal, hide the fuperior ones; but this is rare, and as the fuperior are moft in fight and obvious, the characters are moftly drawn from them. All the wings are of a triangular form, but they have their differences; fome being rectilinear, fome curvilinear, and fome mixtilinear: one of thefe angles is the place of joining of the wing to the body of the animal, and this is called by naturalifts the fummit of the wing; the angle is here broke off, to give more room to a firm joining on, otherwife this would be that part of the wing which would make the fummit of the triangle. The two fides are called interior and exterior; the firft, is that neareft the body of the creature; the other, the oppofite one. The bafe or end of the wing, is that part which is oppofite to the fummit, and forms the verge of the wing endways. The different proportions which thefe three parts of the wing bear to one another, are the origin of a great variety of figures in the whole. When the exterior and interior fide, or as they may be called in other words, the upper and under rib or verge of the wing, are nearly ftrait and equal, the whole wing then forms an ifofceles triangle, or a fection of a curve, according as the bafe is ftrait or convex; and the angle is larger or fmaller according as the bafe is more or lefs broad. The differences of the exterior and anterior edges from one another, give alfo a great number of varieties in the form. The inner edge is ufually the fhorteft, and this is the cafe in various different fpecies. The bafe alfo has its varieties in figure, as remarkable as the reft; it is fometimes ftrait or plane, fome-

times concave, and often convex: in some species the edge of it is perfectly smooth and even, and in others it is more or less deeply indented; and in some of the species it is jagged, and in some few instances one of the jaggs is so far extended from the rest of the wing, as to form a sort of tail. The wings are also in some very large, in others small, in proportion to the body. The two pairs have also great varieties in their proportion one to the other; in some species the inferior pair are nearly or wholly as large as the superior, and in others they are very small in comparison of them; and in some species the under wings are remarkably longer than the upper.

The differences in the manner of the *butterflies* carrying their wings has been more considered by Reaumur than by any author who went before him He observes, that some of the species carry their wings perpendicular to the thing they sit upon; others carry them plain or level with the horizon; and others let them fall below that level: these are called the drooping-wing kind. Some others form a sort of canopy with them, to cover their bodies; and others makes them as it were embrace their bodies. The colours of the wings make excellent distinctions for the several species; but they are not at all fit for generical distinctions.

It has been already observed, that there are three kinds of antennæ which are peculiar to the day *butterfly*, but the distribution under these alone would be too large; the species of the button-horned ones being alone greatly too numerous to be held altogether. It is necessary, therefore, to take in with these the positions of the wings, according to the preceding differences, and the day *butterflies*, or *papilios*, are thus distinguished into seven classes. *Reaumur*'s Hist. Inf. Vol. I. P. I. p. 344.

Class 1. Contains those *papilios* whose antennæ are terminated by buttons, and whose wings, when at rest, are placed in a perpendicular direction to the thing the creature sits upon, the under edges of which embrace the lower part of the body, and whose six legs are all employed in sustaining the body, and in walking. The black-spotted white *butterfly*, produced from the beautiful cabbage carterpillar, is one of the *papilios* of this class.

Class 2. Contains the *papilios* of the same characters with the former in all respects, except that they use only four of their legs in sustaining the body and in walking. The two anterior legs in the flies of this class are held in a bent posture, and are furnished with a downy part at their ends, and seem to serve as a sort of arms. These *papilios* in general are produced from the prickly caterpillars. The solitary nettle kind gives us an instance in its *papilio*.

Class 3. Contains those *papilios* which agree in all respects with the former, except that their two anterior legs, which they use as arms and never in walking, are not terminated by downy ends, but are fashioned like the other legs at the extremity, only so small, that it requires a microscope to distinguish them. There is an instance of this class in a common grey and yellow *papilio*, that is found in pastures among the grass in June, July, and August.

Class 4. Contains those *papilios* which have buttoned antennæ, as the others, and which carry their wings, when at rest, in a perpendicular direction to the thing they sit upon; but, as the former have the inferior edge of their wings bent round the under part of their body, so in these the inferior edge is bent upwards in both pair of wings, and embraces and covers the upper part of the body. However obvious this distinction may be, there is another yet more plain one in this, that all of this class have one of the jaggs of the wing so far extended beyond the rest of the verge, that it forms a kind of tail, and they are called the tailed *butterflies*. These use all their six legs in walking.

Class 5. Contains those *papilios* which have six real legs, which they use as such, and their horns terminated by buttons as the others; but whose wings, when they are in repose, are not elevated perpendicularly to the thing they sit on, as in the four preceding classes, but are held in an horizontal direction, or at the utmost never meet in an angle over the back. We have an instance of this class in a *butterfly* bred from a smooth caterpillar of the marsh mallow.

Class 6. Contains those *papilios* which have club antennæ, that is, such antennæ as gradually increase in thickness from their origin to their extremity. See Feelers. These are that class of *papilios* which are always upon the wing, and buzz about flowers without ever settling upon them. They dart their trunks into the flower while they sustain themselves in the air, and have a way of holding themselves in poize, like a kite or other bird of prey; but when they are busy about the flowers, they have their wings in continual motion, and make a humming noise, like the humble bees. Mad. Merian has called all these *phalenæ*, or night *butterflies*, but they are all truly of the day kind. The French, from their poizing themselves on the wing, and making that humming noise, call them *eperviers*, and *papilions-bourdons*. Of this class are those small species called the fly *butterflies*, whose wings are only covered in part with dust or scales, the remainder being transparent and glassy, as some express it. *Reaumur*'s Hist. Inf. Vol. I. p. 1, 356.

Class 7. In this last class are comprehended those *papilios* whose antennæ are large at their origin, smaller afterwards, and finally terminated by an oval head; and which differ from the club antennæ in having no pencils of hairs at the end. This class is not very numerous, and the most frequent instance we have of it is in a painted kind, which we frequently find on blades of grass, in meadows in July. This flies little in the day time, but is usually found fixed to a plant, as the moths are. Mad. Merian and others have thence called it a *phalena*, or *night-fly*; but the truth is, that it flies no more by night than by day light, but is a lazy creature which makes very little use of its wings. See Phalenæ.

There is some appearance from one of Mad. Merian's tables, *viz* the 20th, that an eighth class of these day *papilios* should be found, she having figured one with conic granulated antennæ, common to some of the moths. If this observation be just, or if any new ones of a like kind should demand it, the classes may be easily enlarged *Reaumur*'s Hist. Insect.

The world is well acquainted with the beauties of this part of the animal creation, but Mr. *Reaumur* has given accounts of some very singular species, which deserve a peculiar regard.

One species of these he has called the *bundle of dry leaves*. This, when it is in a state of rest, has wholly the appearance of a little cluster of the decayed leaves of some herb. The position and colour of its wings greatly favour this resemblance, and they have very large ribs, wholly like those of the leaves of plants, and are indented in the same manner at their edges as the leaves of many plants are. This seems to point out the care of nature for the animal, and frequently may preserve it from birds, &c.

The *skull butterfly* is another singular species, so called from its head resembling, in some degree, a death's head, or human skull. This very remarkable appearance is terrible to many people, but it has another yet greater singularity attending it; which is, that, when frighted, it has a mournful and harsh voice. This appeared the more surprizing to Mr. Reaumur, as no other known *butterfly* had any the least voice at all; and he was not ready of belief that it was a real voice, but suspected the noise, like that of the cicadæ, to be owing to the attrition of some part of the body; and, in fine, he, by great pains, discovered that this noise was not truly vocal, but was made by a hard and brisk rubbing of the trunk against two hard bodies between which it is placed.

Another *butterfly* there is, so small, that it might be mistaken for a very small fly. This is certainly the extreme in degree of size of all the known *butterflies*, and cannot but have been proportionably small in the state of a caterpillar and chrysalis: this creature spends its whole life in all the three stages of caterpillar, chrysalis, and *butterfly*, on the leaf of the celandine. It lives on the under side of the leaf, and tho' in the caterpillar state it feeds on it, yet it does no damage. It does not eat the substance of the leaf, but draws from it only a fine juice, which is soon repaired again, without occasioning any change in the appearance of the leaf. This species is very short lived, and passes through its three states in so short a time, that there are frequently ten generations of it in one year; whereas in all the other *butterflies*, two generations in the year are all that are to be had. These two generations are sufficient to make a prodigious increase: in a large garden, if there are twenty caterpillars in spring, these may be overlooked, and there may be easily concluded to be none there, even on a narrow search; but if these twenty caterpillars afterwards become twenty *butterflies*, ten of which are male and ten female, and each female lay the same number of eggs that the common silk-worm does, that is four hundred; if all the caterpillars hatched of these become *butterflies*, and these lay eggs in the same proportion, which remain the winter, and come to be hatched in the succeeding spring; then from these twenty, in only one year, you will have eight hundred thousand; and if we add to this the increase of these in a succeeding year, the account must appear terrible, and such as no art could guard against. The great ruler of the world has put so many hinderances in the way of this over-abundant production, that it is very rare such years of destruction happen. Some such have happened, however, and much mischief has been dreaded from them, not only from their eating all the herbage, but from themselves being eaten with herbs in sallads and otherwise; but experiments has proved this an erroneous opinion, and they are found to be innocent, and eatable as snails or oysters.

Caterpillars in general are by some supposed poisonous to the touch. Mr. Reaumur has proved by repeated experiments, that all the smooth ones are perfectly clear from this accusation, and may be handled with perfect safety; but the hairy ones are capable of producing great pain and itching after the touching them. These pains are not only felt in the hands, but also in the face, or any other part; and that even tho' the animal have not been touched, if it have only been brought near the part. The spolia, or cast skin of these animals, have also the same effect; but then it is absolutely necessary they should be touched. This unquestionably carries the appearance of the effect of a poison to vulgar eyes, but the case will appear otherwise to those who will examine into the whole more nearly. The mischief occasioned by these creatures

comes on very quick, and sometimes continues many hours, sometimes even three or four days.

The explication of this by Mr. Reaumur, is only this, that these caterpillars have, beside their coarse and large hairs which we see them covered with, a vast number of others, which are so extremely small and fine, as to be invisible to our eyes. These are sharp-pointed, very rigid, and are loosly fastened to the creature's body; so that they separate from it on the lightest touch: these make a sort of atmosphere of fine darts surrounding them every way; and many of the species of hairy caterpillars have evidently a method of darting these out in great numbers. When the hand of any one is put toward this creature, so as to come within the reach of these small darts, it immediately discharges a whole shower of them, and of these a great number enter the pores of the skin, and a great number more lie along upon it, ready to enter, as soon as any accident changes their posture. If while the hand be thus covered with these weapons, whose smallness, tho' it makes them invisible, yet does not incapacitate them from being very troublesome, be moved up to the face, or the cheeks, or eyes, rubbed with it, it is easy to conceive, that many of these little darts will be made to lodge in the skin on which the hand where they lie is rubbed; and the consequence must be a greater itching, pain, and swelling in these tender parts, than on the hand. And thus is produced by simple means, what is by many esteemed the effect of a piercing and penetrating poison. And thus are the strangest appearances often explained by the most simple means.

As it has been observed, that the abundance of caterpillars would be a terrible mischief to mankind if they were subject to no accidents in their increase, it may be proper to examine what are the means by which gracious providence has provided against an over supply of them. Many of the species are great devourers, and feed on one another; but they have all much more destructive enemies; these are reptiles like themselves, a sort of worms, in a state of passage, at the end of which they are to pass thro' the chrysalis state into that of flies or beetles. Even the small species of butterfly, which lives on the celandine, has its enemies proportioned to its own size; and the same leaf of the plant is usually covered at the same time with these butterflies, their chrysalises, and their caterpillars, and with these small beetles, their chrysalises and worms all confusedly together; and by their smallness they are not easily distinguished one from another. The caterpillars of this small species are very unhappily circumstanced; they have not only an open war to carry on with the worms of these beetles, which are continually attacking them, and piercing their bodies and sucking their juices; but they have much more terrible intestine enemies, a sort of small worms which they carry within their bodies, and which eat away their flesh within the skin.

The first people who observed these creatures, supposed them the young of the caterpillars; but this was not only wholly out of the course of nature, but the cruelty of the thing gave it no title to belief. The true history of these little worms bred within the body of the caterpillar, is, that they are not its children, but its most cruel enemies; they are deposited there by a species of fly, which at the time of laying her eggs pierces the skin of the caterpillar with an instrument she carries on the hinder part of her body for that purpose; in the same manner in which the fly which occasions the galls on oaks, pierces their wood. She deposits her eggs in the wound she has made, the skin of the caterpillar heals over the place, and the creature feels no inconvenience at first from the wound; but the heat of her body soon hatches these eggs, and they producing maggots, which are naturally flesh-eaters, they feed on the flesh among which they are produced, and eat the miserable creature up alive, without breaking its skin; and they are often so numerous, that when they are increased to their destined size, they fill up the whole body of the caterpillar, scarce leaving a sufficient space for the entrails. What might appear very singular, is, that during all this time the animal which carries these intestine enemies, seems well and at ease; it eats and grows larger, as it would do without them. Mr. Reaumur inquiring into the reason of this, found that caterpillars have a long canal reaching from the mouth to the anus, and serving for stomach, oesophagus and intestines; and besides this, there is throughout its whole body, a cellular and fatty substance. It is on this that these devourers feed, without touching the intestine, or breaking its communication, which would kill the animal, and deprive them of a supply of food. Thus they are supplied from the great quantity of food the caterpillar takes, with a renewed flesh; and when the caterpillars which are infested with them are opened, this always is found to be the case; they being lodged in, and feeding intirely on this cellular substance, or the fat contained in it.

When these worms have arrived at their full growth, they come out of the body of the caterpillar, but this not all the same way, or by any natural passage, but each eats its way thro' the skin. As soon as they are got out they go to work, to spin themselves shells, or cases for their transformation: these they make upon the spot, and place them side by side, either upon the body of the caterpillar, or close by it; and stick so close to one another, that they appear one case or shell. This is a circumstance which has contributed not a little to the belief of their being the natural produce of the caterpillar, as people have thought they were all inclosed in one case of that creature's spining for them. The caterpillar dies of the wounds it has received by their eating their way out, added to the loss of what they had eat from it; and after a few days, the worms hatch out of this their chrysalis state into that of the fly, like the parent that lodged the eggs, from whence they arose in the body of their supposed parent.

Sometimes the caterpillar enters into its chrysalis state before these worms arrive at the time of their going out of its body; and in this state sometimes they eat thro' the sides of the case, but more frequently they remain in it, and become flies there, saving themselves, by this means, the trouble of spining. Some species of caterpillars are so greatly infested with these worms, that they are very seldom found free from them; and it is not more than one in twenty that by this means comes to the butterfly-state. Here then is one great stop to the increase of these destructive animals. Another cause of their destruction is also very common, and not less singular: a sort of flies lay their eggs in the eggs of the butterflies; and the maggots produced from these eat up the embryo caterpillars.

These worms are very terrible to the caterpillars by their number, but the small birds are much more so by their strength; multitudes of caterpillars are annually destroyed by these creatures, either for their own food, or for that of their young. In this also there seems a sort of regularity; for as the caterpillars have their taste for peculiar species of plants, so the birds have theirs for peculiar species of caterpillars. In general, they do not love the hairy kinds; but tho' this accident is a defence to them in that state, it is but a temporary one; for they are as subject to be devoured when butterflies, as those of the smooth sorts; and those which have escaped danger in their two first states of life, are by their size and conspicuous colours, very much exposed to these devourers in this their last stage. Each of their states has its appropriated enemies; and it is the same with respect to us, whether it is in the caterpillar, the chrysalis, or the fly-state, that the creature is destroyed; since the propagation is equally stopped in which ever it happens, provided only that it be before the laying of the eggs; all the difference, at the utmost, however, is, that if they are destroyed in the beginning of the caterpillar-state, a few leaves or herbs are saved that would have been eaten by them. Memoirs Acad. Science, Ann. 1736. See Tab. of Insects.

PAPILIO-*musca*, in natural history, a name given by some authors to a series of small insects, which seem to be of a middle nature, between the fly and the butterfly classes. Its wings are in part covered with those scales in form of dust, which render the wings of the butterfly kinds opake, and in part are transparent and glassy. Reaumur has called the wings *ailes vitrees*, glassy wings. *Reaumur's* Hist. of Inf.

PAPILION-*bourdon*, in natural history, a name given by the French authors to a sort of butterflies, which while they feed keep upon the wing with a humming noise like that of the humble-bee. *Reaumur's* Hist. of Insects. See the articles EPERVIERS and PAPILIO.

PAPILION-*a-queue*, *tailed butterflies*, a name given by the French naturalists to a sort of butterfly, of which there are several species. The feeds of the wings of these butterflies are jagged, and one of the jaggs runs out so far beyond the rest as to represent a sort of tail issuing from the creature. *Reaumur's* Hist. of Insects.

PAPILLARIS, in botany, a name used by some authors for the common *lampsana*, or *nipple-wort*. *Chabræus*, p. 318. See the article LAMPSANA.

PAPILLOSE, among botanists. See LEAF.

PAPIO, in zoology, the name of those species of monkeys which we call *baboons*. The word seems not yet properly determined as to the species which are to be comprehended under it; but what we usually acknowledge for *papiones* or *baboons*, are such as have long heads like a dog, and very long tails, and are of the number of those called by authors *cynocephali*.

PAPULÆ, a name used by many authors for eruptions of various kinds upon the skin, but appropriated by Bontius to those reddish and rough eruptions thrown out upon the body by sweat in the East Indies. These are thrown out all over the surface of the body, and at their first appearance are accompanied with an intolerable itching and desire of scratching.

Strangers are more exposed to these eruptions at their first arrival in these countries, than the natives, or those who have long resided there; as they are also to the bitings of the musquitos, than which they are not less frequent: hence a new comer into the country is distinguished by these troublesome maladies. The natives call him *organ bearon*, that is, a new arrived man; and tell him these complaints are a tax upon him for consuming the provisions. They call themselves *organ lamme*, or *veterans*, and honour with the same name such strangers as have lived long in the country.

The *papulæ* are in themselves no way dangerous; but when they are rashly and ignorantly treated, or when the skin is torn off

off from them by the nails, they often are the occaſion of malignant and very troubleſome ulcers, that are not eaſily cured.

Bontius, whoſe long reſidence in this part of the world gave him many opportunities of obſerving theſe *papulæ* in all their ſtages, adviſes people, to prevent danger and remove their troubleſome itching, to foment all the parts where they appear with a mixture of vinegar, water, and ſaltpetre; or if this be required yet more acrid, to add to it juice of lemons, and uſe it as before. The effect of this application is at firſt an intenſe pain, but this ſoon decreaſes ſo far, as to become leſs troubleſome than the intolerable itching of the parts. He gives great caution alſo againſt purging medicines, however mild; for by theſe the matter which cauſes the *papulæ* is often carried to the bowels, and produces dyſenteries. The cure is either to be wholly left to nature, or aſſiſted by ſudorifics. *Bontius* de Med. Ind.

PAR (*Cycl.*)—PAR *acceſſorium*, in anatomy, See the article ACCESSORY, *Cycl.*

PARABELE, in ichthyology, a name given by Marggrave to the flying fiſh, the *milvus hirundo* and *cuculus* of ſeveral authors. Theſe are names, however, ſo little expreſſive of the characters of fiſh, that they are applied by different authors to the different ſpecies. Artedi is the only author who has reduced this part of natural hiſtory to a regular ſyſtem; he makes this fiſh a ſpecies of the *triglia*, and diſtinguiſhes it by the name of the *triglia* with the head a little aculeated, and with a ſingular fin placed near the pectoral fins. See the articles MILVUS and TRIGLIA.

PARABOLIC (*Cycl.*)—PARABOLIC *aſymptote*, in geometry, is uſed for a *parabolic* line approaching to a curve, ſo that they never meet; yet by producing both indefinitely, their diſtance from each other becomes leſs than any given line.

There may be as many different kinds of theſe *aſymptotes* as there are parabolas of different orders. See *Mac Laurin's* Flux. B. 1. ch. 10.

When a curve has a common parabola for its *aſymptote*, the ratio of the ſubtangent to the abſciſs approaches continually to the ratio of two to one, when the axis of the parabola coincides with the baſe; but this ratio of the ſubtangent to the abſciſs approaches to that of one to two, when the axis is perpendicular to the baſe. And by obſerving the limit to which the ratio of the ſubtangent and abſciſs approaches, *parabolic aſymptotes* of various kinds may be diſcovered. See *Mac Laur.* Flux. Art. 337.

PARABOLIC *ſpiral*, in conics. See HELICOID *parabola*, *Cycl.*

PARACENTESIS (*Cycl.*)—See TAPPING.

PARACOPE, a word uſed by Hippocrates to expreſs a ſlight delirium in fevers.

PARACRUSIS, a word uſed by Hippocrates, and by many other writers, and expreſſing the ſame as *paracope*, a ſlight delirium in a fever.

PARADIGRAMMATICE, is uſed by ſome for the art of making all ſorts of figures in plaiſter. The artiſts in this are called *gypſochi*.

PARADISÆA, in zoology, a name uſed by ſome authors for the bird *manucodiata*, or *avis paradiſæa*, the bird of paradiſe, by others. In the Linnæan ſyſtem this makes a diſtinct genus of birds of the order of the *picæ*, the diſtinguiſhing characters of which are, that they have two ſingular and extremely long feathers, which are neither inſerted in the wings nor rump. See Tab of Birds, N°. 6 and *Linnæi* Syſtem. Nat. p. 44.

PARADISIACA, in botany, a name given by ſome authors to the *arbor* vitæ, or *thuya*. *Chabræus*, p. 73.

PARADOX (*Cycl.*)—Geometricians have of late been accuſed of maintaining *paradoxes*; and it muſt be owned, that ſome uſe very myſterious terms in expreſſing themſelves about aſymptotes, the ſums of infinite progreſſions, the areas comprehended between curves and their aſymptotes, and the ſolids generated from theſe areas, the length of ſome ſpirals, &c. But all theſe *paradoxes* and myſteries amount to no more than this: that a line or number may be continually acquiring increments, and thoſe increments may decreaſe in ſuch a manner, that the whole line or number ſhall never amount to a given line or number.

The neceſſity of admitting this is obvious from the nature of the moſt common geometrical figures: thus, while the tangent of a circle increaſes, the area of the correſponding ſector increaſes, but never amounts to a quadrant. Neither is it difficult to conceive, that if a figure be concave towards a baſe, and have an aſymptote parallel to the baſe, as it happens when we take a parallel to the aſymptote of the logarithmic curve, or of the hyperbola, for a baſe; it is not difficult to conceive, I ſay, that the ordinate in this caſe always increaſes while the baſe is produced, but never amounts to the diſtance between the aſymptote and the baſe. In like manner, a curvilinear area may increaſe while the baſe is produced, and approach continually to a certain finite ſpace, but never amount to it; and a ſolid may increaſe in the ſame manner, and yet never amount to a given ſolid. See LOGARITHMIC *curve*

A ſpiral may in like manner approach to a point continually, and yet in any number of revolutions never arrive at it; and there are progreſſions of fractions which may be continued at pleaſure, and yet the ſum of the terms ſhall be always leſs than a given number. See *Mac Laurin's* Fluxions, B 1. ch. 10. ſeq. where various rules are demonſtrated, and illuſtrated by examples, for determining the aſymptotes and limits of figures and progreſſions, without having recourſe to thoſe myſterious expreſſions which have of late years crept into the writings of mathematicians. For, as that excellent author obſerves elſewhere, tho' philoſophy has, and probably always will have myſteries to us, geometry ought to have none.

PARÆA, in zoology, the name of a ſpecies of ſerpent, called alſo *anguis æſculapii*. It is a perfectly innocent and harmleſs creature, and is ſo little dreaded by the inhabitants, that it is common about their houſes, and even ſometimes gets into their beds. Its mouth is full of very ſmall teeth, and when much provoked, it is ſometimes known to bite, tho' without any bad ſymptoms attending the wound. It is a very long kind, and is of a yellowiſh green colour on the ſides and blackiſh on the back: it has two ſmall eminences on the neck, and between them two ſmall ſinews. It is very common in Spain, Italy, and moſt other of the warm countries. *Ray's* Syn. Anim. p. 291.

PARAGAUDÆ, among the Romans, a ſort of wreaths, either wholly of gold, or of ſilk adorned with gold, which were interwoven in garments, and not ſowed to them. The garment was ſometimes of one colour, in which was woven one *paragauda*; others were of two colours, and had two *paragaudæ*; and ſome had three colours, and three *paragaudæ*. They were worn both by men and women.

PARAGOGE (*Cycl.*) a word uſed by medical writers to expreſs a reduction of luxated bones.

PARAGONE, in natural hiſtory, the name given by many to the baſaltes, a black marble, uſed as a touchſtone. See the article BASALTES.

PARAGUA, in zoology, the name of a Braſilian parrot, of the ſize of our common green parrot; but its back is all black, and its breaſt and the forepart of its belly are of a beautiful red. Its eyes are black, with a red circle round them; its beak brown, or a very duſky grey, and legs and feet grey. *Marggrave*, Hiſt. of Braſil.

PARALAMPSIS, a word uſed by medical writers to expreſs a cicatrix in the tranſparent part of the cornea of the eye.

PARALIA, Παραλια, in antiquity, a day kept in memory of an antient hero, called Paralus. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 424.

PARALIA was alſo the name of one of the Athenian tribes. *Potter*, ibid. T. 1. p. 49.

PARALLAXIS, in the medical writers, expreſſes a mutual change in the ſituation of the parts of a broken bone, as when the two fragments ſlip to the ſides of one another.

PARALLEL (*Cycl.*)—PARALLELS *of declination*, in aſtronomy, are circles parallel to the equinoctial, imagined to paſs through every degree and minute of the meridians, between the equinoctial and each pole of the world.

PARALLELA, a word uſed by medical writers to expreſs a ſort of ſcurf or leprous appearance, affecting only the palms of the hands. It is a ſymptom of the pox.

PARALLELOGRAM (*Cycl.*)—PARALLELOGRAM *of the hyperbola*, in geometry, is uſed for the *parallelogram* formed by the two aſymptotes of an hyperbola, and the parallels to them, drawn from any point of the curve. A *parallelogram* thus formed, is of an invariable magnitude in the ſame hyperpola; and the rectangle of its ſides is equal to the power of the hyperbola. L' Hopital, Sect. Coniq. Art. 99—101. See the article POWER, *Cycl.*

This *parallelogram* is the modulus of the logarithmic ſyſtem; and if we take it as unity, the hyperbolic ſectors and ſegments will correſpond to Napier's or the natural logarithms. If the *parallelogram* be taken $= 0.43429$, &c. theſe ſectors and ſegments will repreſent Briggs's logarithms. See the article LOGARITHM.

Huygens has made uſe of this term, De cauſ. gravitat. in fin. See LOGARITHMIC-*curve*.

PARALLELOGRAM-*protractor*, a mathematical inſtrument, conſiſting of a ſemicircle of braſs, with four rulers in form of a *parallelogram*, made to move to any angle: one of theſe rulers is an index, which ſhews on the ſemicircle the quantity of any inward or outward angle.

PARALLELLOPIPED (*Cycl.*)—The *parallellopiped* with oblique angles, is a figure very common to many kinds of ſtones, eſpecially of the ſofter ſort. The common cryſtallizations of grottos break naturally into fragments of this ſhape; and the ſtalactitæ which hang down from their roofs in form of icicles, are originally ſmall hollow pipes formed by the water which continually trickles down drop by drop; and whoſe outer ſurfaces, fixing themſelves by their ſmall baſes, form by degrees a ſort of blunted pyramids, which, like ſo many rays from the axis, which is the hollow pipe, grow hollow at laſt. This axis ſeems to be compoſed of plates, almoſt cylindrical, laid one over another; but if broken, the whole divides into fragments of a *parallellopiped* figure: the blunted pyramids that are about the axis divide themſelves at firſt into other blunted pyramids; but afterwards almoſt all theſe fragments divide of themſelves into other fragments of a *parallellopiped* figure, this ſeeming every where the ultimate ſhape of the particles.

In the mountain of Barege there is found a vaſt quantity of aſbeſtus; the ſtone upon which this grows, tho' in itſelf of

no determinate figure externally, yet always breaks into regular *parallellopipeds*: nor is this peculiar to theſe ſtones found naturally concreted on the ſurface or within the bowels of the earth, but it is alſo found in ſuch as are concreted by means of art out of the water in which they are originally ſuſpended. The water of the fountain de Salut, near Bagneres in Gaſcony, when evaporated to a certain degree, yields a ſcum on the ſurface, which alſo adheres to the ſides of the veſſel; and this ſcum, examined by the microſcope, is found to be compoſed of many regular *parallellopipeds*. If the ſame waters, and thoſe of ſeveral other ſprings, be evaporated to a drineſs, there remains a white ſhining powder, out of which the microſcope can direct us to ſeveral the like regular figures. Phil. Tranſ. N. 472, p. 32.

PARALLELLOPIPEDIA, in natural hiſtory, the name of a genus of ſpars, thus called, becauſe regularly of a *parallellopiped* form.

They are pellucid cryſtaline ſpars, externally of a determinate and regular figure, always found looſe, detached, and ſeparate from all other bodies, and in form an oblique *parallellopiped*, with ſix parallelogram ſides and eight ſolid angles, eaſily fiſſile, either in an horizontal or perpendicular direction, being compoſed of numbers of thin plates, and thoſe of very elegantly and regularly arranged bodies, each of the ſame form with the whole maſs, except that they are thinner in proportion to their horizontal planes; and naturally fall into theſe and no other figures, on being broken with a ſlight blow.

Of this genus there are four known ſpecies. 1. The hard pellucid and colourleſs one, called the iſland cryſtal of authors. See ISLAND *cryſtal*. 2. A dull and whitiſh kind, found in France, Germany, and England, particularly in the Derbyſhire and Yorſhire lead-mines, and about Scarborough. This has the ſame property with the former, of giving a double refraction; but it is ſo dull and opake, that it does not ſhew it ſo elegantly. 3. A ſoft, whitiſh, and very bright one, found principally in the lead-mines of Yorkſhire and about the ſeaſhores of that county. And, 4. a dull, hard, and pale brown one: this is found in the lead-mines of the ſame county, and in ſome parts of Ireland. All theſe ſpecies have the ſame power of double refraction with the firſt, but are too opake to ſhew it ſo beautifully, and often have not tranſparence enough to make it at all diſtinguiſhable. *Hill*'s Hiſt. Foſſ. p. 333.

PARALOPHIA, a word uſed by Keil and ſome other anatomical writers, to expreſs the lower and lateral part of the neck.

PARALOURGES, Παραλουργες, among the antients, a kind of garment, with a purple clavus on each ſide. *Pitiſc.* Lex. Ant. in voc. See CLAVUS.

PARALYSIS, in botany, *&c.* the ſame with *primula veris.* See PRIMULA *veris.*

PARAMERIA, a word uſed by the antients to expreſs the internal part of the thighs.

PARAMESE, in the Greek diagram, or ſcale, was the note above the meſe, which anſwers to a-la-mi-re of Guido's ſcale. V. *Wallis*'s Append. Ptolem. Harm. p. 157. Hence, as the *parameſe* was the firſt of the diazeugmenon tetrachord, it will be equivalent to Guido's higheſt ♮ mi. See DIAGRAM.

PARAMESOS, a word uſed by ſome to expreſs the ring-finger, that next the little one.

PARANETE, in the antient muſic, was a name ſometimes uſed to ſignify the next note, or chord to the nete, or laſt note of a tetrachord. See TETRACHORD.

Hence it might be called the penultimate chord. It was otherwiſe, and more properly called, *lichanos*, or index: the reaſon of which ſee under LICHANOS.

PARANETE *diezeugmenon*, in the Greek muſic, was the penultimate note of the *diezeugmenon* tetrachord, and anſwers to Guido's de-la-ſol-re. *Wallis*'s Append. Ptolem Harm. p. 157. See DIAGRAM.

PARANETE *hyperbolæon*, in the Greek muſic, was the penultimate note of the *hyperbolæon* tetrachord, and anſwers to Guido's g-ſol-re-ut. *Wallis*'s Appen. Ptolem. Harm. p. 157. See DIAGRAM.

PARAPHORA, a word uſed by the antients to expreſs a ſlight kind of delirium, or light-headedneſs in a fever: ſome have made it ſignify a delirium in general.

PARAPHRENITIS, in medicine, the name of a diſtemper which conſiſts in an acute ſymptomatic fever; which is the means uſed by nature to break through inflammatory ſtates in the diaphragm. The alienation of the mind in this diſeaſe is owing to the conſent of the nerves.

Signs of it. This is always attended with a moſt violent and painful cardialgia, or heart-burn; inſomuch, that the perſon cannot bear the leaſt touch of a finger on the region of the breaſt or ſtomach. It always brings on alſo a tumor of the præcordia, and an alienation or roving of the mind, which is always ſenſible in the words and actions of the perſon, but is not ſo great as in the true *phrenitis*. The reſpiration is interrupted by frequent ſighings; belchings are very frequent; as alſo the diſcharge of a black matter by vomit. The mouth is dry and parched, and the tongue very white and furred; and there is great thirſt.

Cauſes of it. The moſt frequent cauſe of this is a ſudden tranſlation of the morbific matter in fevers to the diaphragm; a ſuppreſſion of natural hæmorrhages by the noſe, the hæmorthoidal veſſels, or by the menſes; an omiſſion of habitual bleedings, and the drinking cold liquors when the blood is heated by exerciſe; and finally, a tranſlation of the matter of a quinſey to this part.

Prognoſtics in it. This is a dangerous diſeaſe, but it has three ways of terminating, according to the diſpoſition of the patient's blood and humours: 1. Sometimes the matter which cauſed the obſtruction is eaſily diſcuſſed, and ſweats happening on the critical days, carry off the diſtemper. 2. Sometimes the matter is reſolved, indeed, but not ſo happily; the reſolution takes longer time, and the matter finally does not evacuate itſelf by ſweat, but is tranſlated to the ears, where it occaſions deafneſs, tumors, and other accidents; or to the joints, where it brings on either the gout or eryſipelatoſe diſorders: or, 3. The matter comes to ſuppuration; in which caſe, the perſon dies either within ſeven days, or, at the utmoſt within fourteen. The ſigns which preſage a gangrene in this diſeaſe, are violent hiccoughs, coldneſs of the extremities, violent internal heat, and clammy ſweats.

Method of cure. When, by a preceding error in the perſon's diet, the peccant matter remains in the primæ viæ, a gentle emetic is to be given, with the digeſtive medicines before it; and if the vomit does not operate, a few grains of emetic tartar are to be given afterwards. When the patient is of a plethoric habit, bleeding is extremely neceſſary; and ſometimes, where the ſymptoms require it, may be repeated to a third time. Twenty drops of the mixtura ſimplex may afterwards be given at a doſe, every four hours, in the morning; and in the afternoon, powders of purified nitre, with vitriolated tartar and crabs eyes ſated with juice of lemons: beſides theſe, there may be externally applied, plaiſters, with a large portion of camphor, to the breaſt and back; ſinapiſms, and other hot cataplaſms, to the ſoals of the feet; ſtimulating clyſters, and acrid ſuppoſitories have alſo their uſe in this caſe; and the application of leeches to the hæmorrhoidal veins, in people who have been ſubject to diſcharges from thence, are very often of ſingular ſervice. All the while there muſt be kept up a gentle tranſpiration, either by copious draughts of warm and weak liquors, or by lightly accidulating medicines. *Junker*'s Conſp. Med. p. 307, ſeq.

PARAPHROSYNE, a word uſed by ſome medical writers to expreſs a delirium, or an alienation of mind in fevers, or from whatever cauſe.

PARAPOTAMIA, in the materia medica of the antients, a word uſed at firſt as an epithet of diſtinction for a kind of Œnanthe, from which the œnanthine ointment of the Greeks was made; but afterwards uſed ſimply as the name of that plant. This kind of œnanthe was the moſt fragrant of all the kinds, and was therefore uſed for the making the ointment preferably to the reſt.

Theophraſtus makes a very great difference in the œnanthe of different places, obſerving, that the Cyprian kind was fragrant, and fit for making this ſweet ointment; but that the Grecian had no ſmell at all: and thence it probably aroſe, that the Greeks uſed afterwards the flowers of the wild vine for this purpoſe, and called them by the ſame name.

Pliny's account of this ointment is by no means to be depended upon. The whole paſſage where he names it, and the others of the like kind, is taken from the account of Apollodorus, in Athenæus; but it is ſo careleſly tranſlated by Pliny, that the author's ſenſe can ſcarce any where be made out. *Athenæus*, l. 15.

PARAPROSDOCIA, Παραπροσδοκια, in rhetoric, the ſame with *paradox*. See PARADOX, *Cycl.* and *Suppl.*

PARARTHREMA, a word uſed by medical writers to expreſs a ſlight luxation.

PARARYTHMOS, an epithet uſed by the antients to expreſs any kind of pulſe which did not ſeem ſuitable to the age and ſtate of the perſon.

PARASCEUE, (*Cycl*) in antiquity, a Greek word which ſignifies *preparation*. The Jews gave the name of *paraſceue* to Friday, becauſe being not allowed on the Sabbath to prepare their food, they provided the day before. Exod. xvi. 23. xxxv. 2. 3. *Calmet*. Dict. Bibl.

PARASCHIDES, a word uſed by chirurgical writers to expreſs the ſplinters of fractured bones, or the fragments of bones corroded by ſharp humours.

PARASEISMA, a ſort of exerciſe preſcribed by the Greek phyſicians in many caſes. It was a general concuſſion of the body.

PARASEMUM, Παρασημον, among the antients, a ſign painted or carved on the prow of ſhips, by which they were diſtinguiſhed from one another. This ſign was commonly the figure or picture of ſome animal, as the bull, lion, *&c.* or of any other thing, as a mountain, tree, flower, *&c.* *Pitiſc.* in voc. and *Potter* Archæol. Græc. T. 2. p. 128.

PARASIOPESIS, Παρασιώπησις, in rhetoric. See the article PARALEPSIS, *Cycl.*

PARASITIUM, among the antients, a granary or place where the ſacred corn, deſigned for religious purpoſes, was preſerved. *Pitiſc*. Lex. Ant. in voc. See PARASITE, *Cycl.*

PARASPHAGIS, a word used by some anatomical writers to express that part of the neck which is contiguous to the clavicles.

PARASTREMMA, a name given by medical writers to a convulsive distortion of the mouth, or of any part of the face.

PARATHENAR-*major*, a pretty long muscle forming part of the outer edge of the sole of the foot. It is commonly called *hypothenar*, but very improperly, according to the proper signification of that word It is fixed backward by a fleshy body to the outer part of the lower side of the os calcis, from the small posterior external tuberosity all the way to the anterior tuberosity, there it joins the metatarsus; and at the basis of the fifth metatarsal bone, separates from it again, and forms a tendon which is inserted in the outside of the first phalanx of the little toe near its basis, and near the insertion of the *parathenar*-minor. *Winslow*'s Anatomy, p. 226.

PARATHENAR-*minor*, a fleshy muscle fixed along the posterior half of the outer and lower side of the fifth bone of the metatarsus; it terminates under the head of that hone in a tendon which is inserted in the lower part of the basis of the first phalanx of the little toe.

The tendinous insertion of this muscle is very closely united to the cartilaginous ligament; and the same thing is to be observed of the other muscles, which go to the basis of the first and second phalanges of the toes. In aged persons, some part of these ligaments are often turned to bone, and thereby form those hony portions which many have taken for distinct sesamoide bones. *Winslow*'s Anatomy, p. 226.

This muscle is more expressively named by Albinus, the *flexor brevis digiti minimi pedis*.

PARATI, in zoology, the name of a Brasilian fish of the mullet kind, much resembling that species called *curema*, or *taintra*, in all respects but size; and in the colour of its eyes, the iris of which, instead of the silvery colour it has in the *curema*, is of a fine yellow. Its flesh also when dressed, is drier than that of the *curema*. *Piso*'s Hist. of Bras. See the article CUREMA.

PARBUNCLE, in a ship, the name of a rope almost like a pair of slings; it is seized both ends together, and then put double about any heavy thing that is to be hoised in or out of the ship; having the hook of the runner hitched into it to hoise it up by.

PARCELLING, in ship-building, is caulking the seam of a ship, then laying over it a narrow piece of canvas, and then pouring on it hot pitch and tar. See PAYING.

PARDALIS, in zoology, a name by which many authors call the bird more commonly known by the name of *pluvialis*, and called in English the *grey* and *green plover*; birds of the size of the lapwing, and much esteemed at table. *Ray*'s Ornithology, p. 229.

PARDALIS is also used as the name for the leopard, called also *pardus*, *panthera*, and *varia*, by some. It is distinguished from the lion by its variegation of colour, and from the tyger by the disposition of those colours; which are in this creature always in round spots like eyes, as in the tyger they are in long streaks. The leopard is also less than the tyger.

PARDUS, in zoology, a name used by many for the *leopard*; the more accurate authors, however, use the word *pardalis*. See PARDALIS and LEOPARD.

PARDUS, in conchyliology, a name given by authors to a kind of shells, of the genus of the volutæ. We have three kinds of this shell: 1. A voluta spotted with black. 2. Another spotted with yellow. And 3. A very elegant one spotted with a redish colour. They are called *pardi*, or *leopard-shells*, from their distinct spots resembling those on the skin of a leopard.

PARE, in the manege. To *pare* a horse's foot is to cut his nails; *i. e.* the horn and sole of his foot; which is done with a butteris, in order to shoe him. See BUTTRESS, *Cycl.*

In England, the smith or farrier holds the horse's foot between his knees; in which posture he *pares* the foot, sets on the shoe, drives the nails, and rivets them, and this all alone without any assistance from the groom.

PARECBASIS, Παρέκβασις, in rhetoric, is used to signify the exaggeration of a crime, and not a digression from the question in hand, as some have thought. *Voss.* Rhet. l. 3. p. 364.

PARECHESIS, Παρήχησις, in rhetoric, the too frequent repetition of the same syllable, thus, *perire me malis malim modis*. *Voss.* Rhet. l. 5. p. 331.

PAREDRIA, a term used by Hippocrates to express an association of two or more diseases in the same patient, making what we call a complicated illness.

PAREDRI, Πάρεδροι, among the Athenians. When the Archon, Basileus, or Polemarchus, by reason of their youth happened not to be so well skilled in the laws and customs of their country, as might have been wished, it was customary for each of them to make choice of two persons of age, gravity, and reputation, to sit with them upon the bench, and direct them as there was occasion. And these assessors, or *paredri*, were obliged to undergo the same probation in the senate-house and public forum, with the other magistrates; and like them too, to give an account how they had behaved themselves in their respective trusts, when their office was expired. *Potter*, Archæol. T. 1. p. 77.

PAREIRA-*brava* (*Cycl.*)—The Portuguese name signifies the wild vine, and is given to a root first brought into Europe by Mr. Amelot, and celebrated by many at that time for its extraordinary virtues. The plant which produces it is not known, but is generally supposed to be of the vine kind. Mr. Geoffroy examined into its virtues carefully, and also its characters and distinctions; he found that there were properly two kinds of it: The one brown on the outside, and yellowish within. This is what was then most frequent in use; and the other white on the outside, and of a paler yellow or lemon colour within. This is said to be of a flesh colour on the outside where recent, and to turn white in drying; both are of a spungy or porous texture, yet considerably hard and woody; of a bitter taste, but with an admixture of a sweetish flavour like that of liquorice; and their usual size is from that of one's middle finger, to that of one's thumb.

The Portuguese were informed of the virtues of this root by the natives of the Brasils; and on trial extolled it above all the medicines in use. Their accounts of its efficacy were too exaggerated to gain credit with the judicious part of the world; but Mr. Geoffroy's experiments, which set its virtues in a much modester light, yet shew them to be very great; and that the root deserves to be for ever continued in use in medicine, and rekoned among the most valuable simples. The Portuguese pretend, that it dissolves the stone in the bladder; but tho' this is not true, Mr. Geoffroy found that it was admirable for breaking the common weaker fabulous concretions in the kidneys and ureters; and that the taking it was always attended with the voiding of large quantities of gravel He gave it also with great success, to persons afflicted with ulcers in the kidneys and bladder, and whose urine was purulent, and at many times totally suppressed: these suppressions of urine were always cured by it, and their urine became less thick and purulent; many also were perfectly cured of these complaints by a course of it, with the addition of balsam of capivi toward the end of the course.

This property of the *pareira-brava*, of dissolving thick humors, gave Mr. Geoffroy an opinion of trying it in humorous asthmas; and these obstinate cases often were greatly abated, and sometimes perfectly cured by it. The usual way of taking it, is in decoction, sweetening it in the manner of tea. Mem. Acad. Par. 1710.

PAREMBOLE, Παρεμβολή, in rhetoric, a figure wherein something relating to the subject is inserted in the middle of a period. All the difference between the *parembole* and *parenthesis*, according to Vossius, is, that the former relates to the subject in hand, whereas the latter is foreign to it. An example of each we have in Virgil, and first of the *parembole*.

Æneas (neque enim patrius consistere mentem
Passus amor) rapidum ad naves præmittit Achatem.

The following is an instance of the *parenthesis*:

——— *ipsique suos jam morte sub ægrâ*
(*Di melior a piis, errorem que hostibus illum*)
Discissos nudis laniabant dentibus artus.

Voss Rhet. l. 5. p. 334. See PARENTHESIS, *Cycl.*

PARENCEPHALIS, a name given by some authors to the *cerebellum*.

PARENTHESIS, Παρένθεσις, in rhetoric, is frequently confounded with *parembole*. See the articles PAREMBOLE, *Suppl.* and PARENTHESIS, *Cycl.*

PARERGON, in painting, an appendix, or piece added to the main design by way of ornament. *Hofm.* Lex. in voc.

PARER, in the manege, a term formerly used as a command to stop, but now exploded; all the riding-masters, when they have a mind the scholar should stop the horse, calling out *hola*. *Guillet*, in voc. See STOP.

PARETONIUM, in natural history, the name of an earth antiently found on the shores of Egypt, Cyrene, and the island of Crete; and used by the antients in painting

It had its name either from a part of Egypt near which it was gathered, or from the name of a town in that kingdom where it was usually sold. Vitruvius is of the first opinion, and Volaternus of the other.

There have been some differences among the earlier writers about the nature and origin of this substance; and much confusion and mistake among the moderns. Pliny imagined it formed of the froth of the sea coalesced into a solid mass, with the addition of some mud: Aldrovand thought it formed of the disunited particles of what he calls the fatter stones, such as lime-stones, and the like, washed from them by the motion of the water, and afterwards got together in that form. And Dalecshamp esteemed it a chalk, produced about the shores, which he adds was very white, fat, and glutinous, and could not be taken up without a mixture of some of the mud along with it. It is very clear, however, according to this very account, that the substance could be no chalk: viscidity and fatness, are qualities that cannot belong to an earth of that class; neither are we to imagine, that it was ever dug up from the flat parts of the shores; since if there was a stratum of it there, tho' ever so thin, it might certainly have been taken up pure.

Such were, however, the opinions of authors about this substance. Of late we have been taught to think it lost; but it is still common on the shores of most of the islands of the Archipelago, tho' not observed or regarded; and is truly a very heavy and tough clay of a fine white colour, found in masses of different sizes, generally as soft as the softer clays within the strata; and by rolling about on the beech in this state, it gathers up the sand, small shells, and other foulnesses we always find about it. It is most probable, that there are strata of it fine and pure in the cliffs there, and that the sea washes off masses of them in storms and high tides, which are what we find. *Hill's* Hist. of Foss. p. 17.

PARGET, in natural history, a name given to the several kinds of gypsum or plaister-stone, which when slightly calcined, make what is called *plaister of Paris*, used in casting statues, in stuccoing floors and cielings, and many other like occasions.

The word *parget*, tho' generally understood of all the gypsums, is, however, by the workmen principally applied to the two species which make up the first genus of that class, called by Dr. Hill the *pholides*. These are the Montmartre kind, and that of Derbyshire. See Pholis.

The first of these, or *parget* of Montmartre, is dug in the place from whence it has its name, and is very pure; of a considerably bright and glossy appearance: when fresh broken, of a close, firm, and compact texture, and somewhat soft and smooth to the touch. It is found in masses of different sizes, from four inches to as many feet in diameter; and of no determinate shape or figure, but usually somewhat flatted. It is usually of a pure and fine white, tho' sometimes a little brownish; and in both cases so exactly resembles in structure and appearance, a lump either of coarser or finer loaf sugar, as not to be easily distinguished from it at sight. When broken, it looks considerably bright, and is seen to be composed of small flat particles laid together with no order or regularity. It will not give fire with steel, nor ferment with aqua fortis; but very freely calcines to a fine white powder, the uses of which are well known. We have none of this kind in England. *Hill's* Hist. of Foss. p. 112.

The Derbyshire *parget* of this genus, (for there are many of the others dug in the same county, which are much less valuable) the *pholis* of that country, as it ought distinctly to be called, which is what our workmen distinguish by the name of *Derbyshire parget*, of all the gypsums comes the nearest the nature of the French. This is distinguished from all the other English gypsums by its superior hardness, its brightness, and the breadth of its constituent particles. It is of an extremely irregular, rough, coarse, and unequal texture, and is not at all soft to the touch. It is very beautifully variegated in colour with a fine bright white, and a dusky pale red. The white is usually the ground, and the red is disposed in form of clouds, spots, or veins in it. It is found in broad flat masses of uneven and rugged surfaces; some of these are four or five feet in breadth, and two or three in thickness.

These are of a dusky surface, but very bright and shining when broken, and its construction is very irregular; some parts of it, where the broad faces of its flakes are seen, appearing of a foliaceous structure, and others, where their egdes come in view, of a striated one. Its constituent particles are scaly, but longer and narrower than those of the French kind. It is much heavier than the French kind, and will neither give fire with steel, nor ferment with acids; and calcines a little more slowly than the other to a white plaister. This is dug in vast quantities in Derbyshire, in Yorkshire, and some other parts of England. *Hill's* Hist. of Foss. p. 113.

PARHELIUM *(Cycl.)*—The frequent appearances of *parhelia* in cold climates, seem to confirm Descartes's hypothesis, of their proceeding from icy particles suspended in the air. See Phil. Trans. N° 465. Sect. 2.

PARHOMOLOGY, Παρομολογια, in rhetoric, a figure wherein part is yielded to the opponent, and the rest denied: thus, *Sume hoc ab judicibus nostrâ voluntate: neminem illi propiorem cognatum, quam te, fuisse, concedimus: officia tua nonnulla in illum extitisse, stipendia vos unâ fecisse aliquamdiu, nemo negat sed quid contra testamentum dicis, in quo scriptus hic est.* *Voss.* Rhet. l. 5. p. 389. See Concession, *Cycl.*

PARIETALIA *ossa*. These are situated on the superior, lateral, and a little on the posterior parts of the skull. They are of a larger extent than any other bone of the skull; and their figure is nearly that of an irregular convex square. They have each an external and convex side, and an internal and concave one, four edges, one superior or sagittal, one inferior or temporal, one anterior or frontal, and one posterior or occipital. The superior edge is the longest; the inferior the shortest; in this last there is a very large squamose slope, which may be properly named the temporal slope; the upper and posterior edges are indented thro' their whole length; the anterior edge is indented also, except at its lower part; and all the lower edge is squammous, except a small portion next the os occipitis. It has four angles, the anterior and upper, the anterior and lower; the posterior and upper, and the posterior and lower: the anterior and lower angle ends in a squammous production, which from it situation may be called the *temporal angle*, or *apophysis*. On the outside above the temporal slope, is seen the most considerable portion of the semi-circular plane of the temporal muscle; near the upper edge toward the posterior angle, is a small hole called the *parietal hole*, which is sometimes found only in one of the bones, sometimes in the sagittal suture, and in some subjects is intirely wanting. In some this hole also goes only to the diploe, in others it perforates both tables.

These bones are the weakest of all the eight that compose the skull. The diploe is found between the tables thro' the whole length of the sagittal and occipital edges, and thro' the upper half of the coronal suture. These bones contain a large portion of the brain, form part of the temples, and serve for the insertion of the temporal muscles. *Winslow's* Anatomy, p. 24.

PARIETARIA, *pellitory of the wall*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the apetalous kind, and consists usually of only four stamina, which arise out of a cup divided into four segments. This is sometimes of the bell-shape, sometimes of the funnel-shape, and sometimes rotated. The pistil finally becomes an oblong seed, which is contained in the cup of the flower.

The species of *parietaria*, enumerated by Mr. Tournefort, are these: 1. The common *parietaria*, or *pellitory of the wall*. 2. The Basil-leaved *parietaria*. 3. The least annual Portugal *parietaria*. *Tourn* Inst. p 509.

This is a plant of a long time famous in medicine. It is cooling and abstergent. It is prescribed in stranguries, and in cases of gravel or small stones in the kidneys; and is an ingredient in many of the shop-compositions, intended for those purposes. It is sometimes made an ingredient in decoctions for clysters, to be given in nephretic cases, and externally is much recommended in the erysipelas, and for the softening of hard tumors.

PARISTHIMA, a word used by some authors to express the tonsils. See Tonsils.

PARIUM *marmor*, in the natural history of the antients, the white marble used then, and to this day, for carving statues, &c. and called by us at this time *statuary marble*.

Too many of the later writers have confounded all the white marbles under the name of the *parian*; and among the workmen, this and all the other white marbles have the common name of *alabasters*; so that it is in general forgotten among them, that there is such a thing as alabaster different from marble; which, however, is truly the case. Almost all the world also have confounded the Carrara marble with this, tho' they are really very different; the Carrara kind being of a finer structure and clearer white than the *Parian*, but less bright and splendid, harder to cut, and not capable of so glittering a polish.

The true *Parian* marble has usually somewhat of a faint blueish tinge among the white, and often has blue veins in different parts of it. It is supposed by some to have had its name from the island Paros, one of the cyclades in the Ægean sea, where it was first found; but others will have it to have been so called from Agoracritus Parius, a famous statuary, who ennobled it by cutting a statue of a Venus in it. *Hill's* Hist. of Foss. p. 462.

PARK *(Cycl.)*—A *park* ought to have three sorts of ground in it: 1. Mountainous and barren. 2. Hilly and yet fertile. And 3. Plains that are sufficiently fruitful. The mountainous part should be well covered with high woods over at least a third part of it. The downs and hilly part should have one third part coppices and low woods; and the plains should be at least one third part pasture ground, with some arable or corn land. There should be a river contrived to run thro' some part of it, and a spring or brook to go through a great part, and at length fall into the river.

These are the natural advantages to be wished in a *park*; but when they are wanting, they are to be supplied as far as may be by art, as by ponds to preserve rain water, to supply the place of rivers and springs and proper plantations, and exposures for the rest; only the person who is to make a *park* should know what the natural advantages are, that he may take in as many of them as he can. When ponds are to be made to supply the place of natural brooks and rivers, they should be made large enough; the extraordinary expence in this will be easily repaid, by breeding fish in them, and fowl may also be kept in plenty on them. The *park* should also be well stored with trees; oaks should not be wanting in it; but beech and chesnut are the quickest of growth, and are easy to be had: these, therefore, should be planted in considerable numbers. Apple-trees and plum-trees also should be planted, as generally thriving very well, and affording good food to the deer, &c.

The best inclosure for a *park* is a brick or stone wall; but as the expence of this is very great, it may be done by paling; the pales must, in this case, be of sound heart of oak; and so close planted, that no animal of prey can make its way in between them; and for a farther defence, a good-quick set hedge is very proper, and should be kept in good order. Some part of the mountain and high wood, may conveniently be made a heronry, and some part of the

middle may be a warren for hares and rabbits. Colts and horfes may be bred at large in the *park*, and in the fummer feafon it will be proper to have cows in the pafture ground on the plains.

There fhould be at leaft five or fix enclofures in the *park*, that the deer may be fhut out or let in as occafion requires. In the coldeft feafons they fhould always be kept altogether in the high woods, where they have good fhelter, and are to be fed conftantly with provender by the keepers. In the fummer fuch a number as are intended to be ufed may alfo be kept on the beft ground, that they may thrive quicker than thofe intended only for ftore. Some artificial holes and caverns fhould alfo be made for the deer to retire into in the hot weather, as well as in the cold.

PARK-*bote*, in our old writers, fignifies to be quit of inclofing a *park* or any part thereof. 4 Inft. 308. *Blount.*

PARKINSONIA, in botany, the name of a genus of plants, fo called in honour of the Englifh botanift, Parkinfon. The characters are thefe: the perianthum is deciduous, and is formed of one leaf divided into five fegments at the edge. The flower is compofed of five petals, nearly equal in fize, and larger than the fegments of the cup. They are difpofed in a circular form, and the four uppermoft are oval, the under one kidney-fhaped. The ftamina are two filaments, fomewhat crooked; the antheræ are oblong; the germen of the piftil is oblong, flender, and fomewhat bent; there is fcarce any ftyle; the ftigma is oblate and affurgent. The fruit is an extremely long pod, of a cylindric figure, and fwelling out in the places where the feeds are, fo that it looks like a necklace. The pod terminates in a point, and contains as many round feeds as there are protuberances on it. *Linnæi* Gen. Pl. p. 179. *Plum.* Gen. 3.

PARLIAMENT (*Cycl.*)—From the inquiries and reafonings of our antiquarians, it feems there has always been fomething of the nature of a *parliamentary* affembly, as antient as any thing we know of our conftitution. This affembly was fometimes called *magnates regni, omnes regni nobiles, proceres et fideles regni, difcretio totius regni, generale concilium regni. Spelm.* Gloff. voc. *Parliament. Prynn*'s Rights of Commons, 99.

But tho' this in general feems fettled, yet many have been the difputes of antiquaries, with refpect to the power and authority of thefe affemblies; as alfo about the perfons who compofed them. The firft formation of the houfe of commons has been particularly the fubject of warm debates.

Cambden, in his *Britannia* [a], dates the original of the houfe of commons, as now elected, from the 39th of Henry III. and fays he has it *ex fatis antiquo fcriptore*, but does not name his author. Pryn, in his plea for the lords, follows him [b]; and fo do Dugdale, Heylin, Brady, Filmer, and others. Among other reafons this is one, that the firft writ of fummons of any knights, citizens and burgeffes, now extant, is no antienter than the 49th of Henry III. and it feems the moft probable, and moft commonly received opinion, that the houfe of commons was eftablifhed during the reign of Henry III. after he had vanquifhed the barons. Before that it is fcarce credible they would have fuffered any power in oppofition to their own. Thus much is certain, that in the reign of Edward I. we find a houfe of lords, and alfo a houfe of commons, confifting of knights, citizens, and burgeffes. [[a] *Cambd.* p. 13. [b] Pryn. l. c. p. 182.]

Sir Edward Coke, in his fourth inftitute [a], fays, that the lords and commons at firft fate together. Whether they did or did not, does not well appear, nor does Selden [b] determine the point. [[a] p. 2. [b] Tit. of Hon. 704.]

The parliament commences by the king's writ or fummons: antiently fome of the peers only were fummoned, as it might have often proved inconvenient to fummon them all, if it be true that they were once about 3000 in number [a]. When a parliamentary peerage was eftablifhed, all were fummoned: hence my lord Coke fays [b], that every lord, fpiritual and temporal, of full age, ought to have a writ of fummons *ex debito juftitiæ*. [[a] Vid. *Spelm.* Gloff. 67. *Seld* Tit. of Hon. 692. [b] 4 Inft. 1. For the form of fuch fummons, fee *Cotton*'s Records, 3, 4.]

Antiently the tenure firft created the honour, and fuch as held *per baroniam* were fummoned to do fuit and fervice in parliament; and as fuch a fummons was an evidence of the tenure, fo it has been fince fettled, that the fummons and fitting in parliament makes the baron. But in all degrees of quality above a baron, a fummons is not fufficient; becaufe there are other ceremonies requifite, which muft be performed, unlefs difpenfed with by letters patent; and thefe being matters of record muft be produced [a]. [[a] *Seld.* Tit. of Hon. 495, 530. *Show.* P. C. 5. *Spelm.* Glofs 142.]

The firft fummons of a peer to *parliament* differs from an ordinary fummons, becaufe in the firft fummons he is called up by his proper chriftian and furnames, not having the name and title of dignity in him till he has fat; but after that, the name of dignity becomes part of his name: but the writ of creation, in all other things, is the fame with the ordinary writ that calls him. *Co. Litt.* 16.

The writ of fummons iffues out of chancery, and recites, that the king *de avifamento concilii*, refolving to have a *parliament*, defires *quod interfitis cum*, &c. Each lord of *parliament* is to have a diftinct fummons, and each fummons is to iffue at leaft forty days before the parliament begins. Vid. 7 and 8 of *Will.* and *Mar.* c. 25.

Of the manner of fummoning the judges, barons of the exchequer, king's council, and civilians, mafters in chancery, who have no voices, and how the writs differ from that to a lord of *parliament*, Vide Reg. 261. F. N. B. 229. 4 Inft. 4.

Alfo a writ of fummons muft be directed to every fheriff of every county in England and Wales, for the choice and election of knights, citizens, and burgeffes, within each of their refpective counties [a]. [[a] 4 Inft. 6. 10. *Co. Litt.* 109. Vid. 7 and 8 *Will.* and *Mar.* c. 25.]

So a writ of fummons muft iffue out to the lord warden of the cinqueports, for the elections of the barons for the fame; who in law are burgeffes. 4 Inft. 6.

The fubftance of thofe writs ought to continue in their original effence, without any alteration or addition, unlefs it be by act of *parliament*. 4 Inft. 10.

At the return of the writ, the *parliament* cannot begin but by the royal prefence of the king, either in perfon or by reprefentation: by reprefentation two ways; either by a guardian of England by letters patent under the great feal, when the king is out of the realm, or by commiffion under the great feal of England to certain lords of *parliament*, reprefenting the perfon of the king, he being within the realm, in refpect of fome infirmity. 4 Inft. 6.

Every lord fpiritual and temporal, and every knight, citizen, and burgefs, fhall, upon fummons, come to the *parliament*, except he can reafonably and honeftly excufe himfelf; or he fhall be amerced. That is, refpectively, a lord by the lords, and one of the commons by the commons. 4 Inft. 43, 44.

If any member of the houfe of commons votes, or fits there during any debate, after the fpeaker is chofen, without having firft taken the oaths of allegiance and fupremacy, &c. between the hours of nine and four, in full houfe, he fhall be adjudged a popifh recufant convict, be incapable of any office, and fhall forfeit 500l. Stat. 30. *Car.* II. c. 1. But fee 1 *Will* and *Mar.* by which the form of the oath is altered; and 13 and 14 *Will.* III. which enjoins the abjuration oath, with like penalties, which is altered in its form by 4 *Ann.* c. 5.

The rights and qualifications of elections depend for the moft part on feveral acts of *parliament*. But it is to be obferved, that the rights and qualifications of voters in cities, towns, and boroughs, depend on their charters, and fuch cuftoms as have prevailed in them time immemorial. *Hobart.* 120, 126, 141.

The 2 Geo. II. c. 24, was made for the better afcertaining in general the right of voting, and for the greater fecurity of returning officers.

Antiently the manner of proceeding in bills was very different from what it is at this day: formerly the bill was in the nature of a petition, and thefe petitions were entered upon the lords rolls; upon thefe rolls the royal affent was likewife entered; and upon this, as a ground work, the judges ufed, at the end of the parliament, to draw up the act into the form of the ftatute, which was afterwards entered upon the rolls called the *ftatute rolls*: this was different from thofe called the *lords rolls*, or the rolls of *parliament*. Upon thefe *ftatute rolls*, neither the bill, nor the petition from the commons, nor the anfwer of the lords, nor the royal affent, was entered; but only the ftatute, as it was drawn up and penned by the judges. This was the method till about Henry Vth's time; but then it was defired, that the acts of *parliament* might be drawn up and penned by the judges before the end of the *parliament*; by reafon of a complaint then made, that the ftatutes were not equally and fairly drawn up and worded. After the *parliament* was diffolved or prorogued in Henry VIth's time, the former method was altered; and then bills *continentes formam actus parliamenti*, were firft brought into the houfe. Thefe bills, before they were brought into the houfe, were ready drawn in form of an act of *parliament*, and not in the form of a petition, as before: upon which bills it was written by the commons, *foit baile al feigneurs*; and by the lords, *foit baile al roy*; and by the king, *le roy le voit*. The bill thus endorfed, was to remain with the clerk of the *parliament*, and he was to enter the bill thus drawn at firft in the form of an act of *parliament*, or ftatute, upon the *ftatute rolls*, without entering the anfwer of the king, lords, or commons; and then he iffued writs to the fheriffs, with tranfcripts of thefe *ftatute rolls*, to proclaim the ftatute.

To the paffing of a bill the affent of the knights, citizens, and burgeffes muft be in perfon; but the lords may give their votes by proxy: and the reafon hereof is, that the barons did always fit in *parliament* in their own right, as part of the *pares curtis* of the king; and therefore, as they were allowed to ferve by proxy in the wars, fo they had leave to make their proxies in *parliament*; but the commons coming only as reprefenting the *barones minores*, and the focage tenants in the county, and the citizens and burgeffes as reprefenting the men of their cities and boroughs, they could not conftitute proxies, becaufe they themfelves were but proxies and reprefentatives

of others, and therefore could not constitute a proxy in their place; according to that maxim of law, *delegata potestas non potest delegari*. 4 Inst. 12.

Both houses must be prorogued together, and dissolved together; for one cannot subsist without the other [a]. [a Sir *Robert Atkin*'s argument.]

PARNASSIA, in botany, the name of a genus of plants, the characters of which are these: 1. The flower is of the rosaceous kind, being composed of several petals, some large and others smaller, fimbriated and arranged in a circular form. The pistil arises from the cup, and finally becomes a membranaceous fruit of an oval figure, unicapsular, and containing small seeds affixed to a four-fold placenta. There is only one known species of this plant. See Tab. 1. of Botany, Class 6. and *Tourn*. Inst. p. 246.

PARNOPS, in natural history, the name of a species of wasp, found very frequently in vineyards, and among the winepresses, especially in hot countries. It is distinguished from all the other wasps by the roundness of its body, which is not slender or flatted in the common way, but round and tumid.

PAROCHETEUSIS, a term used by Hippocrates to express a derivation of the humors from one part, in order to the evacuating them by another not far distant. This is often a very happy turn for the cure of a disease.

PAROCHUS, among the Romans, one who provided mules, tents, and carriages, with all other necessaries, for the provincial magistrates in their journies, as also for ambassadors. For in the early times of the republic, they had their charges borne by the public, that the allies or provincials might not be burthened. *Pitisc*. in voc.

PARONYCHIA, *whitlowgrass*, in botany, the name of a genus of plants, the characters of which are these: the flower has no petals, but is composed of numerous stamina, arising from a cup formed into the shape of a basin and divided into five segments. The pistil finally becomes an orbicular seed, which is contained in a sort of pentangular capsule, which was once the cup of the flower.

The species of *paronychia*, enumerated by Mr. Tournefort, are these: 1. The Spanish *paronychia*, called by some the *white anthyllis*, and *white small knot-grass*. 2. The upright Narbonne *paronychia*. 3. The broad-leaved procumbent *paronychia*. 4. The chickweed-leaved procumbent Spanish *paronychia*, with less compact heads. 5. The shrubby myrrh leaved Spanish *paronychia*. 6. The knotgrass-leaved Portugal *paronychia*, with echinated heads. *Tourn*. Inst. p. 507.

PARRELS, in a ship, are frames made of trucks, ribs, and ropes, which having both their ends fastened to the yards, are so contrived as to go round about the masts, that the yards by their means may go up and down upon the masts. These also, with the breast ropes, fasten the yards to the masts.

PARROT, the English name expressing in general the whole psittacus kind, but appropriated by use to that class only of them, which is of a middle size between the macaw and paroquette.

The common green *parrot* is of this kind, and besides that, there are eleven other known species: 1. The white crested *parrot*. 2. The spotted beaked kind. 3. The black beaked kind. 4. The white headed one. 5. The changeable, or red and blue *parrot*. 6. The blue-grey one, common in our cages. 7. The red and white one. 8. The Ajuracura, or blue and green *parrot* of the Brasils; of which there are two subordinate species beside the common one, the one with a sea-green, and the other with an admixture of black about the head. 9. The paragua, a black *parrot* with a red belly. 10. The tarabe, a green one with a red head. And 11. The ajuracatinga, a *parrot* of considerable size, all over of a beautiful green, except that the beak is white and the legs grey; and of this there is a smaller species, no way different except in size. The four last are Brasilian birds, the rest are natives of both the East and West Indians; but many of them have never been seen amongst us. *Ray*'s onrithology, p. 74, 75, 76.

PARSLEY, *apium*, in botany, &c. See APIUM.

PARSNEP, *pastinacha*, in botany, see PASTINACHA.

The *parsnep* is to be propagated by sowing the seeds in February or March, in a rich mellow soil, which must be deep dug, that the roots may be able to run deep without hindrance.

It is a common practice to sow carrots at the same time, upon the same ground with the *parsneps*; and if the carrots are designed to be drawn young, there is no harm in it. The *parsneps* when they are grown up a little, must be thinned to a foot distance, and carefully kept clear of weeds. They are finest tasted just at the season when the leaves are decayed; and such as are desirous to eat them in spring, should have them taken up in autumn, and preserved in sand. When the seeds are to be saved, some very strong and fine plants should be left for it at four feet distance, and towards the end of August, or in the beginning of September, the seeds will be ripe: they must then be carefully gathered, and dried on a coarse cloth. They should always be sown the spring following, for they do not keep well. *Miller*'s Gard Dict.

The common wild *parsnep* is frequent by road-sides and in dry pastures; it flowers in autumn and ripens its seed soon after.

The seeds deserve to be brought into use in medicine much more than they are at present. They are warm and carminative, tho' not so violently hot as the caraway seeds and others which we commonly use on these occasions. They dispel flatuses, and are in great esteem among the country people for curing the colic. They also are diuretic and aperient, and gently promote the menses.

PART (*Cycl.*)—PART, in the manege, in French *partir*, is used to signify the motion and action of a horse when put on at full speed. From the horse's *parting* to his stop there is commonly two hundred paces of ground. To make your horse *part* with a good grace, you must put your bridle three fingers lower, and press gently with your heels, or only with the calves of your legs. See ECHAPER.

To PART *again*. See REPART.

PART *owners*, those that are concerned in ship matters, and who have joint shares therein.

PARTERRE, (*Cycl.*) in gardening, a level division of ground, which for the most part faces the south, or best front of a house, and is generally furnished with ever greens, flowers, &c. There are two kinds of these, the plain ones and the *parterres* of embroidery.

Plain *parterres* are most valuable in England, because of the firmness of the English grass turf, which is superior to that of any other part of the world; and the *parterres* of embroidery are cut into shell and scroll work, with alleys between them. An oblong, or long square, is accounted the most proper figure for a *parterre*; and a *parterre* should, indeed, be always twice as long as it is broad, because, according to the known laws of perspective, a long square always sinks to a square; and an exact square always appears less than it really is. As to the breadth of a *parterre*, it is to be proportionable to the front of the house; but less than a hundred feet in breadth is too little.

There should be on each side the *parterre* a terras walk raised for a view, and the flat of the *parterre* between the terrases should never be more than three hundred feet, at the utmost, in breadth; and about a hundred and forty feet in width, with twice and a half that in length, is esteemed a very good size and proportion. *Miller*'s Gard. Dict.

PARTHENIUM, in botany, the name given by Linnæus to a large genus of plants, comprehending, beside the *parthenia* commonly so called, the partheniastrum of Nissole and Dillenius, and the hysterophorus and tarchonanthus of the same author, and of Vaillant. The characters of the genus are these: the common cup is very simple, being five leaved and expanded; the leaves of it are roundish, plane and equal; the corolla is compound and convex; the corollulæ or semifloscules are very numerous; and the hermaphrodite ones are placed in the center. The female ones are only five in number; they are placed in the verge or radius, and scarce exceed the others in length. The hermaphrodite flowers are monopetalous, tubulose, and erect; the rim divided into five segments, and of the length of the cup. The female ones are monopetalous and tubulose, but they are flatted at the end, obtuse, and roundish, and of the same length with the hermaphrodite ones. In the hermaphrodite flowers there are five capillary filaments serving as stamina; these are of the length of the flower, and the antheræ are thick and almost loose. In the hermaphrodite flowers the pistil has a germen placed under the cup, and so small as to be scarce visible; the style is very slender, and shorter than the stamina, and it has no stigma. In the female flowers the germen of the pistil is turbinated and cordated at the end, and is naked and of a compressed figure; the style is capillary and of the flower's length; there are on this two capillary stigmata of the same kind, and opening at their tops. There is no other fruit but the cup, which remains upon the plant unaltered. The seed in the hemaphrodite flowers is abortive, and in the female, remains in the cup and is single, of a turbinated form, cordated at the extremity, and compressed. The flowers are so disposed in the head, that every female has two hermaphrodite ones at its back. *Linnæi* Gen. Pl p. 455. *Nissole*, A. G. 1711. *Dillen*. Gen. 13. Hort. Elth. 22. *Vaillant*, A. G. 1720. p. 1719.

Some of the Greek writers have called the *parthenium* by the name of the sweet marjoram, *amaracus*; and this has often occasioned great doubts, as to which of the two plants was meant. Dioscorides says, that the *parthenium* was by some called *Leucanthemum*; and by others, *amaracus*. Pliny says, that some called it *tamnacus*; but this is evidently only a false print, for he has trrnslated the before mentioned words of Dioscorides in the very order in which they stand in that author, and the word *tamnacus* should be *amaracus*. But this is not the only perplexity Pliny has occasioned about this plant: he has translated the account of it in a Greek author, which plainly shews, that the plant was the same that we now call by the name *parthenium*. Pliny has mistaken his original when he says, that it has a white flower, swelling like an apple; whereas the original says, that the exterior border of the flower was white, and the central part a discus yellow

The antients had another *parthenium*, which they distinguished by the name *murale*. This is our *parietaria*.

PARTISAN, in the military art, the commander of a *partisan* party.

PARTISAN-*party*, a small body of infantry given to a *partisan*, to make an incursion upon the enemy, to lurk about their camp, to disturb their foragers, and to intercept their convoys.

PARTITION (*Cycl.*)—PARTITION, in husbandry. The *partitions* in land sown with wheat by the drill, for the horse-hoing husbandry, are different according as the wheat is sown, in double, treble, or quadruple rows. The double row has but one *partition*, and this is best to be used in cases where the land is suspected to be full of the seed of weeds, which must be taken out with the hand hoe. This *partition* should be twelve or fourteen inches wide. Whole fields drilled in these rows may be hand-hoed at the expence of four shillings an acre; and when there is but one foot in six, the price of that work ought to be proportionable.

The common width of the two *partitions*, when the wheat is sown in treble rows, is six or eight inches. Care is to be taken in this particular; for, if they are planted closer, they will starve one another before the intervals are hoed to give them a fresh supply of nourishment; and if they are planted too far asunder, the two outer rows will thrive well, but the middle row will be starved, and look worse and weaker, because of its being at so great a distance from the hoed intervals. In quadruple rows the *partitions* are best to be seven inches wide each: at this distance the plants will thrive sufficiently, and if they are set nearer, the whole will be worse; and if farther off, the two outer rows will thrive, but the two inner ones will be starved, by reason of their distance from the plowed intervals.

PARTITION, *partitio*, in rhetoric, the same with division. See the article DIVISION.

PARTITIONE *facienda*, in law, a writ which lies for those who hold lands or tenements *pro indiviso*, and would sever to every one his part, against them that refuse to join in partition, as copartners, &c. F. N. B. 61, 31 H. 8. c. 1. *Cowel.*

PARTITURA, in the Italian music, the same as *partition*. See PARTITION, *Cycl.*

PARTNER (*Cycl.*)—PARTNERS, in a ship, are strong pieces of timber bolted to the beams incircling the masts, to keep them steady in their steps, and also keep them from rolling, that is, falling over the ship's sides. There are also of these *partners* at the second deck, to the same end; only the missen-mast hath but one pair of *partners*, in which that mast is wedged so firm that it cannot move. Some ships do not sail well unless their masts are loose, and have leave to play in the *partners*; but in a storm this is dangerous, lest the *partners* should be wronged, (as they say) *i. e.* forced out of their places; for then there is no help but to cut the mast by the board.

PARTRIDGE, *perdix*, in ornithology. See PERDIX.

The *partridge* is a timorous and simple bird, and is so valuable at the table, that there are a great many ways of taking it invented by sportsmen, all of which succeed from the folly and fear of the animal.

The places that *partridges* most delight in, are corn-fields, especially while the corn grows; for that is a safe retreat, where they remain undisturbed, and under which they usually breed. They frequent the same fields after the corn is cut down, and that with another intent; for they then feed on the corn that has fallen from the ears, and find a sufficient shelter for them under the covert of the stalks, especially those of wheat stubble. When the wheat stubble is much trodden by men or beasts, they retire to the barley stubble, and will there hide themselves in coveys of twenty or thirty. When the winter comes on, and the stubble fields are trodden down or ploughed up, they then retire to the upland meadows, where they lodge in the high grass and among the rushes; sometimes they resort to the low coppice woods, especially if there be corn lands near them.

In the harvest time, when the corn fields are full of men, they are found in the fallow fields next to the corn fields, where they lie lurking among the weeds till evening, and then they get over into the corn, and feed late and early on the corn in the sheaves. When the proper haunts are known, the next thing is to find the birds in them: this is done variously, some will do it by the eye only; and this art can never be taught, but can be had only from long observation: the colour of the birds being so like that of the earth at a distance, that no eye but a very conversant one could distinguish them. When they are once seen, the business is to keep the eye upon them, and then to keep in continual motion. They are a very lazy bird, and by this means will let a person almost tread upon them; tho' if the person stands still to eye them, they will rise immediately, tho' they are at a considerable distance.

Another method of observing them is by going to their haunts very early in the morning, or at the close of the evening, which is called jucking time. The noise of the cock *partridge* is to be attended to at this time, and is very loud and earnest. The hen will soon come up to the cock after her making the noise, which she does by way of answer; and when they are got together, their chattering will discover them. Thus they may always be found at these times: but there is a yet better method of finding this bird, which is by the call. The business, in order to have success in this way, is carefully to learn the notes of the *partridge*, and be able to imitate all the several sounds. When perfect in this, the person is to go to the haunts morning and evening, and placing himself in some place where he can see the birds without being seen by them, he is to listen to their calling; and when they are heard, he is to answer in the same notes, doubling again as they do: by continuing this, they may be brought so near, that the person lying down on his back may count their whole number. Having in this manner found where the birds are, the next care is to catch them.

They are so foolish, that it is extremely easy to take them in nets. In order to this, there needs no more than the going out, provided with two or three nets, with meshes somewhat smaller than those of the pheasant nets, and walking round about the covey, a net is to be fixed so as to draw over them, on pulling a line at a distance. All this may be easily done; for so long as the sportsman continues moving about, and does not fix his eyes too intently upon them, they will let him come near enough to fix the nets, without moving. If they lie so straggling, that one net will not cover them, then two or three must be fixed in the same manner. The sportsman may then draw the nets over them, and they will often lie still with the nets upon them till he comes up to fright them, then they will rise and be entangled in the net.

A second method of taking them is with bird-lime: this is done by means of wheat straws. These must be large, and cut off between knot and knot; they must be well limed with the best and strongest bird-lime, and the sportsman must carry a great number of them out with him. Having found a field where there are *partridges*, he is to call; and if they answer, he is then to stick up the limed straws in rows across two or three lands, and going backward, call again to them, leading them on in the road where the straws are: they will follow one another like a flock of chickens, and come out to the call; and will in their way run upon the straws, and liming themselves, they will daub one another by crowding together, so that very few of them will be able to escape.

But there is yet a pleasanter way of taking them than this, that is, by driving of them: in order to this, an engine is to be made of canvas stuffed with straw, to represent a horse; this horse and nets are to be taken to the haunts of the *partridges*, and the nets being placed slanting or slopewise in the lower part of the field, the sportsman is to take the wind in his back and get above them, driving them downwards; his face is to be covered with something green or blue, and placing the horse before him, he is to go towards them slowly and gently; and by this means they will be raised on their legs, but not on their wings, and will run before the horse into the nets. If in the way they go into a wrong path, the horse is to be moved to face them; and they will be thus turned back again, and driven every way the sportsman pleases.

Indian PARTRIDGE, *coturnix Indica*, the name given by the Spaniards to a bird of the West Indies, of which there are three or four species; all which, Nieremberg says, are properly of the *partridge* kind. See the articles COLIN, and QUAUHTZONECOLIM.

Red-legged PARTRIDGE, a very delicate and valuable bird, called *cutumo* by the Italians.

It is distinguished from the common *partridge* by the redness of its beak and legs. It is of a greyish ash colour on the back; its throat is white near the head, but has a small black spot on each side at the angle of the bill, and this white space is surrounded by a black line; its breast is of a yellowish brown, and its wings are variegated with black, yellowish, and white. It is not found in England, but is sometimes shot in the islands of Guernsey and Jersey. *Ray*'s ornithology, p. 122

PARTY (*Cycl.*)—PARTY-*bleu*, in the military art, a name given to a party of robbers who infested the roads in the Netherlands. They belonged to neither army, but robbed both sides, without any regard to passes.

PARTY-*china*, a name given by the English merchants and others to a sort of porcelain or china-ware, which is elegantly painted on the outside with some bright colour, and blotted or variegated with round or square spots of a different tinge. The manner in which the Chinese do this is a very simple and easy one, and may be imitated in our own potteries with great ease. They prepare as many pieces of paper as they intend to have spots on the vessel, and cut them exactly into the shape of those spots: they wet these, and then spread them smoothly on the places where the spots are to be. When this is done, they cover the vessel with the brown and gold, or any other varnish, and then take off the papers: in the places which they covered no varnish has come, so that they are so many regular white spaces. These they cover with some other colour, laying it on carefully with a pencil: when this is done, they varnish over the whole vessel with the common varnish, and bake it. In some vessels they lay on only plain blue, or plain black in the spaces destined for spots; and after the first baking they cover these with gold, and make them so many figures of squares, triangles, or globes in pure gold. Observ. sur les Coutumes de l'Asie.

PARU, in natural history, the name of a very singular American fish.

It is broad, flat, and roundifh; of no great thicknefs, and is ufually of about five or fix inches long, and more than four broad. It has fix fins, one large and long, one on the back, and another on the belly, behind the anus. Each of thefe reaches to the tail, and has, toward the end, a long ftring or cord, made of a fingle filament; that, on the back fin, be ing longer than that on the belly. Behind the gills it has alfo two fins of two fingers breadth long, and one broad; and two others on the belly, which are very narrow. Its head is fmall, and its mouth elevated and fmall, and furnifhed with fmall teeth. Its fcales are of a moderate fize, and are half black and half yellow; fo that the fifh appears of a black colour, variegated with yellow half moons. Its gills, and the beginning of its fins, are alfo yellow; and it has, on each fide near the head, a yellow fpot; it is an eatable fifh. *Marggrave*'s Hift. of Brafil.

PARULIDES, in furgery. See Gum-*boils*.

PARUS, the *titmoufe*, in zoology, the name of a genus of fmall birds, of which there are feveral fpecies; fome very common with us, the others of foreign origin. The Englifh kinds are, 1. The *fringillago*, or great *titmoufe*. See Fringillago. 2. The *parus ater*, or *colemoufe*, which has a black head, white fpot on the back part of it, a greyifh green back, and a green rump. This is the fmalleft of all the kind, not weighing above two drams. 3. The *parus paluftris*, or *marfh titmoufe*, commonly called the *black cap*. This is fomething larger than the colemoufe, and weighs three drams; its head is black, but its jaws white; its back greenifh, and its feet of a lead colour. It has a larger tail alfo than the colemoufe, and wants the white fpot at the back of its head, which is its diftinguifhing character. 4. The *parus cæruleus*, or *blue titmoufe*, or *nun*. This is of the fame fize with the black cap, but its head is blue, with a circle of white drawn round it; and round that white circle there is another of different colours, which furrounds the back part of the head and throat; there runs on each fide a black line, from the beak to the hinder part of the head, and the jaws are white; the back is of a greenifh yellow, its fides, breaft, and belly, yellow; but there runs a white line longitudinally down the middle of its breaft 5. The *parus caudatus*, or *long-tailed titmoufe*. The head of this fpecies is white, the neck black, and feveral black lines of the fame colour, run from the beak to the back of the head; the breaft is white, variegated with fmall fpots of brown; the belly and fides are of a pale chefnut colour. Its tail is extremely long, and is variegated with black and white. It is found in gardens and orchards, and builds its neft with great art and nicety. *Marggrave*'s Hift. of Brafil.

The kinds not known to be found in England, are the blue American one called *guiracenoia*. See Guiracenoia. The *paruscriftatus*, or *crefted titmoufe*, known by its black head being fimbriated with white feathers, and its creft, which it can at pleafure raife to a fingers breadth high: and the *parus fylvaticus*, or *wood titmoufe*, of Gefner and Aldrovand, which is very fmall, and is diftinguifhed from all others by a red fpot on its head. *Aldrovand*. de Avib.

The *titmoufe*, in the Linnæan fyftem of zoology, makes a diftinct genus of birds, of the order of the pafferes; the diftinguifhing characters of which are thefe: The extremity of the tongue is truncated, or as it were cut off, and terminated by four briftles, and the beak is pointed. *Linnæi* Syftema Naturæ, p 49.

The general characters of the *parus* kind, according to Mr. Ray, are, that they are all very fmall, and are fond of climbing about trees, where they feed on the fmall infects they find in their bark; tho' fome of them will alfo eat feeds. They are always reftlefs; their beaks are fhort, and their tails long; they make a confiderably loud noife, fome of them finging very agreeably; and all lay a great number of eggs. *Ray*'s Ornithology, p. 174.

PARVUS *nafi mufculus*, in anatomy, a name given by Cafferius, and fome others, to a fmall mufcle of the nofe, called by Albinus *compreffor naris*; by Winflow, *tranfverfalis*, or *inferior nafi*; and by Cowper, *elevator alæ nafi*.

Parvus *et tenuis palpebræ*, in anatomy, a name given by Fallopius to one of the mufcles of the face, called by Cowper and Douglafs, *aperiens palpebram rectus*; and by Albinus, the *levator palpebræ fuperioris*. See Aperiens, *Cycl.* and *Suppl.*

PARYPATE, in the antient mufic, was the name of that note or chord of a tetrachord which lay next to the hypate. As the hypate was the *principalis*, the firft or principal found, according to Martianus Capello's tranflation; fo the *parypate* was, according to him, the *fub principalis*. See the article Tetrachord.

The name *parypate* was given to this fecond note when a tetrachord was confidered feparately from others; but when combined, this chord fometimes took the name *trite*. See the articles Diagram and Trite.

Parypate *hypaton*, in the antient Greek fcale of mufic, was the fecond note of the hypaton tetrachord, and anfwers to C-fa-ut of Guido's fcale. *Wallis*, Append. ad Ptolem. Harm. p. 157. See Diagram and Parypate.

Parypate *mefon*, in the Greek mufic, was the fecond note of the *mefon* tetrachord, and anfwers to F-fa-ut of the Guidonian fcale *Wallis*, Append. Ptolem. Harm. p. 157. See Diagram.

PAS *de fouris*, in the military art, the fame with *liziere*. See the article Liziere, *Cycl.*

PASHA, an office of dignity under the Grand Seignior, otherwife called *bafhaw*. See Bashaw, *Cycl.*

All Egypt is, on the part of the Grand Seignior, governed by a *pafha*, who has in reality but little power; but feems principally to be meant for the means of communicating to his divan of beys, and to the divans of the feveral military ogiacs, that is, their bodies, the orders of the Grand Seignior, and to fee that they be executed by the proper officers.

If he farms the country of the Grand Seignior, the fines that are paid when any life drops upon the lands belong to him; for originally all the lands of Egypt belonged to the Grand Seignior; and the porte ftill looks on them as its own: but the Grand Seignior's power being now loft, they all go to the next heir; who muft, however, be invefted by the *pafha*, and is glad to compound for a fmall fum.

The nature of the *pafha*'s office requires him to be ever attempting means to cut off fuch as are too afpiring, or engaged in defigns that may be any way prejudicial to the porte. This often occafions his own depofition; but he is in no care about that, as his perfon is always facred; and his lofing this poft is only a ftep to higher preferment. *Pocock*'s Egypt, Vol. 1. p. 162.

PASHAUNA *beady*, in natural hiftory, a name given by the people of the Eaft Indies to a kind of fibrofe talc, found in the fides of the mountains, and ufed in medicine with them. They calcine it, and then powder and boil it in milk, and give half a dram for a dofe mixed in milk, for the gravel and ftone.

PASS (*Cycl.*)—Pass, among miners, a frame of boards confifting of two or three bottom boards and two fide ones, fet flope-wife; thro' which the ore flides down into the coffer of the ftamping mill.

PASQUE-*flower*, in botany. See Pulsatilla.

PASSACAGLIO, in the Italian mufic, is properly no more than a chacone. See Chacone.

The only difference then, is, that the movement of the *paffacaglio* is fomewhat graver, the tune fofter, and the expreffion lefs lively: they are for the moft part in the minor modes, or flat keys.

PASSADE, (*Cycl.*) in the manege. This cannot be performed without changing the hand, or turning and making a demitour at each of the extremities of the ground. Hence it is, that there are feveral forts of *paffades*, according to the different ways of turning, in order to part or put again, and return upon the fame pifte, or tread; which we call clofing the *paffade*. See Close and Serrer.

A paffade of five times, or a demivolt of five times, is a demitour made at the end of the ftraight line, one hip in, in five times of a gallop upon the haunches; and at the fifth time ought to have clofed the demivolt, and to prefent upon the *paffade*-line ftraight and ready to return. The demivolts of five times or periods, are the moft common airs of changing the hand or turning, that are now practifed.

Furious paffades, thofe performed upon a full career, being moftly ufed in duels. To make thefe *paffades*, you put your horfe ftraight forwards, and towards the extremity of the line make a half ftop, keeping the horfe ftraight without traverfing; then you make the demivolt at three times, in fuch a manner, that the third time the horfe prefents ftraight upon the *paffade*-line ready to fet out again upon a fhort gallop. You continue this fhort gallop half the length of the *paffade*, then you put on furioufly at full fpeed; and at the end of the *paffade* mark a half ftop, and then a demivolt of three times. This you continue to do as long as the horfe's wind and ftrength will hold. This *paffade* at full fpeed, fuppofes that the horfe has an excellent mouth, and requires ftrength and agility both in the horfe and horfeman. There are but few horfes that are capable of it.

Paffade of one time, is a demivolt or turn, made by the horfe, in one time, of his fhoulders and haunches. To make this *paffade*, which is the moft perfect of all, the horfe fhould ftand ftraight upon the *paffade*-line; and then putting forwards, he forms a half ftop, making falcades two or three times in fuch a manner, that he is ftill ftraight upon the line; and at the laft time he prepares to turn nimbly, and retain to fix his haunches as a center; fo that the demivolt is performed in only one time of the fhoulders: and tho' the haunches make likewife a time, they make it in the center, or upon the fame fpot, and *de ferme a ferme*, as the French call it.

Raifed or high paffades, are thofe in which the demivolts are made in corvets.

In all *paffades* the horfe fhould, in making the demivolt, gather and bring in his body, making his haunches accompany his fhoulders, without falling back, or not going forward enough each time: and he fhould go in a ftraight line, without traverfing or turning his croupe out of the line.

PASSAGE (*Cycl.*)—*Birds of* Passage, a name given to thofe birds which at certain ftated feafons of the year remove from certain countries, and at other ftated times return to them again, as our fwallows, and many other fpecies.

The places to which thefe birds retire on their leaving the countries in which they have made their abode, for a certain

feafon,

seafon, not having been ever perfectly known, fome have formed idle conjectures of their not going away, but remaining torpid in hollow trees, in caverns, and under waters; but thefe are too abfurd to gain credit with the thinking part of the world; and their whole journey feems directed by inftinct toward fuch parts of the world as will afford them food, when that whence they depart will no longer do fo: this want of food feems in all the fpecies to be the chief reafon of their departure; and the plenty of it in an after-feafon, that of their return from a place which then, perhaps, affords it no more.

The generality of birds that remain the winter with us, have ftrong bills, or are enabled to feed on what they can find at that feafon; thofe which leave us, have ufually very flender bills, and their food is the infects of the fly kind; which difappearing toward the approach of winter, compel them to feek them in regions where they may be found; and the length of the wings of the generality of thefe birds, enables them to prey flying, if there be food for them in their way, and to continue a long time on the wing without reft.

The various conjectures about the places to which they retire, are owing to want of ocular teftimony; but if we confider the vaft tracts of land yet unknown to us, we cannot doubt but there may be many places for them, in which we can have had no opportunities of finding them. But the moft probable conjecture feems, that the places to which they retire lie probably in the fame latitude in the fouthern hemifphere, as the places from whence they depart; where the feafons reverting, they may enjoy the like agreeable temperature of the air. And if thefe places are fuppofed to be divided from them by too large feas, why may not fome other parts of the fouthern hemifphere, which are lefs diftant, ferve their turn?

This, certainly, feems much more reafonable than that they fhould remain on our fide of the northern tropic, within a few degrees of which, at the winter folftice, it is fo cold as frequently to produce fnow; which, by difperfing fuch infects as birds that feed upon the wing fubfift on, muft make them perifh, were they not to remove to thofe warmer climates where they may ftill find food.

The fwallows, as they cannot fubfift fo long in cold feafons as fome other birds of *paffage*, which feed after the difappearance of flies in the air, on what infects they find in their receffes, vifit us later, and depart from us fooner, than the reft. The nightingales, and fome other birds, which leave us for the winter, are feen, fometimes, a month after the fwallows: and from the whole it feems natural to infer, that the fwallows pafs the tropic of Cancer, tho' it is not yet known to what place they at length retire.

The manner of the birds of *paffage*, journeying to their fouthern abode, may vary, according to the different ftructure of their bodies, and their power of fupporting themfelves in the air. Thofe birds with fhort wings, fuch as the redftart, blackcap, *&c.* tho' they are incapable of fuch long flights as the fwallow, or of flying with fo much celerity, yet may pafs to lefs diftant places, and by flower movements. Swallows and cuckows, may perform their paffage in a very fhort time; but there is for them no neceffity for fpeed, fince every day's paffage affords them an increafe of warmth, and a continuance of food.

Providence, which has guided the defencelefs animals in many other inftances to the fafeft methods of performing their neceffary works, may have inftructed many of thefe birds which have fhorter paffages to make, or places to ftop at by the way, to fly only in the night, that they may be fecure from the birds of prey: and Mr. Catefby gives a proof that fome fpecies do fo, from his own obfervation; for lying on the deck of a floop on the north fide of Cuba, himfelf and the whole company, heard fucceffively, for three nights, flights of rice birds, which are eafily diftinguifhed from all others birds by their notes, and which were paffing over their heads northerly; which is their direct way from Cuba, and the fouthern continent of America, from whence they got to Carolina, annually about the time that rice begins to ripen, and from whence they return fouthward again, when it is gathered, and they are become fat.

The fhort winged birds are fuppofed little qualified for long flights, particularly the quail, which is a bird never feen long together on the wing, or making any long flights: its not doing this frequently, is, however, no proof that it is not able to do it; nor does the ftructure of its body at all befpeak its inability: and Bellonius affirms, that he faw them in great flights paffing over, and repaffing, the Mediterranean fea, at the very feafons when they leave us, and return to us again. The fame inftinct that directs thefe birds to depart to diftant countries, doubtlefs, alfo directs them to the fhorteft way, and fends them to the narroweft cuts, not the wider feas to crofs.

Among the birds of *paffage*, we have fome alfo which come to us in the autumn, at the time when the fummer birds are leaving us; and go from us again in the fpring at the times when thefe return: thefe, however, are only four kinds; the fieldfare, the redwing, the woodcock, and the fnipe; and of thefe, the two laft often continue with us thro' the fummer, and breed; fo that the two firft feem the only kinds that certainly leave us at the approach of fpring, retiring to more northern parts of the continent, where they live the fummer and breed; and at the return of winter, are driven foutherly from thofe frigid climes, in fearch of food, which there the ice and fnow muft deprive them of. There are many others alfo, particularly of the duck or wading kind, that breed and make their fummer abode in the defolate fenny parts of our ifland; and when the feverity of our winters deprives them of their food, neceffity forces them to retire toward the fea in numerous flights; where they find water unfrozen, and where they remain till the return of fummer; but thefe cannot properly be called birds of *paffage*.

It feems pretty evident from the whole, that the fummer birds of *paffage* leave us only in fearch of a more warm climate, and a greater plenty of food; both which advantages they procure to themfelves by their alternate change of climate; but the migration of the winter birds of *paffage* is not fo eafily accounted for, fince there is no fuch apparent neceffity of their leaving us either on the fcore of food, or climate.

The place of the fummer retirement of thefe birds is Sweden, and fome other countries in that latitude; but as they would find thofe places too cold and deftitute of provifion, were they to haften immediately to them on their departure from us, they journey along gradually, and prolong their paffage thro' the more moderate countries of Germany and Poland; by which means they do not arrive at their northern habitations, where they are to pafs their fummer, and where they breed till the feverity of the cold is fo far abated as to render it pleafing to them, and there is proper food there for them: and when they revifit us the following winter, thier journey is performed in the fame leifurely manner.

Sweden, and the other countries whence they come to us, feem the proper home of thefe birds; fince there they were bred; and the journey they take to us being only for a warmer climate, and a plenty of food, it is no wonder that when thefe benefits are to be expected again in their native place, they return to it.

The principal food of thefe birds, while with us, is the fruit of the white thorn, or haws; which hang on our hedges, in winter, in prodigious plenty; but where they breed, and feem to live moft at eafe, as in Sweden, *&c.* there are no haws, nor indeed in many of the countries thro' which they journey in their way; fo that it is evident they change their food in their paffage. And upon the whole it appears, that Providence has created birds, *&c.* with conftitutions and inclinations adapted to their different degrees of heat and cold; which, to them, are moft agreeable, and to which they will travel from places which to other animals might feem more agreeable: by this means no part of the globe is without its inhabitants.

Befide the migratory birds, which live in different countries a whole winter, or a whole fummer, there are fome others which annually appear in particular places, at the time of the ripening of particular kinds of grain which their own country is deftitute of; and thefe depart after a fhort ftay, and are no more feen till that time the following year. Of this kind are the rice-bird, and bluewing of Carolina. Birds like men, purfue their fearches after food, or whatever elfe is neceffary and agreeable, thro' diftant climes; and when they difcover fome new grain, or pleafing food, they return and acquaint their community of the good fortune, and then joining in numerous flights, make annual excurfions to folace themfelves on this exotic food.

Since the difcovery of America, there have been introduced from Europe feveral forts of grain which were before unknown there, and which, not before fome length of time, were found out, and coveted by birds of this migratory kind. Of this fort there is a very beautiful fpecies, which has very lately made its firft appearance in Virginia: thefe arrive annually at the time that the wheat is ripe, or nearly fo; and conftantly fince they found it out, have appeared in great droves every year, at the feafon of its ripening; the inhabitants call them, for this reafon, *wheat-birds.* Phil. Tranf. Nº 483.

PASSAGE, in the manege. To *paffage* a horfe upon his own length. See LENGTH.

PASSAGIO, in the Italian mufic. See PASSAGE, *Cycl.*

PASSAGO, in the glafs trade, the inftrument with which the workman makes the bowl of the drinking glaffes, or other the like veffels. *Neri*'s Art of Glafs, p 247.

PASSARADO, in a fhip, is a rope whereby all the fheet-blocks of the main and fore fails are haled down; the clew of the main fail to the cubbridge-head of the main maft, and the clew of the fore fail to the cat-head. This is to be done when the fhip goes large; and they are alfo kept firm down, and hindered from flying up, by this *paffarado* rope.

PASSEPIED, in the French mufic, an air in all refpects like a minuet, except that it is more brifk and lively. See the article MINUET.

PASSER, the *fparrow*, in zoology, the name of a large genus of birds, the diftinguifhing characters of which are thefe: they feed on corn and worms; their beak is thick, fhort, and fomewhat bent; their colour commonly a dufky brown.

There

There are many known species of this bird. 1. The common house *sparrow* 2. The *passer stultus*, or foolish *sparrow*, which is of a yellowish brown, with dusky streaks. 3. The bastard *sparrow*, *passer congener*, of Aldrovand, which is of a reddish brown, and has no black spot under its throat. 4. The *passer tricolor*, or three coloured *sparrow*; this is variegated with an equal proportion of black, white, and yellow. 5. The *passer albicilla*, or white-tailed *sparrow*, distinguished by its greyish white tail. 6. The *passer Illyricus*, or Illyrian *sparrow*, which is larger than the common kind, and has a very white belly. 7. The *passer torquatus*, or ring *sparrow*, which is very small, and has a white ring about its eyes: the spot under the throat, which is black in the common *sparrow*, is yellow in this species. 8. The *passer Indicus caudatus porphyromelas*, or long tailed black and red Indian *sparrow*. 9. The *passer Indicus*, called *tijepiranga*. See TIJEPIRANGA. 10. The *passer Indicus macrouros rostro miniaceo*, or long-tailed Indian *sparrow*, with a red beak. 11. The *passer Indicus macrouros alius* of Aldrovand, or the other long-tailed Indian *sparrow*; a very beautiful bird, with a blue beak and a black head; the body being mostly of a fine scarlet. 12. The *passer Indicus brachyuros*, or short-tailed Indian *sparrow*, which is small, and all over of a bluish black. 13. The *passerculus brachyuros Europæanus*, or European small short-tailed *sparrow*: this is common in Italy, and is very small, and all over of a pale yellow. 14. *Passer erythromelas Indicus, sine uropygio*, the red and black Indian *sparrow*, with no tail. 15. *Passer Indicus cyanerythromelas, sine uropygio*; the blue, black and red Indian *sparrow*, without a tail. These are described by Marggrave; but he only saw the figures of them, so that the painter, not nature, perhaps, denied them tails. 16. The *passer montanus*, or mountain *sparrow*: this is common in Carinthia, and is variegated with a brownish red and black. 17. The *passer sylvestris*, or field *sparrow* of Aldrovand: this is of the size of the common *sparrow*, and is of a dusky rust-coloured brown, and has a broad streak running from the angle of its beak to its tail. And lastly, 18. The Brasilian *sparrow*, called *Guiranheemgatu*. See GUIRANHEEMGATU. *Ray*'s Ornithology, p. 184. *Aldrovand* de Avibus, l. 15 c. 33. *Ray*'s Ornithology, p. 182, to 186. *Aldrovand* Hist. l. 15. c. 16.

In the Linnæan system of zoology, the *passer* is one of the orders of the bird kind; the distinguishing mark of which is, that the beak is of a conic form, and tapers to a point. *Linnæi* System. Natur. p. 48. See Tab. of Birds, N°. 29 and 38.

PASSER, in the history of fishes, the name of the common plaise, a flat fish, of a dusky olive-colour, spotted with red on the back, and white on the belly, called in Latin also, *quadratulus* and *platessa*. *Willughby*'s Hist. Pisc. p. 96.

PASSER-*aquaticus*, the water *sparrow*, the name of a bird described by Nieremberg, which he says the Indians call *acototlequichitl*. It sings all day long without ceasing, but with no very pleasing note: it is, however, a well tasted bird; it lives among sedge and bushes, and is of the size and shape of a swallow, but has a black bill and yellow legs; its breast and belly are white, and its back is of a brownish yellow, variegated with spots of black and white. This bird much resembles our reed *sparrow*. *Ray*'s Ornithol. p. 300.

PASSER-*arundinaceus*, the reed *sparrow*, a bird of which there are two species, a greater and a smaller, both living among reeds and in watery places, and both singing very sweetly: the greater is known among authors by the name of *junco*, and the lesser by that of *cannevarola*. *Ray*'s Ornithology, p. 99. See JUNCO and CANNEVAROLA.

PASSER *arundinaceus torquatus*, the ringed reed *sparrow*, the name of a small bird, scarce exceeding the linnet in size, found among reeds, and always building its nest among them. Its head is black; its neck has a very beautiful ring of white, reaching to the angle of the beak on each side; its throat is black, and its breast and belly white; its back and wings are of a brownish black, and its rump bluish or greyish, with an admixture of brown. In the female the ring scarce appears, and the colours on the throat are reddish, brown, black, and grey. *Ray*'s Ornithol. p 197.

PASSER *asper*, in ichthyology, the rough or scaly *plaise*, called in English the *dab*; a flat fish, something thicker than the common *plaise*, and of the same general size, covered with considerably large scales, rough at their extremities, and edged as it were with teeth: the eyes are on the left side, and are placed very close together: its back is of a reddish grey, spotted with yellow, and the mouth moderately large. It is caught in the Mediterranean and English seas. *Rondelet*. de Pisc. p. 352.

PASSER *Britannicus*, in ichthyology, a name given by Charleton to the soal fish, and by some others to the turbut. See the articles HIPPOGLOSSUS, and PLEURONECTES.

PASSER *canarius*, and *canariensis*, in zoology, the common name for what we call simply in English, the *canary bird*.

The *canary bird* may be bred with us, and if treated with proper care, they will become as vigorous and healthful as in the country from whence they have their name. The cages in which these birds are kept are to be made of either walnut-tree or oak, with bars of wire, because these being woods of strength, do not require to be used in large pieces; and the more freedom they have of looking about them, the less will they be startled at people going up to them. The common shape of cages, which is cylindric, is very improper for these birds; for this allows little room to walk, and without that the birds usually become melancholy. The most proper of all shapes is the high and long, but narrow.

If these birds eat too much they grow over fat, lose their shape, and their singing is spoiled; or at least they become so idle, that they will scarce ever sing In this case their victuals is to be given them in a much smaller quantity, and they will by this means be recovered, by degrees, to all their beauty, and will sing as at first.

At the time that they are about to build their nests, there must be put into their cages some hay, dried thoroughly in the sun: with this must be mixed some moss dried in the same manner, and some stag's hair; and great care is to be taken of breeding the young, in the article of food. As soon as the young birds are eight days, or somewhat more old, and are able to eat and pick up food of themselves, they are to be taken out of the cage in which they were hatched, and each put separately into another cage, and hung up in a room where it may never have an opportunity of hearing the voice of any other bird. After they have been kept thus about eight days, they are to be excited to sing by a bird pipe; but this is not to be blowed too much, or in too shrill a manner, lest they sing themselves to death.

For the first fifteen days the cages are to be covered with a black cloth, and for the fifteen days following with a green one. Five lessons in a day from the pipe are sufficient for these young creatures, and they must not be disturbed with several sounds at the same time, lest they confound and puzzle them: two lessons should be given them early in the morning, one about the middle of the day, and two more at night. *Hervieux*, des Serins de Canarie.

The genius and temper of the several birds of this kind are very different. The males are almost always melancholy, and will not sing unless they are excited to it by hearing others continually singing about them. The male bird of this kind will often murder the female put to him for breeding; and when there are several females together with the males, they will often do the same to one another with jealousy. It is therefore not easy to manage the article of their breeding well in this particular, unless in this manner: let two female birds be put into one cage, and when they have lived together some time, they will have contracted a sort of love for one another, which will not easily be dissolved. Put a male bird into the cage with these two, and every thing will go well; their friendship will keep them from quarrelling about his favours, and from danger of his mischievous disposition; for if he attacks one of them, in order to kill her, the other will immediately take her part, and after a few of these battles, the male will find that they are together an overmatch for him at fighting, and will then distribute his favours to them, and there will not fail of being a young breed or two, which are to be taken away from their parents, and educated as before directed.

Some males watch the time of the female's laying, and devour the eggs as fast as she deposits them; and others take the young ones in their beaks, as soon as hatched, and crush them to death against the sides of the cage, or some other way destroy them. When a male has been known once to have been guilty of this, he is to be shut up in a small cage, in the middle of the large one in which the female is breeding her young, and thus he will often comfort her with singing all day long, while she sits upon the eggs or takes care of the young ones; and when the time of taking away, to put them into separate cages, is come, the male is to be let out, and he will always after this live in friendship with the female.

If the male become sick during the time of the female's sitting or bringing up her young, he must be removed immediately, and only brought to the side of her cage at certain times, that she may see him, till he is perfectly cured; and then he is to be shut up again in his cage in the middle.

PASSER *faber*, in zoology, a name given by Nieremberg to a bird, the genus of which we are not very certain about; it being also called *turdus chiappæ*. It is remarkable for perforating the bark of the pines, and lodging its acorns there, which it afterwards eats occasionally. *Ray*'s Ornithol. p. 303.

PASSER *fluviatilis*, in ichthyology, the name of the common flounder, distinguished from other fish of that genus by the smallness and close situation of its scales, which are such, that which ever way it is rubbed, the hand perceives no roughness; and that at the insertion of the fins there is a series of short prickles bent backwards, which are easily perceived by the touch, or by the eye on a close view. *Willughby*'s Hist. Pisc. p. 98.

PASSER *mosquitus*, a name by which some have called the *guainumbi*, or *humming bird*, the smallest of all birds. Ornithol. See GUAINUMBI.

PASSER *niger*, in ichthyology, a name given by Artedi from Charleton, to the common flounder The *flesus* and *fletelatus* of authors, and the *plaad* of the Germans.

PASSER *solitarius*, the solitary *sparrow*, a name given by authors to a bird properly of the *merula* or *black-bird* kind, and of the same size and shape with the common black bird, and not very different from it in colour.

Its head and neck are large and thick; the upper part of its head of a dusky grey, and its back of a deep bluish black, but with a little whiteness at the ends of the feathers; its tail is of a brownish black, and its wings are variegated with brown, black, and a little white; its breast, throat, and belly are beautifully variegated with black, white, and grey; its beak is long and strong, and its legs of a blackish brown, and very short: it feeds on berries and other vegetables. The male is more beautiful than the female, and has a cast of purple in the blue of his back. It sings very sweetly, and loves the tops of old buildings. It builds in the same places, and is the bird mentioned in the book of psalms. It is much esteemed for its singing, and will learn to imitate the human voice, and talk as the starling, parrot, *&c.* *Ray's* Ornithol. p. 140.

PASSER *stultus*, in ichthyology, a name given by Nieremberg to a species of the *larus*, or, *seagull*, so tame and foolish that it will stand still for any to lay his hand upon it. *Nieremberg.*

PASSER *troglodites*, in zoology, the name by which authors call the small bird known in English by the name of the *wren*. Some have very erroneously called this the *regulus*, which is the name of a perfectly different bird. See REGULUS.

Our *wren*, tho' a very small bird, is three times as large as the regulus, and of a brownish colour, with transverse streaks of black on its back, wings, and tail; a yellowish throat and a white breast, with some transverse streaks of black also on its lower part, and its belly of a reddish hue; and singing very sweetly and melodiously, much finer and louder in its voice than could be expected from so small a bird. *Ray's* Ornithol. p. 164.

PASSERINE, in botany, a name by which Ruellius and some other authors have called the common *alsine* or *chickweed*.

PASSION *(Cycl.)*—PASSION-*flower*, *granadilla*, in botany. See the article GRANADILLA.

The different species of this plant cultivated in the gardens of the curious are very numerous, and most of them very beautiful.

The three more common kinds, which are what we see in most gardens, are very hardy, and bear all the severities of our climates as well as if natives of it; for, tho' the tender branches, and sometimes even the main stem, are destroyed in our severer winters, yet it always shoots up again from the root.

These are propagated by laying down their branches, which in one year's time will take good roots, and may be removed to the places where they are designed to remain. The best season for transplanting them is the latter end of March or the beginning of April: they should be planted against a wall, or other building, which faces the south east or south west; or else mixed among the flowering shrubs in quarters of large gardens: in this case they must be trained up to poles fixed in the earth for that purpose, and thus will flower well, and appear extremely beautiful. The best season for pruning them is in the spring, and it is a good custom to lay a foot thickness of mulch at the roots, which will effectually preserve them from the severity of the winter, and is necessary when they are planted in open quarters, and have not the defence of a wall behind them. The manner of pruning is to cut entirely off all the weak shoots, and shorten the strong ones to about three feet in length. When they are planted against high buildings, they may be left something longer than this, to fill up the wall; but this is not very necessary, for they are very quick growing plants, and in open quarters they should be always pruned much shorter than this, to bring their flowers nearer the ground.

The most common kind with us never bearing fruit in this climate, can never be propagated any way but this; but there is another species which has by some been mistaken for the same, tho' really very different, which constantly bears fruit with us; and the plants of this may be raised from seeds in the common way. *Miller's* Gard. Dict.

Hysteric PASSION. See HYSTERICS.

PASSIONATO, in the Italian music, intimates that the part to which it is annexed ought to be played passionately, or in a moving and affecting manner.

PASSULATUM, a name given by the antients to medicine composed of the pulp of raisins passed through a sieve, sometimes alone, sometimes with other ingredients.

PASSUM, a name given by the antients to a kind of wine made of grapes, which had been suffered to remain on the vines till much withered and dried up: it is hence used also by some of the moderns to express raisin wine.

PASTE *(Cycl.)*—PASTES, in the glass trade, a sort of compositions of the glass kind, made from calcined crystal, lead, and metallic preparations, to imitate the several natural gems These are no way inferior to the native stones, when carefully made and well polished, in brightness or transparence, but want their hardness.

The general rules to be observed in the making them are these: 1. That all the vessels in which they are made are firmly luted, and the lute left to dry before they are put into the fire. 2. That such vessels are chosen for the work as will bear the fire well. 3. That the powders be prepared on a porphyry stone, not in a metal mortar, which would communicate a tinge to them. 4. That the just proportion in the quantities of the several ingredients be nicely observed. 5. That the materials be all well mixed; and if not sufficiently baked the first time, to be committed to the fire again, without breaking the pot; for if this be not observed, they will be full of blisters and air-bladders. 6. That a small vacuity be always left at the top of the pot, to give room to the swelling of the ingredients. *Neri's* Art of Glass, p. 127.

To make a *paste* of extreme hardness, and capable of all the colours of the gems, with great lustre and beauty, take of prepared crystal ten pounds; salt of polverine, six pounds; sulphur of lead, two pounds; mix all these well together into a fine powder, make the whole, with common water, into a hard *paste*, and make of this *paste* small cakes, of about three ounces weight each, with a hole in them made in their middle; dry these in the sun, and afterwards calcine them in the straightest part of a potter's furnace; after this powder them, and levigate them to a perfect fineness on a porphyry, and set this powder in pots in a glass-furnace to purify for three days; then cast the whole into water, and afterwards return it into the furnace, where let it stand fifteen days; in which time all foulness and blisters will disappear, and the *paste* will greatly resemble the natural jewels. To give this the colour of the emerald, add to it brass thrice calcined: for a sea-green, brass simply calcined to a redness: for a sapphire, add zaffer, with manganese: and for a topaz, manganese and tartar. All the gems are thus imitated in this, by the same way of working as the making the coloured glasses; and this is so hard, that they very much approach to the natural gems. *Neri's* Art of Glass, p. 142.

The colours in all the counterfeit gems made of the several *pastes*, may be made deeper or lighter, according to the works for which the stones are designed; and it is a necessary general rule, that small stones for rings, *&c.* require a deeper colour, and large ones a paler. Besides the colours made from manganese, verdigrease, and zaffer, which are the ingredients commonly used, there are other very fine ones, which care and skill may prepare: very fine red may be made from gold, and one not much inferior to that from iron; a very fine green from brass or copper, and a sky colour from silver; and a much finer one from the common small garnets of Bohemia, which are of little value. The gems also afford glorious colours like their own. *Neri's* Art of Glass, p. 136.

The fine blue from silver is, probably, only from the small quantity of copper used in the alloy.

A very singular and excellent way of making the *paste* to imitate the coloured gems, is this: take a quantity of saccharum saturni, or sugar of lead, made with vinegar in the common way; set it in sand, in a glass body well luted from the neck downwards; leave the mouth of the glass open, and continue the fire twenty-four hours; then take out the salt, and if it be not red, but yellowish, powder it fine and return it into the vessel, and keep it in the sand-heat twenty-four hours more, till it becomes as red as cinnabar. The fire must not be made so strong as to melt it, for then all the process is spoiled. Pour distilled vinegar on this calcined salt, and separate the solution from the dregs; let the decanted liquor stand six days in an earthen vessel, to give time for the finer sediment to subside; filter this liquor, and evaporate it in a glass body, and there will remain a most pure salt of lead; dry this well, then dissolve it in fair water; let the solution stand six days in a glazed pan; let it subside, then filtre the clear solution and evaporate it to a yet more pure white and sweet salt; repeat this operation three times; put the now perfectly pure salt into a glass vessel, set it in a sand heat for several days, and it will be calcined to a fine impalpable powder, of a lively red. This is called the sulphur of lead. *Neri's* Art of Glass, p. 140.

Take all the ingredients as in the common composition of the *pastes* of the several colours, only instead of red lead use this powder, and the produce will well reward the trouble of the operation, as experience has often proved.

PASTE *for angling*. There are many receipts which particular people are fond of, but the following composition seems one of the best: take equal quantities of fresh butter and sheep's suet, about half as much of good old cheese, and the crumb of an old stale white loaf, as much as will, when they are all beaten in a mortar, make the whole into a *paste*; add a little wool or tow; that it may keep the better on the hook. The place should be baited with blood and grains over night, and in the morning this *paste* will be found an excellent bait.

PASTES *for birds*, a general sort of food made by the people who breed up birds from the nest, and suiting almost all kinds.

It is made in the following manner: grind half a peck of large beans, well dried, to a very fine meal; take of this meal two pounds, of the best sweet almonds blanched one pound; these must be well beat together in a mortar, till perfectly mixed; then to a quarter of a pound of fresh butter, in a saucepan well tinned, add the *paste*, and mix all well together over a charcoal fire, stirring it as it boils with a wooden spoon; then add the yolks of four eggs, and a little saffron, and finally a small quantity of the finest virgin honey. When these are well incorporated, and are tolerably thin and without lumps,

the whole is to be poured into a colander made with fuch holes as will let the compofition pafs thro': if any of it is fo ftiff that it will not go thro', it muft be beat again in a mortar, and by that means made fit to pafs the holes and mix with the reft. When the whole is done, it is to be put into a pot, and a little clarified honey being melted and poured on it, it will keep very well for fix months or longer.

PASTELL, (*Cycl.*) a name given by fome to the *ifatis*, or *woad*. See the articles WOAD and ISATIS.

PASTERN (*Cycl.*)—PASTERN-*joint*, in the manege, called alfo the *fetlock* of a horfe's leg, is the joint above the *paftern*, which ferves for a fecond knee in each fore leg, and a fecond ham or hough, to each hinder leg. The *fetlock* is apt to be cut by the fide of one of the fhoes; and when that happens, we fay, a horfe cuts or interferes. Sprains happen upon the *fetlock*, and cratches above it behind.

PASTINACHA, *parfnep*, in botany, the name of a genus of plants, the characters of which are thefe: The flowers are difpofed in umbells, and are of the rofaceous kind, being compofed of feveral petals arranged in a circular order upon a cup; which finally becomes a fruit compofed of two large oval, flattifh, marginated feeds; which frequently depofit their covering. To this it may be added, that the leaves are large and alated.

The fpecies of *parfnep*, enumerated by Mr. Tournefort, are thefe: 1. The great broad-leaved garden *parfnep*. 2. The broad-leaved wild *parfnep*. 3. The largeft wild *parfnep*, called by authors *panax cofterium*s. *Tourn.* Inft. p. 319. See the article PARSNEP.

PASTINACHA *marina*, in zoology, the name of a fifh, called in Englifh the *poifon fifh*, or *fierce flaw*. It is one of the flat cartilaginous fifhes, and fomething like the common fkate. It is very broad, and is thick in the middle, and thin at the edges; fmooth fkined, and yellowifh on the back, and of a filvery white on the belly; but the ridge, or middle part of the back and the tail, are blue. It has only two fmall fins, which furround the anus; the whole body is, however, thinned off at the edges into a fort of fins. Its fnout is very fharp; its eyes large and protuberant; its mouth is fmall, and without teeth; but its jaws are rough and rugged. Its noftrils are very large, and placed near the mouth, and of a lunulated figure. Its tail, in which all its poifon is lodged, is long, fmooth, and round, with a thorn, or dart, of a finger's length, toothed on each fide like a faw, with the teeth ftanding upwards, or toward the head. This is placed at the diftance of about one third of the length of the tail; and that from this place grows very flender, and ends in a very flender point. It grows, fometimes, to ten pound weight; and when the tail is cut off, is commonly fold in the markets in Italy and elfewhere. See Tab. of Fifhes, Nº 6.

Authors give us many remarkable accounts of the poifon of this fifh, which it communicates to animals by the ftroke of its tail. They mention alfo two kinds of it; that is, befide the ordinary fpecies which is fmooth, another called the *paftinacha marina afpera*, which is rough and prickly. *Jonfon*, de Pifc. p. 19.

PASTOPHORI, Παστοφοροι, among the antients, priefts whofe bufinefs it was, at folemn feftivals, to carry the fhrine of the deity, when they were to pray to him for rain, fair weather, or the like. *Pitifc.* in voc.

PASTOPHORIA, in antiquity, the apartments near the temples where the *paftophori* were lodged.

Clemens Alexandrinus [a], defcribing the temples of the Egyptians, fays, that after having paffed through magnificent courts, you are conducted to a temple, which is at the farther end of thefe courts, and then a *paftophorus* gravely lifts up the veil which is at the door, to fhew you the deity within; which is nothing but a dog or a cat, or fome other animal. Thefe *paftophori* alfo fupported the fhrine, or niche of thefe ridiculous divinities, when they were carried in proceffion. Apuleius [b] fpeaks of the *paftophori* that carried the Syrian goddefs. —[[a] *Clem. Alex.* l. 3. c. 2. Pædag. [b] *Apul.* Afin. Aur. l. 10. c. 11. *Calm.* Dict. Bibl. in voc. *paftophoria*.]

In the temple of Jerufalem there were two courts furrounded with galleries, and all round about were feveral lodging rooms for the priefts, and to lay up wood, wine, oil, falt, meal, fpices, incenfe, veftments, valuable veffels, and provifions neceffary for the facrifices and lamps; as alfo for the fupport and maintenance of priefts. Vid. 1 *Chron.* ix. 26, 33. *Ezek.* xl. 17, & 18. 1 *Chron.* xxvi. 16. *Calmet.* Dict. Bibl.

PASTOR (*Cycl.*)—PASTOR *pifcis*, in zoology, the name of a fifh of the mullet kind, caught in the American feas and rivers, and efteemed a very well tafted one.

It is of the ufual fize of our river-trout, and not unlike that fifh in fhape. Its fcales are large and of a filvery white; and are ranged in the fame order that thofe of the perch are, with greyifh lines between the feveral arrangements. It has feven fins all very large, efpecially that on the back; and its tail is remarkably forked. All the fins are white, and the coverings of the gills are fcaly, not bony, as in moft other fifhes; whence it has been fuppofed to have no gills. *Marggrave's* Hift. of Brafil.

PASTORAL, in the Italian mufic, an air compofed after a very fweet, eafy, gentle manner, in imitation of the airs fhepherds are fuppofed to play.

PASTURE (*Cycl.*) — *Pafture-land* is of fuch advantage to hufbandry, that many prefer it even to corn-land, becaufe of the fmall hazard and labour that attends it, and as it lays the foundation for moft of the profit that is expected from the arable-land; becaufe of the manure the cattle afford which are fed upon it. Where dung is not to be bought, as is often the cafe in places diftant from large towns, the farmer is forced to proportion his arable to his *pafture*-land, in fuch manner, that the cattle fed on the latter may be fufficient for a fupply of dung, fo neceffary for producing the fruits of the former.

Pafture-lands are of three kinds: 1. The uplands: thefe lie fo high as not to be overflowed by rivers, or land-floods. 2. Thofe low lands which lie near rivers and fens. And 3. Thofe that lie near the fea. *Mortimer's* Hufbandry, p. 15. See the articles UP-LAND, MARSH-LAND, &c.

Pafture-land requires the refrefhment of dung, as well as the arable or corn-land; but there is to be a difference made in the laying it on and fpreading it. A harrow performs the office of fpreading the dung on ploughed lands; but the beft contrivance for paftures, is, to lay the dung in fmall heaps, and draw over it a gate ftuck full of bufhes. All dung that is laid on *pafture*-land, muft be laid on in winter, that the rains may wafh its fatnefs into the ground before the fun fcorches it, or evaporates its goodnefs. Fine mould mixed with the dung, and fpread with it over the land, is very good for *paftures*; for it is wafhed down to the very roots of the grafs, and gives them a new and fine foil juft in thofe places where it is moft wanted.

The beft manure for *pafture*-land, is, the rotten bottoms of old hay-ftacks; for thefe moulder away into a very rich foil, and are always full of vaft quantities of feed, fallen at times from the hay, which all grow when fpread on the ground: and thus new nourifhment, and a new fet of plants are given at once to the exhaufted ground. But as particularly ufeful as this is for *pafture*-ground, it is as improper for corn-land, and fhould by no means ever be fuffered to mix with the manure for thofe grounds; as it will then raife grafs and other plants, which tho' of ufe in the *pafture*, are weeds among the corn. *Mortimer's* Hufbandry.

Artificial PASTURE. As to the difference of the quantity of *artificial pafture* made by dung without tillage, and that made by tillage without dung, the latter is many times greater, as has been proved by repeated experiments on unploughed land, whereon a dunghill had lain for two or three years, and being then removed, was planted with turneps; and at the fame time a tilled land contiguous thereto, was drilled with turneps, and horfe-hoed. The other being hand-hoed, feemed to profper beft at firft, but, in fine, it did not amount to a fifth part of the tilled and horfe-hoed land, either in bignefs or in crops; fo that the benefit of the dung and hand-hoe was inconfiderable in comparifon of the plough and horfe-hoe. The little quantity of *artificial pafture* raifed to the other, was only near the furface, and did not reach deep enough to maintain the turneps till they arrived at the fifth part of the growth of thofe which were placed in an *artificial pafture*, that reached to the bottom of the common bed of mould.

Another proof of the fame kind, is, that feveral lands of turneps drilled on the level, and at three foot rows, ploughed, and doubly dunged, and alfo horfe-hoed, did not produce nearly fo good a crop of turneps as fix foot ridges adjoining horfe hoed, tho' no dung had been laid on them of many years.

In this cafe, there was no other difference but that the three foot rows did not admit the hoe-plough to raife half the *artificial pafture* as the fix foot rows did. The dung ploughed into the narrow intervals before drilling, could operate no farther with any great effect, than the hoe-plough could turn it up and help its pulverization. Upon the whole, dung without tillage can do very little; with fome tillage it does fomething, with much tillage it pulverifes the foil in much lefs time than tillage alone can do it in; but tillage alone, in more time, can pulverife it as well. Much of the dung commonly ufed on fields is to be faved on this principle; a little more hoeing between the rows of the plants fupplies the place of it, and is done at much lefs expence than that of fo much manure, of the hands neceffary to lay it on, and the carriage. *Tull's* Horfe-hoeing Hufbandry.

PASTURE *of plants*. Plants themfelves make the *pafture* for animals; but before they are in a condition to give nourifhment to them, they muft themfelves receive that nourifhment from the earth. This *pafture* of plants feems lodged out of the way of our fenfes; and the ignorance in regard to this, feems the reafon why hufbandry, tho' one of the moft ufeful and neceffary arts to man, has been treated in a very fuperficial manner by the authors who have written of it. The food, or matter of increafe of plants, is earth; and, therefore, that may be properly enough called *their pafture*.

This *pafture* is the inner, or internal fuperficies of the earth; or, which is the fame thing, it is the fuperficies of the pores, cavities

cavities and interſtices of the divided parts of the earth: theſe are of two kinds; the one natural, the other artificial. By nature the whole earth, or ſoil, is compoſed of parts; and if theſe had been in every place abſolutely joined, it would have been without interſtices or pores, and would have had no internal ſuperficies, or *paſture* for plants; but ſince it is not ſo denſe, there muſt be theſe interſtices at all thoſe places where the parts remain ſeparate or divided. Theſe interſtices, by their number and largeneſs, determine the ſpecific gravity or true quantity of every ſoil; the larger they are, the lighter is the ſoil, and the inner ſuperficies anſwers accordingly. The mouths of the veſſels deſtined to take in the food or nouriſhment of the plant, are all ſituated on the convex ſurface of the roots; and theſe take their pabulum or food, which is extremely ſmall particles of earth, blended with a due proportion of water, from the ſuperficies of the pores or cavities within which the roots are included.

It is certain that the earth is not diveſted of this pabulum by any other means than by the roots of plants, or by actual fire; for where no vegetables are ſuffered to be, the ground will always grow the richer.

Plough it or harrow it as oft as you pleaſe; let it be expoſed to the ſun in horſe-paths all the ſummer, and to the froſts all the winter; let it be covered by water at the bottom of ponds and ditches, or grind it to fine powder; the longer it is expoſed or treated by any or all of theſe methods, or any other poſſible way, except actual fire be uſed, the more fertile it will be. Thoſe particles which are the pabulum of plants are ſo extremely minute and light, as not to be ſingly attracted to the earth, if ſeparated from thoſe parts to which they adhere, or with which they are in contact. They adhere in the earth like duſt to the ſurface of a ſmooth clay, which, tho' you turn it up and down, ſtill remains in its place, as theſe particles do to thoſe parts of the earth, till removed by ſome external agent. The proper agent for this purpoſe is the root of a plant, but this cannot act upon them unleſs they are firſt moiſtened by water; which helps to looſen them, and goes with them into the mouths of the veſſels in the root. It is neceſſary alſo that the nitre of the air come in contact with the matter of this pabulum, in order to relax and render it fit to be ſeparated and imbibed by the roots of thoſe plants which are in the way of it.

As to the ſize of the particles of this pabulum of plants, it is not unlikely that the roots may take in no groſſer ones than thoſe on which the colours of bodies depend; but to diſcover the magnitude of theſe corpuſcles, Sir Iſaac Newton thinks will require a microſcope that will repreſent things five or ſix hundred times bigger than they appear to the eye at a foot diſtance, and that with ſufficient diſtinctneſs.

We are well aſſured, that the fine particles of the food of plants, after they have been received into the bodies of plants, do perſpire thro' their pores in a large quantity, and fly off into the air: this affords us a proof, that they are not to be ſeparated from the parts of the earth with which they are in contact, otherwiſe than by means of plants; for if they could, then all our ſtirring and digging the earth would make it the poorer, by giving them occaſion to evaporate; the contrary of which is found by experience.

Water alone affords in appearance nouriſhment to plants, ſince they will grow in water; but this water is allowed never to be free from earth, and that makes it ſo very nutritive to plants, even when freſh rained down. This is the earthy matter, which is properly the pabulum or food of plants, which is continually in great abundance evaporated from plants and trees into the air, and in a manner fills the whole atmoſphere about them; this is met by and embodied in the watry vapours in their aſcent, and again brought down to the earth in ſhowers of rain with them.

Hence it is no wonder, that rain-water proves ſo very nutritive to plants, ſince it contains the very matter of their food, ready ſeparated from the reſt of the earth, and mixed in that very vehicle with, and by means of which alone it can be received into the bodies of plants, through the mouths of the veſſels of their roots.

The pores, cavities, and interſtices of the earth being of two ſorts, *viz.* natural and artificial, the one affords the natural, the other the artificial *paſture* for plants; all depending on the different nature of the internal ſuperficies of the earth. *Tull's* Horſehoeing Huſbandry. See the article *internal* SUPERFICIES.

PATA, in zoology, the name by which the Portugueze in Braſil call a large and very beautiful American duck, known among others by its Braſilian name, *ipecati-apoa*. It is nearly of the ſize of the gooſe. See IPECATI-*apoa*.

PATÆCI, in mythology, images of certain gods carried by the Phœnicians on the prows of their gallies. *Hoffm.* Lex.

Herodotus, lib. 4. calls them Παταικοὶ. The word is Phœnician, and derived from *pethica*, i.e *titulus*. See *Bochart's Chanaan*, l. 2. c. 3. but Scaliger does not agree. Morin derives it from Πίθηκος, monkey, this animal having been an object of worſhip among the Ægyptians, and hence might have been honoured by their neighbours. Vid. *infra*.

Mr. Elſner [a] has lately obſerved, that Herodotus does not call the *patæci*, gods; but that they obtained this dignity from the liberality of Heſychius and Suidas, and other antient lexicographers, who place them at the ſtem of ſhips, whereas Herodotus placed them at the prow. Scaliger, Bochart, and Selden [b], have taken ſome pains about this ſubject. [[a] In Mem. de l'Acad. de Berlin, Tom. 2. p. 379. [b] *Gale*, Not. ad Herodot.]

Mr. Morin has alſo given us a learned diſſertation on this head, in the Memoires de l'Acad. des Inſcript. and Belles Lettres, Tom 1. but Mr. Elſner thinks it defective in point of evidence. He alſo rejects the etymologies of Bochart, Scaliger, and Morin; he himſelf thinks that the *patæci* were the ſame as the Dioſcuri [c], not Caſtor and Pollux, invented by the Greeks, but the Dioſcuri of oriental and higher antiquity. [[c] Children of Jupiter, Διοσκουροι, or Διοσκοροι; for we may meet with both. See *Hemſterhuys* in Lucian. Dialog. Deor]

Herodotus ſays, the *patæci* reſembled the little ſtatues of Vulcan. Pauſanias tells us they were about a foot high. They were eſteemed the protectors of navigation. See *Eſner*, loc. cit.

PATAGONULA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: The cup is an extremely ſmall perianthium, divided into five ſegments, and remains after the flower is fallen. The flower conſiſts of a ſingle petal, with ſcarce any tube, the margin of which is divided into five acute oval ſegments. The ſtamina are five filaments of the length of the flower. The antheræ are ſimple. The germen of the piſtil is oval and pointed. The ſtyle is ſlender, and ſlightly bifid; its ramifications are alſo bifid again. This is of the ſame length with the ſtamina, and remains when the flower is fallen. The ſtigmata are ſimple The fruit is an oval and pointed capſule, ſtanding on a large cup, made up of five long ſegments emarginated, or rimed round their edges. The ſeeds of this plant are yet unknown; but the conſtruction of the cup in which the capſule ſtands is alone a ſufficient diſtinction for this genus. *Linnæi* Gener. Plant. p. 66.

PATANGHI, in botany, a name by which ſome authors have called the tree whoſe wood is the logwood, uſed in dying and in medicine. *Herm.* Muſ. Zeyl. p. 47.

PATE (*Cycl.*)—PATE, in zoology, a name given by the people of the northern counties of England to the *badger*. See the article TAXUS.

PATEE (*Cycl.*) in heraldry, a term uſed by ſome to expreſs a ſort of irregular line, differing from the indented, ingrailed, and all the other regular and common lines, and called by ſome the dovetail line.

It is ſomewhat like the joint called by our joiners by this laſt name, but it is not in general uſe, and is by ſome reckoned among what the French call the *clatte*, a term they have for ſuch irregular lines as they find in old engravings or figures, tho' not in uſe in any arms preſerved to this time. *Niſbet's* Heraldry. See CLATTE.

PATELLA, (*Cycl.*)—This is a ſmall bone, ſituated above the ſpine of the tibia, reſembling a large cheſnut. It is about half as thick as long, and its length and breadth are nearly equal. It is divided into a baſis, apex, and two ſides, one convex, the other concave. The baſis is the ſuperior and thickeſt part of the bone, and is marked with a very conſiderable muſcular impreſſion, which runs down for a little way on the convex ſide. The apex is obtuſe, and ſerves for the inſertion of a ſtrong ligament, which ties the *patella* to the ſpine of the tibia. The anterior ſide is convex, with ſome ſmall inequalities and furrows upon it. The poſterior ſide is concave, covered with a cartilage, reaching near the apex, and terminating at an unequal cavity or foſſula, which is an impreſſion for the ligament already mentioned. This cartilaginous ſide is parted in two by a ridge which goes between the baſis and apex, and the two parts are exactly ſuited to the pulley of the os femoris, the external part being broader than the internal, which is likewiſe obſervable in the pulley. The *patella* remains long cartilaginous, and in oſſifying it becomes entirely cellular, except the ſurfaces of its two ſides and the impreſſions. It is connected with the tuberoſity of the tibia by a thick ſhort ligament; and, indeed, it may be looked upon as belonging in a particular manner to the tibia, or as a moveable olecranum; which again may be looked upon as a fixed *patella*. *Winſlow's* Anat. p. 94.

Fracture of the PATELLA. The *patella* or *knee-pan* is much more ſubject to a tranſverſe fracture than to one in any other direction. The longitudinal fracture of this bone happens more rarely, but when it does, is much more eaſily cured; becauſe the fragments of the bone in this caſe, generally keep in their right places, but when the bone is broken not only tranſverſely, but into ſeveral pieces, the caſe is yet more difficult and dangerous. The cure of this fracture muſt be attempted in this manner: in a longitudinal or perpendicular fracture, the patient muſt be laid upon his back, and, extending the foot, the ſurgeon muſt replace the fragments on both ſides with the preſſure of his hands, binding them up carefully with the uniting bandage; which muſt be applied in this caſe in the ſame manner with that uſed in large wounds in the belly or forehead. But when the *patella* is broken tranſverſely, or into ſeveral pieces, the patient being laid in the ſame poſture, and extending his foot as before, the ſurgeon is with great care

care to endeavour with the palms of both hands, affifted by his fingers and thumbs, to bring together and replace the fragments in their natural fituation; and when that is done, they muft be retained firmly together, by means of a plaifter made in form of a half moon, or properly perforated, and then the foot and leg are to be bound up, and placed fo that they cannot be eafily moved: but to prevent the bone from being difplaced again, the patient muft not ufe his leg till after the ninth or tenth week. *Heifter*'s Surg. p. 134.

PATELLA *luxated*. The *patella* is moft ufually luxated either on the internal or external fide of the joint, tho' phyficians give accounts of its being fometimes luxated both above and below it. Whenever the knee itfelf is perfectly luxated, the *patella* can fcarce avoid being difplaced at the fame time, becaufe of its ftrong connection to the thigh and to the tibia.

The reduction of a luxated *patella* is ufually no great difficulty. The patient is to be laid flat on his back upon a table or bed, or upon an even floor, fo that his leg may be pulled out ftreight by an affiftant; when this is fufficiently extended, the furgeon muft grafp the *patella* with his fingers, and afterwards, by the affiftance of his hand, prefs it ftrongly into its proper place. This may be alfo poffibly effected while the patient ftands upright: when this is done, there remains nothing but carefully to bind up the part, and let the patient reft for fome days; fometimes gently bending and extending his leg in the mean while, that it may not become ftiff. *Heifter*'s Surg. p. 171.

PATELLA, the *limpet*, in natural hiftory, the name of a genus of fhell-fifh, the characters of which are thefe: It is an univalve fhell, of a gibbous fhape, always fixed in its natural ftate to a rock or to fome other hard body, and having its apex or fummit fometimes fharp pointed, fometimes obtufe, fometimes ftreight, fometimes crooked, fometimes whole, and fometimes perforated. There are feveral fpecies of each of thefe kinds. See Tab. of Shells, N° 1, 2.

Of the *limpet* with a fharp pointed fummit, there are the following fpecies: 1. The pyramidal mucronated *limpet*. 2. The pyramidal furrowed *limpet*. 3. The grey *limpet*: this, tho' a plain fpecies in its rough ftate, is very beautiful when its outer coat is taken off by polifhing. 4. The ten-ribbed *limpet*.

Of the *limpets* with depreffed heads are the following: 1. The furrowed marbly *limpet*. 2. The nipple *limpet*: this refembles the nipple of a woman's breaft. 3. The ftriated *limpet*, jagged at the edge. 4. The finely ftriated *limpet*: the lines in this fpecies are as fine as hairs. 5. The ftriated and prickly *limpet*: this, when polifhed, makes a very different figure, and is like a fhield with variegations of colour like thofe of tortoife-fhell. 6. The red-fpotted *limpet*. 7. The red and white ftriped *limpet*.. 8. The goat's eye *limpet*, fo called from its variegations on its infide, reprefenting the eye of a goat. 9. The carbuncle *limpet*, fo called from a glowing red in the fhell: this is beft feen when the fhell is polifhed, and held againft a ftrong light. Hift. Nat. Eclairc, P. 2. p. 237.

Of the *limpets* with perforated tops we have the following fpecies: 1. The cancellated open *limpet*. 2. The high-ridged *limpet*. 3. The fine ftreaked *limpet*, with ftreaks like hairs. 4. The oblong *limpet*, with two holes: this, when its furface is taken off by polifhing, makes the fine red *limpet* feen in many collections; and the fame fhell, with the coat juft erafed from the furface, fo as not to penetrate to the red part, makes the grey *limpet* with the double aperture, alfo frequently feen in the cabinets of collectors. Hift. Nat. Eclairc, P. 2. p. 238.

The Latins call this fhell *patella* from its refemblance to a difh, and the Greeks named it *lepas*, as if they meant to call it a fcale or flake of the ftone. Indeed this fifh always adheres to rocks, as if a part of the ftone; and the rock ferves it in the place of a fecond fhell, to defend it from the injuries of the weather. Aldrovand and Rondeletius have carried this thought fo far, as to place the *limpet* among the bivalve fhells; but no author has followed them in this. Bellonius obferves, that when they are found adhering to ftones in great numbers, as they frequently are, they refemble the heads of fo many large nails driven into the ftone. Columna diftinguifhes four kinds of the *limpet*: the firft he calls the common *limpet*, becaufe it was moft common of all the fpecies about Naples where he wrote; this is of an oval figure and of an afh colour. The fecond he calls the great exotic *limpet*: this he had from Spain; it was large and hard, and had feveral ribs, which ended into many dents at the verge. The third he calls the wild *lepas*: this is a fmall *limpet*, of an irregularly oval figure, and of an afh colour, and has a hole at the top, out of which the excrements are evacuated. The fourth kind he calls the royal *limpet*, becaufe he fays it is worthy to come to the table of a king: this is rough and has feveral holes at the top. The number of holes in the laft is either accidental, or elfe it is a fpecies of *limpet* unknown at prefent; the others may be eafily found among the already mentioned fpecies. *Bellonius. Fab. Columna* Aquat. et Terreft. p. 11.

Some *limpets* are concamerated within, or formed into feveral diftinct apartments. Of thefe there are the following fpecies: 1. The oblong beaked *limpet*. 2. The rounded arched *limpet*. 3. The large Chinefe *limpet*. 4. The *limpet* with a ftyle rifing within it from the bottom. 5. The irregularly fhaped longed beaked *limpet*. 6. The femi-concamerated *limpet*: this has feven remarkable ribs running from its top, which terminate in feven fpines at the bafe. This fpecies is hence radiated like a ftar at the verge, and is thence called by fome *aftrolepas*.

Of the *limpets* with crooked tops are the following fpecies: 1. The long and crooked headed *limpet*. 2. The red nipple *limpet*. 3. The grey *limpet*, of an elegant rofe colour within. 4. The *limpet* with a crooked top ending at the limb, and making the whole fhell thus reprefent, in fome meafure, a deeply ftriated pecten or fcallop: this is hence called by fome *concholepas*. 7. The lefs ftriated *concholepas*.

PATELLA, in the hiftory of infects, a name given by Lifter and fome others to a certain little hufk or fhell found on the bark of the cherry, plum, and rofe trees, and fome others, containing an animal within, and ufeful in colouring. Thefe *patellæ* are of a globular form, except when they adhere to the tree, and are of a fhining chefnut colour in moft kinds. The hufk itfelf ftrikes a very fine crimfon colour on paper, and within it is found a white maggot of no value: this, in time, hatches into a very fmall but beautiful bee. The whole fize of this bee is not more than that of half the body of an ant. They have the fting of bees, and the three fpots placed in a triangle on the forehead, which are fuppofed to be eyes. They are black, and have a large round whitifh or pale yellow fpot upon the back. The upper pair of wings are fhaded and fpotted, but the under pair are clear.

The fhells or hufks deferve a trial, to find whether the colour they yield might not be brought to ufe; it is to be obferved, that the deepeft coloured hufks afford the fineft and deepeft purple: they muft be alfo ufed while the creature contained in them is in the maggot form; for when it is changed into the bee ftate the fhell is dry and colourlefs. Dr. Lifter, who firft obferved thefe *patellæ*, went fo far on the comparing them with the common kermes, as to declare that they were of the fame nature with that production; but his hiftory of their being the workmanfhip of a bee, to preferve her young maggot in, is not agreeable to the true hiftory of the kermes; for that is an infect of a very peculiar kind. This author has been too juftly cenfured for his precipitancy of judging of things, and perhaps has fallen into an error by means of it here.

It is very poffible that thefe *patellæ* may be the fame fort of animal with the kermes, but then it produces its young within this fhell or hufk, which is no other than the fkin of the body of the mother animal; but as there are many flies, whofe worms or maggots are lodged in the bodies of other animals, it may be, that this little bee here defcribed may love to lay its egg in the body of the proper infect here defcribed, and the maggot hatched from that egg may eat up the proper progeny, and undergoing its own natural changes there, iffue out at length in form of the bee. This may have been the cafe in fome few which Dr Lifter examined, and he may have been mifled by this to fuppofe it the natural change of the infect. Phil. Tranf. N°. 72.

PATELLA *fera*, the wild *limpet*, a name very improperly given by Rondeletius and Aldrovand to the *auris marina*, or *concha veneris*. This is by no means of the *patella* kind. See the article EAR-*fhell*.

PATENT-*leaf*, among botanifts. See LEAF.

PATER *patratus*, among the Romans, the firft and principal perfon of the college of heralds, which formed a kind of board or council to examine the differences that arofe between neighbouring ftates, and endeavour amicably to accommodate the fame. *Danet* in voc.

PATETÆ *uvæ*, a name given by the antients to grapes dried on the vine. See PATETHISÆ.

PATETHISÆ *uvæ*, a name given by the antients to grapes which were fuffered to remain on the vine till they were greatly dried and withered. They were alfo called *patetæ uvæ*, and were fuffered to hang thus to make a peculiar wine called *paffum*.

PATH (*Cycl.*)—PATH-*fly*, the name given by us to the fly called in Latin *humifuga*; it is found in foot-paths, and fuppofed to live by fucking the ground. It is of a grey colour, ftreaked with dufky white. See HUMISUGA.

PATHOGNOMIC *figns*, in medicine. See ASSIDENT.

PATIENCE, in botany, the name by which fome people call the monks rhubarb; but the French, from whom we have borrowed the word, mean by it all the fpecies of the *lapathum* or dock kind. See the article LAPATHUM.

PATIENTIÆ *mufculus*, in anatomy, a name given by Spigelius to a mufcle of the fhoulder, which he alfo calls by the more expreffive name of *fcapulam attollens*. The French call it the *releveur propre de l'omoplate*, and Albinus, Morgagni, Cowper and others *levator fcapulæ*.

PATIN-*fhoe*, in the manege, a kind of horfe-fhoe, under which is foldered a fort of half ball of iron, hollow within. It is ufed for hip-fhot horfes, and put upon a found foot, to the end, that the horfe not being able to ftand upon that foot without pain, may be conftrained to fupport himfelf upon the lame foot, and fo hinder the finews to fhrink, and the haunch to dry

dry up. We likewise clap *patin-shoes* upon horses that are sprained in the shoulders.

PATIS, in zoology, the name of a small sea-bird, described by Oviedus, and seeming to be the same with the stormfink described by Hoier in his epistle to Clusius. It is a little larger than our sparrow, and skims the surface of the water very nimbly, and is supposed a fore-runner of storms.

PATLAHOCA, in botany, the name given by some authors to the tree which produces the resin, commonly called *gum-copal*. *Hernand*, p. 46.

PATREZ, a name for a sort of vermichelli, a paste made of flour and water, and formed into beads. This and all other kinds of vermicelli are often stained with saffron.

PATRICIDE, *patricidium*, the same with *parricide*. See the article PARRICIDE, *Cycl.*

PATRIMI *and* MATRINI, among the Romans, children whose father and mother were both living.

It was by a certain number of these that hymns were sung to supplicate the gods. V. *Liv.* 37, 3.

PATTALIA, in natural history, a word used by Aristotle and the rest of the old Greek writers, to express a stag or deer of two years old. The interpreters of Aristotle have generally rendered this by the Latin word *subulo*; but that is of a very vague and uncertain sense, and this Greek word of a very determinate one, never being used to express any animal except the stag at this age. Pliny and the Roman authors in general use the word *subulo*, indeed, sometimes for a young stag; but they oftener use it to express that imaginary beast the oryx or unicorn. Pliny says, that nature has given this animal *cornua simplicia*, single horns, as it is generally understood to mean; but the phrase may as well be translated plain, uniform, and unbranched horns. The word may have been thus used to distinguish the horns of this creature, whatever it was, from the stag, and not to imply that each of them had only one horn: in this sense, however, it is no proper translation of the word *pattalia*, which signifies a stag of a certain age, not any other animal.

PAVANA, in botany, the name of the plant which produces the *grana tiglia* of the shops. It is a species of *ricinus*. *Jons.* Dend. p. 458. See RICINUS.

Pavana-wood, when fresh, operates very violently, both by vomit and stool: when dried, it is much more gentle, never vomiting at all; but at present it is scarce heard of in the shops.

PAVIA, in botany, the name of a genus of plants described by Boerhaave and Linnæus, the characters of which are these: the perianthium consists of one leaf, and is coloured, of an oval figure, and divided into five obtuse segments at the edge. The flower consists of five oval petals, the upper ones longer than the others; the longest of all are very long, and are inserted into the cup. The stamina are eight subulated filaments, somewhat crooked, and of the length of the flower. The antheræ are roundish, the germen of the pistil is of an oval figure, the style is subulated, and the stigma acute. The fruit is a coriaceous turbinated capsule, of an obtusely four square form, composed of four valves, and containing four cells; in each of which is contained a single roundish seed. *Linnæi* Gen. Pl. p. 158.

PAVICULA, among the Romans, a rammer, or instrument for beating down and levelling a spot of ground.

It consisted of a block of wood one foot long and half a foot thick, with a long handle. *Pitisc.* in voc.

PAVILIONS, among jewellers, the under sides and corners of the brilliants, lying between the girdle and the collet. *Jeffries* on Diamonds. See GIRDLE, *&c.*

PAULA *gunda*, in natural history, a name given by the people of the East Indies to a species of fossil of the *osteocolla* kind, found in some springs, the waters of which are loaded with spar. These people use it in medicine, giving it in milk for gonorrhœas, and that with good success.

PAULADADUM, a name given by some authors to the medicinal earth of the island of Malta, called *terra melitensis*, and *gratia sancti Pauli*. Some have given this name also to a species of white bole found in some parts of Italy, which is made into cakes, and sealed, and serves in the place of this and other white earths.

PAULINIA, in botany, the name of a genus of plants, according to Linnæus, taking in the *seriana* and the *cururu* of Plumier. The characters are these: the perianthium is composed of four oval and expanded leaves, and remains when the flower is fallen. The flower consists of four oblong and cordated petals; these stand expanded, and are of twice the bigness of the leaves of the cup. The stamina are eight simple and short filaments. The antheræ small. The germen is three cornered, obtuse, and of a turbinated form. The styles are capillary, and are three in number, and very short. The stigmata are simple and broad. The fruit is a large three cornered capsule, composed of three valves, and containing three cells, in each of which is a single seed of an oval figure. The difference between the *cururu* and *seriana* of Plumier is, that the *seriana* produces its seeds in the base of the cells, and the *cururu* in the cells of them. *Linnæi* Gen. Pl. p. 170. *Plumier* Gen. 35.

PAUNCH, or PANCH, on ship-board, those matts made of sinnet, which are made fast to the main and fore yards, to keep them from galling against the mast.

PAVO, (*Cycl.*) The *peacock*, in the Linnæan system of zoology, makes a distinct genus of birds of the *gallina* kind; the distinguishing characters of which are, that the feet have each four toes, and the head is adorned with an erect ornament of feathers, in form of a plume. *Linnæi* System. Naturæ, p. 47.

PAVO, in ichthyography, the *peacock-fish*, one of the larger species of the *turdus*, or *wrasse*, but of a middle nature between the long and the flat bodied kinds. Its usual standard, as to size, is about three pounds weight; and its colour on the back a mixture of blackish and a dusky blue: the blue is disposed in three or four longitudinal parallel lines, on a dusky blackish ground; about the head and gills the blue lines are more bright and numerous. Its lower jaw is almost wholly blue, and its belly is of a fine saffron colour or reddish yellow. It has thick lips, and very sharp tho' not very large teeth. Its back fin is, on the anterior part, of a fine deep blue, with an edge of purple, and sometimes of yellow; and the rest of the fin is red at the bottom and yellow at the top, and in the middle is finely variegated with blue spots. The foremost nerves of the back fin are rigid and prickly, and have soft and flexile rays accompanying them beyond the limb or edge of the fin, and of more than their own length. Its gill-fins are a mixed red and yellow, and its belly-fin behind the anus of a pale flesh colour, with a variegation of blue and yellow. The other belly-fins are of the same colours, and the tail is wholly blue. It is a most remarkably beautiful fish, and from the spots and variegations of its fins has obtained its name. *Ray's* Ichthyol. p. 321. See Tab. of Fishes, N° 59.

PAVONIUS-*lapis*, the *peacock stone*, a name given by Ludovicus Dulcis, and other writers of his time, to a stone of which they say many idle things, such as its having the virtue of gaining a person's love to another, and the like. They have left us no description of it, but probably it was one of the variegated agates.

PAURAEDRASTYLÆ, in natural history, the name of a genus of crystals. The word is derived from the Greek παῦρος, a few, ἕδρα, a side or plane, the privative particle α, not, and στῦλος, a column; and expresses a fossil composed of but a few sides or planes, and having no column.

The bodies of this genus are crystals composed of two pyramids joined base to base, without the intervention of a column; these being both hexangular, and consequently the whole body composed only of twelve planes; the others of the same structure being composed of sixteen. *Hill's* Hist. of Fos. p. 167.

Of this genus there are only four known species: 1. A whitish one with short pyramids, found in many parts of France. 2. A brown one, with long pyramids, found in great plenty in some parts of Scotland. 3. A crooked or slanting one, very clear and colourless: this is common both in the East and West Indies, but no where so plentiful as in New Spain. And, 4. A bright and blackish one, with very short pyramids: this is found in Italy, Germany, France, and England, but with us is usually met with very small. It is commonly found in clusters together. See Tab. of Fossils, Class 3.

PAUSANIA, Παυσανία, in antiquity, a festival in which were solemn games, wherein freeborn Spartans only contended. It had its name from Pausanias, the Spartan general, under whose conduct the Grecians overcame Mardonius in the famous battle of Plateæ, there being always an oration in praise of him. *Potter*, Arch. Græc B. 2. c. 20. T. 1. p. 424.

PAUSEBASTOS, in natural history, the name of a beautiful stone dedicated to Venus, and called also *paneros*. It seems to have been a beautiful agate.

PAUSICAPE, Παυσικάπη, among the Athenians, a kind of punishment. A round engine was put about the neck in such a manner, that the sufferer could not lift his hand to his head. *Potter*, Archæol. Græc. T. 1. p. 131.

PAUSIS, a word used by the old physicians for a remission in acute diseases.

PAUXI, in zoology, the name of an American bird described by Nieremberg, and seeming to be the same with the *mitu* of the Brasilians described by Marggrave, and with the *tepetototl* of Nieremberg: the whole difference is, that this, instead of a crest, has a fleshy protuberance at the basis of its bill; this is of the shape of a pear and as hard as a stone, and is of a beautiful turcois colour, or fine pale blue. *Ray's* Ornithol. p. 305. See the article MITU.

PAW, (*Cycl.*) in the manege. A horse is said to *paw* the ground when his leg being either tired or painful, he does not rest it upon the ground, and fears to hurt himself as he walks.

PAWLE, in a ship, a small piece of iron bolted to one end of the beams of the deck, close to the capstan; but yet so easily as that it can turn about. Its use is to stop the capstan from turning back, by being made to catch hold of the whelps; therefore they say, *Heave a pawle*; that is, heave a little more for the *pawle* to get hold of the whelps; and this they call *pawling the capstan*.

PAWN (*Cycl.*)—PAWN, among miners, is a pledge of money put into the bar-master's hand, at the time when the plaintiff causes

causes the bar-master to arrest the mine. *Houghton's* compl. Miner in the Explan. of the Terms.

PAYING, in the sea language. When the seams of a ship are laid over with a coat of hot pitch, it is called *paying her*; and when this is done with canvas, *parcelling*. Also when after she is graved, and her soil burned off, a new coat of tallow and soap, or one of train oil, rosin and brimstone, boiled together, is put on her; that is called *paying of a ship*. They say also sometimes, when in tacking about, a ship's sails being back stayed, fall all flat against the masts and shrouds, *she is paid*.

PEA, *pisum*, in botany. See PISUM.

Chick-PEA. See the article CICER.

PEACH, *persica*, in botany. See PERSICA.

The curious in fruits account twenty-eight sorts of *peaches*, but many of them seem very trifling distinctions. The fineness of this fruit, in general, depends on the firmness of the pulp, the delicacy of the flavour, and the thinness of the skin. A fine *peach* should be of a fine deep red next the sun, and of a pale whitish hue next the wall; and the pulp should be of a yellowish cast, and very juicy; and the stone should be small, tho' the fruit in general be large.

The varieties of the *peach* are produced like those of the finer flowers, by sowing the seeds; and tho' many raised this way will be of little value, as is also the case in flowers, yet probably among a parcel of stones, saved from the finer kinds of *peaches*, there would be some new kinds produced; which, as they were raised here, would be easily kept up in their perfection; which is not to be expected of those brought from other countries.

The best method of saving the stones is, to let some of the finest *peaches* of the best kinds hang till they drop of themselves from the tree, and then the stones should be immediately planted on a bed of light rich earth, planting them four inches deep in the earth, and at about six inches asunder. The beds should be covered, to preserve them in the winter; and in spring, when the trees come up, they must be cleared of weeds, and well watered. The next spring they should be carefully taken up, and planted in the nursery, at greater distances; and after two or three years standing here, they may be removed to the places where they are to remain; or they may at that time, when the condition of their fruit is known, be grafted on other stocks, which is the common way now used to propagate these trees.

The common method of propagating the *peach* is, by grafting. In order to this, some good stocks should be provided, which should be of the muscle, or white pear-plum. When these stocks are two or three years old, they will be strong enough to bud; and the common season for doing this is about Midsummer. The buds should be chosen from a healthy tree, which produces a great deal of fruit: they must be taken from the trees either in a cloudy day, or else in the morning or evening, when the sun has not much power: they should be then inoculated on the stocks as soon as possible, and the stocks treated with the usual care afterwards. See INOCULATION.

When these are to be transplanted where they are to remain, the most proper soil for them is, a light rich pasture-land, taken up with the turf, and rotted together, before it is to be used; and the borders to be made with this cannot be too wide, and ought to be raised five or six inches above the level of the ground; or if the soil be moist, more than that. They must be transplanted in autumn, as soon as the leaves are fallen off; and should never be set at less than fourteen feet distance from one another. The heads of the trees are then to be raised up against the walls, to keep the roots from being moved by the wind; and they should be watered at times, with a nose on the watering pot, and the water sprinkled all over them In the middle of May the new shoots are to be nailed to the wall, training them horizontally; and the foreright shoots are to be rubbed off: in October the new branches should be pruned, shortening them according to the strength of the tree; if strong, they may be left eight inches long; if weak, they should only be left five; and the same care is to be taken of them for the succeeding years.

There are two general rules always to be observed in the pruning of *peach* and nectarine trees, which are, 1. Always to have enough bearing wood. And 2. Not to lay in the branches too close to one another. All *peach* trees produce their fruit from the young wood either of the same, or at the most, of the former years shoot; for this reason the branches are to be so pruned, as to encourage them to throw out new shoots in every part of the tree: and this is to be done in May; when by pinching, or stopping the strong shoots, there may be new wood forced out in any part of the tree. This is the method of the summer pruning; the winter pruning is usually done in February or March, but is much better done at Michaelmas, as soon as their leaves begin to fall; and the wounds will then have time to heal before the severe frosts come one.

In pruning of these trees it must always be observed also, that it is best done under a wood bud, not a blossom bud; which may be distinguished by the wood buds being less turgid and longer, and narrower than the blossom bud; for if the shoot have not a leading bud where it is cut, it will commonly die down to the leading bud. In nailing the shoots to the wall, they should be placed at as equal distances as possible; and so far apart that the leaves may have room; and they must always be trained as horizontally as possible, that the lower part of the tree may be well wooded, which it will not be if the branches are suffered to run upright. *Miller's* Gard. Dict.

PEACH-*colour*, the pale red colour of the blossoms of the *peach*-tree.

To give this beautiful colour to glass, add at different times, and in small quantities, the powder of prepared manganese to the mass, for the making of lattimo, or milk-white glass while in fusion. This alone gives the *peach*-colour; but the metal must be immediately worked when of a right tinge, for the colour is very apt to go off. *Neri's* Art of Glass, p. 99. See the article LATTIMO.

PEACH-*colour*, in the manege. See BLOSSOM.

Wolf's PEACH. See LYCOPERSICON.

PEACH *flowers*. These are used as a purge for children, made into a syrup, and are by some recommended as great destroyers of worms; but there is a circumstance attending them which is little taken notice of, and yet greatly alters their virtue. The custom of gardeners is, to graft the *peach* upon the almond, or the plumtree, and the flowers partake of the nature of the stock; those which are produced on *peach*-trees grafted on plum-stocks, being much more purgative than those from almonds; the reason of which seems plainly, that the plum is a purgative fruit, the almond not at all so. The flowers of the least esteemed sorts of *peaches* are also usually found to be the best for medicinal use.

In examining these flowers, they are found to contain more than three fourths of a superfluous humidity. The buds contain a little less than the blown flowers; which is very natural to suppose, because it is their being afterwards charged with a larger portion of humidity which makes them open. The buttons, or buds of the flowers, are found on experiment, however, to be somewhat more purgative than the flowers when open.

If four pounds of these flowers are distilled in a *balneum mariæ*, they yield 12 or 13 ounces of a whitish liquor, sweet to the taste, and of an agreeable smell, resembling that of bruised *peach* kernels; and this is so strong in the water, that a few drops of it will very agreeably scent a larger quantity of any thing. If the buds are used to this purpose, instead of the open flowers, the same sort of liquor is drawn over; but it is of a somewhat coarser and more earthy smell. The residuum of these distillations put into a retort, and distilled by a reverberatory fire, gradually raised to its several degrees, yields both acid and alkaline substances; and, finally, a red spirit comes over, full of fuliginous particles, and containing some oil, part of which swims at the top of the liquor, and the other part which is heavier, sinks to the bottom. This is what a chemical analysis shews in these flowers, different from other vegetable matters. Spirits of wine draws a very weak tincture from these flowers; it is indeed much weaker than an infusion of them in common water. An infusion in water of half an ounce of fresh *peach*-flowers, or of a dram of dry ones, (for, as before observed, they contain three fourths of superfluous moisture) is a very gentle and agreeable purge. This method of infusion is much better for these and all other purgative flowers, than the taking the expressed juice; for in that case there is always a large quantity of purgative matter remaining in the residuum; which water in a warm infusion is able to take out The infusion of rose or *peach*-flowers, keeps also better than their expressed juice. The juice always turns sour very soon, but the infusion, with the common caution of pouring a little oil on the surface, will keep good even for years.

When oil is used to this purpose, there should always be care taken that it be such as does not freeze easily; for in that case the air gets in between the cake of frozen oil, and the sides of the vessel, and spoils the liquor. Oil of almonds is greatly to be prefered to oil of olives on these occasions; as it freezes with much more difficulty. Another way of preserving the infusions is, the evaporating about half the liquor; and thus they will often keep a long time: infusions keeping better than the juices of plants, seems to shew, that the former contains more of the principles than the latter.

The young leaves of the *peach* made into an infusion in the same manner as the flowers, are more purgative than they, but less agreeable; they are to be taken in the same manner. Mem Acad. Par. 1714.

PEACH-*gall-insect*, in natural history, a small *gall-insect*, found in great plenty on the *peach*-tree. It is of an ob'ong figure, flat at the belly, and prominent on the back; pointed, and not unaptly resembling in miniature a small boat turned bottom upwards. Their longer diameter is usually extended in the same direction with the length of the branch; sometimes a little obliquely, but scarce ever perpendicular to that direction Their exterior skin, the only part of them one sees, as they are attached to the tree, is very like the fine, thin, and

and glossy outer bark of many trees, as that of the cherry, &c. Their colour is usually a faint brown, sometimes it approaches to a coffee colour, sometimes to a bright chesnut, but more frequently it has something reddish in it.

The young shoots of the *peach*-tree are often covered with these on all sides; sometimes they are more distant and fewer in number. All that one sees of this kind at this season have the same lifeless appearance, and all appear perfectly motionless; but they are, however, of very different states and conditions, for usually some are in full life and vigour, others already dead, and others even the spoils of those of a former season, which remain in the places on which they died without the least sensible alteration in their appearance. Those, however, on the old wood may be judged to be dead ones, but those on the branches of the present year are usually found alive and well. The dead ones, if touched, appear as a mere film, and fall off in their scales from the branch; but the others, if crushed, yield a viscid juice, like that from the crushing of other living insects. The living animal is at this season so closely affixed to the tree, that it is not easy, by the fingers alone, to separate them without destroying them; but with caution they may be easily raised unhurt, by getting the point of a knife between them and the bark: in this case, the part of the tree from whence they are raised is seen covered with a cottony matter. The belly of the animal, which is naturally applied against this downy matter, is at this season puffed up, as it were, and seems as full as it can well hold. A little later than this season, if others are raised from the tree, it is then less easy than before to know them to be animals.

If in a fortnight, or a little more, after the time of their being as full as can be, they are removed from their place, they then make no other appearance than that of one of those dead and dry ones before mentioned, no more of the full fleshy appearance is to be seen, but they appear merely a thin flake of tortoise shell, or some other such substance, covering a vast number of small bodies close lodged together, but as loose from one another as so many grains of sand, and fall to the earth on raising the shell, unless it be done with great care.

These small bodies are somewhat reddish, and when examined by the microscope, the oval figure of them will not let one doubt but that they are eggs; and the whole insect might now appear to any one no other than a case prepared by some animal for the safety of its eggs. A little afterwards, if the animals in this state be examined, the shell is found, instead of eggs, filled with small living insects, among a quantity of loose powder. No more eggs are found entire: these are the animals hatched from them, and the shells are what now make the loose powder.

The galls, and such excrescences on vegetables, are always found pierced with holes, out of which the fly issues, which, in its worm state, had been nourished there; and that there might be no resemblance wanting in these creatures to galls, their skins are often found pierced in two or three different places, nay, and flies are seen sometimes issuing out of these, which had lived within them in the worm state. That these are of a certainty animals, and not galls, is evinced, however, beyond doubt and dispute, by raising one of them in an intermediate time between that of its being found full of eggs, and that of its appearing only distended and swelled; because in this interval the animal will be found in the act of laying them, and may be seen doing so.

The young animals hatched from these eggs are for many months seen in the condition of other small insects; but as they become full of eggs, they swell, and, by degrees, lose their true shape: they grow in size as these eggs grow in them, and when full grown and ready to lay, their bellies are smooth and even, and the rings of which they are composed are not to be distinguished: in another state it is easy to distinguish these; they are five in number, and the passage for the eggs is in the last. The animal has six legs, which not having been used of a long time, are found closely applied to its belly; and a little above the first pair there may be seen a small prominence, which is the part by which the creature takes in its nourishment. The cottony bed that lies under these insects on the tree, shews extremely plain the impressions of all the parts of the animal; the legs, rings, &c. are easily distinguishable here.

It is a general law of nature, that insects perish when they have done all that was necessary for the multiplying of their species; that is the case also with this little animal. It lives but a little while after it has laid its eggs, and its dried body makes an excellent covering and defence for them; and what is very remarkable is, that as this insect is now immoveable, and cannot draw itself over its egg, they are not thrown out behind its body, as the eggs of other animals; but as they are laid, are drawn under the belly, and evenly arranged there. The eggs are ten or twelve days before they hatch, and when hatched, the young animals remain quiet under the cover of their mother's carcass for several days.

After some time, when their parts are duly strengthened, they get out and enjoy their liberty: these new-born insects are so extremely small, that it requires a microscope to observe them; but they are in nothing like what their parent was, or what they are to be hereafter; they are very nimble and active, and march backward and forward with prodigious swiftness. There is now nothing singular in their form; they are somewhat flattish, and of an oval figure, and have two horns or antennæ, as well as their six legs, very easily distinguishable. The number of young ones hatched by each parent is very great, often not less than four thousand. The young ones have an easy passage from under the shell made of their parent's body in this, that the hinder extremity of that shell is split, and is not, as are all the other parts, fastened to the branch.

It has been supposed, that the young *gall-insects* eat up their mother's body, and eat holes through it to get out; but this is by no means the case; the opening already mentioned gives them a free passage, and the holes we sometimes see on the backs of these animals are ever made by extraneous animals, small flies, which have in the worm state grown and been nourished within the body of the animal, as they do in the bodies of caterpillars and many other insects; and which, when hatched into the fly state, make themselves these holes for their escape.

It is usually about the beginning of June that the young insects get at liberty from under the body of their parent; they may then be found running very nimbly all over the branches of the tree, but are not distinguishable otherwise than by examining the branches with a microscope. The branches thus covered with these young animals, are in a few days cleared again, and the insects found in form of small scales, covering the leaves, and now large enough to be seen by the naked eye. They are of different colours; some white, some yellow, some greenish, and some reddish: and in this state they are so very flat, and withal so immoveable, that they may naturally be mistaken for the skins quitted by some insects; but on crushing them with one's nail, a yellowish juice is always squeezed out, which shews them to have been real animals; but the greatest proof of it is to be had from observation, for after some time they will be found again very swiftly in motion.

Thus these little animals, after being hatched on the branches, run over them in search of the leaves for nourishment: they do not eat these, however, but suck the juices from their vessels by a fine trunk, and it is only while they are employed in this that they in this state appear immoveable. These trunks are placed a little above the first pair of legs; but we are not to look for them in the young insects, it is only in the full grown ones that they are distinguishable, and in those not without difficulty. In these, however, with attention, one may observe in this part a small hollow, or short fleshy pipe, out of which the insect can at pleasure thrust a fine white trunk, as small as a fine hair, and of half the length of its body.

The more careful gardeners always clear their best fruit-trees from these insects, especially their orange-trees, well knowing that they drain the juices of the tree, and will sometimes even kill it. This is not to be supposed owing to what juices they take in for their nourishment alone, but they occasion the waste of a vast deal besides: under several *peach*-trees, and particularly under distinct parts of them which are loaded with these *gall-insects*, it is common in the middle of May, or between that and the beginning of June, to see the earth as wet as if newly watered, while that all about is dry; a very large quantity of the juices of the tree continually making their way through the holes left by the trunks of these innumerable little animals. At the same time that one finds the young *gall-insects* on the leaves, one finds them also on the young shoots of the *peach*-trees, and the reason is the same, that these parts are more easily pierced by the tender organs of the young animals than the branches and harder parts of the tree. Their backs in this state are not smooth and even, but, examined by the microscope, are found to be wrinkled and channelled in a beautiful and regular manner.

Not only the *gall-insects* of the *peach*, but all the other species, after a certain time, become immoveably fixed to the place where they are, and no longer able to use their legs. Their growth is very slow from the time of their hatching, through the months of July, August, September, and October; at the beginning of November they are found somewhat enlarged in breadth, but they are yet no thicker, and at this time they are all become of the same colour, which is somewhat reddish.

In the beginning of March they begin to swell and be filled with the growing eggs; their backs become a little convex, and, viewed with a microscope, appear covered with little tubercles; and one may, at this time, perceive seven or eight long threads, which run from several parts of their bodies: these fasten themselves to the branch at a distance from the creature, and fix it immoveably in its place. In the beginning of April they become much more convex, and tho' they can no longer walk about, they yet have at this time sufficient motion to shew an animal life. At this time, by very slow motions, they change their skin; and it is after this change that they assume so exactly the figure of galls, and grow so very quickly to their full size. Seven or eight days now make such a change in them, that they are not to be known for the same animal; but it is not till the beginning of May that they ar-

rive at their utmost size. About the 15th of May they are in a condition to lay, and as the eggs are discharged, the belly is pushed closer and closer to the back; and when all are laid, becomes the shell before described, and the young ones are hatched under it, and become full of eggs, and do the same office afterwards to their young.

One great difficulty, however, is to conceive by what means they are fecundated: some have imagined them each to be male and female in the same individual, and hermaphrodites of a very singular kind; for as in snails, worms, and some other insects, which are both male and female in the same individual, there still is the congress of another animal of the same species required for propagation; in these it should seem, on the contrary, that one alone was sufficient. Others imagine them males and females, as other animals, and that they perform these offices during the three or four first days after they are hatched, while they are running on the branches. Had these observers known that the animals were in a condition to move during all the winter months, that is during the greater part of their lives, they would not have been reduced to the improbable conjecture of their performing this office as soon as produced: the truth is, however, that it is not known that they do it at all, these observers never having seen the thing, but only judging it an indispensible necessity; but a close observation will furnish grounds for an opinion of another kind.

In the end of April the branches of the *peach* and other trees covered with these insects, will be found to be greatly frequented by a sort of small flies, beautiful enough to demand attention: their head, breast, body, and legs are all of a deep red; they have only two wings, but those very large, being nearly twice as long as their bodies: these, in the fly's common posture, are crossed on the back, and the upper almost entirely hides the under one; they are less transparent than those of the common flies, and are of a dusky white, bordered with an edge of a fine bright and beautiful red: but what chiefly distinguishes them from all other species is, that they have two long white threads which run from their hinder part, and are of twice the length of their wings; between these there is also a remarkable part, a sort of tail made like a piercer, and of a third or fourth part of the length of these threads. This is like all other stings, thicker at its base than at its point, and is bent a little downwards.

The antennæ of this fly are adorned with long bodies, hairy, and larger at their extremities than at their insertions on the antennæ. It is easy at first sight to conceive, that these are the flies that had been produced of worms fed in the bodies of the *gall insects* of a former year, and that they were now searching an opportunity to deposit their eggs in the bodies of these little creatures, to be hatched into worms there, and thence to come out in flies, as they themselves before had done.

The piercer at their tails made this the more probable, as it seemed to refer them to the ichneumon class; but a closer attention to the whole progress of these insects will give much more room to believe, that these flies are the male *gall-insects*. They are, indeed, very small in proportion to the females, but this will give the judicious naturalist no cause to doubt their being the males of the same species, any more than their having wings and the females not; since the same difference and disproportion is found in beetles and many other insects; the colour of their juices, when crushed, and their smell, are in both exactly the same. And another observation adds greatly to the probability, which is, that many branches of the *peach*-tree are so loaded with the young *gall-insects* that have newly fixed themselves, that one would wonder what must become of them when they swell in bulk, as there could be no room for their growth on the branch on which they already stood so close as to touch one another.

But examining these branches afterwards, at the season when these flies appear, multitudes of these *gall-insects* are found converted into mere shells, out of which something has escaped and gone; and these are so compleat, and seem to have been quitted in so very different a manner from the broken spoils of the female *gall-insects*, that there is all the probability in the world of these flies having been let out of them, which had before lain there in the form of nymphs: several of these, in the very state of nymphs, Mr. Reaumur found in these shells; and the whole remaining question is, whether these were the proper animal, or whether they were owing to the egg of some fly accidentally deposited there, and hatched in the body of the animal. The former, however, seemed on all considerations to be the more probable opinion; for no observation at a proper season will ever shew a living worm in the body of the *gall-insect*: and the manner of the fly's egress is not that of these unnatural births, which are always by a hole made by the fly; but the shell in this case readily opens at a proper season, and lets out the fly, by parting all round at the commissure of the belly and back, which seems too natural for any thing but the very manner destined for the production of the proper species

The flies examined on the branches with a glass will also be found to introduce this seeming piercer always at the same place into the body of the *gall-insect*, and this is that cleft in the hinder part of the body, out of which the young ones when hatched, afterwards find their way. The flies, which lodge their eggs or young worms in the bodies of other insects, if crushed at that season, will be always found to contain such eggs or small worms; and the microscope never fails to discover them in the matter crushed out of flies even smaller than these, but in these no observation ever shews any such. See Tab. of Insects, N° 29

Notwithstanding that the *peach-gall-insect* is the only species in which the male fly has been observed, there is no room to doubt but that the other species all have males of the same kind. The orange *gall-insect* has been observed not universally fecundated, but that there is only a part of the animals that lays eggs; probably the others are those which hatch into the male flies: and the kermes, the noblest and most valuable of all the *gall-insects*, is known often to produce a white winged fly, very like that of the *peach-gall-insect*. And Brennius, who gave some time since a history of the scarlet grain of Poland, the *coccus Polonicus*, a kind of *pro-gall insect*; tho' in the first account he gave into the opinion of both sexes being included in each of these animals, and that each was in itself sufficient for the propagation of its species: yet afterwards, to his very great honour, he added an account of his having discovered the male of this species, which he describes to be a small fly, with a red body and white wings bordered with red; a fly in all respects like the male of the *peach-gall-insect*.

These flies, carefully examined, and pressed gently on their belly, and at the same time observed with a good microscope, will be seen to thrust out of the part which resembles the piercer of the ichneumon race, a fine, slender and soft white thread. Were this in reality the same with the piercers of the ichneumons, this part must have been hard and horny, to be able to enter hard substances; on the contrary, it is ever found soft and fleshy, and is undoubtedly no piercer, but the organ of generation in the male insect.

It is much to be doubted, whether the *gall-insects*, in form of a boat inverted, are not the same species living on different trees: this is certain, that the animal taken from one tree will live and multiply on another; and the distinctions between the species, even so different in their maturity, are often not easy while the animals are young, the boat-fashioned, the orbicular, and the reniform being not distinguishable till the time they acquire the greatest size, and with that size, this their natural figure. The *gall-insects* of the hazel and lime, which are of the half-round kind of the *peach*, and the perfectly orbicular one of the oak, are all instances of this; and all between the time of their being a simple flat body, and their acquiring an orbicular or partly orbicular figure, assume one much like that of the boat-fashioned ones. *Reaumur's* Hist. Inf Tom. IV. p. 1, to 44.

PEANTIDES, the name of a stone to which the antients attributed great virtues for promoting delivery,

These stones were found in Macedonia and other places; and all the description we have of them is, that they resembled water congealed by frost. Probably the antients meant by this name the *stalactitæ*, or stony icicles, which, as they hang from the roofs of caverns, greatly resemble the droppings of water from the eves of houses congealed in frosty weather.

PEARCH, *perca*, in ichthyology. See Perca.

Pearch-*glue*, in mechanics, the name of a kind of glue, of a remarkable strength and purity, the manufacture of which we owe to the Laplanders, from whom Scheffer has described it. They take a number of large *pearches*, and slitting them open, they carefully pick away the flesh with a knife, so as to leave the skin pure. They put a number of these skins into a vessel of warm water, which they expose to the sun, and by that means keep it in a continual moderate heat for several days; when the scales become loose by this maceration, they take out the skins and rub them clean off. The soft and clean skin then remains alone, and feels as soft as a wetted bladder. These clean skins they throw into a small quantity of fresh water, and boil them gently over the fire, stirring the whole together, and toward the end beating it forcibly with little sticks. The skins by this means at length wholly dissolve in the water, and the whole becomes a thick transparent liquor; which, when boiled as long as the thickness of it will permit, without burning, they pour out on a flat stone, and as it cools they cut it into cakes exactly resembling our glue, but that they want the coarse reddish colour it has, and have no disagreeable smell. When they would use this, they dissolve it in more water, exactly as we do our glue. The bows of this people give us a very great proof of the strength of this sort of glue: they are made of two pieces fastened together with it, and tho' put to the most forcible trials, as these people are very strong, and use them in shooting bears, rain-deer, &c. yet the glue part is never known to start. *Scheffer's* Hist. Lapland.

PEAR, *pyrus*, in botany. See the article Pyrus.

All the sorts of *pears* propagated in gardens, are produced by budding, or grafting them upon stocks of their own kind; which are commonly called *free-stocks*, or else upon the quince or whitethorn stocks; but the last are now generally disused, the fruit produced this way being apt to be dry and mealy. The quince-stocks are, however, in great esteem

for the trees designed for dwarfs or for walls; because they do not let the shoots grow so fast and luxuriant. But there are objections against even these, which are of some consequence; for there are many kinds of *pears* which will not do upon them, but will die, or become weak and good for nothing after three or four years; and the hard-breaking *pears* are rendered very unpleasant by being grafted on these stocks, while the buttery or melting ones are meliorated by them. And it is to be added, that no sort of *pear* will thrive upon a quince stock in a poor or gravelly soil.

PEAR-*trees* planted either against walls, or in espaliers, must not be placed nearer to one another than twenty foot. *Pear*-trees commonly produce their blossom-buds first, at the extremity of their last year's shoots; the common way of pruning is very prejudicial, therefore, as it takes off the part which should bear the fruit, and occasions new shoots from the same branch, which will over-fill the tree with wood, the trees should always be carefully looked over in summer, and all the foreright shoots taken off; by which means the fruit will not be over shaded, and the trees will need but little winter-pruning. The several sorts of summer *pears* all ripen best in espaliers, but the winter *pears* require a south-east or south-west, or else an east wall. *Miller's* Gardener's Dict.

It is said that crabs and wild *pears*, such as grow in the wildest and most barren clifts, and on hills, may make the richest, strongest, most pleasant and lasting wines that England yields. See Phil. Transf. N° 477. Sect. 4.

Indian PEAR, a name given by several writers to the fruit of a large tree in the East Indies. The bark of this tree is reddish without and white within, and very smooth; the leaves are small, thick, and of a pale green; the flower consists of three long triangular leaves, which, when shut up, form a sort of triangular pyramid; this is of a very disagreeable smell. The fruit is also of a conic figure, its broad part being joined to the pedicle: this is of a woody texture, and of the thickness of one's finger; it divides itself into several filaments, which run thro' the whole body of the fruit. When the fruit is ripe, its rind or skin is red, very smooth and thin, which is contrary to the common course of nature in the Indian fruits, to which nature has given very thick rinds, in order to make them able to bear the great heats they are exposed to. The inside of this fruit is full of a white, soft, and sweet substance, which is usually scooped out with a spoon, and is of a very pleasant taste: within this fruit there are several smooth, black, kernels, like those of our common *pears*. When this fruit is mellow, the pulpy part of it falls away from the fibres, and they remain hanging to the pedicle for a long time.

Chio PEAR. See CHIO PEAR.

PEARCH, in ichthyology. See PERCA.

PEARLS (*Cycl.*)—Mr. Reaumur was very happy in his conjectures as to the nature, origin, and differences of *pearls*, founded on what he saw in the coarse *pearls* of the *pinna marina*. He very judiciously observes, on that occasion, that often the least valued things are those which most of all explain, even by their imperfections, the manner of formation and the true history of the most perfect.

The *pearls* found in the *pinna marina*, are of two kinds; some being white and glossy, like the common *pearls*, and others brownish, reddish, or blackish. He very well observes, that they are all formed of extravasated juices; which have made their way out of broken vessels, and therefore are the effect of a distempered state of the animal, and are formed in the manner of bezoars in the stomachs of animals, or the stones in their bladders. The inner surface of the shell of the *pinna* is of a silvery white, or of the nature of mother of *pearl*, to a certain depth, after which it is reddish or brownish. These are the two colours also of the two sorts of *pearls*.

The shells of fishes Mr. Reaumur supposes, are formed merely like those of snails, of a viscous matter, secreted from their bodies, which hardens by degrees into a sort of stony texture; and that the *pearls* in this fish owe their colour to their being formed of the extravasated juices of the white or the brown parts of the shells. The juices of these parts are severally intended to form their part, and the bed or plate of shelly matter formed of either, in its proper and natural state, could be only white or brown, as the liquor was coloured; and, consequently, so must be the distempered production of *pearl*. The breaking of the vessels of the inner *pearly* coat both in this and other shells, seems much more frequent than that of those of the browner external part; and it is easy to see, that this may much easier make its way into the hollow of the shell than that from the more outward part; but it is also easy to see that, provided the brown juices of this outer part could be extravasated, and find their way into the hollow of the shell, they could only form *pearls* of their own colour.

In this shell of the *pinna marina*, the white or *pearly* inner part is formed of a vast number of flat plates or beds, laid one upon another; and the brown external part is formed of transverse fibres, not formed into such plates, but running in long striæ. The *pearls* of the two different colours have also this difference in their structure; not but that both the one and the other are composed of concentric beds or plates, but these are much less distinguishable in the brown than in the white ones; and each of them may in these be seen to be made up of filaments exactly as the brown part of the shell, to the extravasated juices of which they owed their origin, and whose texture therefore they could not but emulate. Mem. Acad. Par. 1708.

PEARLS, in commerce, increase in value as the square of their weight: thus, the price of a *pearl* of one carrat being settled at 8 s. to find the price of a *pearl* weighing six carrats: first find the square of six, *viz.* 36; which multiplied by 8 gives 288 shillings, or 14 l. 8 s. the price required. *Jeffries* on Diamonds, p. 64.

PEARL, in ichthyology, a name given by us in the parts about London, to that fish which is called in Cornwall, and other parts of the west of England, *lug-a-leaf*; it is the *rhombus lævis* of the generality of authors; and, according to the new system of Artedi, it is a species of the *pleuronectes*, distinguished by the author by the name of the *smooth bodied pleuronectes*, with the eyes on the left side. See the articles RHOMBUS, PLEURONECTES, and LUG-A-LEAF.

PEARL-*barley* affords to the microscopic observer, a peculiar kind of mite worthy attention, and very different from the common species. The bodies of these have some brown marks upon them, and have not such long hairs as the common mites have; the hinder part of the body also is of a different make. They have eight legs; and before the head there stand two weapons twice as thick as the legs, and of about half their length: these are divided toward the ends with joints like fingers, and these have at their ends a sort of nails formed with sharp and crooked claws; and one of the longest joints is serrated at the edge like a saw. These weapons serve not only as arms and hands to seize hold of things, but they also serve as a defence; for as soon as any danger threatens the creature's head, it erects them both, and makes them meet and fold into one another over the head, as we can join our hands and fingers together in the same erect posture. Phil. Transf. N° 222.

PEARL *colour*, in glass. This beautiful colour is given to glass in the following manner: Put tartar calcined to a whiteness into putrified crystal, while in fusion, at several times, in small quantities, mixing it well every time, till the glass is become of the desired colour; and when it is, work it as quick as can be, for it is a colour that is quickly gone. *Neri's* Art of Glass, p. 103.

PEARL-*fishing*, in the north of Ireland. See an account of it in the Philosophical Transactions, N° 198.

PEASE, *pisa*, in botany. See PISUM.

We have several sorts of *pease* cultivated for use in the gardens about London and elsewhere; and as many people are desirous of having them very early, it is a common practice to raise them on hot beds. The method of doing this is, to sow the *peas* under warm hedges or walls. In the middle of October, when the plants are come up, their stalks are to be kept earthed up, and thus they are to remain till the beginning of January, or even till February, covering them against the severe frosts with *peas*-haulm, or other light covering. In January or February, there must be made a moderate hot-bed; the dung must be laid about two foot thick, and carefully beat down, and covered about six inches deep with light fresh earth; and when the frames have been set on about four days, the plants must be planted in the earth, at about a foot distance, in rows, and placed in each row at about two inches one from another. They must be watered and shaded till they have taken root, and then they must have as much air as may be; and when they begin to fruit, they should be watered more frequently than before, which will occasion their producing a larger quantity of fruit.

The common dwarf *pea* is the sort always used on this occasion, as all the rest ramble too much in their stalks.

The first sort of *pea* to be sown to succeed those on the hot-beds is, the hotspur; of which the gardners reckon three or four sorts, which differ very little from each other; but that called the masters hotspur is usually preferred to the rest. These are to be sown in October, as those intended for the hot-bed, and treated every way in the same manner; but in spring these are subject to be destroyed by slugs and other vermin; the best method of destroying which is, to slake a little lime, and throw over the earth among the plants. For fear of this crop miscarrying by the severity of weather, it is always proper to sow two others after this, at the distance of a fortnight each; and after this there should be no others sowed till the end of January; and after these there should be others at the beginning and end of February. To succeed these, which will supply the table with early *pease*, the Spanish morotto, which is a large *pea*, and a very plentiful bearer, should be sowed in rows on a clear plat of ground; the rows should be two foot and a half distant, and the *pease* dropt at an inch or two asunder: these must be all very carefully covered two inches deep with earth, and the rooks, mice, &c. prevented from getting at them. A fortnight after this another spot should be sowed with this or some other large

large *pea*, and this continued every fortnight till the latter end of May. *Miller*'s Gardner's Dict.

Field-PEASE. The common white *pea* succeeds best in a light land, somewhat rich: the time of sowing them is in the middle of April. Three bushels are the common allowance for an acre; and they kill the weeds a land is subject to, better than any other crop. In Staffordshire they sow the garden rowncivals in fields, and they grow and yield very well, tho' they are left trailing upon the ground without any support of sticks.

The white and rowncival *pea*, are only to be sown with a broad cast, and harrowed in; but the common grey *pea*, which is more frequently sown in fields than either of them, must be sown under furrow, and delights most in a cold wet clay. These are to be sown in February; and the common quantity of seed is two bushels to an acre. The blue *pea* is the best kind for light sandy land, and is to be early sown; all *pease* love land manured with lime or with marle. In Suffolk they plough up their lays in the beginning of March, and turning the turf well, they have a cross-stick set with iron pegs, which they strike down with their feet: these pegs make holes at an even distance; into which they have boys and girls following to put the *pease* singly, till all the land is set. As soon as this crop is cut, they plough the land a-cross, and harrowing it well they plough it again, and sow it about Michaelmas with wheat, and the next year with barley, then with oats; after which the land requires new improvement. *Mortimer*'s Husbandry.

PEASE *bloom-damp*, in natural history. See the article DAMP, *Cycl.* and *Suppl.*

PEAUCIER, in anatomy, a name given by Winslow, in his treatise on the head, and by other of the French writers, to the muscle called by Albinus *latissimus colli*; and by others *detrahens quadratus*, and *quadratus genæ*. Santorini has called the part of this which arises from the cheek, *musculus risorius novus*; and some call the whole *platysma myoides*.

PEBBLES, *calculi*, in natural history, the name of a genus of fossils, distinguished from the flints and homochroa, by their having a variety of colours. These are defined to be stones, composed of a crystalline matter, debased by earths of various kinds in the same species, and then subject to veins, clouds, and other variegations; usually formed by incrustations round a central nucleus, but sometimes the effect of a simple concretion, and veined like the agates, by the disposition, the motion of the fluid they were formed in gave their differently coloured substances.

The variety of *pebbles*, were it of England alone, is so great, that a hasty describer would be apt to make almost as many species as he saw specimens. A careful examination will teach us, however, to distinguish them into a certain number of essentially different species, to which all the rest may be referred, as accidental variations. When we find the same substances and the same colours, or those resulting from a mixture of the same, such as nature frequently makes in a number of stones, we shall easily be able to determine that these are all of the same species, tho' in different appearances; and that whether the matter be disposed in one or two, or in twenty crusts laid regularly round a central nucleus, or thrown without a nucleus into irregular lines, or, finally, blended into a sort of uniform mass.

These are the three states in which we are liable to find every species of *pebble*; for if it have been most naturally and regularly formed by incrustation round a central nucleus, we find that ever the same in the same species, and the crusts not less regular and certain. If the whole have been more hastily formed, and have been the result only of one simple concretion, if that has happened while its different substances were all moist and thin, they have blended together and made a mixed mass of the joint colour of them all; but if they have been something harder when this has happened, and too far concreted to diffuse wholly among one another, they are found thrown together into irregular veins. These are the natural differences of all the *pebbles*; and having regard to these in the several variegations, all the known *pebbles* may be reduced to thirty-four species. *Hill*'s Hist of Foss. p. 512, seq.

These are, 1. A yellowish grey one, with a bluish white crust, very common in the gravel pits about London. 2. A yellow-centered one, with whitish grey and reddish crusts, very common in most of the gravel pits about London. 3. A yellow-centered one, with white, black, brown, and straw-coloured crusts. This is a very beautiful one, and is very common on Hampstead-heath. 4. A dull brown-centered one, with whitish, bluish, and brown crusts. This is a tolerably beautiful stone, and is common about London. This, in a certain state, is a very fine ætites or eagle stone See ÆTITES. 5. A shining brown-centered *pebble*, with white and brown crusts. This is a very elegant stone, and is found plentifully in the gravel-pits about Islington, and more rarely on Hampstead-heath. 6. A small brownish yellow-centered *pebble*, with white, brown, red, and yellow crusts. This is an extremely elegant stone, and is not uncommon in our gravel-pits about London, and would be worth the cutting into toys. 7. A small brown-centered *pebble*, with greyish white, pale brown, brown, and reddish crusts. This is another very beautiful *pebble*, and is common in the gravel-pits on Hampstead-heath. 8. A reddish brown-centered *pebble*, with yellow, red, and bluish white crusts, common about Kensington, and in some other places 9. A brown-centered one, with white, orange-coloured, brown, and dusky yellow crusts. This is an extremely elegant stone, and is common about London. 10. A dull brown centered one, with thick whitish, brownish, and yellowish crusts. This is a very scarce species, and is of the coarsest texture of all the *pebbles*. 11. A bluish white large centered *pebble*, with yellowish-brown, and ash-coloured crusts; very common on Hampstead-heath and about Windsor. 12. An elegant large white-centered one, with flesh-coloured, brown, and bluish-white crusts. This is found principally in Hertfordshire, and is sometimes wrought into toys, and sold in London by the name of an *agate onyx*. 13. An elegant white-centered kind, with red, yellow, and flesh coloured crusts. This is found on Hampstead-heath; and we sometimes meet with it wrought into vases. 14. A greyish-white-centered kind, with very thin and numerous brown, and yellow crusts. This is common in Hertfordshire, and is sometimes found on Hampstead-heath. 15. A greyish-white-centered *pebble*, with brown, yellow, and white crusts; common on Hampstead-heath, and in the gravel-pits about Islington. 16. A very white-centered one, with white, grey, yellow, and flesh-coloured crusts; common in the gravel-pits about London. 17. A brownish-white-centered one, with brownish-white, ferruginous, and yellowish crusts; found about Windsor, and sometimes in Northamptonshire, bedded in the strata of stone. 18. A bluish centered one, with brown and grey crusts; common in Hertfordshire. 19. A grey-centered thick-coated one, with whitish and red crusts. This is a scarce species, but is sometimes found about Paddington, and in some parts of Northamptonshire. 20. A very elegant bluish-white one, with flesh-coloured and bright red crusts; found frequently about London. 21. A bluish-grey one, with brown, yellow, and flesh-coloured crusts; common on Hampstead-heath, and frequently wrought into tops of snuff-boxes. 22. A greenish-blue-centered one, with white, yellow, flesh-coloured, and red crusts; common in many parts of England. 23. A flesh-coloured centered one, with whitish brown and yellowish crusts, and a very thick white external coat. This is a very uncommon species about London, but in Northamptonshire and Leicestershire is found in great abundance 25. A red-centered one, with black, white, and flesh-coloured crusts. This is a very rare species, but is sometimes found on Hampstead-heath. 26. A yellow-centered one, with yellow and greenish white crusts. This is found principally on the shores of Yorkshire. 27. A red-centered one, with purple and pale yellow crusts; found on the shores of Sussex, and sometimes in the gravel-pits about Oxford. 28. A yellow-centered one, with grey and pale-red crusts; found principally on the Yorkshire shores. 29. A pale grey-centered one, with red, purple, bluish, and brown crusts. This is a very scarce species, and found principally in Hertfordshire. 30. A black-centered one, with black and white crusts. This is a very beautiful stone, and is sometimes wrought into seals, &c. under the name of the *onyx*. 31. A yellowish-brown one, with brown and greyish black crusts; very common in Hertfordshire and some other countries, but seldom seen about London. 32. A pale-grey-centered kind, with white and greenish crusts. This is a very elegant stone, and is found on the shores of the Thames, and in the gravel-pits about Islington. 33. A brownish white-centered one, with yellowish brown and black crusts. This is well known among our lapidaries by the name of the *Ægyptian pebble*. And, lastly, 34. A deep green-centered *pebble*, with yellow and pale-crusts. This is sometimes found in the gravel-pits about London, but is not common. *Hill*'s Hist. of Foss. p. 540.

In all the strata of *pebbles* there are constantly found some which are broken, and whose pieces lie very near one another; but as bodies of such hardness could not be broken without some considerable violence, their present situation seems to imply, that they have suffered that great violence in or near the places where they now lie. Beside these, there are others also found which have as plainly had pieces broken off from them, tho' those pieces are no where to be found; whence it seems equally plain, that whatever has been the cause of their fracture, they have been brought broken, as we find them, from some other place, or else that the pieces broken from them must at some time or other have been carried from this place to some other distant one.

Several of these broken *pebbles* have their edges and corners so sharp and even, that it seems evident they never can have been tossed about or removed since the breaking; and others have their sides and corners so rounded, blunted, and worn away, that they seem to have been roughly moved and rolled about among other hard bodies, and that too either with great violence, or for a very long continuance; since such hard bodies could not have been reduced to the condition we now see them in without long friction.

It may be supposed by some, that these stones never were broken,

broken, but have been naturally formed of this shape; but it will be easily seen by any one who accurately surveys their veins or coats that surround the nucleus, like the annual circles of a tree, that they must have been originally entire; and this will be the more plain if they are compared with a stone broken by art. Such *pebbles* as are found in strata, that lie near the surface of the earth, are much more brittle than those which lie in deeper strata.

The more clear and transparent the sand is, which is found among *pebbles*, the more beautiful the *pebbles* are generally observed to be.

The use of these stones, and their disposition in the earth, is a subject of great admiration; and may serve as one of the numerous proofs of an over-ruling Providence in the disposal of all natural bodies. The surface of the earth is composed of vegetable mould, made up of different earth mixed with the putrid remains of animal and vegetable bodies; and is of the proper texture and compages for conducting the moisture to the roots of trees and plants: and under this are laid the sands and *pebbles* which serve as a sort of drain to carry off the redundant moisture deeper into the earth, where it may be ready to supply the place of what is constantly rising in exhalations; and lest the strata of sand should be too thick, it is common to find thin ones of clay between, which serve to put some stop to the descent of the moisture, and keep it from passing off too soon; and lest these thin strata of clay should yield and give way, and by their softness, when wetted, give leave to the particles of sand to blend themselves with, and even force their way through them, there are found in many places thin coats of a poor iron ore placed regularly above and below the clay; and by that means not only strengthening and supporting the clay, but effectually keeping the sand from making its way into it. Phil. Transf. N° 483.

Ridged PEBBLES. It is not uncommon to meet with *pebbles* in our gravel-pits which have one or more ridges, or white lines, standing above the surface of the rest of the stone, in form of a rib or zone, laid on the stone after its formation. This, however, is not the case; but the lime or zone always goes through the whole body of the *pebble*: the matter forming this *ridge* is always harder than the rest of the stone; and it seems probable, that at first it was not extant or elevated, but level with the rest of the surface; but being not so easily worn away by accidents, and when the whole *pebble* came in the way of rubbing among harder bodies, this would be less rubbed away, and consequently would be left more elevated than the rest. We daily see on the sea-shores numbers of stones rounded by the continual rolling and tossing among the waves, and in these the softer parts have given way first and been worn into holes, while the harder have been left prominent. It seems probably to have been the case with these *pebbles* also; but they are not found on the shores, but in our gravel-pits, at a great distance from the sea: and it is evident, that these have had their surfaces thus ground and worn down between the time of their being formed by concretion in the waters of the deluge, and their being deposited where we now find them. This could only happen by means of the hurry and rapid motion of the waters of the deluge, at the time of their running off from the surface of the earth into the ocean or great abyss, at the bottom of it: for, by numerous observations, it is plain, that the force of this water thus returning off from the earth was so great, that in many places it tore up the solid strata, and washed off vast masses from them, tumbling them afterwards along, and rounding and smoothing their surfaces in its passage, and finally leaving them where its force began to abate. This we have instances of in all parts of the world, and that smaller pieces of stone were thus rounded we see in the case of these *pebbles*, the harder parts of which are left standing higher than the rest, and in many other the like instances.

The smoothness of the surfaces of some *pebbles* and flints, which we find with their natural coats or crusts worn off, is another proof of the same thing. These *pebbles*, in this unnaturally naked state, as well as the ribbed and lineated ones, are found in our pits under the strata of earth; and we doubtless find them where they have lain undisturbed ever since the time of their having been deposited there at the going off of the general deluge: and yet they are in exactly the same condition with those which have been tossed about and rounded on the sea shores.

This is a plain indication, that they have been, before their being deposited there, tossed and rolled about in the same manner with the others; and there remains no time at which this should have been done, but that of the going off of the waters of the deluge, when a much larger body of water was evidently in a much greater agitation, and consequently could do in a very little time what we see done on the sea shores in a longer space.

Swallowing of PEBBLES. There are many people of opinion, that the swallowing of *pebbles* is very beneficial to health, in helping the stomach to digest its food, and a *pebble* posset is an old woman's medicine in the colic in many parts of England. They usually order the small white stones to be picked up out of gravel walks for this purpose, and eat them in large quantities in some sort of spoon meat, of which milk is an ingredient.

The thing that has given occasion to this practice seems to have been, that people observe the birds to pick up the gravel, and that they are never well unless they have frequent recourse to this to help their digestion: but this is no similar case at all, for the gizzard or stomach of a bird is made very strong, because the creature hath no teeth to chew its food; and this gizzard is lined with a rough coat, by the help of which and these stones, the food they swallow whole is so ground, as to yield its juices to the nourishment of the animal. But the stomach of man is formed so very differently, that it can never require those assistances to the comminution of food. Many people have, however, accustomed themselves to swallow not only these small white stones, but large *pebbles*, even to the size of a walnut each; and these will often pass safely, and people who have long accustomed themselves to swallow them, boast of receiving no injury from them: we can never know, however, that the death of such persons is not owing to them at last; and as they can do no good, it is best always to avoid them. There is one instance on record, of much mischief done by them; this is in our Philosophical Transactions. Phil. Transf. N° 257, p. 190.

A man of about twenty-seven years of age, and lean habit, had been used for three years before to swallow round white *pebbles*, as a cure for some windy disorders to which he was subject, and they used to pass thro' him easily, and give relief for the time. In one of his fits, at the end of this time, having swallowed his usual number, which was nine, and they not passing thro' him, he swallowed more and more, to the number of two hundred. None of these passed off at the time, nor even in the space of two years and an half; at the end of which time he applied for relief in a miserable way: he could digest no food, but vomited up all he swallowed. On examining his belly, the stones were found lodged, not in the stomach, but almost as low as the os pubis; they might be felt with the hand thro' the integuments, and rattled as if in a bag; if the man was hanged up by the feet to a ladder for a small space of time, they would get up into his stomach again; but upon setting him on the ground they would soon fall into their old place, and that so plainly to the senses, that they might be distinctly heard and counted one by one. If his body was not laxative, he certainly vomited all he eat; if it was, he had a little respite at times; and as he lay in bed he could perceive the stones also higher than their usual place, and give him great disturbance. He was on these occasions always forced to get up, and on standing or kneeling he could perceive them fall down into their old place again, and could count them as they fell. He usually on these occasions could count more than an hundred: at length he became unable to work or move for them, and voided large quantities of blood by stool, after disturbing them by any violent motion. The use of proper medicines relieved him in many of these symptoms, but no means ever made use of was able to carry off one single stone.

PECHEM, in the materia medica, a name given by the modern Greek writers to the root called *behem* by Avisenna and Serapion. Many have been at a loss to know, what this root *pechem* was; but the virtues ascribed to it are the same with those of the *behem* of the Arabians; its description the same, and the division of it into white and red, is also the same as that of the *behem*. Nay, the word *pechem* is only formed of *behem*, by changing the B into a P, which is very common, and the aspirate h into χ, or ch, which is as common.

Myrepsus, who treats of this root, says the same thing that the Arabian Avisenna says of *behem*, namely, that it was the fragments of a woody root much corrugated and wrinkled on the surface, which was owing to its being so moist whilst fresh, that it always shrunk greatly in the drying.

PECHYAGRA, a name given by authors to the gout affecting the elbow.

PECHYS, a name used by some anatomical writers for the elbow.

PECHYTYRBE, an epithet used by some medical writers for the scurvy.

PECORA, *locks*, in the Linnæan System of zoology, a classical term, comprehending a whole order of quadrupeds. The characters of this order are, that the creatures have *dentes incisores*, or *cutting teeth*, in their under-jaw, but none in their upper: they have no *canini*, or *dog-teeth*, and have five molares each way. The paps of this order of animals are situated in their groin, and their feet have hoofs. Of this order are the camel, stag, goat, sheep, and ox. *Linnæi* Syst. Nat. p. 41.

PECTE, in botany, a name given by some of the old Greek writers to the *great comfry*, called also *ossipagina*, from its agglutinating broken bones.

PECTEN (*Cyl*) in natural history, the name of a genus of shell-fish, the characters of which are these: it is a bivalve shell, shutting close in all parts, of a flatted shape, striated in the manner of a comb, and often auriculated, sometimes only semiauriculated, and in some species not auriculated at all. There are also some few species which are elate, not flat as the others.

This genus of shells has had its name *pecten* from the longitudinal striæ with which its surface is covered, which resemble the teeth of a comb. According to the general character of this shell, it will be easy to perceive that it is meant to include the cockles as well as the scallops; these being the *pectens* without ears, and with less flat or elated shells. These are called by all authors by a name which is only a diminutive of *pecten*, *pectunculus*. And tho' the having ears is the common mark of distinction between the *pectens* and the *cockles*, which last usually have none, yet the genera are not distinct, as some have supposed; for there are shells allowed to be *pectens*, or scallops, which have yet no ears, and others universally allowed to be *pectuncles*, or cockles, which have ears. Hence appears the error of Lister, who made these two distinct genera, and gave the ears and the equal convexity of both shells as the great characters of them: these, tho' good marks to distinguish the species by, are by no means unalterable enough to found different genera upon. Hist. Nat: Ecla re. p. 340.

The genus of *pectuncles*, or *cockles*, has been made by all authors a very extensive one, but the reader will find all the supposed species of it very aptly received into the genus of the *cordiformis*, or *heart-shell*, and the *pectens*.

According to this establishment of the genus of the *pecten*, the species are to be enumerated under several distinct heads. Thus, some *pectens* are auriculated on both sides: of these we have the following species; 1. The red *pecten*, called the *ducal mantle* 2. The yellow *ducal mantle pecten*. 3. The coral *pecten*, with beautiful red tubera. 4. The variegated *pecten*, called the St. *James's shell*. 5. The yellow variegated *pecten*, called the St. *Michael's shell*. 6. The gold yellow *pecten* of the Caspian sea. 7. The great reddish *pecten*. 8. The variegated bluish *pecten*. 9. The red deep furrowed *pecten*. 10. The umbrella *pecten*, or, as some call it, the *sun pecten*: this is yellow at the upper part of the shell, and white on the under. 11. The *pecten* which is variegated on the upper part, and white on the under. 12. The yellow high-ribbed *pecten*, with a bordered lip. 13. The *pecten* with both shells equally hollow. 14. The pear-fashioned *pecten*. 15. The beautiful *pecten*, called by Rumphius, *virgineus*. 16. The *amusium*, or smooth polished *pecten* of the same author. 17. The rough *pecten*, variegated with brown spots. Hist. Nat. Eclaire. p. 338.

Of these *pectens*, which are semiauriculated, we have the following species: 1. The black spinose *pecten*: this is all over beset with sharp points. 2. The red spinose *pecten*. 3. The grey spinose *pecten*. 4. The yellow spinose *pecten*. 5. The variegated spinose *pecten*. 6. The smooth white *pecten*.

Of those *pectens* which have no ears at all, we have the following species: 1. The rough *pecten*, called the *file cockle*. 2. The oblong white rough *pecten*. 3. The yellowish ribbed and jagged *pecten*. 4. The variegated *pecten*, jagged at the edge. 5. The thick *pecten*, with blue, yellow, and brown streaks. 6. The smooth variegated *pecten*. 7. The white globose *pecten*, called the *common cockle*.

This shell-fish is one of the spinners of the sea, having a power of spinning or forming threads like the muscle; but they are much shorter and coarser even than those of that fish: so that they can never be wrought into any sort of work, in the manner of the longer and finer threads of the *pinna marina*. The use of these threads which the *pecten* or *scallop* spins, is to fix the creature to any other body that is near, whether it be a stone, a piece of coral, or another shell. All these threads proceed, as in the muscle, from one common trunk; they make their way out of the shell in those *pectens* which have only one ear, a little below that ear; in the others probably they issue out on both sides. It is an evident proof, that the fish has a power of fixing itself at pleasure to any solid body by means of these threads, that after storms the *scallops* are often found tossed upon rocks, where there were none the day before; and yet these are fixed by their threads, as well as those which had remained ever so long in their place. They form their threads in the very same manner with the muscle, only their organ which serves for spinning is shorter, and has a wider hollow, whence the threads are necessarily thicker and shorter. See MYTULUS.

PECTINATION, *combing of the head*. Frequent *pectination* is recommended by many physicians to women, and men who wear their hair, as an exercise; and at the same time, a kind of friction.

PECTORAL (*Cycl*).—PECTORALIS *internus*, in anatomy, a name given by Riolan and others to a muscle of the breast, now generally known by the name of the *triangularis sterni*; called by the older writers, *sextus thoracis*.

PECTORALIS *major*, a large, thick, and fleshy muscle, covering the breast from the stomach, where it is very broad, to the axilla, where it contracts in its passage to the arm. It is naturally divided into two portions, one superior and small, and the other inferior and large; the first may properly be called the *clavicular portion*, the other the *thoracic*.

The *clavicular portion* is fixed by a fleshy insertion in almost half the clavicle next the sternum, ending under the insertion of the sterno-mastoidæus; from thence it runs obliquely down towards the axilla, contracting by small degrees, and finally ending in a flat tendon or tendinous band. The *thoracic* portion is broad, and in some measure radiated. It is fixed by its anterior circumference in the lateral part of the outside of the sternum, in the outside of the cartilages, and in a small part of the bones of all the true ribs, and of the first and sometimes the second false rib; all these insertions are like so many digitations. The insertions in the sternum, end by a great number of very short tendons, which run towards the middle of the bone, meeting and decussating those from the same muscle on the other side.

This muscle, together with the deltoides, sends off an aponeurosis, which joining that of the biceps, is spread over the muscles of the arm: it partly covers the pectoralis minor, and serratus major; and by its broad tendon covers transversely the brachial channel, and the tendon of the biceps lodged there. Lastly, it forms the anterior border of the hollow of the axilla, as the posterior is formed by the latissimus dorsi. *Winslow*'s Anat. p. 180.

PECTORALIS *minor*, a muscle called also *triangularis*. It is small and fleshy, something of a triangular shape, and is situated at the superior, lateral, and anterior part of the thorax. By its basis it is inserted into the external labium of the upper edge of the second, third, fourth and fifth true ribs, near their union with the cartilages, by the same number of digitations, or separate fleshy portions, between the intervals of the ribs; and for that reason it has been called the *serratus minor anticus*. From hence these portions run up more or less obliquely toward the shoulder, and form a fleshy belly, which contracts as it passes before the two first ribs; and then becoming a short, flat, and broad tendon, is inserted in the upper part of the apophysis coracoides of the scapula, reaching all the way to the point of that process. This muscle is covered by the *pectoralis major*, and adheres very closely to the external intercostal muscles. The digitations commonly taken notice of cover and hide several others, by which the number of fibres and thickness of this muscle is increased. Its tendon unites a little at the apex of the coracoide apophysis, with the insertion of the coraco-brachialis, and with that of one portion of the biceps.

PECTOREL, in our old writers, armour for the breast, a breast-plate or *petral*, for a horse. It is mentioned Stat. 14. Car. II. c. 3.

The word *pectorel* comes from the Latin *pectus*, a breast.

PECTORIS *ossa*, in fishes. The bones of the breast and belly are best sought after in the cetaceous and spinose kinds. In the spinose kinds they are these: the clavicles, the sternum, the scapulæ, or bones, to which the *pinnæ pectorales* are affixed at their basis, the bones at the roots of the *pinnæ ventrales*. The number, situation, and figure of these differ greatly in the several kinds of fish, and make very essential characters. *Artedi* Ichthyol.

PECUARII, among the Romans, those who farmed the public pastures, in order to let them again to advantage. *Pitisc.* Lex. Ant. in voc.

PECULATOR, one who is guilty of the crime called *peculate*. See PECULATE, *Cycl.*

PEDARIAN, in antiquity, those senators who signified their votes by their feet, not their tongues; that is, such as walked over to the side of those whose opinion they approved of, in divisions of the house.

The origin of the word Dr. Middleton thinks owing to this, that tho' the magistrates of Rome had a right to a place and vote in the senate, as well during their office as after it, and before they were put upon the roll by the censors, yet they had not probably a right to speak or debate there on any question, at least in the earlier times of the republic. For this seems to have been the original distinction between them and the antient senators, as it is plainly intimated in the formule of the consular edict, sent abroad to summon the senate, which was addressed to all senators, and those who had a right to vote in the [a] senate. From which distinction, these last, who had only a right to vote, were called by way of ridicule, *pedarian*; because they signified their votes by their feet, not their tongues, and upon every division of the house, went over to the side of those whose opinion they approved [b]. It was in allusion to this old custom, which seems, however, to have been wholly dropt in the later ages of the republic, that the mute part of the senate continued still to be called by the name of *pedarians*, as we learn from Cicero [c], who in giving an account to Atticus, of a certain debate and decree of the senate upon it, says, that it was made with the eager and general concurrence of the *pedarians*, tho' against the authority of all the consulars [d]. [[a] *Festus* in voc. senatores, *A. Gell.* l. 3. 18. [b] Vid. *A. Gell.* ibid. *Fest.* in pedarius. [c] Ad *Attic.* 1. 19. [d] *Middlet.* of Rom. sen. p 86. seq.]

PEDATURA, in Roman antiquity, was used for a space or proportion of a certain number of feet set out. *Pitisc.* Lex. Antiq. in voc.

The word occurs frequently in writers about military affairs: thus in Hyginus de Castrametatione we meet with, *meminerimus itaque ad computationem cohortis equitatæ milliariæ pedaturam ad milletrecentis sexaginta dari debere*; which is to be thus explained: the *pedatura*, or space allowed for a cohors equitata, or provincial cohort, consisting of both horse and foot, (see COHORS *equitata*) could not be the same as the *pedatura* of an uniform body of infantry, of the same number, but must exceed

ceed it by 360 feet: for the proportion of the room of one horseman to one foot soldier he assigns as two and an half to one. Vid. Phil. Transact. N°. 482. sect. 3.

PEDETICHE, in natural history, a name given by some of the Greek writers to the chamois goat, the creature whose skin affords us the chamoy leather.

The antient Greeks called this creature *ixaros*, and from thence came the word *isarus* and *yssaros* or *ysardos*. The Latin authors of antiquity call this *dama*, but authors have since applied the word *dama* to the *cervus platyceros*, or broad-horned stag.

Aristotle has called this last animal *prox*, and his translators have rendered the word *dama*; but they are in this to be understood as meaning the *dama* of their own times, not that of the antients, or this *pedetiche*, or chamois goat.

PEDICULARIS (*Cycl.*)—PEDICULARIS, *lousewort*, in botany, the name of a genus of plants, the characters of which are these: the flower consists of one leaf, and is of a personated form, and divided into two lips; the upper one hooded, the lower divided into three segments: the pistil arises from the cup, and is fixed in manner of a nail to the hinder part of the flower. This afterwards ripens into a capsule, divided into two cells, and containing oblong, flatted, and marginated seeds. See Tab. 1. of Botany, Class 3.

The species of *pedicularis* enumerated by Mr. Tournefort, are these: 1. The common meadow yellow *pedicularis*, called yellow rattle and cockscomb. 2. The taller meadow yellow *pedicularis*, with horny flower cups. 3. The Alpine *pedicularis*, with pale yellow spiked flowers. 4. The serrated clammy-leaved meadow yellow *pedicularis*. 5. The umbellated Spanish *pedicularis*. 6. The narrow-leaved mountain *pedicularis*. 7. The spiked Italian *pedicularis*, with changeable coloured flowers. 8. The sea *pedicularis*, with long serrated leaves. 9. The narrow-leaved annual Alpine yellow *pedicularis*. 10. The least spring annual purple *pedicularis*, called by some purple eye-bright. 11. The least annual white flowered spring *pedicularis*. 12. The short blunt-leaved English red *pedicularis*, called also red eye-bright. 13. The blackish red-flowered Alpine *pedicularis*, with teucrium leaves. 14. The speedwell-leaved Pyrenean *pedicularis*. 15. The tall germander-leaved Portugal *pedicularis*. 16. The late flowering purple *pedicularis*. 17. The late flowering yellow *pedicularis*. 18. The narrow flax-leaved *pedicularis*. 19. The Portuguese grassy-leaved meadow *pedicularis*. 20. The Spanish marsh *pedicularis*, with glass wort leaves. 21. The yellow Alpine *pedicularis*. 22. The great fern-leaved Alpine *pedicularis*. 23. The small fern-leaved Alpine *pedicularis*. 24. The spleen-wort leaved Alpine *pedicularis*. 25. The purple Alpine *pedicularis*, with asphodel roots. 26. The broader leaved, asphodel-rooted, Alpine, red *pedicularis*. 27. The common meadow purple *pedicularis*. 28. The white-flowered meadow *pedicularis*. 29. The taller red meadow *pedicularis*. 30. The taller white meadow *pedicularis*. *Tourn.* Inst. p. 172.

A decoction of *pedicularis* is esteemed good against hæmorrhages and fluxes of all kinds. *Demery*, Dict. des drogues.

PEDICULUS, the *louse*, in the history of insects. See LOUSE.

PEDICULUS *marinus*, a name given by some to the Molucca crab. *Ray's* Ichthyogr. p. 3. See SQUILLA.

PEDILUVIUM. The uses of warm bathing in general, and of the *pediluvium* in particular, are so little understood, that they are often preposterously used, and sometimes as injudiciously abstained from. Med. Ess. abr. Vol. I. p. 244.

In the Medical Essays of Edinburgh, we find an ingenious author's opinion of the warm *pediluvium*, notwithstanding that of Borelli, Boerhaave, and Hoffman, to the contrary, to be: that the legs becoming warmer than before, the blood in them is warmed; this blood rarifying, distends the vessels; and in circulating imparts a great degree of warmth to the rest of the mass: and as there is a portion of it constantly passing through the legs, and acquiring new heat there, which heat is, in the course of circulation, communicated to the rest of the blood; the whole mass rarifying, occupies a larger space, and of consequence circulates with greater force. The volume of the blood being thus increased, every vessel is distended, and every part of the body feels the effects of it; the distant parts a little later than those first heated. The benefit obtained by a warm *pediluvium* is generally attributed to its making a derivation into the parts immersed, and a revulsion from those affected, because they are relieved; but the cure is performed by the direct contrary method of operating, *viz.* by a greater force of circulation through the parts affected, removing what was stagnant, or moving too sluggishly there. Warm bathing is of no service where there is an irresoluble obstruction, tho' by its taking off from a spasm in general, it may seem to give a moment's ease; nor does it draw from the distant parts, but often hurts by pushing against matter that will not yield with a stronger impetus of circulation than the stretched and diseased vessels can bear: so that where there is any suspicion of scirrhus, warm bathing of any sort should never be used. On the other hand, where obstructions are not of long standing, and the impacted matter is not obstinate, warm baths may be of great use to resolve them quickly. In recent colds, with slight humoral peripneumonies, they are frequently an immediate cure. This they effect by increasing the force of the circulation, opening the skin, and driving freely through the lungs that lentor which stagnated or moved slowly in them. As thus conducing to the resolution of obstructions, they may be considered as short and safe fevers; and in using them we imitate nature, which by a fever often carries off an obstructing cause of a chronical ailment. Borelli, Boerhaave, and Hoffman are all of opinion, that the warm *pediluvium* acts by deriving a larger quantity of blood into the parts immersed. But arguments must give way to facts: the experiment related in the Medical Essays seems to prove to a demonstration, that the warm *pediluvium* acts by rarifying the blood. Vid Med. Ess. abr. Vol. I. p. 245. seq.

A warm *pediluvium*, when rightly tempered, may be used as a safe cordial, by which circulation can be roused, or a gentle fever raised; with this advantage over the cordials and sudorifics, that the effect of them may be taken off at pleasure. Med. Ess Edinb. abr. Vol. I. p. 237.

Pediluvia are sometimes used in the small pox; but Dr. Stevenson thinks their frequently tumultuous operations render that suspected, and at best of very doubtful effect; and he therefore prefers Mons. Martin of Lausanne's method of bathing the skin, not only of the legs, but of the whole body, with a soft cloth dipped in warm water, every four hours, till the eruption; by which means the pustules may become universally higher, and consequently more safe. Med. Ess. abr. ib. p. 248.

PEDO, in natural history, a name given by some writers to the *tipula*, or father long-legs; called also by others, *Gruina*, or the crane-fly.

PEDRO *de Porco*, a sort of bezoar, called by the Portuguese *pedro de vassar*, and found in the gall bladders of the wild boars in the Indies. It is usually of the size of a filbert, and of an irregularly oval shape; it is generally of a pale greenish colour, and of a very smooth surface.

This sort of bezoar is extremely valued; the Dutch East India fleets are seldom able to bring home more than five or six of the stones, and they are purchased at three or four hundred livres each, by the opulent burghers, either for presents to the great, or else to be handed down to their posterity in their families; so great is their opinion of their virtues.

The Indians call this species of bezoar, *masticha de scho*, and have as high a veneration for its virtues as the Dutch. The Inhabitants of Malacca also esteem it greatly, not as an antidote against poison, but as a remedy for the mordixi; a disease to which they are subject, and which is as fatal as the plague with us. It is also esteemed a very valuable medicine in the small pox. The method of using it is to suspend it in wine or water, till it has given it an agreeable bitterness; and this is to be drank every morning, and as often beside as the nature of the disorder may require. The common method of keeping it is in a gold box, bored full of holes, and having a gold chain fastened to it: by this means they can dip it into liquors as they please, without taking it out of the box; and by that means prevent the mischiefs it might get by handling. *Bont.* Med. Ind.

PEDUNCLE, among botanists, expresses that little stalk wh ch grows from the trunk or branches of a plant, and supports the parts of fructification, the flower and the fruit, or either: when this is produced from the stalk, it is called *caulinus*; when from the alæ of the leaves, *alaris*; when it terminates the plant or its branches, *terminalis*.

PEDUNCULARIA, in botany, a name by which some authors have called the *staphisagria*, or stavesacre; a plant whose seeds are used to kill vermine. *Ger.* Emac. Ind. 2.

PEE, in mining, is used for the place where two veins meet and cross one another, thus ┼. *Houghton's* compl. Miner, in explan. of the terms

PEGANELÆON, a word used by the antients to express oil, in which the leaves and flowers of rue had been infused and insolated.

PEGANERON, a name given by some old authors to a plaister in which rue was a principal ingredient, from *peganon*, the Greek name of rue.

PEGANON, or PEGANUM, a name used by some authors for the *ruta sylvestris*, or wild rue; called *harmala*, or *harmel*, in the shops. *Ger.* Emac. Ind. 2. See HARMALA.

PEGEMUS, one of the many names by which the Chemists have called mercury.

PEGMA, among the Romans, a wooden machine, used in theatrical entertainments, which was raised and let down by secret engines, whence it was said to grow. *Pitisc.* Lex. Ant in voc.

PEGOMANTIA, Πηγομαντεία, in antiq ity, a species of divination, which was performed with fountain water. See the article HYDROMANTIA.

PEGORELLA, in ichthyography, a name by which some have called a fish of the trutaceous kind, caught in the Mediterranean, and more usually called *callarias*. *Bellonius* de Pisc. See the article CALLARIAS.

PELADA, a kind of alopecia, or distempered state of the body, occasioning the shedding of the hair, arising from a venereal cause. *Castel.* Lex. Med.

PELÆAS, Πελειάς, in zoology, the name by which the antients called that species of pigeon now known by the name of the *livia* and *sassarollo*; a grey pigeon, of a very small size, and with some variegations of purple and green. *Ray's* Ornithol. p. 136. See LIVIA.

PELAGIA, (*Cycl.*) in natural hiftory, a name by which Pliny, and other of the antient naturalifts, have ufually called the *purpura*. See PURPURA.

PELAMYS, in zoology, a name by which the antients expreffed the young brood of the *thynnus*, or tunny fifh, at a certain age and fize; but later writers have appropriated the word for the name of a diftinct fpecies of fifh, of the fame genus, called by others *farda*; and by fome by the two names joined into one, *pelamys-farda*.

It is a fea-fifh, of the fhape of the tunny; but of a fmooth fkin, and free from fcales every where, except about the gill-fins. Its teeth are large, long, and crooked. Thefe are the only external marks by which it is to be known from the young brood of the tunny; but when brought to the table, it is eafily diftinguifhed by the hardnefs of its flefh. *Ray*'s ichthyography, p. 179.

PELAMYS *vera*, a name given by Rondeletius, and fome other authors, to the fifh more diftinctly known by the name of *amia*. *Willughby*'s Hift. Pifc. p. 180. See AMIA.

PELANI, Πελανοι, among the Athenians, a kind of cakes ufed in their libations. *Pott.* T. I. p. 214.

PELATÆ, Πελαται, in antiquity, a particular kind of fervants among the Athenians.

The *pelatæ* were free-born citizens, who, by reafon of their indigence, were forced to ferve for wages. They had no fuffrage in public affairs, as not being mafters of an eftate proper to qualify them for giving their votes; but this reftriction was not perpetual. They were otherwife called *thetes*, and continued in the condition of fervants only during their own pleafure and neceffities; for they had power either to change their mafters, or (if they became able to fubfift themfelves) wholly to releafe themfelves from fervitude. *Pott.* Arch. Græc. T. I. p. 57.

PELECANUS, a name given by fome authors to the *platea*, or fpoon-bill; a bird very different from the pelican, being of the ftork, or heron kind. *Aldrovand.* de Avib.

PELECINUS, in botany, the name of a genus of plants, the characters of which are thefe: the flower is of the papilionaceous kind, and from its cup arifes a piftil, which finally becomes a flat, bicapfular and bivalve fruit, containing feveral flat feeds, ufually approaching to a kidney-like fhape.

There is only one known fpecies of this genus, which is the plant called by fome the fmooth-podded *fecuridaca*, and by others the radiated *lunaria*. *Tourn.* Inft. p. 417.

PELICAN, (*Cycl.*) in the Linnæan fyftem of zoology, makes a diftinct genus of birds of the order of the *anferes*, or goofe kind; the characteriftic of which is to have a beak of a depreffed form, with a hooked point, and furnifhed with a large bag or purfe beneath. *Linnæi* fyftem. Nat. p. 46.

PELLA, in zoology, a name by which many have called the common grey heron. See the articles ARDEA and HERON.

PELLACK, the name of a young fpout-whale, often found in Zetland; where they run into creeks, and fo entangle themfelves among the rocks, that they are caft on fhore, or eafily taken. Phil. Tranf. N°. 473, fect. 8.

PELLAGE, in our old writers, a cuftom or duty paid for fkins or leather. Rot. Parl. 11 *Hen.* IV. *Blount.*

PELLITORY *of Spain*, in the materia medica. See the article PYRETHRUM.

PELLITORY *of the wall.* See PARIETARIA.

PELOPIA, Πελοπεια, in antiquity, a feftival celebrated by the Eleans, in honour of Pelops, for whom that nation had more veneration than for any other hero. For the ceremonies of this folemnity, fee *Pott.* Archæol. Græc. l. 2. c. 20. T. I. p. 429.

PELORIA, Πελωρια, in antiquity, a feftival not unlike the Roman faturnalia, celebrated by the Theffalonians. *Pott.* Archæol. Græc l. 2. c. 20. T. I. p. 425.

PELORIDES, in natural hiftory, a name given by fome to a peculiar fpecies of chama. Bellonius, who firft ufed the word, never gives it alone as the name of the fhell, but only ufes it as an epithet derived from *peloro*, the name of the place where a particular fpecies of chama was very frequent.

PELT-*wool*, wool ftripped of the fkin or *pelt* of a dead fheep. Stat. 8 Hen. VI. c. 22. *Blount, Cowel.*

PELTASTES, Πελτασης, among the antients, one who ufed the buckler called *pelta*. See PELTA, *Cycl*

PELTATED-*leaf*, PELTATUM *folium*, among botanifts. See the article LEAF.

PELVIS (*Cycl.*)—The *pelvis* is the third and loweft part of the trunk, confifting chiefly of two large pieces, called *offa innominata*; which being united anteriorly by a cartilaginous fymphyfis, and pofteriorly to the two fides of the os facrum, reprefent a kind of bafin. When confidered feparately, they are of no determinate figure; being of different breadths in different parts, and unequally convex on the outfide, and unequally concave within. Each bone is but one piece in adults, but in children each confifts of three pieces, joined together by a cartilage; which afterwards perfectly offifies, leaving commonly no veftige of the firft divifion. Anatomifts confider it, however, even in adults, as made up of three portions; and diftinguifh them by different names, as if they were three different bones. Of thefe three bones the largeft is fuperior and pofterior, and is called *os ilium*. The fecond inferior called *os ifchium*: and the third and fmalleft anterior called *os pubis*. Without entering on the particular defcription of thefe, (which, fee under their proper heads) it is to be obferved, that there are in the entire bone feveral common parts, or parts which belong to more portions of it than one, *viz.* a deep cartilaginous cotyloide cavity, called in Latin *acetabulum*: this is formed by all the three portions. A large opening, called the *foramen ovale*, formed by the *os ifchium* and *os pubis*. A large pofterior notch or finus, called the *ifchiatic* notch, and formed by the *os ifchium* and *os ilium*. An oblique eminence, or protuberance, above the *acetabulum*, toward the *foramen ovale*, made by the *os ilium* and *os pubis*: and to thefe may be added, a ridge on the infide the *pelvis*, which divides the wide upper part from the bottom, to which alone the antients gave the name *pelvis* *Winflow*'s Anatomy, p. 69.

PELUS *armena*, in the materia medica, a name given by fome of the old writers to the drug that we at prefent call *bole armoniac*. This was the original name, and the term *bolus armena* is not to be found, but in the later writers.

PEMPHINGODES, an epithet beftowed by Hippocrates on fevers by flatulencies and inflations, in which the patient feels a kind of wind paffing along under the fkin, and the phyfician may perceive it in the fame places rifing againft the preffure of his finger, called by fome an inflative fever.

PEMPTÆUS, a word ufed by medical writers, as the name of an ague, the fits of which return always on the fifth day.

PENDANT-*gardens*. See PENSILES *horti*.

PENDULOUS *roots*, among botanifts, fuch as are fixed to the ends of fibres, whence they feem to hang. See ROOT.

PENDULUM (*Cycl.*)—Mr. Poleni feems to think, that if a long *pendulum* were made to fwing in the place of the meridian, and another of equal length in a plane perpendicular to the meridian, fome difference might be found in their vibrations from the centrifugal force arifing from the earth's rotation about its axis. See Phil. Tranf. N°. 468. fect. I.

Pendulum clocks refting againft the fame rail, have been found to influence each other's motions. See the Phil. Tranf. N°. 453, fect. 5 and 6, where Mr. Ellicot has given a very curious and exact account of this phænomenon.

PENELOPE, in zoology, the name ufed by authors for the bird commonly known in England by the name of the *wigeon*; called alfo in fome places the *whewer*; and by the Germans the *fchmey*. The head and upper part of the neck in this bird are of a reddifh hue, variegated with black fpots; but toward the beak the colour is paler, and blended with fome white and yellow. The upper part of the breaft and the fides are of a deep reddifh hue, and variegated with tranfverfe ftreaks of black, and the back is brown; the head is proportionably fmaller than that of the wild duck. It feeds on weeds and fmall fhell-fifh. *Ray*'s Ornithol. p. 288.

PENETRALE, among the Romans, properly denoted the chapel confecrated to the *penates*, or houfehold gods. *Pitifc.* Lex. Ant. in voc. See PENATES, *Cycl*

PENGUIN, in zoology, a name given by failors of different nations to two different fpecies of water-fowl, both web-footed, and both wanting the hinder toe.

The *penguin* of the Englifh is the bird more commonly known by the name of the *goifugel*.

It grows to the fize of a common tame-goofe, and is black on its back, or upper part, and white on the belly. Its wings are very fmall, and by no means fit for flying. Its beak is fomewhat broad and long, compreffed on the fides and back, and has toward the extremity feveral furrows, feven or eight on the upper fide, and about ten on the under; and the lower chap fwells into a protuberance downward. Its head has two white lines reaching from the beak to the eyes. It tail is very fhort, and it has no hinder toe.

The *penguin* of the Dutch is the *anfer magellanicus* of Clufius. *Ray*'s Ornithol. p. 242. See the article DUCK.

PENICILLI *marini*, in natural hiftory, a fort of marine tubuli, or cafes of fea-worms, making a diftinct genus of thofe fhells. They are defined to be fhelly tubes, very flender, and terminating in the fhape of a painter's pencil; many of them in their native ftate adhering to ftones, &c. on the fea-fhores, by means of a foft and lax fubftance. Some of thefe are white and pellucid, others yellowifh or brown; and the more common fort are about a finger's length, and about the thicknefs of a wheaten ftraw; and fome are of a fort of funnel-like fhape, and have their mouths furrounded by a fort of hairs, or filaments. Thefe are called by fome *probofcipleEtani*, others are called *cadi*, and others *entalia*. *Klein*, de Tubul. Marin. p. I.

PENIS (*Cycl.*)—Bleeding in the vena dorfalis of the *penis* is ufually found to furpafs all remedies whatever in abating inflammatory diforders of this member. This large vein, which runs along the back or upper fide of the *penis*, being generally pretty much diftended and confpicuous in an inflammation of this part, may be opened about the middle, and kept bleeding till the member becomes flaccid, and a fufficient quantity of blood be difcharged proportionably to the urgency of the cafe; which done, a comprefs muft be applied, and kept on by bandage. There muft, however, be great caution in this operation not to injure the arteries or nerves which enter the *penis* near this vein, as alfo not to make the bandage too

ſtrict, by which the inflammation and ſymptoms may become worſe than before. *Heiſter's* Surgery, p. 284.

PENIS *primus muſculus*, in anatomy, a name given by Veſalius and others, to a muſcle of the *penis* now generally known by the name of *accelerator*.

PENITENTS, in the church of Rome. See POENITENTES.

PENNANT, in a ſhip, a ſhort rope made faſt at one end to the head of the maſt, or to the yard-arm, with a block at the other end, and a ſhiver to receive ſome rope into. All the yard-arms, except the miſen, have *pennants*.

PENNATED-*leaf*, in botany. See LEAF.

PENNEVISCH, in zoology, a name given by ſome to the moſt common ſpecies of the fiſh called *bagre*, caught in the Eaſt and Weſt Indies. *Ray's* Ichthyol. Append. p. 4. See the article BAGRE.

PENNY (*Cycl.*) — PENNY-*earth*, in agriculture, a term uſed by the farmers for a hard loamy, or ſandy earth, with a very large quantity of ſea ſhells intermixed in it; ſome of which being round and flat, and in ſome meaſure reſembling pieces of money, have occaſioned the earth's being called by this name. It is an earth not eaſily dug, but is uſually undermined with pick-axes, and then falls in large lumps; which, with the froſts, break to pieces, and leave the ſhells looſe. It is prepared by breaking and mixing well with water, and then makes very deſirable floors. The Jerſey combers combpots are alſo made of it, and the ſides and roofs of ovens are plaiſtered with it; and being rightly managed, it combines into a floor almoſt as ſtrong as plaiſter of Paris. *Moreton's* Northampt. p. 66.

PENNYROYAL, *pulegium*, in botany, &c. See PULEGIUM. The ſeveral ſorts of *pennyroyal* all propagate themſelves very faſt by their trailing branches, which take root at every joint; ſo that no more is required in their culture and propagation than to cut off and plant out theſe rooted branches: they ſhould be planted at a foot diſtance every way, that they may have room to grow. The beſt ſeaſon for this is in September, that the plants may be rooted before winter. They love a moiſt ſoil, and generally grow very faſt. *Miller's* Gardener's Dict.

PENSILES-*horti*, in antiquity, gardens raiſed on arches by the kings of Babylon. Q. Curtius makes them equal in height to the walls of the city, *viz.* fifty feet. Trees of a very large ſize grew and flouriſhed here. *Hofm.* Lex. in voc. *Q. Curt.* l. 5. c. 1.

PENTACEROS, in natural hiſtory, a name given by Linkius, and ſome other authors, to a kind of *ſtella marina*, or *ſea ſtar-fiſh*, compoſed of five principal rays, with ſeveral tranſverſe hairy or downy proceſſes.

PENTACTINODOS, in natural hiſtory, a name given by ſome authors to thoſe ſpecies of ſtar-fiſh which are compoſed of a body divided into five rays.

PENTADACTYLON, *five fingers*, in botany, a name given by ſome authors to the *ricinus* or *palma chriſti*, from the figure of its leaf. *Ger.* Emac. Ind. 2.

PENTADACTYLOS *piſcis*, *the five fingered fiſh*, in zoology, the name of a fiſh common in all the ſeas about the Eaſt Indies, and called by the Dutch there *viif vinger viſch*.

It has this name from five black ſtreaks which it has on each ſide, reſembling the prints of five fingers. It grows to about a foot and a half long, and its head is ſmall in proportion to its body. Its ſnout is long, and its fins large, and reaching almoſt to its tail. Its general colour is very bright and elegant, a yellow with an admixture of purple and of a ſilvery gloſs. It has no ſcales, and is a dry but not ill-taſted fiſh. *Ray's* Ichthyogr. Append. p. 6.

PENTADACTYLOS-ASTER, in natural hiſtory, a name given by Linkius, and ſome other authors, to a ſpecies of *ſtar-fiſh*, compoſed of a ſmall body, and five principal rays, which have each ſeveral proceſſes coming from them, covered with down.

PENTAEDROSTYLA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek πέντε five, ἕδρα ſides, and στῦλος a column.

The bodies of this genus are ſpars, in form of pentangular columns, terminated by pentangular pyramids at one end, and irregularly affixed at the other to ſome ſolid body.

Of this genus there are three known ſpecies: 1. One with a very long pyramid. This is found in the mines on Mendip-hills. 2. One with a thick column, and a very ſhort and large pyramid. This is found in the Hartz foreſt in Germany and in Cumberland. And 3. One with a broad depreſſed pyramid. This is found, ſo far as is yet known, only in the mines at Rammelſberg in the Hartz foreſt in Germany. *Hill's* Hiſt. of Foſſ. p. 220.

PENTAGON-ASTER, in natural hiſtory, a name given by Linkius, and other authors, to a kind of *ſtella marina*, or *ſtar-fiſh*, compoſed of five rays, with a number of tranſverſe proceſſes iſſuing from them, covered with a hairyneſs.

It is one of the general claſſes of the *ſtellæ crinitæ*, ſo called from this hairyneſs.

PENTAGONOTHECA, in botany, the name given by Vaillant to the plant called by Linnæus, Plumier, Houſton, and others, *piſonia*. It has this laſt name from Piſo, the great botaniſt, and the other from the figure of its ſeed-veſſel, which is of a ſort of pentangular figure, but contains only one cell. *Vaillant* Act. Germ. See PISONIA.

PENTANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with five ſtamina or male parts in each. See Tab. 1. of Botany, Claſs 1.

The word is formed of the Greek πέντε five, and ἀνὴρ male. Of this claſs of plants are the primroſe, willow-herb, bindweed, &c.

PENTANGLE, in geometry, a figure with five angles.

PENTAPHARMACUM, a medicine conſiſting of five ingredients: it has alſo been uſed in the ſame ſenſe to aliments. Adrian the emperor was, as we are informed, particularly fond of a diſh of five ingredients, called by this name. The ingredients were the udder of a ſow, ham, peacock, brawn, and a ſort of paſte.

PENTAPHYLLOIDES, in botany, the name of a genus of plants, the characters of which are theſe: The flower and fruit are the ſame with thoſe of the common cinque-foils, but the leaves do not grow as in that at the tops of the ſtalks, but arranged along them, as in the other plants.

The ſpecies of *pentaphylloides*, enumerated by authors, are theſe: 1. The erect *pentaphylloides*, called by authors the *ſtrawberry-cinque-foil*. 2. The procumbent *pentaphylloides*, called by authors the *creeping ſtrawberry-cinque-foil*. 3. The ſilvery *pentaphylloides*, with alated leaves, called by authors, *argentina*, *potentilla*, *ſilver-weed*, and *wild tanſy*. 4. The upright ſhrubby *pentaphylloides*. 5. The red-flowered marſh *pentaphylloides*. 6. The red-flowered marſh *pentaphylloides*, with thicker and hairy leaves. *Tourn.* Inſt. p. 298.

PENTAPLEURUM, a name given by ſome botanical writers to the common ſmall plantain, uſually called *ribwort* and *plantago quinquenervia*, from its leaves always having juſt five ribs running along them.

PENTAPTEROPHYLLUM, in botany, a name by which Dillenius has called the *myriophyllum* of other authors, charactered under that name in the genera plantarum of Linnæus, p. 459. See MYRIOPHYLLUM.

PENTAUREA, a name given by ſome fabulous authors to a ſtone ſaid to have been firſt found by Apollonius Tyaneus, and to poſſeſs the virtues of all the other ſtones, and to attract them all to it, as the magnet does iron.

PENTECONTARCHA, among the antients, the captain, or commander of a galley, called *penteconteros*. *Pitiſc.* Lex. Ant. in voc. See PENTECONTEROS, *Cycl.*

PENTELICUM-*marmor*, in the works of the antients, a name given to a very beautiful and gloſſy ſpecies of white marble, of which many of the columns and ſtatues of larger ſize of the antients were made: the Parian marble, from certain cracks and fiſſures in the ſtrata, ſeldom affording blocks of more than five foot in length.

PENTEXOCHE, a name given by authors to a ſpecies of echinites, reſembling the ripe fruit of a medlar, and thence called alſo *meſpileus lapis*.

PENTHORUM, in botany, the name of a genus of plants, the characters of which are theſe: The cup is very ſmall and permanent; it is compoſed of one leaf divided into five ſegments at the edges. There is no flower, the ſtamina are ten ſetaceous filaments of double the length of the cup. Theſe are permanent, the antheræ are roundiſh and fall off very quickly. The germen of the piſtil is divided into five parts, and terminates in five ſtyles, which are conic, erect, and of the length of the ſtamina. The ſtigmata are obtuſe; the fruit is a capſule divided into five parts, and containing five cells. The ſeeds are numerous, ſmall, and compreſſed. *Linnæi* Gen Plant. p. 204.

PENTODRYON, in botany, a name given firſt by the Greek writers, and after that by the Romans, to a kind of *ſtrychnum* or *nightſhade*, which cauſed madneſs in thoſe who eat of it. This was called by others *manicum ſtrychnum*, and by ſome ſimply *manicum*.

PENTOPHTHALMOS, in zoology, the name of an Eaſt Indian fiſh, approaching to the European *liparis* or *butterfiſh*, but larger, and called by the Dutch there *viifoog*. It has theſe names from five round ſpots in the tail-fin, reſembling five eyes. It is of a yellowiſh colour, and is covered with a ſmooth ſkin, having no ſcales. Its body is thick; its head ſmall; its beak long. It has two red fins, and its tail is bluiſh. It is an inhabitant of the freſh waters, and is a very well-taſted fiſh. *Ray's* Ichthyogr. Append. p. 6.

PEPIN-*cyder*. See CYDER.

PEPITA, in the materia medica, a name given by ſome authors to the *faba ſancti Ignatii*, or *St. Ignatius's bean*. *Dale* Pharm p. 328.

PEPLION, or PEPLOS, names given by the antients to medicines which they uſed as briſk cathartics to purge off the bile and other humors.

PEPLIUM, in botany, a name given by the antient Greek writers to a ſhrub which had pinnated leaves and papilionaceous flowers. It is tranſlated by many *ſena*; but this does not appear certainly to be right: the ſeveral ſpecies of *colutea* agree as well with this deſcription as the *ſena*, and they have indeed been called *ſena* by many; probably it was one of theſe.

PEPLUS,

PEPLUS, Πεπλος, among the antients, a kind of garment worn by women. *Pitisc.* in voc.

The *peplus* was a long robe that reached to the feet, without any sleeves, and so exceeding fine that the shape of the body could easily be discovered through it. Hist. l'Acad. Inscr. vol. 3. p. 401.

The *peplus* of Minerva is very famous among antient mythologists. The Athenians used a great deal of ceremony in the making the *peplus*, and dressing the statue of this goddess with it. See *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 421.

PEPLUS, in botany, a name given by some authors to the smaller round-leaved species of *tithymal*, or *spurge*, as they call the narrow-leaved ones *esula*. See the article TITHYMALUS.

PEPO, the *pompion*, or *pumpkin*, the name of a genus of plants allied to the melon and cucumber kinds. The characters of the genus are these: The flowers consist of one leaf each, shaped like a bell, wide open at the mouth, and divided into several segments at the end. Of these flowers some are male or steril, having no embryo; others are female or fruitful, having an embryo, which ripens into a large fruit, with sometimes a smooth, sometimes a rough bark. The figure is sometimes oval, sometimes round, and the bark often very hard, tuberous, and hollow: it is divided into three cells within, and contains flat seeds surrounded with a sort of ring, and fixed to a spongy placenta.

The species of *pompion*, enumerated by Mr. Tournefort, are these: 1. The great long-fruited *pompion*. 2. The great round-fruited *pompion*. 3. The orange-fruited *pompion*. 4. The ball *pompion*, or *ball gourd*, called by authors *cucurbitula pilæ palmariæ figura*. 5 The small round fruited-*pompion*, called the *small rough-fruited yellow gourd*. 6. The round-fruited variegated *pompion*. 7. The *pompion* with a variegated fruit of a turbinated form. 8. The turbinated white *pompion*. 9. The turbinated yellow *pompion*. 10. The least turbinated *pompion*. 11 The pear-fashioned *pompion*. 12. The oval yellow *pompion*. 13. The rough oval yellow *pompion*. 14. The variegated yellowish oval *pompion*. *Tourn.* Inst. p. 105.

We generally esteem the *pompion* but an unwholsome food, but there is another use in it worth enquiring into. The world heard much of the fame of a secret medicine prepared by Petrus de Castro, chief physician to the duke of Mantua, for the cure of pleurisies. When the secret of this was discovered and published in the Acta Leipsiensia, it appeared to be no more than the rinds of the oblong Italian *pompions*, pared clean from the pulp, and boiled many hours together in old oil of olives.

PEPPER (*Cycl.*) — *Ciapa* PEPPER, *pimienta de Ciapa*, a name given by the Spaniards to a sort of spice which they discovered in Ciapa, a province of Guatimala in New Spain, and of which they were at first very fond, both in food and medicine.

In medicine it is a very good cephalic and stomachic. It is recommended very strongly also by some of the Spanish writers, as a cure for the epilepsy and the gutta serena, but those who have tried it in these cases do not confirm such accounts.

The descriptions we have of it are, that it has the taste of cloves, pepper, cinnamon, and ginger, all blended together; and Redi is of opinion, that it is no other than our *pimenta*, or *Jamaica pepper*. *Redi's* Esperien.

PEPPER-*mushroom*, in botany, a name given by Dr. Lister to a new species of fungus, discovered by him in the woods of Yorkshire, whose juice is acrid and hot as pepper. This is somewhat larger than the common esculent mushroom, but of the same shape with that, having a round head and open gills underneath. The head is very fleshy, and the pedicle also is solid, not hollow, as in most other of the larger fungoses: any part of this *mushroom* being cut or broken, it bleeds very freely a white milky juice, like that of the tithymals. This juice tastes like pepper, only that it is much hotter. It is not viscous or clammy to the touch, and the air does not much discolour it; nor does it render the blade of the knife, with which it is cut, black, as most other vegetable juices do. When let out of the plant it very soon concretes into a firm and dry mass, making a sort of cake; and when thus dried into a solid substance, it retains its white colour and pungent taste. It is very remarkable, that this *mushroom*, tho' so hot to our tongues as not to be endured, yet is so well suited to the palates and nature of certain insects, that they can not only feed on it, but live comfortably in the midst of it. The yellow naked snail feeds greedily on the plant while growing, and the stalks of it at such times as the juice is sharpest of all, that is, while it is growing to the full size, are full of the maggots or worms hatched from the eggs of flies, deposited there for a nidus and food for them in that state. The juice has a great affinity with euphorbium, and may be brought into medicinal use, perhaps, to very good purpose.

John Bauhine describes a *mushroom* much resembling this, but smaller and less fleshy; and the Prussians and Polanders have a sort of great *mushroom*, which they call *groozdishys*, which agrees with this in many particulars; but it is larger and thicker. Phil. Trans. N° 89. See the article GROOZDISHYS.

PEPPER-*tree* of Jamaica. See PIMIENTA.

PEPPER-*water*, a liquor prepared by the curious for examination by the microscope, as always affording a great number of small animals.

The method of preparing it is this, put common black *pepper* grossly powdered, into an open vessel so as to cover the bottom of it half an inch thick, and put to it rain or river water, till it covers it an inch, shake or stir the whole well together at the first mixing, but never disturb it afterwards: let the vessel be exposed to the air uncovered; and in a few days there will be seen a pellicle or thin skin swimming on the surface of the liquor, looking of several colours.

This is a congeries of multitudes of small animals; and being examined by the microscope, will be seen all in moti n: the animals, at first sight, are so small as not to be distinguishable, unless to the greatest magnifiers; but they grow daily till they arrive at their full size. Their numbers are also continually increasing, till the whole surface of the liquor is full of them, to a considerable depth. When disturbed they will sometimes all dart down to the bottom, but they soon after come up to the surface again. The skin appears soonest in warm weather, and the animals grow the quickest; but in the severest cold it will succeed, unless the water freezes. *Baker's* Microscope, p. 71.

About the quantity of a pin's head of this scum, taken up on the nib of a new pen, or the tip of a hair pencil, is to be laid on a plate of cle r glass; and if applied first to the third magnifier, then to the second, and, finally, to the first, will shew the different animalcules it contains, of several kinds and shapes as well as sizes Phil. Trans. N° 284.

The animalcules found in this liquor, are principally of six kinds: 1. The largest kind of all is in length about the diameter of a hair, and of scarce a fourth part of that measure in breadth: they are very thin and transparent, but their back is darker than their belly: they turn about very frequently and nimbly in the water; their sides are fringed with a great number of minute feet, which are seen principally at the two ends; and at one end there are also some bristles longer than the feet, which make a sort of tail. They are very nimble, and walk as well as swim, and will climb up a hair if put in among them.

2. There is a smaller sort, whose length is about a third of a hair's breadth; but their tail is five or six times as long as their body. This they either carry strait, or in a spiral form; and at the other end they thrust out a sort of bearded tongue: these make a constant current of water toward them.

3. There is a smaller sort than these, which are sometimes seen of an oval figure, and sometimes long and flat like a flounder: these also have feet which are plainly seen when the water is evaporating.

A fourth kind appear like slender worms, fifty times as long as broad: their thicknesss is not above the hundredth part of a hair's breadth; and they move with equal ease either forward or backward. There are a fifth sort extremely minute and round; and a sixth kind which are longer than these, but not larger; and probably there may be yet many kinds not discovered. These small animals are easily destroyed; a little dissolved salt or sugar, or spirit of vitriol, or even spittle will kill them; and in the drying away of the waters many of them burst. Phil. Trans. N° 203

PERÆQUATORES, among the Romans, assessors appointed to regulate the *census* according to every man's circumstances, by easing those that were overcharged, and raising the taxation if too low. *Pitisc.* in voc.

PERANEMA, in zoology, the name of a Brasilian fish, of the size of the pearch, being ten or eleven fingers in length, and about three fingers broad in the broadest part.

Its mouth is large and round, and has no teeth, but several very rough and sharp prominences. Its eyes are large, and it has one long fin running down the back, which is supported by rigid and prickly rays. Its tail is not forked; its whole body is a silvery white, with a faint blush of red. Its scales are extremely small, and of a triangular figure, and its belly is very white. It is a sea fish, and is wholesome and well-tasted. *Marggrave's* Hist. Brasil. *Willughby's* Hist Pisc. p. 339.

PERANITES, the name of a stone mentioned with many idle stories of its origin, by the writers of the middle ages.

It seems originally to have been only a corruption of the word *peartides*, a name by which the antients seem to have called our *stalactites* or *dropstone*

PERCA, the *pearch*, in the Linnæan system of zoology, the name of a genus of fishes of the order of the acanthopterygii. The characters of these are, that the membrane of the gills has seven bones, and the back has one or two fins. Of this genus are the *perca*, *lucioperca*, *lupus*, &c. *Linnæi* Systema Naturæ. p. 53.

In the Artedian system of ichthyology, the characters of the *pearch* are these: It is of the acanthopterygious kind. The branchiostege membrane on each side, contains seven bones. The scales are very hard and rough, or armed with a sort of little

little hooks at the ends; and the upper lamina of the coverings of the gills is ſerrated at the edges. There are ſometimes two fins on the back, ſometimes only one.

Of the former ſort, or thoſe which have two fins on the back, the ſpecies are, 1. The *pearch* with ſix tranſverſe black lines, and with the fins of the belly red. This is our common *pearch*. 2. The pale ſpotted *pearch*, with two teeth in the jaws, on each ſide, larger than the others. This is the *lucioperca* or *barſe*. 3. The *pearch* with eight or nine black tranverſe lines on each ſide. This is the *aſper piſciculus* of authors.

Of thoſe *pearch* which have only one fin on the back, the following are the ſpecies: 1. The *pearch* with one back-fin, and a cavernous head. This is the *cernua* of authors. 2. The *pearch* with one back-fin, with black longitudinal lines on each ſide. This is the fiſh called by the Germans *ſchraitſer*. 3. The *pearch* with ſeven tranſverſe black lines on each ſide, and with red and blue marks on the head and belly. This is the *perca minima auctorum*. 4. The *pearch* with thirteen rays in the back-fin, and forty in the *pinna ani*. This is the *labrax* of authors, by ſome called the *lupus marinus*; and by others *ſpigola*; we call it a *baſſe*. *Artedi* Gen. Piſc. p. 38.

The name *perca* is of Greek origin, and is derived from the word πέρκος, which ſignifies variegated with black or duſky ſpots; a character common to moſt of the ſpecies of this fiſh.

The common *pearch* affords good ſport for the angler. The beſt time for their biting is, when the ſpring is over, and before the heats of ſummer come on. At this time they are very greedy, and the angler, with good management, may take at one ſtanding all that are in the hole, be they ever ſo many.

The proper baits are a minow or young frog; but the worm called the *brand ing*, well ſcowered, is alſo excellent at all times of the year. When the *pearch* bites, he ſhould always have a great deal of time allowed him to ſwallow the bait. The *pearch* will bite all day long, if the weather be cloudy; but the beſt time is from eight to ten in the morning, and from three till ſix in the afternoon. The *pearch* is very abſtemious in winter, and will ſeldom bite in this ſeaſon of the year; if he does at all, it is in the middle of the day; at which time indeed all fiſh bite beſt at that ſeaſon.

If the bait be a minow, which is the bait that affords moſt diverſion to the angler, it muſt be faſtened to the hook alive, by putting the hook thro' the upper lip or the back-fin; it muſt be kept at about midwater, and the float muſt be a quill and a cork, that the minow alone may not be able to ſink it.

The line muſt be of ſilk, and ſtrong; and the hook armed with a ſmall and fine wire, that if a pike ſhould take the bait, as is not unfrequently the caſe, he may be taken. The way to carry the minows or ſmall gudgeons alive for baits, is this: A tin pot is to be provided with holes in the lid, and filled with water, and the fiſh being put in this, the water is to be changed once in a quarter of an hour by the holes, without taking off the lid at any time, except when the bait is to be taken out.

A ſmall caſting-net made for theſe little fiſh ſhould be taken out with the *pearch* tackle, and one or two caſts of this will take baits enough for the day, without any farther trouble. When the bait is a frog, the hook is to be faſtened to the upper part of the leg. The beſt place for the fiſhing for *pearch* is, in the turn of the water near ſome gravelly ſcour. A place of this kind being pitched upon, it ſhould be baited over night with lobworms choped to pieces; and in the morning on going to it, the depth is to be regularly plumbed, and then the hook is to be baited with the worm or other bait; and as it drags along, the *pearch* will ſoon ſeize upon it.

Perca *amboinenſis*, in zoology, the name of a freſh water fiſh, ſomewhat reſembling our pearch, but differing in that it is of a brown colour, and has ſeveral blue lines under its ſnout, and ſome blueneſs in the adjoining fins, but its back and belly fins are green. It is caught in the lakes and rivers of freſh water, at Amboina, and is a very delicately taſted fiſh. *Ray*'s Ichthyogr. Append. p. 1.

Perca *aurata*, the *gilded pearch*, a fiſh of the ſhape of the pearch, but remarkable for a gold colour about its gills: it is common in our rivers, and is called in Engliſh a *ruffe*; its more common name among authors is *cernua*. *Geſner* de Piſc. p. 825. See Cernua.

Perca *marina*, the *ſea pearch*, in zoology, the name of a ſea fiſh, much reſembling the common freſh water pearch in ſhape, ſize, and colours, but ſomething thinner in proportion to its length, and more variegated.

Its back is variegated with ſix or ſeven blackiſh tranſverſe lines, like thoſe of the pearch, and the intermediate ſpace is of a ſomewhat reddiſh hue, eſpecially toward the head. Its whole head, and part of its belly, are very elegantly variegated with red and blue ſtreaks. Its back fin is of a pale yellow, with ſeveral reddiſh yellow ſpots, and is very long, and has its anterior rays terminated in ſpines. Its mouth is extremely wide, and almoſt always gapes open; its teeth are ſharp, and its eyes very large. It is very common in the Mediterranean, and is a well-taſted fiſh. *Rondelet.* de Piſc. p. 170. *Geſner* de Piſc. p. 819.

PERCOLATION (*Cycl.*)—Many have attempted the condenſing of wines by *percolation*, or ſeparating from them that ſuperfluous moiſture or water, which dilutes them below the true ſtandard of vinous liquors, in order to make them richer and fitter for keeping; but it does not appear that ſuch attempts have as yet ſucceeded. See *Stahl*, de concentr. vin.

PERCUNOS, the name of an antient Pruſſian idol. See the article Potrimpos.

PERCUSSION (*Cycl.*)—If an elaſtic body ſtrike a larger elaſtic body at reſt, the ſmaller body will always rebound, and move in a contrary direction to what it did at firſt, and alſo give the larger body a greater quantity of motion than what was originally in the ſmaller body. And this quantity of motion communicated, may be greater than the original motion, in any ratio leſs than that of 2 to 1. For ſuppoſing the ſmall body and its velocity, to be denoted by unity, and the larger body at reſt by x, the velocity of x after the ſhock will be $\frac{2}{1+x}$, and its quantity of motion will be $\frac{2x}{1+x}$. But tho' the proportion of $2x$ to $1+x$ increaſes when x increaſes, yet its limit will be the proportion of 2 to 1; which is the limit to which the motion of x may approach indefinitely near.

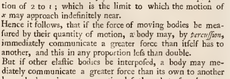
Hence it follows, that if the force of moving bodies be meaſured by their quantity of motion, a body may, by *percuſſion*, immediately communicate a greater force than itſelf has to another, and this in any proportion leſs than double.

But if other elaſtic bodies be interpoſed, a body may mediately communicate a greater force than its own to another larger body x, in any proportion leſs than that of $x\sqrt{x}$ to 1. Thus if $x = 1000000$, the body 1 with the velocity 1, may, by the means of intermediate bodies, give it the force 999000000; and the ſum of the abſolute forces of all theſe bodies taken together, ariſing from the *percuſſion*, may exceed the force of the firſt or unity, in any ratio leſs than $2x\sqrt{x}$ to 1, or 2000000000 to 1, altho' the relative force in all caſes remains as at firſt $= 1$.

Theſe are paradoxes which cannot be urged againſt thoſe who maintain the forces of bodies to be meaſured by their maſſes and the ſquares of their velocities.

It is alſo to be obſerved, that thoſe who meaſure force by the quantity of motion, muſt deny that there is any force loſt by the impreſſions made on ſoft bodies, or by the bending of elaſtic bodies: for if any were loſt from ſuch cauſes, the ſum of the quantities of motion of bodies moving the ſame way, could not remain the ſame before, during, and after the ſhock, which is an univerſal rule admitted by the Newtonians. But they admit that a ſpring bent between two bodies may, by unbending itſelf, generate motion in theſe bodies. Hence it follows, that according to this doctrine, tho' a ſpring may give motion to bodies, it cannot, by a contrary action, take it away; which ſeems no ſmall paradox.

If a body A move towards the body C, at reſt, and an intermediate body B of a mean magnitude be placed at reſt between them, ſo that A firſt impels B, and then B impels C, a greater motion will be given to C than if A had ſtruck it directly. And if B be a mean proportional between A



and C, the velocity communicated to C will be the greateſt that can be. *Huygens*, de mot. Corp. ex Percuſſ. Prop. 12.

If more bodies be interpoſed between A and C, the motion of C will be greater; and it will be the greateſt when the bodies interpoſed conſtitute a ſeries of mean proportionals between A and C. Ibid. Prop. 13.

If there be a ſeries of an hundred bodies in the proportion of 1, 2, 4, 8, 16, &c. and the motion begins by the greateſt body, the velocity communicated to the ſmalleſt will be to that with which the greateſt moved nearly as 2,338,500,000,000 to 1. And if the motion begins by the leaſt body, the quantity of motion will be increaſed on the whole nearly as 1 to 4,677,000,000,000. *Huyg.* ib.

But it is to be obſerved, that there is a miſtake in the impreſſion of Huygens's book, as to the firſt number, which is there printed 14,760,000,000, inſtead of 2,338, &c. ſo that the velocity thus given to the ſmalleſt body is 150 times greater than what the printed copy of Huygens aſſigns. *Bernoulli*, Diſc. ſur le Mouv. Oper. Tom. 3. p. 34. and *S. Graveſande*, Pref. ad Huygen Oper. Poſth. Tom. 2. Amſt. 1728.

This ſtupendous augmentation of the quantity of motion, is a remarkable inſtance of the falſity of the Cartesian principle,

ciple, that the same quantity of motion is always preserved in the world.

Some have thought this augmentation no small difficulty against those who maintain the moving force or power of action in bodies, to be proportional to their quantities of motion. This difficulty does not press the Leibnitians; for it is to be observed, that notwithstanding the prodigious increase of motion here assigned, yet there is no increment of the *vis viva* of this system of bodies. See the articles FORCE and VIS *viva*

A learned author has urged, that if the force of bodies were in proportion to their quantities of motion, the increase in the motion here mentioned might be employed to restore the motion of the first body, and hence make a perpetual motion. But it is answered, that as the motion of the last is increased in the same direction with the first, the motion of all the rest will be in the contrary direction, and equal to that of the last diminished by unity: hence the sum of the motions in the same direction, remains as it did, equal to that of the first and smallest body, which we suppose unity. See *Maclaurin's* Demonstrat. des Loix du choc des Corps, p. 21. Paris, 1724. and *S. Gravesand*, rem. sur la possibilité du mouvement perpetuel in Journ. Liter.

It is to be observed, that there is a limit which the velocity communicated to the last body never amounts to, (supposing the first and last bodies, and the velocity of the first before the stroke, to be given) but to which it approaches continually, while the number of such bodies interposed between the first and last is always increased. And this limit is to the velocity of the first body before the stroke, in the subduplicate ratio of the first body to the last.

Mr. Huygens has not mentioned this limit, but the curious may see the determination of it in Mr. Maclaurin's fluxions, art. 514. In the case mentioned by Huygens, this limit will be a number expressed by fourteen figures, for its logarithm is 14.9004850.

PERDIX, the *partridge*, a bird well known and esteemed at table, of which naturalists enumerate five species. 1. The common *partridge*. 2. The Brasilian *partridge*, called *iambu*, of a dusky yellow colour, spotted with brown: of this there are two species, a larger and a smaller. See the article IAMBU. 3. The *perdix damascena* of Aldrovand, which resembles our *partridge*, but its feet are yellow and its beak longer. 4. The red-legged *partridge*, common in France and Italy, and called there *cotumo*. See COTUMO. And, 5. The Græcian *partridge*, which is twice as large as ours, and not seeming to differ from the *cotumo* in any thing but size: they are all very finely tasted birds, but none are so delicate as the *cotumo*. *Ray's* ornithology, p. 119.

PERDIX *alba*, the white *partridge*, a name given by many to the *lagopus*, a rough-footed bird of the gallinaceous kind, common on the snowy mountains, and by some called the *rabolane*. See the article LAGOPUS.

PERDIX *marina*, the *sea-partridge*, a name given by some authors to the foal-fish, from the firmness and delicacy of its flesh. *Bellon.* de Aquat. Vol. I. p. 34.

PERDIX, in conchyliology, a name given by authors to a genus of shells, supposed to resemble the partridge in the shades and disposition of the colours.

The partridge-shell is of the *dolium*, or *concha globosa* class, and is striated and spotted in a peculiarly elegant and regular manner. See DOLIUM.

PERDONIUM, a term, invented by Paracelsus, to express wine medicated with herbs.

PEREGRINATORES, in botany, a name for such students in that science as have taken long journies, and visited the remotest regions, in search of plants. *Linnæi* Fund. Bot. p. 1.

PERETERION, a name given by chirurgical writers to the perforating part of the trepan.

PERFECT, *perfecti*, in church history, a designation which the followers of Valentinus assumed to themselves. *Hoffm.* Lex. invoc.

PERFOLIATA, the same with bupleurum, or hare's ear; a plant recommended by authors as a vulnerary of the first class. It is applied externally to contusions, fresh wounds, and luxated joints. There are many who esteem it a remedy even for the king's evil, and its virtues in the cure of navel-ruptures have long been famous: but all this wants proof. See HARE'S *ear*.

PERFOLIATE-*leaf*, among botanists. See LEAF.

PERFORATA, in botany, a name given by some authors to the *hypericum*, or St. John's wort, from the small holes seen all over its leaves, if held up to the light. *Ger.* Emac. Ind. 2.

PERFORATUS (*Cycl.*)—PERFORATUS *brachii*, in anatomy, a name given by Placentini to a muscle of the arm, now generally known by the name of the *coraco-brachialis*. It has been by many disputed not to be a distinct muscle. Vesalius calls it only *pars interioris principii cubitum flectentium primi carnosa*, esteeming it only a part of that muscle. Many of the writers who followed Vesalius have given it also the name of *pars* and *portio*, not esteeming it a distinct muscle: and Casserius, who wrote after Placentini, calls it only *portio carnosa*, and censures that author for thinking it a distinct muscle, and calling it *perforatus*.

PERIAMMA, a word used by some medical writers to express an amulet.

PERIANTHIUM, in botany, expresses that sort of cup which consists of several leaves, or else of one leaf divided into several segments, and surrounds the lower part of the flower. See the article CALYX.

PERIAGOGE, Περιαγωγή, in rhetoric, the same with peribole. See the next article.

PERIBOLE, a word used very frequently by Hippocrates, and in different places, in very different senses. Sometimes it signifies a translation of the humors from one part to another; sometimes only the dress or garments of a patient. In the first of these senses, the word is frequently used to express a translation of the morbific matter from the center to the surface, in the termination of a disease, by the breaking out of pustules all over the body.

PERIBOLE, Περιβολή, in rhetoric, is used where many things are accumulated into one period; which might have been divided into several. We have an instance in Cicero's defence of Flaccus: *Quod si esset aliquando futurum, ut aliquis de L. Flacci pernicie cogitaret; nunquam tamen existimavi, Judices, Decium Lælium, optimi viri filium, optimâ ipsum spe præditum, summæ dignitatis, eam susceptu rum accusationem, quæ sceleratorum potius civium odio, & furori, quam ipsius virtuti, atque institutæ adolescentiæ, conveniret.*

Now this long period might very well have been divided into the three following: 1. *Quod si esset aliquando futurum, ut aliquis de L. Flacci pernicie cogitaret; nunquam tamen existimavi, judices, Decium Lælium, eam susceptu rum accusationem.* 2. *Est enim is optimi viri filius, optimâ ipse spe præditus, summæ dignitatis.* 3. *Accusatio vero hæc sceleratorum potius odio et furori, quam ipsius virtuti atque institutæ adolescentiæ, conveniret.* *Vossii* Rhet. l. 6. p. 439. seq. See PUNCTUATION, *Cycl.*

PERICALAMITIS, in the materia medica of the antients, a name given by some to the *adarce*.

We find the word *pericalamitis* in a description recorded in Galen, and it has generally been understood to mean *styrax*, that being called *calamita*: but the *adarce* is the thing signified by the name, which expresses its manner of formation, it being always found concreted about the stalks of reeds that grow on the edges of waters. *Galen* l. 1. See ADARCE.

PERICARDIUM (*Cycl.*)—We read of a *pericardium* of a monstrous size, out of which above three pounds of coagulated blood and serum were taken. See Medic. Ess. Edinb. Vol. V. art. 56.

PERICARPIUM, among botanists, a covering or case for the seeds of plants: it is the germen of the pistil enlarged. There are no less than nine species of *paricarpia*: 1. A capsule. 2. A conceptaculum. 3. A pod. 4. A legume. 5. A nut. 6. A drupe. 7. An apple. 8. A berry. 9. A strobilus. See CAPSULE, CONCEPTACULUM, &c.

PERICHAREIA, a word used by the antients to express a sudden surprize of joy, such as has been frequently known to occasion death.

PERICHRISIS, a word used by the antients for a liniment, principally of the oleaginous or spirituous kinds, and as thin and fluid as oil.

PERICLASIS, a word used by the antients for a fracture of a limb, attended with a large wound, by which the broken ends of the bone, or part of it, are laid bare.

PERICLYMENUM, *wood-bind* or *honey-suckle*, in botany, the name of a genus of plants, the characters of which are these: the flower consists of one leaf, and is tubular, and divided into several segments at the edges; the cup finally becomes a roundish juicy fruit or berry, containing a compressed seed of a rounded shape.

The species of *periclymenum*, enumerated by Mr. Tournefort, are these: 1. The ever green Virginian long flowering *periclymenum*: and, 2. The yellow flowered Indian *periclymenum*. *Tourn.* Inst. p. 608.

PERICNEMIA, a word used by some medical writers for the parts about the calf of the leg.

PERIDONIUS *lapis*, in natural history, a name given by some of the writers of the middle ages to the *pyrites*, which they call also *perithe*.

PERIDROMIDES, Περιδρομίδες, in antiquity. See XYSTI.

PERIDROMOS, a word used by the old Greek writers to express the extreme edge of the hairs of the head, when hanging down in their natural form.

PERIESTECOS, in medicine, an epithet for diseases, signs, and symptoms, which are salutary, and prognosticate the future better health of the patient.

PERIGRAPHE, a word usually understood to express a careless or inaccurate delineation of any thing: but in Vesalius it is used to express the white lines or impressions that appear in the musculus rectus of the abdomen.

PERILEUCOS, in the natural history of the antients, a name given to an agate; but not of a distinct species, but only a particular appearance of the lead-coloured agate, more usually known among them by the name of *phassachates*. See the article PHASSACHATES.

PERINENEUCOS, an epithet given to a peculiar sort of irregular pulse common in hectic patients, in which the artery beats more strongly in some parts than in others. See the article EPINENEUCOS.

PERIOSTEUM *(Cycl.)*—The bones of the human body in their natural ftate, are for the moft part covered exteriorly by a membrane, called by the general name *periofteum*. This is extended over the cartilages and ligaments alfo, as well as the bones; but when it covers the cartilages, it is called *perichondrium*, when the ligaments, *peridefmium*.

The *periofteum* in general is a fine ftrong membrane, or membranous expanfion, not equally thick in all its parts, more or lefs tranfparent, of a very clofe texture, not eafily yielding, extremely fenfible, and compofed of feveral planes of fibres differently difpofed, and mixed with a great number of fine veffels and nervous filaments.

This membrane does not immediately furround thofe portions of bones which are covered by cartilages, nor thofe in which ligaments or tendons are inferted; neither does it cover thofe portions of cartilages which are expofed to friction, as in the moveable articulations, channels, &c. and laftly, it does not cover thofe portions of the teeth which lie out of the fockets and gums. The innermoft plane of the fibrous texture of the *periofteum*, or that which immediately adheres to the furface of the bones, is fixed thereto by an infinite number of fmall fibrous extremities, brought from all the planes, and which enter the pores of the bones. Thefe extremities are accompanied by capillary veffels and nervous filaments, which having run for fome fpace between the different planes of the *periofteum*, perforate the innermoft at the orifices of the pores of the bones. The *periofteum* is of different thickneffes, but this difference of thicknefs does not appear near fo much on the outer furface, as on the inner; which is marked in many places with impreffions, owing to the fulci, depreffions, lines, and inequalities on the furface of the bones.

Some anatomifts have been of an opinion, that this membrane was not only united to, but clofely braced round the bones; and that therefore it might fet bounds to their growth. It is probable they had only examined a few bones on this occafion, for had they confidered thofe which have concave furfaces, depreffions, and inequalities, they would there have found only a fimple adhefion of the *periofteum*, without any tenfion. In places where it is only fixed to the bone by the filaments of its innermoft plane, it is eafily pulled off from the bones; but where the fibres of the other planes likewife penetrate the bones, efpecially when thefe planes are very numerous, and where the infertions of tendons and ligaments mingle with thefe fibres, the feparation is much more difficult.

The *periofteum* in general ferves to fupport that admirable texture of an infinity of capillary veffels, by which the bones and all the parts belonging to them are nourifhed: it likewife fupports a vaft number of nervous filaments, by which fenfation is communicated not only to this and to the internal membrane of the bones, but even, in fome degree, to fome portions of the bones themfelves. *Winflow*'s Anat. p. 116.

PERIPHALLIA, περιφαλλια, in antiquity, the fame with *phalagogia*. See PHALLAGOGIA and DIONYSIA.

PERIPLOCA, in botany, the name of a genus of plants, the characters of which are thefe: the flower confifts of only one leaf, and is very open at the mouth, fo as to refemble a wheel; from the cup there arifes a piftil, which is fixed like a nail into the back part of the flower, and ripens into a fruit fo like that of the *apocynum* or dog's bane, that authors in general have confounded the two genufes. The pod is long, and is compofed of two vaginæ, and fplits open lengthwife from the bafe to the apex. *Tourn.* Inft. p 93.

The fpecies of *periploca*, enumerated by Tournefort, are thefe: 1. The long-leaved *periploca*, with purple flowers. 2. The long and narrow-leaved one, called by the Ægyptians *fecamone*. 3. The *periploca* of Monpelier, with roundifh leaves, called by many authors *fcammonia Monfpeliaca*. 4. The Montpelier *periploca*, with fharp pointed leaves. 5. The American *periploca*, with a fomewhat echinated fruit 6. The broad American *periploca*, with a hard, oblong, fmooth and tumid pod. 7. The white flowered climbing *periploca* of America, with very narrow willow-like leaves. 8. The low fpreading American *periploca*, with leaves like thofe of toad flax. 9. Citron-leaved umbelliferous creeping *periploca* of America, with red flowers. 10. Creeping white-flowered American *periploca*, with leaves like thofe of money-wort. 11. Citron-leaved climbing American *periploca*, with a very large fruit. And, 12. The climbing bindweed-leaved American *periploca*, with an alated fruit.

PERIPLYSIS, a name given by fome authors to a diarrhœa, in which the ftools are extremely thin and watry, and very frequent and large in quantity.

PERIPNEUMONY *(Cycl.)*.—This difeafe is very frequently confounded with the pleurify, and then one is miftaken for the other, fometimes even by phyficians. As this, however, is a diforder of the lungs, and the other of the pleura, there are fymptoms attending them by which they may be certainly diftinguifhed. See PLEURISY.

PERIPYEMA, a word ufed by chirurgical writers to exprefs a collection of matter, wholly furrounding any part.

PERIRRHANTERION, περιῤῥαντηριον, in antiquity, a veffel, ufually of ftone or brafs, filled with holy water, with which all thofe that were admitted to the facrifices were fprinkled; and beyond which it was unlawful for any one that was βεβηλος, or profane, to pafs. Some fay it was placed in the Αδυτον, or inmoft recefs of the temple, into which none entered but the prieft: but Cafaubon will have it to be placed at the door of the temple, which opinion feems moft probable, becaufe all perfons who were Αβεβηλοι, or unpolluted, were permitted to pafs beyond it. *Potter*, Archæol. Græc. l 2. c. 2. T. 1. p. 189.

PERISCYLACISMUS, περισκυλακισμος, a method of purification in frequent ufe among the Greeks. It was done by drawing a whelp round the perfon to be purified. *Potter*, Archæol. Græc. T. p. 223 The word comes from σκυλαξ, a whelp.

PERISSON, in botany, a name given by the antient Greeks, and afterwards by the Romans, in the time of Pliny, to a kind of night-fhade, which made thofe people who took it internally run mad. It was called alfo *pentadryon* and *anhydron*, and by fome *manicum ftrychnum*, or fimply *manicon*. See the article STRYCHNUM.

PERISSOSIS, a word ufed by Hippocrates to exprefs a redundance of humours.

PERISSOLOGY, περισσολογια, in rhetoric, a quality of ftile directly oppofite to *brachylogy*, and is otherwife called *macrology*. See MACROLOGY, BRACHYLOGY, and DICTION.

PERISTERION, in botany, a name given by fome authors to the *fcabiofa minor*, or fmall fcabious. *Ger.* Emac. Ind. 2.

PERISTERITES, the *pigeon-ftone*, in natural hiftory, a name given by fome whimfical people to an odd conformation of a pebble, which they fuppofe to reprefent very exactly a pigeon without its wings. It feems to have been a mere *lufus naturæ*, in the formation of a common pebble. The variations of figure in the common pebbles are fo infinite, that a perfon of a fertile imagination might find refemblances to all the parts of the creation in the ftones of a fingle gravel-pit. The giving names to fuch accidental things is not only unneceffary, but mifchievous, as it caufes great confufion in natural hiftory.

PERISTERNA, in anatomy, is ufed for the lateral parts of the thorax.

PERISTIARCHUS, περιςιαρχος, in antiquity, a name given to the perfon that officiated in a luftration. *Potter*, Archæol, Græc. T. 1. p. 35.

The word comes from Περιςια, another name for Καθαρμαλα.

PERISTOMA, in anatomy, a word ufed by authors to exprefs the villous coat of the inteftines.

PERISTYLION, περιςυλιον, among the Athenians, a large fquare place, tho' fometimes oblong, in the middle of the *gymnafium*, defigned for walking, and the performance of thofe exercifes which were not to be performed in the *palæftra*. *Pott.* Archæol. Græc. l. 1. c. 8. T. 1. p. 39.

PERITERE, in architecture, a place encompaffed round with columns, and with a kind of wings about it. Here the pillars ftand without, whereas in the periftyle they ftand within.

PERITEXIS, a word ufed by the old medical writers to exprefs a colliquation.

PERITHE, a name by which fome of the writers of the middle ages have called the *pyrites*; they fay it has great virtues againft the gout: fome of them alfo have called it the *lapis peridonius*.

PERITONEUM *(Cycl.)*—In the fifh kind, the *peritoneum*, or membrane furrounding the abdomen, is very varioufly coloured. In fome it is of a fhining filvery whitenefs, as in the cyprini, perch, efoces, &c. In others it is of a fine pale flefh colour, as in the falmon; and in fome it is wholly black, or elfe variegated with very numerous black fpots, as in the clupeæ, gadi, cotti and fpari. *Artedi*'s Ichthyolog.

PERIWINKLE, in natural hiftory, the Englifh name of a fpecies of fhells, called by authors *buccina*. See BUCCINUM.

PERIWINKLE, *pervinca*, in botany. See PERVINCA.

PERIZOMA, a word ufed by fome authors for a trufs.

PERMISSION, *permiffio*, in rhetoric, a figure which differs in nothing from *conceffion*, except that the latter relates only to argument and pleading, but the former to action: E. G. *Quoniam, omnibus rebus ereptis, folum mihi fupereft animus et corpus: hæc ipfa, quæ de multis relicta funt, vobis et veftræ condono poteftati. Vos me quo pacto vobis videtur, utamini, atque abutamini; licebit impune. In me, quicquid libet, ftatuite*, &c.

PERNIONES, *childblains*. When thefe tumours tend to fuppuration, it is proper to treat them like other recent abfceffes; the beft method is firft to cleanfe the wound with fome digeftive ointment, then to drefs it with balfam of Peru, or other the like application; and laftly, to apply fome of the lead or litharge plaifters. Oil of myrrh *per diliquium* is alfo found of vaft fervice in thefe cafes, as is alfo the applying a comprefs dipped in a mixture of equal parts of lime-water and camphorated fpirit of wine, over the other remedies.

In people who have been ufed to be afflicted with *chilblains* at the return of a certain feafon, it will be found a great prefervative againft thofe troublefome tumours, to anoint the parts where they are expected to appear, both before and during the accefs of the fevere cold, with oil of turpentine or petroleum; and when the diforder firft begins to fhew itfelf, it is a very good method to wrap round the affected part a piece of a hog's bladder, well wetted with one or other of thofe oils, and care taken to keep off the cold. *Heifter*'s Surg. p. 211.

PERODACTYLÆUS, in anatomy, a name given by Riolan and others to one of the mufcles of the foot, called by Albinus the

the *flexor longus digitorum pedis*, and by Winflow, the *perforans pedis*, and the *acceſſorius perforantis pedis*.

PERONÆUS (*Cycl.*)—PERONÆUS *maximus*, a mufcle of the leg, commonly called *peronæus poſterior*.

It is long and penniform, and lies on the fibula. It is fixed above to the anterior and outer part of the head of that bone, and to a fmall portion of the head of the tibia; then to the outfide of the neck of the fibula, to the upper half of the external angle of that bone, and to the aponeurofis tibialis; which at that place makes a feptum between this mufcle and the extenfor pollicis; from hence turning backward according to the direction of the bone, it forms a confiderable tendon; which running down behind the external malleolus is inferted in the fide of the bafis of the firft metatarfal bone, and a little in the bafis of the os cuneiforme majus. *Winſlow's* Anatomy, p. 221.

PERONÆUS *medius* This is commonly called *peronæus anticus*, and is a long mufcle fituated anteriorly on the middle part of the fibula. It is fixed above by flefhy fibres to more than the middle third part of the anterior or outfide of the fibula, and to the neighbouring part of the aponeurofis tibialis. It is likewife fixed to a production from the infide of that aponeurofis, which runs to the upper part of the tibia, and there ferves for a middle feptum between this mufcle and the extenfor digitorum longus; from thence it runs down and forms a tendon, which going in the direction of the oblique line of the fibula, paffes behind the external malleolus, and then thro' an annular ligament common to it and to the *peronæus maximus*, and is afterwards inferted in the tuberofity, at the bafis of the fifth metatarfal bone, fending off a fmall tendon to the firft phalanx of the little toe. *Winſlow's* Anatomy, p 218.

PERONÆUS *minimus*, a fmall mufcle vulgarly thought to be a portion of the extenfor digitorum longus, tho' it is eafily feparable from it.

It is fixed by flefhy fibres in the lower half of the infide of the fibula, between two oblique bony lines, on one fide of the lower part of the extenfor digitorum longus, to which mufcle it is fimply contiguous; from thence it runs down, contracting in breadth, and paffes, with the extenfor longus, thro' the common annular ligament, forming a flat tendon, which foon feparates from thofe of the extenfor, and is inferted near the bafis of the fifth metatarfal bone. It is diftinguifhed from the other two *peronæi* by a feptum, or production of the ligamentary aponeurofis of the tibia. *Winſlow*, Ibid.

PEROQUETTE, in zoology, the name of a fmall fpecies of the *pſittacus* or parrot kind, with a long tail.

There are feveral kinds of this bird: 1. The common, which is green, red, and yellowifh, and was the firft fpecies of parrot brought into Europe, and well known among the antients. 2. The *peroquette*, which is green all over, without any variegation. 3. The pale, green, and red kind. 4. The red and green crefted kind. 5. The red kind, with wings variegated with black and green.

Befide thefe, Marggrave has defcribed feven other Brafilian kinds, called the *tuiaputejuba*, *tuitirica*, *jendaya*, *tuiete*, *tuipara*, *anaca*, and *quijubatui*, which fee under their feveral names; and two others, to which no particular name has been given; one of the fize of a fwallow, all over green, with a black beak and a very long tail; and the other of the fize of a ftarling, of a deep green on the back, and paler green on the belly, and with a fhorter tail. *Ray's* Ornithology, p. 76, 77, 78.

PERPENDICULAR-*roots*. See FIBROSE-*roots*.

PERSIAN-*ſhell*, a fpecies of dolium. See DOLIUM.

PERSICA, the *peach-tree*, in botany, the name of a genus of trees, the characters of which are thefe: The flower is of the rofaceous kind, being compofed of many petals, arranged in a circular form. The piftil arifes from the cup, and finally becomes a flefhy fruit of a roundifh figure, fulcated lengthwife, and containing a ftone rough and full of irregular holes, containing an oblong kernel.

The fpecies of *peach*, enumerated by Mr Tournefort, are thefe: 1. The common green white foft flefhed *peach*. 2. The double flowered *peach*. 3. The *peach* with blood-red juice. 4. The hard *peach*, with white or flefh-coloured pulp. 5. The hard *peach*, with box-coloured pulp. 6. The fummer apricot *peach*, or john *peach*. 7. The early ripe *peach*. 8. The fine flavoured corbelian *peach*. 9. The hardeft *peach*. 10. The paler *peach*. 11. The *peach* with fweet-fcented fruit, with a fmooth fkin. 12. The *peach* with a round, dufky red, very fweet-tafted fruit. 13. The *peach* with a large round firm fugar-like fruit. 14. The large round yellow late *peach*, called the *admirable yellow*. 15. The *peach* with large round blackifh late-ripening fruit. 16. The great fcarlet *peach*. 17. The *peach* with a fruit variegated with purple and red, and of a rich vinous tafte. 18. The early violet-coloured vinofe *peach*. 19. The *peach* with red, roundifh-flatted fruit, with red flefh. 20. The dwarf African *peach*, with fingle flefh-coloured flowers. 21. The dwarf African *peach*, with double flefh-coloured flowers. *Tourn.* Inft. p. 614. See PEACH.

PERSICA *concha*, in natural hiftory, a name given to a very remarkable and beautiful fea fhell, which authors have long been at a lofs to reduce to any genus.

Aldrovand has thrown it to the end of his work, and fays, it would be of the turbinated kind, if it did not want the turba. It is truly of the genus of the *concha globoſa*, or *dolium*. See DOLIUM.

PERSICA *terra*, in natural hiftory, an earth of the ochre kind, known in the colour fhops of London by the name of *Indian red*.

It is a very fine purple ochre, of a confiderably compact texture, and great weight; while in the earth it is of a pure blood colour, and is not to be cut with the fpade, but is dug with iron crows, and falls in irregular maffes. It is of a rough dufty furface, and full of confiderably large bright glittering particles: thefe are white and of a fine luftre. It adheres firmly to the tongue, is rough and harfh to the touch, ftains the hands very deeply, and is of a rough aftringent tafte, and makes a very violent effervefcence with acid menftruums.

It is dug in the ifland of Ormuz, in the Perfian gulf, and in fome parts of the Eaft Indies. *Hill's* Hift. of Foff. p 58.

PERSICARIA, *arſmart*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the apetalous kind, confifting of feveral ftamina which arife from a cup divided into feveral fegments. The piftil finally becomes a fruit of a flatted oval figure, and pointed at one end, and contained in the capfule, which was the cup of the flower.

The fpecies of *perſicaria*, enumerated by Mr. Tournefort, are thefe: 1. The common mild or fpotted *arſmart* 2. The fpotted *arſmart*, with fpots of the figure of a horfe-fhoe. 3. The mild *arſmart* without fpots. 4. The white flowered mild *arſmart*. 5. The burning *arſmart*, or water pepper. 6. The burning *arſmart*, with white flowers. 7. The leffer *arſmart*. 8. The white flowered leffer *arſmart*. 9. The narrow-leaved *arſmart*. 10. The long and narrow-leaved *arſmart*, called the *long-leaved and water pondweed*. 11. The long-leaved Valentia *arſmart*. 12. The *arſmart* with leaves huary underneath. 13. The great dock-leaved *arſmart*, with purple cups. 14. The black-leaved alpine *arſmart*, with white cups. 15. The *arſmart* with lepidium leaves. 16. The long procumbent *arſmart*, with narrow not fpotted leaves, and long flender fpikes. 17. The white flowered fhrub fpotted Virginian *arſmart*. 18. The fhrub fpotted Virginian *arſmart*, with flefh-coloured flowers. *Tourn.* Inft. p. 509.

The common *arſmart* without fpots, is by fome efteemed a good diuretic, but it feems too acrid to be given internally without great caution. Externally it is ufed by many in cataplafms againft indurated tumors, and in inveterate ulcers. That with fpotted leaves has no virtues.

PERSOLATA, in botany, a word ufed by Pliny as the name of a kind of burdock, different from the *perſonata*.

He has, in the beginning of the chapter, fpoken of the arcium of the Greeks, which he fays the Latins fometimes called *perſonata*, and afterwards adds this *perſolata*; which, he fays, was a plant vulgarly known and called by the Greeks *arcium*.

He feems to allow, that the Greeks called both thefe plants by the fame name; but he diftinguifhes the *perſolata* from *perſonata*, by faying that the former has leaves like thofe of the great gourd, but larger and more hairy. It is probable, therefore, that he diftinguifhes under thefe two names, the two different fpecies of the great burdock common with us, the one with fimple, the other with woolly heads.

PESONATA, in botany, a name by which fome have expreffed the common great burdock. *Bauhin*, v. 3. p. 111.

PERSONATED-*flower*. See PERSONATI, *Cycl.*

PERSPECTIVE (*Cycl.*)—*Military* PERSPECTIVE, that wherein the eye is fuppofed to be infinitely remote from the table or plane.

PERSPICUITY, *perſpicuitas*, in rhetoric, is a principal virtue of ftile, to which all the ornaments and beauties of fpeech ought to give way.

A difcourfe is equally obfcured by too much concifenefs and profufenefs. (See BRACHYLOGY and MACROLOGY.) Several rhetorical figures are likewife deftructive of *perſpicuity*. See *Voſſ.* Rhet. l. 4. c. 1 p 30, feq.

PERSPIRATION (*Cycl.*)—*Perſpiration* is influenced by the paffions of the mind. Thus anger and joy increafe, and fear and fadnefs leffen both *perſpiration* and urine. Anger caufes a ftrong motion in the membranes of the heart, and quickens its contraction and dilatation, and thereby quickens the contraction and dilatation of the blood veffels and fecerning ducts, and of confequence increafes the difcharges of *perſpiration* and urine; and that more or lefs, in proportion to the ftrength and continuance of the paffion.

Joy affects thefe difcharges in like manner as anger. In the paffions of fear and forrow, *perſpiration* and urine are leffened; by the depreffion of the activity of the foul under thofe paffions. Dr *Bryan Robinſon* of the Food and Difcharges of Hum. Bodies, p. 77, feq.

The proportion of *perspiration* to urine is increased by all those exercises which increase the motion of the blood, and warm the skin. Dr. *Bryan Robinson* of the animal Œconomy, p. 280.

We have an account of a person, who by passing many nights in astronomical speculations, had his *perspiration* so obstructed by the cold and damp of the air in Holland, that a shirt he had worn for five or six weeks was as clean as if it had been worn but one day. The consequence of this was, that he gathered subcutaneous waters, but was cured in time. Phil. Transf. N° 8. p. 138.

We have several observations, experiments, and tables, relating to the quantity of *perspiration*, urine, and stool, in South Carolina, by Dr. John Lining. See Phil. Transf. N° 470 and 475.

PERTICA, a sort of comet, being the same with *Veru.* See the article VERU.

PERTICA, among the Romans, a long rod for beating the fruit from trees. It was likewise used for a long measure. See PERCH, *Cycl.*

PERVIGILIA, in antiquity, an appellation given to nocturnal festivals, celebrated in honour of several deities, as Ceres, Venus, Fortune, *&c.* They were so called because the nights were spent in waking.

PERVINCA, *periwinkle*, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, and is of the funnel-shaped kind, but so very wide at the mouth, that it approaches to the saucer-shaped ones, and is divided into several segments at the rim. The pistil arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower: this, afterwards, becomes a seed vessel, composed of two capsules, containing an oblong seed, usually of a cylindric figure, and fulcated. See Tab. 1. of Bot. Class 2.

The species of *pervinca*, enumerated by Mr. Tournefort, are these: 1. The common broad-leaved *periwinkle*, with blue flowers. 2. The common broad-leaved *periwinkle*, with white flowers. 3. The common narrow-leaved *periwinkle*, with blue flowers. 4. The common narrow-leaved *periwinkle*, with white flowers. 5. The common narrow-leaved *periwinkle*, with red flowers. 6. The common narrow-leaved *periwinkle*, with double blue flowers. 7. The common narrow-leaved *periwinkle*, with double flowers, of a deep purple. 8. The variegated double flowered *periwinkle*. 9. The broad-leaved variegated *periwinkle*. And 10. The narrow-leaved variegated *periwinkle*. The tree called *padrus*, approaches very much to this genus. *Tourn.* Inst. p. 119.

The *pervincæ* are easily known, even when not in flower or seed, by their branches being long and trailing, and their leaves smooth and glossy, and approaching to the shape of bay-leaves. These plants seldom ripen their fruit; and the way to make them do it is, to plant them in a small pot, and cut off all the trailing branches; by which means the nourishment will be carried up to the ripening the fruit. *Tourn* Inst. p. 120.

PERUVIAN *bark* (*Cycl.*)—The virtues of this medicine are at this time sufficiently known; but the largeness of its dose in the common forms of powder, or infusion in wine or in water, are great disadvantages; and our common method of giving it in the extract or resin, as we prepare them, not certain, and have their inconveniency.

Mr Geoffroy has attempted a method of giving the *bark* in all its efficacy, without its ill taste, and in one third of the usual dose, by means of his dry extract; twenty four grains of which, it is very certain, contains the whole efficacy of a dram of the choicest *bark* in powder; and is found by experience to be wholly as efficacious, as certain, and as speedy, and really possesses all that the juices of the stomach can extract from thrice the quantity of powder, without loading it with so large a quantity of useless matter.

The experiments this gentleman made to be assured of what was the efficacious, what the useless part of the *bark*, and what the quantity of each in the whole, were these. He put into a matrass a dram of choice *bark* in fine powder, and pouring on it an ounce and a half of rectified spirit of wine, set the vessel in a balneum mariæ till the spirit was high coloured, and had extracted all the tincture it could, and filtering this tincture, and evaporating it on a China-plate in a balneum mariæ, he obtained twenty grains of a dry extract; and then putting on two ounces of water on the remaining powder, he drew what tincture he could by this means, and evaporating that in like manner, he obtained three grains and a half of extract in the like dry form.

Thus, by the nicest process, twenty-four grains were all that could be separated of the efficacious matter from a dram of *bark*, and the remaining powder, which was perfectly insipid, weighed as much as was required to make up the dram, excepting six grains, which the author supposes to have been the fibrous and insipid powder remaining in the filtre.

Hence it appears very evident, that when we take the *bark* in substance, it is only about a third part of what we are forced to swallow that can be of any use to us; and that the same portion is all we can expect in the virtues of any decoction or infusion of it.

The resin of the *bark* is of such a nature, that it is capable of being penetrated by, and suspended in boiling water, poured on the substance in fine powder; and so long as this water retains a certain degree of heat, it remains suspended and invisible in it, and the water is of a clear brownish colour; but when the liquor becomes cooler, the resin can be no longer suspended, the whole becomes milky, and the resin precipitates itself.

Wine, which is a liquor partly aqueous, partly saline, and partly spirituous, is a menstruum much properer to extract the virtues of the *bark* than mere water, as it is much more able to dissolve the juices or sap condensed and inspissated in the *bark* of the tree; and for this reason a strong infusion of *bark* in this menstruum remains clear, and keeps the resin suspended when cold. Thus it is the fire alone which can suspend the resin in a watry infusion of the *bark*; and in a vinous one, the spirituous and inflammable part of the liquor does the same thing: and as the resin of the *bark*, which there is great reason to believe possesses all the virtues of that medicine, is wholly precipitated from watry infusions when cold, it is plain that there can be very little dependance placed on the common clear infusions in this menstruum: the remaining taste in these infusions is only a faint bitterness, which arises from the gummose and saline parts of the dried juices of the *bark*; the whole concrete which alone possesses the virtue of the medicine, being of the nature of those bodies properly called *gum resins*; which are but very imperfectly soluble in water, and of which wine is the proper dissolvent.

In making the dry extract by means of water, the same author put a dram of fine powder of pick'd *bark* into a large quantity of water, and keeping it in a considerable heat in a matrass twenty-four hours, and after that, filtring the liquor as hot as possible, that the resin might not coagulate, he set it to evaporate on a balneum mariæ in China-vessels; the resin soon began to separate itself, and a pellicle appeared on the surface of the liquor, of all the changeable colours of the breast of a pigeon; and this covering the extract when dry, made it appear as if gilt or browned over. This infusion from a pint and half of liquor, yielded twenty grains of extract perfectly dry; and an ounce and half of spirit of wine being poured on the remaining powder, when it had extracted all the tincture it could, left only three grains of extract; so that the result of this process was much the same with that begun with spirit of wine; and from the whole it appears very evident, that by this method of management, the whole virtue of the *bark* may be given in a third part of the dose. Memoirs Acad. Science Par. 1738.

Peruvian-bark has been found very effectual in preventing colds. The method in which it was used, in a case mentioned in the Philosophical Transactions, was, after due preparation, by bleeding or purging, to take two ounces of it every spring and fall. By this method, an habitual taking of cold, and a consequent sore throat was cured. Phil. Transf. N° 478. p. 3.

We have many accounts of the great effects of the *peruvian-bark* in the cure of gangrenes and mortifications. See Med. Ess. Edinb. Vol. 3. Art 5. or its Abridgment, Vol. 1. p 175, seq. We have also several accounts of the good effects of this medicine in ulcers and the small pox. See Med. Ess. Vol. 5. Art. 10. or Abridgment, Vol. 1. p. 187.

Many instances are recorded in medical writers of the jaundice, dropsy, asthma, and all the train of nervous disorders, brought on in a surprisingly short time after an injudicious administration of the *bark*: among others the curious may consult the Med. Ess. Edinb. Vol 4. Art. 24.

The *peruvian-bark* is discovered to be effectual in the cure of mortifications from an internal cause. The history of this discovery is: In 1715, Mr. Rushworth, surgeon in Northampton, gave it to a patient labouring under a mortification; and having afterwards other proofs of its good effects in this disease, communicated his discovery in 1731. Mr. Amyand soon tried it in such cases, and found it successful in seven. Mr. John Douglas confirmed this by the history of a patient of his, which he published in 1732; and Mr. Shipton soon after related his success by this medicine, to the Royal Society. Mr. Rushworth and Mr. Amyand confine its use to mortifications, from an internal cause; the former thinks it is not proper in all cases of that kind, particularly where there is no intermission of the fever. Mr. Douglas seems to think it will succeed in all mortifications. All these three gentlemen gave half a dram for a dose every fourth hour. Mr. Shipton increased the dose to two scruples, and gave it while the fever continued. He proposed to have it tried in nomæ, phagedenæ, herpes, or other chironian ulcers. Mr. William Arrot, who lived a considerable time in Peru, describes the tree from which the *peruvian-bark* is got.

It grows in the country between two and five degrees south latitude; it is tall, without branches to near the top, where it spreads out into a hemisphere; its bark is of a dark colour on

on the outfide; its leaves refemble thofe of a plum-tree. There are four forts of the *bark*, the reddifh, the yellowifh, the curling, and the whitifh. The two firft are the beft kinds; the curled is got from young trees, and the white foon becomes infipid. The beft fort grows about the city of Loxa. The Indians flice off the *bark* from the trees, and carry it to houfes to be dried [a]. M. de la Condamine [b] fays this tree is called *caſcarilla*, and is very different from the *quina quira*. [[a] See Phil. Tranf. N°. 446. fect. 1. [b] Mem. de l'Acad. des Scienc. 1738.]

PERYGUA, in botany, a name given by fome authors to a plant of the caffine kind, called the *caffioberry* bufh, and by fome the *Paraguay tea*. *Dale* Pharm. p. 319.

PERYSIAS, a word ufed by authors to exprefs wine of the laft year's vintage.

PES (*Cycl.*)—PES *leonis*, in botany, a name by which fome authors exprefs the *alchymilla*, or ladies mantle. *J. Bauhin*, V. II. p. 398I. *Chebræus*. 172.

PESCE *vacca*, the *cow-fifh*, a name given by Auguftino Scilla to a kind of dog-fifh, not defcribed by any author before his time, but accurately drawn by him in his book on petrifactions, on occafion of its teeth: many fpecies of the *gloſſopetræ* of the ifland of Malta, and other places, being plainly the fame with the teeth in the jaws of this fifh.

PESSOMANTIA, Πεσσομαντεια, in antiquity, the fame with *chiromantia*, which fee.

PESTERABLE, in our old writers, an epithet for fuch wares as *pefter*, or take up much room in a fhip. Stat. 32 *Hen.* VIII. c. 14. *Blount*, *Cowel*.

PESTILENTIAL *buboes*. By *buboes* in *peſtilential* cafes, the writers in phyfic not only exprefs fuch tumours as arife under the arms, under the ears, and in the groin; but comprehend under this term thofe alfo which are fituated in the neck, breaft, arms, legs, and other flefhy parts of the body, which fwell and inflame in *peſtilential* fevers, and feem the confequences of the endeavours of nature to throw out the peftiferous matter which lay concealed in the body.

Peſtilential buboes are diftinguifhed from other tumors by their happening at a time and in conjunction with the plague, and from their being accompanied by the fymptoms proper to that difeafe. Thefe tumours appear fometimes fooner, fometimes later, in the courfe of the difeafe; in fome they appear before the patient knows he has the infection, and in others two or three days elapfe before their appearance: they are very feldom known to appear later than on the fourth day, and are fometimes joined with carbuncles; but tho' the *buboes* frequently appear without thefe, yet the carbuncles never appear without tumors.

Perfons who have thefe tumors come on without any very bad fymptoms, and have them maturate fpeedily, are in general the fooneft freed from the diftemper, infomuch, that the beft method of giving relief in this terrible difeafe, confifts in the carefully promoting and keeping up the *buboes* and tumors. All difcutient or difperfing medicines are carefully to be avoided, and the phyfician's bufinefs is to affift nature in the throwing out, and moft fpeedily bringing thefe tumors to fuppuration.

The patient is to be confined to his bed on the firft appearance of thefe, and with the help of internal medicines proper to haften the fuppuration of tumors, the parts affected are to be rubbed pretty ftrongly with the hands or cloths, and external, maturating and emollient cataplafms to be applied; of this kind is that of yeaft, falt, and muftard-feed, all mixed together, or of yeaft alone: by means of thefe the tenfe parts are relaxed and ftimulated, and the fuppuration greatly promoted; as alfo by the cataplafms of roafted onions, with Venice-treacle and butter; or of crumb of bread, with milk and faffron. Plaifters are alfo very ufeful on fome occafions, in thefe cafes, as the frequent renewal of the cataplafms expofes the patient too much to the external air, and thefe are not attended with that inconvenience.

The moft famed plaifters on thefe occafions are that of Barbet, made of the diachylon, with the gum and mucilage plaifter, of each half a pound; muftard feed in powder, three ounces; bafilicon, four ounces, all mixed and made into a plaifter: and that of Dr. Hodges, made of three ounces of oxycroceum, an ounce of galbanum, the fame quantity of gum caranna, and two ounces of black pitch, reduced to the confiftence of a plaifter.

This may be ufed like the former; nor is that plaifter to be efteemed a trifle, which is made of honey, flour, and the yolks of eggs.

Bliftering and cupping, fo much ufed by the antients to forward fuppuration, are entirely laid afide by the modern phyficians: but the celebrated German phyfician, Beintern, afferts, that *peſtilential buboes* have been very frequently difcuffed, without being brought to fuppuration, by the application of warm afhes alone; and that with very happy fuccefs: and he obferves, that in this cafe the *peſtilential* venom is not abforbed into the blood again, but is attracted and carried off by the afhes.

In fome cafes in this terrible diftemper, the tumor comes to fuppuration in a few days; in others it is fome weeks before it can be brought to it, by all that can be done. When thoroughly fuppurated, it is to be opened with the fcalpel, if it does not break of itfelf; and after thus opening, when the matter has been difcharged, it muft be well cleanfed. The beft digeftive in this cafe is the common ointment ufed on that occafion, mixed with a fmall quantity of Venice treacle, and balfam of fulphur made with oil of turpentine. At each dreffing the matter is to be gently fqueezed out of the abfcefs, and the ointment applied without tents, unlefs the opening prove very narrow; then applying over all a plaifter of the common diachylon, or of honey and flower, the whole may be bound on, and this dreffing continued till it is a proper time to heal with fome vulnerary balfam.

There has been much difpute between the phyficians of different ages about the proper time for opening *buboes* of this kind; fome have been for making an immediate incifion, and others even for extirpating the whole fwelling, as foon as it appeared, by means of the knife; but the firft of thefe methods has been found to be frequently attended with the ill confequences of ill conditioned fiftulæ, ftiffnefs, and lofs of motion in the limb, and fometimes even with mortifications and gangrene; and the other too harfh, and dangerous in many parts of the body: and the prefent practice univerfally difallows both methods, being always for bringing the fwelling to fuppurate. *Heifter*'s Surg p. 200.

The poifon of the matter of thefe fores has been nicely and boldly enquired into, as to its nature and properties, by Dr. Alpranus of Prague, in the time of the plague there in 1680. This gentleman having launced a *peſtilential* boyle, collected the matter from it, and putting it into a retort, luting the junctures with the receiver very clofely and exactly, and applying by proper gradation the feveral degrees of fire; at firft there came over a water, then a more fat and vifcid liquor, of an oily nature; and laftly, there appeared in the neck of the retort, a falt.

The fire being taken away, and the veffels cooled, the Doctor prepared himfelf for the opening of them by ftopping his ears with cotton, his noftrils with peffaries, and his mouth with pieces of fpunge, all foaked in vinegar and Venice treacle. The moment the veffels were opened, however, there proceeded out of them a ftench more horrible than can be conceived, and ftriking the Doctor with an univerfal trembling, in fpite of his defence. He proceeded, however, to break the neck of the retort, and feparating the fœtid falt from it, he ventured himfelf to tafte it, and defired Mr. Refhel, the perfon from whom the matter was obtained, to do the fame: it was found to have a moft dreadfully piercing acrid tafte, which the Doctor compares to that of *aqua regia*.

Hence he infers, that the moft terrible fymptoms of this fatal difeafe are to be accounted for: the ftomach, wounded by fo acrid a juice as this mingled among the blood, naufeates food, and is afflicted with continual vomitings: the guts, infefted by the fame unwelcome gueft, are thrown into violent perturbations, whence arife thofe diarrhœas which often accompany the patient to his death; and from the horribly acrid quality of this juice, it is no wonder that fuch piercing pains are found in the *buboes*, and fuch burnings in the carbuncles that attend this difeafe.

Hence alfo, as he obferves, it is, that fudorifics are the beft remedies, fince they allay the acrimony, and tend to expel the venomous juices thro' the pores. In this ficknefs at Prague this gentleman obferved, that almoft all who fweat plentifully recovered, whereas thofe who did not fweat, were moftly taken off. *Hook*'s Philofoph. Collect. N°. 2. p. 18.

PESTILENTIAL *carbuncle*. This is an inflammation that arifes in time of *peſtilential* contagion, with a veficle or blifter, almoft like thofe which are caufed by burning; but this inflammation generally terminates in a mortification, and putrefies the adjacent parts down to the bone, all about becoming as black as a coal.

This kind of inflammation always breaks out very fpeedily, fometimes even in an hour or two, attended with the moft intolerable heat and pain. On opening it, there is always difcharged a darkifh limpid or watry fanies, and the flefh underneath is of a black colour, the mortification having then already feized it, and fpreading more and more by degrees; but in thofe who recover, the mortification at length ftops, and the putrefied flefh fuppurates, and parts from the found.

The fize and number of thefe inflammations in the fame patient, are both very various and uncertain; there is no part of the body but what they may infeft, and they are generally, if not always, accompanied by buboes.

The immediate caufe of thefe is a violent inflammation, excited in the blood by the *peſtilential* venom; and the inflammation, from the nature of the cafe, is ever fpeedy, and always followed by fphacelation and corruption of the parts. What is remarkable is, that the parts and juices do not fuppurate into matter, as is ufual in other tumors, but whatever is internally corrupted, feparates and entirely falls off: for the inflamed parts fuppurate at the margin of the inflammation, fo that if the patient does not die fuddenly, the fphacelated parts are feparated, and naturally thrown off.

Carbuncles are always a worfe fymptom than buboes in thefe

cafes, efpecially if the eruptions turn directly either livid or black; but if they are red firft, and then gradually turn to a citron colour, the danger is lefs.

Thofe *carluncles* alfo which arife in the face, neck, breaft, or arm-pits, are always accounted the worft, and ufually kill the patient.

The chief bufinefs of internal medicines, in this cafe, is to keep the patient in a conftant breathing fweat; and the bufinefs to be aimed chiefly at in external applications, is to procure, as foon as poffible, the feparation of the fphacelated parts from the found. Some, therefore, ufe fcarification alone in this cafe, and that with very good fuccefs; for, by making a great number of incifions in the corrupted parts, they let out the *peftilential* venom which corrupted the blood. Others only open the blifters, and afterwards wafh the parts with a mixture of camphorated fpirit of wine and Venice treacle, and afterwards apply a maturating cataplafm, made of four fpoonfuls of honey, three fpoonfuls of yeaft, the yolks of two eggs, and half an ounce of foap, which are all to be mixed and applied warm to the part: others on the fame occafion ufe alfo, as a cataplafm, a mixture of two ounces of flour and half an ounce of vinegar, made with water or fkimmed milk into a proper form, and with an ounce of honey, and an ounce of powder of faffron, thofe ingredients are to be thoroughly mixed in, and the cataplafm to be applied warm, and renewed frequently, till the whole carbuncle feparates and falls off from the found parts; and this is a much better and fafer method of extirpating the *carbuncle*, than by cutting it out at once, by which operation fome have been known to have been killed upon the fpot. When the greateft part of the *carbuncle* is, however, of its own accord feparated from the found parts, the part where it adheres may always be fafely divided with the fcalpel; and this, indeed, is abfolutely neceffary.

If an ill-conditioned and luxuriant flefh grows internally in this cafe, either of itfelf, or from the extirpation of the *carbuncle* being made too foon, this muft ever be neceffarily entirely confumed by the application either of the Ægyptian ointment, or of the following: Take two fpoonfuls of honey, the yolks of two eggs, and of burnt alum, gentian, and birth wort root in powder, each an ounce, make the whole into an ointment.

If the inflammation inclines the adjacent parts to a gangrene, it will be moft proper to ufe the following application: Take falt of wormwood, half an ounce of the herb fcordium, and of elder and chamomile-flowers each a handful, and of river water two pints and an half; when thefe have been well boiled and ftrained, mix with the liquor fix ounces of camphorated fpirit of wine, and two ounces of Venice treacle; and let this be applied hot to the parts by means of double linnen rags being well wetted in it, and repeated frequently till the violence of the inflammation abates.

When the mortified flefh of the carbuncle has feparated itfelf from the found part, it is neceffary to cleanfe the ulcer perfectly with digeftive ointments, left any of the matter remain there, and mix itfelf again by degrees with the blood; and this deterging of the ulcer is always to be continued till there remain no more fymptoms of the *peftilential* infection in the patient; and after this the wound may be healed like other ulcers.

In the laft great plague in London, and in many other the like cafes, it was found the beft and happieft method with *carbuncles* to extirpate them at once by the actual cautery, or red hot iron, till the dead parts being burnt to the quick ones beneath, there were no relicts of the *carbuncle* left in the patient. And in fome cafes this may be a very proper method, but there are others where prudence will not allow the ufe of it; as where the patient is too much terrified by it, where the parts on which the carbuncle is fituated are of the utmoft tendernefs and confequence: in thefe it will be readily determined, that the milder treatment before advifed muft be greatly preferable.

Another famous remedy is the applying to the parts butter of antimony. The circumjacent parts being anointed with this, the diforder is prevented from fpreading, and an efchar is readily made, which divides the found from the corrupted parts, and at length wholly feparates and throws off the latter.

There are not wanting, however, phyficians who are againft the ufe of butter of antimony on thefe occafions; but where the actual cautery might have been applied, this furely is a fomething milder, and not much lefs effectual remedy. *Heifter*'s Surg. p. 205.

PESTILENTIAL *difeafes*. Many think that the caufe of all thefe is in the air, and is exhaled in vapours through the pores of the earth.

It is generally obferved, that *peftilential difeafes* feize firft the cattle; which is not wonderful, fince they naturally carry their nofes near the ground, and fuck in the vapours as they rife, or feed on the herbage that is infected by them. It often happens, that the vapours do not rife fo high as to affect men at all; but tho' in this cafe the plague would be naturally confined to the cattle alone, yet it gets among men by means of the food eaten by them, and before tainted with the contagion. There is no doubt but that the flefh of animals that die of difeafes, partakes fomewhat of the nature of thefe difeafes; and when they are *peftilential*, may fpread a peftilence among us, which, perhaps, would otherwife never have reached us.

The plague once begun, frequently joins itfelf with fuch other difeafes as the people it attacks are moft fubject to; hence, in the northern nations, where the fcurvy is frequent, it is often feen that the plague and fcurvy appear mixed. Thefe two difeafes, in their nature fomewhat agreeing, make each other the worfe and more violent; but, on the contrary, there are other difeafes, depending on fuch contrary caufes, that the plague, if the patient furvives, proves a cure to them.

Dr. Hodges inftances the confumption, and the king's evil, as two difeafes of this kind; which, tho' in themfelves of the moft terrible kind, and when in an advanced ftage ufually baffling all remedies, yet he faw perfons in the plague that laft raged in London, cured of both by the plague: the fymptoms of the difeafe appearing more mild in thefe than in other cafes, and the patients at once recovering of both complaints.

He alfo tells us of fome people terribly afflicted with the gout for many years; who being at that time affected by the contagion, had the plague with lefs violent fymptoms than others; and were, on its going off, cured of the gout alfo.

A fever is ufually a concomitant fymptom of the plague, but it is not an infeparable fign of it. A palpitation of the heart is another of the ufual, but not conftant fymptoms; where this comes on, it is ufually very violent, and often is fo loud, that it may be heard at a confiderable diftance.

The plague is lefs contagious than is ufually fuppofed, and thofe who efcape the terror of it, often efcape it wholly. Hodges gives us an inftance of a poor woman who had the plague foon after her delivery, and fuckled her young child as fhe lay ill of it. She had a carbuncle on her breaft near the nipple which the child fucked at, and yet the mother recovered, and the child never caught the infection at all; tho' this feemed a circumftance under which there could be no efcaping.

Hodges, treating of the prognoftics of an imminent plague, tells us, that one very remarkable one is the change of chronic diftempers in general into acute ones, and thofe attended with very violent fymptoms; and a murrain among the cattle happening at the fame time, form together a prognoftic not eafily to be got over, without the terrible fequel of a general *peftilence*.

If the plague is very terrible at its firft appearance, it never is of long duration; and on the contrary, when it comes, from a fcarce perceptible beginning, more and more violent, it is generally of a long continuance. What time it takes from the beginning to the height, the fame it takes from the height to the final period.

The moft fatal fymptoms in the laft plague in London, and which ufually prefaged death very near, were hæmorrhages from the nofe or ears, fluxes of the menftrua in women, diarrhœas, dyfenteries, and greennefs and blacknefs of the excrements.

The firft fweats coming on without giving eafe, and long naufeoufnefs continuing afterwards, are alfo terrible fymptoms. The pulfe and urine, which are the two great things to judge by in moft illneffes, in thefe prefage nothing at all. The pulfe is fallacious in the higheft degree, and the urine often appears as well in the height of the plague, as while the perfon was in health.

Among the feveral prefervatives for particular places, the two beft are the burning fweet-fcented woods in the time, and fome of the refins, fuch as frankinfence and the like; the other is the firing a number of cannon every morning and evening. *Hodges* de Peft.

PETAL, among botanifts, that part of the flower which conftitutes the corolla: it generally diftinguifhes itfelf by its fingular colour.

When the corolla confifts only of one *petal*, its lower tubular part is called the *tube*; its upper expanded part, the *limb*: when feveral *petals* go to make up the flower, the narrow part where they are inferted is called *unguis*; their broader part towards the end, *bractea*. See COROLLA.

PETARDEER, in the military art, is he who loads, fixes, and fires the *petard*.

PETASITES, *butterburr*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the flofculous kind, being compofed of many fmall flofcules, divided into feveral fegments at their edges, and placed on the embryo fruit, and all furrounded by a fort of a cylindric cup, divided into many fegments. The feeds, when ripe, are winged with down, and the flowers of this plant appear before the leaves, early in the fpring.

The fpecies of *petafites*, enumerated by Mr. Tournefort, are thefe: 1. The great or common *petafites*. 2. The leffer *petafites*, with white flowers and angular leaves. 3. The fmall *petafites*, with colt's-foot leaves. 4. The leffer Alpine *petafites*, with fmall angular leaves. *Tourn.* Inft. p. 450.

The common *butterburr* is famous as a cordial and alexipharmic. It has been made an ingredient in moft of the compound medicines of that intention. The plague-water of the old

old difpenfatories owed the greateft part of its virtues to it. The root is the part principally ufed; and befide thefe virtues, it has thofe of an aperient and detergent. It is prefcribed in fuppreffions of the urine and menfes, and in coughs, afthmas, and other difeafes of the breaft. See BUTTERBURR.

PETASUS, among the Romans, a covering for the head, not unlike our hats; it had a broad brim, and was ufed in journeys to fave the face from being fun-burnt.

The *pileus* differed from the *petafus*, as having no brim *Pitifc.* in voc. See PILEUS.

The *petafus* is obferved upon the head of antient figures of Mercury; who wore it in the quality of the god of travellers and merchants. *Calmet.* Dict. Bibl.

PETECHIAL *fever*. See *catarrhal* FEVER.

PETELMA, in the Turkifh military orders, is the procurator general of the effects of the janizaries. When any one dies under the protection of this body, he feals up their houfes, to fecure the tenth part of their effects; which are due to the janizaries. *Pocock's* Egypt, p. 168.

PETIA, a word ufed by medical writers in different fenfes. It is commonly underftood to mean a piece of rag, ufed to tie up medicinal ingredients in, to be ufed by infufion in liquors; but *petia oculi* fignifies an hæmorrhage of the eye.

PETICULÆ, the fame as *petechiæ*, purple fpots appearing on the flefh in malignant fevers.

PETIGO, a word ufed by fome authors for *impetigo*. See the articlee IMPETIGO, *Cycl.*

PETILIUS-*flos*, a name ufed by fome botanical authors for the African marygold. *Ger.* Emac. Ind. 2.

PETIMBUABA, in ichthyography, the name of a fifh caught in the American feas, and called by fome, in Englifh, the *tobacco-pipe fifh*; a name more commonly ufed for the *acus ariftotelis*. See Tab of Fifhes, N°. 40.

It grows to the length of three or four feet; its body is like that of an eel, long and flender; and its mouth without teeth. The length of the nofe is confiderable, and the upper jaw is fhorter than the lower. Its eyes are remarkably large, not fmaller than a hazel nut, and fomething of the fame figure. Its fkin is fmooth, like that of the eel, and of a liver-colour on the back and fides, with feveral rows of blue fpots difpofed in three rows on the back, two on the head and one on each fide; there are alfo fome green fpots every where interfperfed among the blue ones. The belly is white, but has fomething of a brownifh red caft, and is flat. It is a well-tafted fifh. *Willughby's* Hift. Pifc. p. 234.

PETIOLATE-*leaf*, among botanifts. See LEAF.

PETIOLE, *petiolum*, among botanifts, expreffes that ftalk which fupports the leaves of a plant, as the peduncle does the fructifications.

Some ufe the word *petiolum* to denote the whole middle rib of a leaf of any plant, which is the ftrongeft part of it, and runs from the ftalk by which the leaf adheres to the tree or plant to its extremity, and from which the lateral fibres or nerves, as they are ufually called, commonly arife.

The authors who have written on the fubject of the anatomy of leaves, have had occafion to be accurate about the diftinctions of the feveral parts; and they have called this main or middle rib, the *petiolus*. The fide branches going off from this, they call *rami*; and the fubdivifions of thefe into more minute fibres *furculi*: thefe generally are interwoven into a reticular plexus one with another, and make up the fubftance of the leaf, with the bladders of a liquid matter, which are contained in their interftices.

All thefe folid parts of leaves, the *furculi* and *rami*, as well as the *petiolus*, are congeries of oblong fibres extended evenly together, and collected into one body; and the fibres in all parts of plants are divided into two kinds; the one containing juices, and called *fucciferæ*; the other giving paffage only to air, and therefore called *tracheæ*.

Lewenhoek has diftinguifhed the fucciferous veffels into two kinds, which he calls veins and arteries: the latter, he obferves, receive the fap from the root, where it is firft collected, and carry it up to the reft of the plant, and the others bring it back again from thence, in the manner of veins. Perrault has joined a great number of experiments to Lewenhoek's, in order to prove this fyftem of the juice veffels, but Fontenelle, and fome others, have doubted either the exiftence, or at leaft the ufe of the *tracheæ* or air veffels, fuppofing them either imaginary veffels, or deftined for other purpofes. The vine branches, however, examined either by a microfcope, or by a good eye in a good light, will fhew evidently that fuch veffels exift, and that in very great numbers: and the veffels in the *petiole* and *furculi* of leaves, when ftrictly examined, are found to be of both thefe kinds. Act. Erudit. 1722. See TRACHEÆ.

PETIOLUS, a word ufed by botanical writers to exprefs the ftalk of a fruit.

PETIVERIA, in botany, the name of a genus of plants, the characters of which are thefe: The perianthium is compofed of three flender, erect, obtufely-pointed leaves, and remains to inclofe the feeds. There are no petals; the ftamina are fix fubulated equal erect filaments, of the length of the cup; the antheræ are fimple; the germen of the piftil is oblong, and of a compreffed figure; the ftyles are four, they are fubulated and ftrait; the ftigmata are fimple and permanent; the feed is fingle, of an oblong figure, narrow at the bottom, broader at the top, emarginated and crowned with the ftyles, which are rigid, acute, and fomewhat bent. *Linnæi* Gen. Plant, p. 150. *Plumier*, Gen 39

PETOLIN, in natural hiftory, the French name for a fhrub of the piftachia kind, famous for affording bladders or tubercles on its leaves and tender branches, in the manner of the common turpentine-tree; which are found full of infects. Thefe infects are always found to be of the puceron kind, and fome of them are winged, others not, as is known to be the cafe in that genus of animals. Thefe bladders, and thofe of the turpentine-tree, called its *horns*, have been by fome fuppofed to be the natural production of the trees, but they are in reality only a peculiar fpecies of bladder-galls, formed by thefe animals, one female of which making her way into the leaf, while the young raifes its covering membrane into a bladder, in which fhe produces her young ones; which by fucking its fides, derive the juices to it, and occafion its increafe. *Reaumur's* Hift. of Inf. p. 34. See the article PUCERON.

PETRÆA, in botany, a name given by Houfton to a genus of plants, in honour of the name of the Lord Petre. This author, however, was guilty of an error in the characters of this genus; for he defcribed the flower of this, and the fruit of another very different genus, the *tetracera*. The external refemblance of thefe two trees led him into the error; but Linnæus has given its characters more fully, and without any fuch miftake. They are thefe: The perianthium is very large and coloured; it is compofed of one leaf divided into five obtufe expanded fegments, and remains with the fruit. The flower confifts of one leaf, and is irregular and fmaller than the cup; its tube is very fhort; its verge plain, and divided into five fegments, which are roundifh; and the loweft of which is larger than the others. The ftamina are four filaments, two being longer than the others, and all hid in the tube of the flower. The antheræ are fimple; the germen of the piftil is of an oval figure; the ftyle is fimple, and of the length of the ftamina; and the ftigmata is obtufe. The error of Houfton, in regard to the fruit, has left the world wholly in the dark as to what it really is. *Linnæi* Gen. Pl. p. 298. *Houft.* Act.

PETRIFACTIONS (*Cycl.*)—The knowledge of this part of natural hiftory is but of very late years arrived at any degree of perfection. Dr. Hook, Steno, Boerhaave, and Auguftino Scilla, have been among the firft who treated judicioufly of thefe things; but great honour is to be done to Fabius Columena, who, before the time of any of them, publifhed two admirable difcoveries upon the parts of aquatic and terreftrial animals, and of plants buried in the earth, and which he had himfelf feen dug up in the mountains of Andria, Apulia, and other places. He boldly declares, that thefe could be depofited there by no other means but by the general deluge in the days of Noah; and enters into the reafons why, in fome places, thefe remains of animal and vegetable bodies are found perfect and intire, and in others corrupted or altered; and obferves, that they anfwer fo exactly in every lineament to the recent bodies of the fame kind, that there can be no doubt of their having once been alfo fuch.

It is a very remarkable obfervation, in regard to the really and certainly determining the origin of *petrified* fhells, that they are not all alike altered by lying in the earth, but that they differ according to the matter among which they have lain to *petrify*. Thus the fame fpecies of fhell *petrifyed* in a loofe fand-ftone, is never nearly fo hard as when *petrifyed* in a folid quarry, or in a hard lime-ftone; fo that it is evident they were brought into the places where they now lie, in the ftate of fhells; and that the ftone in which they are depofited, having imparted to them its own nature, they are harder or fofter, in proportion to its hardnefs. We find in pits where the fhells are depofited in loofe earth, that they are often not *petrifyed* at all, but rendered more foft and crumbly than before.

The echini marini, and other fuch hollow and open-mouthed fhells, are very often found filled up with earth or ftone, the fame with that in which they lie; and refufe matter is fometimes found among this, fuch as the fragments of other fhells, and the fpines of fome other echini. All thefe ferve to prove that the fhell, in its recent ftate, was fufpended in water among fuch fubftances as thefe. And it is not to be fuppofed, with fome authors, that they are found originally as foffils within the fhell; fince, in this cafe, they would be fometimes doubtlefs found of fuch a fize as could not have got in at the mouth of the living animal; but this is never the cafe And upon the whole it appears very plain, that after the membranes which covered the mouths of thefe fhells in their recent ftate, were decayed or wafhed away, thefe extraneous bodies found entrance at them along with the marle, chalk, ftone, or whatever other fubftance

ſubſtance they were among, which was evidently all ſoft and fluid at that time. *Auguſtino Scil'a* de Petrifact.

The *petrified* vertebræ of fiſhes cannot be ſuppoſed real foſſile productions, but are plainly remains of animals; and when examined ever ſo accurately, they are found to agree with the ſame bones in the recent animal in every lineament Scilla mentions a foſſile lobſter's claw preſerved in his muſæum, and found in the hills near Meſſina, in which a piece of a ſcallop-ſhell was found clenched juſt in the manner in which that animal ſeizes its prey. Thoſe who ſuppoſe theſe foſſiles to be really produced in the earth, ſurely cannot ſuppoſe that there could be any ſeminal principle only for the claw of an animal. In Poland there is a kind of ſtone called *niec kammi*, which they bring from a place called by the ſame name. This ſtone has very much the appearance of the grain of wood, and is probably wood *petrified*. Rzaczinſki, in his hiſtory of Poland, mentions the place, and tells us, that there are many whole roots and parts of the trunks of trees *petrified* there. He tells us alſo of an old beech tree in Podolia, whoſe lower part is not only *petrified*, but that into the hardeſt and pureſt of the common ſtones; it being converted wholly into flint, and ſerving the country people thereabout for their common uſes as ſuch. The author tells us, indeed, that the lower parts of trees become *petrified* there as they ſtand, and while the upper parts continue growing; but this ſeems ſcarce credible.

We have indeed ſome other accounts of the ſame nature, but not from authors of ſufficient authority to build our faith on, in ſo ſeemingly unnatural a caſe. This author, in particular, ſeems too credulous in many inſtances; among other things, giving us an account of ſome earthen veſſels found at conſiderable depths in the earth, which he ſuppoſes to have been formed there by nature. We have other accounts beſide this of foſſile urns, but the authors of them all have either miſtaken the cruſtated ferrugineous bodies for urns, or elſe they have ſuppoſed things natural which are certainly artificial. *Rzaczinſki's*, Hiſt. Polon.

Mr. Boyle mentions a kind of ſandy earth found in England, which turns wood into ſtone, tho' there be no *petrifying* ſpring near the place: and this, he ſays, is done in a better manner than by any water he ever ſaw. See Works Abr. Vol. I. p. 161.

Animal PETRIFACTIONS, a term uſed to expreſs ſuch *petrifactions* as are found in the ſeveral parts of the bodies of living creatures.

Of theſe the human body affords many which are the occaſions of very terrible and generally incurable diſeaſes. The philoſophical tranſactions afford us two very ſingular inſtances of this ſort of *petrifactions*; the one in a woman, whoſe whole left kidney was intirely *petrified*, not being filled up in its cavity with a ſtony concretion, as frequently happens in nephritic caſes, but its whole ſubſtance converted into abſolute ſtone, only covered with a thin ſkin.

The other inſtance is in the caſe of a conſumptive perſon, whoſe lungs were found, on diſſection, full of ulcers, and thoſe having almoſt all of them, more or leſs gravel in them; but this was not all, for ſeveral large pieces of the lungs were found, as the kidney in the other inſtance, wholly concreted into ſtone, only covered with a thin ſkin. Phil. Tranſ. Nº 71.

PETRIFACTIONS *of Lough Neagh*. The moſt noted place for *petrifactions* in our dominions is, the famous lake called *Lough Neagh*, in Ireland. Moſt of the antient writers who have given accounts of Ireland, have mentioned the power the waters of this lake have of turning wood into ſtone; and ſome of them have added the abſurd to the marvellous, by affirming, that it would turn that part of the wood which was buried in the mud into iron, that part that was in the water into ſtone, while the part which was above water remained mere wood ſtill.

Some late authors, as Molyneux Nevil, Smyth, Woodward, and others, ſuppoſe this effect not to be found in the water of this lake, but that it either is in the earth about the lake, or elſe that the *petrifactions* found there are not ſuch as have been formed there, but *petrified* elſewhere, and long ſince, and brought thither by the waters of the deluge.

Mr. Smyth affirms, that no experiment ever made has proved that the water of that lake has any power of *petrifying* wood; and gives an example of a gentleman's having planted two ſtakes of holly in the lake, on purpoſe to try; which were taken up after 19 years, without the leaſt advance made toward *petrifaction* It is certain, indeed, that vaſt quantities of *petrified* wood are found in the lake, and even whole trees with their roots and branches all turned to ſtone, have been found buried in the mud of it; and it ſhould ſeem the moſt rational account of their being found there, that they had grown in their natural ſtate on the banks of the lake, and had, in fine, fallen in, and been there *petrified*. And it is equally certain, that of the great quantity of wood met with here, the different pieces are in different degrees of *petrifaction*; and that ſeveral of them are ſeen to be *petrified* in different degrees in their parts; nay, that one ſide of a large piece is often ſeen to be mere rotten wood, while the other is hard ſtone.

It is not to be aſſerted, becauſe ſtakes driven down in ſome one part of the lake are not *petrified* in a ſmall number of years, that therefore the water has no where a *petrifying* virtue; ſince it is poſſible that there may be ſprings ariſing in ſome parts of it, the waters of which may be ſo highly impregnated with ſtony matter, as to *petrify* wood, if they meet with it near their origin; yet the waters of theſe, when mixt with that vaſt body of water which makes the whole lake, may not be able to communicate that *petrifying* quality to ſo large a quantity.

There is ſcarce any water that does not contain ſaline and ſtony particles, which may be ſeparated from it by evaporation; and the generality of *petrifying* ſprings, when examined by this proceſs, are found to be very full of calcarious, or other ſtony matter, and frequently of ferrugineous and vitriolic kinds. Thoſe which contain calcarious matter, when they drop upon ſticks, moſſes, or other vegetable bodies, act on them by incruſtation; their calcarious particles being left behind while the water goes off, and forming by this means ſucceſſive cruſts ſometimes to a great number, which adhere cloſely to one another, and form a ſtony coat to the wood: if theſe be broken at different periods of time from their formation, ſome of them will be found with the wood remaining ſound within them, others with the wood rotten; and others with a ſtony matter of the ſhape of the wood, ſupplying its place, and formed by the depoſition of ſtony particles in the cavity left by the periſhed wood. Sometimes, indeed, theſe waters permeating the pores of wood, fill them up with the calcarious particles they leave behind them; and when the vegetable matter is periſhed, the calcarious concretion remains in its place and exact ſhape. The bodies in this laſt ſtate approach much more to the nature of *petrifactions* than the others, but they all differ greatly from the genuine *petrifactions*; becauſe it is not true ſtone that they conſiſt of, but merely a ſpar or calcarious matter, which readily ferments with, and is ſoluble in acids, and by a ſlight calcination is reduced to lime, in the manner of other ſpars.

The *petrifying* waters, which contain particles of true and genuine hard ſtone, and perhaps with them ſome ferrugineous or other metallic ones, do not act in this manner by incruſtation, but always leave the ſurface naked, and penetrate into the inner ſubſtance of the wood, filling every pore with the hard matter they depoſit; which, in fine, without altering their texture or ſize, adds greatly to their gravity, and gives them the hardneſs of a ſtone. In many parts of Ireland there are great quantities of the incruſtations of calcarious matter on vegetables; but the *petrified* wood found in the Lough Neagh, and on its ſhores, is wholly of the other kind; and ſhews no covering of any foreign matter, but preſerves the grain and all the veſtigia of wood; all the alteration is in the weight and cloſeneſs reſulting from the ſtony matter having filled all the pores: theſe make no efferveſcence with acids, nor will be calcined into lime in a common fire, as the calcarious incruſtations are.

It is probable, that the *petrifying* matter with which the water of ſome part of this lake is endued, is owing to ſeveral ſprings; which running in their courſe thro' mountains where there is abundance of ſtony and mineral matter, waſh off and carry with them great quantity of the particles of one or both theſe ſubſtances; which they afterwards depoſit in the wood they meet with, where they are diſcharged up thro' the mud of this lake; and that tho', when blended among the general water of the lake, they have not this property, yet if the ſtakes of holly had been driven down juſt where thoſe ſprings were, they would probably have been *petrified*, tho' there was no ſuch quality in the reſt of the water of the lake And that there are theſe ſprings in ſeveral parts of the lake, is certain from hence, that when in the great froſt in the year 1740, the great lake in general was frozen over ſo as to bear men on horſeback, yet ſeveral circular ſpaces remained unfrozen.

The *petrified* wood is found in conſiderable plenty on the ſhores of the Lough, but moſt abundantly after ſtorms; and this rolling about of the *petrifactions* at the bottom in ſtorms, makes it not eaſy to fix upon the place where they received their alteration.

Nor are the *petrifactions* found only in and about the lake, but they are turned up by the plough almoſt daily in all places, at two or three miles diſtance from it; and ſome have believed that they were all *lapides ſui generis*, and never had been wood till the roots of trees were found in their natural poſition in the ground, with their ſmaller ramifications and every other part wholly *petrified*.

Many of theſe are much ſofter than the *petrifactions* in the lake, and may be cut and cleaned with a knife, tho' not near ſo eaſily as other wood. It is not impoſſible, but that many of theſe may have been originally *petrified* in the lake, which may have either once extended over a much larger ſpace of ground than it now does, or elſe have loſt on one ſide what it has gained on the other; not that it is neceſſary to ſuppoſe this, ſince there is no doubt but that mineral ſteams and exhalations being highly ſated with ſtony particles, are often found to have a *petrifying* virtue; and ſuch effluvia ariſing thro' the earth may operate on wood accidentally buried in

in that ground; and this seems to be the most probable opinion as to the origin of the *petrifactions*, not only of our fields, but of those found in many parts of the world among sand or gravel.

It is to be observed also, that the finer the lapidific particles are, the more beautiful and natural the *petrifaction* will appear. Of this kind there was once found a beautiful specimen on the shores of the Lough Neagh. This was a root of the common yellow flag-flower, with the bottom part wholly converted into stone, but yet retaining all the fibres, and every part of the texture of the root; the pith in the middle was turned into a whiter stony substance, and the upper surface had all the traces of the several tubercles, or first shoots of leaves, tho' a very hard stone; and the outer covering of some of these retained its vegetable nature still so far, as to be flexile in a small degree, while all within was solid stone.

Some of the pieces of *petrified* wood, found on the shores of the lake, have curious veins of a red and bluish colour, and others are beautifully variegated with black and white striæ. The woody part of them gives a red tincture to aqua fortis, and when taken out of that menstruum, shews some red spots in its pores, which, perhaps, are its first approaches towards *petrifaction*, and are either of a mineral or stony matter.

It is common to find in the cracks of these stones, nay, and of such parts of them as are yet wood and not turned into stone, great numbers of very beautiful and regular, tho' small, crystals: these are transparent and hexangular, and of the same kind with the small crystals found in the cracks of ferrugineous stones, and within our common flints. When calcined, the powder yields to the magnet, which shews that they have some ferrugineous as well as stony particles: and it is not unfrequent to meet with pieces of unaltered wood in the very center of the largest of these *petrified* masses; and the *petrified* parts of the masses, when examined by the microscope, appear extremely beautiful, their pores being all visibly filled with pure and very bright crystal. The different degrees of *petrifaction* appear very various in the several pieces, some are woody on the outside, and altogether stony within; and others outwardly stony, and inwardly unaltered wood; and others having the woody or the stony part appearing only in thin lines and coats on different parts. The harder or more stony parts of these *petrifactions* always give fire with steel. Phil. Tranf. N°. 481.

Some of them shew the grain of ash, some of holly, and some of fir, others of oak; but these are more rare. They frequently have the plain traces of knots and other irregularities, and some are found bent and half broken, and plainly have been worked by art before they were *petrified*.

It is a common opinion, that these stones are what are used for hones in different parts of England; but this is an error, the substance of which these are made being real stone, and not found here, but at Drogheda. Those *petrifactions* of the lake, which have part wood, part stone, usually lose the wood afterwards, by its cracking and falling to pieces as the stone dries; but if examined while it remains on the stone, it is very convincing, as to the reality of the origin of the whole from wood. Id. ibid.

PETRIFICATION, in medicine. See ANCUBITUS.

PETRIFIED *Ivy*. See the article IVY.

PETRIFYING *waters* Alonso Barba gives an account of some *petrifying* waters of Peru, which greatly exceed all those we have in Europe in the quantity of stony matter they contain. He tells us, that they soon choak up their own passage by the stony matter they deposit there; and that all the cattle that drink of them die. He adds another story, which he probably took a little too hastily upon credit, which is, that they have moulds of the shape of our bricks, which they fill with this water, and that on being exposed to the sun a few days, the water is wholly converted into a stone of the same shape; and that they build their houses and other buildings with these stones. *Alonso Barba* de Metal.

PETROCOSSYPHUS, in zoology, a name given by some authors to the bird more usually called from its colour the *cæruleus*.

It lives among the rocks, in woody mountains, and sings very sweetly. See CÆRULEUS.

PETROL, or PETROLEUM—(*Cycl.*)

Mr. Boulduc made several experiments with the white *petroleum* of Modena, an account of which he gave to the Paris academy.

It easily took fire on being brought near a candle, and that without immediately touching the flame; and when heated in any vessel, it will attract the flame of a candle, tho' placed at a great height above the vessel, and the vapour it sends up taking fire, the flame will be communicated to the vessel of heated liquor, and the whole will be consumed. It burns in the water, and when mixed with any liquor swims on the surface of it, even of the highest rectified spirit of wine, which is $\frac{1}{7}$ heavier than pure *petroleum*. It readily mixes with all the essential oils of vegetables, as oil of lavender, turpentine, and the rest, and seems very much of their nature: nor is this very strange, since the alliance between these bodies is probably nearer than is imagined, as the essential oils of vegetables may have been originally mineral ones, and drawn up out of the earth into the vessels of the plant. Mem. Acad. Par. 1715.

Petroleum, when shaken, yields a few bubbles; but they sooner subside than in almost any other liquor, and the liquor resumes its clear state again almost immediately. This seems owing to the air in this fluid being very equally distributed to all its parts, and the liquor being composed of particles very evenly and nicely arranged.

The extensibility of this oil is also amazing. A drop of it will spread over several feet of water, and in this condition it gives a great variety of colours, that is, the several parts of which this thin film is composed, act as so many prisms. The most severe frost never congeals *petroleum* into ice, and paper wetted with it becomes transparent, as when wetted with oil; but it does not continue so, the paper becoming opake again in a few minutes, as the oil dries away.

Spirit of wine, which is the great dissolvent of sulphur, has no effect upon *petroleum*, not even with ever so long a digestion. It will not take fire with the dephlegmated acid spirits, as oil of cloves, and other of the vegetable essential oils do: and in distillation, either by balneum mariæ, or in sand, it will neither yield phlegm nor acid spirit; but the oil itself rises in its own form, leaving in the retort only a little matter, thick as honey, and of a brownish colour. Whoever, therefore, would use this oil in medicine, must take it as nature has prepared it, art having no power to make any alteration in it. Mem. Acad. Paris 1715.

Alonso Barba, in his book of metals, gives a very melancholy instance of the power of *petroleum* of taking fire at a distance: he tells us, that a certain well, yielding *petroleum* on the surface of its water, being to be repaired, the workman took down into the well with him a lanthorn and a candle in it; there were some holes in the lanthorn, through which the *petroleum*, at a considerable distance, sucked out the flame of the candle, and taking fire, burst up with the noise of a cannon, and tore the man to pieces. *Alons. Barba* de Met.

The people of mount Ciaro, in Italy, have some years since found out a much easier way of finding *petroleum*, than that they formerly had been used to.

This mountain abounds with a sort of greyish salt, which lies in large horizontal beds, mingled with strata of clay, and large quantities of a spar of that kind called by the Germans *selenites*; which is the common sort, that ferments with acids, and readily dissolves in them, and calcines in a small fire. They pierce these slates in a perpendicular direction till they find water, and the *petroleum* which had been dispersed among the cracks of those slates, is then washed out by the water, and brought from all the neighbouring places to the hole or well which they have dug, on the surface of the water of which it swims after eight or ten days. When there is enough of it got together, they lade it from the top of the water with brass basons, and it is then easily separated from what little water is taken up with it. It is remarkable, that all the *petroleum* got by this means is white, whereas that of Modena is yellow, and that of Parma brown. These wells or holes continue to furnish the oil in different quantities for a considerable time, and when they will yield no more, they pierce the slates in some other place. Mem. Acad. Scien. Par. 1736. See the article NAPHTHA.

Petroleum is never used among us; but the French give it internally in hysteric complaints, and to their children for worms: some also give it from ten to fifteen drops in wine, for suppressions of the menses. This, however, is rather the practice of the common people than of the faculty.

PETROMARULA, in botany, a name given by several authors to the pyramidal rapunculus of the island of Crete, called by Mr. Tournefort, *rapunculus creticus seu pyramidalis alter*. See RAPUNCULUS.

PETROMYZON, the *stone-sucker*, in the Linnæan system of zoology, the name of a genus of fishes of the chondropterygii order, comprehending the lamprey, &c. The characters of this are, that the apertures of the branchiæ are seven on each side. *Linnæi* System. Natur. p. 52

The name is originally Greek, and is derived from the words πέτρα, a stone, and μύζω, to suck; this fish being usually found in rivers adhering to the stones by sucking, and so keeping its place.

The characters of this genus, according to Artedi, are these: the foramina, or apertures of the branchiæ, or lungs, are seven on each side; they are placed longitudinally, and beside these, there is one single aperture in the head, placed immediately between the eyes. The body is long, and nearly of a cylindric figure; it is smooth, and has only two fins, and those are both placed on the back.

The species of this genus, enumerated by Artedi, are these: 1. The *petromyzon*, with only one row of minute teeth in the verge of the mouth, except the large lower ones. This is the *lampetra fluviatilis minor* of authors, or the lampern eel: and the *lampetræ medium genus*, called by the Germans the *brick*, is only a variety of this, not a distinct species. 2. The spotted *petromyzon*, with about twenty rows of teeth. This is the *lampetra major* of authors, and is called in English the *lamprey*. 3. The *petromyzon* with an annulated body, and with two appendages on each side of the mouth. This is the *enneophthalmus cæcus* of au-

authors. The body consists of eighty-four rings, and it has no teeth. *Arted.* Gen Pisc. 42.

PETRONELLUS, in zoology, a name under which some have described the bunting.

PETRONIA *marina*, in zoology, the name of a small bird of the œnanthe kind, or nearly allied to that genus. Its beak is strong and sharp, like that of the chaffinch; its head is of a brownish grey, but has usually a long whitish streak running along it; its neck is ash-coloured, and at the bottom is variegated with black; the rump is of a brownish green; the long wing-feathers are blackish, with edges and tips of green, and are white underneath; the breast is of a dusky white, and the tail brownish, variegated with yellow. It is, however, distinguished from all other birds by a fine large yellow spot, which it has on the middle of its throat. *Aldrovand.* de Avib. l. 17. c. 38.

PETROSELENI *radix*, *parsley-root*. See PARSLEY.

PETROSELINUM *Macedonium*, in the materia medica, the name of a seed used in medicine The plant which produces it is a native of the warm countries; and the seed should be chosen for use clean, well fed, longish, and of a brownish green colour, and well tasted, and aromatic. The buyer should be careful in the choice of this seed, because it is commonly adulterated, and the seeds of the common *parsley*, or those of a sort of smallage, are too frequently sold in its place. It is aperitive, provokes urine and the menses, and expells wind; and, in form of a cataplasm, is said extremely to help the gout. It is an ingredient also in the Venice treacle. *Lem.* Dict. of Drugs.

PETROSUM *sal*, in natural history, a name given by some of the old writers to the nitre of Ægypt, used in the antient times; and by others to the common nitre, which we use at present, and call by a similar name, *salt petre*.

PETTY *bag* (*Cycl.*)—In antient times the chancellor was likewise chaplain to the king, and it was his business, in the time of the justiciar, to write the diplomata; that is, all charters and commissions from the king: therefore, when the power of the justiciar was broke, he obtained the *officina brevium* and *chartarum regiorum*; from thence all the extraordinary jurisdictions, touching granting of charters, as likewise all inquests of office to entitle the crown, were returned into this office; and the exchequer, in which these things were antiently transacted, became only an ordinary court of revenue, to let leases to the king's farmers, and to get in the king's debts: and therefore the office in the exchequer was only an office of instruction, of what lands were in the king in particular counties; but to invest lands in the crown *de novo*, it was necessary to have an office under the great seal, and so to grant lands from the crown, unless it were merely farms granted for years. Vid. New Abr. Law, Vol. I. p. 587.

From hence, at this day this court has a jurisdiction to hold plea upon a *scire facias*, to repeal the king's letters patents upon petitions, *monstrans de droit*, traverses of offices, *scire facias* upon recognizances, executions upon statutes, &c. which being registred in this court, the process thereupon issues, and is returnable there, and entered in the office called the *petty bag*; whereas the writs which were the foundation of the business of the other courts, were put together in the hamper, which gave the distinction of those names, and begat distinct officers in the court. 4 Inst. 80.

If in this court the parties descend to issue, the chancellor cannot try it, but is to deliver the record, with his proper hand, into the king's-bench, where judgment is to be given; but upon a demurrer, the chancellor is to give judgment [a]: so if the issue is to be tried otherwise than by a jury, as by the bishop's certificate, judgment shall be given in chancery [b].

[a Vid. New Abr. Law, Vol I. p. 587. b 1 Jon. 80.]

Also all personal actions, by or against any officer or minister of this court, in respect of their service or attendance, may be determined in this court; but in these no jury process can issue, therefore the record is to be removed into the king's-bench, as before mentioned.

PETULANTIUM *festum*, in antiquity, a festival celebrated by the Athenians and Lacedæmonians in honour of the moon, under the name of Venus: at which the men assisted, dressed in womens cloaths; and the women in the habits of men. *Hoff.* Lex univ. in voc.

PETUNTSE, or as it is usually called *petunse*, one of the two earths or fossile substances of which the porcelain ware of China is made. The other is named *kao in.* See KAOLIN.

The *petuntse* is sprinkled all over with bright glittering particles. It is beaten to powder, and afterwards made up into a sort of bricks, and in that form it is sent to the places where it is to be wrought. It is of a hard texture, and of a somewhat greenish colour. Mr. Reaumur, of the academy of sciences of Paris, who was extremely industrious in searching into the nature of porcelain, obtained some specimens of the *petuntse*, both in its native state, and in form of the brick, which is given it after it is powdered and reduced to a paste.

Mr. Reaumur found that the *petuntse* is so far from being an earth, as usually supposed, that it was truly of the nature of the European flint or pebble, as he establishes the character of that body but to understand this rightly, it is to be observed, that this author makes the flints and pebbles a very large class of bodies, some of which are more, some less transparent; and that this *petuntse* is of the nature of the coarser, or less transparent kind, the surface of which, when broken, is not so smooth and polished as that of the ordinary flint. The great character of these stones for the porcelain manufactures is, however, that they are very easily vitrified, without the assistance of any salt, and without the immediate contact of the fire, the operation succeeding in a crucible, which is not at all the case in regard to the European flints, they very differently melting alone in a crucible, and then only into a whitish opake glass.

It being certain from hence, that one of the two ingredients of the china-ware is easily vitrifiable, it follows, from the experiment of the whole mixture, or china-ware not being reducible into glass in a large fire, that it is a composition of a vitrifiable, and a not vitrifiable (or at least not easily vitrifiable) substance; and consequently, that the kaolin is a scarce vitrifiable body, and that the result of the action of fire on a mixture of these two, is a semivitrification; which is what we call the china-ware.

If we, therefore, could, in Europe, provide the materials of china, or such as were like them, we might reasonably hope to succeed; and this appears far from improbable. The *petuntse* is easily supplied by many of our own earths, stones, and sands, as nothing is required in it more than a property of running easily into a white glass. The kaolin seems most to be resembled by our European talcs. Mem Acad. Par. 1727. See the article KAOLIN.

PEUCEDANUM, *hogs-fennel*, in botany, the name of a genus of plants, the characters of which are these: the flowers stand in umbells, and are of the rosaceous kinds, being composed of several petals arranged in a circular form, and placed upon a cup, which afterwards becomes a fruit, composed of two flat, oval, marginated, and striated seeds. To this it is to be added, that the leaves are alated, narrow, grassy, and divided always into three parts.

The species of *peucedanum*, enumerated by Mr. Tournefort, are these: 1. The greater Italian *peucedanum*. 2. The smaller or German *peucedanum*. 3. The French *peucedanum*, with fewer and shorter leaves. And, 4. The French *peucedanum*, with fewer and shorter leaves, with purple flowers. *Tourn.* Inst. p. 318.

The common *hogs fennel* is found in wet and moorish places, and about fen ditches. It flowers in June and July. Its root is esteemed of great use, as an expectorant and attenuant. It is prescribed in diseases of the breast and lungs, particularly in those in which those parts are loaded with a tough phlegm. It is also recommended in all obstructions of the viscera. It promotes urine, and is recommended in nephritic cases. The old authors have spoke greatly of its efficacy in all nervous cases, and have recommended it as a singular remedy in lethargies, palsies, epilepsies, and the like.

PEWIT, in zoology, the English name of a common bird of the *larus*, or sea-gull kind, called by some authors *larus cinereus*, and by others *cepphus*, and in some of the counties of England the *black cap*, and *sea-crow*.

It is about the size of a pigeon Its beak is red; its head and throat of a greyish black, and its neck, tail, breast, and belly white; the middle of its back grey. It has its English name from its note, which seems to express the word *pewit*. It is affirmed by many, that the head of this bird is only black at a certain season of the year. *Ray's* Ornithol. p. 264.

PHACOIDES, a word used by the antient physicians to express any thing that in size and shape approached to a lentill. Thus the crystalline humor of the eye was so called.

PHACOPTISANA, a medicine often mentioned by the antient writers as a nourishing and strengthening thing: it was a ptisan with lentills.

PHACOSIS, a word used by the antients to express a disorder of the eye, appearing in form of a black spot, of the size and round figure of the lentill.

PHÆCASIA, in antiquity, a kind of shoes. For the different opinions concerning which, see *Hofm.* Lex. Univ. in voc.

PHAGEDENIC-*water*, a name given to lime water, to every pint of which twenty or thirty grains of sublimate has been added. It is a great deterger of foul wounds; whence it has its name.

PHAGESIA, φαγησια, in antiquity, a festival in honour of Bacchus, celebrated during the Dionysia. See DIONYSIA, *Cycl.* It was otherwise called *phagesiposia*, φαγησιποσια; which names come from φαγει, to eat, and πινειν, to drink; because it was a time of good chear. *Potter*, Archæl. Græc. l. 2. c. 20. T. 1. p. 434.

PHAGON, φαγων in antiquity, a festival of the same nature with that called *phagesia* See PHAGESIA.

PHAGRUS, the *sea bream*. The Artedian system of ichthyology does not allow this fish a peculiar generical name, but makes it a species of the large genus of the *spari*: the author distinguishes this from the others by the name of the *reddish sparus*, with the skin hollowed into a sinus at the roots of the back fins. See SPARUS.

PHAGUS, in botany, a name given by many authors to the exulus, or sweet and esculent oak, found in Greece and Dalmatia. *Parkins.* Theatr. p. 1387.

PHALACRA, a word used by Hippocrates to express all the blunt

blunt instruments used in surgery; such as probes and others, with buttons at the ends.

PHALACROCEPHALUS *indicus*, in zoology, the name of an anadromous fish of the East Indies. Its neck and head appear naked and bald, as it were It is all over of a greyish white in colour, and is variegated with red spots about the mouth. The eyes are large and very prominent, and their irises yellow. Its usual size is about a foot and a half in length, and it lives part of its time in the sea, and part in rivers. It is an extremely delicate-tasted fish, and esteemed one of the finest of that part of the world. It is called by the Dutch *kael kop*. *Ray*'s Ichthyogr. Append p. 2.

PHALAIA, a word invented by Basil Valentine, and used as the name of a *panacæa*, or universal medicine; but Rolfink has since used it to express a tincture of jalap.

PHALANGIUM, in the history of insects, the name of a peculiar genus of *spiders*, the characters of which are these: They do not move regularly and evenly as other *spiders*, but hop in the manner of fleas. This was a character recorded of them by Pliny, and the antients, and is found at this time in all species. They have a square forehead; and in this are placed eight eyes of different sizes, and disposed in form of a part of a circle. They have also the forelegs greatly longer and stronger than any of the others. Of these there are four principal kinds: 1. The grey *spider*, variegated on the belly, with six transverse fasciæ meeting in an angle in the middle. These are alternately black, and of a silvery white. It is of a middle size, and its grey colour seems a mixture of a deep black and a silvery white. It is common in woods and about old walls 2. The reddish brown *spider*, variegated with two large black marks, and a foliaceous obscure figure on the body. This is somewhat smaller than the former, and is found about old walls, but not frequently. 3. The yellowish *spider*, with green eyes, and with three yellow lines on the hips. This is of a middle size, but it is a very rare species. 4. The reddish rock *spider*. This is a moderately large kind, and is of a reddish chesnut colour. It is a very scarce *spider*, and lives among rocks and on heaths. *Ray*'s Hist. of Insects, p. 36. See OPILIO.

PHALANGIUM *apulum*, the *apulian phalangium*, a name given by authors to that large and poisonous species of spider called by the vulgar, the *tarantula*, from the name of a city of Calabria, Tarantum; near which it is very common. Valetta, a monk of Apulia, who had always resided about the places where this mischievous animal is most frequent, and had had many opportunities of tracing its several qualities, published a succinct, but very accurate history of it in the year 1706, under this name.

It had its name *phalangium*, from the three phalanges or joints of its legs, and this name equally suiting many other spiders, as well as this, it ceased to be its appropriated name, and was applied as a generical term to several other spiders of the larger kind; among which this species was always distinguished by the epithet *apulian*, from the place where it was so frequently found.

The *tarantula*, or *apulian phalangium*, is frequent in all parts of this country, in uncultivated places, but more especially it breeds most in sunny dry hills, and particularly in such parts of them as are exposed to the south. It is said not to be found any where, except in Apulia; but probably it is an inhabitant of many other places, tho' its poison may not be violent enough any where else to bring on the effects it does there: as we find in vipers and many other poisonous creatures, that the strength of their poison differs greatly in degree in different places. As this spider is very tender, and easily injured by cold winds and rain, it always digs itself a cave in the side of a hill for its habitation; and usually chuses for this purpose the hardest ground it can find, which is better able to defend it, and which it easily works into with its forceps and claws. This always is hollowed upward in the hill, and by that means is safe from wet, all the water in rainy seasons running down over its top. Sometimes it burrows itself a cave in a valley or plain, but then it always chuses a dry, usually a chalky soil. In this case the entrance into its cave is small, and within there are several winding passages: if it happens to be surprised with wet in this place from hard rains, it quits the floor and hangs by its feet against the top of the cave. It preys upon a number of small insects with which the fields of Apulia abound, and seldom appears in the day-time, but creeps out about the time of sun-set, and preys at large upon the animals which are then betaking themselves to rest; without the danger it would be exposed to from its own enemies by day light. If at any time he remains the whole evening in his cave or den, it is only to practise another method of hunting his prey In this case he comes forward to the mouth of the hole, and there lies in wait; his fore-legs are placed at the extremity of the hole, and his eyes have a clear view all round. The other insects are not aware of this trick, but as they walk near his hole he bursts out upon them, and seizing them, conveys them into his habitation; where, as soon as he has eaten them, he retires back into his cell to dispose of the wings and other fragments, till he can carry them out at a more convenient time, and then places himself in his former posture for another prey.

The peasants of Apulia have a method of getting him out of his hole in the day-time, in order to destroy him. This they do by making a soft hissing noise thro' an oat straw; whether it be that the creature loves this sound, or rather that he takes it for the voice of some insect that he is used to prey upon, he always comes out, and falls a sacrifice to his greedyness.

This creature has eight legs, and walks very well; his legs have each three joints, and are covered with a fine downy hairyness: they are of a whitish colour at the bottom, and variegated with black lines, and are wholly black in their upper part, where they are joined to the breast These all arise from a kind of oval shield, which is placed upon the breast, and is black, hairy, and very hard. This is called by some the *speculum* of the *tarantula*. From the shoulders there grow a pair of horns, at least they are usually called so, tho' they seem much better to deserve the name of *arms*. The use of these is to hold fast the prey, that it may not be able to escape while he is killing it with his forceps. These horns or arms have the same number of joints that the legs have, but they greatly differ from the legs, in that they are shorter and of a yellowish colour. They are also covered with a longer and thicker hair, for the more certainly holding the prey, and are terminated by black claws, and they are much smaller and more capable of motion every way. The belly is either white, or of a pale yellow, and is marked with a transverse black streak: this is surrounded with several other small spots of the same colour, and is cloathed with a very fine and short down. The whole body beside is covered with longer hairs, and is of a whitish or brownish colour. The apex of the head, the shield of the breast, and the ends of the forceps, are as hard as a crab's claws, but the rest of the body is covered with a tender and supple skin. The eyes are very large, and of a fine shining black; they are continually in motion, and when seen in the night or in a dusky place, they shine like the eyes of a cat. In the place where the mouth is placed in other animals, there arises in this a black hard forceps; the upper part of this instrument is covered with a yellow hairyness, and it is terminated by extremely fine and sharp claws, which the creature can open or close up at pleasure. While the arms hold the prey in a proper position, these sharp points make wounds in the body, and the other parts of the forceps squeeze the body till all its juices are pressed out, and the creature feeds on them. The mouth is placed much below these, and stands exactly in the proper place to receive the juices expressed by this operation. The *tarantula* sleeps in his cave the whole winter, and a great part of the autumn and spring; and if during this time he is ploughed up, as is often the case, or is any other way taken out of his hole, he is found quite torpid and numbed, and is unable to do any mischief by biting.

The hole or mouth of a tarantulous cave always gives some idea of the size of the creature within: he makes it small if he enters while young; and as he grows larger he eats away more and more of the earth to widen it still more, so that the diameter of it is usually about equal to the diameter of the body. The size of a chesnut is about the standard of a full grown *tarantula*; but there are some old ones found much larger and more hairy. The female is known from the male by having longer legs and a larger belly. They copulate in June and July, and at that season the females are often met with in the fields carrying the males upon their back In August and September they lay their eggs, which remain the whole winter; and in the summer after are hatched. Pliny tells a story of the young ones always eating up their mother for the first food, which is countenanced by the relation of the peasants in those parts, who say that they all swarm about her and suck her juices from many places at once, till they leave her lifeless carcass on the field, and then go each their several way in search of other food. The bite of the *tarantula*, as it is called, is not properly a bite, but a wound inflicted in a very peculiar manner. The creature pierces the skin with its forceps, and at that instant injects from its mouth a poison into the wound. The time in which their wounds are fatal, is that of their copulation; at this time they are in their utmost vigour and power of hurting. People of fashion are rarely hurt by them, but principally the poor labourers, who sleep half naked in the field, and the women who travel the country with naked feet, gathering medicinal herbs.

Authors are divided about the nature of the poison of the *tarantula*. Cardan says it is a cold one, and Scaliger says it is a hot one; but be this as it will, its effect is very sudden: it is no sooner received into the flesh but the veins take it up and carry it to the heart, where it becomes diffused thro' the whole mass of blood, and gives an immediate trembling of the limbs, and a difficulty of breathing. The next part it seizes is the brain, where it produces different effects in different subjects; and according to their state of health, and the condition of their juices, brings on various species of phrensies.

The

The patient sees a thousand phantoms, sometimes all jovial and merry ones, and sometimes imaginary scenes of blood and cruelty. Some are fond of seeing little streams of water trickling down into a bason; others are never easy unless they have green leaves before them: this indeed is almost an universal symptom. Some are delighted with various colours, and some are fond of violent motion, such as dancing, leaping, and the like; and some are in love with slow and graceful movements, as walking majestically, bowing, and dancing slow dances. Some are military mad, and call out for the noise of drums and trumpets, and the clashing of swords; but all of them, as well the brisk and noisy as the lethargic and dull, are pleased with music.

They will get up and dance to any instrument; and the moment it ceases playing they will fall down to the ground as if apoplectic, and not stir again till the music is renewed. Many people have laughed at the whole history of the bite of the *tarantula*, from this one accident of its poison being cured by music; but all who have been upon the spot attest it; and there seems no reason to call in question the various authorities on which we have it related. *Valett.* de Phalang. Apulo.

Phalangium *decticum*, in natural history, a name given by all the old Greek writers to a poisonous kind of field spider, the same with the *solipuga* of the Latins, or *solifuga*, as some write it. It is a small insect that buries itself in the sand, and if it bites a man does very great mischief; the part swelling, and the person becoming sick as if bitten by a viper: some say the bite is actually mortal; but this seems to be going too far. Solinus tells us that this creature is peculiar to Sardinia, but we find Pliny mentioning it in Ethiopia; and Lucan tells us that it was one of the poisonous reptiles that were in his time the pest of Africa.

Phalangium, *spiderwort*, in botany, the name of a genus of plants, the characters of which are these: The flower is liliaceous, and consists of four petals; from the center of which there arises a pistil, which finally becomes a roundish fruit divided into three cells, and filled with angular seeds; to this it is to be added that the root is fibrous.

The species of *phalangium*, enumerated by Mr. Tournefort, are these: 1. The large flowered not branched *phalangium*. 2. The small flowered not branched *phalangium*. 3. The branched *phalangium* with small flowers. 4. The iris-leaved alpine marsh *phalangium*. 5. The iris-leaved English marsh *phalangium*. 6. The least iris-leaved Scotish marsh *phalangium*. *Tourn.* Inst. p. 368.

PHALANGOSIS, in surgery, the name of a tumor and relaxation of the eye-lids, which is often so great as to deform the eye, and very much impede vision. Sometimes the relaxed eye-lid subsides or sinks down, occasioned either by a palsy of the muscles which sustain and elevate the eye-lid, or else from a relaxation of the cutis above, from various causes. Sometimes also an œdematous or aqueous tumor is formed on the eye-lids, so as almost entirely to exclude vision; but this last case should be well distinguished from the other, and may be remedied without much difficulty, by the use of internal and topical medicines; such as purges and diuretics given inwardly, and a compress dipped in warm spirit of wine and lime water.

But in the paralitic or relaxed case, the use of cordial and nervous medicines must be proposed internally, and outward ly balsam of Peru and hungary water are to be employed. If all these fail, the remaining method is to extirpate a sufficient quantity of the relaxed cutis; and then, after healing up the wound, the remainder will be sufficiently shortened. *Heister's* Surgery, p. 367.

PHALANX (*Cycl.*) — Phalanx, in natural history, a term used by Dr. Woodward, and some other writers of fossils, to express an arrangement of the columns of that sort of fossile coralloide body found frequently in Wales, and called *lithostrotion*.

In the great variety of specimens which are found of this, some have the whole *phalanx* of columns cracked through, and others only a few of the external ones; but these cracks never remain empty, but are found filled up with a white spar, as the smaller cracks of stone usually are. This is not wonderful, as there is much spar in the composition of this fossil; and it is easily washed out of the general mass to fill up these cracks, and is then always found pure, and therefore of its natural colour white.

The *lithostrotion* or general congeries of these phalanges of columns, is commonly found immersed in a grey stone, and found on the tops of the rocky cliffs about Millford in Wales. It is usually erect, tho' somewhat inclining in some specimens, but never lies horizontal. It seems to have been all white at first, but to have been since gradually tinctured with the matter of the stone in which it lies. The single columns which form each *phalanx*, are usually round or cylindric, tho' sometimes flatted and bent; some of them are also naturally of an angular figure; these, however, are not regular in the number of their angles, some consisting of three sides, some of five, and some of seven; some are hexangular also, but these are scarce. They are from five or six to sixteen inches in length; and the largest are near half an inch over, the least about a quarter of an inch; the greater number are very equal to one another in size; but the sides of the columns being unequal, the same column measures of a different thickness when measured different ways: the phalanges or congeries of these are sometimes of a foot or more in diameter.

The columns are often burst, as if they had been affected by external injuries; and it is evident, that they were not formed before several other of the extraneous fossils; for there are found sometimes shells of sea-fishes and entrochi immersed and bedded in the bodies of the columns. It appears plainly from hence, that when these bodies were washed out of the sea, and tossed about in the waters which then covered the tops of these cliffs, which cannot reasonably be supposed to have been any other than those of the universal deluge; this elegant fossil, together with the stony bed in which it is contained, were so soft that these other bodies found entrance into their very substance, and they were formed, as it were, upon them. This fossil takes an elegant polish, and makes in that state a very beautiful appearance, being of the hardness of the common white marble, and carrying the elegant structure visible in the smallest lineaments. *Woodward's* Coll. of Foss. p. 11.

PHALARIS, in the Linnæan system of botany, the name of a peculiar kind of grass called *phalaroides* by Scheuhzer and others; and with this author making a distinct genus of plants, the characters of which are: That the cup is a glume, containing only one flower; this glume is large, bivalve, obtuse, and compressed, each of the valves being of a boat-like shape, flatted, obtuse above, with strait edges meeting one another in parallel lines. The flower is also bivalve, and is smaller than the cup; the exterior valve of it being oblong, pointed, and folded, the interior much smaller. The stamina are three capillary filaments, shorter than the cup; the antheræ are oblong; the germen of the pistil is roundish; the styli are two in number, and are capillary ones; the stigmata are hairy; the flower serves for a close covering to the seed, not at all gaping from it; the seed is single, smooth, and roundish, but pointed at both ends. *Linnæi* Gen. Plant. p. 14.

PHALENÆ, in natural history, the name by which authors distinguish those butterflies which fly by night, and which the French thence call *papilions nocturnes*, and we vulgarly *moths*.

All the creatures of this class are quiet by day, remaining fixed to the stalks or leaves of plants, except only some of the males, which are now and then found fluttering about in the woods in search of the females; but as soon as night approaches they all fly about. This disposition is very remarkably implanted in their nature; for when kept shut up in boxes they always remain quiet without changing place all day, but as soon as the sun is about setting, they always begin to flutter about and fly as much as their prison will permit them. The species of these are more numerous even than those of the day butterflies. The day kinds all have trunks fitted for the sucking the juices of flowers for their nourishment, but many of the *phalenæ* wholly want them: these, however, have always the beards which serve to defend the trunk from injuries in the day-flies, and sometimes in the place of the trunk within these, there is found a small white protuberance or two. It is certain, therefore, that many of the *phalenæ* have no organs of eating, nor take in any food during their whole lives in that winged state. *Reaumur's* Hist. of Inf. Vol. i. P. 1. p. 363.

The grand distinction of the *phalenæ* is into those which have trunks, and those which have not; or at least which have not any sensible to the eye of a common observer; according to these, and to other essential distinctions, these, in the manner of the *papilios* or day-flies, are arranged into seven classes. See Papilio.

Class 1. This contains the *phalenæ* which have prismatic antennæ, or such as are of an equal thickness in almost all their length, and have their anterior part rounded, but their hinder part formed of two planes meeting in an angle; so that a transverse section of one of these antennæ represents a curvilinear triangle. All the *phalenæ* of this class have trunks, and the greater part of them have their wings so disposed, that they form a flat surface when the creature is at rest, and leave the upper part of the body naked; and this usually terminates in a point. The inferior wings are small in comparison of the superior, and their inferior edge is shorter, and usually very much so, than the superior; and the end of this reaches to the end of the body, or beyond that, whereas the other usually leaves two or three rings of it uncovered.

Those moths which have large and heavy bodies, and have short under-wings, and narrow, tho' long upper ones, always make a great noise in flying, and cannot support themselves in the air without agitating their wings very swiftly. This is also the case with some of the day-butterflies.

Many of the very large and beautiful *phalenæ* are of this first class, particularly that which is produced of the beautiful spurge caterpillar.

Class 2. This comprehends the *phalenæ* which have conic horns or antennæ, which regularly decrease in diameter from their

their origin to their extremity, and terminate in a very fine point. These *phalenæ* also have trunks, as well as those of the former class; and their antennæ are usually very slender.

Class 3. This comprehends the *phalenæ* which have antennæ of the same form with those of the former class, but have no trunk.

Class 4. This comprehends the *phalenæ* which have bearded antennæ and a trunk.

Class 5. This comprehends those which have bearded antennæ and have no trunk.

There are several genera of each of these classes, distinguished by the particular structure of their antennæ, tho' of the general form described in the character of the class. Those which are composed of several vertebræ joined end to end, which make the length, have great differences in the size and proportion of these joints, and some of them are hairy, others smooth. These, however, tho' very certain and unerring distinctions, are not to be perceived without the assistance of the microscope; whereas the same animals offer us much more plain and obvious distinctions, and those equally certain, in the different manners in which they fly, and carry their wings when at rest. The butterflies have different manners of carrying their wings, but these are but few in comparison of the moths; so that if the classes in these last were to be established according to this character, they would be greatly too numerous; tho' this gives very happy subdistinctions of the peculiar genera of each class, of which we shall give some instances hereafter, in regard to this class.

Class 6. This comprehends a very peculiar sort of *phalenæ*, the females of which have no sensible wings. Several of those caterpillars which have long parcels of hairs at their heads resembling horns, give *phalenæ*, the females of which have no wings; and the creeping ones, with ten legs, also give some. *Reaumur's* Hist. Inf. V. 1. P. 1. p. 408.

Class 7. This comprehends a set of *phalenæ* which are much more distinctly charactered by nature than any of the former: they have wings shaped like those of birds, and composed of true and proper feathers. All the *phalenæ* of this class are small, but their singular structure makes them worthy a peculiar attention.

It is scarce possible to determine exactly, whether they belong to the *phalenæ* or butterfly class most properly: they have the conic antennæ, which character a former class of the *phalenæ*; but they are often found flying about in the day time, in the manner of the day-flies: their changes also are made in the same manner with those of the day-flies; so that upon the whole, it is, perhaps, most proper to account them a peculiar class of the *papilio*, considered as a general term, but without regard to the first distinction of day and night kinds, or of moths and butterflies.

There are three genera of this class, each of which carries its distinctions from the others very obvious and distinct, so as not to be in any danger of being mistaken.

Those of the first genus are all of a remarkable whiteness; they always stand upon all their six legs, and the two hinder ones are much longer than the others. This creature never carries its wings lying on its body, as the generality of *papilios* do; but they are placed in a direction perpendicular to the length of its body, or nearly so. When it is at rest, the wings are closed somewhat in the manner of those of birds; yet in this state we may see that they are made of feathers, which, when we view them with the microscope, appear to be so many segments into which the wings are divided; the upper being divided into two, and the lower into three, each of which is edged on both sides with real feathers. Mr. Hook has figured this creature in his micrographia, and has given but two divisions to the under wing; but that was probably an oversight, the middle one being easily overlooked. When this little creature flies, it separates the segments of its wings farther off, and expands its feathers so, that they perfectly resemble those of a bird; and the two wings are in this state so placed together as to resemble only one. As beautiful, however, as these wings are to look at, they are but of very little use to the creature in flying. It is not known to fly at all by night, and in the day it takes only very small and short flights.

The creature given by Reaumur as an instance of the second genus of this class, is of a fine bright brown colour, as are all of the genus. When this creature is in a state of rest, its wings are not seen to be feathery, nor even to be wings at all; but are so folded up, as to resemble arms stretched out at length: and the creature in this posture looks like the miniature figure of a man upon a cross, the two wings of each side being folded into a sort of cord, and turning hooked at the ends. The inferior wings are composed each of three plumes, and are lodged in a furrow made by the upper ones, which are convex externally, and concave within, and are divided only about a sixth part of their length, but their segments are well feathered at the edges for half their length.

This species also differs from the former, in that it stands only on its four anterior legs, the two hinder ones being usually extended along the sides, and forming a sort of tail after they have crossed one another behind.

The creatures of the third genus of this class are small, and are frequently seen on the glass of our windows; and their wings are the most truly plumose of those of any species. They are of a brown colour, with somewhat of a gilded look when closely viewed, and have a few black spots in different parts. They carry their wings flat, or horizontally, when at rest; and these appear like the wings of the common butterfly, but when nearly examined, they are found to be composed of real feathers; and their seeming continuity is only owing to the close arrangement of these feathers. This is a very tender creature, and easily crushed to pieces; but when caught carefully, and examined by the glass, each upper wing is found to be composed of eight feathers, and each under one, of four; and the quill part of the pedicle of these feathers, is in all the wings separate to the very point at the top, which is very different from the others, where the wing is only divided a little way into segments; and the upper and under wing of each side are so nicely fitted together when the creature flies, that they only resemble one very large wing. Yet even these feathered wings, when viewed by powerful microscopes, are found not to be truly feathered; but what we term plumes are in reality only a nice arrangement of scales, like those of other butterflies upon the deep segments of the wing. This species has conic antennæ and a trunk. Its origin is unknown, but it seems to be produced of some of the teniæ which live in our houses, since it is always found within doors, never in the fields; and is seen in the month of March, which is earlier than the field butterflies are seen: they are also found in August, September, and October, and sometimes later than that month. *Reaumur's* Hist. Inf. V. 1. P. 1. p. 419.

Mr. Reaumur has given an example of the manner of distinguishing the subordinate genera of the other classes, in those of the second, fifth, &c. before mentioned. In this he has regard to the position and direction of the wings, which is sufficiently certain and determinate, and is the most obvious of all characters; according to this he has established the following genera of this extensive class:

Genus 1. The *phalenæ* of this genus carry their wings parallel, and in an horizontal direction; but they cross one another, one of the upper wings lying in great part over the other. Sometimes it is the right that crosses over the left, and sometimes the left that crosses over that; but however this be, the under wings always lie folded underneath them. Many of the caterpillars which feed on our garden herbs, afford *phalenæ* of this genus, of which there are several of the second class.

Genus 2. This comprehends those *phalenæ* whose wings lie parallel, as in the former genus: they also cover in the same manner the under wing, but these never cross one another. Of this genus there are several subdivisions.

Genus 3. This comprehends those *phalenæ*, the upper wings of which have their interior edges applied one against the other: and tho' they are in general held parallel to the horizon, yet that part of them which covers the body has not the same parallelism with the rest; but are bent round about the body, and so moulded, as it were, upon it, that they shew the shape of that part of it which they cover. We have an instance of this genus in that *phalena* which is produced of the caterpillar which feeds upon the young and green seeds of the nettle. Its wings are variegated with white, and with a deep brownish black, in an elegant manner.

Genus 4. This genus comprehends those *phalenæ* which carry their upper wings in an horizontal direction, but which, instead of crossing, or even touching one another, are so wide asunder, that they do not cover any part of the body, but leave both that and the under wings naked. This genus comprehends a great number of species, which are distinguished according to the different distances to which they expand the wings in sitting; some having them little less so at rest than when flying.

Genus 5. This comprehends those which have the interior edges of the upper wings joined one to the other, and raised above the surface of the body, so that they form a sort of canopy over the creature. In this case, the under wings are always necessarily hid. We have an instance of this genus in the second class, one of the *phalenæ* of that being a very beautiful one, variegated with red and black, always carrying its wings in this manner very remarkably.

Genus 6. This comprehends a set of *phalenæ* which somewhat resemble the former in the placing of their wings, insomuch, that they meet at the interior edges, and form a canopy over the body; but as this is strait and angular in the former genus, it is rounded or arched in this: the inner part of each outer wing being bent, as it were, into the shape of the body. We have a very frequent instance of this genus in one of the *phalenæ* of the third class, which has conic antennæ and no trunk: the caterpillar of this species feeds on the rotten trunks of trees.

Genus 7. This comprehends a great number of *phalenæ*, the greater part of which are very small in size, and carry their wings almost horizontally, forming a very depressed canopy over their bodies. These are remarkably thick about the shoulders, or origin of the wings, and are known by many by the name of the *large-shoulder'd*. When these are in a state of rest, their largest diameter is either at the origin or at the middle of the breast, at or near the insertion of the wings.

We have many *phalenæ* of this kind produced from thofe caterpillars which artfully roll up the leaves of trees, particularly one bred from a fmooth caterpillar of this kind, with fixteen legs.

Genus 8. This comprehends thofe *phalenæ*, the wings of which are laid clofe down upon the body, fo as to be moulded on it, and take its exact fhape: thefe cover the body exactly as the wings of birds do theirs. There are numbers of fmall moths of this fpecies, which are produced of thofe kinds of caterpillars which live all their time in fociety in one common web; of thefe there are many fpecies.

Genus 9. This comprehends a fet of *phalenæ* fmaller than the former, which carry their wings in the fame manner, clofely folded upon their bodies; but differing in this, that they are extended to a confiderable length, and towards their extremity rife up above the level of the body, and form a fort of tail like that of a cock. The *phalenæ* of this genus are diftinguifhed by fome under the name of *cock-tailed*; and tho' they are fmall, yet they are very numerous, and of very great variety; and when examined with the microfcope, appear of a beauty equalling almoft any kind. Their wings thus viewed are frequently found variegated with gold and filver in appearance, the yellow and white fpots frequent in them having a brightnefs which a painter could give us no idea of, but by ufing thofe metals. The moths of the teniæ of feveral fpecies are of this kind: their antennæ are ufually of the conic kind, and as flender as hairs; and it is difficult to fay whether they have any trunk, it being, if they have any, of a very minute kind.

Genus 10. This comprehends a fet of *phalenæ* whofe upper wings are very remarkably folded over the body, one of them furrounding it in a manner, and the other turning itfelf fpirally round that; fo that a very great part of one of the upper wings is always covered by the other. *Reaumur*'s Hift. Inf. V. 1. P. 1. p. 394, 396.

PHALERA, the name of a bandage for the nofe, defcribed by Galen in his treatife on bandages.

PHALERÆ, among the antients, horfe-trappings. See the article TRAPPINGS.

PHALLUS *marinus*, a name given by fome authors to a fpecies of *canalis* or *tubulus marinus*, found about Amboina, and called by the French writers *priape* and *arrofoir*. It is an oblong fhell, with a large head, which is pierced full of holes; fo that it at once refembles the *glans penis*, and the nofe of a watering-pot ufed by gardeners.

PHARI, among the antients, a kind of candleftick. See the article BRANCH.

PHARICUM, the name of a famous poifon among the antients: it was faid to be compofed of many ingredients, but we know nothing of it at this time.

PHARMACI, φαρμακοι, among the Greeks, an appellation ufed for two perfons who were employed in the luftration or purification of cities. *Pott.* T. 1. p. 400.

Thefe were two men, according to fome; but others fuppofe them to have been a man and woman, to reprefent the male and female fex, for each of which they offered a facrifice. It was ufual for the man to carry about his neck figs, called ισχαδες, of a blackifh colour; and the woman fuch as were white. *Pott.* Archæol. Græc. T. 1. p. 400, feq. See the article LUSTRATION, *Cycl.*

PHARMACIA, φαρμακεια, in antiquity, denotes the art of effecting ftrange and wonderful things, by means of medicated and inchanted compofitions of herbs, minerals, *&c.* Thefe things themfelves were called *pharmaca*, fome of which being taken inwardly, were faid to caufe blindnefs, madnefs, love, *&c.* Such were the medicaments by which Circe transformed Ulyffes's foldiers; others infected by touch, fuch was the garment Medea fent to Creufa; others fpread their venom afar off, and operated upon perfons at a great diftance.

There were alfo *pharmaca foteria*, φαρμακα σωτηρια, which were amulets againft the former; fuch was the herb moly, which preferved Ulyffes from Circe's inchantments; the laurel, the fallow-tree, the rhamnus, or Chrift-thorn, flea-bane, the jafperftone, and many others mentioned by Albertus Magnus, and Orpheus, in his book de lapillis. *Pott.* Archæol. Græc. l. 2. c. 18. T. 1 p. 353. See AMULET.

PHARMACITIS *terra*, in the materia medica, a name which fome authors have given to the common *ampelites* or cannelcoal. See AMPELITES.

PHARMACOCHEMIA, a term ufed to exprefs that part of the chemical art which treats of the preparation of medicines.

It is thus called by way of diftinction from that chemiftry which is wholly employed about the tranfmutation of metals by means of the philofopher's ftone; this being called *fpagirico-chemia*.

PHARMACY *(Cycl.)*—Moft of the natural bodies being fome way or other employed as fubjects of *pharmacy*, the materia medica is extremely large, and its operations various. Its materials in the earlieft ages, indeed, were very few, and the ways of managing them very fimple: fubjects afterwards multiplied, operations increafed, and at prefent we feem abundantly ftocked with both fimple and compound medicines.

Difeafes muft have been very early, if the firft inhabitants of the earth experienced the fame changes of feafons, breathed the fame kind of air, and ufed a like kind of diet and regimen of life with ourfelves: but foon after the difeafe afflicts, the patient feeks a remedy; and this appears to have been the foundation of *pharmacy* in different parts of the world.

Experiments being thus multiplied, and the preparations of fimples better made, *pharmacy* became at length an art. Hippocrates, however, when he came to compile a kind of fyftem of phyfic from the obfervations of antiquity, defcribed but few, and thofe generally fimple. *Shaw*'s Lectures, p. 193. Succeeding phyficians then enlarged the materia medica; Galen confiderably fwelled the catalogue, and the Arabians much more; and when learning began to revive in Europe, the materia medica was again enlarged, and great changes wrought upon it by chemiftry.

The art of *pharmacy* muft be confidered under the management of phyficians, apothecaries, trading chemifts, and druggifts. To the phyfician it belongs to direct the medicines, and to give the rules of extracting and managing the fimples. To the apothecary belongs the reduction of the materia medica into certain forms of medicines, according to the direction of the phyfician. And the defign of trading chemifts and druggifts, is to furnifh medicinal matters to the apothecary, who cannot always detect an artificial counterfeit, or a dexterous fophiftication; and perhaps many remedies, well defigned by the phyfician, have failed or had mifchievous effects on this account. *Shaw*'s Lectures, p. 195.

PHARMUTHI, in the Ægyptian chronology, one of the months of their year, which anfwered to the month of April among the Romans *Hoffm.* Lex. univ. in voc.

PHARYNGÆUM *fal*, a name given by authors to an artificial falt, of ufe in the quinfey, and cafes of the like kind, when the *pharynx*, or fauces are incommoded by a difcharge of ferous or other humours.

It is prepared of cream of tartar and nitre, each an ounce, with half an ounce of burnt alum; all thefe are to be diffolved in vinegar, and coagulated according to art. This falt mixed with honey, and diffolved in plantain water, makes an excellent gargle.

PHASEOLUS, *kidney-bean*, in botany, the name of a genus of plants, the characters of which are thefe: the flower is of the papilionaceous kind, and its piftil, which arifes from the cup, finally becomes a long pod, containing feveral kidney-fhaped, or elfe oval feeds. To this it is to be added, that the leaves always ftand three upon a ftalk, and the whole trace and habit of the plant is peculiar, and diftinguifhes it from the other papilionaceous flowered genera.

The fpecies of *phafeolus*, enumerated by Mr. Tournefort, are thefe: 1. The common garden *phafeolus*. 2. The common *phafeolus*, with black fruit. 3. The common *phafeolus*, with yellow fruit. 4. The common *phafeolus*, with red fruit. 5. The common *phafeolus*, with livid fruit. 6. The common *phafeolus*, with pale coloured fruit. 7. The common *phafeolus*, with violet coloured fruit. 8. The common *phafeolus*, with fruit variegated with black and red. 9. The common *phafeolus*, with white fruit, variegated with black lines and fpots. 10. The common *phafeolus*, with purple fruit, variegated with circles of white. 11. The leffer garden *phafeolus*. 12. The leffer *phafeolus*, with pods bending upwards, and with white fruit. 13. The black-fruited leffer *phafeolus*, with pods bending upwards. 14. The white-fruited leffer *phafeolus*, with pods bending upwards, and with black or purple circles variegating the fruit 15. The large *phafeolus*, with broad white fruit, ftriated with numerous black veins 16 The large *phafeolus*, with broad, compreffed, perfectly white fruit. 17. The large *phafeolus*, with large flat white ftriated fruit. 18. The large *phafeolus*, with fmall fnow-white tumid fruit. 19. The *phafeolus*, with greenifh black fruit, refembling thofe of the anagyris. 20. The *phafeolus* with red fruit, refembling that of the anagyris. 21. The fmall *phafeolus*, with white fruit, marked with a black fpot. 22. The narrow-leaved exotic *phafeolus*. 23. The narrow-leaved exotic *phafeolus*, with variegated black and white fruit. 24. The fmall-leaved foreign *phafeolus*, with white, and fometimes with variegated fruit. 25. The foreign *phafeolus*, with the pod and the fruit both black. 26. The foreign *phafeolus*, with variegated fruit. 27. The foreign *phafeolus*, with reddifh fruit, variegated with black lines. 28. The foreign *phafeolus*, with white fruit, of the fhape of a pigeon's egg, and marked with a fingle black fpot. 29. The foreign *phafeolus*, with black fruit, variegated with a white fpot. 30. The Æthiopian *phafeolus*, with black pods, ridged with rough veins, and with a black fhining feed. 31. The Æthiopian *phafeolus*, with yellow leaves and a black feed. 32. The Æthiopian *phafeolus*, with deep red pods and black feeds. 33. The black-fruited Ægyptian *phafeolus*. 34. The red-fruited Ægyptian *phafeolus*. 35. The American *phafeolus*, or lablab, with rofe-coloured fruit. 36. The Indian *phafeolus*, with cochleated flowers. 37. The fcarlet-flowered *phafeolus*. 38. The fmalleft flowered *phafeolus*, with a green fruit of an oval fhape. 39. The garden *phafeolus*, with white fmall oval feeds. 40. The American *phafeolus*, which propagates itfelf by its tendrils. 41. The African *phafeolus*, with fmall white fruit. 42. The fmalleft *phafeolus*, with very long pods. 43. The Brafilian *phafeolus*, with a black fruit, of the fize of a pea. 44. The fmall perennial African *phafeolus*, with bright

bright red flowers. 45. The American *phaseolus*, with a sinuated and spear-pointed leaf. 46. The knotty-rooted American *phaseolus*, with purple flowers, and very narrow pods. 47. The knotty-rooted American *phaseolus*, with yellow flowers and knotty pods. 48. The hairy *phaseolus* of America, with knotted pods. 49. The largest American *phaseolus*, with a great pod, and a hard scarlet fruit. 50. The large American *phaseolus*, with a great flower and with slender crooked pods. 51. The hairy American *phaseolus*, with jointed pods. 52. The American *phaseolus*, with a tuberous esculent root, and with hairy, and, as it were, jointed pods. 53. The American *phaseolus*, with a cochleated flower, and falcated pods. 54. The American sea *phaseolus*, with a hard fruit and variegated seed. 55. The American *phaseolus*, with small pods and variegated seeds. 56. The American *phaseolus*, with a pyramidal spike of flowers, and red seeds, marked with a black spot. 57. The American *phaseolus*, with a remarkable large vexillum to the flower, and with strait cylindric-shaped pods. 58. The round-leaved sea *phaseolus*, with a purple flower, a short-crested pod, and brown striated seeds. And, 59. The pernicious wood *phaseolus* of America, with open pale purple flowers, and slender black pods, and small spotted seeds. *Tourn.* Inst. p. 412. seq.

There are at present three sorts of *kidney-beans* propagated for the table in England. These are, 1. The common white or Dutch *kidney-bean*. 2. The smaller *kidney-bean*, commonly called the Battersea *kidney-bean*. And, 3. The upright sort, called the tree *kidney-bean*.

The first sort was sometime ago greatly propagated in England, and is still in Holland: it grows very tall, and requires long stakes and poles to climb on, and its beans are considerably broad; this makes them less saleable in the markets, people supposing them to be old because they are broad; and they are hence grown into disuse, tho' a much more valuable kind for eating than any other.

The second, sort or Battersea bean, is what is more universally cultivated; it never grows very tall nor rambles far, and the air can easily pass between the rows, because of its moderate growth; and this makes it bear plentifully and ripen well for the table. It is the best-tasted bean, except the last.

The third, or tree *kidney-beans*, is also a plentiful bearer, and never rambles, but grows up in form of a shrub; but its beans are broader than the Battersea kind, and are not so well-tasted.

They are all propagated from seeds which are to be put into the ground in the latter end of March or beginning of April for an early crop, but these should have a warm situation and a dry soil; they must also be planted in a dry season. The manner of planting them is, to draw lines with a bough over the bed, at two foot and a half distance, into which the seeds are to be dropped at about two inches asunder, and the earth is to be drawn over them with the head of a rake, to cover them about an inch deep. In a week after sowing, the plants will appear, and the earth should be drawn up about their stalks as they rise up; for a few days after this they will require no farther care, except to be kept clear from weeds, and when the beans appear, to have them gathered twice a week; for if the beans are suffered to hang on too long, they not only become of no value, but they weaken the plant.

The first crop of *kidney-beans* will continue a month in good order; and to supply the table afterwards, there should be fresh sowings in March, April, May, and June, the last of which will continue till the frosts come to destroy them. Some raise their early crops on hot-beds; and this is to be done exactly in the same manner as the raising the early cucumbers. *Miller's* Gard.Dict. See the article CUCUMBER.

PHASSACHATES, in the natural history of the antients, the name of a species of *agate*, which, in its different appearances, they sometimes called also *leucachates* and *perileucos*.

The same *agate*, from the various proportion or manner of admixture of its particles in different specimens, often makes a very different figure; but no species is so liable to remarkable diversities of this kind as this. It is but of a small variety of colours, yet is often very beautiful; its ground or basis is always a pale bluish grey, approaching to what we call a lead colour, or dove colour. Sometimes it is equally and evenly of this colour, thro' the whole mass, but often also it is variegated within with veins of a deep black and of a pure and clear white: these sometimes approach the surface of the stone, but more usually they are only near the center; and they are almost always disposed in concentrical, but irregular circles, round one, two, or more points. The pieces of this stone, cut where there are many of these veins, much resemble parts of onyxes.

It is found in the East Indies, and in Bohemia, and some other parts of Europe. When the whole matter of the veins and basis of this stone are all blended together into one equal mass, as is frequently the case both with this and many other of the naturally veined stones, the whole becomes of a deeper greyish blue, or a dove colour, and is then the *phassachates*; when the veins are kept distinct and clear, it is the *leucachates* and *perileucos*, agreeing with all the descriptions of the antients. *Hill's* Hist. of Foss. p. 480.

PHAUSINGES, a name given by the antients to red circles on the legs, occasioned by fire: it is by some also extended to several other spots and blemishes on the skin.

PHEANTIDES, in natural history, a name given by some to the stone called *encymonites*; it was of the nature of our sparry incrustations on the roofs of subterraneous caverns. It was supposed to have great virtues in promoting delivery, and was given to women when they fell in labour.

PHEASANT, in ornithology, a bird so nearly allied to our common poultry, that it would naturally appear a very easy thing to breed them up from young; but the proper food of them is not sufficiently enquired into. Tho' they eat corn when full grown and in health, yet they have recourse in their young state, and when sick, to another sort of food, preying on several insects, and that in a very voracious manner.

The young *pheasants* and partridges prey upon ants; and they will never succeed with us if they have not a proper quantity of ants to have recourse to, as soon as they leave their roost in a morning. When musty corn, or want of due care in cleaning their houses has made them sick, a repast of ants will often recover them. When that fails, they may be offered millepides or ear-wigs, or both together, which will always do much better than either singly. To this medicine must be added a proper care that their common food of corn be very sweet, their habitation kept nicely clean, and their water shifted twice a-day. They must not be let out of the house in a morning till the dew is off the ground; and after sun-set they must be immediately taken in again: in the heat of the day they must be allowed to bask in the sun in a dry sandy place. With these regulations the birds of this kind will succeed much better than they usually do. The *pheasant* is a bird of a sullen disposition, and when the coupling time is over, there are seldom found more than one in a place. Phil. Trans. N° 23.

The way of taking *pheasants* is, first to be acquainted with their haunts and breeding places; which are usually young, thick, and well-grown coppices, free from the disturbances of cattle, and having no path-way thro' them, for the *pheasant* is an extremely timorous bird. When the haunts are discovered, the next thing to be attempted is, to find where the eye or brood is. In order to this, it is to be considered, that the *pheasant* comes out of the wood three times a-day to feed in green corn, fresh pastures, or the like places The times of coming out are in the morning soon after sun-rise, at noon, and at sun-set. The sides of the wood where they are supposed to come out, are to be carefully watched on this occasion, and the young ones will be seen following the female just as a flock of chickens follow the hen. The wood may be also well watched in the evenings, and the noise of the cock and hen calling the young ones together will soon be heard; and the sportsman is on this occasion to get as near as he can to the place, and being very still and silent he may observe their numbers and disposition, and learn how to spread his nets so as to take the whole brood with great ease; but if his least motion when near them discover him, they will all take to their legs and run to a great distance; they seldom rise on the wing, except very close frighted indeed. Practice will make some people so expert at the imitating the voice of the old *pheasant*, that he will be able to call the young ones together to any place that he pleases, when the haunts are once found out, and by this means they are easily led into the nets.

The best time for using the call is, in the morning or evening; and the note imitated should be that by which the old ones call them out to feed; but by learning to imitate the other notes they will be brought together at any time of the day. The sportsman who can make this call, must shelter himself in some close place, and begin by very softly making the note; then if none are near enough to be within hearing, he is to raise it to more and more loudness, and at length he will be answered as loud, if any are within hearing, tho' at a considerable distance; whereas if he should set up the call too loud at first, and any of the birds should happen to be very near, they would be frighted away.

As soon as a *pheasant* answers, the sportsman is to creep nearer and nearer, still calling, tho' not so loud; he will still be answered, till at length he will be led by the bird's voice within sight of her. As soon as this is the case, he is to spread his net, and then begin to call again, keeping in some close and well-sheltered place behind the net: in this place he is to call till the bird approaches; and when he has drawn her under the net, he is to appear suddenly, and the bird rising up will be caught in the net.

Another method of taking *pheasants* much quicker than by this means is, the having a live cock *pheasant* to use as a stale: this bird is to be fixed under the net, and by his crowing he will soon entice others in. The sportsman must lie concealed, and as soon as another *pheasant* comes in, he is to draw the net over him. Many people have a method of taking *pheasants* in springes or horse-hair snares: the succeeding in this depends on the carefully searching out their haunts and the places by which they go out of the woods into the fields. When these are found, a peg is to be fixed in the ground at each, and at each peg two springes are to be laid open; the one to take in the legs, the other the head. As

soon as the springes are set, the sportsman is to go into the woods, and getting behind the birds, he is to fright them with some little noise, such as shall not be enough to raise them to the wing, but only to set them a running. They will naturally make their way out of the wood thro' their accustomed passes, and be then caught in the springes.

There is another method yet of taking these birds in the winter, provided that there is no snow. This is to be done with a net made like a casting net, but with the meshes much wider; they may be five inches wide. Some peas or wheat are to be taken out, and the path of the *pheasants* being discovered, which may easily be done by their dung, a pint or thereabout of corn is to be thrown down in the path in a place marked, so that the sportsman can come to it again. This is to be done for several days, till at length the *pheasants* are expecting it every day regularly; and all the birds of this kind that frequent the place, are brought together to feed there, and then the net is to be fixed over the place; its top being tied up to some bough of a tree, and its bottom fixed down all round, except in one place, where the walk of the *pheasants* lies. In this place it is to be raised in form of an arch, and the entrance is to be lined with several rods of hazel; the thick ends of which are to be tied to the net, and the thin ones let into the space covered by it; and thus the *pheasants* will easily get in by parting the small ends of the sticks, as fish into a wheel, but they will not easily get out again. The nets are to be dyed of a russet colour, by laying them in a tan-pit; and they must, when planted for this purpose, be covered with boughs, so that the birds do not discover them, and then they will easily run into them, and be all taken at once.

PHECOS, in botany, a name used by some authors for the *sagittari*, or *water-arrow-head*. *Ger.* Emac Ind. 2.

PHELLANDRIUM, *water-hemlock*, in botany, the name of a genus of plants, the characters of which are these: The flowers stand in umbells, and are of the rosaceous kind, each being composed of several heart-fashioned leaves, disposed in a circular form. The cup finally becomes a fruit composed of two small seeds, lightly striated and gibbose on one side, and flat and plain on the other.

The species of *phellandrium*, enumerated by Mr. Tournefort, are these: 1. The common *phellandrium*, or *water-hemlock*. 2. The alpine *phellandrium*, with purple umbells, called by some *meum alpinum* and *mutellina*. *Tourn.* Inst. p. 316.

PHELLOS, in botany, a name used by some authors for the cork-tree. *Ger.* Emac. Ind. 2.

PHELLOS, φελλος, in antiquity, a festival in honour of Bacchus, being a preparative to the Dionysia. See DIONYSIA, *Cycl. Potter*, T. 1. p. 436.

PHENGITES, in the natural history of the antients, the name of a very beautiful species of alabaster. It is a very rude and irregular mass, very shattery and friable, yet of a brightness superior to that of most of the other marbles, and excelling them all in transparence: it is in colour of an agreeable pale, yellowish, white, or honey colour; the yellowish is more intense in some places than in others, and sometimes makes an obscure resemblance of veins. It is very weak and brittle in the mass, and when reduced to small pieces, is easily crumbled between the fingers into loose, but considerably large angular pieces, some perfect, others complex, irregular, or mutilated, and all approaching to a flat shape.

The antients were very fond of this species in their public buildings; and the temple of fortune, built wholly of it, has long been famous. Its great beauty is its transparence; from which alone this temple was perfectly light when the doors were shut, tho' it was built without a window, and had no other light but what was transmitted thro' the stone its walls were built with. It was antiently found in Cappadocia, and is still plentiful there: we have it also in Germany and France, and in our own kingdom in Derbyshire, and some other counties. It takes an excellent polish, and is very fit for ornamental works where there is no great strength required. *Hill's* Hist. of Foss. p. 490.

PHEOS, in botany, a name given by Theophrastus, Dioscorides, and others, to a plant used by the fullers in dressing their cloths, and of which there were two kinds, a smaller, called simply *pheos*, and a larger called *hippopheos*.

The name of this plant is sometimes written *phleos*; and it is by that confounded with a kind of marsh cudweed, or *gnaphalium*, called also by that name; but it may be always found which of the two plants an author means, by observing the sense in which the word is used, and the use to which the plant was put. The *pheos*, properly so called, that is, the cudweed, was used to stuff beds and other such things, and to pack up with earthen vessels to prevent their breaking; but the *pheos*, improperly called *phleos*, only about cloths; this was, however, also called *stœbe* and *enaphon*.

Theophrastus describes the *pheos* and the *hippopheos*, and calls them the same plant, only differing in size and some other small particulars. And he says, in many places, that this plant was also called by many *stœbe*; he mentions them often together, and several times compares some one plant to them both; so that there seems to have been only the difference of size between them. Galen also, as well as this author, calls the *hippopheos stœbe*.

Dioscorides, however, has somewhat perplexed the matter, by describing the *pheos* and the *hippophes*, so he writes the *hippopheos*, in different places of his works, and not seeming to allow any similitude or alliance between them. The virtues he ascribes to them are also plainly different; he tells us, that the *stœbe* or *pheos* binds, is good in dysenteries; and, on the contrary, that the *hippopheos* is a purgative, and carries off the bile. The *stœbe* is numbered by him among the smooth plants, and the *hippopheos* among the prickly ones. Upon the whole, the names *stœbe* and *pheos* with this author, seem applied only to the plant properly called *phleos*, that is, *gnaphalium*; and he treats of this *stœbe* either as a thing universally known, or else as unknown even to himself; for he no where gives any description of it. *Theophrast.* l. 6. c. 5.

PHEREPHATTIA, Φερεφάττια, in antiquity, a festival at Cyzicum, wherein a black heifer was sacrificed to Pherephatta or Proserpine. *Potter*, Archæol. Græc. T. 1. p. 436.

PHILADELPHIA-*stones*, a name given by some authors to what are called by others *Christian's bones*, found in the walls of that city. It is a common error, that these walls are built of bones, and the tradition of the country is, that when the Turks took the place they fortified it for themselves, and built their walls of the bones of the Christians whom they killed there. Dr. Smyth in one of his epistles mentions this wall as an instance of the Turkish barbarity; but this is an idle opinion, what passes for bone being only a loose and porous stone of the sparry kind, found in an old aquæduct which is still in the wall. Sir Paul Rycaut brought home pieces of these stones, which he also supposed to have been bones, but on examination they proved to be no other than various bodies, chiefly vegetable, incrusted over and preserved in a spar of the nature of that which forms incrustations in Knaresborough spring, and other places with us. These bodies are often cemented together in great numbers by this matter, and their true shape lost in the congeries, till a diligent and judicious eye traces them regularly. *Woodw.* Catal. of Foss. V. 2. p. 14.

PHILANTHROPOS, in botany, a name used by some authors for the common *aparine*, *cleavers*, or *goose-grass*. *Ger.* Emac. Ind. 2.

PHILANDER, in zoology. See the article DIDELPHIS.

PHILETERIUM, in botany, a name used by some authors for the *behen album*, the common white flowered bladder campion, called *white ben*. *Ger.* Emac. Ind. 2.

PHILLEREA, a garden shrub, which, in the Linnæan system of botany, makes a genus, the characters of which are: That the cup of the flower is very small, indented into four seeming divisions, and does not fall off with the flower. The flower is composed of one petal, beginning with a very short tube, and dividing into four segments placed evenly, and each pointed; the stamina are short, two in number, and placed opposite one to the other; the antheræ single and erect; the pistil is composed of a roundish germen, a single style of the length of the stamina, and terminated by a somewhat larger stigma; the fruit is a single berry, containing one large orbicular seed. *Linnæi* Gen. Plant. p. 2.

PHILOMEDIUM, in botany, a name used by some authors for the *great celandine*. *Ger.* Emac. Ind. 2.

PHILONIUM (*Cycl.*)—PHILONIUM *Londinense*, the name by which the medicine commonly called *philonium romanum*, is called in the late London dispensatory. The composition is also much altered, as well as the name, and is now ordered to be made thus: Take white pepper, ginger, caraway-seeds, of each two ounces, opium six drams, syrop of diacodium boiled to the consistence of honey, three times the weight of all the rest. The opium is to be dissolved in a little wine, and then mixed with the syrup; after which the powders are to be stirred in, and the whole made into an electuary. *Pemberton's* Lond. Disp. p. 342.

PHILOSOPHIC *chemistry*, an art of dividing or resolving all the bodies in our power by means of all the instruments that can be procured, and that as well into integrant as into constituent parts, and joining these parts together again, so as to discover the principles, relations and changes of bodies, make various mixtures and compositions, find out the physical causes of physical effects, and hence improve the state of natural knowledge and the arts depending on it. *Shaw's* Lectures, p. 1. See the article CHEMISTRY.

PHILOSOPHIC *spirit of wine*. See the article WINE.

PHILOSOPHY (*Cycl.*)—By *philosophy* we mean the knowledge of the reasons of things, in opposition to history, which is the bare knowledge of facts; or to mathematics, which is the knowledge of the quantity of things or their measures.

These three kinds of knowledge ought to be joined as much as possible. History furnishes matter, principles and practical examinations, and mathematics compleat the evidence. *Philosophy* being the knowledge of the reasons of things, all arts must have their peculiar *philosophy* which constitutes their theory: not only law and physic, but the lowest and most abject arts are not destitute of their reasons, which might usefully employ

employ the time of the ſtudious. It is true, thoſe who call themſelves *philoſophers* and learned men have as yet done little towards forwarding the intelligence of arts: but we ſpeak not of what is done, but of what ought to be done.

One great obſtacle to the progreſs of arts and ſciences has been the neglect of practice in ſpeculative men, and the ignorance or contempt of theory in mere practical men. What chimeras and abſurdities the neglect of experience and practice has produced, need not be mentioned; the miſchiefs ariſing from a neglect of theory, are not ſo obvious: yet certainly it retards the progreſs of arts. All invention or improvement muſt be either caſual or rational, including analogy or inference from ſimilar caſes, under the term rational. Now altho' the foundations of arts have often been owing to ſome caſual diſcovery, as gunpowder or the loadſtone; yet is this not to be truſted to alone. Improvements do not always flow from this ſource, but rather from the reflexions of artiſts; and if theſe reflexions were rendered more diſtinct, more communicable and eaſier to be retained, by the proper uſe of ſigns and other *philoſophical* helps, great advantages might be expected: it being certain, that *philoſophical* knowledge is more extenſive, and more ſure in the application; and beſides, gives a pleaſure to the mind not to be expected from that which is merely hiſtorical.

It is to be obſerved, that the bare intelligence and memory of *philoſophical* propoſitions, without any ability to demonſtrate them, is not *philoſophy*, but hiſtory only. However, where ſuch propoſitions are determinate and true, they may be uſefully applied in practice, even by thoſe who are ignorant of their demonſtrations. Of this we ſee daily inſtances in the rules of arithmetic, practical geometry, and navigation; the reaſons of which are often not underſtood by thoſe who practiſe them with ſucceſs. And this ſucceſs in the application produces a conviction of mind, which is a kind of medium between *philoſophical*, or ſcientifical, and hiſtorical knowledge. The ingenious author of the Analyſt has gone ſo far as to ſuggeſt, that mathematicians have no other conviction of the truth of the doctrine of fluxions.

Philoſophy may be divided into three parts, intellectual, moral, and phyſical. The intellectual part comprizes logic and metaphyſics. The moral part contains the laws of nature and nations, ethics and politics. And laſtly, the phyſical part comprehends the doctrine of bodies, animate or inanimate. Theſe, with their various ſubdiviſions, will take in the whole of *philoſophy*.

Wolfius makes the three parts of *philoſophy* to be the doctrine of God, the human ſoul, and of bodies [a]. However, when he ſubdivides, and comes to treat the ſeveral branches ſeparately, his diviſions readily come under the three heads intellectual, moral, and phyſical, before mentioned. The doctrine of God and the human ſoul may be ranged under the ſame head metaphyſics, the notion of the divine nature being formed from that of the human ſoul, excluding limitations and imperfections [b]. [[a] *Wolf.*. Diſc. Prælim. Logic. ſect. 56. [b] *Wolf.*. Theol. nat Part. 1. ſect. 1059.]

We have ſaid that *philoſophy* is the knowledge of the reaſons of things. It may be aſked what is the reaſons of things, or what is the explication of phænomena or facts. An ingenious author tells us, that the explication conſiſts only in ſhewing the conformity any particular phænomenon hath to the general laws of nature, or, which is the ſame thing, is diſcovering the uniformity there is in the production of natural effects. This he thinks evident to whoever ſhall attend to the ſeveral inſtances, wherein philoſophers pretend to account for appearances. By a diligent obſervation of the phænomena within our view, we may diſcover the general laws of nature, and from thence deduce, tho' not demonſtrate other phænomena, all deductions of this kind depending on a ſuppoſition that the author of nature always operates uniformly, and in a conſtant obſervation of thoſe rules we take for principles; which we cannot evidently know. *Berkeley*, Princip. of Hum. Knowl. Sect. 62 & 107.

If we take a view of the ſeveral phænomena, and compare them together, we may obſerve ſome likeneſs and conformity between them. For example, in the falling of a ſtone to the ground, in the riſing of the ſea towards the moon, in coheſion and cryſtallization, there is ſomething alike, namely an union or mutual approach of bodies: ſo that any one of theſe, or the like phænomena, may not ſeem ſtrange or ſurpriſing to a man who has nicely obſerved and compared the effects of nature: for that only is thought ſo which is uncommon, or a thing by itſelf, and out of the ordinary courſe of our obſervation. That bodies ſhould tend towards the center of the earth, is not thought ſtrange, becauſe it is what we perceive every moment of our lives; but that they ſhould have a like gravitation towards the center of the moon, may ſeem odd and unaccountable to moſt men, becauſe it is diſcerned only in the tides; but a philoſopher, whoſe thoughts take in a larger compaſs of nature, having obſerved a certain ſimilitude of appearances, as well in the heavens as the earth, that argue innumerable bodies to have mutual tendency towards each other, which he denotes by the general name attraction, whatever can be reduced to that he thinks juſtly accounted for. Thus he explains the tides by the attraction of the terraqueous globe towards the moon, which to him doth not appear odd or anomalous, but only a particular example of a general rule or law of nature.

If, therefore, we conſider the difference there is betwixt natural philoſophers and other men, with regard to their knowledge of the phænomena, we ſhall find it conſiſts not in an exacter knowledge of the efficient cauſe that produces them, for that can be no other than the will of a ſpirit; but only in a greater largeneſs of comprehenſion, whereby analogies, harmonics, and agreements are diſcovered in the works of nature, and the particular effects explained: that is, reduced to general rules, which rules, grounded on the analogy and uniformneſs obſerved in the production of natural effects, are moſt agreeable and ſought after by the mind; for that, they extend our proſpect beyond what is preſent and near to us, and enable us to make very probable conjectures, touching things that may have happened at very great diſtances of time and place, as well as to predict things to come; which ſort of endeavour towards omniſcience, is much affected by the mind. *Berkeley*, Princ. of Hum Knowledge, Sect. 104, 105.

PHILYRA, in natural hiſtory, a name given to the ſubſtance of which ſome of the moſt antient books are written. It is the inner bark of the *tilia*, or common lime-tree. The emperor's library at Vienna has a book written by Tully, never yet publiſhed, which is written on this ſubſtance. *Munting.* de Plantis.

PHLEBOTOMY, *(Cycl.)* in ſurgery, the opening of a vein by a proper ſharp-edged and pointed inſtrument of ſteel, for letting out a proper quantity of blood, either for the preſervation or recovery of a perſon's health.

This appears not only to be one of the moſt uſeful, but one of the moſt antient operations in ſurgery, ſince we find by Hippocrates, Celſus, &c. that it was practiſed near three thouſand years ago. The operation is frequently performed in different parts of the body, as the hand, the foot, the forehead, temples, neck, tongue, penis, and other parts; yet it is moſt generally performed in that vein of the arm which lies near the joint of the cubit. *Heiſter*'s Surg p. 273.

In bleeding it ſometimes happens, that an artery is opened either inſtead of, or together with, the vein: an accident of this kind is attended with the utmoſt danger. An artery is known to be wounded when the blood ſpins out very forcibly from the orifice, and that by ſtarts or leaps, not in an even ſtream, and extends itſelf in a greater arch from the orifice to the baſin. The colour of the blood from an artery is alſo much more florid than from a vein; to which add, that on preſſing the finger on the veſſel below the orifice, the blood ſtarts out more violently than before; and ſtops, or at leaſt abates, on preſſing above the orifice; quite the contrary of what happens on the opening a vein.

In an accident of this kind, the ſurgeon ſhould have preſence of mind not to betray the caſe by his fears to the patient, or attendants: he ſhould obſerve whether the blood flows freely from the orifice, or whether it inſinuates itſelf in any conſiderable quantity between the integuments. If the firſt is the caſe, he muſt take a large quantity of blood away, even till the patient faints, perſuading the attendants, that the heat of the blood requires it; and while the patient is in his fainting fits, as the flux then ceaſes, he may commodiouſly dreſs and bind up the wound; and by this precaution hinder a freſh hæmorrhage or an aneuriſm. The ſurgeon muſt place ſome ſmall piece of money between the folds of the firſt compreſs; and on this place two, three, or more compreſſes, each larger than the other: and then bending the cubitus, apply two bandages in this manner, as after bleeding in the vein, only a little tighter; and lay a thick, long, and narrow compreſs over the artery, from the cubitus to the axilla and the patient muſt be warned to wear his arm in a ſling, pinned to his cloaths, for a fortnight, and refrain from all uſe of it. *Heiſter*'s Surg. p. 287.

If the blood from the wounded artery is found to inſinuate itſelf between the integuments, the orifice muſt be immediately compreſſed, and tied up as before directed; and the arm often inſpected, to ſee whether a bleeding within the integuments does not yet continue. The patient muſt be frequently bled in the other arm, and if a large quantity of blood ſhould be lodged from the wounded artery under the integuments, it will be neceſſary to open the integuments to diſcharge it.

It is too common an accident to find a nerve or tendon punctured in bleeding, and this is generally known to be the caſe by the patient's making a ſevere outcry at the time; and eſpecially if he complains afterwards of acute pains, and the limb begins to ſwell and be inflamed, convulſed, ſtiff, and extended as in the cramp: which ſymptoms, if not timely relieved, threaten convulſions of the whole body, a gangrene of the part, and even death in a ſhort time.

The beſt method to be taken in theſe accidents, is to firſt bathe the part with a mixture of oil of turpentine and ſpirit of wine, and then inveſt the whole arm with the diachalciteos plaiſter, melted down in oil of vinegar and roſes, retaining it on by the expulſive bandage; which beginning upon the hand, aſcends gradually by ſpiral turns to the top of the ſhoulder; by which means the impulſe of the blood on the part is not only much abated, but alſo the pain and inflammation much diminiſhed: and laſtly, the following cataplaſm ſhould be applied

to the arm, to compleat the cure: take of flour of barley and of bitter vetch, of each two ounces; chamomile flowers and melilot flowers, of each two handfuls; freſh butter, an ounce and half: boil theſe into a cataplaſm with ſoap ſuds, and apply them to the arm till the pain and other bad ſymptoms are removed. *Heiſter*'s Surg. p. 286.

PHLEBOTOMY *in the eyes.* There are ſeveral ways of performing this operation, but the beſt ſeems to be this. The patient being ſeated on a chair, and his head held in a proper poſture, a tranſverſe inciſion is to be made, with a fine lancet, upon the turgid ſmall veins in the corners of the eye, ſo as to open them or cut them quite aſunder. The eye-lids muſt be held apart with one hand, whilſt the veins are opened with the other; and ſome uſe a pair of fine ſciſſars for this purpoſe, inſtead of a lancet, and others elevate the veins with a crooked needle before they divide them: but in this operation the better way would be to make the needles with edges, that when the veins were thus elevated, they might divide them without the help of any other inſtrument. When the inciſion is made, the diſcharge of blood muſt be promoted by means of fomentation, with a ſpunge dipped in warm water; and if the diſcharge is not ſufficient, the inciſion may be repeated two or three times: but few patients can be brought to ſuffer this, and there is no practiſing it at all upon infants, becauſe they will not keep the eye ſteady. *Heiſter*'s Surg. p. 377.

PHLEGMASIA, a word uſed by ſome of the medical writers for an inflammation. Hippocrates alſo ſometimes uſes it to expreſs the violent heat in fevers.

PHLEGMON (*Cycl.*)—If the proximate cauſe of theſe tumors be enquired into, we ſhall find it generally riſes from too thick or viſcid a ſtate of the blood, ſtagnating in the anaſtomoſes of the ſmalleſt veins and arteries; ſo that the blood being propelled in larger quantities than can paſs thro' thoſe veſſels, it muſt of conſequence excite the ſymptoms that are the attendants of this tumor, and occaſion great diſorder at every part where ſuch ſtagnation is made.

No part of the body, whether external or internal, is perfectly exempt from this ſort of tumor, not even the bones themſelves; but it is more common in the fat and glands than elſewhere.

The cauſes of this ſtagnation of the blood are either external or internal.

Among the external, are all wounds, fractures, luxations, contuſions, punctures, by thorns and ſplinters, with a too great compreſſion of the veſſels, whether by too ſtrict a bandage, or by other means; each of which obſtructing the paſſage of the blood thro' its minute veſſels, either by dividing, bruiſing, compreſſing or diſtorting them, may give riſe to this tumor. And to this may be added, burns of all kinds, with too violent cold, the too great motion of the body, the external application of ſharp and ſtimulating ſubſtances to the ſkin, and others, which ſtop the pores of the ſkin, and impede the circulation of the blood.

Among the internal cauſes, are to be reckoned the too great acrimony of the blood, as in ſcorbutic habits, the blood's abounding in too great quantities, or being of too thick a conſiſtence, or, laſtly, its circulating in the body with too violent a motion; for by this laſt means, the groſſer particles of the blood are protruded, and wedged in, as it were, in the ſmaller veſſels, thro' which they cannot find a paſſage; and this is eſpecially the caſe, when a ſudden cold is given to the body from a ſtate of extreme heat. In ſhort, every thing will produce an obſtruction that makes either the particles of the blood too large, or the mouths of the veſſels too ſmall and narrow to receive them.

The reſolution or diſperſion of a tumor of this kind is only practicable when the tumor is of a milder kind; when it is in a ſound habit of body, and when the blood is not yet too viſcid, or too violent in its motion: but ſuppuration follows when the inflammation is more violent, the circulation more rapid; but yet the maſs of blood ſomewhat temperate and free from acrimony. That is, when the blood becoming more inſpiſſated, and its larger particles ſticking in the more minute veſſels, can find no paſſage; but the ſmall veſſels are burſt by the preſſure and impulſe of the obſtructed blood, ſo that their contents are extravaſated in the fat, fleſh, and adjacent parts. Upon this extravaſation, the more ſubtle and fluid parts of the blood putrefy, by means of the great heat, and become fœtid and acrimonious, and corrode the adjacent parts: the fluids thus changed or corrupted, are, by the ſurgeons, called matter or pus; and this is of ſeveral kinds, according to its conſiſtence and colours: it is either white, yellow, greeniſh, reddiſh, or party-coloured.

When the forementioned ſymptoms are much more violent, and the blood at the ſame time more acrimonious than it ought to be, this inflammation generally terminates in a gangrene: for in that caſe, the ſmalleſt arteries and veins are corrupted, burſt, and broke; and hence the adjacent parts are diſſolved and corrupted by theſe extravaſated acrimonious humors, and particularly the ſkin is very ſubject to be filled with puſtules, when its cuticle has been ſeparated, as in burns. The ſanies contained in theſe puſtules and elſewhere, is uſually termed ichor, and is generally of a pale reddiſh caſt, and ſometimes brown or livid, which is much worſe; for unleſs the patient in this caſe is timely aſſiſted, the ſymptoms of inflammation all go off, the tumor, reſiſtance, heat, redneſs, pain, and pulſation, gradually diſappear, and the limb becomes flaccid and cold; it afterwards turns pale, and becomes dead and inſenſible, and the inflammation creeps to ſome other part.

If this caſe be treated with medicines too hot, too aſtringent, cooling, fat, acrimonious, or narcotic; or if the parts be bound too tight, the fleſh quite dies, its paleneſs turns to a livid lead colour; and the incloſed ſanies finding no vent, becomes more acrimonious, and ſo greatly corrodes the adjacent parts, as to deſtroy all ſenſe and motion, and brings on an entire ſphacelation of the whole limb. But if the inflamed part be full of glands, and the blood very thick, glutinous, and tough, the ſmall veſſels are then ſtrongly ſtuffed up with it, and impacted together; and the parts loſing their ſenſation, become changed into a hard tumor, called a ſcirrhus. The cure of *phlegmons* is by diſperſion or ſuppuration: the methods for bringing on theſe, ſee under the heads DISPERSION and SUPPURATION. *Heiſter*'s Surg. p. 178.

PHLEOS, in botany. See the article PHEOS.

PHLEUM, in the Linnæan ſyſtem of botany, a graſs called *typh idea*, or cat's-tail graſs by Scheuhzer, which makes, with this author, a diſtinct genus of plants, the characters of which are: that the cup is a glume, containing one flower; it is bivalve, oblong, ridged, and compreſſed, and opens into a double-pointed ſummit; the valves are erect, hollowed, compreſſed, equal in ſize, and bearded; the flower is compoſed of two valves, ſhorter than that of thoſe of the cup, the outer one, which is the larger, ſurrounding the inner or ſmaller one; the ſtamina are three capillary filaments, longer than the cup; the antheræ are oblong, and divided into two at the ends; the germen of the piſtil is roundiſh; the ſtyles are two in number, ſmall, and bent; and the ſtigmata are plumoſe; the cup and flower incloſe the ſeed, which is ſingle, and of a roundiſh form. *Linnæi* Gen. Plant. p. 14.

PHLOGIDAUGIA, in natural hiſtory, the name of a claſs of inflammable foſſils, of a pure texture, and in ſome degree tranſparent.

Of this claſs are the ſulphurs, orpiments, zornics, and amber. They are by this name diſtinguiſhed from the *phlogiſcieria*, or inflammable foſſils, of a coarſe texture, and opake; ſuch as the ambergreaſe, jet, and aſphalta, and the ampelites and common coal. *Hill*'s Hiſt. of Foſſ. p. 399.

PHLOGINOS, the name of a ſtone found in Ægypt, and called by ſome *chryſitis*, from its colour, reſembling gold.

Pliny deſcribes it as reſembling the Attic oiſter, as the paſſage is uſually printed; and hence Agricola and ſome others have ſuppoſed he only meant the *oſtracites*, or foſſile oiſter ſhell, by this name, tho' the other name, *chryſiti*, could not well be applied to that body. Salmaſius has very well explained the paſſage, by obſerving, that as the antients have no where mentioned the Attic oiſter, the words probably were originally *Attic ochre*; the ſenſe is then plain, and the ſtone is only ſaid to be of a fine yellow, like gold; or the *Attic*, that is the brighteſt yellow *ochre*. It probably was an agate of the cerachates kind.

PHLOGISCIERIA, in natural hiſtory, the name of a claſs of foſſils, the characters of which are, that the bodies contained in it are inflammable, of a coarſe and impure texture, and not pellucid.

The word is derived from the Greek φλόγινος, inflammable, and σκίερος opake. The bodies of this claſs are divided into two general orders, and under thoſe, into five genera. Thoſe of the firſt order, are ſuch as are found looſe, and in detached maſſes: thoſe of the ſecond, ſuch as are found conſtituting whole ſtrata. The genera of the firſt order are, ambergreaſe, jet, and the aſphalta; and thoſe of the ſecond, cannel and common coal. *Hill*'s Hiſt. Foſſ. p. 411. See AMBERGREASE, GAGATES, ASPHALTA, AMPELITES, and LITHANTHRAX.

PHLOGITES, in natural hiſtory, a name given by Pliny and other authors to a ſtone, which, they ſay, had the appearance of flames of fire, bubbling up and riſing to ſeveral points within it. It is ſometimes called alſo *phlegonites*.

Some have ſuppoſed that the antients meant no more by this diſtinction, than to expreſs a fire colour lodged in the ſtone, and have meant it as a name for the opal; but as the Germans have at this time an odd ſtone among them, which they commonly call petrified flames of fire, it is poſſible the antients might have had the ſame ſtone, and called it by this name.

The abſurdity of petrified fire is too groſs to need refutation, but the whole that is meant by the name, ſeems to be, that the ſtone had ſome ſtrait and erect rays, of fire colour.

Pliny ranks the *phlogites* among the gems, but Sabinus and others place it among the larger ſtones: and we have from ſome parts of Germany, a ſpar, with radiations of a fiery red in a white ground, which looks as like flames as any thing one could expect in a ſtone; but whether this, or ſome other, be the ſtone called petrified flames of fire by the collectors of that nation, we are not aſſured; the name only having as yet come to us, without the ſubſtance itſelf.

PHLOGONIÆ, in natural hiſtory, the name of a claſs of foſſils, uſually included by authors with many others of a very different kind, under the general name *pyritæ*. Theſe are defined

fined to be compound, inflammable, metallic bodies, found in ſmall maſſes, and of determinately angular figures. Of this claſs of bodies there are three genera.

1. The *pyricubia*, which are *phlogoniæ* of a regularly cubic figure. 2. The *pyroctagonia*: theſe are *phlogoniæ* of an octohædral figure, or compoſed of eight planes. And, 3. The *pyripolygonia*: theſe are *phlogoniæ* of a dodecahædral figure, or compoſed of twelve planes. *Hill's* Hiſt. of Foſſ. p. 618, 619. See PYRICUBIUM, &c.

PHLOGUS, in botany, a name given by ſome of the antients to the ſeveral ſpecies of the *iris* and *gladiolus*. and by ſome to the *flammula jovis*, a ſort of clematitis, ſo called becauſe of the violent heat of its leaves to the taſte.

Theophraſtus mentions this in the ſame part of his work with the violet and other ſpring flowers, and thi, not becauſe they are allied to one another in their characters, but becauſe they all flower at the early time of the year. Pliny miſtakes the author's meaning in this ſo far, as to ſuppoſe that he placed it among the violets as a plant of that kind; and has accordingly mentioned it as a violet with a flame-coloured flower.

This plant ſeems to have owed its name *jovis flamma* to a miſtake of Pliny's, who copying Theophraſtus, and finding him mention this *phlogus*, or *phlogium*, and another flower, called *dioſanthos*, or Jove's flower, together, has ſeemed to blend the two names, and make out the word *flamma*, or *flammula Jovis*, between them.

PHLOMIS, in botany, the name of a genus of plants, the characters of which are theſe: the flower is labiated, conſiſting of one leaf; the upper lip is hooded, and the lower, over which this lies, is divided into three ſegments: the piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and ſurrounded with four embryos, which finally ripen into four ſeeds, of an oblong ſhape, contained in a pentangular cup, which is the cup of the flower.

The ſpecies of *phlomis*, enumerated by Mr. Tournefort, are theſe: 1. The ſhrubby *phlomis*, with a broad and roundiſh ſage-like leaf. 2. The ſhrubby *phlomis*, with a narrow and longer ſage-like leaf. 3. The round leafed purple-flowered ſhrubby *phlomis*. 4. The pointed-leaved purple-flowered ſhrubby *phlomis* of Portugal. 5. The purple-flowered clary-leaved *phlomis*. 6. The purple-flowered very white Spaniſh ſhrubby *phlomis*. 7. The herbaceous very white Spaniſh *phlomis*. 8. The taper *phlomis*, commonly miſtaken for a ſpecies of mullein, and called by authors *verbaſcum anguſtis ſalviæ foliis*, or the narrow ſage-leaved mullein, and the wild yellow mullein, with gaping flowers. *Tourn.* Inſt. p. 177.

PHLOMON *ſtephanomaticon*, in the botanical writings of the antients, a name given to the common white mullein. The upper part of the thyrſus, or ſpike of flowers of this plant, was frequently uſed in the garlands and coronæ of the antients; and it is named by Dioſcorides and others among the yellow flowers in general uſe on that occaſion.

It is remarkable, that Dioſcorides, tho' he mentions this plant in the claſs of garland herbs, among the elychryſa and other yellow flowered herbs, no where mentions it under the mullein, where he is deſcribing the characters and ſpecies of that plant. It ſhould ſeem from this, and from ſome other ſuch paſſages, where this author deſcribes the ſame plant twice without knowing it; or omits it in its proper place, and treats of it only occaſionally in ſome other, that he had not a perfect knowledge of the botany of his time: but that, like Pliny, he collected what he has left us from the works of other authors now loſt.

PHLYSIS, a term uſed by the antients to expreſs an eruption on the ſkin, from a redundance of humors.

PHLYZATION, a puſtule or inflammation on the ſkin, or the bliſters ariſing on it after being burnt or ſcalded with a hot liquor.

PHOCA, the *ſea-calf*, in the Linnæan ſyſtem of zoology, a diſtinct genus of animals, the characters of which are, that they have two paps placed near the navel, feet adapted to ſwimming, and have no ears.

There are two kinds of this animal: the common one, called the *ſea-calf*, which has its canine, or dog-teeth, encloſed like the others in its mouth; and the other, which ſome improperly call the *hippopotamus*, or ſea horſe, which has theſe teeth exſerted or thruſt out. *Linnæi* Syſtem. Natur. p. 36.

We have a draught of this animal in the philoſophical tranſactions, numb 469, by Dr. Parſons, who obſerves, that Aldrovandus, Johnſton, Rondeletius, and Geſner, have made ſeveral miſtakes in the figure of this creature, ſo as to convey no juſt idea of it.

Upon diſſecting one of theſe animals, the ſtomach, inteſtines, bladder, kidneys, ureter, diaphragm, lungs, great blood-veſſels, and pudenda, were like thoſe of a cow; the hairs of the whiſkers were very horny and clear; the ſpleen was two foot long, four inches broad, and very thin; the liver conſiſted of ſix lobes, each hanging as long and as lank as the ſpleen, with a very ſmall gall-bladder. The beaſt was long and flabby in its contexture in general, having a large foramen ovale, and very great columnæ carnoſæ. In the lower ſtomach were about four pounds weight of flinty pebbles, all ſharp and angular, as if the animal choſe them of that form for cutting the food. The uterus was of the horned kind, each of the cornua being thicker than the body or duct leading to them. The ovaria were very large, being granulated on the ſurface with the ova, under a very thin membrane; and the opening into the tubes leading to the cornua is a great hole.

The authors who have treated on this animal, are Ariſtotle, Pliny, Aldrovandus, Rondeletius, Geſner, Wolfgangius, and Johnſton. Phil. Tranſ Nº. 469.

This animal is viviparous, and ſuckles its young by the mammillæ, like quadrupeds; and its fleſh is carneous and muſcular. That diſſected by Dr. Parſons was ſeven foot and an half long, tho' very young, having ſcarce any teeth, and having four holes regularly placed about the navel, which in time become papillæ.

PHOCÆNA, in zoology, the name uſed by authors for the *porpeſſe*, diſtinctively from the dolphin, a fiſh very like it, and by many confounded with it. See DELPHINUS.

The *phocæna* is of a roundiſh, not flat body, growing gradually ſmaller toward the tail; and juſt at the root of the tail is a little flatted. Its noſe is long and pointed, and furniſhed with ſtrong muſcles; by means of which it is able to turn up the mud and ſand, to ſeek after ſmall animals. Its ſkin is ſmooth, and but thin: its back is of a duſky bluiſh hue, almoſt black in ſome of the fiſh; and from the middle of the ſides downwards, it is whitiſh: it has no gills, nor any apertures in the place of them; but in the middle of the upper part of its head, it has a ſpiracle, in form of a half moon, divided by a ſubſtance reſembling a coxcomb, into two noſtrils, which, as they run inward, join and make one canal, which opens within the mouth a little below the œſophagus. This canal is provided with muſcles, to keep it ſhut againſt the admiſſion or emiſſion of any fluid, but at the creature's pleaſure; and by means of this he diſcharges the water taken in with his food. Its eyes are ſmall: its auditory paſſages extremely minute: its teeth alſo ſmall: it has two fins on the breaſt, and one on the back: and its tail is ſlightly forked, and placed horizontally, not vertically, as in other fiſhes: its lungs are like thoſe of quadrupeds: it is common in many places, and ſometimes is ſtranded on the Engliſh coaſt: its fleſh is not at all valued. *Ray's* Ichthyol. p. 31.

PHŒNICOPTERUS, in zoology, the name of a very remarkable water-bird, called alſo *flammant* and *flamingo*.

It has extremely long legs, and an extremely long neck. Its beak is broad, and of a very ſingular figure; the upper chap being bent, depreſſed, and dentated; the lower, much thicker, and firmer. It is black at the end, and in the other part of a duſky blue. Its neck and body are white; the long flight feathers of its wings black, but the ſhorter feathers, which make the covering of the wings, are of a very elegant and bright red, whence the bird has its name: it is web-footed, tho' ſo remarkably long legged: it lives about waters, and feeds on fiſh: it is common in many parts of America, and is ſeen at times in many parts of Europe: it was well known to the antients, and its tongue was accounted a very great delicacy among the nice eaters of old times. See Tab. of Birds, Nº 46. *Ray's* Ornithol. p. 240.

One thing very remarkable about it is, that its beak is ſo long and crooked, that the whole head muſt be immerſed before the water can get into it. *Pitiſc* in voc.

PHŒNICOPUS *gallinula*, in zoology, a name by which ſome authors have called a bird, more uſually known by the name *tringa*. *Geſner* de Avib. See TRINGA.

PHŒNICURUS, φοινικουρος, in zoology, a name by which the antient naturaliſts called the *ruticilla*, or redſtart. See the article RUTICILLA.

PHŒNIX, (*Cycl.*) in botany, a name given by medicinal writers to the graſs called *lolium rubrum*, and in Engliſh, *ray-graſs*. *C. Bauhin.* p. 9.

PHOENIX is alſo the name given by Kæmpfer and Linnæus to a genus of plants, called by others *elate* and *katou-indel*. The characters are theſe: it produces ſeparate male and female flowers, in both the whole ſpatha ſerves for a cup: in the male the petals are three in number, and are of an oval figure, and concave: the ſtamina are three ſlender filaments, and the antheræ are very ſhort: in the female flower the germen of the piſtil is of a roundiſh figure: the ſtyle is ſhort and pointed, and the ſtigma is acute: the fruit is an oval berry, having only one cell; this contains one ſeed, which is of a bony hardneſs, and of an oval figure, with a deep longitudinal furrow reaching from one end to the other. *Linnæi* Gen. Pl. 513. Muſ Cliff, 12. Hort. Mal 3, 23.

PHOENIX, φοινιξ, among the antients, a muſical inſtrument not unlike the *cithara*. *Hoffm* Lex in voc. See the article CITHARA, *Cycl.*

PHŒOPUS, in zoology, a name uſed for two different birds; the one called by the Germans *brachvogel*, and the other the *whimbrell*, or *aquata minor*, the ſmall curlew of authors.

The firſt of theſe, or the *brachvogel*, is of a deep black colour, ſpotted with a yellowiſh and a reddiſh brown: its beak is long, ſlender, and black, and is moderately bent: its neck is grey, tending to reddiſhneſs towards the bottom, and its belly is white. Mr. Ray ſuſpects this not eſſentially to differ from the other, but the ſight of the bird alone can determine that. *Geſner* de Avib. *Aldrovand* de Avib. L. 20. c. 41.

PHOLAS, in natural hiftory, the name of a genus of fhells, the characters of which are thefe: It is an oblong multivalve fhell, compofed of five fhells, tho' in fome, improperly ac counted fpecies of this genus, only of two. It is fmooth in fome fpecies, in others rough, and in fome reticulated; in fome fpecies it fhuts clofe and even, in others it gapes always open.

Of the oblong fhells, ufually called *pholades*, and confifting only of two fhells, we meet with the following fpecies: 1. The fmooth *pholas*, of Rondeletius. 2. The fmooth nar rower *pholas*, of Aldrovand. 3. The wood-*pholas*, of Rumphius. 4. The fmooth mufcle-like *pholas*. 5. The finger-*pholas*, of Bonani. 6. The pale red and white *pholas*.

Of the oblong and irregular *pholades*, which confift only of two valves, we have the following fpecies: 1. The great American *pholas*. 2. The broad *pholas*, with the long trunk

Of the oblong irregular *pholas*, confifting of five valves, we have only one known fpecies, which is the *pholas* of Lifter. See Tab. of Shells, N°. 29 and Hift. Nat. Eclairc. p. 356.

The word *pholas* is derived from the Greek, and fignifies no more than any thing which is hidden; the name was given to this genus of fhell-fifh from their cuftom of making themfelves holes in earth, fand, ftones, or wood, and living hidden in them. Many being of opinion, that thefe fifh could not work themfelves into the fubftance of hard ftones, have thought that they were hatched in holes accidentally formed in ftones, and that the fhells naturally grew of fuch a fhape as was neceffary to fill the cavity. Nor is this the only error propagated concerning the *pholas*; for as all that was fignified by the name being only that the fhell was hidden in fome folid fubftance, whenever an author found a fhell-fifh of whatever kind thus buried in ftone, he defcribed it under the name of *pholas*.

There are many fpecies of the fhell-fifh, and thefe of feveral different genera, which thus hide themfelves in ftone; and thefe have therefore been called by different authors *pholades*; and hence it has been faid, that the *pholas* was in fome fpecies a bivalve, and in others a multivalve fhell. The true *pholas*, which Lifter has very well defcribed, is a genuine multivalve, being compofed of five pieces; but this is a very fcarce fifh, and feveral of the mufcles and of the chamæ being often found in ftone, they have all been called bivalve *pholades*; and fuch as have found the chamæ thus immerfed, and found them really to confift of only two fhells, have cenfured the authors of error who have defcribed the *pholas* as having five. Hift. Nat. Eclairc. p. 362.

All the fpecies of fhell-fifh which are found in ftone, have certainly been the means of making the holes in which they are found: the fact is inconteftible, but the means yet wholly unknown. Perhaps when fome accurate obferver fhall have an opportunity of examining the fifh alive, the myftery will be cleared up. All that we know at prefent is, that they are firft buried in the ftone while very fmall; fince the aperture on the furface of the ftone is ufually much fmaller than the diameter of the fhell contained within, and only ferves to admit the fea water, or to give paffage to the probofcis of the inclofed fifh.

The chamæ, which are frequently known among us under the name of the *pholas*, and common about our fhores, are often found in a foft ftone of the feptaria or ludus Helmontii kind; and as there is a great refemblance between this ftone and a hardened clay in its external appearance, many have fallen into an opinion of its being a petrified clay. On this principle it has feemed eafy to account for the ftrange phænomenon of the *pholades* or chamæ being found in it, fince it has been fuppofed that they made their way into it while in the ftate of clay, and that it afterwards became petrified or hardened into ftone while they were in it. But not to mention the error of the opinion of this fort of ftone being a petrified clay, or the abfurdity of fuppofing that fuch a petrifaction, were it made at all, could be effected in fo fhort a time as during the life of the fifh. It is eafy to anfwer this opinion by another obfervation, which is, that on the coafts of Italy it is not uncommon to find wrought pieces of hard marble, formed into pillars and other ornamental parts of building, in which are lodged the true *pholades*, as alfo chamæ and mufcles, in the fame manner as in our fofter ftones. It is not to be fuppofed that thefe pieces of marble were ever any thing elfe but marble; and we have an account from Woodward of certain columns of marble which were dragged up out of the fea, after their having been loft there but a few years before, and thefe were all full of *pholades*. If any thing could be wanting after this to prove the certainty of the fact, that the *pholades* make themfelves the holes they live in, it might be added that they are often found lodged in wood, as well as in different kinds of ftones; the bottoms of fhips being frequently pierced by them. There is an opinion among the vulgar, that the *pholades*, after a time, change into butterflies; but this is too abfurd to need a refutation. The fifh is very good to eat, and is taken in quantities on breaking the ftones; for they never live fingly, but many in the fame ftone.

In the memoirs of the academy of fciences it is faid, that the fhell of the *pholas* is compofed of three pieces, two of which are equal in fize and alike in fhape; and the third, which is vaftly fmaller than thefe, is placed near the fummit of the others, and fills up a little fpace, which they leave empty: this is ufually of the figure of a lozenge, one of the fharp ends of it coming in contact with the other fhells at their tops; but fometimes it is only pointed at both ends, and rounded in its intermediate part, and the external furface of it is ufually convex. The two large valves of the fhell are twice or three times as long as they are wide, and the cardo, which joins them, is placed near one end; they grow gradually fmaller to the other extremity, where they terminate in an oval. They are furrowed and channelled in the manner of a file, having many longitudinal ftreaks croffed by a great number of tranfverfe ones; thefe lines mark the age or different growths of the fifh, and their ridges are often befet with fmall points like prickles. The two valves of the fhell are ufually open, and are capable of expanding to a great width; but they do not expofe, or leave naked the body of the fifh on this occafion; for they are connected together by a membrane which opens to give them room, and forms with the two fhells a fort of cafe for the body of the fifh; and indeed this was the more neceffary, as the figure of the fhells is fuch, that they cannot ever perfectly clofe together, for when they come into contact in one part, another neceffarily remains open from their fhape. Mem. Acad. Par. 1712.

The holes in which the *pholades* lodge are ufually twice as deep, at leaft, as the fhell is long; and the figure of thefe holes is, that of a truncated cone, except that they are terminated at the bottom by a hollow rounded cavity, and their pofition is ufually fomewhat oblique to the horizon. The openings of thefe holes are what betray the *pholas*'s being in the ftone; but they are always very fmall, in proportion to the fize of the fifh. There feems to be no progreffive motion of any animal in nature fo flow as that of the *pholas*; it is immerfed in the hole, and has no movement except a fmall one toward the center of the earth; and this is only proportioned to the growth of the animal. Its work is very difficult in its motion, but it has great time to perform it in, as it only moves downward, finking itfelf deeper in the ftone as it increafes itfelf in bulk. The part by means of which it performs this, is a flefhy fubftance placed near the lower extremity of the fhell; it is of the fhape of a lozenge, and is confiderably large in proportion to the fize of the animal; and tho' it be of a foft fubftance, it is not to be wondered at that in fo long a time it is able, by conftant work, to burrow into a hard ftone. The manner of their performing this may be feen by taking one of them out of the ftone, and placing it upon fome foft clay; for they will immediately get to work in bending and extending that part allotted to dig for them, and in a few hours they will bury themfelves in the mud in as large a hole as they had taken many years to make in the ftone. They find little refiftance in fo foft a fubftance, and the neceffity of their hiding themfelves evidently makes them haften their work. The animal is lodged in the lower half of the hole in the ftone, and the upper half is filled up by a pipe of a flefhy fubftance and conic figure, truncated at the end: this they ufually extend to the orifice of the hole, and place on a level with the furface of the ftone; but they feldom extend it any farther than this. The pipe, tho' it appears fingle, is in reality compofed of two pipes, or at leaft it is compofed of two parts feparated by a membrane. The ufe of this pipe or probofcis, is the fame with that of the probofcides of other fhell-fifh, to take in fea water into their bodies, and afterwards to throw it out again. In the middle of their bodies they have a fmall green veffel, the ufe of which has not yet been difcovered; this, when plunged in fpirit of wine, becomes of a purple colour; but its colour on linnen will not become purple in the fun like that of the murex; and even if it would, its quantity is too fmall to make it worth preferving. Mem. Acad. Par. 1712.

The true or multivalve *pholas* is compofed of two large fhells, two other fmall ones at the back, and one long narrow and crooked one at the cardo. The three fmall fhells always fall off as foon as the creature is dead; hence we ufually fee the true *pholas*, with only two fhells, in cabinets, and hence fome have called it a bivalve, and others a trivalve fhell, having found one of the three other valves. Some alfo pretend, that the Englifh *pholades*, befide the five pieces already mentioned, have another, which ferves as an operculum. Many are of opinion, that the *pholades* bore their way into the ftones, by means of their rough fhells, but Bonani is of opinion, that they do it with certain teeth. *Lifter*'s Hift of Animal. Engl. p. 172. *Aldrovand* de Teftac. l 3. *Bonani* Recreat. Ment. et Oculi. p. 36.

PHOLIS, in natural hiftory, the name of a genus of foffils of the clafs of the gypfums or plaifter ftones, the diftinguifhing characters of which are, that the bodies of it are confiderably hard, compofed of fomewhat broad particles, and of a bright cryftalline luftre.

The word is derived from the Greek φολίς, a fcale, or fmall flake, from thefe bodies being compofed of particles of that form.

The ſpecies of this genus are the moſt valuable of all the gypſums, as burning to the beſt and fineſt plaiſter, but ſo far as is yet known there are but two of them. The fine plaiſter ſtone of Montmartre in France, called by us *plaiſter of Paris ſtone* and *Parget*; and the other the coarſer and ſomewhat reddiſh kind, common in many parts of England, and called *hall plaiſter*. *Hill's* Hiſt. of Foſſ. p. 112. See the article PARGET.

PHOLIS, in zoology, the name of a ſmall anguilliform fiſh, the back of which is brown, the belly white, and the whole back and ſides ſpotted, and the ſkin ſoft and not covered with ſcales, but with a tough mucilaginous matter like the eel. This moſt of all approaches to the *alauda*, and tho' uſually ſomewhat larger, yet Mr. Ray doubts whether it really differs from it in any thing eſſential; its great diſtinction being its colour, which tho' a very obvious, is a very precarious one. *Rondelet.* de Piſc. p. 20. *Ray's* Ichthyography, p. 135.

PHOLLIDES, a word uſed by the antient phyſicians for ſoft and fungous tumors of the legs, ſuch as thoſe of people in an anaſarca, or leucophlegmacy.

PHONASCI, in antiquity. See PHONASCIA, *Cycl.*

PHORBÆA, or PHORBEIA, in the muſic of the antients, a name given to a ſort of *frenum* or *bandage*, applied to the mouths of people who played on the pipe.

It was a ſort of leather band, which went firſt a-croſs the forehead, then behind each ear, and from thence making one or two turns round the head, it paſſed over the mouth, where its office was to reſtrain the lips from emiting too much breath at once, and cauſe them to diſcharge only juſt ſo much as would ſerve to inflate the pipe.

Simonides deſcribing the trial of ſkill between Marſyas and Apollo, mentions this *phorbeia* or *capiſtrum*, and ſome antique gems yet remaining among us, have the figure of a Marſyas's head, with the *phorbeia* upon it.

By the different ſtructure of the *phorbeia*, as expreſſed on the different coins, we find, however, that there were two ſpecies of it, the one was leſs complex, conſiſting only of a perpendicular piece down the cheek, and a tranſverſe one, running a-croſs the lips, and covering the whole orifice of the mouth, only leaving a hole cut thro' it, at which the mouth-piece of the pipe was to be put in. The other conſiſted of ſeveral bandages, as at firſt deſcribed, and the lower tranſverſe piece of theſe did not come over the mouth, but only bore up the lower lip, in a forcible manner, againſt the upper. The old Greek writers diſtinguiſhed theſe by two different names added to the original word *phorbeia*; the firſt, or ſimple one, was called *monomeres*; and the other, or more complex one, *diemeres*: they were both called alſo by Soranus, and others, *epideſma*, and ſometimes ſimply *deſma*. *Soranus* de Epideſmis.

PHORIMOS, a name given by ſome authors to *roach alum*. See the article ALUM.

PHORINE, a word uſed by ſome authors to expreſs the ſkin of a hog; ſome alſo underſtand it to mean a ſkin of any kind, extending it even to the human cutis.

PHORMIX, among the antients, the ſame with *cithara*. See the article CITHARA, *Cycl.*

PHORMORAPHIS, in the materia medica, a name often uſed by the later Greek writers, and generally looked on as one of their unintelligible words, or the name of ſome drug not known at this time.

If we may gueſs at the reſt of their unintelligible words, however, by this, it is probable that ſomething might be done toward the explaining and underſtanding them, by conſulting the other medical writers neareſt their times, and particularly the Arabians.

Aviſenna mentions the drug called *carpeſium*, or *carpeſia*, which, he ſays, was a common ſubſtitute, in his time, for cinnamon. Galen alſo tells us, that the ſame uſe was made of the *carpeſium* in his days; they add deſcriptions of the drug, by which it appears probable, that it was either the young ſhoots of the cubeb tree, or of ſome ſuch ſhrub. The later Greek writers generally copy their accounts of things from theſe, and they give exactly the ſame deſcription of the *phormoraphis* as theſe do of the carpeſia: its uſe, as a ſubſtitute for cinnamon, is alſo mentioned by them. And upon the whole it appears, that it was the name the later Greeks gave to the *carpeſium*, or *carpeſia*, of their predeceſſors. It is to be obſerved here, that there is another very different ſubſtance given in the old Greek writers under the name of *carpeſium*; and this word is ſometimes written *carpeſium* and *carpeſia*. This was a gum reſembling myrrh in ſmell and colour, but of a poiſonous nature: the *carpeſia* here mentioned was, on the contrary, an aromatic medicine. See CARPESIA.

PHOS, a word uſed by ſome medical writers to expreſs a diſtemperature of the eye, in which there is ſeen a black circle wholly ſurrounding the pupil.

PHOSCAS, in zoology, the name of a freſh-water fowl of the duck kind, and of the ſize of the common wigeon. Its body is remarkably flat; its beak and legs are blue; its head and neck are of a browniſh colour, variegated all over with numerous triangular black ſpots; and on the top of the head theſe ſpots are larger than elſewhere, and are of a ſomewhat greeniſh hue; the back, wings, and tail are of a duſky brown, but the edges of the feathers are pale or whitiſh; the wings are variegated by two long white ſtreaks; the breaſt and ſides are of the ſame colour with the back, but paler; and the belly of a fine white, but with a few duſky ſpots under the tail. *Ray's* Ornithol. p. 289.

PHOSPHORIA, φωσφορια, in antiquity, a feſtival in honour of Phoſphorus or Lucifer. *Potter*, Archæol. Græc. T. 1. p. 436.

PHOSPHORUS (*Cycl.*)—*Phoſphori* may be divided into ſeveral kinds; ſome ſhine of themſelves naturally, as the glow-worm and dates; or adventitiouſly, as the fleſh of animals, which moſt probably ariſes from a degree of putrefaction, ſometimes too ſlight to be obvious to our ſenſes. Other bodies become luminous by attrition, heat, the free action of air; and laſtly, by imbibing and retaining the rays of light. Thoſe bodies that are luminous by attrition, are, amongſt others, ſome diamonds, and the hairs of animals; by heat, ſeveral ſorts of gems, and mountain cryſtals; from the free acceſs of the air, the *phoſphori* of Kraft and Homberg; from the aſpect of light, the Bolognian luminous ſtone, the preparation by Chriſtian Adolphus Baldwin, of chalk diſſolved in ſpirit of nitre, as well as ſeveral others diſcovered by the late Monſieur du Fay, who found, that whatever ſubſtances would by calcination be converted into a calx, or whoſe concrete, from a ſolution in the acid of nitre, would bear fire enough to become red-hot, theſe bodies were adapted to imbibe and retain light.

The greateſt number of *phoſphori* are of the laſt mentioned kind. Some of theſe are natural, others artificial; but of theſe laſt the preparation is ſo ſlight, as not to change the nature of their conſtituent parts.

The natural *phoſphori* are either foſſile, vegetable, or animal. The foſſile are, though very different in degree, ſome ſorts of earths, white ſand, lime ſtones, ſtalactites, and ſeveral other figured ſtones, iſland cryſtals, flints, ſome ſpecies of agates, white arſenic; but no ſort of metals, metallic or ſulphureous bodies, as jet, amber, except the before-mentioned arſenic. On the other hand, ſalts imbibe light, provided they are diveſted of every metallic principle; otherwiſe not, though as pellucid as poſſible. For this reaſon none of the vitriols will imbibe light; but other ſalts will, tho' with a conſiderable difference as to quantity; for ſal gem and rock ſalt imbibe very little; ſea ſalt, if dry, and in cryſtals, much more; and in like manner, ſal ammoniac. ſal catharticum and nitre yet more. This power is weak in the natron of the antients, and alum; but brighteſt of all in borax.

In the vegetable kingdom we find very few *phoſphori*; that of dry rotten wood is weak and not laſting; it appears chiefly upon the edges and inequalities of the ſurface. But this is moſt remarkable in the rotten wood of the fir-tree, and ſome others, where, in the dark, you ſee ſhining ſpots as big as tares; whereas in full light the whole ſurface appears alike. Some few barks are luminous, but not conſiderably ſo; but no fruits, ſeeds, or their meals. Cotton and the cryſtals of tartar, appear very bright, but fine loaf ſugar appears the moſt luminous of all, both without and within: gums and reſins retain no light.

There is a vaſt variety of *phoſphori* in the animal kingdom, ſuch as the bones and teeth; to theſe may be added the ſhells of fiſh, egg-ſhells, the human calculus, bezoar, and in whatever parts of animals the terreſtrial principle is very predominant. But where there is a conſiderable quantity of oily matter, as in the hoofs, horns, and feathers, no light is manifeſt.

Beccari propoſes ſome queries concerning the natural *phoſphori*, of which the firſt is, In what and how great a light the object ought to be placed? He tried different *phoſphori* in different degrees of light, and found them imbibe moſt light from the ſun itſelf; next in quantity when the ſky was clear; and the leaſt in foggy weather. Theſe experiments ſhould be made in the open air, and not in a houſe with the glaſs-windows ſhut; becauſe many bodies appear luminous when the light has come directly to them, which will not have that appearance when the light has paſſed through the glaſs. He laſtly tried what light they would imbibe from very bright flame, and found that alabaſter itſelf, which is ſaturated more than any ſubſtance by the ſun's rays, imbibed exceedingly little. The next query is, How long theſe bodies ſhould remain in the light to be ſufficiently ſaturated? Four or five ſeconds were found the utmoſt length of time required for that purpoſe. The other query is, How long the received light will continue in theſe *phoſphori*? It does not laſt the ſame time in all; but continues more or leſs, from two ſeconds to eight, in proportion to the ſtrength of the *phoſphorus* and the quantity of light received.

Phoſphori are, it is well known, often produced by art; ſome are made by the maceration of plants alone, and without any fire; ſuch as thread, linnen cloth; but above all paper. The luminous appearance of this laſt is greatly increaſed by heat. This is confirmed by two experiments; the firſt is, by expoſing the paper, ſpread upon an iron-grate to the naked fire, yet not near enough to ſcorch it, and then laying a warm brick thereon to retain the heat; by which means it was obſerved, that where the paper was not ſkreened by the iron grate, it was moſt luminous; ſo that by the lights and ſhades you might diſtinguiſh in the dark the image of the iron-

iron-grate a confiderable time. The other experiment is, the application of the paper to a plate of warm brafs; from which, when in the dark, you might very eafily, by its being lefs luminous, diftinguifh the margin of the paper that had not been warmed by the brafs. The forementioned author takes notice alfo of thofe *phofphori* which become fo by the affiftance of fire; but the fire here fpoken of is not great enough to diffolve their conftituent parts, but only fuch as may affect the external parts of their texture, and that but gently; fo that the procefs here mentioned is only drying or roafting. For it is not the watry or the faline parts in bodies which are torrified; but the oleaginous, wherewith many vegetables, and moft animals abound. The white flefh of animals, fuch as that of chickens, becomes a *phofphorus* by roafting, as well as the tendons; and whatever parts of animals become glutinous by boiling, fuch as carpenters glue, ifing-glafs, &c. to thefe may be added cheefe. Bones, though they imbibe light without any preparation, have that property in a much greater degree when burnt, and their luminous appearance is much more lively. But roafting has not this effect upon feathers, hoofs, horns, or whites of eggs. The fame operation which produces feveral *phofphori* from the animal kingdom, gives alfo feveral from the vegetable. Thus, by gently toafting gums, as myrrh, gum tragacanth, and others, they appear luminous tho' different in degrees; and this light is clear in proportion to the gentle evaporation of their aqueous parts. By this treatment nuts of every kind, pulfe, corn, coffee-berries, meal, bread, and wafers, alfo become *phofphori*. Turpentine, amber, and fome refins, require more fire before they imbibe light; fo that you muft diveft them of their acid, and their light etherial oil, to make them appear luminous. But here great care muft be taken that they boil no longer than from being white they turn yellow; for if you proceed longer, your labour is loft. Thofe *phofphori* produced by torrefaction, foon lofe their power, which, perhaps, neither time nor a thorough diffolution of their parts can deprive the natural ones of. In general, as long as the *phofphori* gained by torrefaction, preferve their power, their light is more fharp and ftriking, but the natural more weak. Thofe that are gained by calcination, and Baldwin's *phofphorus*, feem to poffefs both the ftriking light of thofe gained by torrefaction, and the weaker light of the natural *phofphori*: the laft they preferve a long time, but the former is loft by degrees much fooner. The well calcined afhes of plants, or rather their terreftrial parts remaining after the folution of their fixed falts by wafhing, and neutral falts, continue *phofphori* after many years: fo that, as far as we can judge, the luminating power which is gained by calcination, tho' not fo intenfe, continues perpetual; whereas that gained by torrefaction always decreafes, and in a very little while is no longer vifible. Some even by this method, continue to imbibe light much longer than others. Gum arabic, which continues longeft, lafts fix days; bread not one, and coffee only a few minutes. However, at any time, by a frefh torrefaction, you may recover thefe languid *phofphori*; in which property they have great likenefs to the Bolonian ftone, and other *phofphori* prepared by art. The *phofphori* gained by torrefaction, as well as that of Bolonia, will not imbibe light while they are warm; and this laft does not appear fo luminous when firft prepared, as when it has been fo for fometime.

The natural *phofphori* do not differ only in the before-mentioned particulars, but alfo in the colour of the light itfelf. The light of the natural generally appears either perfectly bright, or fomewhat inclining to yellow; the artificial produces a red, and fometimes a brown light; but there are fome exceptions to both thefe rules. From thefe different appearances it may be conjectured, that there are two forts of fire arifing from different principles; *viz.* that in torrified fubftances from a fulphureous, and that of the natural from a terreftrial principle. In obferving a piece of lapis tutiæ, that was rough and unequal on its convex fide, but fmooth and fomewhat polifhed on the concave, Beccari, to his great furprife found, that the rough fide was luminous, and the fmooth one not: being very defirous of inveftigating the caufe of this appearance, he remembered that fome polifhed marbles did not imbibe light, or very little, and that at their edges; but having loft their polifh, they did admit and retain it. He therefore conjectures, that bodies, according to the difpofition of their furfaces for the reflection of the light, either fuffer or prevent its entrance into them. If this pofition hold good in the reflection, Why fhould it not with regard to the refraction? The fame author produces two experiments, which he apprehends not foreign to the prefent purpofe. Expofing a glafs-bottle full of well water to the light, and, as foon as poffible, obferving it in the dark, it was found to have imbibed no light; upon pouring into it fome oil of tartar, it became turbid and whitifh, from the well-water being ufually impregnated with calcarious matter. Upon obferving it then in the dark, after having been expofed as before, it retained enough of a pale light to diftinguifh the fhape of the bottle. In a bottle of rain water he diffolved fome talc; which ftone, by rubbing, will diffolve in water as falts do, without rendering it opaque; to this folution he added oil of tartar, and this mixture was luminous as the preceding. He therefore concludes, that fo long as earthy corpufcles are very fmall, feparate, and agreeing in their furfaces with the water in which they float, they readily tranfmit the light they receive; for which reafon 'tis impoffible they fhould retain light enough to appear luminous in the dark. But by the affufion of the faline principle, the earthy corpufcles unite with the water and falt; and from the union of thefe principles the mixture grows thick, whereby the ready tranfmiffion of the light is prevented; fo that if this mixture is without colour, or any thing metallic, the light will be ftopped long enough to be vifible in the dark. But if, inftead of oil of tartar, you add fugar of lead, the mixture will be turbid, but retain no light. In thefe two experiments the water becomes a *phofphorus*. Gems, cryftal, and glafs, whether whole, or powdered ever fo fine, retain no light; fo that neither their tranfparency nor whitenefs contribute to their becoming luminous in the dark. Of feveral diamonds in all appearance perfectly the fame, fome were very luminous, others not at all. Of many opaque fubftances, whether rough, polifhed, or finely powdered, fome were luminous, others not: fo that it appears that not only the external, but the internal texture of bodies alfo, may conduce fometimes to their being luminous.

Almoft all bodies, by a proper treatment, have that power of fhining in the dark, which, at firft, was fuppofed to be the property of one, and afterward only of a few. How this is brought about is not eafy to folve. If we fuppofe with fome, that the light from a luminous body, enters and abides in the *phofphori*, we fhall find fomewhat new to admire in light itfelf. It is no new opinion, that this fluid confifts of very fine particles, which are continually darted forth from a luminous body in all directions, with a very great velocity: but it has by no body been laid down hitherto, that thefe particles are not diffolved by the violence of their agitation, not difperfed, nor immediately ceafe to exift; but fubfift ftill, and adhere to what bodies come in their way, as heat does. If therefore the particles of light are not diffolved as foon as they are emitted from a radiant body, but continue fome time, what elfe is required but that we allow its atmofphere to every lucid appearance? If the *phofphori* fhine with a borrowed light, but not with their own, and that only when put in motion, and fired by the rays of a fhining body, which fome experiments feem to confirm, then other new doctrines will arife. There muft be then a hidden, a fecret principle in bodies, to be lighted up by this moft fubtle fire. There will be in the univerfe a certain perpetual fire from thefe *phofphori*; the matter of which, tho' conftantly diffipated by burning, does not wafte enough to be obvious to our fenfes. See Phil. Tranf. N° 478.

PHOSPHORUS *of urine*. The fuccefsful method of making this famous fubftance is this: evaporate any quantity of frefh urine over a gentle fire, to a black and almoft dry fubftance; then, with two pounds thereof, thoroughly mix twice its quantity of fine fand; put the mixture into a ftrong coated retort of ftone, and having poured a quart or two of water into a large receiver with a long neck, join it to the retort, and work it in a naked fire: let the heat be fmall for the two firft hours, and then increafe it gradually to its utmoft violence, and continue thus for three or four hours; at the expiration of which time there will pafs into the receiver a little phlegm and volatile falt, much black fœtid oil, and laftly, the matter of the *phofphorus*, in form of white clouds; which will either ftick to the fides of the receiver, like a fine yellow fkin, or elfe fall to the bottom, in form of a fmall fand. Now let the fire go out, but take not away the receiver before it is cold, for fear of fetting the *phofphorus* on fire by admitting the air. Take out the matter of the *phofphorus*, and put it into a little tin ingot mould, along with water; heat the mould to make the matter all run into a mafs, then add cold water, till it is congealed into a folid mafs like bees-wax; cut this into long flender pieces, which put into a phial, and fill it up with water, and then cork it clofe. *Shaw*'s Lect. p. 403.

This *phofphorus* is nothing but the animal fulphur. Now all animals, on which experiments have been made, are found to contain more or lefs of the phofphoreal principles; fome infects conftantly fhine, or emit light, in the open air; many forts of fifh are luminous, if expofed to the air a fhort time; nay, even the bubbles of the fea water appear like fire in the dark: fome quadrupeds have been obferved to emit light on very flight friction of their hair, as the necks of horfes, the backs of cats, and the like; and there are many inftances in our own fpecies of many parts of the body appearing luminous, and even of the exhalations from it adhering to the cloaths, caufing them to fhine likewife. We have feveral curious obfervations relating to this fubject in the Phil. Tranf. N° 476. p. 444, 445, 456, 457, &c.

Upon this principle of *phofphorus* exifting in animals, fome attempt to explain the caufe of thofe accidental accenfions or burnings which have happened to fome of the human fpecies, as that of the lady at Cefena in Italy, the carpenter in Hampfhire, and the woman lately at Ipfwich. It feems moft probable, that they were all fet on fire by lightening. It may be faid, many are ftruck by lightening, but not fet on fire. But it is to be remarked, that the lady at Cefena had charged all

all her pores and abforbent veffels with a great quantity of camphor. The woman at Ipfwich had drank plenty of gin; which circumftances muft greatly promote the kindling the *phofphoreal* fire in them: and as this pabulum was conveyed into the moft minute capillary veffels, it might produce an almoft inftantaneous deflagration and diffolution of all the folid containing parts. Phil. Tranf N°. 476, p. 447. feq.

Ammoniacal PHOSPHORUS, in chemiftry, the name of a *phofphorus*, compofed of fal ammoniac and lime, which Mr. Homberg firft difcovered.

The method of preparing it is this: take one part of fal ammoniac in powder, and two parts of lime extinguifhed by lying in the air: mix them exactly together, and fill a crucible with the mixture; fet it in a fmall melting heat. As foon as the crucible grows red hot, the matter in it will melt, and it muft be ftirred with an iron rod, left it fwell over the edges of the crucible: as foon as the whole is melted, pour it into a copper bafon; it will appear of a greyifh colour and vitrified, and if it be ftruck upon with any hard body, there will be feen a fire all over the place where the blow was given. As this matter is brittle, however, and the fame mafs will not ferve often for the experiment, the beft method is to dip iron rods in it while melting, and thefe will be covered with the matter, and will anfwer the purpofe eafily and often. Mem. Acad. Par. 1693.

Antimonial PHOSPHORUS, in chemiftry, the name of a fubftance having the qualities of the *phofphorus* difcovered by Mr. Geoffroy in his experiments on antimony. This gentleman had prepared a foap from pot-afhes, quick-lime, and oil, with which he made feveral experiments on antimony; among others he was defirous, by means of this, to reduce fome diaphoretic antimony, which he had before made from two parts of the regulus of antimony, and three parts of nitre; but inftead of the reduction which he was labouring after, his operation afforded him a much more fingular phænomenon: the refult of them being a *phofphorus*, which he had never thought of; a matter, which after having remained perfectly quiet while clofe ftopped down, took fire as foon as ever it was expofed to the air; and that with a violent detonation, and darting every way a fhower of fire.

It is eafy to fee, that there are in the preparation all the requifites for fuch an effect; nitre, charcoal furnifhed by the burnt foap, and fulphur both from the foap and from the regulus of antimony; and to all thefe, a fort of calx, either from the foap, or from fome earthy parts of the antimony. It is eafy to conceive, that all thefe fubftances coming to a mixture together, fhould be ready to catch fire and blaze upon a proper application; but it is not lefs difficult to account for this effect's being produced merely by the air, after the whole had been for a long time in a ftate of reft.

The method of preparing this new fpecies of *phofphorus* is this: Mr. Geoffroy mixed two ounces of his foap with one ounce of this diaphoretic antimony; this mixture being put by little and little into a red hot crucible, took fire, and fwelled very much. After it had done flaming, the mafs fubfided, and became a red or fire-coloured fubftance, of an even furface, but ftill throwing up a vaft quantity of bluifh-green luminous vapours: and all this regularly happened on every frefh throwing in of the matter, without the leaft variety. When the whole quantity was thrown in, and had ceafed to give any flame or luminous vapour, it remained in the crucible in the form of an inverted mufhroom, being hollow, very porous, and of a black colour. When the crucible was taken out of the fire, the edges of this fubftance were beaten down into the middle, and the whole covered with an ounce of frefh foap. When this laft foap was burnt, and a fmall bluifh flame appeared upon the furface of the mafs, the crucible was covered with a lid, and a large quantity of charcoal laid upon it, and the fire blowed up very brifkly, by an hundred blafts of the bellows, or thereabouts; but notwithftandig the fiercenefs of the fire, there was no fluid fcoriæ formed, but the whole mafs remained fpungy and porous. The fire was then fuffered to go out, and the crucible placed in a corner of the elaboratory at reft for five hours. In the evening, when the crucible was perfectly cold, Mr. Geoffroy went to examine the matter, and a fervant went to uncover the mafs, by removing its furface with an iron inftrument; but the moment the air was admitted, the whole mafs took fire, burning with a very confiderable noife, and darting its flames every way to a great diftance.

Mr. Geoffroy repeated the procefs feveral times, and always with the fame fuccefs, whether he ufed his own diaphoretic antimony, or that made in the common manner. The great caution to infure the fuccefs, feems to be the taking care of not carrying the fire too far before the addition of the laft quantity of foap. Mem. Acad. Scien. Par. 1736.

Aquatic PHOSPHORUS, a name given by Dr Leigh, in his hiftory of Lancafhire, to a water found near Wigan in that county, which takes fire on holding a lighted candle to it. It is not properly the water, however, that takes fire in this cafe, but a fteam which burfts out of the ground with it. The author alfo calls it a fulphurated water; but that very improperly, for it contains no fulphur, but only iffues out in company with this bituminous vapour.

PHOSPHORUS *of the bearne-ftone*, in natural hiftory, is a name given to a ftone, (which, when heated, becomes a fort of *phofphorus*) from the place where it is found; as the famous one of Bologna is called alfo from its native region.

The *bearne-ftone* is of a moderate hardnefs, confiderably pellucid, and ufually colourlefs, or whitifh, tho' fometimes with a tinge of green, yellow, or fome other colours: it is compofed of numbers of plates, or flakes, laid one over another, in the manner of the ifland cryftal; and therefore, like that body, is plainly a fpar. It breaks into feveral faces, and has different angles; but of a fomewhat determinate meafure, the acute ones being of fixty degrees, and the obtufe ones of 120. Mem. Acad. Par. 1724.

This ftone, when heated at one of its angles with the flame of a lamp or candle, fplits by means of the flame's infinuating itfelf into the interftices of the plates that are lefs firmly united; and thefe feparate, and fome fragments ufually fly off with confiderable violence. One of thefe pieces carried into an obfcure place, appears furrounded with a blue flame, which lafts about a minute. And it is to be obferved, that thefe pieces which fly off, have all the fhape of an irregular pyramid, with an uneven bafe. If this ftone be put into a crucible, and furrounded with coals, it becomes a very beautiful *phofphorus*. The whole bottom of the crucible is feen, even tho' it be in broad day light, fhining with a bright and beautiful blueifh white; and if it be carried into a dark place, the light is feen much more beautifully. If, after it is cold, it be again heated in a crucible, in the fame manner it fhews the fame bright appearance. After this, if it be tried a third time, it does not fhine at all. According to all thefe phænomena, the effects of fire upon this ftone feem to depend on a fulphur contained in it, probably of the fame nature with that which enters the compofition of the metals. This may, by means of a heat, fuch as that given by the candle or in the crucible, difengage itfelf fo far from the body of the ftone as to take fire; and when it has burnt fo long as to confume itfelf, the luminous property of the ftone feems to ceafe.

The coloured gems are cryftals of a peculiar kind, tinged with the fulphurs of metals: this fulphur gives them their colour, and confequently it ought to give them the properties of the *bearne-ftone*, if it were not too fixed to be diffipated in the fame eafy manner, and to take fire in the diffipation. And it appears on trial, that the baftard emeralds of Auvergne and other places, the matrix of the amethyft, the fragments of fome of the accidental jafpers, the jacynths, and fome fort of rubies, are all *phofphorufes* of the nature of the *bearne-ftone*, but with different degrees of brightnefs. The mother of the emerald, the yellow jafper, the water fapphire, the malachite, the opal, and the garnet, have none of them any of this property. Mem Acad. Par. 1724.

Since the fame fulphurs which take fire in the *bearne-ftone*, are what give colour to thefe other ftones, it fhould feem, that thofe which are not of this *phofphorus* kind, nor give a light after being heated, fhould not lofe their colours in the fire; and this is found to be true in the garnet, which does not lofe any part of its colour, nor is it at all luminous; whereas the hyacinth, and fome of the jafpers and other ftones, which lofe a part of the colour, not the whole, in the fire, become alfo in part luminous, or more fo, in degree, according to the quantity of colour which they lofe. This, however, is no certain rule, fince the mother of the emerald, the topaz, and fome other ftones, lofe all their colour, and yet are not at all luminous. The reafon of this feems to be, that the fulphurs are driven out of thefe ftones fo flowly, and in fuch minute quantities, that they are not at any time collected into body enough to be capable of flame. There is nothing to be objected as to the *bearne-ftones* fhining; tho' they are ufually white, they may poffefs no fmaller portion of fulphurs than the coloured ftones; only in thofe the fulphurs may be colourlefs, or white in themfelves.

It may be poffible alfo, that the fulphurs, in a ftone of this kind, may be difperfed in fuch fmall molecules, as not to form a body fufficient to give any colour; but when collected, in order to be driven off in the fire, they may then be fufficient in quantity to give a blue tinge to the flame.

The ifland cryftal, which is alfo a fpecies of fpar, and which greatly refembles this *bearne-ftone* in many particulars, flies to pieces alfo in the fame manner, on being heated; and when carried into the dark, this alfo gives fome fparks of light, but they are few in number, and loofely fcattered over the furface: when this ftone is burnt a little in a crucible, there is fome fmall appearance of flame, with a fmell of fulphur, and the matter in the bottom of the crucible is found fhattered to pieces; but all the pieces are regular parallelopipeds, as was the original mafs. Mem. Acad. Par. 1724.

It is to be obferved, that the *bearne ftone*, and others of the fame kind, which only fhine in the dark, and that only for a few minutes, when firft taken out of the fire, are, properly fpeaking, endued with no other luminous quality, than that of a burning coal; but their light having been generally unobferved, and requiring darknefs to fhew it, has obtained them the fpecious title of *phofphori*.

PHOSPHORUS *fæcalis*, a very fine kind of *phofphorus*, exhibiting many wonderful phænomena, and prepared from human dung mixed with alum.

Mr. Homberg, who was the inventor of it, gives the method of preparing it in the following manner: take four ounces of human dung newly made, mix it with the ſame quantity of roach alum groſsly powdered; put the mixture into a ſmall iron ladle, capable of holding about a pint; ſet it over the fire in a chimney, and it will melt together, and become as fluid as water; let it boil gently over a ſmall fire, continually ſtirring it with an iron ſpatula, till it is dry: it will then be difficult to ſtir, but it muſt be kept ſtirring about, and all the lumps it runs into muſt be broken, and what adheres to the ſides of the ladle ſtirred in and blended with the reſt: this muſt be continued till it is perfectly dry, and the ladle muſt be now and then taken from the fire, and the matter ſtirred about in it that it may not grow red-hot. When the whole is thus perfectly dried, it will ſtill be in little lumps, and when cold it muſt be rubbed to powder in a metal mortar; it muſt then be put into the ladle and ſet over the fire again, it will then become a little moiſt again, and run into clods and grumes, but it muſt be again ſtirred till dry; when cold it is to be powdered again, and a third time put into the ladle; and when perfectly dried this time, it is to be laid by in a paper in a dry place: thus is the firſt or preparatory operation finiſhed.

Take two or three drams of this powder, put it into a ſmall matraſs, capable of holding an ounce and half of water, and which has a neck ſix or ſeven inches long; put a paper ſtopper lightly into the neck of the matraſs, then take a ſmall crucible of three or four fingers breadth high, put two or three ſpoonfuls of ſand into it, then ſet the bottom of the matraſs on the ſand, and take care that no part of it touches the ſides of the crucible; fill up the reſt of the crucible with ſand, and let the whole body of the matraſs be covered with it; then ſet the crucible in one of the common little earthen furnaces, and make a charcoal fire about it; for the firſt half hour let the coals only reach up to the middle of the crucible, but afterwards lay them up to the rim of it; continue this fire about half an hour, or till the powder within the matraſs is red-hot, then pile up more charcoal above the rim of the crucible, and continue this fire an hour, after which let the whole cool. There will ariſe a large quantity of fumes during the operation, and they will often throw out the ſtopper of the matraſs; but this muſt be replaced, and the fire a little abated in that caſe: when theſe fumes ceaſe, the fire may be raiſed without hurting the proceſs, when the crucible is ſo cool that it may be taken out of the furnace without burning the hands. This is to be done, and the matraſs is to be half raiſed out of the ſand to make it bear the cold by degrees, and its mouth muſt then be ſtopped cloſely with a cork, inſtead of its paper ſtopper. If, on ſhaking the matraſs about, the matter falls into powder, it is a proof that the operation has been well performed; but if it hang together in form of a cake, 'tis a ſign that the matter was not well roaſted in the ladle before the putting it into the matraſs.

When the operation has been well performed, and the matter is in powder in the matraſs, pour out a ſmall quantity of it on a piece of paper, and immediately ſtop the matraſs again: the powder upon the paper will immediately fume and take fire, burning the paper, and any other combuſtible matter that is in the way. If there has been too much of the powder poured out of the matraſs, it muſt not be returned in again; for tho' that ſhould be done before it begins to ſmoak, yet it will certainly ſet fire to all that is in the matraſs; from this it may be eaſily ſeen alſo, that the matter cannot be emptied out of the matraſs into a phial, but muſt always be in the veſſel in which the calcination was made.

If too much alum be uſed, the powder will not take fire at all: it will be of different colours, according to the veſſel the firſt calcination was made in, and according to the degree of fire that was uſed; hence it is ſometimes black, ſometimes brown, ſometimes red, green, yellow, or white.

It takes fire equally well in the day-time and in the night, and that without the mixture of any other ſubſtance, or without the leaſt rubbing, or any other circumſtance beſide the mere expoſure to the air. In this it differs from all the other known artificial *phoſphori*; for that of urine requires a ſmall degree of heat, in order to its burning; the ſmaragdine *phoſphorus* requires a conſiderable degree; the Bononian ſtone does not ſhine except after having been expoſed to the day-light; and all the others require violent rubbing, or a ſmart blow to produce their light.

If it be deſired to keep this powder good for any time, it muſt be put in a dry place where there is not too much heat: the mouth of the matraſs muſt be kept cloſe ſtopped, and its body covered with paper; and the place where it ſtands muſt not be in too ſtrong a light, for the open day-light has been often known to weaken its power; and, in fine, wholly to ſpoil it thro' the glaſs. Mem. Acad. Par. 1711.

Fulgurating PHOSPHORUS. See FULGURATING.

PHOSPHORUS *metallorum*, a name given by ſome chemiſts to a preparation of a certain mineral ſpar, which is found in the mines of Saxony and other places, where there is copper. The ſpar to be uſed on this occaſion is, that kind which is tinged green, and from its, in ſome degree, reſembling the colour of the emerald, is called by ſome *pſeudoſmaragdus*, and by others *lapis ſmaragdi mineralis*. This is to be powdered very fine, and this powder is to be laid on a flat plate of copper, iron, or any other metal: this plate is then to be ſet over ſome lighted charcoal, and the whole placed in a dark place. The ſpar will receive its neceſſary degree of heat for ſhining long before the metal will, and, conſequently, as ſoon as it begins to ſhine, the fire is not to be made any briſker. While the plate of metal is held in this degree of heat, and does not appear at all red, the powder upon it will ſhine like a lighted coal, and will continue ſo for ſome time. If it be removed away, and ſuffered to cool, it will be fit to repeat the experiment a ſecond time with, but its light will not be ſo ſtrong as before. Phil. Tranſ. N° 244. p. 365.

PHOSPHORUS *of ſulphur*, the name given by the French academicians to a new-diſcovered ſpecies of *phoſphorus*, which readily takes fire on being expoſed to the open air.

The invention was Mr. Le Fevre's, and the proceſs is this: The ingredients are two drams of common *ſulphur*, half an ounce of ſteel filings, ten grains of colophony, and ſix drams of common water. Theſe things being all weighed and ſet apart, powder about half a dram of the *ſulphur* in a ſmall mortar, then add the colophony, and afterwards the remainder of the *ſulphur*. When this is all reduced to a fine powder, put in the filings of ſteel, and rub the whole together till it is ſo thoroughly mixed, that the ſteel does not appear; but the colour of the whole looks every where uniform and regular: then add about twenty drops of the water; and after beating the whole together add as much more, and continue to do ſo till the maſs is of the ſubſtance of a paſte, but not too moiſt. Put this paſte into a ſmall matraſs that will contain about three ounces, and pour on it more of the water till it ſwim above the ſurface of the paſte near a quarter of an inch. The matter of the paſte will then break, and appear in form of a granulated powder under the water; put the matraſs on a ſand furnace, but give it no greater heat than that the hand can bear to lie upon the matraſs. When it begins to heat, the mixture will ferment and ſwell, and become black; it is then to be ſtirred with an iron rod, and a little more water muſt be added every quarter of an hour, till the whole is uſed. The matter will then be very black and liquid; and it is to be then taken from the fire, and ſet by for the whole night. This is the firſt and moſt eſſential part of the operation, and in this great care is to be taken that the fire be not too violent; for if the *ſulphur* be burnt, the operation will be ſpoiled, and the matter would ferment ſo high as to run over at the mouth of the veſſel.

To finiſh the operation, a little water muſt be added to the matter, ſo as to ſwim over it, and the veſſel muſt be again ſet in the ſand, and a ſtronger fire given than before; this is known to be ſtrong enough when there is any humid vapour obſerved to ariſe out of the mouth of the veſſel. This fire is to be continued about two hours, that the greater part of the humidity may be evaporated; which is known by the iron rod finding ſome reſiſtance when put into the veſſel, and the matter it brings up being granulated and ſolid, or no longer moiſt; it muſt then be immediately taken from the fire, and the whole is then finiſhed. It is neceſſary to be very exact in this laſt critical minute; for a very little longer ſtanding on the fire will burn the *ſulphur*, and render all the former care of no effect. The black matter remaining in the matraſs is to be taken out, and the ſides ſcraped clean with an iron rod; any piece of this that happens to fall upon a paper takes fire in a very little time, and burns away like the other *phoſphorus*. The proceſs is a very nice one, but by obſerving all the rules here laid down, ſeveral perſons have ſucceeded in making the *phoſphorus* to perfection: the whole intent of the operation ſeems to be to join together the minute particles of ſteel and *ſulphur*; which when thus joined cannot fail to be very inflammable, and to take fire on receiving the ſmalleſt humidity from the air to make them ferment.

It cannot but be obſerved, that this *phoſphorus* is founded on Lemery's experiments of ſteel and *ſulphur*, taking fire together; but this is a greatly more nice and accurate operation, and a fine improvement on the original plan, which was only by mixing large quantities of ſteel-filings and *ſulphur* together into a paſte with water, and burying this in the earth to make it take fire of itſelf, and thus repreſent the natural phænomena of vulcanos, thunder, lightening, &c. Mem. Acad. Par. 1728.

Phoſphorus may be kindled by the effluvia of electricity. See Phil. Tranſ. N° 475. Sect. 11.

PHOSSA, in zoology, a name underſtood by ſome to expreſs the whole genus of pigeons, but more properly it is the name of one ſpecies only, the *palumbe*, *torquatus*, or *ring-dove*. See the article RING *dove*.

PHOTINX, φῶτιγξ, in antiquity, a kind of flute in uſe among the Greeks: it was the ſame with the *plagiaula* of the Romans. *Hoſm.* Lex. Univ. in voc.

PHOXINUS, in zoology, a name given by ſome to the *rutilus*, or *common roach*. *Rondelet.* de Piſc. See the article RUTILUS.

PHOXINUS *ſquammoſus*, in zoology, the name of a ſmall freſh-water fiſh, called by ſome the *bambele*, by others the *riemling*, and by ſome the *pink*. It ſeldom is found beyond the length of two or three inches; its head is large in proportion to the reſt of its body, and is blackiſh; and the roots of all its fins have ſomething of a ſaffron colour; and the joint of the gill fins has a little prominence, which in ſome is yellow, and in others reddiſh; its ſcales are ſmall and whitiſh, and the lines on its ſides reaching from the gills to the tail are brown; its belly and ſides are a little yellowiſh; it has one fin on the back, one behind the anus, a pair at the gills, and another pair on the belly; they love running waters; and when dreſſed have a bitteriſh taſte. *Geſner*, de Aquat. p. 484.

PHRÆNIAN, in the botanical writings of the antients, a name given to a kind of *anemone*, uſed in making garlands and other ornaments.

The ſcholiaſt on Theocritus obſerves from Solibius, that the Lacedæmonians called the *anemone* in general *præniòn*; and Nicander ſeems to comprehend under this title ſeveral beautiful ſpecies of the *anemone*, which he diſtinguiſhes from the *chelidonian anemones*; but Athenæus informs us, that others have made the *chelidonian* and *phrænian anemonies* the ſame. Some have ſuppoſed the *anemonies* of the antients uſed in garlands, and thoſe uſed in medicine to be different, but the generality of authors do not warrant this.

PHRATRIARCHUS, φρατριαρχος, among the Athenians, a magiſtrate that preſided over the *phratria*, or third part of a tribe. He had the ſame power over the *phratria*, that the *phylarchus* had over the tribe. *Potter*, Archæol. Græc. T. 1. p. 78. See the article PHYLARCHUS.

PHRENITIS (*Cycl.*) — The preceding ſymptoms of this diſorder are, long watchings, troubled ſleep, and very reſtleſs dreams, acute and terrible pains of the head, an entire forgetfulneſs of every thing, and a wandering of the mind, diſcovering itſelf by inconſiſtent anſwers to queſtions, a ſmall deſire of liquors, tho' the heat of the mouth plainly indicates all that can occaſion the moſt intenſe thirſt; large and ſlow reſpiration, a weak and ſlow pulſe, and ſuppreſſion of urine. All theſe ſigns predict an approaching *phrenitis*; but when it has already ſeized the patient, the blood-veſſels of the head all ſwell, and the temporal arteries have ſo ſtrong a pulſation, that they are ſeen to beat very forcibly; the eyes ſparkle and look wild and fierce; the talk is all wild and raving; and at certain times the patient has uſually violent fits of ſtruggling to get out of bed; the extremities are cold, and the urine thin, white, and pellucid.

The perſons moſt ſubject to a *phrenitis* are thoſe of a ſanguineous and plethoric habit, and much given to anger; ſuch as are addicted to a hot diet, and the uſe of ſtrong liquors; ſuch as are many hours together expoſed to the ſun in hot weather in their daily occupations; and ſuch as have been ſubject to violent head-achs, or have had habitual hæmorrhages at the noſe ſtopped upon them, or have had the blood uſually diſcharged by the hæmorrhoids thrown up into the head; and women who have had the menſes ſtopped upon them, and the blood in the ſame manner thrown up into the head. Theſe perſons are, from ſuch circumſtances and accidents, ſubject to the *phrenitis* as an idiopathic diſtemper, dependant on no other. But beſides theſe, others are alſo very ſubject to it as a ſymptom in other diſeaſes. People in acute fevers are very often thrown into it by an incompleat critical congeſtion of blood about the head; and this principally happens to ſuch as have been treated by apothecaries in an improper and injudicious manner. From the ſudden checking of ſweats many have alſo been thrown into it, and ſome from improper bleedings, and more than all theſe by a too hot regimen.

Method of cure. A clyſter is one of the firſt things to be preſcribed in this caſe; or if this cannot be given from the violence of the patient, the bowels muſt be gently relaxed by large draughts of warm emollient liquors, with a ſmall addition of nitre; after this bleeding is to be ordered, where the pulſe and condition of the patient ſhew it to be neceſſary, and gentle alexipharmics are then to be given in repeated ſmall doſes, ſuch as the mixtura ſimplex highly camphorated, and the like; and in the intermediate times the violent emotions of the blood are to be quieted by the uſe of powders of nitre, tartar of vitriol, crab's eyes, and a ſmall portion of cinnabar; theſe are to be given with cooling emulſions; a placid regimen muſt be obſerved, and the patient kept in a gentle perſpiration; and external applications are ſometimes of great ſervice, ſuch are ſpirit of wine and camphor, rubbed on the forehead and temples, and frictions, cataplaſms of various kinds, and bliſters laid to the ſoles of the feet. *Junker*'s Conſp. Med. p. 304.

Others in this caſe apply epithems to the forehead, either of the abſolutely repellent kind, ſuch as vinegar of roſes, or of lavender; theſe are moſt proper in the beginning; and if theſe do not ſucceed, the reſolvents are left afterwards to be tried; ſuch are ſpirit of wine and camphor, and ſpirit or tincture of ſaffron; bags of camphor and nitre in powder, may alſo be applied, and if theſe fail it is proper to put on leeches to the temples and behind the ears; bleeding in the jugular vein is another method; and bliſters are to be applied to the legs and arms, and ſinapiſms to the feet, compoſed of yeaſt and ſtrong vinegar, with muſtard-ſeed, nitre, and other ingredients of that kind; and, finally, when all theſe fail, an irritation of the noſtrils to promote an hæmorrhage, and bleeding in the noſe, as practiſed in Egypt, and ſome other countries, is proper. *Heiſter*'s Conſp. Med. p. 125.

Dr. Friend has recommended bleeding at the jugular veins, in a *phrenitis* coming upon a fever; but Dr. Langriſh endeavours to prove the bleeding in this caſe to be rather hurtful; and he thinks the caſes quoted by Dr. Friend to prove his opinion, either do it not, or may be turned againſt him. See Med. Eſſ. Abrid. Vol. 2. p. 457.

PHRICODES, a term uſed by the antients for a kind of fever which is attended with a coldneſs and ſhivering, not only at the beginning of the fit, but at different intervals throughout its whole continuance. The ſemitertian fever is of this kind.

The uſual ſymptoms of theſe fevers are a remarkable lowneſs of the pulſe, which is ſcarce to be felt, but recedes as it were from the finger. The belly is tumified, and a rumbling noiſe is heard in it, and the tongue is very humid, and irrigated with a ſharp acid humor, as with the ſaliva.

PHRONTIS, a word uſed by Hippocrates as the name of a peculiar diſorder of the general nature of the melancholy affections. In this caſe the patient, he ſays, feels, as it were, a thorn pricking the abdominal viſcera; he is extremely reſtleſs and uneaſy, and always avoids light and company. He dreads being touched, and becomes timorous and afraid of every thing; he is moleſted with troubleſome dreams, and imagines that he frequently ſees ſpectres and frightful objects.

PHRYCTE, a word uſed by the antient phyſicians as a name for common reſin.

PHRYGANIDES, in natural hiſtory, a name given by authors to the fly which is produced from the *phryganium*, or common cadoſworm, found in ditches, and uſed as a bait for fiſh. This has a long body, four brown wings, and a forked tail, and is found in the month of Auguſt very frequent on waters.

PHRYGANICUS, in botany, a term uſed by Dioſcorides and many other of the antient Greeks, to expreſs ſuch herbaceous plants as have hard and woody ſtalks, ſuch are the garden thyme, and ſeveral others of that kind: they alſo called theſe plants *xylodes*, ξυλωδεις, and ξυλωδεα ποα.

PHRYGIAN, (*Cycl.*) in antient muſic, the third ſpecies of the *diapaſon*. See the article DIAPASON.

PHRYGIAN *ſtone*, *phrygius lapis*, in natural hiſtory, the name of a ſtone deſcribed by the antients, and uſed in their time in dying; probably from ſome vitriolic or aluminous ſalt contained in it, which ſerved to enliven or fix the colours uſed by the dyers.

It was a light ſpungy maſs, reſembling a pumice, and the whiteſt and lighteſt were eſteemed the beſt. Pliny gives us an account of their preparing it for uſe for dying, which was by moiſtening it with urine and then heating it red-hot, and ſuffering it to cool again: this calcination was repeated three times, and the ſtone was then fit for uſe; and Dioſcorides recommends it in medicine after burning; he ſays it was drying and aſtringent.

PHTHIRION, in botany, a name uſed by ſome authors for the *pedicularis*, or *red rattle*. *Ger.* Emac. Ind. 2. See the article PEDICULARIS.

PHTHISIS (*Cycl.*)—This diſeaſe is properly an ulcerous diſpoſition of the lungs, taking its origin from a ſtaſis of blood in that viſcus, which in time degenerates into matter, and which is attended with a very remarkable waſting of the fleſh and loſs of ſtrength. A *phthiſis* in different perſons, and at different times, differs in degree; in ſome caſes it is only a tendency to ulceration in the lungs, but in others it is an actual ulceration in that part.

In the firſt of theſe caſes, where there is only a tendency to an ulceration, the lungs are only ſtuffed up with a quantity of tenacious and viſcid matter, or of a mucous fluid, with a mixture of blood. This matter, by degrees, becomes more and more hard and tough, by the diſſipation of its more fluid parts; and hence gives a ſchirrous hardneſs to that part of the lungs where it is contained, but is not eaſily changed into abſolute matter. In this caſe the patient may live many years, and often there is no ſuſpicion of his being in a *phthiſis*.

In the ſecond caſe, or an actual exulceration of the lungs, the diſeaſe cannot long remain unknown, but the hectic fever, which is its conſtant attendant, readily diſcovers it; and the waſting of fleſh, and ſpitting of matter, ſoon bring the patient to his end, if ſpeedy and efficacious remedies are not applied.

Many are very anxious about the diſtinguiſhing a true *phthiſis* from an abdominal hectic; but this is a diſtinction of very little uſe in practice, ſince both caſes require the ſame regimen: the gently reſolvent and diſcutient medicines, and balſamics, which have nothing acid in them, are the proper method in a *phthiſis*, and are equally neceſſary in this hectic. The principal differences, however, between them are theſe: The abdominal hectic always is attended with a fever, whereas the *phthiſis* is often free from a fever, or at leaſt is not attended with one of any conſequence. If, in a ſtrong inſpiration, on drawing as much breath as may be into the lungs, the

the cough is always brought on, and there is a pain and ftraitnefs in the breaft, that alfo declares the feat of the diforder to be in the lungs.

Atrophies are alfo much of the fame nature with a *phthifis*, differing only in regard to the part they affect, and to the age of the patient. An atrophy is an injury of the glands of the mefentery, pancreas, or liver, and is common to infants; whereas the *phthifis* is a like diftemperature of the lungs, and affects perfons nearer the time of their growing to man's eftate.

A true *phthifis* is, however, to be carefully diftinguifhed from that marafmus which frequently affects old perfons: this arifes from many different caufes, but never from that of a *phthifis*, or diftemperature of the lungs. The vomica pulmonum is alfo by fome confounded with a *phthifis*, but improperly; for tho' thefe diftempers are nearly allied to one another, and often degenerate into each other, yet their origin is different. The *phthifis* takes its origin from an ulcer, properly fo called; the vomica is an abfcefs, or impofthumation. The ulcer in a *phthifis* affects the humid parts of the lungs, where there is leaft blood; the vomica, on the contrary, is always feated in thofe parts where there is moft abundance of blood: fince it generally happens, that a vomica is a fhorter difeafe in its period, and carries the patient off earlier; the *phthifis* does it more flowly and gradually. When a vomica, indeed, does not carry off the patient at firft, it ufually degenerates into a true *phthifis*; and on the other hand, when the matter lodged in the lungs in a true *phthifis* is fo acrid as to corrode the veffels, then a vomica pulmonum often comes on in the courfe of that difeafe; but thefe are accidental degenerations of one difeafe into another, and tho' the firft cafe is frequent, the other is more rare.

Signs of a phthifis. This difeafe, when it begins flowly and gradually, has fcarce any figns at all by which it may be known: the utmoft fymptoms of it in this cafe, is a cough, which, tho' not violent, will not be cured. This cough, by degrees, increafes, and holds the patient always, in fpite of medicines: in fome cafes it is moderate, but in others it becomes in a little time very violent. This cough is in fome attended with a confiderable fpitting, in others with very little, and in fome perfons, both at the beginning and end of the diftemper, with no fpitting at all.

It is, however, a vulgar error to fuppofe every cough attended with fpitting to be a confumption, for very frequently the faults of the firft concoction will give origin to coughs more violent, and attended with greater fpitting than thofe in a genuine *phthifis*. Hence, for the proper diftinguifhing of a *phthifis*, many other fymptoms are neceffary: thefe are, that the patient be of an age fuited to this difeafe, in general, between fifteen and thirty-five: the cough alfo, in a true *phthifis*, is continual, and always becomes much more violent on being expofed to the cold, as alfo on drawing the breath very deeply, or taking the effluvia of any acrid fubftances: when the matter feems fetched up from very deep, and is ftreaked with blood, or is of an ill fmell, and approaching to the nature of matter; this alfo denotes the cafe to be a true *phthifis*. This difeafe is always attended alfo with a decay of ftrength, a fenfation of a ftraitnefs in the breaft, a want of appetite, or a defire for nothing but cold foods and drinks. The fleep in this cafe alfo rather tires and weakens than refrefhes the patient, and the mouth is dry, the faliva glutinous, and the temper ufually peevifh, and affected ftrongly at trifles; the body alfo becomes extremely fenfible of all changes of the weather. If thefe fymptoms happen in a cafe where there is either an hereditary difpofition to a *phthifis*, or where there has been any prior injury done to the lungs, there is no room to doubt but that the cafe is a true confumption or *phthifis*.

Thefe prior injuries of the lungs may be either from preceding difeafes, fuch as a fpitting of blood, a peripneumony, or the like; or from external contufions or wounds of the breaft; or finally, from frequently being among the vapours of corrofive medicines: and when thefe are attended with a hectic, or lofs of flefh in the whole body, and particularly in the face, there is not the leaft room to doubt but that the cafe is a dangerous *phthifis*. The fpitting of purulent matter is one of the moft certain figns of a perfect *phthifis*, but it is not an univerfal one; for there are fome cafes in which the bronchia and membraneous portions of the lungs only are affected, in which a *phthifis* may arrive at its greateft degree without any fuch fpitting. It is alfo to be obferved, that the common thick, yellowifh, or greenifh matter, which is frequently voided in large quantities in fimple coughs, is not to be confounded with the purulent matter voided in a continued *phthifis*.

The urine of people in this difeafe is ufually very like that of perfons in health, except that it retains its froth longer; this, however, is no certain fymptom of the difeafe, for it frequently happens in cafes of fimple colds, in people of phlegmatic habits.

If a vomica pulmonum comes on from a *phthifis*, the fever, which was before a flow one, affumes the appearance of an acute one; and the pain that attends the cough becomes more violent, and refpiration more difficult; finally, colliquative fweats, and diarrhœas, are very fatal fymptoms, ufually appearing towards the laft ftages.

Perfons fubject to a PHTHISIS. Thefe are principally young people of a plethoric habit, accuftomed to perfect health, and of florid conftitutions, particularly fuch as live idle lives. Thofe who labour hard, or are of a fcorbutic or phlegmatic habit, are more than all others free from this difeafe. Perfons who are fubject to hæmorrhages of any kind, or to violent pains in the head, and thofe who find their breath very fhort after a little exercife, and particularly fuch as have had at any time fpitings of blood, are moft fubject to this diftemper; as thofe, on the contrary, who are fubject to cattarrhal defluctions, to fimple coughs, or to diarrhœas, or cutaneous eruptions, or external ulcers, are ufually free from it. Women in general are much more expofed to *phthifes* than men; and that for this plain reafon: the fuppreffion of any habitual hæmorrhage, endangers the patient as to this difeafe; and women are well known to be more fubject to evacuations of blood than men; and alfo to the fuppreffions of thofe evacuations.

Old people are very feldom found to have *phthifes*, unlefs they arife from violent external injuries; and very young perfons are as feldom liable to them, unlefs from fuppreffions of large and habitual hæmorrhages by the nofe.

Caufes of a PHTHISIS. The remote caufe of this difeafe, is a plethoric habit; the proximate caufe is a congeftion of florid, rarely of ferous blood, in the breaft. The occafional, or accidental caufes, are either external injuries from blows, falls, or bruifes on the breaft, a violent cough in the autumn, at which feafon the air is peculiarly bad for all perfons inclined to a *phthifis*; the abufe of fpirituous liquors, the immoderate ufe of venery, the receiving the fumes of corrofive medicines, and finally, the improper cure of other difeafes, particularly the fuppreffing of fevers and hæmorrhages by aftringents, without any previous cautions. An hereditary difpofition is alfo frequently in fault; the cough which attends this difeafe is only an effort of nature, to break through the congeftion in the firft ftages, and in the latter, to throw up the matter occafioned by it.

Prognoftics in it. A true *phthifis*, even in its beginning, is a dangerous difeafe, and admits but of a very dubious prognoftic; but when in an advanced ftate, it is always fatal. The reafon of this is evident, becaufe there are in this cafe real ulcers in the lungs, and we well know that no ulcer can be cured till it is firft perfectly cleanfed, and that is not eafy in an internal part; and after this, the healing up of a wound in the lungs is fcarce to be expected, as thofe parts are continually difturbed by the very drawing in and voiding the breath, and greatly more fo by the cough. There have been, however, inftances of cures in the beginning of a *phthifis*, in which there have been evident proofs of a reftitution and cicatrization of the parts.

People of a dry habit are much fooner carried off by it than thofe of a moift one; as are alfo thofe of a brifk difpofition, than thofe of a more languid temper; and finally, younger perfons ufually die fooner in it, than thofe who are more advanced in years. Women, as they are more fubject to a *phthifis* than men, fo they are more eafily cured. This diftemper is often brought upon them merely from a fuppreffion of the menfes, and in that cafe it is often cured only by regularly bringing them again to their proper periods. The hectic fever in thefe cafes is what haftens the death of the patient; fo that the lefs of that fever the patient has, the longer he lives under it.

When the fpitting of true purulent matter is come on, and is attended with colliquative fweats and a diarrhœa, there is no farther hope for the patient; and in general, what is reported of the curing of confumptions, is founded on errors, and other cafes have been miftaken for it. A catarrhal cough become habitual, and attended with a voiding of a thick, pulpy, greenifh matter, is often miftaken for a confumption: as is alfo a flow fever, attended with copious fweats, and an extenuation of the body; or a recent hectic, arifing from a continued flow fever; or a merely afthmatic diforder of the breaft; or finally, a hæmoptyfis has been miftaken for a *phthifis*. In all the cafes faid to have been *phthifes*, and perfectly cured, either one of thefe has been the cafe, or the mere ftrength of nature, affifted by happy circumftances in the conftitution, not to be expected from one perfon in a thoufand, have carried the patient through it.

Method of Cure. The general method in a genuine *phthifis*, is to refpect firft the refolving, abftergiug, and difcuffing the ulcerous matter in the lungs; and after this to attempt the cleanfing and healing of the ulcers; afterwards to reftore the ftrength by analeptics, and to give the weakened parts their due tone again: and during this, the feveral fymptoms, fuch as the cough, fever, &c. are to be palliated as much as may be

To this end, in the beginning of the courfe, gentle laxatives are by all means to be given; fuch as fmall dofes of rhubarb, with manna, tamarinds, and the like: and in fubjects abounding with bad humors, jalap, fena, and, in fome cafes, even mercurius dulcis are found neceffary; but this laft medicine is only to be given with the utmoft caution, for fear of a falivation. After a few dofes of the laxatives, the refolvent, abftergent, and difcutient medicines are to be given for feveral weeks together; fuch are, decoctions of pimpernell, elecampane, florentine, iris, birth-wort, and frefh arum-root,

root, with maidenhair, horehound, hyssop, and daisy-leaves: the gum-resins are also to be given in small doses; such as ammoniacum, sagapenum, and the like; and mixtures of crabs eyes saturated with lemon juice, with vitriolated tartar dissolved in the pectoral waters, are to be given every day three or four times: a little nitre cautiously given in the intermediate times, will also be of great use in abating or taking off the fever. After this, the healing the ulcerated parts is to be attempted by the more temperate balsamics; such as boiled turpentine, mastic, olibanum, balsam of Peru and capivi, and Lucatellus's balsam: with these there always must be joined such things as will nourish and give strength; such are emulsions made rich with sweet almonds, with jellies and conserve of roses.

If the violence of the disorder is found to remit on this Method, it will be proper to give a mixture of spirit of sal armoniac, with tincture of salt of tartar, in doses of about twenty drops, three times a day: this is greatly serviceable in restoring the parts to their due tone; and if the cough still continues violent, it will be proper to give small doses of the storax-pill at night. If the disease is finally taken off by this method, it will be proper afterwards, by way of prevention, to bleed freely in the foot every spring and autumn; to recall, by all possible means, any habitual discharges of blood that had been stopped or suppressed; and particularly in men to promote a discharge by the hæmorrhoidal veins, by applying leeches to the part: the patient is not to be loaded with medicines in this case, but it will be sufficient always to keep the bowels moderately open, and to use moderate, but not violent exercise, with diets that are soft and easy of digestion. *Junck.* Consp. Med. p. 160, seq.

Mr. de Sault endeavours to prove, that a consumption of the lungs always depends on tubercles, and that an ulcer there is only an effect of these tubercles; and when the disease is in its last stadium, and incurable, it then only becomes contagious, by small worms, which it communicates to others. The cure which he proposes for the consumption, before it comes to the last stage, is to resolve the tubercles with mercury, steel, millepedes, and the aperient and antiscorbutic plants. He remarks, that the liver is generally hard in this disease; and therefore he applies a warm mercurial plaister to the right hypochondriac region, rubbing some mercurial ointment every night on the skin of that part; then continues in the use of tablets made with steel, millepedes, benzoin, coral and crabs-eyes, of each half an ounce; cinnamon, three drachms; sugar, half a pound; mix all with the mucilage of gum-tragacanth, made with orange-flower water. The dose of these tablets is two drachms, morning and evening, washing it down with a ptisan made of the roots of nettles, two ounces of the juice of water-cresses, and as much juice of cervill. Med. Eff. Edinb. He says this method, with riding, has often been successful.

Dr. Cheyne thinks that a total milk and seed diet, with frequent phlebotomies, vomits, bark in the morning and rhubarb at night, will totally cure consumptions. See his Nat. Method. of Cures, p. 264.

Morton reckons among the species of *phthisis*, those proceeding from the diarrhœa, dysentery, gonorrhœa, hæmorrhage, and dropsy, and from many other diseases; and perhaps there are many other remote causes which can produce a consumption, without varying the common immediate cause of the disease, or the method of cure. Med. Eff. Edinb V. I p. 266.

This distemper, according to some, is principally to be cured by frequent bleedings in small quantities. Med. Eff. Edinb.

PHU, in botany, a name by which some authors call the great garden valerian. *C. Bauh.* p. 164.

PHYCIS, in zoology, the name of a fish of the truttaceous kind, more usually called *callarias*, or *asellus callarias*, and *tinca marina*, or sea-tench. *Gesner*, de Pisc p. 819. See the article CALLARIAS.

PHYCIS, in ichthyology, is also a name given by Artedi, after Aristotle, Pliny, and the rest of the antients, to a fish nearly allied to the genus of the *blenni*, and called by some *trebius* and *fuca*; and according to Rondeletius, the *tinca marina* of the Italians. Salvian, however, denies that it is the *tinca marina*, and the matter is yet undecided among the writers on this subject. See TINCA *marina*.

PHYCITES, in natural history, the name given by the antients to a stone which had the impression of a sea plant of the fucus or alga kind; probably in the manner in which our black coal slate is frequently found to contain the impressions of fern and other vegetables.

PHYLACISTÆ, among the antients, officers to whose keeping the slaves in prisons and work-houses were committed. *Pitisc.* Lex. Ant. in voc.

PHYLARCHUS, φύλαρχος, among the Athenians. The *phylarchi* were magistrates who had each of them the government of a tribe committed to his charge; and their business was to take care of the public treasure belonging to each tribe, to manage all their concerns, and call them together as oft as any thing happened that required the presence of the whole body. *Potter*, Archæol Græc. l. 1. c. 13. T 1. p. 78.

PHYLATERIA, a name given by some botanical authors to the *polium*, or poly-mountain. *Ger.* Emac. Ind. 2.

PHYLLA, among the antients, wreaths, or fillets, that hung from the womens head dress, in form of flowers. *Pitisc.* Lex Antiq. in voc.

PHYLLANTHUS, in botany, the name of a genus of plants, called by Martin, in his centuries, *niruri*, as also in the hortus amstelodamensis, and malabaricus.

The characters are these: the flowers are some male and others female, produced on the same plant In the male flowers the cup is composed of one leaf, of a campanulated form, and divided into six oval and obtuse segments: these are coloured, and are the whole flower, for there are no petals. The stamina are three filaments, shorter than the cup, standing close at the base, and expanding towards the points. The antheræ are double in the female flower. The cup is the same as in the male, and there are no petals. The nectarium is a sort of rim of twelve angles, surrounding the germen of the pistil. This germen is roundish, but obtusely trigonal. The styles are three, they stand expanded, and are obtusely bifid at the extremities. The stigmata are obtuse. The fruit is a roundish capsule, marked with three furrows, and containing three cells, each composed of two valves. The seeds are single and roundish, and do not wholly fill the cells of the capsule. *Linnæi* Gen. Pl. 447. *Martin*, Cent. 1. p. 9. Hort. Mal. Vol. 10. p. 27.

PHYLLEN, in botany, a name given by some of the old authors to the *mercurialis*, or male and female French mercury. *Ger.* Emac. Ind. 2.

PHYLLEREA, *phillerey*, in botany, the name of a genus of plants, the characters of which are these: the flower consists only of one leaf, and is of a bell like shape, and divided into four segments at the edges. The pistil arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower. This finally becomes a fruit of a roundish figure, containing roundish seeds

The species of *phyllerey*, enumerated by Mr. Tournefort, are these: 1. The broad-leaved smooth *phyllerey*. 2. The broad-leaved prickly *phillerey*. 3. The *phyllerey* with lightly serrated leaves. 4. The privet-leaved *phyllerey*. 5. The common narrow-leaved *phyllerey*. 6. The longer narrow-leaved *phyllerey*. 7. The narrow-leaved prickly *phyllerey*. 8. The *phyllerey* with long and deeply serrated leaves. 9. The box-leaved *phyllerey*. 10. The Spanish bay leaved prickly *phyllerey*. 11. The Spanish nerium-leaved *phyllerey*. 12. The dwarf American *phyllerey*, with thick yellow roots, and sharp-pointed leaves. And, 13. The dwarf American *phyllerey*, with a thick rose-coloured root and roundish leaves. *Tourn.* Inst. p. 596.

PHYLLITIS, *hart's tongue*. The several species of this plant see enumerated under the word LINGUA *cervina*.

It is recommended by many as an astringent, and has a place in most of our dispensatories. The common kind is esteemed the best for medicinal use; it is found in old wells, and under damp walls, sometimes in the ditches under very thick hedges. It is given, in powder or decoction, in swellings and indurations of the spleen; as also in diarrhœas, and in spitting of blood, or other hæmorrhages, externally: it is accounted a good mundificative for old ulcers. Ray, in his history of plants, tells us also, that the powder of the dried leaves does wonders in palpitations of the heart, and hysteric affections.

PHYLLITIS *marina*, *sea-hart's tongue*, in natural history, a name given by some authors to a species of sea-plant, the leaves of which, in some degree, resemble those of the common *hart's tongue*. It grows on the rocks at great depths, and is seldom seen, unless when taken up by the coral fishers. Its leaves are sometimes single, sometimes they divide into two: they are of a dusky green colour, and are about two inches in length: they have each a nerve or rib running along their middle: they are very thin and transparent, and are of a sort of cartilaginous structure; and each has several rows of small points on each side of the middle rib, which not unaptly resemble the seed-spots on the leaves of some of the capillary plants; but not on those of the *phyllitis*, or hart's tongue in particular, because they are in that plant not round but oblong, and stand only in a single row on each side the rib. When this plant is viewed by the microscope, it appears in all parts of the leaf full of little holes; and those which are so plain to the naked eye, are no other way different from the imperceptible ones, but in that they are larger. The plant has no root, and therefore takes in its nourishment by these numerous holes in its surface. *Marsigli*, Hist. Mer.

PHYLLITIS *marina Triumfetti*, in natural history, the name of a sea plant, described by count Marsigli and others, and taking its denomination from Triumfetti's judging it like the common *hart's tongue*, which grows on the sides of wells, and in other such places. It is found in great abundance on the coasts of the Mediterranean in several places at different depths, and grows to the rocks and stones. It grows to about three inches in height, and its colour is a yellowish green; it is soft and tough while in the water, but when dried it becomes very brittle, and may be rubbed to powder between the fingers. It is very elegantly branched, and its leaves are disposed with great symmetry and regularity, and are placed in a nice order for the properly receiving nourishment and conveying it all over the plant On examining these leaves with a microscope, they are found to be in reality only so many tubes, hollow all the way along, and having an aperture at the extremity,

tremity, by which they admit the sea water: as these stand above one another on the main stalks, each receives its portion of fluid, and transmits it without mixing with the rest, pure to that part of the stalk where it joins: they are all nicely jointed on to the main stalk or trunk, and that also is hollow as well as the leaves. The leaves of most of the sea plants, on being examined by the microscope, appear to be full of glandules and tubercles, which are in reality so many small pipes destined to admit the sea water; but in this plant, as that water is admitted in sufficient plenty by the extremities of the leaves, the rest of their surface is kept smooth and perfectly even. *Marsigli*, Hist. de la Mer, p. 76.

PHYLLOBOLIA, φυλλοβολία, in antiquity, a custom that prevailed among the antients to strow flowers and leaves on the tombs of the dead. The Romans adopted this custom from the Greeks, and added likewise wool. See the article BURYING.

The *phyllobolia* was also used on occasion of a victory obtained at any of the public games; when not only the victors, but likewise their parents, were strowed with flowers and leaves. *Hofm.* Lex Univ. in voc.

PHYLOBASILES, φυλοβασιλεῖς, among the Athenians, magistrates, who, with respect to particular tribes, had the same office that the *basileus* had, with respect to the commonwealth.

They were chosen out of the eupatridæ or nobility, had the care of public sacrifices, and other divine worship peculiar to their respective tribes, and kept their court in the portico called *basileion*, and sometimes in the *bucoleian*. *Potter*, Archæol. Græc.T. 1. p. 78.

PHYRAMA, in the materia medica, a name given by some of the old writers to the gum ammoniacum, particularly to that kind of it which was soft and ductile between the fingers. It is not clear that the gum ammoniacum of those times was the same thing which we now know by that name; at least it is certain, that the other kind of it, which they called *thrauma*, or *ammoniacum thraustum*, was not; for Dioscorides describes this as being of a reddish-brown colour, and very friable; and Avisenna says, that it marked a fine yellow or gold colour upon paper. These are properties by no means agreeing with our gum ammoniacum; and if justly applicable to that, must prove that it could not be the same; and the characters given by Avisenna of its bitterness, and making a yellow stain upon paper, seems to make it the *gamboge*. This, however, by no means can agree with the other virtues attributed to it.

PHYSALUS, a name given by Rondeletius to a species of sea insect, of the *scolopendra marina* kind, supposed by some to be the same with the *scolopendra marina*, or *centipes* of the Irish sea, described by Molyneux; but this does not appear to be the case, on a strict enquiry. The *physalus* of Rondeletius has no mouth, whereas the sea *centipes* of Ireland has a remarkably large one: that of Rondeletius is wider in the middle, and tapers at each end; but the Irish kind is largest at the head, and tapers from thence all the way to the tail. Rondeletius's has tubercles on the back, but the Irish one has only hairy stripes; and his is a poisonous animal, whereas that of Ireland was found in the stomach of a cod-fish, which had eaten it as food. The figure given by Rondeletius agrees also very well with the account he gives, but not with the figure of that drawn upon the spot from the Irish fish, and given in the Philosophical Transactions. On the whole, nothing is more plain than that these are two distinct species of animals, tho' of the same genus. Phil. Transf. N° 225. See the article SCOLOPENDRA.

PHYSETER, in ichthyology, the name of a genus of fishes of the *plagiure* kind, the characters of which are these: The teeth are crooked, and are placed only in the lower jaw There is one high fin or spine on the back, and a fistula or hole in the forehead. There are only two known species of this genus; these are, 1. The *physeter* with the upper jaw longer than the under one, and with a long spine on the back. The head of this fish is so large, that it is half as long as the body, and thicker than the thickest part of it. The lower part of the upper jaw runs out two foot beyond the under one, and its upper part more than five foot. The eyes are remarkably small, scarce longer than those of a haddock; the fistula or pipe, is placed a little above the center of the head; it is divided into two channels, and covered with one common operculum; the teeth are in number forty-four, and all of the shape of a reaper's sickle, roundish and a little flatted, thickest and most arched in the middle; and at the end terminating in a cone very sharp-pointed; the base is thinner than the middle of the tooth. 2. The *physeter* with a very high back-fin, with the tops of the teeth flat. This is a species of whale, described, as well as the former, by Sibbald The head is very large; the fistula, or pipe, is in the middle of the head; the fin stands so high in the middle of the back, that it has been compared to the mizzen mast of a ship. *Artedi*, Gen. Pisc See the article BALÆNA.

The name *physeter* is of Greek origin, and is derived from the verb φυσάω, to blow. It has this name from its quality of taking in a great quantity of sea water, and then blowing it out again with great force and violence.

PHYSIOLOGI, in botany, those authors whose writings tend to set that study in its clearest light, by explicating and enumerating the various dispositions of the male and female parts in the flowers of plants. *Linnæi* Fund. Bot. p. 2.

PHYSOCELE, a word used by many authors to express a *wind-rup ure.*

PHYSTA, in ichthyology, a name given by Gesner, and some others, to the fish called by the Greeks, and many of the later authors, *ballerus* and *balerus*. Artedi denies its right to any general name, reducing it to the genus of the cyprini, to which it evidently belongs, and distinguishing it from the others of that numerous genus by the specific name of the very broad and thin *cyprinus*, with forty rays in the pinna ani. See the articles BALLERUS and CYPRINUS.

PHYSTE, in the writings of the antient physicians, a word used to express a mass of meal macerated in a close vessel with wine, but not left to ferment.

PHYTALIA, a word used by the antients in two very different senses; with some expressing the latter part of the winter season, and with others a place where vines are planted, whither in standard vineyards or otherwise.

PHYTOLACA, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, consisting of several petals arranged in a circular order; from its center arises a pistil, which finally becomes a soft fruit or berry of an oval figure, or nearly round, and containing several seeds disposed in a circular order.

The species of *phytolaca*, enumerated by Mr. Tournefort, are these: 1. The larger fruited American *phytolaca*, called by authors the *great red cluster-fruited Virginian nightshade*. 2. The American *phytolaca*, with smaller fruit. *Tourn.* Inst. p. 299.

PHYTOLOGI, *phytologists*, authors who have written any treatise on botany, or the history or uses of vegetables. *Linnæi* Fund Bot p. 4

PIA *mater* (*Cycl.*)—According to Mr. Le Cat, the *pia mater* gives three membranes to the eye; the first lines the sclerotic coat, and is joined to it; the second is the choroid coat, and the third is the villous mammary one, proceeding from the choroid, and is commonly called *Ruysche's coat*. Med. Ess. Edinb. abrid. Vol. II p. 482.

PIABA, in ichthyology, the name of a small fresh-water fish, caught in all the fresh rivers and brooks in the Brasils, and some other parts of America.

It is of the size of the common minow; its eyes have a fine black pupil, and a yellow iris; it is covered with small scales, and has a triangular fin on its back, two under the belly, two at the gills, and one behind the anus; its tail is forked; its head is of a mixed yellow and white, and of the brightness of gold and silver; its back is of a silvery hue, with an admixture of green, and in some parts of a fine strong blue; and the sides of a silvery white and blue, without any admixture of green; and its belly of a mixed yellow and white, with only a slight cast of blue; behind each of the gills it has a fine deep blue spot, and immediately behind that another of the same colour, but of a lunated shape; and two other oblong ones of the same colour, near the origin of the tail; its tail and back-fins are yellow; its belly-fins red; it is a well-tasted fish, and much esteemed by the natives. *Willughby*'s Hist. Pisc. p. 269.

PIABUCU, in zoology, the name of an American fish eaten by the natives in many places. It is a ravenous fish, and so greedy of blood, that if a man goes into the water with a wound in any part of his body, this fish will make up to it to suck the blood. It is a small fish, seldom exceeding four inches in length, and of no great breadth; its belly is somewhat protuberant, and the whole fish is covered with bright silver-coloured scales The lines running one on each side from the gills to the tail are broad, and not shining like the rest of the body; the back is of a greenish olive-colour, and the fins are white. *Marggrave*'s Hist. of Brasil.

PIAFFEUR, in the manege, is a proud, stately horse, who, being full of mettle, or fire, restless and foreward, with a great deal of motion, and an excessive eagerness to go forwards, makes this motion the more that you endeavour to keep him in, and bends his leg up to his belly. He snorts, traverses if he can, and by his fiery action shews his restlessness; whence some, though very improperly, say, he dances. Such horses as these, or such as are bred to passage upon a straight line, are much admired in carousels and magnificent festivals. See the articles SNORT and PASSADE.

PIANISSIMO, in the Italian music, is used to signify that the part to which it is added should be played very softly, and so as that the sound may seem at a great distance, and almost lost in air. See *Corelli* Concerto VIII. in fine.

PIANO, in the Italian music, signifies soft and sweet, by way of an eccho.

PIANO PIANO, or PIU PIANO, in the Italian music, is nearly the same with *pianissimo*, or rather a degree between it and *piano*.

Piu PIANO, in the Italian music, signifies more slow, or more soft, and is much the same with *piano piano*.

PIC, an East Indian weight, containing 100 catis. See the article CATI

PICA, the *pye*, or *magpie*, in the Linnæan ſyſtem of zoology, the name of one whole order of the bird kind; the character of which is, that they have a convex beak, flatted above. The birds of this order are, the bird of paradiſe, the magpie, the crow, the cuckow, the wood-pecker, the ſitta, the creeper, the hoopoe, and the iſpida. *Linnæi* Syſtema Naturæ, p. 44.

Of this genus of birds, authors enumerate the following ſpecies: 1. The *pica varia caudata*, or common *magpie*. 2 The *pica braſilienſis*, called *toucan*. (See the article TOUCAN.) 3. The *pica glanduria*, or common jay. 4. The *garrulus argentoratenſis*, or roller. (See the article ROLLER.) 5. The *pica marina*, or ſea *pie*, a very beautiful ſpecies, being all green except the head, neck, and feet, and a ſmall part of the wings; the head is cheſnut-coloured on the top, and yellow at the ſides, and its feet brown; its claws black and very ſharp, and it has a ſmall variegation of cheſnut colour on its wings. This Mr. Ray ſuſpects, however, to be no other than the *garrulus argentoratenſis*, or roller. 6. The *pica perſica*, or Perſian *pie*, variegated with yellow; and two others mentioned by Charleton, the *pica caudata indica*, or long-tailed Indian *magpie*; and the *mimus*, or *pica garrula indica*; a bird reſembling our jay, but much ſmaller: theſe two laſt, however, are mentioned by no other author, and have never been ſeen in Europe. *Ray*'s Ornithology, p. 87, 88, 89, 90.

PICA is alſo a name by which ſome have called the *lanius*, or butcher bird. *Ray*'s Ornithology, p. 52. See the article LANIUS.

PICA *marina*, in ornithology, the name of a bird called in Engliſh the *ſea pie*, and by Bellonius and ſome others, the *hæmatopus*. It is of the ſize of the common *magpie*; its beak is three fingers breadth long, ſtrait, and of a reddiſh, or a blackiſh colour, and ending in a point, and ſeeming well-fitted for its buſineſs of rooting up the limpets from the rocks, the bodies of this fiſh being its common food; its legs are red; it has no hinder toe, and has its other toes ſo far connected by a membrane, as to ſeem almoſt of a middle nature between the web-footed and other birds; its head, neck, back, throat, and half its breaſt are black, as is alſo its rump; its tail is half black, and half white, as are alſo its wings. It is common on the weſtern ſhores of England, and on the ſhores of Wales. *Ray*'s Ornithology, p. 230.

PICA *marina* is alſo uſed by Geſner very improperly for the bird commonly known by the name of *anas arctica cluſi*. *Aldrovand.* de Avib. T. 3. p. 315. See the article DUCK.

PICA *naſi*, in medicine, a name given by Cohauſen to the immoderate taking of ſnuff. It ſeems a whimſical term, but he chuſes to treat this habit as a diſeaſe, and has written an expreſs treatiſe concerning it. The word *pica*, in general, denotes an abſurd and unnatural appetite; and the deſire of taking the powder of tobacco in this manner, is called a diſtempered appetite of the part into which it is taken, that is, the noſe. The conſequences of the taking ſnuff immoderately, are, that the ſenſe of ſmelling is either entirely deſtroyed, or at leaſt greatly impaired: for the nervous tubercles of the noſtrils being continually vellicated by this powder, are by degrees clogged up, or wholly deſtroyed, and the ſenſible membrane, which lines the noſtrils, is rendered callous, and wholly unfit for the diſcharge of its office in ſmelling. The voice is next affected by this powder; for it cauſes a ſort of aſtriction at the bottom of the noſe, which affects the palate, and conſequently the ſpeech; this gives the perſon who takes it a continual deſire of taking more and more, to rid himſelf of that ſtoppage. *Cohauſen*, de Pica Naſi.

PICACIA, a name given by the antients to that diſtempered appetite of women with child, and maidens at a certain time of life, which makes them long for things not fit for food. It is more uſually called *pica*.

PICACUROBA, in zoology, the name of a Braſilian ſpecies of pigeon, of a greyiſh colour variegated with a reddiſh brown, and with very red legs and feet. *Marggrave*'s Hiſt. of Braſil.

PICARDS *(Cycl.)* —PICARD, in our old writers, a kind of large boat, of about fifteen tons or upwards, uſed on the river Severn. Stat. 35 Hen. VIII. c. 9. 13 Eliz. c. 11.

PICICITLI, in zoology, the name of a bird of the Spaniſh Weſt Indies, deſcribed by Nieremberg. Its head and neck are black, and its whole body grey; it is a ſmall bird, and makes its appearance in Mexico after the rainy ſeaſons; it is a bird of paſſage, and it is not known where it breeds. *Ray*'s Ornithol. p 305.

PICK, among miners, is a tool with which they uſe to cut down the cliffs and rocks of ſtone to make paſſages in the earth *Houghton*'s Compl. Miner in the Explan. of the Terms.

PICK-*ax*, in the military art, a tool carried by the pioneers to dig up ground that is too hard for the ſpade; they are of great uſe for mending the ways, and in fortification.

PICKER, or *horſe*-PICKER, in the manege, an iron inſtrument five or ſix inches long, bent or crooked on one ſide, and flat and pointed on the other. It is uſed by the grooms to cleanſe the inſide of the horſes feet, and to pick out the earth, ſand, or ſmall ſtones that get into them.

PICKERELL, in ichthyology, an Engliſh name uſed by ſome authors for the *jack* or *pike*.

PICOLOS, the name of an antient Pruſſian idol, to which human ſacrifice was offered. See the article POTRIMPOS.

PICOTA, a name given by ſome authors to a diſtemper which they deſcribe as conſiſting wholly in an eruption of a number of very minute pimples upon the ſkin, all over the body; it is attended with no danger, unleſs they are ſtruck in.

PICRIS, in botany, the name given by Linnæus to a genus of plants called by Vaillant *helminthotheca*; the characters of which are theſe: The common cup is double; the outer cup is very large, and compoſed of five cordated leaves; the interior is imbricated and of an oval figure, and is not cloſe at the mouth, as the other, but open. The flower is of the compound kind, it is imbricated and uniform; and the ſmall flowers of which it is compoſed, are equal and numerous; each is compoſed of one petal, and is narrow, ligulated, and truncated at the end, where it is divided into five ſegments; the ſtamina are five capillary filaments, ſo ſhort that they are hardly ſeen; the antheræ are cylindric and tubulate; the germen of the piſtil ſtands under the flower; the ſtyle is of the length of the ſtamina, and the ſtigmata are two in number, and reflex. The cups both remain when the flowers are fallen, and ſerve as capſules for the ſeeds, which are ſingle, ventricoſe, obtuſe, and crowned with a plume of down; the receptacle is naked.

In ſome of the ſpecies of this genus, the ſeeds are crooked, and have a ſeſſile down; in others they are ſtrait, and their down is placed on a pedicle. *Linnæi* Gen. Pl. p. 377.

PICTA *toga*, among the Romans. See TOGA *picta*.

PICTAVIENSIS *colica*, the name of a kind of very terrible nervous colic, more uſually called *colica pictonum*; and by the natives in the Weſt Indies, where it rages, the *dry belly-ach*. It is ſo popular a diſeaſe in the Leeward Iſlands, that it may be very juſtly reckoned endemic among them, moſt of the people there having been at one time or other ſubject to it in all its fury. See the article COLIC.

PICUIPINIMA, in zoology, the name of a Braſilian ſpecies of pigeon, very ſmall, ſcarce exceeding the lark in ſize. Its head, neck, and wings, are all of a pale-lead colour, with a black ſemilunar mark at the extremity of each wing; but its long wing feathers, which are ſeen when the wings are expanded in flying, are of a reddiſh-brown on one ſide, and blackiſh on the other, with black ends or tips; the tail is long, and is variegated with black, white, and brown; the belly is covered with white feathers, every one of which has a brown mark of the ſhape of a half moon at the end. *Marggrave*'s Hiſt. of Braſil.

PICUS, or PICUS *martius*, in zoology, the name of a large genus of birds, of the wood-pecker kind, the characters of which are theſe: They have a ſtrait, very hard, ſtrong and ſharp beak, proper for making holes in trees; and a very long cylindrical-ſhaped tongue, terminated by a rigid and ſharp bony ſpine, ſerrated or notched at each end, proper for the ſeizing on, and tearing to pieces, of worms and other inſects; and this they can, at pleaſure, thruſt out to a great length; and ſtriking it into the clifts of trees, faſten it into inſects that lie there, and draw them out with it. Their thighs are very ſhort and ſtrong, and their toes four in number, placed two before and two behind; their tails are rigid, and bent downwards, and their feathers bare at the ends, the ſtumps aſſiſting the creature in climbing: they live only on inſects, and have only ten feathers in their tail. *Ray*'s Ornithology, p. 91.

Some underſtand the word *picus* in a larger ſenſe, making it take in the *ſitta*, *picus murarius*, *junco*, *certhia*, and all the birds that climb trees. In which caſe the characters of the genus are only, that they have very ſhort, thick, and ſtrong legs, adapted to the running up the bodies and branches of trees.

The *pici*, or wood-peckers, properly ſo called, however, are a very large and numerous family; they are, 1. The great black wood-pecker, which is all over black, except that the crown of his head is of a fine florid red. This is called the *picus niger maximus*, by authors, and is the largeſt of the whole genus: it is common in the woods of Germany, but not in England. 2. The *picus viridis*, or common green wood-pecker, well known by its beautiful colours, and its loud and diſagreeable noiſe. 3. The *picus varius major*, the great ſpotted wood-pecker. This is ſomewhat larger than the thruſh, and has a yellowiſh breaſt and beautiful redneſs near the tail. 4. The *picus varius minor*, called in Engliſh the *hickwall*. (See HICKWALL.) 5. The *picus varius Braſilienſis*, or ſpotted Braſilian wood-pecker, called the *ipecu*. (See IPECU.) 6. The *jynx*, or wry neck. (See JYNX.) 7. The *jacamaciri* of the Braſilians. 8. The *curucui*. 9. The *guira-acangatara*. 10 The *aracari*; and 11. The *guiratangemia*; and 12. The *japu* of the ſame nation; all which ſee under their ſeveral names; and beſides all theſe, Aldrovandus deſcribes another ſpecies, which he calls the *picus luteus cyanopus perſicus*, or blue-footed yellow Perſian wood-pecker. This is of the ſame ſize with the common wood-pecker; but its head and neck are thicker, and its beak longer; its feet are blue, and its general colour yellow; but with

with a broad line of a ferruginous brown down the back. *Ray's* Ornithol. p. 96. *Aldrovand.* de Avibus, l. 12. c. 35.

In the Linnæan system of zoology, the *picus* makes a distinct genus of birds, of the order of the pyes. The characters of this genus, according to this author, are, that the feet have two toes before; the tail is rigid and of the shape of a wedge; the bill is angular, and terminates in the form of a wedge; the tongue is pointed, hard, and sharp.

Of this genus are the black, green, and variegated woodpecker, and the three-toed species, described in the acta literaria sueciæ in 1740. *Linnæi* System. Natur. p 45.

PICUS *imbrifœtus*, in zoology, the name of an American bird, described by Nieremberg, and called by the natives *quatotomi*. It is of the size of the hoopoe, and is variegated with black and brown. It is of the wood-pecker kind, having a beak three finger's breadth long, with which it perforates trees. Its head is small and red, and has a fine red crest; but the feathers are black on their upper side. It has on each side of the neck a broad white line, reaching to the breast. Its legs and feet are of a bluish colour. It builds in high trees, and is principally found near the shores of the south sea. It feeds on insects. *Ray's* Ornithol. p 301.

PICUS *murarius*, in zoology, the name of a bird called in English the *wall-creeper*, and but improperly ranked among the *pici*, as wanting many of the characters of that genus. It is about the bigness of the common sparrow; its bill is black, slender, and long; its head, neck, and back grey; its breast white, and its wings partly grey and partly red; its tail is short and black; its long wing-feathers also, and the lower part of its belly, and its legs, are of the same colour; its legs are short, but its feet are not placed as in the wood pecker; but are three before, and one behind: it is very common in Italy, Germany, and some parts of France; it is a very lively and chearful bird, and as the common wood-pecker climbs trees, and feeds on the insects in their cracks; so this bird runs up old walls, and feeds on what it finds in the cracks of the stones. *Aldrovand.* de Avib. L. 12. c. 37.

PICUS *nidum suspendens*, a name by which some authors have called the *galbula*; a yellow bird of the thrush kind, very remarkable for its beauty, and for the structure and manner of hanging its nest. *Aldrovand.* de Avib. See GALBULA.

PICUS *salutiferus*, in zoology, a name under which Nieremberg has described a Mexican bird, called by the natives *henquechoitotl*.

It is of the size of the common black-bird, and has a long and black beak: its head and a great part of its neck are red: its breast and belly are grey, and it has a crest of red feathers upon its head. It is of the wood-pecker kind, and has its name from the supposed virtues of its feathers, particularly those of the crest, in curing the head-ach. *Ray's* Ornithol. p. 301.

PIEDRA *de la hyada*, in natural history, the name given by the Spaniards to a stone found in many parts of America, particularly in New Spain; and famous among the Indians for curing the colic on being applied to the navel.

It is green, and is a species of jasper, approaching to the nature of the *lapis nephriticus*, and is called by many *colicus lapis*, from its virtues.

PIERRE *d'automne*, a French name translated from the Chinese. It is the name of a medicinal stone, famous throughout the east for curing all disorders of the lungs.

Many people suppose it had its name of the *autumn-stone*, from its being only to be made at that season of the year; but it may be made equally at all times, and the origin of the name is to be farther searched into.

The Chinese chemists, like those of all other nations, delight in a sort of gibberish. A part of this is, the referring the several parts of the body to the several seasons of the year. The lungs are in this scheme referred to autumn. This appears in their writings; and thus the stone for diseases of the lungs came to be called *autumn-stone*.

It is a tedious preparation of human urine, and made as follows: they put thirty pints of the urine of a strong and healthy young man into a large iron pot, and set it over a gentle fire; and when it begins to boil, they add to it, drop by drop, about a large tea-cup full of rape-oil: it is then left on the fire till the whole is evaporated to a thick substance resembling black mud; they then take it out of the pot, and laying it on a flat iron, they dry it so that it may be powdered very fine.

This powder they moisten with fresh oil, and put the mass into a double crucible, surrounded with coals; where it stands till thoroughly dried again. They finally powder this again, and putting it into a china vessel, covered with silk cloth and a double paper, they pour on boiling water, which makes its way, drop by drop, thro' these coverings, till so much is got in, as is sufficient to reduce it to a paste. This paste is well mixed together in the vessel it is kept in, and this is put into a vessel of water, and the whole set over the fire. The matter thus becomes again dried in balneo mariæ, and is then finished. Observ. sur les Cout. de l'Asie, p. 258.

PIERIDES, among the antients, an epithet given to the muses, upon account of their having been born in that part of the country of Macedon which was called *Pieria*. *Pitisc* in voc.

PIESMA, a word used by the antients to express the remaining mass after the expression of any fluid substance from among its more solid parts. Thus the cake remaining in the bag after the expression of oils, is called by this name: but there are instances of authors calling the expressed juice, instead of the residuum, by this name. Thus Dioscorides calls the expressed juice of the bay-berries, the *piesma laurinum*; and others, the expressed juice of roses, *piesma rosarum*, paying no regard to the rose-cake left behind.

PIESTER, the name used by the antients for the press which they employed in preparing the several juices of plants, &c. hence the word *piesma*, which see.

PIESTRON, a word used by Hippocrates to express a sort of forceps, which he recommends to be used in difficult labours, to break the bones of the cranium of the fœtus, when its head is too large to suffer it to pass whole.

PIETERMAN, in zoology, the name used by some for a fish of the *cuculus* kind, approaching to the nature of the *draco marinus*, or weaver; and more usually called among authors by its Brasilian name *niqui*. *Willughby's* Hist. Pisc. p. 289. See Tab. of Fishes, N°. 39. and the article NIQUI.

PIETOSO, in the Italian music, signifies to play or sing in a soft manner, fit to move pity or compassion.

PIETRA *embosf.ata*, in natural history, a name given by the Italians to the Florentine marble, so remarkable for its delineations.

This marble is found in thin strata, and is full of cracks; in these cracks there is usually found a black mineral matter, which getting into the substance of the stone a little way on each side of the crack, forms there various delineations, or the figures of pieces of moss bushes, and the like: the paler pieces of the marble usually have these delineations; the darker coloured having the forms of trees and houses, or the ruins of old buildings. *Woodw.* Hist. Foss. V. II. p. 19.

PIEXE-*gallo*, in zoology, a name given by the Portuguese to a fish caught about the shores of the Brasils, and much resembling our *doree* or *faber piscis*; more usually known among authors by its Brasilian name, *abacatuaia*. *Willughby's* Hist. Pisc. p. 295. See ABACATUAIA.

PIEXE-*porco*, in zoology, a name by which some authors have called the *monoceros*, or unicorn fish of Clusius. The name is Portuguese, and signifies hog-fish; this little creature having a mouth like a hog. *Willughby's* Hist. Pisc. p. 150.

PIG *Guinea*. See GUINEA.

PIGAYA, in natural history, a word used by the natives of Brasil as a name for the famous *ipecacuanha*-root.

The first European who brought this root into use was an apothecary of Brasil, whose name was Michael Tristaon. The book which this author published on this subject falling into the hands of the English, is translated into our language, and stands, among a number of like accounts, among Purchas's pilgrims.

He says it is an excellent remedy against dysenteries and fluxes of all kinds. He says also, in its description, that the stalks are a quarter of a yard long, and the roots nearly as much; and that the leaves grow only four or five upon a plant.

This agrees very well with all that we have since discovered of this plant, and the method of using it at that time; we find, was not as a vomit; but they bruised the fresh root, and steeped it about twelve hours in water, at the end of which time, the patient drank the water early in the morning: it operated by stool; but after its operation, the natural purging and voiding of blood ceased. This seems the original account we have of this drug.

De Laet from this compiled his account; which is almost a literal translation of this into Latin: from his hint Piso and Margrave enquired after it more carefully upon the spot, and from them came the first accurate accounts we had of it; so that all seems, *ab origine*, deduced from Michael Tristaon's account of it.

PIGEON, in zoology. See COLUMBA.

PIGEON-*holes*, in brick-making. See BRICK.

Turbit PIGEON. See TURBIT.

PIGNOLETTI, in ichthyography, a name used by many for the *aphua cobites*, a small fish of the *gobius*, or sea-gudgeon kind, common in the Mediterranean, and brought to the markets of Rome and Venice. *Willughby's* Hist. Pisc. p. 207. See the article APHUA.

PIGUS, in zoology, the name of a species of leather-mouthed fish, very much approaching to the nature of the carp.

It is of the same shape and size with the common carp, and its eyes, fins, and fleshy palate wholly the same. From the gills to the tail there runs a crooked dotted line: its back and sides are bluish, and its belly reddish: it is covered with large scales, from the middle of every one of which there rises a fine, pellucid, and very sharp prickle.

It is a finer fish than the carp for the table, and is in season in the months of March and April. It is caught in lakes in some parts of Italy, and is mentioned by Pliny, tho' without a name.

It is a species of *cyprinus*, according to Artedi, and is distinguished by that author under the name of the *cyprinus*, called *pielo* and *pigus*. He adds, that the tail is forked, and the scales large; and that in spring and autumn there grow out of them

them white pyramidal prickles, which remain about five or fix weeks, and then fall off. The back is of a blackifh blue, and the belly white, with a faint caft of red. It never grows to more than five or fix pound weight: the flefh is well tafted. It is found in the lakes in the northern nations. *Willughby*'s Hift. Pifc. p. 247. *Rondelet* de Pifc p. 64

PIISSKER, in zoology, the name of a fifh of the *muftela* kind, ufually called the *muftela foffilis*, or *pif.is foffilis*, the foffile fifh.

This fifh is ufually found of a hand's breadth long, and as thick as one's finger; but they grow fometimes to be much longer. The back is of a grey colour, fpotted with a great number of fpots, and tranfverfe ftreaks, partly black and partly blue The belly is yellow, and is fpotted with red and white and black; the white ones are the larger, and the others look as if made with the point of a needle; and there is on each of the fides a longitudinal black and white line. There are certain flefhy excrefcences at the mouth, which in fwimming they expand; and when out of the water, they contract them

They run into caverns in the earth, in the fides of rivers, in marfhy places, and penetrate a great way, and are frequently dug up at diftances from waters; and often, when the waters of brooks and rivers fwell beyond their banks, and they are again covered by them, they make their way out of the earth into the water, and when it deferts them, are left in vaft numbers upon the ground, when they are eaten by the fwine

This feems very much of the kind of the *fifgum* fifh, and poffibly is no other than the fame fpecies; and poffibly alfo the pæcilia of Schonefeldt is the fame *Gefner* de Aquat.

PIKE, in ichthyology, a name given by us to the fifh called by authors the *lucius* and *efox*, and by the old Greek writers *oxyryn hus*. See LUCIUS and ESOX.

This fifh is the tyrant of the frefh waters, and is at once the moft voracious and the longeft lived of all fifh, according to the generality of naturalifts.

The very large *pike* are efteemed as a pompous fifh at the tables of great people; but they are coarfe, and the middling ones are in reality much the beft.

The *pike* never fwims in fhoals, as moft other fifh do, but always lies alone, and is fo bold and ravenous, that he will feize upon almoft any thing lefs than himfelf. This fifh breeds but once in a year, which is in March. It is found in almoft all frefh waters, but is very different in goodnefs, according to the nature of the places where it lives. The fineft *pike* are thofe which feed in clear rivers; thofe in ponds and meres are inferior to thefe, and the worft of all are thofe of the fen ditches. They are very plentiful in thefe laft places, where the water is foul and coloured, and their food, fuch as frogs and the like, very plentiful, but very coarfe; fo that they grow large, but are yellowifh and high-bellied, and differ greatly from thofe which live in the clearer waters.

The fifhermen have two principal ways of catching the *pike*; by the ledger, and by the walking-bait.

The ledger-bait is fixed in one certain place, and may continue while the angler is abfent: this muft be a live bait, a fifh or frog; and among fifh, the dace, roach, and gudgeon, are the beft: of frogs, the only caution is to chufe the largeft and the yelloweft that can he met with. If the bait be a fifh, the hook is to be ftuck thro' the upper lip, and the line muft be fourteen yards at leaft in length: the other end of this is to be tied to a bough of a tree, or to a ftick driven into the ground near the *pike*'s haunt, and all the line wound round a forked ftick, except about half a yard. The bait will by this means keep playing fo much under water, and the *pike* will foon lay hold of it.

If the bait be a frog then the arming wire of the hook fhould be put in at the mouth, and out at the fide; and with a needle and fome ftrong filk the hinder leg of one fide is to be faftened by one ftitch to the wire-arming of the hook. The *pike* will foon feize this, and muft have line enough to give him leave to get to his haunt and poach the bait.

The trolling for *pike* is a pleafant method alfo of taking them: in this a dead bait ferves, and none is fo proper as a gudgeon This is to be pulled about in the water till the *pike* feizes it, and then it is to have line enough, and time to fwallow it: the hook is fmall for this fport, and has a fmooth piece of lead fixed at its end to fink the bait; and the line is very long, and runs through a ring at the end of the rod, which muft not be too flender at top.

The art of feeding *pike*, fo as to make them very fat, is the giving them eels, and without this it is not to be done under a very long time; otherwife perch, while fmall, and their prickly, tender fins, are the beft food for them. Bream put into a *pike*-pond are a very proper food: they will breed freely, and their young ones make excellent food for the *pike*, who will take care that they fhall not increafe over much The numerous fhoals of roaches and ruds, which are continually changing place, and often in floods get into the *pike*'s quarters, are food for them for a long time.

Pike, when ufed to be fed hy hand, will come up to the very fhore, and take the food that is given them out of the fingers of the feeder. It is wonderful to fee with what courage they will do this, after a while practifing; and it is a very diverting fight when there are feveral of them nearly of the fame fize, to fee what ftriving and fighting there will be for the beft bits, when they are thrown in. The moft convenient place is near the mouth of the pond, and where there is about half a yard depth of water; for, by that means, the offal of the feedings will all lie in one place, and the deep water will ferve for a place to retire into and reft in, and will be always clean and in order.

Carp will be fed in the fame manner as *pike*; and 'tho' by nature a fifh as remarkably fhy and timorous as the *pike* is bold and fearlefs, yet by cuftom they will come up to take their food out of the perfon's hand; and will, like the *pike*, quarrel among one another for the niceft bits. See the article FEEDING *of fifh*.

Half PIKE, in the military art, is the weapon carried by an officer of foot. It differs from a *pike*; becaufe it is but eight or nine foot long, and the fpear is fmaller and narrower.

PIKE, is alfo the name of an Ægyptian meafure, of which there are two kinds, the large and the fmall.

The larger *pike*, called alfo the *pike* of Conftantinople, is $27\frac{930}{1000}$ Englifh inches. They meafure all foreign goods with this, excepting only fuch as are made of flax and cotton: for thefe they ufe the fmall *pike*, called *pike belledi*, or the *pike* of the country; becaufe they meafure with it all the manufactures of the country. This *pike* confifts of about $25\frac{176}{1000}$ Englifh inches. *Pocock*'s Ægypt, p 175.

PILA (*Cycl.*)—PILA *marina*, the *fea-ball*, in natural hiftory, the name of a fubftance very common on the fhores of the Mediterranean, and in fome other places. It is ufually found in form of a ball, about the fize of the balls of horfe-dung, and compofed of a multitude of fibrillæ, irregularly complicated.

Its origin has been very varioufly gueffed at by different authors. John Bauhine fays, that it confifts of fmall hairy fibres and ftraws, fuch as are found about the fea-plant called *alga vitriariorum*; but he does not pretend to afcertain what plant it owes its origin to. Imperatus judged it to confift of the exuviæ both of vegetable and animal bodies. Mercatus doubts whether it be a congeries of the fibrillæ of plants, wound up into a ball by the motion of the fea-water; or whether it be not the workmanfhip of fome fort of beetle living about the fea-fhore, and analogous to our common dung-beetles ball, which it elaborates from dung for the reception of its progeny. Schreckius will have it compofed of the filaments of fome plant of the reed kind: and Welchius fuppofes it compofed of the pappofe part of the flowers of the reed. Maurice Hoffman thinks it the excrement of the hippopotamus: and others think it that of the phoca, or fea-calf.

But Klein, who had thoroughly examined as well the bodies themfelves, as what authors had conjectured concerning them, is of opinion, that they are wholly owing to, and entirely compofed of, the capillaments which the leaves growing to the woody ftalk of the *alga vitriariorum* have, when they wither and decay. Thefe leaves, in their natural ftate, are about the thicknefs of a wheat ftraw, and they are placed fo thick about the tops and extremities of the ftalks, that they enfold, embrace, and lie over one another; and from the middle of thefe clufters of leaves, and, indeed, from the woody fubftance of the plant itfelf, there arife feveral other very long, flat, fmooth, and brittle leaves: thefe are ufually four from each tuft of the other leaves, and they have ever a common vagina, which is membranaceous and very thin. This is the ftyle of the plant, and the *pila marina* feems a clufter of the fibres of the leaves of this plant, which cover the whole ftalk divided into their conftituent fibres; and by the motion of the waves, firft broken and worn into fhort fhreds, and afterwards wound up together into a roundifh or longifh ball. *Klein*, de Tubul. Marin. p. 22.

PILARIS, or PILARIS *turdus*, in zoology, the name hy which authors in general call the field-fare. See the article FIELDFARE.

PILATIO, a word ufed by the antients to exprefs a minute fiffure in the cranium, when not larger than a fingle hair of the head.

PILATRO, or PILATRO *di Levante*, a falt ufed in the glafs trade in fome particular cafes. It is extracted from the froth of the fea, coagulated by heat in the hot countries. *Merret*'s Notes on Neri. p. 349.

PILCHARDUS, the common *pilchard*, in zoology, a fifh much approaching to the nature of the common herring, but fmaller and differing in feveral other particulars.

The diftinguifhing characters of it are thefe: it never exceeds fix or feven inches in length: its body is thicker in proportion than that of the herring, and its belly lefs fharp: its fcales are very large, round, and very thin: its back is of a bluifh green, and its belly white; and near the upper angle of the gills, it has a black fpot on each fide; fometimes alfo there are four or five other fmaller in a ftrait line behind thefe: the head is flatted, and the mouth large; but it has no teeth, neither in the jaws nor palate

It is generally found fwimming in vaft fhoals, and is caught on many parts of the Englifh fhores. Its flefh is better tafted than that of the herring.

PILE (*Cycl.*)—PILE *worms*, are a kind of *worms* found in the *piles* of the sea dikes in Holland. These *worms* are of various sizes, some of the young ones are not above an inch or two in length; but others have been found of thirteen or fourteen inches long.

The heads of these creatures were covered with two hard shells, or hemicrania; which together form a figure resembling an augur; and with which they bore the wood. The best remedy against them is, to perforate the *pile* with many small holes, about an inch asunder; then it must be done over with a varnish in the hottest sun; and while the varnish is hot, brick dust must be strewed over it; and this being several times repeated, the *pile* will be covered with a strong crust, impenetrable to all insects. See a farther account of these creatures in Phil. Transf. N° 455. Sect. 5.

PILES, the popular name for the *hæmorrhoides*. See the article HÆMORRHOIDES, *Cycl.* and *Suppl.*

PILEÆ, a name given by some authors to a genus of *echinodermata*. See the article CONULUS.

PILENTUM, among the Romans, an easy kind of chariot, used by the Roman ladies at games and religious processions. *Pitisc.* in voc.

PILEUS *presbyteri*, in botany, a name given by some writers to the *euonymus* or *fusanus*, a shrub which grows in our hedges, and bears a square fruit somewhat resembling the cap worn by some orders of priests.

PILHANNAW, a name given by the Indians to a bird found in the forests on the back of some our American plantations.

It is a bird of prey very large and bold; it is described by Josselin as four times as big as our goshawk, and having a remarkably large head. All the birds are terrified at its approach; but it principally feeds on quadrupeds, as the young fawns and the like.

PILIMICTIO, a word used by several authors to express a discharge of small and long filaments, which resemble hairs among the urine.

PILL (*Cycl.*)—*Aromatic* PILLS, *pilulæ aromaticæ*, a form of medicine in the New London Dispensatory, intended to stand in the place of the *pilulæ diambræ* of the former, and the *pilulæ alephanginæ*, or *aloephanginæ* of that, and some other Dispensatories.

The composition is this: Take socotrine aloes, an ounce and half; gum guaiacum, an ounce; the aromatic species and balsam of Peru, of each half an ounce; let the aloes and gum guaiacum be powdered separately, and afterwards mixed with the rest, and formed into a mass with syrup of orange-peel. *Pemberton's* Lond. Disp. p. 326.

PILLS *of colocynth with aloes*, *pilulæ e colocynthide cum aloe*, a name given in the New London Pharmacopœia, to the purging-*pill*, commonly known by the name of *pilulæ cocciæ minores*.

As this is originally a prescription of Galen's, and the manner of proportioning the ingredients has been altered for the worse, since his time, by enlarging the quantity of that nauseous ingredient the *colocynth*; the college have reduced it to its former proportions, and ordered it to be made in this manner: Take socotrine aloes and scammony, of each two ounces; pith of coloquintida, one ounce; oil of cloves, two drams; let the dry species be reduced to powder separately, the oil mixed among them, and the whole formed into a mass, with syrup of buckthorn. *Pemberton's* Lond. Disp. p. 327.

PILULÆ *e colocynthide simpliciores*, a name given in the late London Pharmacopœia, to the purging-*pill* commonly known by the name of *pil. ex du bus*. It is made of equal parts of colocynth and scammony, with a considerable proportion of oil of cloves; and is beat up to a consistence with syrup of buckthorn. *Pemberton's* Lond Disp p. 327.

Mercurial PILLS, *pilulæ mercuriales*, a form of medicine prescribed in the late London Pharmacopœia, and containing crude mercury mixed for internal use.

The composition is to be made as follows: Take of pure quicksilver, five drams; of Strasburg turpentine, two drams; of the cathartic extract, four scruples; rhubarb in powder, one dram; grind the quicksilver with the turpentine till it makes one uniform mass, and then add the other ingredients, and beat up the whole into *pills*. If the turpentine be too hard, it must he softened with a little oil of olives. *Pemberton's* Lond. Disp. p. 329.

Soap PILLS, *pilulæ saponaceæ*, a form of medicine prescribed in the late London Dispensatory, and ordered to be made in the following manner: Take almond *soap*, four ounces; strained opium, half an ounce; essence of lemons, a dram; soften the opium a little with wine, and beat that and the *soap* with the essence, till it be reduced to the form of a *pill*.

This is intended to stand in the place of the *pill*, commonly called *Mathew's pill*, and is very happily corrected in regard to the taste of the *soap*, by the addition of the essence of lemons. *Pemberton's* Lond. Disp. p. 231.

Ward's PILL. See WARD'S *pill*.

PILLAR (*Cycl.*)—It seems not impossible for stone to be cast into the shape of *pillars*. We find mention made in the Philosophical Transactions, of two *pillars* of stone, at Fontevraud, in France, each about 60 feet high, all of one solid piece, which are said to have been run. N° 481. p. 328. in Not.

Pillars of stone were antiently erected as sepulchral monuments, near the highways; and also in memory of some victory. We find traces of this custom in Cornwall and Wales, where these *pillars* are often found, and called *meinigwir*, a stone for play, perhaps in memory of funeral games; and sometimes *llech*, that is, *tabula saxea*. Phil. Transf. N° 458. p. 471.

PILLVENKEGEN, in zoology, the name of a bird approaching to the snipe kind, described by Aldrovand, and supposed by some to be the bird we call the *knot*. See KNOT.

PILLOW *of a plough*, a term used by the farmers to express that part of a *plough* which serves to raise or sink the beam, and with it the share, as the land is to be *ploughed* shallower or deeper.

This *pillow* is a cross piece of wood, reaching from one of the crowstaves or uprights, to the other; and as they are bored with two rows of holes, this *pillow* can be sliped up or down to any height, and kept there by pegs or cords in the holes. *Tull's* Husbandry. See PLOUGH.

PILLOW, in a ship, is that piece of timber whereon the bowsprit rests at its coming out of the hull aloft, close by the stern.

PILOSE *leaf*, among botanists. See the article LEAF.

PILOSELLA, the common *mouse-ear*, is esteemed a great medicine by many, as abstergent and astringent. It is prescribed in dysenteries, and all other hæmorrhages, and particularly in bleedings at the nose. Some have given it a great character also in the cure of ruptures; and its juice is said to be a very great remedy in the milliary herpes, rubbed on the part.

PILOTING, *in navigation*. See the articles NAVIGATION and PILOT, *Cycl.*

PILULARIA, *pepper-grass*, the name of a very remarkable little plant, of which Mr. Bernard de Jussieu has given a very accurate account in the Memoirs of the Academy of Sciences of Paris.

It is a low and creeping plant, always being procumbent upon the earth; its roots are long, slender, white filaments, which pierce perpendicularly down, and have at their extremities a few short fibres. Every one of these roots is fixed to the base of one of the leaves that stand on the branches. The branches are divided and spread about, and are all so regular in size, and so oddly interwoven among one another, that it is not easy to say which of them is the main stalk, which the ramifications; but the several radicles which usually go down very deep, keep the whole lengths of the branches close down to the ground. The branches are round, green, and knotty; and their ramifications are placed alternately, and are terminated by a protuberance or soft button, or a small leaf rolled up in a spiral form.

The leaves stand also alternately on the branches, and are strait, narrow, and somewhat cylindric in shape, and pointed at the end; they resemble, in some sort, the young shoots of rushes, and are seldom more than four inches long; nor are the stalks usually more than six.

The flowers of this plant stand in the alæ of the branches, and four flowers, each enveloped by its own peculiar membrane, which is very fine and delicate, are always contained in one common covering; which resembles a sphere set all over with prickles or hairs. This globule increases at length to the size of a pepper-corn; and when mature, it opens into four quarters, each of which has its peculiar pedicle, by which it adheres to the branch.

The membrane which envelopes each particular flower, or as it may be called, each quarter of the globule, is very fine and delicate; and each has three faces; one convex, and the other two in form of semi-circles. The inferior angles of these three faces terminate in one common point; and the semi-circular faces open a little at the opposite end, to disclose the flower. See Tab. of Mosses, N° 21.

Every quarter of the globule is hollow, and has the shape of a quarter of a regular hollow sphere, and contains its perfect flower, which is of the hermaphrodite kind, containing stamina and pistils, arranged on, and fixed to a common placenta. This placenta is a membranaceous band, fastened to the inner spherical part of the membrane, which incloses the flower; it occupies only about half the cavity, and is so formed as to represent, in some measure, two thirds of a crescent; from which one of the points had been cut off. This placenta is, in a manner, surrounded with pistils, having four series of them on each side; some of which stand opposite to others, and some are erect, while others lie horizontally. The pistils fill up two thirds of the cavity of the flower, and the rest is occupied by the stamina; which are so many little horns all growing from a little head, which stands in the angle made by the sides of the placenta. The stamina diverging from this point, form a sort of pyramidal cluster. The number of the pistil is various in different flowers; some having twelve, others twenty; they are each of them of an oval figure, and are enveloped each in a fine thin membrane, which is folded and wrinkled. They have no style, but have only a downy prominence on their upper extremity, which may be properly called the stigma.

These pistils are so many embryo seeds; the stamina are usually more than thirty in number, and are so small as not to be easily discoverable to the naked eye; and 'tis from this minute-

minutenefs of the feveral parts of the flower of this plant, that it has been generally fuppofed, by botanifts, to have no flower at all; the globule at the root of the leaves having been ufually efteemed merely a capfule for the feeds.

The pedicles, on which thefe globules ftand, are not more than a twelfth of an inch long; and it has ufually, at its bafe, two or three fmall leaves of the fame fhape with the other leaves of the plant. The globules ufually ftand fingly at the bottom of each leaf. The ftamina of the flowers, examined by the microfcope, appear compofed of a fine tender membrane, inclofing a number of fmall round bodies; and the whole affuming a conic form: thefe put into a drop of water before the microfcope, received the humidity into them, and fwelled into the figure of an oblong pearl, and foon after burfting open tranfverfely, they difcharged their grains of fine powder with an elaftic force: thefe grains, which are the globules of the farina, are regularly round and rough on the furface; they fwell on lying in the water, but never burft. The piftils, on being put into water, loofe their folded and wrinkled figure, and fwell into a fort of bladder: thefe piftils finally become each a perfect feed, which is rounded at the bottom, and terminates in a point at the top, and of a fomewhat yellowifh white colour.

The feeds of the *pilularia* fend up fingle leaves of the fhape of thofe which afterwards appear on the whole plant; and the herb is therefore of the order of the *monocotyledones*; and, according to the opinion of Mr. Juffieu, approaches more to the nature of the *ferns* than to any other clafs of plants, tho' fo widely different from them in the manner of growth: he is for allotting it a place, however, next the *ferns*, and that for the following reafons:

1. Becaufe the *pilularia* imitates the difpofition and arrangement of the branches of many of the *ferns*, tho' in fo extremely different a form, creeping over the ground with its horizontal roots, in the manner of the common female *fern*, and like it, having its leaves and branches placed in an alternate manner.

2. Becaufe the young leaves of the *pilularia* are enveloped like thofe of the *ferns*, with a fort of down, and are rolled up in the fame manner, in a fpiral form; from which they gradually expand.

3. Becaufe the tafte is the fame with that of the *ferns*, vifcous, with a gentle aftriction.

4. Becaufe the fmell of the leaves, when bruifed, is wholly the fame with that of *fern*; and, finally, becaufe the fummits of the ftamina, when nicely examined, appear to have a great analogy with fome parts of the fructifications of the *ferns*. Memoirs Acad. Scien. 1739.

PIMIENTA, in botany, the Jamaica *pepper-tree*; the characters of which are thefe: Its trunk is as thick as one's thigh, rifing ftreight about 30 feet high, covered with an extremely polifhed or fmooth fkin, of a grey colour, and branched out on every hand; having the ends of its twigs fet with leaves of feveral fizes; the largeft being four or five inches long, two or three broad in the middle, where broadeft; whence it decreafes to both extremes, ending in a point, fmooth, thin, fhining, without any incifures, of a deep green colour, and ftanding on inch-long foot ftalks; when bruifed very odoriferous, and in all things like the leaves of a bay-tree. The ends of the twigs are branched into bunches of flowers, each footftalk fuftaining a flower made up of four herbaceous pale-green petala, bowed back, or reflected downwards; within which are many ftamina of the fame colour. Thefe are followed by a bunch of crowned or umbilicated berries, (the crown being made up of four fmall foliola or leaves) which are bigger, when ripe, than juniper-berries, at firft when fmall, greenifh; but when ripe they are black, fmooth, and fhining, containing in a moift, green, aromatic, and biting pulp, two large *acini*, or feeds, feparated by a membrane lying between them, each whereof is a hemifphere, and both joined make a globe or fpherical *acinus*; whence Clufius makes it one feed, divifible into two parts.

It grows on the hilly parts of Jamaica, and is much cultivated there; becaufe of the great profit from the cured fruit fent in great quantities yearly into Europe.

It flowers in June, July, and Auguft, fooner or later, according to its fituation and the different feafons for rain; and after it flowers, the fruit foon ripens.

There is little difficulty in curing and preferving this fruit for ufe, which is done thus: the Negroes climb the trees and pull off the twigs with the unripe green fruit, and afterwards carefully feparate the fruit from the twigs, leaves, and ripe berries; which done, they expofe them to the fun from its rifing to fetting, for many days, fpreading them thin on cloaths, turning them now and then, and carefully avoiding the dews. By this management they become a little rugous or wrinkled, dry, and from a green change to a brown colour, and then they are fit for the market.

The ripe berries are very carefully feparated from thofe to be cured; becaufe their wet and plenteous pulp renders them unfit for cure.

It is accounted the beft and moft temperate, mild and innocent, of common fpices, and fit to come into greater ufe, and to gain more ground than it hath yet done. It furpaffes moft of the Eaft Indian aromatics in promoting the digeftion of meat, attenuating, tough humors, moderately heating, ftrengthening the ftomach, expelling wind, and doing thofe friendly offices to the bowels we generally expect from fpices. Clufius takes it to be the *garyophyllon* of Pliny; and by others it is fuppofed to be the *amomum* of the antients; but 'tis not likely that it was known to the antients, not being known to grow in the Eaft, but Weft Indies; whence it was brought to England, and fent to Clufius, who firft defcribed and figured it, giving it the name of *amomum quorundam*, or *caryophyllon Plinii*. Phil. Tranf N° 192. See the article PIPER.

PIMP-*tenure*, a kind of *tenure* mentioned in our old writers.— Willielmus Hoppefhort, *Tenet dimidiam Virgatam terræ, per fervitium cuftodiendi fex Damifellos fcil. Meretrices, ad ufum Domini Regis.* 12 Ed. I. *Blount's* Ten. 39.

PIMPERNELL, *pimpinella*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one petal, which is of a rotated form, and is deeply divided into four fegments, and contains a vaft number of ftamina, or a fimbriated ftyle. The cup finally becomes a fruit ufually of a quadrangular figure, and pointed at each end: this is fometimes divided into two cells, fometimes it confifts only of one; and it contains numerous feeds, ufually of a longifh figure.

The fpecies of *pimpinella*, enumerated by Mr. Tournefort, are thefe: 1. The common greater *pimpinella*, called *Burnet faxifrage*; and by moft authors *pimpinella fanguiforba major*. 2. The great rigid very tall *pimpinella*, with auriculated leaves. 3. The great Spanifh *pimpinella*, with a pale-red fpike. 4. The great Spanifh *pimpinella*, with cluftered flowers. 5. The American *pimpinella*, with long red fpikes. 6. The greateft American *pimpinella*, with white fpiked flowers. 7. The fweet agrimony-leaved *pimpinella*. 8. The fmaller hairy *pimpinella*. 9. The fmall fmooth *pimpinella*. 10. The fmall fcentlefs *pimpinella*. 11. The fmaller *pimpinella*, with large thick feeds. And 12. The prickly ever green *pimpinella*, called by fome authors *poterium*, and by others *colchicum*. *Tourn.* Inft. p. 157.

The feeds of this plant are warm, carminative, and difcutient: they are given with fuccefs in colics and flatulencies, and in fuppreffions of urine. The leaves and roots alfo poffefs the fame virtues; and when the diuretic property only is expected from it, the root alone frefh taken up, cut fmall, and boiled in water, is the beft. The decoction is to be drank in large draughts, and often repeated.

Red PIMPERNELL, *anagallis*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf, and is rotated and divided into feveral fegments. The piftil arifes from the cup, and is fixed in the manner of a nail, to the lower part of the flower: this afterwards becomes a fhelly fruit, of nearly a globular figure; which, when ripe, divides tranfverfely into two parts, and difcovers a number of angular feeds affixed to a placenta.

The fpecies of *anagallis*, enumerated by authors, are thefe: 1. The common red flowered *anagallis*. 2. The larger leaved red-flowered *anagallis*, with leaves growing four at a joint. 3. The common blue-flowered *anagallis*. 4. The blue-flowered *anagallis*, with two or three leaves at every joint. 5. The ferrugineous flowered *anagallis*. 6. The dufky purple-flowered *anagallis*. 7. The pale red-flowered *anagallis*. 8. The white-flowered *anagallis*. 9. The broad-leaved Spanifh *anagallis*, with large blue flowers. 10. The round-leaved Portugal *anagallis*. 11. The broad-leaved Portugal *anagallis*, with a fmall flower. 12. The great toad-flax-leaved *anagallis* of Portugal. 13. The narrower-leaved *anagallis* of Portugal. 14. The fmalleft *anagallis*. 15. The fmall French, fea, round-leaved *anagallis*.

Authors name, befide thefe, feveral other plants *anagallis aquatica*, the *brooklime*, &c. but thefe are properly either of the genus of the *veronica*, or that of the *famolus*. *Tourn.* Inft. p. 142. See the article SAMOLUS, &c.

PIMPILIM, in botany, a name by which fome authors have called the plant which produces the long pepper, ufed in medicine. *Pifo*, Mant. 182.

PIMPINELLA. See PIMPERNELL, fupra.

PIMPLE, in medicine, a fmall puftule arifing on the face.

By mixing equal quantities of the juice of houfe-leek, *fedum minus*, paffed through paper, and of fpirit of wine rectified by itfelf, a white coagulum of a very volatile nature is formed, which Dr. Burghart commends for curing *pimples* of the face; and fays, that the thin liquor feparated from it, with fugar-candy, is an excellent remedy for thick vifcid phlegm in the breaft. Satyr. Silefiac. Spec. 4. Ob. 2.

PINACOTHECA, among the antients, a place where pictures, ftatues, and other curiofities were kept *Pitifc* in voc.

PINACIA, πινακια among the Athenians, tablets of brafs, whereon the names of all the perfons in each tribe duly qualified, and willing to be judges or fenators of the Areopagus, being feverally written, they were caft into a veffel provided on purpofe; and into another veffel were caft the fame number of beans, an hundred of which were white, and all the reft black. Then the names of the candidates and the beans were drawn, one by one; and thofe whofe names were drawn out together with the white beans, were received into the fenate. See the article PROBULEUMA.

In

In Solon's time there were only four tribes, each of which elected an hundred senators; so that the Areopagus consisted of four hundred members: but the number of tribes being afterwards encreased, the number of senators was consequently augmented by some hundreds; b t the manner of election remained the same. *Pott.* Archæol. Græc. T. 1. p. 97. See the article AREOPAGUS, *Cycl.*

PINARII, among the Romans, an order of under-priests belonging to Hercules, who offered sacrifices to that god morning and evening. They were only servants to the *potitii* *Danet.* in voc. See the article POTITII.

PINCHING *(Cycl.)*—PINCHING, in horsemanship, a term used to express a method of trying a horse's mettle, or vigour, and of shewing it to a purchaser when the creature is on sale. The whole method is, when the rider is on his back, he keeps him standing still, and keeping him fast with the bridle-hand, he applies the spurs to the hair of the sides. If the horse is impatient under this, and draws himself up, and wants to go forward, it is a sign of vigour and mettle. But the purchaser ought to try the thing himself on the horse's back; for the jockies have the art of making the dullest horse seem to have mettle in these trials. The purchaser must also distinguish between the restlesness of the horse under this treatment that arises from vigour, and that which arises from the horse's being ticklish, and which goes off immediately. See the article METTLE.

PINDAIBA, in botany, the name used by some authors for the tree which produces the cubebs of the shops. *Piso*, p. 144.

PINE-*tree*, *pinus*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the amentaceous kind, being composed of a great number of stamina, but it is barren: the embryo fruit appear in other parts of the tree, and finally become a sort of cone; between the several scales of which, eachhaving two hollows, there are found two seeds contained in a stony husk, which is frequently alated. To this it is to be added, that the leaves grow more than one out of the same theca.

The species of *pine*, enumerated by Mr. Tournefort, are these: 1. The common manured *pine*. 2. The common wild mountain *pine*. 3. The tender fruited wild *pine*, called *cambro*. 4. The mountain *pine*, called by authors *mugho*. 5. The wild sea-*pine*, with the cones growing firmly to the branches. 6. The Idæan sea-*pine*. 7. The small sea-*pinaster*. 8. The dwarf *pine*, with pale or greenish juli. 9. The dwarf *pine*, with purple juli. And, 10. The *pine* with erect cones, called by some the Austrian *pinaster*. *Tourn.* Inst. p. 585.

The leaves and tender tops of *pine* and fir are used for diet-drinks, and allowed to be antiscorbutic and diuretic.

The resinous exsudations of *pines* and firs are an important branch in the materia medica, and not only useful in the prescriptions of physicians, but have also been thought otherwise conducive to health. Pliny tells us, that wines, in the time of the old Romans, were medicated with pitch and resin. And Jonstonus, in his dendrographia, observes, that it is wholesome to walk in groves of *pine*-trees, which impregnate the air with balsamic particles. It is known that all turpentines and resins are good for the lungs, against gravel also, and obstructions: and it is said, that the medicinal properties of those drugs are found in tar-water, which operate without heating the blood or disordering the stomach. See the article TAR-*water*.

Pitch, tar, rosin, and turpentine, are all made from these trees by a very familiar process. In the spring time, when the sap is most free in running, they pare off the bark of the *pine*-tree, to make the sap run down into a hole which they cut at the bottom to receive it; in the way, as it runs down, it leaves a white matter like cream, but a little thicker: this is very different from all the kinds of resin and turpentine in use, and it is generally sold to be used in the making of flambeaux, instead of white bees-wax. The matter that is received in the hole at the bottom, is taken up with ladles, and put into a large basket; a great part of this immediately runs thro', and this is the common turpentine. This is received into stone or earthen pots, and is ready for sale. The thicker matter, which remains in the basket, they put into a common alembic, and adding a large quantity of water, they distil this so long as any oil is seen swimming upon the water; this oil they separate from the surface in large quantities, and this is the common oil or spirit of turpentine: the remaining matter at the bottom of the still, is common yellow resin. When they have thus obtained all that they can from the sap of the tree, they cut it down, and hewing the wood into billets, they fill a pit dug in the earth with these billets; and setting them on fire, there runs from them while they are burning, a black thick matter: this naturally falls to the bottom of the pit, and this is the tar. The top of the pit is covered with tiles, to keep in the heat; and there is at the bottom a little hole, out at which the tar runs like oil: if this hole be made too large, it sets the whole quantity of the tar on fire; but if small enough, it runs quietly out.

The tar being thus made, is put up in barrels; and if it be to be made into pitch, they put it into large boiling vessels, without adding any thing to it: it is then suffered to boil a while, and being then let out, is found, when cold, to be what we call pitch. Phil. Trans. N°. 243. p. 291.

Silver PINE, in botany. A branch of this tree being brought from the Cape of Good Hope, by Mr. Goddard, and presented to the royal society, Dr. Sloane gave the following account of it: The twig of this tree had a great many leaves set round it, very close to one another, so as to hide the twig itself there where they grow; each of the largest being about four inches long, and three quarters of an inch broad in the middle where broadest, from whence they decrease towards both extremes, ending in a point; being like those of the osier willow, only broader, and all covered over with the thickest, finest, and longest, white silken hair, or down, that ever any plant the doctor remembers to have seen. The cones are of the bigness of those of the cedars of Lebanon, and of the same shape; The cuticula, or small skin of each scale, being covered over with a white short down or wool, shining also like silk. Between the scales is lodged the seed, whi h is almost as large as the *pine* nut, near the same shape, of a dark brown colour, and having a rising eminent line or belly running through the middle of it from end to end. This seed lies in a thin, reddish brown membrane, which has on its top four feathers, like those belonging to the seed of the clematitis; which being between the scales, and rising above them, adds a very great beauty to the cone, and may likewise serve for wings, by means of the wind, to loosen or carry the seed to distant places, thereby propagating itself. Dr. Plucknet calls it *leucodendr os.* Phil. Trans. N°. 198.

Spunge-leaved PINE, in botany. A branch of this tree being brought from the Cape of Good Hope by Mr. Goddard, and presented to the royal society, Dr. Sloane gave the following description of it: The bark was of a brown colour and smooth; its wood whitish and hard, with only a small pith; the leaves were round it, without any order, very thick set, having no foot-stalks; being about two inches and an half long, and about one third of an inch broad near the farther end, where broadest; smooth, hard, and of a brownish or dirty green colour: on the top of the branch comes the fruit, which is surrounded by three or four twigs overtopping it, and with their leaves almost hid in it: it is about five inches long, and is made up of many scales, hard and red, inclosi g one another; the lowermost and outwardmost being very short, the innermost four inches long, each of t em ending in a point; some scales, having on their outsides a gummy piece: In the middle of these scales were the first rudiments of many seeds, the same not being fully ripe; each of which is set about with a great quantity of yellow, fine, silken down, about three quarters of an inch long, having a stylus, or string, two inches long, and yellowish membranes inclosing the stylus and tomentum; being feathered at top for their better dispersion, in order to propagate themselves. Philos. Trans. N°. 198.

PINE-*apple*, a delicious fruit, called by authors *ananas*. See the article ANANAS.

There are several varieties of it, but the principal are five: 1. The oval *pine*-apple, with white flesh. 2. The pyramidal kind, with yellow flesh. 3. The smooth-leave l kind. 4. The shining-leaved kind, with scarce any spines on its edges. And, 5. The pyramidal olive coloured kind, with yellow flesh. There are a multitude of other varieties of less note, and probably there might, by proper management in the sowing, be raised as many kinds as we have of apples and pears in our orchards.

The plant grows wild in vast abundance in many parts of Africa, and has been long cultivated in the hotter islands of the West Indies, where they are now very plentiful and very fine. It is now some time also since it has been introduced into the gardens of Europe, where, with proper management, it succeeds very well. There is an opinion, that there are none raised so good from the American plants, as from those originally propagated by M. la Cour of Leyden, the first who ever succeeded in the bringing it to fruit in Europe; but this is an error, occasioned by some of the indifferent kinds having been at first frequently sent over from America; but of late we have had much finer from thence than ever M. la Cour knew.

The first sort is the most common in Europe, but the second is greatly preferable to it; being much larger and better flavoured, and the juice being less astringent, the fruit may be eaten with less danger in large quantities. This usually produces six or seven suckers also under the fruit, from whence it may be propagated, and therefore is the most fit for culture of any. The third sort is propagated merely as a curiosity, the fruit being much inferior to that of the others. The fifth is the most valuable of all, and is had from Barbadoes and Montserrat. The fourth is what is called in America, the *king-pine*; they are propagated by planting the heads or suckers: these are to be set in pots of five or six inches over at the top, filled with good fresh light earth, mixed with a little rotten dung; this mixture must be often turned, to make it mix the more perfectly, and the plants, when set, must have a little water, to settle the earth to their r ots; and the pot then plunged into a well-tempered bed of tanners bark. See the article HOT-BED.

They muſt have frequent but gentle waterings, and if the heat of the bed decreaſes, new bark muſt be mixed with the old, which will make it ferment again, and renew the heat.

In Auguſt and September, as the nights grow cool, the covering muſt be increaſed over the glaſſes; and towards the latter end of October, the plants muſt be removed out of the bark-bed into the ſtove.

During the winter ſeaſon, great care muſt be taken to regulate the heat in the ſtove, never ſuffering the ſpirit in the thermometer to fall below the degree for *pine* apples in the botanical ones, nor ever to riſe above five degrees more. They muſt be frequently watered, and the water uſed to them muſt always be firſt kept four and twenty hours in the ſtove.

In the beginning of February the plants will ſhew in their center their bud for the fruit; and in the middle of February the hot-bed of tanners bark muſt be prepared, that the heat of it may be in ſome meaſure over before the plants are ſet into it, which muſt be about the middle of March. The pots muſt be at firſt but half way buried in the bark; about a month after this they ſhould be raiſed up, and the bed ſtirred about with a fork; and after this, the pots are to be plunged into it, up to their rims. They are now to have frequent waterings during the ſummer ſeaſon; they are to be frequently watered, and ſhaded from the violence of the ſun, in very hot days, and the glaſſes are now and then to be raiſed a little, to give them air; the bark muſt be ſtirred from the bottom, and, if neceſſary, a little freſh bark added to it to encreaſe the heat; and this may be repeated two or three times in a ſummer. The time of the ripening of the fruit in greateſt perfection, is from the beginning of July to the end of September: they are known to be ripe by their ſtrong and agreeable ſmell, and by gently preſſing the protuberances with a thumb and finger; which, if they feel ſoft and give way, afford certain ſigns that the fruit is ripe. When ripe, it ought to be gathered; for, in a day or two, it loſes its high flavour: and when gathered, they ought to be eaten at the utmoſt within twenty-four hours. It is always beſt to keep the crown on till the time of eating the fruit.

Many make their hot-beds for the cultivating this fruit in frames of about three feet deep; but it is a much better way to erect a ſtove on purpoſe, with bark pits in it for the hot-bed. Theſe ſtoves need not be higher than to admit a perſon to walk upright on the back ſide, and may be brought ſloping down at the front till the glaſs touches the bed. *Miller's* Gard. Dict. See the article STOVE.

PINE-*apple*, in metallurgy, a word uſed to expreſs a ſort of mould, uſed in the refining ſilver. It has this name from its ſhape, reſembling the fruit of that name.

When the refiners have taken the mixture of the ſilver and mercury together out of the cauldron, and ſtrain it through two coarſe wetted cloths, to make it the thicker, they then beat it with a ſort of battledoors, to drive out yet more of the quickſilver; and ſtraining it again after this, they take out the remaining thick amalgame, and forming it into little pellets, they put theſe carefully into the moulds called *pine-apples*, preſſing them down. The amalgame, when put into this veſſel or mould, is uſually ſo rich as to be about one fifth ſilver.

The manner of diveſting this of the quickſilver afterwards, is by means of fire; in which the quickſilver riſes in vapour, and the ſilver is left pure behind: but the careleſsneſs of the workmen in doing this, and particularly the uſing bad veſſels, or the not luting them cloſe, cauſes a waſte of this mineral greater than could be conceived. Alonſo tells us, that in the city of Potoſi alone, at the time of his writing, when the trading in metals ran but low, above thirty thouſand pieces of eight were waſted in quickſilver that was loſt one year with another. To prevent this, they then principally ſtudied the means of keeping the ſilver as dry of quickſilver as they could, in the *pine-apple*; but it then holding four fifths of the whole maſs in quickſilver, the great waſte was in the ſeparating it afterwards. *Alonſo Barba* de Metal.

PINE-*ſalt*, a name given to a preparation of the bark of the *pine*-tree, uſed as a ſort of ſeaſoning to food in the manner in which we uſe ſalt.

The Laplanders are very fond of this, and the manner of their preparing it is given in Scheffer's hiſtory of that country: they peel off the bark from the lower part of the bodies of thoſe trees, and ſeparating the outer rough part, they take the inner bark, which they carefully divide into its ſeveral thin coats: when they have thus reduced them to as thin pieces as they can, they expoſe them to the ſun in their ſummer months to dry, and when thoroughly dried, they tear them into thin and narrow ſlips, and put them up in boxes made of the outer bark of other trees freſh taken off. They bury theſe boxes in deep holes dug in the ſands, and let them remain thus one day; on the day following they bring together a number of ſtumps of trees, and other wood, and laying them over the place where the bark is buried, they ſet them on fire: the next day they take out their buried boxes, and the heat having penetrated ſo deep into the earth in a mild degree, the bark is found to have been greatly affected by it, and to have received a red colour, and a very agreeable flavour, ſomewhat ſweetiſh. This is their general ſauce; they eat it with all their food, as we do ſalt, but it has ſo little of the nature of ſalt, that the name is but ill adapted to it.

There is another vegetable ſubſtance, which, tho' of a diſagreeable taſte to us, yet cuſtom teaches them to be fond of. This is the angelica petroſa: they cut the large ſtalks of this plant before it runs to ſeed, and roaſt them; they eat this in conſiderable quantities with their *pine-ſalt*, and eſteem it not only an agreeable, but a more than ordinarily wholeſome ſort of food.

PINGUICULA, *butterwort*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of a ſort of bilabiated form, in ſome degree reſembling the violet flower, and ending in a ſort of heel: the piſtil ariſes from the cup, and is fixed in the manner of a nail to the hinder part of the flower; and finally becomes a fruit or capſule, containing a great number of ſmall ſeeds affixed to a placenta.

The ſpecies of *butterwort*, enumerated by Mr. Tournefort, are theſe: 1. The common *butterwort*, called alſo *mountain ſanicle*, and *Yorkſhire ſanicle*. 2. The white flowered *butterwort*, with a very ſmall flower and ſhort heel. 3. The purple *butterwort*, with a very large flower and a very long heel. 4. The ſmaller *butterwort*, with a fleſh-coloured flower. *Tourn.* Inſt. p. 167.

The characters of this genus, according to Linnæus, are, that the cup is a ſmall acute labiated perianthium, which remains when the flower is fallen; its upper lip being erect and trifid, its lower reflex and bifid: the flower is labiated, and made up of a ſingle petal: the longer lip is ſtrait, obtuſe, trifid, and laid flat; the ſhorter is bifid, more obtuſe, and ſpread more open: its nectarium is in the figure of a horn, and is produced from the bottom of the petal: the ſtamina are two cylindric filaments, crooked, and inclined upwards, and ſhorter than the cup: the antheræ are roundiſh: the piſtil has a roundiſh germen, a very ſhort ſtyle, and a ſtigma compoſed of two lips; the upper of which is large, plain, bent backward, and covers the antheræ; the lower is very narrow and ſhort, and is placed erect, and is bifid: the fruit is an oval-ſhaped capſule, compreſſed at the top, and naturally opening there, and containing only one cell, full of very numerous and cylindric ſeeds placed looſe in it. *Linnæi* Genera Plant. p. 5.

PINHONES, the name by which the Portugueſe call the purging nuts, as they are called, of America; the fruit of a great ricinus, or palma-chriſti. *Piſo*, 169.

PINIROLO, in zoology, the name of a bird of the tringa kind, ſomewhat approaching to the land-piper, but larger. Its beak is a little more than a finger's breadth long, and black: it is of a mixed cheſnut colour, and brown on the back; and its belly and breaſt are perfectly white: it is common in the Italian markets, and very much reſembles the common tringa: *Ray's* Ornithol. p. 223.

PINK, *caryophyllus*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is compoſed of ſeveral petals, diſpoſed in a circular form, and produced out of a tubular cup, of a cylindric ſhape and membranaceous ſubſtance, and ſcaly at the bottom. The piſtil ariſes alſo from the ſame cup, and finally becomes a cylindric fruit; which, when ripe, opens at the ſummit, and is ſurrounded by the cup, and filled with flat, and, as it were, foliaceous ſeeds, which adhere to a placenta See Tab. 1. of Botany, Claſs 1.

The ſpecies of *caryophyllus*, enumerated by Mr. Tournefort, are theſe: 1. The common great red *pink*. 2. The broader-leaved great *pink* 3. The great *pink*, with variegated flowers. 4. The great *caryophyllus*, with very double flowers, of a variegated red and white 5 The great very double *caryophyllus*, with ſcarlet, red, and white flowers. 6. The great very double, deep red *caryophyllus*, with three white pointals in the middle. 7. The great round-flowered *caryophyllus*, with ſcarlet and white flowers. 8. The great *caryophyllus*, with blackiſh, purple, and ſnow-white flowers. 9. The great double *caryophyllus*, with violet and white flowers. 10. The great double *caryophyllus*, with vermillion and white flowers. 11. The common, tall, variegated, double *caryophyllus*. 12. The great white *caryophyllus*. 13. The red and blood-coloured *caryophyllus*. 14. The white *caryophyllus*, with dots and lines of red. 15. The double *caryophyllus*, with purpliſh red flowers. 16. The fleſh-coloured and white double *caryophyllus*, with ſpots and lines of red. 17. The double *caryophyllus*, with every leaf of the flower half white and half red, and variegated with red ſpots. 18. The crimſon and ſnow-white *caryophyllus*. 19. The great double whitiſh *caryophyllus*, with deep purple ſpots. 20. The great bright white and ſcarlet *caryophyllus*. 21. The great round-flowered double *caryophyllus*, of a deep red and white 22. The great double fleſh-coloured and white *caryophyllus*. 23. The great double white-flowered *caryophyllus*, with a mixture of bright red. 24. The great double *caryophyllus*, with duſky white flowers, and ſpots of a ferrugineous colour. 25. The great broad-leaved *caryophyllus*, of the colour of the peach-bloſſom. 26. The great double purple *caryophyllus*, with ſpotted leaves. 27. The great purple *caryophyllus*, with ſpots of a deeper purple. 28. The greeniſh-flowered *caryophyllus* 29. The leſſer white *caryophyllus*, with lines of ſcarlet or violet colour. 30. The red-lead-coloured *caryophyllus*, with flowers white in the center. 31. The double violet-coloured *caryophyllus*. 32. The double orange-coloured

coloured *caryophyllus*. 33. The dappled *caryophyllus*, of a white and orange colour 34. The middle-ſized *caryophyllus* altilis, with pale violet-coloured flowers. 35. The ſmall *caryophyllus* altilis, with pale yellowiſh flowers. 36. The little variegated *caryophyllus* altilis. 37. The common ſingle garden-*caryophyllus*, with large flowers. 38. The common garden ſingle *caryophyllus*, with fleſh-coloured flowers. 39. The ſingle garden-*caryophyllus*, with variegated flowers. 40. The great wild *caryophyllus*, with variegated flowers. 41. The common double ſmall garden-*caryophyllus*. 42. The procumbent garden-*caryophyllus*, with double-red flowers, ſpotted with white. 43. The double-jagged garden-*pink*. 44. The double-jagged garden-*pink*, with fleſh-coloured flowers. 45. The garden-*caryophyllus*, with very finely divided flowers. 46. The fleſh-coloured finely divided garden-*caryophyllus*. 47. The white finely divided garden-*caryophyllus*. 48. The white ſcentleſs jagged-flowered wild *caryophyllus*. 49. The ſweet-ſcented jagged-flowered wild *caryophyllus*. 50. The white-flowered ſweet-ſcented jagged-flowered wild *caryophyllus*. 51. The jagged-flowered wild *caryophyllus*, with ſweet-ſcented ſtamina. 52. The jagged-flowered ſweet-ſcented *caryophyllus*, without ſtamina. 53. The cretic ſhrubby *caryophyllus*. 54. The ſingle *caryophyllus*, with ſmall pale-red flowers. 55. The ſmall ſingle *caryophyllus*, with ſpotted flowers. 56. The procumbent broad-leaved ſingle *caryophyllus*. 57. The ſingle procumbent narrow-leaved *caryophyllus*. 58. The double purple *ſweet-william*, or *caryophyllus barbatus*. 59. The double white *ſweet-william*. 60. The roſe coloured *ſweet-william*. 61. The ſingle broad-leaved *ſweet-william*, with fleſh-coloured flowers. 62. The ſingle broad-leaved *ſweet-william*, with purple flowers, and with variegated leaves. 63. The purple broad-leaved ſingle *ſweet william*. 64. The white broad-leaved ſingle *ſweet-william*. 65. The ſingle broad-leaved *ſweet-william*, with variegated flowers. 66. The pale red-flowered narrow-leaved *ſweet-william*. 67. The deep red-flowered narrow-leaved *ſweet-william*. 68. The narrow-leaved *ſweet-william*, with milk white flowers, with red ſpots. 69. The narrow-leaved *ſweet-william*, with white flowers with red edges. 70. The narrow-leaved *ſweet-william*, with plain ſnow-white flowers. 71. The narrow-leaved *ſweet-william*, with a few pale-red flowers. 72. The narrow-leaved *ſweet-william*, with purple flowers and white edges. 73. The narrow-leaved *ſweet-william*, with ſnow-white and purple flowers. 74. The wild *ſweet-william*, or common wild *pink*. 75. The wild proliferous, or childing *pink*. 76. The white flowered proliferous wild *pink*. 77. The ſingle-flowered proliferous wild *pink*. 78. The common wild broad-leaved *pink*. 79. The many-flowered mountain-*pink*. 80. The Italian umbellated *pink*, with yellow and ferrugineous flowers. 81. The common narrow-leaved wild *pink*. 82. The wild *pink*, with large ſcentleſs hairy flowers. 83. The little creeping *pink*, with one flower on every ſtalk, called by many the *maiden-pink*. 84. The red wild *pink* of Carynthia. 85. The purpliſh blue woolly or hairy-flowered wild *pink*. 86. The wild *pink* with hairy white flowers. 87. The common little wall-*pink*. 88. The common wild *pink* of the warm climates. 89. The alpine *pink*, with roſe-coloured flower and greeniſh umbilicus. *Tourn.* Inſt. p. 330, ſeq.

PINNA (*Cycl.*)—PINNA, a *fin*, in natural hiſtory, the name of that part of a fiſh which diſtinguiſhes it from other aquatic creatures, no animal but a fiſh having *fins* and wanting legs.

The *fin* is properly a part ſtanding out, or hanging from, the body of the fiſh, and conſiſting of a membrane ſupported by ſeveral rays or oblong bones; which are in ſome hard and firm, and in others cartilaginous.

This definition of a *fin* properly excludes all thoſe other parts of a fiſh which may be prominent from the body, and may be of a membranaceous ſtructure, and even carry the appearance of a *fin*, tho' they have none of the rays or little bony ſubſtances within them, and therefore cannot ſerve the creature in the office of *fins* in ſwimming; for the cartilages or bones, which ſupport the membranes of the *fins*, are what give them their due and neceſſary ſtrength and firmneſs to bear againſt the water for the motion of the body of the fiſh: thoſe other membranaceous appendages to the bodies of fiſhes cannot do this; for wanting the ſupport of theſe rays, the ſimple and ſoft membrane has no more power of moving the water, than the water has of moving it. Hence appears the uſe of the bones or rays, ſupporting the *fins*, and the truth of the definition, that nothing is properly a *fin* which wants them.

The *fins*, by their differences, make very obvious diſtinctions among the ſeveral ſpecies of fiſhes; and theſe differences are, in regard to number, ſituation, figure, and proportion.

The number of the *fins*, including the tail, is very different, in different fiſh. 1. In ſome there is only one *fin* to the whole fiſh. This is the caſe in the ophidium lumbriciforme, and in the muræna. 2. The *fins* are two in number in others, as in the petromyzæ and the like. 3. There are many which have three *fins*; as the conger, the eel, the common ophidium, the greenland whale, the ſea-cow, and the like. 4. Many have four *fins*, of the number of which are the dolphin, the phocæna, and the ſecond kind of the acus Ariſtotelis. 5. Several have five *fins*; as the ammodytes or ſand-eel, the ſword fiſh, the lupus marinus, the mola or ſun-fiſh, and many others. 6. The lump-fiſh gives us an inſtance of ſix *fins*; for the ſeeming firſt *fin*, on the back of that fiſh, is not a real *fin*, but only a cutaneous prominence. 7. Many fiſh have ſeven *fins*; as the gudgeon, the pleuronectes, the cyprinus, the clupea, the coregones, the oſmeri, the ſalmons, the cobites, the eſoces; the cernua fluviatilis, the gaſteroſteæ, the ſpari, the labri, the ſilurus, the mugil alatus, the remora, the capriſcus, the hippurus, the pompilus, and the accipenſer. 8. Many fiſh alſo have eight *fins* each; of this number are ſome of the pearches, the clarea, the cottus, the mugil, the labrax, the ſudis, the mulli, the ling, the trachurus, the ſcyæne, the trachinus, the uranoſcope, and that little fiſh called the *anguella* by the Venetians. 9. The ſcorpæna of Rondeletius gives us an inſtance of the *fins* being nine in number; and, finally, the ſcombri and thynni, give us inſtances of eleven *fins* in the ſame fiſh.

The differences in ſituation are leſs numerous than theſe, as to number, but they are not leſs obvious and eſſential. 1. They are generally placed both on the back and belly, as we ſee in moſt of the ſpecies of fiſhes. 2. They are ſometimes placed only on the back. This is the caſe in the petromyzæ, the acus lumbriciformis, and ſome others. 3. Some have them, on the contrary, only on the belly; of this kind are the Greenland whale, the ſea-cow, and the like: and to this it is to be added, that the back and belly *fins* differ greatly in the ſeveral fiſh, in their being placed more or leſs backward or forward.

The differences of ſhape or figure in the *fins* of fiſhes, are alſo very obvious. 1. They are in ſome nearly triangular, as in the cyprini, and ſalmons, &c. 2. Some few fiſh have them round. And 3. Some have them of an oblong ſquare, or parallellogram figure.

Finally, the difference in proportion is not to be omitted; for they are in ſome much ſhorter and ſmaller than the body; as is the caſe in the generality of fiſhes; but in others they are of an equal length with the body. Of this kind are the pectoral *fins* in ſome of the legyræ, and the ventral *fins* in the mugil alatus of Rondeletius, and other authors. *Artedi*, Ichthyol. p. 4.

Aculei PINNARUM, in ichthyology. Every apophyſis or eminence on the head or body of a fiſh, which is ſo ſharp at the end as to be capable of pricking, is called an *aculeus*; but the *aculei pinnarum* in particular, are thoſe prickly *radii* or bones, which ſerve to ſupport the fins; and being carried out beyond the rim of the membrane, end in ſo many points.

Theſe *aculei* are ſimple cylindric officles, whereas the other officles, which ſuſtain the fins, are leſs rigid, and are bent and not prickly: and theſe are not ſimple, but are compoſed each of two officles cloſely cohering one to another. Many of theſe *radii* are divaricated at their extremity into two, three or more branches; theſe when they are carried out beyond the rim of the membrane, are harmleſs, and are ſeen to be compoſed of two officles, as the body of the radius is. The *aculei* of the back and belly of all fiſhes are ſo far of the ſame nature, that they never ſtand ſingle, as ſome have ſuppoſed them to do in particular inſtances; but they are always connected one to the other at the bottom, by a membrane, tho' that be ever ſo ſmall and low, as in ſome it is ſcarce viſible.

PINNARUM *radii*. See the article RADII *pinnarum*.

PINNA *marina*, in natural hiſtory, the name of a ſhell-fiſh, by the lateſt writers on theſe ſubjects referred to the genus of muſcles. See the article MYTULUS.

This ſhell-fiſh is like the muſcle, held in its place by a number of threads, which proceed from its body, and are fixed to any adjoining ſubſtance, and is one of thoſe fiſh, which, like the muſcle, has a power of ſpinning in the manner of the ſpider and caterpillar. See the article MUSCLE.

The threads which theſe fiſh ſpin, are infinitely finer and ſlenderer than thoſe of the muſcle, notwithſtanding that the fiſh is vaſtly larger; its ſhells being often found two foot long. Theſe threads are indeed ſcarce, leſs fine than the ſingle ſilk threads of the ſilkworm, and like it have in all times been worked into uſe. The fineſt kind of the byſſus of the antients was wrought out of theſe threads, and at preſent they are manufactured at Palermo, and at many other places, into gloves, ſtockings, and other ſorts of wearing apparel.

It is eaſy to conceive, that threads ſo fine as theſe can be of no great ſtrength; but what is wanting in the force of each, is made up in the number of them; which are ſpun by every fiſh, for this is almoſt infinite. They differ in nothing from the threads of the muſcles, beſide their fineneſs and their length; which is in theſe much greater, and therefore makes them greatly the more valuable. They are probably formed in the ſame manner with thoſe of the muſcles; and the *pinna* may be called, by way of diſtinction, the ſilkworm of the ſea; and the muſcle, the caterpillar. See Tab. of Shells, N°. 20. Mem. Acad. Par. 1711.

PINNARUM *dilatator proprius*, in anatomy, a name given by Santorini to one of the muſcles of the face, which he has alſo called *myrtiformis naſi*, and which Cowper has called *depreſſor labii*

labii superioris, sive constrictor alæ nasi, and Albinus the *depressor alæ nasi*. See the article DEPRESSOR.

PINNATED *leaf*, among botanists. See the article LEAF.

PINNATIFID *leaf*, among botanists. See the article LEAF.

PINNATUS, in heraldry, a term used by the Latin writers on these subjects, to express that sort of line in arms which is called by our heralds the *embattled line*, or *crenelle*. It is also called by some *linea pinnis asperata*, and by Sylvester Petro Sancto *murales pinnulæ*. When this line is only embattled on one side, it is properly expressed by this word; but when it is embattled on both sides, as in some arms, it is called *bretesse* and *contre bretesse*. See the article EMBATTLED.

PINT (*Cycl.*)—In the English beer measure, the *pint* is the eighth part of a gallon; consequently contains 35¼ cubical inches. Tr. Pract. Geom. p. 117. See the article GALLON.

As to the *pint* used in Scotland, there are different opinions concerning the number of cubical inches it contains. Dr. Gregory makes them 109; others, from several careful mensurations of the standard kept at Edinburgh, make the Scotch *pint* to contain 103$\frac{1}{10}$; and those in common use are said to contain betwixt 105 and 106 cubical inches. Another experiment was made with a cask, which was found to contain 46⅞ Scotch *pints*, and 18$\frac{1}{16}$ English ale gallons. Supposing this mensuration just, the Scotch *pint* will be to the English ale gallon as 289 to 750; and if the English ale gallon be supposed to contain 282 cubical inches, the Scotch *pint* will contain 108.664 such inches. Tr. Pract. Geom. p. 114.

The Paris *pinte* is nearly equal to an English wine quart. Tr. Pract. Geom p. 117.

PINTADO, or AFRA AVIS, in natural history, a name given by the antient Roman authors to the Guinea hen.

Varro, Columella and Pliny, with many others, make the *pintado* and the *meleagris* the same species of bird; but Suetonius, Scaliger, and some others, are of opinion, that the antients meant two very different birds by these names; and the latter of these authors endeavours to bring Varro over to his side, by altering the pointing in the passage of that author which relates to it.

The bird is of late become very common in England, and breeds with us in great plenty. The hen lays her eggs and sits upon them in the same manner with the common hen; but the eggs are smaller and not so white as the hens eggs, but have a tinge of flesh colour and some black spots. They are not so tame and domestic as our own fowls, and particularly they will not lay in houses; but get into the hedges and among bushes, where they lay and hatch; but this is the occasion of great loss among them, the wild vermin destroying a great part of their young brood. The female also is less careful about the great business of hatching and taking care of them, than any other bird we are acquainted with. She will often leave her nest when the eggs are near hatching, and never return to it again; and often will desert the young as soon as hatched, if she remains at her nest till that time. The best method, therefore, is to set other fowls upon the eggs of this kind. The young fowls of this kind are very beautiful; they look like so many partridges. Their beaks and legs are red, and their whole plumage is at that time of the colour of the partridge. See Tab. of Birds, N°. 21.

The hen, if her nest is found, and the eggs at times taken away, but so as always to have one there, will continue to lay till she has deposited an hundred, or sometimes an hundred and fifty eggs, which are very well-tasted. This is a very active and sprightly bird, and of an unquiet and troublesome disposition to the owner. It runs very swiftly in the manner of the quail and partridge; but its wings are short, and it is not made for flying; yet at night it will not roost among other fowl, but gets upon a house or tree, or any other high and safe place. The cry of the bird is sharp and disagreeable to many ears, and it is almost continually making it. It is of a quarrelsome disposition, and will be mistress of the yard: its agility, and the sharpness of its beak, generally obtain it the victory with what ever bird it fights.

The *pintado* is so common in America, that many have supposed it native there; but this is not the case. The origin of the bird is in Guinea, and the first that were ever brought into America, were brought in the year 1508, with the cargoes of negro slaves. The Spaniards neither at that time nor ever since, have attempted to tame them, or render them a domestic useful bird, but let them go loose and wild in the savanhas; where they have increased to such prodigious numbers, that they may well appear native, and are seen in vast flocks together, and are called *marroon pintades*, by the Spaniards and French. Observ. sur les Cout. de l'Asie, p. 190.

PINUS, the *pine-tree*. See the article PINE.

PIONY, *pæonia*, in botany. See the article PÆONIA.

The several sorts of this plant are all very hardy, and will grow in almost any soil and situation; they are propagated by parting the roots, which multiply very fast. They should be planted in August, or the beginning of September, and will then flower the succeeding summer. The off-sets should not be too small, and should all have a fair bud or eye. The single kinds may also be propagated by sowing their seeds in August in a light earth, and managing them in the method of all other seedling plants. There may probably be some good varieties of the flowers produced this way. The single Portugal *piony* is of so sweet a smell as to deserve a place in any garden, tho' but a single flower. *Miller's* Gard. Dict.

Piony-root, is a celebrated medicine in nervous cases. We have instances well attested, of epilepsies cured by it alone. It is good also in all disorders of the head, in hysteric complaints, and obstructions of the viscera.

PIPE (*Cycl.*)—The Turkish *tobacco-pipe* is very long, the tube is made of wood or reed, and the bowl of earthen ware; those they carry with them when they travel, they have made in two or three joints, to put into a bag; they cover the tube sometimes with cloath, and dip it in water to make it smoak cool. *Pocock's* Egypt, p. 186.

PIPE, in mining, is where the ore runs forwards endways in a hole, and doth not sink downwards or in a vein. *Houghton's* Compl. Miner in the Explan. of the Terms.

PIPER, *pepper*. Baldæus tells us, that the *pepper* thrives best in the coolest and most shadowy places, and that the plant has a weak stem like that of the vine, which must be supported by something to climb upon. These commonly grow about six clusters on every branch, each cluster is a foot long, and in colour like unripe grapes. They gather it while green in October and November, and expose it to the sun to dry, by which means it grows black in a few days. *Baldæus* de Ind. Orient. p. 99.

PIPER *chiapæ*, in botany, a name given by some authors to the clove berry-tree, or *cassia caryophyllata*. *Redi*, Lat. p. 132.

PIPER *Jamaicæ*, the *pepper-tree* of Jamaica. See the article PIMIENTA.

PIPER *nigrorum*, *negro pepper*. The plant called at present by this name is the capsicum, or Guinea *pepper*, a remarkable herb, bearing large pods as red as coral, of which the Cayan butter is made in America. But this is not the plant that was antiently known by this name Avisenna and Serapion, both mention a plant which they call *fulful alsuaden*, the English of which is, the *pepper* of the black people. But this was properly what has been since called the *Ethiopian pepper*; a sort of hot seeds approaching to the nature of the common *pepper*, and contained several together in pods. Avisenna tells us, that the plant properly and rightly called *piper nigrorum*, had pods like those of the kidney-bean, which were of a black colour, and that the seed was hot and biting to the taste like *pepper*. There was also another thing called by the same name, that is, the *zelem* of these authors; this was brought from Barbary, and was a fruit of a high flavour, of the bigness of a vetch, and was yellow on the outside and white within. Serapio absolutely distinguishes this by the name of *zelem*, from the other *piper nigrorum*, properly so called; yet Guillandinus has been the occasion of many errors in regard to these fruits, by attributing to the *zelem* the things which that author expresly says of the other *piper nigrogrum*, or *Ethiopian pepper*: it is not easy from the accounts we have left, to say what it is; but they have left description enough of it for us to say what it is not, and to find that they have all been mistaken, who have supposed it to be either the root tarsi, or the bulbus of the Arabians, which last was as large as a pear.

PIPER *tavasci*, in botany, the clove-berry-tree, or *cassia caryophyllata*; a tree whose bark is used in medicine. *Hernand.* p. 30.

PIPERAPIUM, an old name of a plant found in Apuleius, and said to have its name from its heat to the taste; which was so offensive to the bees, that if a piece of it were hung up in their hive it would drive them all out.

This is a very strange account, and as we meet with nothing to countenance it in any other author, there is reason to suspect it to be an error; and there seems this foundation for it. The acorus root is said by Dioscorides to be the root of a plant allied to the papyrus, or paper reed of the river Nile; and is thence called by that author *papyraceus*. Avisenna and Serapion copy this, and liken the acorus plant to the papyrus; but in all the copies of the Greek author, it is often found written πεπεράκιον. This word *peperacion*, may have been formed by Apuleius into *piperapium*, by way of amendment, and all the rest might be occasioned by this.

PIPERITIS, in botany, a name given by some authors to the *momordica*, or male balsam apple. *Tourn.* Mat. Med. p. 357.

PIPERIVORA *avis*, in zoology, a name given by some authors to the *toucan*, or Brasilian magpye, from its feeding on pepper. *Ray's* Ornithol. p. 88. See the article TOUCAN.

PIPRA, in zoology, a name given by Aristotle, and other antient writers, to the *picus varius major*, the great spotted wood-pecker, or witwall. See the article PICUS.

PIQUE, in natural history, a name given by the Spaniards to an insect of the size of a flea, called by the Indians *tung*. It is common in the East and West Indies, and eats its way into the flesh under the nails, &c. See the article TUNG.

PIQUETTE, among the florists, a term used for a certain sort of carnations, which have always a white ground, and are spotted, or as they call it, pounced with scarlet, red, purple, or other colours.

PIQUITINGA, in zoology, the name of a fmall American river-fifh. It feldom exceeds two inches in length: its mouth appears very fmall, but it can at pleafure open it to a great width: its eyes are very large and black, with a filvery iris: it has fix fins befides the tail, which is forked; its head is of a filvery white: its back olive colour, and its belly and fides are covered with filvery fcales; the fins are all white, and the fide-lines are broad, and very bright and fhining. *Marggrave*'s Hift. Brafil.

PIRA-*aca*, in zoology, a name by which Marggrave and fome other authors have called a little horned fifh of the Weft Indies, called by Clufius and others, the *monoceros pifcis*, or unicorn fifh. *Willughby*'s Hift. Pifc. p 150. See the article MONOCEROS.

PIRA-*acangata*, in zoology, the name of a Brafilian fifh, refembling the perch in fize and fhape. It is of a fmall fize, feldom exceeding four or five inches in length: its mouth is fmall: its tail is forked; and it has on the back only one long fin, which is fupported by rigid and prickly fpines. This it can deprefs at pleafure, and fink within a cavity made for it in the back. Its fcales are of a filvery white, but have an admixture of a fine yellow and reddifh glofs, efpecially on the back: the fides are more purely white, and the belly is of a fomewhat bluifh green, mixed with the white: the back fin is very pellucid, and of a filvery white, and is variegated with brown fpots: the fide fins are white, and the belly ones, and the end of the tail, are blue. It is a wholefome and well-tafted fifh. *Marggrave*'s Hift. Brafil. *Willughby*'s Hift. Pifc. p. 338.

PIRA *bebe*, in zoology, a name ufed by fome authors for the *milvus*, or kite-fifh. *Dale*, Pharm. p. 376.

PIRA *coaba*, in zoology, the name of an American fifh of the truttaceous kind, much efteemed for the delicacy of its flavour. It grows to about twelve inches in length: its nofe is pointed, and its mouth large; but without teeth: the upper jaw is longer than the other, and hangs over it in form of a cartilaginous prominence: its eyes are very large, and its tail forked: under each of the gill-fins it has a beard made of fix-white filaments, and is covered all over with filvery fcales. *Marggrave*'s Hift. Brafil.

PIRA-*jurumenbeca*, in zoology, the name of a Brafilian fifh, called by many the *bocca molle*. It lives in the muddy bottom of the American feas, and is a long-bodied not flatted fifh. It grows to a vaft fize, being fometimes caught of nine, and fometimes even of ten or eleven foot long, and two foot and an half thick. It has one long fin on the back, the anterior part of which is thin and pellucid; and has a cavity on the back, into which the creature can deprefs the fin at pleafure: its tail is not forked: its fcales are all of a filvery colour and brightnefs, and moderately large: it has a greenifh caft on the back, mixed with a fhade of yellow; and it has a line running along the middle of each fide, of the fame filvery hue with the reft of the body, but raifed above the common furface of the part. It is a very well-tafted fifh. *Marggrave*'s Hift. Brafil.

PIRA-*pixanga*, in zoology, the name of a Brafilian fifh of the turdus or wraffe kind, and called by fome the *got-vifch*. Its ufual length is four or five inches. its mouth is confiderably large, and furnifhed with very fmall and fharp teeth: its head is fmall, but its eyes large and prominent: the pupil of a fine turgoife colour, and the iris yellow and red in various fhades: the coverings of the gills end in a triangular figure, and are terminated by a fhort fpine or prickle: its fcales are very fmall, and fo evenly arranged and clofely laid on the flefh, that it is very fmooth to the touch: its tail is not forked, but rounded at the end: its whole body, head, tail, and fins, are of a pale yellow, variegated all over with very beautiful blood-coloured fpots; thefe are round, and of the bignefs of hemp-feed on the back and fides, and fomething larger on the belly: the fins are alfo fpotted in the fame manner, and are all marked with an edge of red. It is caught among the rocks, and about the fhores, and is a very well-tafted fifh. *Marggrave*'s Hift. Brafil.

PIRANHA, in zoology, a name given to the American fifh more commonly known by the name *piraya*. *Marggrave*'s Hift. Brafil. See the article PIRAYA.

PIRAQUIBA, or IPIRAQUIBA, in zoology, a name originally Brafilian, by which fome authors exprefs the *remora*, or fucking fifh. *Marggrave*, 180.

PIRATIA-*pua*, in zoology, the name of an American fea-fifh, which grows to a very large fize, and, while young, is eaten and accounted a delicacy; but, when full grown, is too coarfe, rank, and ftrong. Its jaws are both well armed with teeth; the under all the way on both fides, the upper only in the middle on each. The lower jaw is fomewhat longer than the upper, and the mouth very large. It is of an oblong and rounded body. Its back is a little prominent, but its belly altogether flat and even. It has fix fins befides the tail, which is made of a very large fin, of a fomewhat fquare figure, and is not at all forked. It is all over of a dufky orange colour, but more obfcurely fo on the back than elfewhere; and its fides are variegated with grey fpots, fo difpofed as to reprefent a fort of network. *Pifo*'s Hift. Brafil.

PIRATIAPIA, in zoology, the name of a Brafilian fifh, approaching to the nature of the turdus or wraffe. Its body is oblong, not flatted, and very thick. It is a large fifh, and fometimes grows even to fifty pound weight. Its lower jaw is confiderably longer than the upper, and its teeth are very fharp. Its mouth and tongue are red on the infide, and its eyes are large and prominent. It has only one long back fin, the anterior rays of which are prickly, the hinder fmooth. Its tail is not forked, its fcales are fmall, and its back and belly are of a fine bright red. Its fides of a filvery grey, with a dufky caft. It is all over fpotted alfo with the fame colour in large round fpots. The fins are all red, with a line of white and a fringe of black at their edges. It is a very delicate and valuable fifh *Marggrave*'s Hift. Brafil.

PIRAUMBU, in zoology, the name of a Brafilian fifh, fomewhat approaching to the nature of the turdus, and called by the Portuguefe *chayquarona*. It is of the figure of the carp, and its ufual length is fix or feven inches, and its breadth in the broadeft part about three inches; but gradually diminifhing to the tail. Its eyes are large and prominent. Its mouth like that of the carp. It has two fins on the back. Its fcales are very broad, of a filvery whitenefs, with a fmall admixture of yellow. Its tail is forked The upper half of every fcale is, however, brownifh, and the fins are all grey. Its belly and the under part of the head, are of a fine filvery white. It is caught among the rocks, and near fhores, and is a well-tafted fifh. *Marggrave*'s Hift. Brafil.

PIRAYA, in zoology, the name of a fifh caught in the American rivers. There are two kinds of it: the one growing to a foot long, and very broad in proportion; with a hunched back, and lips that cover its mouth clofely and hide its teeth: its head is blunt and fhort, and its back and fides of a pale bluifh grey, and its belly of a dufky yellow: this loves the muddy bottoms of rivers. The other is much of the fame fize, but has two fins on his back, whereas the other has but one; and has a fine yellowifh and reddifh caft mixed among the bluifhnefs on the back, and its belly of a fine clear and ftrong yellow, between a gold and a faffron colour: this loves the fandy bottoms of rivers. There is alfo a fmaller fpecies of this: all three are eatable fifh. *Marggrave*'s Hift. Brafil.

PIRIT, in natural hiftory, a name given by the people of the Philippine iflands to a peculiar fpecies of fparrow, which is very common with them. It is much fmaller than our common fparrow, and feeds only on the feeds of the canary-grafs, which is very commonly wild there.

PISCES *(Cycl.)*—PISCES, *fifhes*. According to the new Artedian fyftem, *fifhes* in general are divided into five diftinct orders. The generality of fifhes have the tail placed perpendicularly, but a few of them have it horizontally. Of thofe which have the tail perpendicular, fome have the rays of the fins bony; and thefe either have the gills covered with a membrane, containing feveral bones, or they have no fuch membrane: of thofe which have this membrane, with the bones over the gills, fome have the rays, tho' bony, yet not pungent; thefe are called the *malacopterygii*, or the foft-finned fifhes. Others have them with the rays prickly; thefe are the *acanthopterygii*, or prickly-finned fifhes. Thofe which have no bones in the membrane over the gills, make only one genus, and are called the *branchioftegi*. The other kind, which have not bony, but cartilaginous rays in the fins, are called *chondropterygii*. And finally, thofe *fifh* which have the tail placed not perpendicularly, but horizontally, are called *plagiuri*. See MALACOPTERYGII, *&c.*

The *fifh* thus conftituting the order of the *malacopterygii*, are again divided into feveral feries. 1. Thofe which have only one fin on the back, and that placed nearly the middle of the back. 2. Thofe which have one fin placed in the middle of the back, and another ftanding farther behind. 3. Thofe which have only one fin on the back, and that placed far backwards. 4. Thofe which have one or more fins running all the way down the back. 5. Thofe which have one long back fin, fcarce difcernible from the tail. 6. Thofe which have either only one very fmall fin on the extremity of the back, or have no fin at all there. Thefe are the principal diftinctions of the *malacopterygii*.

The *acanthopterygii* are divided only into two feries: the one confifting of thofe whofe head is fmooth; the other of thofe whofe head is rough.

Artedi has given a very fhort definition of a fifh, which fevers it from all other creatures; and feparates from the fifh kind many creatures which fome authors have confufedly treated of among them, as properly of the fame clafs of animals The definition is this: *A fifh is a creature having no legs, and always having fins.* There is no other aquatic animal which has not legs, and has fins properly fo called; and it is very improperly, that creatures, wanting the characters of this definition, are by fome ranked among fifhes; as the infects which have legs, and the ferpent kind, which have no fins. The definition may be rendered longer and more exprefs in the following form: A fifh is an animal having fins, having no legs, always refpiring either by means of lungs or gills; inhabiting the waters, except on extraordinary occafions; and moving itfelf either folely by its fins, or by the additional help of a flexuous motion of the body, fometimes coming out of the water on the earth; and fometimes flying or rifing into the air, and continuing

tinuing there some time, carrying itself along by means of the pectoral fins. The last quality belongs only to the flying fish, and a very few others. *Artedi* Ichthyology, p. 1.

Piscis *fossilis*, in ichthyology, a name given by Jonston to a kind of the cobitis, found buried in the sand, and dug out by the people of many parts of Germany for food. It is called by many authors the *mustela fossilis*, and by some the *pœcilia*. It is properly a species of cobitis, and is called by Artedi the *bluish cobitis*, with five longitudinal black lines on each side of the body. *Artedi*, *Jonston*, de Pisc.

Piscis *sancti petri*, in ichthyology, a name given by Jovius and some other authors to the faber or John Doree. It is properly a species of zeus. See Zeus.

PISCIVOROUS *animals*, are such as feed on fish. See the article Bird.

PISMIRE, in zoology, See Formica.

PISONIA, in botany, the name given by Plumier, in honour of Piso, to a genus of plants, called by Vaillant *pentagonotheca*. The characters are these: it produces separate male and female flowers; in the male flower the cup is erect, very small, and divided into five segments: the flower is of a funnel-shape, the tube is short, and the mouth very wide: it is lightly divided into five segments, and lies open: the stamina are five pointed filaments, longer than the flower: the apices are simple. In the female flower, the cup is the same as in the male; but it stands on a germen: the flower is the same as in the male: from the germen there arises a single, erect, cylindric style, which is longer than the flower, crowned with five oblong stigmata: the fruit is an oval capsule, composed of five valves, and having an obscurely pentangular appearance, but having only one cavity within: the seed is single, smooth, and of an oval or oblong figure. *Linnæi* Gen. Pl. p. 474. *Plumier*, Gen. 11. *Houston*, 13. *Vaillant*, Act. Germ.

PISSASPHALTUM, in natural history, the name of a genus of fossils, the characters of which are these: They are fluid mineral bodies, of a somewhat thick consistence, dusky, and opake; of a strong smell, and readily inflammable, but leaving a residuum of greyish ashes after burning.

There are three known species of this genus: 1. A thinner blackish kind, called *oleum terræ*. 2. A thicker black one, called *pissclæum Indicum*, or Barbadoes tar. And, 3. A black and viscous one, called simply *pissasphaltum* in the shops. See the articles Oil *of the earth*, and Pisselæum.

Pissasphaltum is as tough and viscous as bird-lime, and of the same consistence when old. It very much resembles the common black pitch, when softened a little by heat; and has been generally thought to have something of the smell of that substance: but this seems to have arisen from its being too frequently adulterated by mixing pitch with it, and the true genuine substance has no other smell than the rank one of all the bitumens, which somewhat resemble that of oil of amber. It is produced in several parts of the world, and there are large quantities of it in Germany, in Persia, and in France. It yields a limpid oil by distillation, which very much resembles the native petroleum, and is too often sold with us under this name, being annually imported in large quantities from those parts of Germany where it is manufactured, and having itself no particular name in the shops of our druggists. *Hill's* Hist. Foss. p. 422.

Pissasphaltum was much recommended by the antients for external use, as an emollient, maturant and digestive: with this intention it was used in cataplasms, for ripening all sorts of tumors, and against the sciatica and other pains of the limbs. They also had recourse to it for strengthening the limbs, after the reduction of dislocations. It is little used at present, the petroleum being thought very proper to supply its place.

PISSELÆUM *indicum*, in the materia medica, a substance commonly known by the name of *Barbadoes tar*. It is a heavy, thick, and dusky-looking mineral fluid, of the colour and consistence of common treacle, and of a very opake hue; it is of a disagreeable smell, faintly approaching to that of oil of amber, and is very inflammable. It is found trickling down the sides of the mountains at the back of several of our plantations in America, and is in great esteem there for coughs and disorders of the lungs. We meet with very little in England that is genuine, several different sophistications of it being in common use, even upon the spot. *Hill's* Hist. Foss. p. 421.

PISSEROS, the name of an ointment greatly recommended by Hippocrates in many cases, as in burns, fresh wounds, &c. It was made of oil of roses, bees-wax, and pitch, proportioned so as to give the whole a soft consistence. It was of the nature of our modern black basilicon, found a good ointment in many cases.

PISSINUM. Pliny says it was customary for the antients to hold fleeces of wool over the steam of boiling tar, and squeeze the moisture from them, which watery substance was called *pissinum*.

Ray will have this to be the same with the *pisselæum* of the antients; but Hardouin, in his notes on Pliny, thinks the *pisselæum* to have been produced from the cones of cedars. What use they made of these liquors antiently is not known; but it may be presumed they were used in medicine, tho' at present it does not appear they are used at all.

PISSITES, a name given by the antients to a wine impregnated with the virtues of liquid pitch or tar. To prepare it, the tar was ordered to be washed in sea water or brine, and afterwards in fresh water many times; and after a tedious preparation of this kind, two ounces of it were ordered to be put to eight gallons of must, which is to be suffered to work together, and then the clear liquor to be bottled off.

This was accounted a warm wine, very assistant to concoction, and of an absterfive faculty, and a good pectoral: on these accounts it was given in disorders of the breast, and in obstructions of the liver, spleen, and uterus, if not attended with a fever; and was a common medicine in coughs and asthmas, of all kinds.

PISSOCEROS, a name given by the old naturalists to a substance found very frequently in the hives of bees, and consisting of a mixture of propolis and wax. The antients were well acquainted with the use of this substance, which was used for stopping up the cracks and chinks in the hives: they mention, indeed, three sorts of matter used by the bees for this purpose; the metys, the *pissoceros*, and the propolis: but later authors call them all by the general term propolis, the *pissoceros* and metys being only the same substance, mixed with wax in different proportions. This propolis is a resinous substance, of a soft and viscous consistence, collected from the beds of the poplar and other trees. *Reaumur's* Hist. Inf. Vol. 10. p. 84. See the article Propolis.

PISSOSIS, a word used by the old writers on medicine for the depraved appetite of young women about the first eruption of the menses, and of some women with child.

PISTACHIA *trifolia*, in botany, a name improperly given by some authors to the trifoliate American bladder-nut. See the article Staphylodendron.

Pistachias are esteemed restorative, and peculiarly recommended to prevent obstructions of the liver: they are also found of service in nephritic complaints, and are said to be great provocatives to venery: the faculty, however, seldom prescribe them.

PISTANA, in botany, a name by which some authors have called the *sagittaria aquatica*, or water arrow-head. *Ger.* Emac. Ind. 2.

PISTATIO, among pharmaceutic writers, a word used to express that preparation of simples which consists in covering them with, or including them in, a paste, and sending them to a baker's oven till tender throughout. Squills are sometimes prepared thus.

PISTIA, in botany, the name given by Linnæus to a genus of plants, called *kodda-pail* by Plumier; and in the hortus Malabaricus. The characters are these: There is no cup; the flower consists of one unequal petal, which is cucullated and turbinated, with a single, oblique, and long lip, bent and folded at the side; there are no stamina, but six double antheræ grow to the pistil under the stigma; the germen of the pistil is of an oval oblong figure; the style is shorter than the flower; the stigma is peltated, and obtusely divided into six segments; the fruit is a capsule of an oval figure, attenuated at the base, and contains six cells; the seeds are truncated. This genus seems nearly allied to the birth-worts. *Linnæi* Gen. Pl. 438. *Plumier*, 39.

PISTIL, among botanists, the female organ of generation in flowers. It is composed of three parts, the germen, the style, and the stigma: the germen supplies the place of the uterus in plants; its shape is various, but it is always situated at the bottom of the *pistil*, and contains the embryo seeds: the style is a part of various figures also, but is always placed on the germen; in some it is extremely short, in others it seems entirely wanting: the stigma is also of various figures; its place, however, is certain, as it always stands on the top of the style, and if there is no style, on the top of the germen. See the article Generation *of plants*.

PISTIS, in the materia medica of the antients, a name given to the gum bdellium, particularly to that kind of it which was brought from Arabia, and was of a fine yellowish white, and in small round drops, or lumps of a roundish shape, and firm consistence.

PISTOLOCHIA, in botany, a name used by some authors for the plant of which the Virginian snake-root of the shops is the root. *Park.* Theat 420.

PISUM, the *pea*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the papilionaceous kind, and from its cup there arises a pistil, which finally becomes an oblong pod, containing roundish seeds: to this it is to be added, that the stalks are weak and hollow, and the leaves so surround them, that they seem perfoliate; the rest of the leaves are placed two and two upon a middle rib, which ends in a tendril.

The species of *pease*, enumerated by Mr. Tournefort, are these: 1. The large square *pea*, with brown fruit. 2. The large square *pea*, with grey fruit. 3. The large square *pea*, with yellowish fruit. 4. The upright *pea*, with clustered or umbellated pods. 5. The common garden *pea*, with a white flower and white fruit. 6. The common large garden *pea*, with purple flowers. 7. The common large garden *pea*, with variegated flowers and variegated fruit. 8. The great podded garden *pea*. 9. The great *pea*, with the fruit marked with a black

black line. 10. The *pea* with eatable husks. 11. The dwarf *pea* with firm stalks. 12. The angular-leaved *pea*. 13. The garden *pea* with a crooked or foliated eatable pod. 14. The *pea*, with red striated flowers. 15. The field-*pea*, with a greenish yellow fruit. 16. The field-*pea*, with a white fruit. 17. The field-*pea*, with a green fruit. 18. The field-*pea*, with a grey fruit. 19. The field-*pea*, with a blue fruit. 20. The field-*pea*, with black fruit. 21. The field-*pea*, with rose coloured flowers and variegated fruit. And 22. The wild English sea-*pea*. *Tourn.* Inst. p. 394.

PIT (*Cycl.*)—*Brine*-PITS, the name given by the people of Worcestershire and Cheshire, to the wells or *pits* affording the salt water, out of which they extract the salt.

These waters, tho' they all contain salt, yet have other things also in them, and these not in small quantity. They all contain a very large proportion of stony matter; this is common to the whole set, but particular substances beside this are found in the particular *pits*. At Northwich in Cheshire, there are four *pits*, the water of all which stinks very strongly of sulphur, and contains so much vitriol, that it will turn black like ink, with a decoction of galls; yet this is boiled into a very fine and pure kind of salt, common at our tables under the name of basket-salt, and having no such properties.

There is a vast quantity of stony matter precipitated from these pans of *brine* in the boiling them to salt; this is partly saved in small pans set at the side of the boiler, and partly precipitates to the bottom of the pan, where it forms a crust like that at the bottoms and sides of our tea-kettles, which the workmen find it necessary to remove every week; but there is no vitriol or sulphur separated. Phil. Trans. N° 150.

In the country near where these *brine-pits* are, the instruments used in boring often bring up fine and hard salt; so that they give proofs of there being rocks of salt in many places. All along the river Weever, on each side, the earth affords *brine* wherever it is opened: but all these are not fit for boiling, many of the *pits* affording a *brine* too weak to be worked to any advantage. The very strongest *pits* sometimes also become at once too weak; this is owing to the irruption of fresh springs into them, and sometimes the river itself makes its way into them, and overflows them with such a quantity of fresh water, that they are utterly spoiled. The *brine-pits* at Weston near Stafford, afford a *brine* that stinks like rotten eggs; this turns instantly to ink with galls, and purges and vomits violently, if taken even in a small quantity. This in boiling deposits a white flaky sand, or stony matter, without smell or taste, and the salt is pure and fine.

The *pit* at Droitwich in Worcestershire, affords no sand in the boiling, nor any the least sediment of the stony matter at the bottom of the pan, and the salt is the purest of all the others: and by the people of the country it is esteemed the most wholesome; because of its being without the sand. This and the other *pits* hereabout, all have the smell of rotten eggs, especially after a little rest, as on the Monday morning after the Sunday's rest. If meat be put to pickle in the brine of these *pits*, instead of being preserved it will stink in twenty-four hours, sometimes in twelve, yet they yield the best salt of any inland *pits* in the world.

The sulphur spaws of Yorkshire, which are very numerous in different parts of the county, all stink violently of rotten eggs; but if well drawn and worked, they would prove as inoffensive as the rest, and only so many weaker or stronger brine *pits*; and the smell is no other than that of the Cheshire and Staffordshire brine, when it has been left some time at rest. It is remarkable, that tho' the stony matter is deposited in such vast plenty by the waters of all our salt springs, it is not found in any abundance in those places where salt is made out of sea sand, as in Lancashire and some other places; so that it is much more than the natural quantity of spar contained in water that is thus deposited; and indeed it appears from trial, that the brine of our salt springs, in general, contains more than twenty times the quantity of spar that common water does.

This stony matter separates itself from the water before the salt does, and thus it appears in many other waters impregnated with mineral particles. The vitriolic waters all contain ochre and salt, and in all these the ochre separates itself first in the boiling, and then the vitriol; and the stony matter precipitated from common salt springs affords, on an analysis, the salt called *nitrum calcarium*, in considerable abundance. Phil. Trans. N° 156.

PIT-*fish*, or PIT-*visch*, in zoology, the Dutch name of an East Indian fish, approaching very much to the nature of the European turdus, but that it has no scales. Its body is not flat but rounded, and is variegated with blue and yellow spots; its eyes stand very prominent, and the fish is able, at pleasure, to thrust them out or draw them in; its back-fin is prickly. It loves muddy and foul places, yet is a very well-tasted fish. *Ray*'s Ichthyogr. Append. p. 6.

PITANGUAGUACU, in zoology, the name of a Brasilian bird of the starling kind, called by the Portuguese there the *bemetre*. It is of the size of the common starling; its beak is long, thick, and of a pyramidal figure; its head broad and flatted; its neck short, which as it sits it contracts also, so as to make it appear much shorter; its legs and feet are of a dusky brown; it has a very loud and shrill voice; its head, neck, back, wings, and tail, are all of a brownish black, with a faint admixture of green; the lower part of the throat, the breast, and the belly, are yellow, the upper part of the throat white; its beak is very sharp-pointed. *Marggrave*'s Hist. of Brasil.

PITCH (*Cycl.*)—The antients had a peculiar kind of *pitch* called *brutia*, which was inspissated to a higher than ordinary degree for certain uses; such as the receiving a proper quantity of bees wax, to render it the zopissa used in coating the bottoms of ships; which the common *pitch* could not do, being of too soft a consistence for this use. Pliny tells us, that it was made in this manner: The wood was cleaved and formed into a pile, with proper trenches cut in the earth to receive what run from it in burning. When the pile was lighted, the first thing that flowed into these trenches was a thin fluid liquor like water. This, he says, was called *cedrium* in Syria, and was used in Egypt in the preserving dead bodies. The next liquor that ran out from the pile, he says, was thicker, and was *pitch*; and that a part of this was afterwards boiled in brass vessels, with an admixture of vinegar, and then became very solid and hard, and was called by this name of *brutia*.

However right this author may be in his account of the *brutia*, it is evident that he errs in making the first runnings of the wood the *cedrium*; for this was peculiarly the name of the tar of the cedar; and as there are plenty of turpentine trees in Syria, and the *pitch* and tar of that country were always made of those trees, it is very improper to give the name *cedrium* to it: no one ever called the turpentine and cedar by the same name; nor is there any reason why their products should be thus confounded. Vitruvius is very express in ascertaining the sense of the word *cedria* to the produce of the cedar; he says, that the cypress and pine yield their several fat juices or resins, and that the cedar in like manner yields its oil; which is thence called *cedrium*, or *cedria*, and has so much of the peculiar virtues of the wood, that it preserved books and other things, on which it was rubbed, from being eaten by worms.

This author, however, tho' he distinguishes the product of the cedar from that of the cypress and pine, yet he confounds together the two substances, called by the Greeks *cedrium* and *cedrelæum*. The *cedrium* was properly the *pitch* of the cedar; this was the hard substance produced by burning the wood; but the thin liquid substance called *cedrelæum*, which was the only thing that could be used for rubbing over books, *&c.* was an oil separated from this *cedrium*, or *pitch* of the cedar by melting.

PITCH *of Castro*, in the materia medica, the name given by Boccone and some other writers, to a thick kind of bitumen found issuing out of the cracks of some rocks near the village of Castro; from whence it has its name: it is famous in the ecclesiastical state for its medicinal virtues. *Boccone* Mus. de Fisci.

PITCH is also used by architects and builders, for the angle which a gable-end, and consequently the whole roof of a building is set to. If the length of each rafter be ¾ of the breadth of the building, then they say that roof is of a *true pitch*; but if the rafters are longer, they say 'tis a *high* or *sharp-pitched roof*; if shorter, they call it a *low* or *flat-pitched roof*.

PITCHED, in the sea language. They say the mast is *pitched*, when it is put or let down into the step; also the mast is *pitched* too far aft, when placed too near the stern.

PITH, (*Cycl.*) in vegetation, the soft spungy substance contained in the central part of plants and trees. As the substance of the trunk in trees become more woody, the *pith* is compressed and straitened to such a degree, that it wholly disappears.

It is plain from this, that the office of the *pith* in vegetation cannot be very great, since it is not of perpetual duration. By its spungy structure, it seems fitted to receive any superfluous moisture that might transude thro' the pores of the woody fibres. If by the excess of such moisture, or from any other cause, it happens to rot and perish, as frequently happens in elms, the tree is found to grow fully as well without it; a proof it is of no essential use in vegetation. *Boerhaave*'s Chem. p. 139.

The *pith* of trees is continued farther into their minute parts than is generally conceived; the smallest branches and pedicles of the leaves and flowers have their share of it, according to the nature of the tree they belong to; and even the middle ribs of the leaves, when examined by the microscope, are not without it: a transverse section of one of these ribs of the leaf of a *pithy* tree, shews a very beautiful arrangement of vessels, or little bladders, containing a quantity of clear liquor, and resembling in all respects those of which the *pith* in the branches is composed. The *pith* in these is not round, however, as in the others, but flat, and runs from one end of the pedicle to the other, in form of a thin white rib, gradually lessening to a point.

The *pith* of plants, in fine, seems what the marrow is in animals, a congeries of an infinite number of vesicles, which seem

feem deftined to feparate a finer juice than is neceffary for the nourifhment of the coarfer parts of the tree. It is obferved of plants which have a larger than ordinary fhare of *pith*, that they produce larger quantities of flowers than others; inftances of this are feen in the rofe, the lilac, and the common elder: and in the ferulaceous plants, the quantity of flowers is not only profufely large, according to the great quantity of *pith* in their ftalks, but the *pith* feems carried up the ftalks all the way to the feeds themfelves; the long feeds of the fweet myrrhis, and other the like plants, while not ripe, being only *pith*. Mem. Acad Scienc. 1709.

PITHECALOPEX, the *femivulpa*, or *ape-fox*, a name given by Aldrovandus and fome others, to that ftrange American animal which we call the *opoffum*.

The name is compounded of that of the *fox* and the *ape*; of the natures of both which animals it is fuppofed by fome to participate. See the article OPOSSUM.

PITHIAS, or PITHITES, with fome writers, a fort of comet, or rather meteor, in form of a tub. Of thefe it is faid there are divers kinds, *viz.* fome of an oval figure, others like a tun or barrel fet perpendicular, and fome like one inclined, or cut fhort off; others having a hairy train or bufh, &c.

PITHYUSA, in botany, a name ufed by many authors for a fmall fpecies of fpurge. See the article TITHYMALUS.

PITUINA, in the materia medica, a name for the refin of the pitch-tree.

PITYIDES, a name ufed by fome authors for the kernels inclofed in the cones of the fir or pitch-tree; they are recommended by the old phyficians, in diforders of the breaft.

PITYLISMA, a name of one of the exercifes prefcribed by the antient phyficians, as of great fervice in chronic cafes. It confifted in a perfon's walking on tip-toe, and ftretching his hands as high above his head as he could, keeping the whole body alfo as much upon the ftretch as might be. In this condition the patient was to walk as far as he was well able, all the while moving about both hands as much as he could, in all directions.

PITYRIASIS, a name given by the antients to a fcurfy diforder of the head and eye-brows, and of any other part where there is hair. It makes the fkin feem as if covered with bran, and is attended with a troublefome itching.

PIVA, in the Italian mufic, a hautboy, or a cornet. See the articles HAUTBOY and CORNET, *Cycl.*

PLACAGNODIAUGIA, in natural hiftory, the name of a genus of fpars.

The word is derived from the Greek πλαξ, a cruft, ἁγνὸς, pure, and διαυγὴς, pellucid.

The bodies of this genus are cryftalline terrene fpars, or fparry bodies with much of the brightnefs and tranfparence of cryftal, but debafed by an admixture of earthy matter, and are imperfectly pellucid, and formed into thin plates with flat furfaces, but covered at times either in part or entirely, with tubercles or botryoide prominences, and are compofed of arrangements of oblong concretions, of no determinately angular figure.

Of this genus there are only two known fpecies, tho' thefe vary fo much at times in figure, that they might lead an inaccurate obferver into imagining there were many diftinct fpecies of each. 1. A hard femi-pellucid and yellowifh brown one. This is found in many parts of England; in fome places encrufting over the fides of fiffures of ftone, and in others coating over vegetable bodies in fprings, &c. 2. A brittle pellucid and whitifh one, found on the fides and tops of our fubterranean caverns on Mendip hills and elfewhere, and in form of a roundifh ball, feemingly compofed of threads, in the neighbourhood of Efperie in Hungary. *Hill's* Hift. of Foff p. 342.

PLACAGNOSCIERIA, in natural hiftory, the name of a genus of fpars.

The word is derived from the Greek πλαξ, a cruft, ἁγνὸς, pure, and σκιερὸς, opake.

The bodies of this genus are dull and opake cryftalline terrene fpars, formed into crufts, and of an irregular and not ftriated texture within.

Of this genus there are three known fpecies: 1. A hard whitifh brown one, found very frequently on the roofs and fides of caverns on Mendip hills, and in other parts of England. 2. A dull crumbly whitifh one, found in many parts of England, encrufting the fides of caverns, and of fiffures of ftone. And 3. A dull pale brown friable one, of a very coarfe texture. This is the moft common of all the bodies of this genus, and is found in variety of forms, among others encrufting the fides and bottoms of our tea-kettles, and other veffels, in which water is frequently boiled. *Hill's* Hift. of Foff. p. 346.

PLACE (*Cycl.*)—*Place* is ufed in the doctrine of artificial memory: and thefe *places* may be either fuch in a proper fenfe, as a door, a window, a corner, &c. or familiar and known perfons; or any other thing at pleafure, providing they be placed in a certain order, animals, plants, words, letters, characters, hiftorical perfonages, &c. tho' fome of thefe are more and fome lefs fit for the purpofe; but fuch kind of *places* greatly help the memory, and raife it far above its natural powers. *Bacon's* Works Abr. Vol. II. p. 474, 475. See the article MEMORY, *Cycl.* and *Suppl.*

PLACE-*bricks*. See making of BRICK.

PLACENTA (*Cycl.*)—The *placenta* has generally been looked upon as an original part among the fecundines; but according to Dr. Thomas Simfon of St. Andrews, it feems to have no place in the ovarium, nor in the uterus, till once the ovum becomes contiguous to the fundus, and then every contiguous part becomes really a *placenta*. He thinks the fundus uteri, a place peculiarly fitted for the growth of the *placenta*, as proper foils encourage the growth of the roots of trees and fhurbs, many of which are propagated by the branches however placed; fo that every part of them feems equally fitted to be root or branch. Hence he thinks extra uterine conceptions can have no *placenta*; and he fays, there are no inftances in authors to contradict his opinion. See Med. Eff. Edinb. Vol. IV. Art. 13.

The *placenta* does not increafe in the fame proportion which the fœtus does: for the fmaller the fœtus is, the *placenta* is proportionally larger. *Monro*, in Med. Eff. Edinb. p. 145. from *Ruyfch*.

The *placenta* generally adheres to, or near the fundus of the womb, and is covered on the fide next to the womb, with a fine membranous continuation of the chorion. Vid. *Monro*, Medic Eff. Edinb. Vol. II. p. 128. and the authorities there quoted.

The feparation of the *placenta* from the womb muft produce abortions, and this may be occafioned by different caufes operating in various manners, and requires very different treatment to prevent the lofs of the fœtus. See *Monro*, in Med. Eff. Edinb. Vol II. Art. 11. or it's Abridgment, Vol. I. p. 338, feq.

PLACENTA, in botany, a term improperly given by Mr. Houfton, in the Philofophical Tranfactions, N° 421, to what is ufually called *receptacle*. See RECEPTACULUM *feminum*.

PLACENTA, in natural hiftory, the name of one of the claffes of the echini marini. The characters of thefe are, that they are of a depreffed or flatted form, and are wrought in various fhapes, as the paftry people make their cakes; they all have a cinquefoil flower at their top, and their mouth is in the middle of the bafe; the aperture for their anus is ufually near the edge. See Tab. 8. N° 9, 10.

Of this clafs there are three genera: 1. The *mellita*. 2. The *laganum*. And 3. The *rotula*. Which fee under their feveral heads. *Klein's* Hift. Echin. p. 30.

PLACENTA, among the antients, a kind of cheefe-cake, the moft fimple kind of which was made of flower mixed with oil and cheefe, to which honey was added: but the more luxurious fort of people added likewife a great variety of herbs and fruits, as alfo fugar, eggs, butter, &c. *Pitifc.* Lex. Antiq. in voc.

PLAGIAULOS, πλαγιαυλος, among the antients, a kind of flute.

PLAGIOPLATEUS, in natural hiftory, a term ufed by Artedi and others to fignify depreffed, in oppofition to the term *cathetoplateus*, which fignifies compreffed. See both explained under the article CATHETOPLATEUS.

PLAGIURI, in natural hiftory, the name of one of the great claffes, or families of fifhes. The characters of which are, that the tail is placed horizontally. They refpire by means of lungs, and have ufually a double fiftule in the head. They are viviparous, and the males have a penis and teftes, the females the vulva, ovaria, mammæ, &c. and they bring up their young with milk.

The term is derived from the Greek πλαγίος, tranfverfe, and οὐρὰ, a tail. Vid. *Artedi*, Gen. Pifc. *Linnæi* Syftema Naturæ, p. 31.

PLAGUE (*Cycl.*)—Dr. Dover fays he cured the *plague* among fome failors, in a voyage, by one very plentiful bleeding to the quantity of an hundred ounces, and with drink fharpened with fpirit and oil of vitriol. Med. Eff. Edinb.

PLAIN (*Cycl.*)—PLAIN *furface*, in geometry, that which lies evenly between its bounding lines; and as a right line is the fhorteft extenfion from one point to another, fo a *plain furface* is the fhorteft extenfion from one line to another.

PLAISE, in ichthyology, the Englifh name for the fifh called by authors *plateffa* and *paffer lævis*, by fome *quadratulus*.

It is, according to the Artedian fyftem, a fpecies of the pleuronectes, and is diftinguifhed by that author by the name of the *pleuronectes* with fmooth fides, and with a fpine near the anus, and the eyes and fix tubercles placed on the right fide of the head. This name carries a diftinctive character with it; and it were to be wifhed that we had fuch names in common ufe among authors for all the fifh that are known to us. See PLEURONECTES.

PLAN (*Cycl.*)—PLAN *of a baftion*, in the military art, is the fame with the face of a *baftion*. See FACE.

PLANE-*tree*, *platanus*, in botany, the name of a genus of trees, the characters of which are thefe: The flower is of the amentaceous kind, and is of a glomerated fhape, and compofed of a great number of ftamina with their apices. Thefe flowers are barren, and the embryo fruits are found on other parts of the plant; thefe finally become larger, and contain feveral feeds winged with down.

The

The species of *platanus*, enumerated by Mr. Tournefort, are these: 1. The true oriental *platanus*. 2. The occidental or Virginian *platanus*. *Tourn.* Inst. p. 590.

PLANKS, in a ship, are the timbers which go fore and aft on each side of the ship, whereon lie the beams of the first orlop.

Garboard PLANK, in a ship. See GARBOARD.

PLANT (*Cycl.*)—The greater the degree of heat given to *plants* to a certain degree in the natural way, the sooner they go through the whole business of their fructification. In the northern regions, where there are but a few summer months, the herbs all are ripened in them in a surprizing manner: in Lapland, for instance, where the greater part of the year is subject to intense and inceffant frosts, and for a considerable time to the entire absence of the sun, the summer season affords an excessive heat for two months, the sun never setting in all that time. This season comes on toward the latter end of June, and the grass and other herbs then first begin to appear in their young shoots above the ground, and the trees bud; but all vegetation is, after this, carried on with such speed, that in a fortnight the flowers of the herbs and trees are expanded, and the leaves of their full size and maturity. *Scheffer's* Hist. Lapon.

The virtues of *plants* are very variable; a change of climate will alter or destroy them, as we see in many of the medicinal *plants* of other countries, brought over hither, which, tho' they seem to flourish with us, never possess their virtues in the same degreee as in their native climate. The bodies of different animals also render the effect of the same *plant* different: the tithymals or spurges are all of them very violent cathartics, when taken by us; but yet they are eaten by goats and several other animals without hurt, or without any purgative effect, and seem to give them a particular share of vigour and spirits. The fish are, on the other hand, more strongly affected by it than we are; for the juice made into paste with flower and honey, poisons, or at least intoxicates them so, that they may be taken out of the water with one's hand. Bitter almonds are of no ill consequence to us, yet they kill all sorts of birds. *Deslande's* Trait. Physiq.

Imperfect PLANTS, in botany, a name given to those *plants* which seem to want both flower and seed. These were once a very large tribe of *plants*, but the more accurate observations of the moderns have proved, that the most of these *plants* really contained seeds, and those very numerous, tho' so small as not to appear obvious to the naked eye: and probably the farther discoveries of the microscope will in time leave us no one *plant* deserving the appellation of *imperfect*. In Mr. Ray's time, many whole genera of *plants* were esteemed imperfect; but he includes the several kinds he calls so, under three general heads: 1. The submarine. 2. The fungufes. And, 3. The mosses. Tho' many of all these kinds have by later authors been shewn to have true seeds, and it is scarce to be doubted of the rest. *Ray's* Synopf. Stirp. Brit. p. 1.

Flowering of PLANTS. See the article FLOWERING.

Analysis of PLANTS. The common method of attempting the *analysis of plants*, by common distillations, gave hopes that it would prove very useful in determining their virtues; but experiment shewed it to fail of this intent, since the wholesome *plants* and the poisonous ones afforded by this means much the same sort of principles; and on the whole, these appeared in a great measure to be creatures of the fire rather than parts of the subject. This set Mr. Boulduc of the Paris academy upon trying, whether there might not be some way invented at once more simple and more certain; and with this view he attempted to examine the juices and decoctions of several *plants*, to find their essential salts, which had not been procured in their natural state by the chemical trials. The *plant* this gentleman chose as the subject of his experiments in this view, was the common borage.

First, he made a large quantity of a decoction of borage; this he divided into three equal parts: the first of these he evaporated to a pellicle, or to the consistence of a syrup; it was then of a blackish colour, and was charged with a great quantity of oily particles. This being set by for some days in a warm time of the year, covered itself with a thick skin, which was again covered by a mouldiness. When this skin was removed, there appeared underneath a large quantity of chrystals, in fine slender filaments like needles, mixed among a large quantity of other crystals, which were small, and of no regular figures; all these were swimming in a liquor of the thickness of a syrup. These long crystals being taken out of the liquor, and laid upon a hot iron, took fire, and flamed in the manner of salt-petre when mixed with any sulphureous substance; and, in truth, this was a salt-petre, yet loaded with the oily matter of the decoction.

Here, therefore, is a clear proof, not only of the nitrous acid being in this plant, but of plain nitre itself; for, on pouring oil of tartar on a solution of this salt, there was no precipitation made of any substance whatever; which would have been the case, had there been in this state any earthy matter for its basis.

The second portion of this decoction was divested of its oil by means of lime, and then evaporated to a light pellicle over a very gentle heat. This was set by to rest for some days, and finer and more perfect crystals were found, shot in the form of needles in it: these were truly nitrous, and occupied the upper part of the liquor; below these there were a great number of other cubic ones, which were easily known to be crystals of sea salt.

The long crystals of this operation took fire on a lighted charcoal, and appeared plain nitre; and the others, when dry, crepitated in the fire exactly in the manner of sea salt: and when a solution of them was poured upon a solution of silver, made in spirit of nitre, it immediately occasioned a white curd to appear, which being separated, washed, and put to the fire, became a true luna cornea, being transparent and easily cut with a knife. Here, therefore, are plain proofs of nitre and sea salt in this *plant*. Mem. Acad. Scienc. Par. 1734.

The third portion of the decoction was poured upon some fresh wood ashes, and being afterwards evaporated to a pellicle, and set by for some days, there was found in this more nitre than in any of the others; and that whiter and more clear, the others being usually coloured brownish or reddish by the decoction. The occasion of this seems to be, that part of the nitrous acid, which in the other experiments neither joined with any earthy matter, nor with the fatty matter of the decoction, mixed with the salts of the lixivium, made by pouring the liquor which contained it on wood ashes, and thus yielded a much larger quantity of saltpetre than before.

The fatty substance which covered the first decoction being dried, was found to contain a great quantity of nitre, which it had not suffered to shoot, or form itself into crystals: this dried crust being laid on a burning charcoal, took fire in the same manner as if nitre and powder of charcoal had been thrown into a crucible made red hot.

The salts of the *plant* being thus obtained from its decoction, it was determined to try whether the *plant* remaining after the decoction had any more to yield. To try this, it was gently dried in a shade, and burned in a covered vessel to a black coal, and afterwards, in an open fire, to ashes.

Of these ashes there was made a lixivium in the common way, in order to be evaporated for the salt: this lixivium being mixed with syrup of violets, scarce at all altered it from its blue colours, only just bringing on a faint greenishness, which soon went off again, and left the syrup of as fine a blue as before; this made it evident, either that there was very little alkali salt there, or else that it was blended with salts of some other kind, which altered its effects: and this proved to be the true state of the matter on farther experiment, for, evaporating the lixivium to a pellicle, there very soon shot in it regular and beautiful crystals of a salt, having all the characters of tartarum vitriolatum. A second evaporation of the lixivium afforded more of the same salt, but in smaller crystals. Evaporating the liquor to about half its quantity, and setting it again to shoot, there appeared plain cubic crystals of sea salt; which being strictly examined, were found to be perfect sea salt, no way altered, but having stood the force of the calcination.

After these salts had been separated from the lixivium, it changed syrup of violets immediately to a beautiful green, which colour it always retained.

It is evident from these experiments, that this *plant* affords four different kinds of salts, *viz.* nitre, sea salt, tartarum vitriolatum, and the common fixed alkali; and it is hence no trivial observation, that the three mineral acids are found here all in one *plant*. It is not to be supposed, indeed, that the tartarum vitriolatum was actually in the *plant* in that form, but it is very evident, that the vitriolic acid did always exist there, ready to form it; but that being, before the calcination, enveloped in the oily matter of the *plant*, it was not easy to discover it either by its properties or effects: but as soon as the oil was dissipated by fire in the calcination, the vitriolic acid immediately became free, and finding the alcaline salt of the *plant*, or its fixed nitre, which had remained after the deflagration, it immediately united with it, and formed a tartarum vitriolatum in the same manner as a tartarum vitriolatum may be made from salt of tartar and common sulphur, after the oily or inflammable part of the sulphur is burnt away.

It is not only this *plant* that yields a vitriolated tartar from a lixivium with its ashes, but great numbers of others of the aromatic and bitter kinds: whence it appears, that the vitriolic acid, tho' the most fixed of all the mineral acids, yet raises itself into the juices of a great number of *plants*; and on the result of great numbers of experiments, it appears, that there are very few *plants* which yield a pure alkaline salt, perhaps salt of tartar is the only perfectly pure known alkali of this kind, which retains no portion of any other salt.

Ashes of PLANTS. The ashes of a *plant* carefully prepared, retains its exact form till disturbed by accidents. The way of preparing them is this: Take a whole *plant* which has been used for the distillation of the oil, water, &c. lay it evenly upon a flat plate of iron, and place this on a clear fire, that no smoak may prevent the success of the operation; continue and raise the fire, till the whole substance of the *plant* appears perfectly ignited. There first arises a light smoak from it, this gradually becomes darker, and at length as black as pitch; the smell of burning increases as the smoak increases, at length the smoak breaks out into flame, and then the smell in a great mea-

measure ceases: the *plant* by degrees grows black, as the smoak arises, and as soon as perfectly black all over, it takes fire. When the flame ceases, the leaves appear white; but if any black spots remain, there are always seen sparks of fire scattering themselves about on them, till the blacknefs is perfectly consumed. The ashes being now become perfectly white, yield no smell nor the least appearance of fire; and they yet retain, after all this violence of fire, the perfect form of the *plant*, even to a microscopic observation: for, if examined by glasses, there will be found every feature and lineament of the *plant*, even the hairinefs of the stalks, or down upon the leaves; every rising and cavity natural to the plant, appear also distinct, and every the smallest fibre. But this only remains while they are unmoved, the moment they are disturbed, tho' but by breathing upon them, the whole falls to dust, and the form is irrecoverably lost.

The ashes thus carefully prepared, are perfectly insipid and scentless, and when lixiviated in the common way for making the fixed salt, afford no salt at all; but only on the evaporation leave a small quantity of a matter resembling lime: the remaining ashes are wholly terrestrial, and serve excellently for the making copels, for the use of assaying. *Boerhaave's* Chem. P. 2. p. 19.

From this we learn, that the *plant*, by having been previously boiled in water in the distillation, was divested of all its salts; and that in general, water, with a great degree of heat, is capable of extracting from any vegetable all its saline particles, whether volatile or fixed. We find, however, that water can never separate the fixed oil, which here shews itself to have wholly remained in the *plant*, by the smoak, smell, and flame it yields; and by the sparks of fire in the remaining black parts of the *plant*, which were wholly owing to the remains of this oil, no fire being able to make the smallest spark afterwards appear in the ashes.

Air, as well as fire, is necessary to this oil's taking flame; for in a covered vessel it will not blaze till the cover is taken off. This thick oil is extremely different from what we call the essential oil of a *plant*, and seems to be the same in all vegetables; and to this they owe their cohesion: while the essential oil and salt are extracted from the *plant* by boiling, it yet holds together in its native figure and strength; but as soon as the black oil is dissipated by burning, the whole firmnefs of the *plant* is lost, and a breath of air blasts it to dust.

Face of a PLANT. See the article FACE.

Sensitive PLANT. See MIMOSA and SENSITIVE.

Sea PLANTS. See the article SEA-*plants*.

Food of PLANTS. See FOOD *of plants*.

Nourishment of PLANTS. See NOURISHMENT.

Propagation of PLANTS. See PROPAGATION.

Resuscitation of PLANTS. See RESUSCITATION.

Pasture of PLANTS. See the article PASTURE.

Juices of PLANTS. See JUICES *of plants*.

Oil of PLANTS. See the article OIL.

Salts of PLANTS. It has been observed by all who have examined the different essential *salts of plants*, that some of them, when thrown on the fire, have the effects of salt-petre, and others of common sea-salt; and it has been concluded from hence, that they really contained particles of those salts which their roots had taken in with their nourishment, and conveyed up into the stalk and leaves with the juices; and that these salts still retained their original nature, and were no otherwise altered than by the mixture with other substances in the plant. But as two plants of different qualities, when set in the same earth closely by one another, shall out of the same juices make a medicine, a sallad, or a poison; it cannot be, but that the substances absorbed by the root, be they what they will, must be greatly altered in the plant; insomuch, that a salt purely nitrous, when received into the root, might become of the nature of sea salt, or of the volatile urinous kind, according to the different organs of the plants, and the different natural fermentations it might meet with there. To be perfectly informed of this, Mr. Homberg made the following experiment:

He took a large quantity of rich black garden mould, and washed it in several waters, to carry off all the salts it might contain: this done, he divided the earth into four boxes or cases of wood, into each of which there was put about two hundred weight. Two of these cases of earth he watered with a solution of salt-petre, so as to make each imbibe about two ounces of that salt; the other two cases were left with the earth insipid as the washing had made it, and care taken to water them with none but perfectly pure water, so that they might remain as simple as possible. In one of the cases of nitrous earth, and in one of those of simple earth, he sowed fennel; and in the other two, garden cresses.

The herbs in all the cases grew very well, and when they were grown to about eight inches high, they were all gathered; and when the roots were cleansed, and the whole product weighed, those plants which had grown on the simple earth weighed twenty-five ounces, and those in the nitrous earth twenty-six; their smell and taste manifested no sort of difference in either. In order to examine these plants, while yet quite fresh, by means of fire, he put a pound and an half of each, with their roots, into a retort of glass; he placed these retorts first in a balneum mariæ, and then in a sand-heat, in order to drive over all the aqueous humidity. The quantity of water from each retort was within a few grains of the same weight; and from the beginning to the end of the distillation, there was not the least appearance of any acid.

After this, the cresses which had grown in the insipid earth, yielded a drachm of volatile salt; and that which had grown in the earth which had imbibed salt-petre, yielded seventy-five grains.

The oil of each was very nearly the same in quantity; that from the plants in the salt-petre earth weighing six grains more than that of the plants of the insipid earth.

The lixivial salt was two drachms from the plants in the nitrous earth, and one drachm and sixty-seven grains from those in the insipid.

The differences between those two parcels of plants upon the analysis, appeared on the whole so little, that it could not be counted any thing; since the more or less close luting of the vessels, or many other accidents in the distillation, might have easily occasioned as much in plants perfectly the same in all respects. If there be any thing, however, to be collected from the experiment, it is, that the earth moistened with a solution of nitre, yielded more of the principles than the other; probably from its actually affording a quantity of salt to the juices of the plant in the growth: but as the nitrous earth afforded a plant which yielded more oil than that from an insipid soil, it must be from this that the lotions of the earth not being able to carry off any of the fatty parts, they remained in the same quantity in both; but that the nitre, where it was, had contributed somewhat to the breaking of them, and the rendering them more fit to be absorbed by the plants. From the different weights of the plants when gathered, after the same time of growth, from the same seed, and with all the same advantages in common, proves, that the nitrous salts in the earth are not essentially necessary to vegetation, since the *plants* in the insipid earth grew very well without them; yet that they are very useful, since the *plants* produced there were of a greater bulk, and according to the whole analysis, if the differences are to be depended on as resulting wholly from the nature of the subjects, they yielded more of all the active principles; and therefore, that they were to all purposes better *plants*.

The fennel in these boxes was not gathered with the cresses, but left till it began to bud for flowering: at this time there was found a very great difference, both in the size and appearance of the *plants* of the two sorts of earth. That in the insipid earth was lank, weak, and of a yellowish green; and being gathered, weighed only nineteen ounces: whereas the fennel growing on the nitrous earth seemed in a very vigorous state, its leaves were of a dark green, and it weighed full two pounds. Mr. Homberg weighed nineteen ounces of each of the *plants* fresh, and with their roots, to make the analysis of them in the same manner as he had before done that of the cresses. In the first distillation the water began to taste acid in the first drops, and continued to increase in acidity as long as it ran; and the insipid earth left by the fennel which grew in the nitrous earth, was an ounce more in weight than the residuum of the *plant* which had grown in the insipid soil. That of the nitrous earth yielded one drachm and twelve grains of oil; that in the insipid, only sixty-three grains: neither one nor the other yielded any volatile salt, only the last ounce of the aqueous liquor made some little effervescence. The first salt was in the quantity of three drachms from he fennel of the nitrous earth, and two drachms and ten grains from the insipid earth.

The *plants* had appeared above ground in the same time from their seeds in the nitrous and in the insipid earth, and grew equally vigorous and well for a month; but after that time, tho' both were watered in the same manner, and the same care in all respects was taken of them, the *plant* on the insipid earth became languid, and that on the nitrous earth continued to grow vigorously and well.

It seems that in the first stages of the growth of the *plants*, the two lobes of the seed furnished a proper nourishment to the stalk and leaves, and required no more than mere water, a pure simple fluid to divide its parts and carry it up from the root; but that when these lobes were wholly consumed, and the *plant* was to find its whole nourishment in the earth, there an earth rendered insipid by the carefully washing away all its salts, could not supply a proper and sufficient nourishment, but that an earth, after it had been made to imbibe a certain portion of nitre could: whence the fennel in the insipid earth could not continue to grow vigorously, after the lobes of the seed were destroyed, tho' that in the earth impregnated with an adventitious salt could.

It is true, indeed, that the *plant* in the insipid earth did not entirely perish, and it is reasonable to conclude thence, that all the washing we can give with hot water cannot divest earth of all its salts, but only of those which are most easily soluble; whence it takes away not all, but only the principal fund of nutrition. All the washings in the world must also leave earth impregnated with all the fatty particles it ever had, and these are very instrumental to the growth of *plants*; but these, without some salts, cease to be of their proper use, since they cannot be broken or divided into parts small enough to enter

the vessels of *plant*, otherwise than by these salts. Mem Acad. Par. 1693.

It is very observable, in the course of these experiments, that the cress, tho' planted in an earth containing salt petre, which is well known to be an acid salt, yet yielded, on the analysis, alcaline principles, and not the least mark of an acid in any part of the processes, and this just in the same manner as if it had grown upon an earth impregnated with dung; and that the fennel, whether growing on the nitrous earth, or on the insipid, afforded a large quantity of acid in all its principles, not excepting even its fixed salt, which was very little of the alkali; and by the mixture of the acid of the plant was converted almost into the nature of a neutral salt. Hence it appears that a salt, tho' acid in itself when absorbed into the vessels of an alkaline *plant*, such as the cress, ceases to be any longer an acid; and that a *plant* naturally acid, whether it grow in an earth impregnated with an acid salt, or wholly divested of salts, yet it retains its acid nature, and gives proof of it in all its principles on an analysis; whence it is very reasonable to conclude, that the salts found in *plants* are made what they are in those *plants*; and that the salts of the earth, in which the *plant* grows, be they of what nature they will, will change that nature in the vessels of the *plant*, according to the diversity of its organs, and of the different fermentations they undergo in the course of their alteration there.

The weights above mentioned are French, the word *gros* being translated drachm, tho' really exceeding it by twelve grains. See WEIGHT, *Cycl.*

Tracheæ of PLANTS See the article TRACHEÆ *of plants.*

Transportation of PLANTS. See TRANSPORTATION *of plants.*

PLANTS *in Amber* The cabinets of the curious afford numerous instances of small animals, such as flies, beetles, and the like, buried in *amber*; but the parts of *plants* are more rarely found thus preserved; yet we are not without instances that the same accident may happen to them. The learned Hartman mentions a piece of *amber* in his own possession, in which there were preserved some leaves of the common alga, and another in which a seed of the common lime-tree, with part of its pedicle, and others in which the capsule with its seeds and pedicle were preserved; the pedicle standing out at the end of the piece of *amber*.

Some have given accounts of whole pinnated leaves of *plants* thus preserved, and the mosses are so common, that there is no doubt of the reality of their being naturally buried there. They are generally found only in single leaves and small fragments, but sometimes in whole branches; in which case *amber* can shew no greater beauty. Pieces of straws, sticks, and the barks of trees are often found in it also; but the greater part of these, when strictly examined, are found to be fragments of fossile wood, or of the matter called by Hartman the *matrix* of *amber*; which is a fibrose substance, and much of the appearance of wood, but is really only a bituminous earth. These all must have been received into the *amber* in the same manner that the insects were; that is, while the *amber* was yet moist or soft. These things falling into its way might bury themselves in it, and then must be preserved in it in the hardened state. See SUCCINUM.

Fossile PLANTS. Many species of tender and herbaceous *plants* are found at this day, in great abundance, buried at considerable depths in the earth, and converted, as it were, into the nature of the matter they lie among; fossile wood is often found very little altered, and often impregnated with substances of almost all the different fossile kinds, and lodged in all the several strata, sometimes firmly embedded in hard matter, sometimes loose: but this is by no means the case with the tenderer and more delicate subjects of the vegetable world. These are usually immersed either in a blackish slaty substance, found lying over the strata of coal, or else in loose nodules of ferruginous matter of a pebble-like form, and they are always altered into the nature of the substance they lie among; what we meet with of these are principally of the fern kind; and what is very singular, tho' a very certain truth, is, that these are principally the ferns of American growth, not those of our own climate.

The most frequent *fossile plants* are the polypody, spleenwort, osmund, trichomanes, and the several larger and smaller ferns; but beside these there are also found pieces of the equisetums, or horse-tails, and joints of the stellated *plants*, as the clivers, madder, and the like; and these have been too often mistaken for flowers; sometimes there are also found compleat grasses, or parts of them, as also reeds and other water *plants*; sometimes the ears of corn, and not unfrequently the twigs or bark, and impressions of the bark, and fruit of the pine or fir kind, which have been, from their scaly appearance, mistaken for the skins of fishes; and sometimes, but that very rarely, we meet with mosses and sea-*plants*.

Many of the ferns not unfrequently found, are of very singular kinds, and some species yet unknown to us; and the leaves of some appear set at regular distances, with round protuberances and cavities. The stones which contain these plants split readily, and are often found to contain, on one side, the impression of the plant; and on the other the prominent plant itself: and beside all that have been mentioned, there have been frequently supposed to be found with us ears of common wheat, and of the maiz or Indian corn; the first being in reality no other than the common endmost branches of the firs, and the other the thicker boughs of various species of that and of the pine kind, with their leaves fallen off; such branches in such a state cannot but afford many irregular tubercles and papillæ, and in some species, such as are more regularly disposed.

These are the kinds most obvious in England; and these are either immersed in the slaty stone which constitutes whole strata, or in flatted nodules, usually of about three inches broad, which readily split into two pieces on being struck. They are most common in Kenton coal-pits, near Newcastle, and the forest of Dean, in Gloucestershire; but are more or less found about almost all our coal-pits, and many of our iron mines. See Tab. of Fossils, Clas. 6.

Tho' these seem the only species of *plants* found with us, yet in Germany there are many others, and those found in different substances. A whitish stone, a little harder than chalk, frequently contains them: they are found also often in a grey slaty stone, of a firmer texture, not unfrequently in a blackish one, and at times in many others: nor are the bodies themselves less various here than the matter in which they are contained: the leaves of trees are found in great abundance, among which those of the willow, poplar, whitethorn, and pear-trees, are the most common; small branches of box, leafs of the olive-tree, and stalks of garden thyme, are also found there; and sometimes ears of the various species of corn, and the larger as well as the smaller mosses in great abundance.

These seem the tender vegetables, or herbaceous *plants*, certainly found thus immersed in hard stone, and buried at great depths in the earth; others of many kinds there are also named by authors, but as in bodies so imperfect, errors are easily fallen into, these seem all that can be ascertained beyond mere conjecture. *Hill's* Hist. of Foss. p. 640.

Ice-PLANT See the article ICE.

PLANT-*root*, a term used by Dr. Grew to express the radicle in seeds: he by this name distinguishes it from what he calls the seminal root; which is a very different substance distributed throughout the parenchyma of the seed, but wholly different from it, and preying upon it as the *plant-root* does upon the earth. *Grew's* Anat. of Plants. See the article SEMINAL-*root*.

PLANTAGINELLA, in botany, a name given by Dillenius to a genus of plants since called by Linnæus *limosella*. *Dillen* See the article LIMOSELLA.

PLANTAGO, *plantain*, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, and is wide, expanded at the opening, and usually divided into four segments; from the bottom of this flower rises a pistil surrounded with stamina of considerable length: the pistil becomes afterwards an oval or conic seed-vessel; which when ripe separates transversely into two pieces, and is divided by an intermediate septum into two cells, filled with oblong seeds.

The species of *plantain*, enumerated by Mr. Tournefort, are these: 1. The smooth broad-leaved *plantain*. 2. The broad-leaved *plantain*, with sinuated leaves. 3. The broad-leaved *plantain*, with blood coloured leaves. 4. The broad-leaved hoary *plantain*. 5. The broad-leaved hoary *plantain*, with a white spike 6. The broad-leaved rose *plantain*, with an expanded flower. 7. The broad-leaved rose *plantain*, with flowers disposed in tufts. 8. The broad-leaved *plantain*, with a bushy panicle. 9. The broad-leaved hoary *plantain*, with various spikes. 10. The smaller broad-leaved smooth *plantain*. 11. The smaller broad-leaved hoary *plantain* 12. The hairy or woolly *plantain*. 13. The great narrow-leaved *plantain*. 14. The small proliferous narrow-leaved *plantain*, with foliaceous tops to the stalks. 15. The common narrow-leaved proliferous *plantain*. 16. The narrow-leaved silvery *plantain*. 17. The narrow-leaved serrated *plantain*. 18. The shrubby narrow-leaved *plantain*. 19. The great broad-leaved hoary *plantain*, with three ribs to each leaf. 20. The lesser narrow-leaved *plantain*. 21. The hairy bulbose rooted *plantain*. 22. The narrow-leaved *plantain*, with tufts like the lagopus. 23. The narrowest-leaved three ribbed *plantain*. 24. The alpine *plantain*, with long, narrow and blackish leaves. 25. The three-ribbed mountain-*plantain*. 26. The narrow-leaved and white Spanish *plantain*. 27. The narrow-leaved white French *plantain*. 28. The great narrow-leaved sea-*plantain*, called by some the sea *coronopus*. 29. The lesser narrow-leaved sea-*plantain*. 30. The smallest sea-*plantain*, with rigid grassy leaves. 31. The greater grassy-leaved *plantain*. 32. The smaller grassy-leaved *plantain*. 33. The smallest narrow leaved *plantain*, with heads like the hare's foot. 34. The one-flowered grassy-leaved marsh-*plantain*. 35. The hairy sea-*plantain* of Portugal, with a very long spike. 36. The hairy sea-*plantain* of Portugal, with a short spike.

These are properly *plantains*; but the large plants commonly called by authors water *plantains*, are species of ranunculus. *Tourn.* Inst. p. 127. See RANUNCULUS.

PLANTAGO, in the Linnæan system of botany, is made the name of a large genus of plants, taking in, beside the several species of *plantains*, usually so called, the psyllium, or fleawort, the coronopus or buckshorn, and the gramen junceum, or rush-grass.

The characters of this genus are these: The cup is an erect very short perianthium, divided into four at the edges, and remaining after the flower is fallen. The flower consists of one petal, in form of a cylindraceo-globose tube, with the limb cut into four parts; the segments being depressed, of an oval figure and pointed; the stamina are four extremely long, erect capillary filaments; the antheræ are oblong, flatted, and lean upon the stamina; the germen of the pistil is of an oval figure; the style is slender, and but of half the length of the stamina; and the stigma is simple; the fruit is an oval capsule, containing two cells, parting horizontally; the seeds are numerous, and oblong. *Linnæi* Genera Plant. p. 46.

PLANTE-*ver*, in natural history, the name of an herb sent over from China, where it is called *hiatsaotonetchom*; that is to say, a plant which at a certain time of the year changes into a worm. The Chinese say, that this is a plant during the summer season; but that in winter its stalk dies, and the root becomes a worm. Mr. Reaumur has well observed, that in the present improved state of natural knowledge, we can give no credit to such marvellous accounts; and of the roots sent over to the Academy at Paris, it appeared, that only a certain part of each was to undergo this change: this, however, if true, was no less a marvel than that the whole should.

Father Parenin, who sent it to France, observes, in his account of it, that it was a very scarce plant even in China; being found only at the palace of Pekin there, where also it was not native, but brought from the mountains of Tibet, and some other places on the confines of the Chinese dominions. This father had never seen the leaves or flowers of the plant, but only its roots, which were in high esteem there, not only because of their miraculous changes, but from there possessing the virtues of the famous ginseng; but with this advantage, that the use of them was not subject to be attended with those hæmorrhages which frequently affected the persons who take large quantities of that famous root. The roots of this *plante-ver* are usually about a quarter of an inch thick, and from an inch to three inches in length; but there are much larger in the places where they grow.

These roots had nothing particular in their figure or appearance; but with these the father sent some of those which were supposed to be changed into worms, concerning which he observed, that nothing could more exactly express a worm or caterpillar; the head, the eyes, the feet, and the mouth, being all plainly distinguishable, as well as the several folds and cuttings in of the body. This account was found to be perfectly true; but the mistake was the want of proper accuracy in the observation; for this body, which was supposed to be the root transformed, had in reality never been any part of the plant, but was found to be really and truly a caterpillar. This was one of the under-ground kind, or at least of those which go into the ground to pass their transformation: of these we have a great many different species in all parts of Europe, and some of them, when they are entering into their nymph state, have a custom of fastening themselves to the roots of plants. Of this kind was the Chinese insect, which when the time of its change approached, always selected the roots of this plant as of a proper size and dimension for its purpose; and gnawing off the end hollowed away the stump, so as to introduce its tail into the cavity; where it remains covered with the bark of the root, which so nicely joins to it, that people who observe it in a slight way cannot but mistake it to be a part of the root, or the remainder of the root, a continuation of its body. The more accurate naturalists will, however, easy distinguish the vegetable fibres, which make up the root from the animal ones of the caterpillar; and to an eye accustomed to such researches, the nice joining of the tail to the remainder of the root will easily discover itself. Mem. Acad. Par. 1720.

PLANTED-*coat*, in the manege. See HAIR, *Cycl.*

PLASHING, a term used by our farmers to express an operation performed at certain times upon their quickset-hedges, in order to assist their growth and continuance. This operation is performed sometimes in October, but more usually in February; and this is by much the better season for it. Suppose a hedge to be of twenty or thirty years growth, and full of old stubs as well as young shoots, this is the kind of hedge that requires *plashing* most of all.

The old stubs must be cut off within two or three inches of the ground, and the best and longest of the middle sized shoots must be left to lay down. Some of the strongest of these must also be left to answer the purpose of stakes. These are to be cut off to the height at which the hedge is intended to be left; and they are to stand at ten foot distance one from another: when there are not proper shoots for these at the due distances, their places must be supplied with common stakes of dead wood. The hedge is to be first thinned, by cutting away all but those shoots which are intended to be used either as stakes, or the other work of the *plashing*: the ditch is to be cleaned out with the spade: the ditch must be now dug as at first, with sloping sides each way; and when there is any cavity on the bank on which the hedge grows, or the earth has been washed away from the roots of the shrubs, it is to be made good by facing it, as they express it, with the mould dug from the upper part of the ditch; all the rest of the earth dug out of the ditch is to be laid upon the top of the bank, and the owner should look carefully into it that this be done; for the workmen, to spare themselves trouble, are apt to throw as much as they can upon the face of the bank; which being by this means overloaded, is soon washed off into the ditch again, and a very great part of the work undone again, whereas what is laid on the top of the bank always remains there, and makes a good fence of an indifferent hedge.

In the *plashing* the quick, two extremes are to be avoided; these are, the laying it too low, and the laying it too thick: this makes the sap run all into the shoots, and leaves the *plashes* without sufficient nourishment; which, with the thickness of the hedge, finally kills them. The other extreme of laying them too high, is equally to be avoided; for this carries up all the nourishment into the *plashes*, and so makes the shoots small and weak at the bottom, and, consequently, the hedge thin. This is a commen error in the north of England. The best hedges made any where in England, are those of Hertfordshire; and they are *plashed* in a middle way between the two extremes, and the cattle are by that prevented both from croping the young shoots, and from going thro'; and a new and vigorous hedge soon forms itself.

When the shoot is bent down that is intended to be *plashed*, it must be cut halfway thro' with the bill: the cut must be given sloping, somewhat downwards, and then it is to be wound about the stakes, and after this its superfluous branches are to be cut off, as they stand out at the sides of the hedge. If for the first year or two the field where a new hedge is made can be ploughed, it will thrive the better for it; but if the stubs are very old, it is best to cut them quite down, and to secure them with good dead hedges on both sides, till the shoots are grown up from them strong enough to *plash*; and wherever void spaces are seen, new sets are to be planted to fill them up. A new hedge raised from sets in the common way, generally requires *plashing* about eight or nine years after. *Mortimer's* Husbandry, p. 10.

PLASTER (*Cycl.*)—PLASTER, in pharmacy, an external application of a harder consistence than our ointments: these are to be spread according to the different circumstances of the wound, place, or patient, either upon linnen or leather. If the part upon which they are to be laid be naturally hairy, it must be shaved; but that they may stick the better, the natural shape of the part must be consulted, and the *plaster* spread and formed accordingly, either round, square, triangular, ellepticai, in a lunar form, or in shape of the letter T. Some also are divided at both ends, and others are perforated in the middle; these last are of frequent use in fractures attended with a wound; for by this contrivance the wound may be cleansed and dressed without removing the *plaster*. These *plasters* are of different forms, according to the part they are laid on; but they are usually square, or round; and indeed there is almost no part of the body which a *plaster* of one of those forms may not be made to serve for, if it be notched about the edges with a pair of scissers.

The uses of *plasters* are various; they are serviceable in securing the dressings, they also forward the maturation of the pus, agglutinate and heal wounds, unite broken bones, heal burns, assuage pain, and strengthen weak parts. *Heister's* Surg. p. 18.

PLASTER *of Paris*. The method of representing a face truly in *plaster of Paris*, is this: The person whose figure is designed is laid on his back, with any convenient thing to keep off the hair. Into each nostril is conveyed a conical piece of stiff paper, open at both ends, to allow of respiration. These tubes being anointed with oil, are supported by the hand of an assistant; then the face is lightly oiled over, and the eyes being kept shut, alabaster fresh calcined, and tempered to a thinnish consistence with water, is by spoonfuls nimbly thrown all over the face, till it lies near the thickness of an inch. This matter grows sensibly hot, and in about a quarter of an hour hardening into a kind of stony concretion; which being gently taken off represents, on its concave surface, the minutest part of the original face. In this a head of good clay may be moulded, and therein the eyes are to be opened, and other necessary amendments made. This second face being anointed with oil, a second mould of calcined alabaster is made, consisting of two parts joined lengthways along the ridge of the nose; and herein may be cast, with the same matter, a face extremely like the original. *Boyle's* Works, abr. Vol I. p. 132.

If finely powdered alabaster, or *plaster of Paris*, be put into a bason over a fire, it will, when hot, assume the appearance of a fluid, by rolling in waves, yielding to the touch, steaming, &c. all which properties it again loses on the departure of the heat; and being thrown upon paper, will not at all wet it, but immediately discover itself to be as motionless as before it was set over the fire; whereby it appears, that a heap of such little bodies, as are neither spherical, nor otherwise regularly shaped, nor small enough to be below the discernment of the eye, may, without fusion, be made fluid, barely by a sufficiently strong and various agitation of the particles which compose it; and, moreover,

over, lose its fluidity immediately upon the cessation thereof *Boyle's* Works abr. Vol. I. p 313.

Two or three spoonfuls of burnt alabaster, mixed up thin with water, in a short time coagulate, at the bottom of a vessel full of water, into a hard lump, notwithstanding the water that surrounded it. Artificers observe, that the coagulating property of burnt alabaster will be very much impaired or lost, if the powder be kept too long, especially if in the open air, before it is made use of; and when it hath been once tempered with water, and suffered to grow hard, they cannot by any burning or powdering of it again, make it serviceable for their purpose as before. *Boyle's* Works abr. Vol. I. p. 341.

This matter, when wrought into vessels, &c. is still of so loose and spungy a texture, that the air has easy passage thro' it. Mr. Boyle gives an account among his experiments with the air-pump, of his preparing a tube of this *plaster*, closed at one end and open at the other, and on applying the open end to the cement, as is usually done with the receivers, it was found utterly impossible to exhaust all the air out of it; for fresh air from without pressed in as fast as the other, or internal air, was exhausted, tho' the sides of the tube were of a considerable thickness. A tube of iron was then put on the engine; so that being filled with water, the tube of *plaster of Paris* was covered with it; and on using the pump, it was immediately seen, that the water passed through into it as easily as the air had done, when that was the ambient fluid. After this, trying it with Venice turpentine instead of water, the thing succeeded very well; and the tube might be perfectly exhausted, and would remain in that state several hours. After this, on pouring some hot oil upon the turpentine, the case was much altered; for the turpentine melting with this, that became a thinner fluid, and in this state capable of passing like water into the pores of the *plaster*. On taking away the tube after this, it was remarkable that the turpentine, which had pervaded and filled its pores, rendered it transparent, in the manner that water gives transparency to that singular stone called *oculus mundi*. In this manner, the weight of air, under proper management, will be capable of making several sorts of glues penetrate *plaster of Paris*; and not only this, but baked earth, wood, and all other bodies porous enough to admit water on this occasion. Philos. Trans. N°. 122.

PLASTERING. The modern taste runs greatly into *plastering*; and it were much to be wished that this art could be again brought to its antient perfection. In our best buildings the *plastered* walls and ceilings crack and fly, and in a little time grow damp, or moulder to decay. The Romans had an art of rendering their works of this kind much more firm and durable, and there is no reason to despair of reviving this art by proper trials.

The antient *plastering* of these people, preserved to this time, where it has not met with violent blows or injuries from accidents, is still found as firm and solid, as free from cracks or crevices, and as smooth and polished on the surface, as if made of marble. The bottoms and sides of the Roman aqueducts were made of this *plastering*, and endured many ages without hurt, unless by accidents; witness that whereof some yards are still to be found on the top of the Pont de Garde, near Nismes, for the support of which that famous bridge was built to carry water to the said town. The roofs of houses, and the floors of rooms at Venice are covered with a sort of *plaster*, made of later date, and yet strong enough to endure the sun and weather for several ages, without cracking or spoiling, and without much injury from people's feet.

The secret of preparing this Venetian *plaster* is not among us; but it would be worth while to try whether such a substance might not be made by boiling the powder of gypsum dry over the fire, for it will boil in the manner of water; and when this boiling or recalcining was over, the mixing with it resin, or pitch, or both together, with common sulphur, and the powder of sea-shells. If these were all mixed together, and the water added to it hot, and the matter all kept hot upon the fire till the instant of its being used, so that it might be laid on hot, it is possible this secret might be hit upon.

Wax and oil of turpentine may be also tried as additions: these being the common ingredients in such cements as we have accounts of as the firmest. Strong ale-wort is by some directed to be used, instead of water, to make mortar of limestone be of a more than ordinary strength. It is possible, that the use of this tenacious liquor to the powdered ingredients of this proposed *plaster*, might greatly add to their solidity and firmness. Phil. Trans. N°. 93.

PLAT *(Cycl.)*—PLAT-*veins*, in the manege, called in French *ars*, are the veins in which we bleed horses, one in the lower part of each shoulder, when we blood a horse in the shoulders; and in the flat part of the thighs.

PLATS, in a ship, flat ropes made of rope-yarn, and weaved one over the other: they serve to save the cable from galling in the hawse, or to wind about the flukes of the anchors, to save the pennant of the fore-sheet from galling against them.

PLATANUS, the *plane tree*. See PLANE-*tree*.

PLATÆ, a word used by some anatomical writers to express the scapulæ.

PLATAMON, a word used to express a low and smooth rock, just appearing above water.

PLATANARIA, in botany, a name by which some authors have called the *sparganium*, or burr-reed, from its round echinated fruit, which in shape and size much resemble those of the *platanus*.

PLATE, *(Cycl.)* a term used by our sportsmen to express the reward given to the best horse at our races.

The winning a *plate* is not a work of a few days to the owner of the horse, but great care and preparation are to be made for it, if there is any great dependance on the success. A month is the least time that can be allowed to draw the horse's body clear, and to refine his wind to that degree of perfection that is attainable by art.

It is first necessary to take an exact view of his body, whether he be low or high in flesh; and it is also necessary to consider, whether he be dull and heavy, or brisk and lively when abroad. If he appear dull and heavy, and there is reason to suppose it is owing to too hard riding; or, as the jockies express it, to some grease that has been dissolved in hunting, and has not been removed by scouring, then the proper remedy is half an ounce of diapente, given in a pint of good sack; this will at once remove the cause, and revive the creature's spirits. After this, for the first week of the month, he is to be fed with oats, bread, and split beans, giving him sometimes the one, and sometimes the other, as he likes best; and always leaving some in the locker, that he may feed at leisure when he is left alone. When the groom returns at the feeding time, whatever is left of this must be removed, and fresh given; by this means the creature will soon become high spirited, wanton, and full of play Every day he must be rode out an airing, and every other day it will be proper to give him a little more exercise; but not so much as to make him sweat too much.

The beans and oats in this case are to be put into a bag, and beaten till the hulls are all off, and then winnowed clean; and the bread, instead of being chipped in the common way, is to have the crust clean cut off

If the horse be in good flesh and spirits when taken up for its month's preparation, the diapente must be omitted; and the chief business will be to give him good food, and so much exercise as will keep him in wind, without over sweating or tiring his spirits. When he takes larger exercises afterwards, towards the end of the month, it will be proper to have some horses in the place to run against him. This will put him upon his mettle, and the beating them will give him spirits.

This, however, is to be cautiously observed, that he has not a bloody heat given him for ten days or a fortnight before the *plate* is to be run for; and that the last heat that is given him the day before the race, must be in his cloaths: this will make him run with greatly more vigour, when stripped for the race, and feeling the cold wind on every part. In the second week the horse should have the same food and more exercise, and in the last fortnight he must have dried oats, that have been hulled by beating; after this they are to be wetted in a quantity of whites of eggs, beaten up, and then laid out in the sun to dry; and when as dry as before, the horse is to have them. This sort of food is very light of digestion, and very good for the creature's wind. The beans in this time should be given more sparingly, and the bread should be made of three parts wheat, and one part beans. If he should become costive under this course, he must then have some ale and whites of eggs beaten together: this will cool him, and keep his body moist.

In the last week the mash is to be omitted, and barley-water given him in its place, and every day, till the day before the race: he should have his fill of hay, then he must have it given him more sparingly, that he may have time to digest it; and in the morning of the race-day, he must have a toast or two of white bread, soaked in sack, and the same just before he is led out to the field. This is an excellent method, because the two extremes of fullness and fasting are at this time to be equally avoided; the one hurting his wind, and the other occasioning faintness, that may make him lose. After he has had his food, the litter is to be shook up, and the stable kept quiet, that he may be disturbed by nothing till he is taken out to run.

PLATES, in gunnery. The *prise-plates* are two *plates* of iron on the cheeks of a gun-carriage, from the cape-square to the center, through which the prise-bolts go, and on which the hand-spike rests when it poises up the breech of the piece. Breast-*plates* are the two *plates* on the face of the carriage, one on each cheek. Train-*plates* are the two *plates* on the cheeks at the train of the carriage. Dulidge-*plates* are the six *plates* on the wheel of a gun-carriage, where the fellows are joined together, and serve to strengthen the dulidges.

PLATE-*longe*, in the manege, a woven strap, four fathom long, three fingers broad, and as thick as one. It is used for raising a horse's legs and sometimes for taking him down, in order to facilitate several operations of the farrier. Some improperly give the name of *plate-longe* to a martingale. See the article MARTINGALE, *Cycl.*

PLATEA, in zoology, the name of a bird of the long-necked kind, approaching to the nature of the stork and heron, and called

called in English the *spoon-bill*, from the remarkable figure of its beak, which is different from that of all other birds; being broadest at the extremity, and terminating in a large rounded, flat process. resembling a shovel; or, if it were hollow, a spoon. See Tab. of Birds, N°. 42.

This bird has been called *lucoredius*, *albardeola*, and *le'elaer*, and by some very improperly the *pelecanus*. It is all over very white, like the swan; but that there is some blacknefs in the wings It builds in high trees in some parts of Holland. *Ray*'s Ornithology. p. 212.

PLATESSA, in zoology, a name by which Aufonius and some other authors have called the paffer-fifh, or common plaife. *Willughby*'s Hift. Pifc. p. 96.

PLATFORM (*Cycl.*)—All practitioners are agreed, that no fhot can be depended on, unlefs the piece be placed on a folid *platform*; for if the *platform* fhakes with the firft impulfe of the powder, it is impoffible but the piece muft likewife fhake; which will alter its direction, and render its fhot uncertain. To prevent this accident, the *platform* is ufually made extremely firm to a confiderable depth backwards, fo that the piece is not only well fupported in the beginning of its motion, but likewife through a great part of its recoil. However, it is fufficiently obvious, that when the bullet is feparated from the piece, it can be no longer affected by the trembling of the piece or *platform*; and by a very eafy computation it will be found, that in a piece ten feet in length, carrying a bullet of 24 lb. and charged with 16 lb. of powder, the bullet will be out of the piece before it has recoiled half an inch; whence if the *platform* be fufficiently folid at the beginning of the recoil, the remaining part of it may be much flighter, fince its unfteadinefs beyond the firft half inch will have no influence on the direction of the fhot: and hence a more compendious method of conftructing *platforms* may be found out. New Princip. of Gunn. p. 42.

PLATIASMOS, a word ufed by many authors to exprefs a fault in pronunciation, owing to a perfon's opening his mouth too wide, and thence fpeaking indiftinctly.

PLATICORIA, a word ufed by medical writers to exprefs a preternatural dilatation of the pupil of the eye, ufually owing to a paralytic diforder.

PLATONIA, in natural hiftory, a name given by the modern Greeks to the *prox* of Ariftotle, and of other antient writers in that language. This is the *cervus platyceros*, or broad-horned ftag. Some have tranflated this *dama*, but they are to be underftood in this as meaning the *dama* of their own times, not that of the antients; that being the *ifarus*, or chamoy-goat, not any animal of the ftag kind, nor by any means meriting that title.

PLATYCERCOS *ovis*, in natural hiftory, the name given by Gefner and fome others to a fpecies of fheep, commonly called *ovis laticauda*, or the broad-tailed fheep.

The tail of this creature is very thick, broad, and heavy, weighing often thirty pounds. We fometimes fee it brought over hither as a fhew, and find that authors have defcribed the fhape of its tail very inaccurately. Caius, in Gefner, fays it is of the fhape of the tails of other fheep, broad at the infertion, and growing gradually fmaller to the end; but it is exactly the contrary of this, being narroweft at the infertion, and growing fomewhat larger and broader to the extremity; fo that on the whole, it reprefents a fort of bag or purfe. The creature is not uncommon in Ægypt, Africa, and Arabia, and in fome parts of Syria. *Ray*'s Syn. Quad. p. 74. See the article Macrocercos.

PLATYOPHTHALMON, a name given by fome to antimony, from its ufe among the ladies of old time, to make their eye brows broad and black

PLATYSTERNOS a word ufed by the old phyficians to exprefs a perfon with a very broad cheft or fternum.

PLATYRYNCHOS, in zoology, a name given by fome to the *nafus*, or *nefe*, a frefh water fifh, caught in the Danube, and moft of the large rivers in Germany, and much refembling the chub *Gefner* de Pifc. p. 213. See the article Nasus.

PLATYSMA *myodes*, in anatomy, a name given by Fallopius to one of the mufcles called by Albinus *latiffimus colli*, and by others *quadratus genæ*.

PLAUSUS, among the Romans. See Acclamation.

PLEA (*Cycl.*)—Plea, in abatement. See the article Abatement, *Cycl.*

PLEADING. Among the Athenians, an equal time was allowed both parties to *plead*, which was meafured by a water hour-glafs; and in order to fee juftice done in this refpect, there was an officer appointed to diftribute the water to each, whence he was called *ephydor*. Pott Arch. Græc. l. 1. c. 21 See Ephydor

PLEASURE-*boat*, among the antients. See Thalamegus.

PLECHAS, a word ufed by Hippocrates, to exprefs that region of the body which is terminated backward by the anus, forward by the pudenda, and fideways by the hips.

PLECTANÆ, a word ufed by fome to exprefs the cornua uteri, and by others for any plexus of veffels.

PLECTRONITÆ. See the article Conichthyodontes.

PLECTRUM, a word ufed by fome anatomical writers, to exprefs the ftyloide procefs of the os petrofum; by others for the uvula; and by others for the tongue.

Plectrum, among the antients, an inftrument ufed in playing upon the lyre. We have a defcription of it in Mem. Acad. Infcrip. Vol. V. p. 168, 169. See Lyre, *Cycl.*

PLEMMYROS, a word ufed by the old Greek writers to exprefs a redundance of humors: its proper fignification is the flowing in of the tide.

PLENNA, a word ufed by fome writers to exprefs any mucous humor.

PLEROSIS, a word ufed by the old Greeks to exprefs the repletion or reftoring the body to its natural ftate, after it has been emaciated by ficknefs.

PLESMONE, a word ufed by the antients to fignify plenitude or fatiety.

PLESTYA, in zoology, a name given by Bellonius to a frefh water fifh of the leather-mouthed kind, appearing to be no way effentially different from the more common kind of carcafius, called by authors *carcaffii tertium genus*. *Ray*'s Ichthyogr. p. 250. See Carcassius.

PLETHORA (*Cycl.*)—Medical writers now ufually diftinguifh four kinds of a *plethora*. 1. The fimple *plethora*, which is that ftate of the body in which the blood is too abundant in quantity, but is as yet of no bad quality. 2. The cacochymious *plethora*, which is that where the blood is abundant in quantity, and at the fame time is fubject to a too great thicknefs, or fome other dyfcracy. 3. The *plethora ad vafa*, whereby the blood, from its over great quantity, renders the veffels turgid, without any farther ill effect. And, 4. The *plethora ad vires*, in which there is joined to too great a plenitude of the veffels, a laffitude, and torpor, or numbnefs of the limbs.

The figns of a *plethora* are, 1. A florid conftitution of the body. 2. A tolerable ufe of the non-naturals, a good appetite to food, and a found fleep: this is the cafe while the *plethora* is fimple and unmoved, but when any commotion happens from without, the figns are inquietude at night, dreams of bleeding, and of wounds from fwords or other weapons, rubicund looks in the face, and a general turgefcence of the veffels, a heavinefs of the limbs, an inaptitude to motion, and difficulty of breathing, a vertiginous diforder of the head, a fenfe of a pricking or tingling in the flefh from the flighteft heat, an eafy heating of the body from the weather, a moifture of the eyes, and in hyfteric women a fenfation as if a piece of cold ice were fuddenly laid on fome part of the head.

Perfons moft fubject to a Plethora, are, 1. People of fedentary lives, who live high. 2. The younger rather than perfons more advanced in years. 3. The female fex rather than the men. 4. All perfons who have been accuftomed to large evacuations, and have haftily fuppreffed them. And, 5. Thofe perfons who have fuddenly changed a life of labour or exercife to a fedentary one, without making the neceffary changes in the non-naturals.

Prognoftics from a Plethora. 1. *Plethoric* perfons are more fubject to difeafes in general than others. 2. They are particularly fubject to hæmorrhages, inflammations, and acute fevers. 3. The lighter difeafes coming upon perfons of a *plethoric* habit, are ufually more ftubborn and dangerous than on others. 4. The *plethora* itfelf can fcarcely be called a difeafe, but it is the parent of many difeafes Chronic difeafes are with more difficulty cured in *plethoric* patients than in others, becaufe they are always averfe to exercife. 6. A *plethoric* habit, difturbed by violent motion, by paffions of the mind, or by ftimulating medicines, is capable of producing very terrible confequences. 7. The difeafes arifing from a *plethora*, from ftopping fome accuftomed evacuation, are with difficulty cured; and *plethoras* are more efficacioufly relieved by natural hæmorrhages than by any artificial means.

Method of cure in a Plethora. A fimple *plethora* is eafily removed by bleeding and gentle exercife, and by a more fpare diet; to thefe may be added, gentle purging once a month. The *plethora* with a cacochymy requires gentle purging, bleeding, and cuping, diaphoretics and diuretics. If a violent commotion of the blood happen with a *plethora*, temperance is to be firft prefcribed, then the ufe of nitre, and crabs-eyes faturated with lemon juice; and other cooling and alterative remedies. *Junker*'s Confpect Medic. p. 4.

PLEURISY *and* PERIPNEUMONY (*Cycl.*)—Thefe are two difeafes which have fome refemblance in their general fymptoms, and are thence fometimes miftaken one for the other. They are, however, extremely different in their place of origin, as well as in their feveral fymptoms: the *pleurify* being a ftafis of blood in the *pleura*; and the *peripneumony* a ftafis of the fame fluid in the lungs They are both attended with an acute, continuous, and inflammatory fever, by means of which nature is labouring to break through the obftruction made by the ftafis of the blood in thofe parts.

The fpurious *pleurify* is to be carefully diftinguifhed from thefe two difeafes. In the true *pleurify*, or *peripneumony*, a pain is felt either about or a little below the nipple; but the fpurious *pleurify* generally fhews itfelf higher, ufually about the clavicle. In the genuine difeafes the pains are equal and regular, anfwering to the pulfe: in the fpurious *pleurify* they are vague, and wholly irregular. In the true, they are alfo continual; but in the fpurious, they have frequent intermiffions and remiffions. The true have always a cough attending them, and

that usually attended with a spitting of coloured matter, often streaked with blood; but the spurious often has no cough at all attending it; or if it has, there is no difference seen in the matter voided by spitting. The true has always an acute continuous fever, which attacks the patient at first with a shivering; the spurious either has no fever at all with it, or it is at the utmost a slight and irregular one.

The true diseases do not terminate in less than seven days; the others much sooner. The true usually attack young people; the spurious are common to young and old. The difference between the true and spurious diseases, are determined by the observation of these symptoms; but it yet remains to distinguish justly the true diseases from one another. This is done by the following observations:

The *pleurisy* is a very rare disease; and the *peripneumony* a very common one; but this is exactly contrary to the common opinion, from these diseases being too generally confounded with, and mistaken for one another.

In a *peripneumony*, a spitting of blood usually happens about the close of the second day: this is a primary symptom in a *peripneumony*, but is usually erroneously attributed to a *pleurisy*, tho' reason shews how easily such a spitting may happen from an inflammation of the lungs; and it is very different to conceive how it should happen so readily from an inflammation of a part so remote from having any communication with the organs of expectoration as the pleura.

In the *peripneumony*, the pain extends itself farther, affecting the whole breast, whereas in the *pleurisy* it is rather fixed to the right side, and felt a little below the breast. These are the symptoms by which these diseases are distinguished from one another, and the use of the distinction is principally this, that in the *pleurisy* the application of external remedies often is of great service, whereas it is of no effect in the other case, tho' the mistake is of no great consequence in this respect as the applications in the *peripneumony* can do no harm: but in an unhappy termination of these diseases by suppuration, the distinction becomes of some consequence; since in the *pleurisy* the matter may be evacuated by a paracentesis, or the letting in a canula; which in the *peripneumony* can by no means be done, unless in such an accidental case that the disease terminates in an external *vomica pulmonum*: then indeed the matter being discharged from the abscess into the cavity of the thorax, may be let out in the same manner as in the suppurated *pleurisy*; but this is a case that does not occur in an age.

The usual opinion of medical writers, in regard to this case, is, that the *peripneumony* is always a disorder affecting only the external surface of the lungs; and they observe, that even its name expresses this, the signification of it being a distemperature spreading round about the lungs: this, however, is not agreeable to observation or experience; for in dissections of bodies that have died of this disease, the very internal part of the lungs is always found affected; and indeed if the surface only were so, it is not easy to conceive how the spitting of blood should come on so soon as the second day.

Signs of these diseases. These are in general common to both, and are the following: A vertiginous disorder of the head usually precedes all the other symptoms; this is succeeded by a shivering and chillness all over the body; this increases by degrees, and usually brings on with it cardialgias, nauseas, and anxieties: after this there comes on a very remarkable heat, with very intense thirst, and a violent pain in the head; this is accompanyed with a straitness of the breast, and difficulty of respiration; and the patient feels a violent and severe pain in the breast: and this becomes continual, and is always greatly exasperated by the cough that attends the disease. The urine in the first days is red, and after a few days more it becomes turbid, when it has stood to be cold; and finally deposits a thick pale-red sediment. The peculiar symptoms of each disease are already enumerated.

Persons subject to them. These are diseases not equally common to all ages, but they principally affect young people: they are most frequent in the beginning of the spring season, and mostly affect such as are of a sanguine plethoric habit. Persons who have been subject to bleeding at the nose, but have been for some time free from returns of them, often fall into these diseases; and in general men are much more subject to them than women.

Causes of them. These diseases are brought on by any thing that gives a violent commotion to the blood, such as immoderate exercise, the abuse of spiritous liquors, and violent fits of anger. The suddenly cooling the body when very hot, has also often occasioned them, by shutting the pores and forcing the blood inwards. The neglect of habitual bleedings may also occasion them; and they have been sometimes occasioned by blows, or other external injuries on the breast, and by the endeavouring to lift great weights.

Prognostics in them. All inflammatory fevers are dangerous; but the *pleurisy* and *peripneumony*, when they attack young persons, or such as are under thirty years of age, are attended with the least danger of any, provided that they are properly treated: when they affect persons advanced in years, they usually prove very dangerous, in spite of all the care and caution that they can be treated with.

When they have been treated in a judicious manner, they usually go off on the seventh, or at the utmost the eleventh day in copious sweats, which come on of themselves; after this crisis, the pulse in a very little time returns to its natural state, the violent heat goes off, and the strength, appetite, and sleep, return. When they go beyond the days of their crises, which is often the case in old people, they then become very dangerous. If the urine is observed to be turbid before the fourth day, and afterwards deposits a sediment, and the rest remain clear at the top, there is great hope that the disease will terminate happily, on the critical day, by a sweat. When a yellowish matter is thrown up by coughing, and is neither very viscid nor frothy, and particularly when in a *peripneumony* it is streaked with blood, there is great reason to expect that the disease will go happily off: but, on the contrary, when the patient cannot spit at all, and the urine continues crude, there is great reason to fear the disease will have a fatal period.

Finally, when a discussion and resolution of the stasis cannot be effected by nature, or obtained by art, a corruption and suppuration follows, and often an ulcerous disposition of the lungs, or true phthisis is the consequence.

Method of cure. The bowels are to be kept gently lax, during the whole course of the disease; but no irritating medicines must by any means be given to promote this. When there is a remarkable plethora with a narrowness of the breast, and a sensible stuffing up of the lungs, then bleeding is necessary; but a small quantity only should be taken away, and the same repeated the next day or oftener, if the same symptoms continue to require it: always after bleeding the patient must take some gently diaphoretic medicines, and drink plentifully of warm and weak liquors. In the usual and more common cases, bleeding is not necessary in these diseases, tho' so greatly recommended by some. Every day before noon it is proper to give two doses of the mixtura simplex, or some other such temperate diaphoretic, with large draughts of warm liquors; and in the afternoons the antifebrific powders of nitre, diaphoretic antimony, crabs eyes sated with lemon juice should be given; and emulsions are also very proper, made of sweet almonds and barley water, or of the seeds of carduus mariæ. When these medicines have been given for some days, if the pain continues still violent, the tincture of cascarilla must be taken; and in cases of the *pleurisy* cloths four or more times doubled and wetted in camphorated spirit of wine, are to be applied to the part. Plasters may also be applied occasionally, but they must not be suffered to remain on too long, lest they stop respiration; an equal regimen and perfect quietness is to be observed during the whole time of the disease; but particularly on the critical days, on which nature must be by no means ruffled or disturbed.

Authors differ greatly in their opinions about bleeding in this disease: some judge it absolutely necessary in all cases; and others wholly reject it in all. Etmuller observed, that bleeding in these diseases always gave the stasis a tendency to suppuration; others are of opinion, that it is to be done, or omitted, according to the peculiar indications in the case; and some throw aside all the dissolvent and discutient medicines, and rely on the volatile salts alone for the promoting sweats, and accomplishing the cure by that means alone, only observing, that if the disease will not yield to these, bleeding is to be added.

But the more rational practice seems to determine, that it is a rash attempt to endeavour to discuss a stasis already formed by hot medicines, which expand the blood, and seem calculated only to add to it; and that the natural state of the disease does not indicate bleeding, tho' the urgency of certain symptoms, such as straitness of the breast and infarctions of the lungs, in persons of plethoric habits, may render it necessary and beneficial.

Persons of very plethoric habits, who have died of these distempers, on dissection, have been found to have one side of the lungs so stuffed up with blood, that it would sink in water; and unquestionably in such cases bleeding is necessary.

Sydenham's method of curing by large and often repeated bleedings, and the use of gentle expectorants, is found very dangerous in its effects, and seems the only reproachable thing in the works of that excellent writer. And tho' Riverius gives an instance of a person cured of a *pleurisy* in a few hours, by bleeding alone, the account does not seem wholly to be depended upon; for some circumstances in the relation seem to shew, that the disease was not properly either a *pleurisy*, or a *peripneumony*, but an inflammation of the liver or stomach. Some people recommend the flowers of the common red poppies in these cases, as a specific remedy; but Etmuller allows them no such quality, but says they act in this case merely as a gentle opiate and anodyne; a sort of medicines very dangerous in these cases.

The seeds of carduus mariæ, or the milk thistle, are also by some recommended as specifics: it is very evident that they mitigate the pain; but the fever will always continue to its regular period on the seventh day.

Expectorating medicines, in general, are of no use in these cases, only if the spitting of a bloody matter do not succeed sufficient-

sufficiently by the fourth day, it may be neceſſary to give a doſe or two of ſomething of this kind; and to this purpoſe a decoction of hyſſop is preferred by many before all other medicines. Nitre is to be given boldly for the four firſt days; but after this, if the diſeaſe go on regularly, it is to be given in ſmaller quantities, and not oftener than twice in a day. All oily and fatty ſubſtances are to be excluded from external uſe, but camphor in any form is found to do ſervice.

Opiates in theſe caſes are dangerous; for as there is in all of them a tenacity of the blood, this ſtate of it requires concuſſion, reſolution, and excretion, but opiates effect the exact contrary of all theſe. Caſcarilla properly given, will almoſt always mitigate the pain; and when that fails of it effect it is certain that opiates cannot procure it, but muſt inevitably do harm. *Junck.* Conſp. Med. p. 297, ſeq.

Mr. Du Hamel found the polygala vulgaris of ſervice in promoting expectoration in *pleuriſies*. Med de l'Acad. Science. 1739.

Bliſters too, on the part affected, are ſaid to give great relief.

PLEUROCYSTUS, in natural hiſtory, the name of one of the general arrangements of the echini marini.

The word is derived from the Greek πλευρον, the ſide, and κυσις the anus.

The echini of this diviſion are diſtinguiſhed from the others, by having their anus neither on the ſummit, nor in any part of the baſe, but in ſome part of the ſuperficies of one of the ſides. *Klein's* Echin. p. 32.

PLEURONECTES, in ichthyology, the name of a genus of fiſhes of the malacopterygious kind, the characters of which are theſe: The branchioſtege membrane, on each ſide, contains ſix bones of a cylindric figure; and in the middle between theſe, but lower down, there are two others joined together at the end, but theſe are ſcarce conſpicuous. Both the eyes are placed in one ſide of the head; in ſome they are in the right ſide, and in others in the left. The eyes are covered with a ſkin. One ſide of the fiſh is always white, the other is ſpotted or obſcure.

Of theſe fiſh there are ſome which have a very ſhort ſpine at the anus, and the eyes uſually on the right ſide. The ſpecies of this ſort, enumerated by Artedi, are theſe: 1. The *pleuronectes oculis et tuberculis ſexa dextra capitis, lateribus glabris, ſpina ad anum:* this is the *plaiſe*. 2. The *pleuronectes* with the eyes on the right ſide, with rough ſcales, a ſpine at the anus, and obtuſe teeth. This is the fiſh we in England call the *dab*. 3. The *pleuronectes* with the eyes on the right ſide, altogether ſmooth. This is the *hippogloſſus* of Rondeletius; it is about a foot long. 4. The *pleuronectes* with the eyes on the right ſide, with the lateral lines rough, with obtuſe teeth, and with little ſpines at the origin of the fins. This is our *flounder*. 5. The *pleuronectes* with the eyes on the right ſide, with ſharp teeth and with the anus on the left ſide. This is the fiſh called *linguatula* at Rome, and the *pola* of Bellonius. 6. The oblong *pleuronectes* with the upper jaw longeſt, and ſcales rough on each ſide. This is the *bugloſſus* of authors, or the *ſole*. 7. The *pleuronectes* with the eyes on the right ſide, with a rough hoary body, and the lateral fins ſcarce viſible. This is brought from Amboina.

The other ſeries of the *pleuronectæ* have their eyes on the left ſide of the head, and have no ſpine, or ſcarce any at the anus. Of theſe Artedi enumerates the following ſpecies: 1. The ſmooth *pleuronectes*, with the eyes on the left ſide. This is the *rhombus non aculeatus* of Willughby, and is called the *pearl* in ſome parts of England, in Cornwall the *lugaleaf*. 2. The rough-bodied *pleuronectes*, with the eyes on the left ſide. This is our common *turbott*. 3. The left ſide-eyed *pleuronectes*, with prickly lateral lines. This is the *rhombus aculeatus* of authors. The lines on the ſide where the eyes are, are only prickly. *Artedi*, Gen. Piſc. 14.

The name is of Greek origin, and is derived from the words πλευρον, the ſide, and νηκτης, a ſwimmer; and expreſſes the peculiar and diſtinctive character of theſe fiſhes; which is, that they all ſwim on one ſide, not as other fiſhes.

PLEUROPNEUMONY, a name given by medical writers to a diſeaſe approaching to, and partaking of the nature of both the pleuriſy and peripneumony.

PLEURORTHNOPŒA, a term uſed by medical writers to expreſs that kind of pleuriſy in which the patient cannot breathe, unleſs in an erect poſture.

PLICARIA, in botany, a name uſed by ſome for the club-moſs. *Dale*, Pharm. 60.

PLICATED *leaf*, among botaniſts. See LEAF.

PLINIA, in botany, the name of a genus of plants, deſcribed by Plumier and Linnæus, the characters of which are theſe: The perianthium is ſmall, plane, and conſiſts of one leaf; the flower conſiſts alſo of one petal, which is plane, and is divided into five equal parts; the ſtamina are numerous filaments, very ſlender, and of the length of the flower; the antheræ are ſmall; the germen of the piſtil is ſmall; the ſtyle is ſubulated, and of the length of the ſtamina; the ſtigma is ſimple; the fruit is a large globoſe berry, of a ſtriated or ſulcated ſurface, containing only one cell, in which is a very large, ſmooth and globoſe ſeed. *Linnæi* Gen. Pl. 239. *Plumier*, Gen. 11.

PLINTHITIS, a kind of alum found in ſome of the iſlands of the Archipelago, and called alſo *placitis*, from its uſually being found in thin cakes.

PLINTHIUM, a name given by the antients to a machine invented for the making extenſion of diſlocated or fractured limbs. Oribaſius deſcribes ſeveral kinds.

PLITE *of lawn*, in our old writers, ſeems to be an antient meaſure, as a yard or ell, at this time: 'tis mentioned in the Stat. Ed. IV c. 5. *Blount*.

PLOMO, in metallurgy, a name given by the Spaniards, who have the care of the ſilver mines, to the ore of that metal when it is found adhering to the ſurface of ſtones, and incruſting their cracks and cavities in the form of ſmall and looſe grains of gunpowder. Tho' theſe grains be but few in number, and the reſt of the ſtone have no ſilver in it, yet they are always very happy in meeting with it, as it is a certain token that there is a very rich vein ſomewhere in the neighbourhood. And if in digging forwards they ſtill meet with theſe grains, or the *plomo* in greater quantity, it is a certain ſign that they are getting more and more near the good vein.

PLONKETS, in our old writers, a kind of coarſe woollen cloth. 1 Rich. III c 8. *Blount*, *Cowel*.

PLOTTING (*Cycl.*) – PLOTTING-*table*, in ſurveying, is uſed for a plain *table*, as improved by Mr. Beighten, who has obviated a good many inconveniencies attending the uſe of the common plain *table* See Phil. Tranſ Nº 461. Sect. 1.

PLOVER, *pluvialis*, in zoology. See the article PLUVIALIS.

This bird uſually flies in exceedingly large flocks in the places they frequent; people talk of twenty or thirty thouſand being ſeen in a flock. They generally come to us in September, and leave us about the end of March. In cold weather they are found very commonly on lands lying near the ſea, in queſt of food; but in thaws and open ſeaſons, they go higher up in the country.

They love to feed in ploughed lands, but never remain long at a time on them, for they are very cleanly in their nature; and the dirt which lodges on their beaks and feet, gives them ſo much uneaſineſs, that they fly to the neareſt water to waſh themſelves. When they rooſt, they do not go to trees or hedges, but ſit ſquatting on the ground like ducks or geeſe, far from trees or hedges, when the weather is calm; but when it is ſtormy they often get under ſhelter. In wet weather they do not ſleep in the night at all, but run about picking up the worms as they crawl out of the ground: during this feeding they are continually making a ſmall cry, that ſerves to keep them together, and in the morning they take flight. If in their flight they ſpy any others on the ground, they call them up; and if they refuſe to come, the whole body deſcends to ſee what food there is in the place that detains them.

The *plover* are very eaſily taken at the time of their firſt coming over, when they have not got any other birds mixed among them; but when they afterwards pick up the teal and other ſhy birds among them, it becomes more difficult. The beſt ſeaſon for taking them is in October; eſpecially in the beginning of that month: after this they grow timorous, and are not eaſily taken again till March, which is the time of their coupling. The ſevereſt froſts are not the beſt ſeaſon for taking them in neſts, but variable weather does better. The north weſt wind is found diſadvantageous to the taking of them; and in general great regard is to be paid to the courſe of the wind in the ſetting of the nets. All ſea-fowl fly againſt the wind when the land lies that way; and the nets for the taking them are therefore to be placed in a proper direction accordingly.

PLOVER-*ſtone*, in zoology, a name uſed in ſome parts of England for the godwit, or *ægocephalus* of authors. See the article ÆGOCEPHALUS.

PLOUGH (*Cycl.*)—The advantage of digging with the ſpade, or ſuch other inſtrument, very naturally led men to the invention of the *plough*, as a greatly more expeditious way of doing the ſame thing; that is, cutting and breaking the earth into ſmall pieces; but in this the ſpade has the advantage of the common *plough*, as it goes deeper, and divides the earth more minutely; but the improvement of the common *plough* into the four coultered one, ſhews that it is eaſy to make the *plough* perform this office as much better, as it uſually does it worſe than the ſpade.

The *plough* deſcribed by Virgil had no coulter; and at this time the *ploughs* in Italy and the ſouth of France, have none; and the *ploughs* in Greece, and in the eaſtern nations in general, are of the ſame kind Neither is it indeed poſſible to uſe a coulter in ſuch a *plough*; becauſe the ſhare does not cut the bottom of the furrow horizontally, but obliquely: in going one way it turns off the furrow to the right hand, but in coming back it turns it off to the left; therefore if it had a coulter, it muſt be on the wrong ſide every other furrow.

It is a great miſtake in thoſe who ſay that Virgil's *plough* had two earth-boards, for it had really none at all; but the ſhare itſelf always going obliquely, ſerved inſtead of an earth-board; and the two ears, which were the corners of a piece of wood lying under the ſhares, did the office of ground-wriſts. This faſhion of the *plough* continues to this day in thoſe countries; and in Languedoc this ſort of *plough* performs tolerably

bly well when the ground is fine, and makes a ſhift to break up light land. This is the ſort of land that is common in the Eaſt, and the arable lands about Rome, being never ſuffered to be fallow ſo long as to come to turf: this *plough* ſucceeds very well in ſuch places, but it would be wholly impoſſible to turn up what in England we call ſtrong land, with it.

The Engliſh *ploughs* are therefore different from theſe, as the ſoil is different. Our *ploughs*, where well made, cut off the furrow at the bottom horizontally; and therefore, it being as thick on the land ſide as on the furrow ſide, the *ploughs* cannot break it off from the whole land at ſuch a thickneſs (being ſix times greater than what the eaſtern *ploughs* have to break off) and for this purpoſe it muſt have, of neceſſity, a coulter to cut it off: by this means the furrow is turned perfectly whole, and no part of the turf of it is broken; and if it lie long without new turning, the graſs from the edges will ſpread, and form a new turf on the other ſide, which was the bottom of the furrow before the turning; but is now become the ſurface of the earth, and will ſoon become greener with graſs than it was before *ploughing*.

If whole, ſtrong, turfy furrows are *ploughed* croſs-ways, as is too commonly practiſed, the coulter cannot eaſily cut them; becauſe being looſe underneath, they do not make a proper reſiſtance or preſſure againſt its edge, but are apt to be drawn on heaps, and turned in all directions, but without cutting.

Some of our *ploughs* have heavy drags, with long iron tines in them; and tho' theſe broken pieces of furrows, being now looſer than before, require keener edges to cut them, theſe tines have no edges at all. Thus the clods of earth are toſſed into heaps again, and the ſurface left bare between them, and great labour and expence is uſed to very little purpoſe: all this is owing to the one coulter.

If the ſoil be ſhallow, it may be broken up with a narrow furrow, which will the ſooner be brought into tilth; but if it be a deep ſoil, the furrows muſt be proportionably enlarged, or elſe a great part of the good mould will be left unmoved, and ſo be loſt. The deeper the land is, the worſe it is broke by one coulter; that is, it is broke into larger furrows, and it requires ſuch repeated labour to conquer this, that often the beſt land will ſcarce pay the tillage.

This gives an opportunity to ſervants to cheat their maſters. They *plough* ſuch deep land with a ſmall furrow, and ſhallow, to the end that the turf and furrows may be broken the ſooner, and the ſuperficial part made fine. They pretend the *plough* will go deeper the next time; but this is never the caſe.

This ſort of land muſt not be *ploughed* the ſecond time in wet weather; for this will cauſe the weeds to multiply, and the earth will be formed into thick and heavy clods where trodden: and in dry weather, the reſiſtance of the untouched earth below, and the ſlight preſſure of the *plough* above, will always be reaſons why the *plough* will enter no deeper the ſecond time than it did the firſt.

Another way to conquer a ſtrong turf, is to plow it up firſt with a *breaſt-plough*, very thin; and when the ſwerd is rotten, then it is to be *ploughed* to the proper depth: but this method is liable to great objections; it is very troubleſome and expenſive, and if the turf be pared off in the winter, or early in ſpring, it is a chance but the rains come on, and ſet it to growing faſter than before: if, on the other hand, it be pared later in the year, tho' the turf be thoroughly killed by the ſucceeding dry weather, yet the time is loſt, and the farmer loſes the ſowing ſeaſon for wheat, which is the proper corn for ſuch ſtrong land.

The four-coultered *plough* is the proper inſtrument for the farmer to have recourſe to on this and many other the like occaſions. This is an improvement on the common *plough*, that makes it cut the pieces of earth into four; that is, it thus divides the earth four times as ſmall as the common *plough*.

The common two wheeled *plough* has of late years become univerſally uſed in many counties, and is found greatly preferable to the *ploughs* they uſed before; there is an objection to it, indeed, in regard to ſome ſtiff and miry lands, in which the wheels become clogged up, and cannot turn. This, however, is eaſily remedied by twiſting thumb ropes of ſtraw about the iron circle and ſpokes of the wheels; theſe ſpreading as they turn, and as the circle twiſt bears upon the ground, throw off the dirt, and never clog. The two principal parts of this *plough* are the head and the tail: the *plough*-head contains the two wheels and their axis, or ſpindle, paſſing through a box, and turning round both in it and in the wheels. There are fixed perpendicularly in this box, two crow-ſtaves, as they are called, which are flat and narrow boards, each having on it two rows of holes, whereby to raiſe or ſink the beam of the *plough*, by pinning up or down the pillow, to increaſe or diminiſh the depth of the furrow. Behind are a pair of gallows, through which the crow-ſtaves paſs at the top by mortaiſes, into which they are pinned; and to theſe are faſtened what are called the wilds, which are rings and crooks of iron, by which the whole *plough* is drawn in the working. From the box to the center of the beam there is carried an iron-chain, conſiſting of four, five, or more long links, and called the tow-chain: this faſtens the *plough*-tail to the *plough*-head. It is fixed to an iron collar, faſtened in the beam at one end, and at the other paſſes through a hole in the middle of the box, and is pinned in with a wooden pin.

From the ſame iron-collar to which the tow-chain is fixed, there is alſo another chain faſtened, called the bridle-chain: this runs above the beam, as the tow-chain does below it, and is compoſed of ſmaller and more numerous links. At the upper end, as the tow-chain enters the box of the *plough*, this bridle-chain is fixed to the top of what is called the ſtake of the *plough*: this is a perpendicular ſtick, carried up parallel with the left crow-ſtaff, and pretty near it, and faſtened to it by a wyth or rope, or by the end of the bridle-chain itſelf, when that is long enough. This ſtake is alſo faſtened in its lower part, under the gallows, to the ſame crow-ſtaff, by another wyth or piece of rope.

Theſe are the parts of which the head-part of the *plough* is compoſed. The *plough*-tail conſiſts of the beam carried from the head to the very extremity, and ſerving as the ſupport and baſe of all the reſt. A little below the collar to which the tow-chain and bridle chain are faſtened, this beam is pierced with a large hole, which lets through the coulter: this is a long and narrow piece, terminating in an edge, and reaching juſt to the ſhare; and it is fixed immoveably in its place by means of a wedge which is driven into the hole of the beam with it: the office of this coulter is to cut the earth as it is thrown up by the ſhare. Behind theſe, the ſame beam is pierced with two more holes, one very near its end: theſe give paſſage to two oblong pieces, called the fore-ſheat and hinder-ſheat, by which the *plough*-ſhare is ſupported in its place. To the top of the hinder-ſheat there is faſtened a ſhort handle by a wooden pin. Parallel to the hinder-ſheat there runs up a piece of wood of much the ſame form, called the drock; and to this is faſtened another horizontal piece, called the ground-wriſt: theſe are all on the right hand ſide of the *plough*, and parallel with the fore-ſheat. There runs another piece of much the ſame form with it, on the right hand; and the bottom of this is the earth-board. The long handle of this, which reaches as far that of the ſheat, is faſtened to the drock by a pin, the other end of which goes into the beam. Near the lower end of the fore-ſheat, there are two flat pieces of iron, which paſs from the two ſides of it up to the beam; and being let through it, are faſtened to the upper part by ſcrews and pins. Theſe keep the ſheat in its place.

The ſtructure of the four-coultered *plough* is different, in ſome reſpects from this, tho' in general founded on it. Its beam is ten foot long, whereas that of the common *plough* is but eight. The beam is ſtrait in the common *plough*, but in this it is arched in one fourth part of its length. near the *plough*-head. At the diſtance of three feet two inches from the end of the beam at the *plough*-tail, the firſt coulter, or that next the ſhare, is let through; and at thirteen inches from this, a ſecond coulter is let through: a third at the ſame diſtance from that; and, finally, the fourth at the ſame diſtance from the third, that is thirteen inches.

The crookedneſs of the upper part of the beam in this *plough* is contrived to avoid the too great length of the three foremoſt coulters, which would be too much, if the beam was ſtrait all the way; and they would be apt to bend and be diſplaced, unleſs they were vaſtly heavy and clumſy. Aſh is the beſt wood to make the beam of, it being ſufficiently ſtrong, and yet light.

The ſheat in this *plough* is to be ſeven inches broad. The fixing of the ſhare in this, as well as in the common *plough*, is the niceſt part, and requires the utmoſt art of the maker; for the well going of the *plough* wholly depends upon the placing of this. Suppoſing the axis of the beam, and the left ſide of the ſhare, to be both horizontal, they muſt never be ſet parallel to each other; for if they are, the tail of the ſhare bearing againſt the trench as much as the point, would cauſe the point to incline to the right hand, and it would be carried out of the ground into the furrow. If the point of the ſhare ſhould be ſet ſo, that its ſide ſhould make an angle on the right ſide of the axis of the beam, this inconvenience would be much greater; and if its point ſhould incline much to the left, and make too large an angle on that ſide with the axis of the beam, the *plough* would run quite to the left hand; and if the holder, to prevent its running quite out of the ground, turns the upper part of his *plough* toward the left hand, the pin of the ſhare will riſe up, and cut the furrow diagonally, leaving it half *unploughed*. To avoid this and ſeveral other inconveniences, the ſtrait ſide of the ſhare muſt make an angle upon the left ſide of the beam; but that muſt be ſo very acute a one, that the tail of the ſhare may only preſs leſs againſt the ſide of the trench than the point does.

The great thing to be taken care of, is the placing the four coulters; for on this the ſucceſs of the whole depends. Theſe muſt be ſo ſet, that the four imaginary planes deſcribed by their four edges, as the *plough* moves forward, may be all parallel to each other, or very nearly ſo; for if any one of them ſhould be very much inclined to, or ſhould recede much from either of the other, then they would not enter the ground together. In order to the placing them thus, the beam muſt be carefully pierced in a proper manner. The ſecond coulter hole muſt be two inches and an half more on the right hand than the firſt; the third muſt be as much more to the right of the

ſecond,

fecond, and the fourth the fame meafure to the right hand of the third: and this two inches and an half muft be carefully meafured from the center of one hole to the center of the other. Each of thefe holes is a mortaife of an inch and quarter wide, and is three inches and an half long at the top, and three inches at the bottom. The two oppofite fides of this hole are parallel to the top and bottom, but the back is oblique, and determines the obliquity of the ftanding of the coulter, which is wedged tight up to the poll.

The coulter is two foot eight inches long, before it is worn; the handle takes up fixteen inches of this length, and is allowed thus long, that the coulter may be driven down as the point wears away. *Tull*'s Horfe-hoeing Hufbandry, p. 132, feq. See COULTER.

Trenching-PLOUGH. See the article TRENCHING.

PLOUGH-*bote*, in our old writers, a right of tenants to take wood to repair *ploughs*, carts, and harrows, and for making rakes, forks, &c.

PLOUGH-*head*, a name given by the farmers to the foremoft half of the *plough*, or that part containing the two wheels and their fpindle, the box, the crow-ftaves, the pillow, the wilds, the tow-chain and bridle chain, and the ftake: all which, fee under their feveral heads, and under the article PLOUGH. *Tull*'s Hufbandry.

PLOUGH-*tail* a name given by the farmers to that part of a *plough* which contains the beam, the coulter, or coulters, the fhare, the fheat and under-fheet, the earth-board and handles, as alfo the drock, the ground-wrifts, and the retches: all which fee under their feveral heads, and under the article PLOUGH. *Tull*'s Hufbandry.

PLUKNETIA, in botany, the name of a genus of plants defcribed by Plumier, and called by this name in honour of Pluknet, the great Englifh botanift

The characters are thefe: It produces male and female flowers on the fame plants. The male flowers have no cup, but are compofed of four expanded petals of an oval figure, and in the place of ftamina, there is placed in the center of the flower a fhort pyramidal hairy body. The female flowers have no cup, and the petals in thefe are difpofed as in the male. The germen of the piftillum is fquare. The ftyle is flender, very long, and crooked. The ftigma is peltated and divided into four parts. The fegments are obtufe and flat, and each has a remarkable fpot in the center. The fruit is a depreffed fquare capfule, hollowed at all the angles: it contains four bivalve cells: the feeds are fingle, roundifh, and compreffed, and bluntly pointed at one end.

Linnæus obferves, that this fructification is very fingular, and is very defirous that fome perfon fhould examine carefully the growing plant, fince Plumier, who was not over curious about the nicer parts of the fructification of plants, may have in fome fort mifrepresented this. *Plumier* 13. *Linnæi* Gen. Pl. p. 517.

PLUM-*tree*, *prunus*, in botany. See PRUNUS.

All the fpecies of *plums* have within their fruit a hard ftone, within which there is contained a foft and tender kernel: this kernel contains the feminal plant, from which would be produced another tree of the fame kind, if it were fet in the ground; and it is very natural to fuppofe, that the only ufe of the thick ftone or hufk of this, was only to preferve its tender fubftance from rotting too foon in the earth, and to give it a proper time for developing its parts, to preferve its natural oilynefs during that time, and to furnifh from its own fubftance a proper nourifhment to the growing plant; for obfervation fhews, that it finally breaks into a very fine powder.

There has not been found any fpecies of *plum* which had not its kernel contained in a ftony coat of this kind, from whatever grafts they have been propagated; nor is there any art known by which the kernel of this fort of fruit can, while growing, be deprived of its coat.

Mr Marchand, however, in the year 1735, fhewed before the academy of fciences at Paris, certain *plums*, whofe kernels had no ftone or fhell round them; and found that they grew upon a tree which never had produced any others, and which had been known to produce fuch for twenty years. The kernel in thefe was covered with a reddifh fkin, which was rough to the touch; and within that, with another which was thinner and white. The kernel had nothing particular in it, except that it carried on one fide of its outer furface, and that always in the fame place, a little ftony prominence, more or lefs dented on its convex part: this is ufually a twelfth of an inch broad, and two thirds of an inch long, and has no other appearance but that of a diftempered part of the kernel, only that all the kernels have it.

The thick wrinkled fkin which furrounds the kernel, feems in this cafe to fupply the place of the ftone or hard fhell; and in this alfo it refembles it, that the pulp of the fruit parts eafily and readily from it; and the hard oblong body, which is placed on one fide of the kernel, is by no means proper for this purpofe. Mem. Acad. Scienc. Par. 1735.

All the forts of *plums* are propagated by budding, or grafting them upon ftocks of the mufcle-*plum*, the white pear-*plum*, the St. Julian, or the bonum magnum. See the article INOCULATING.

Budding is much properer than grafting for thefe trees, as they are apt to throw out a great deal of gum from the wound: and the trees fhould be no more than one year's growth from the bud, when they are tranfplanted; for if they are more they feldom fucceed well, being very fubject to canker; and if they efcape that, they ufually produce only two or three luxuriant branches. The whole management of planting and pruning them is the fame with that of peaches. See the article PEACH.

If the walls againft which they are planted are low, they fhould be fet eighteen feet afunder; if they are higher, then fourteen or fixteen.

Plums fhould have a middling foil, for they feldom fucceed well either in too moift or two dry a one; and when planted againft walls, fhould have an eaft or a fouth-eaft profpect. If they have one at full fouth, they are apt to fhrivel up, and mealy.

Plums in general fucceed very well with proper care on efpaliers; they will alfo bear very well as ftandards, but the fruit will not be fo well tafted. *Plums* do not only produce their fruit on the laft year's wood, but alfo on fpurs that come out of the wood of two or three years old. It is a common error to be too free with the knife in the winter-pruning, cutting off the extremities of all the branches; the confequence of which is, that there are an over quantity of young fhoots produced, and the fruit is fmall and poor. *Miller*'s Gard. Dict.

PLUMBAGO, *leadwort*, in botany, the name of a genus of plants, the characters of which are thefe: the flower confifts of one leaf, and is of a funnel-fhape, and divided into fegments at the edge. The cup is tubular, and from it arifes a piftil, which is fixed like a nail to the lower part of the flower, and afterwards ripens into an oblong pointed feed, which remains in the cup to ripen.

The fpecies of *plumbago*, enumerated by Mr. Tournefort, are thefe: 1. The ordinary *plumbago*, called by fome *lepidium* and *dentillaria*. 2. The white flowered *plumbago*. 3. The American *plumbago*, with a large beet-like leaf. 4. The prickly climbing American *plumbago*, with a fmaller beet-like leaf. *Tourn.* Inft. p. 140.

PLUMBAGO, in the hiftory of the gems, a word ufed by the Roman authors to exprefs a blemifh common to their worfe kinds, and greatly debafing their value. It was a fort of bluifh or blackifh deadnefs in the ftone, which mixed itfelf with the other colour, be that what it would, and rendered it dull and dead. The emerald was of all the other gems the moft fubject to this fault; and in this cafe, its fine green colour was always rendered cloudy and bluifh; and in fome lights the ftone appeared of a dufky greyifh blue, with no green at all in it. The Bactrian emeralds, which were in great efteem with the antients, were often fubject to this imperfection; and thofe of Cyprus, taken out of the coppermines, tho' fubject to many other imperfections, were ufually quite free from this.

PLUMBAGO, in mineralogy, a name given by many authors to a fort of foffil, having very much the appearance of a lead-ore, but not fuch in reality.

It is called alfo *galena*, *blende*, and *mock-lead*. It is ufually of a plated texture, and dark blackifh blue colour, like the lead-ores; but on trial yields no metal. See BLACK-*lead*.

PLUMBATA, among the antients, a kind of fcourge, the thongs of which were armed with leads. *Pitifc.* in voc.

PLUMBATÆ likewife fignified leaden balls, ufed by foldiers to annoy the enemy with; whence the foldiers were called *martiobarbuli*. *Pitifc.* in voc.

PLUMBUM (*Cycl.*)—PLUMBUM *nativum*, *native lead*. It is pretended by fome, that the famous *lead*-mineral, found near Freyung, in the Upper Palatinate, is *native lead*: but this is an error; we have an account of it in the philofophical tranfactions, which does not give any ground for this thought. All that is there faid of it, is, that it was at that time much efteemed among the affayers of metals, as containing no mixture of any other metal with the *lead*: this might well recommend it to them, as faving much confufion, or much trouble in feparating its heterogene contents; but it is faid exprefly there, that it is an ore, not a *native* metal: there being two kinds of it, one a chryftalline ftone, almoft all pure *lead*; the other not fo rich, but of a more rough and coarfe texture. Neither of thefe could be *native lead*; and it is remarkable, that they had lefs appearance of being fo than many of our common ores. Phil. Tranf Nº. 3. See the article LEAD.

PLUMBUM *uftum*. See LEAD, *Cycl.* and *Suppl.*

PLUMERIA, in botany, the name of a genus of plants, the characters of which are thefe: the flower confifts of one leaf, and is of the funnel-fhaped kind, and divided into feveral fegments at the edges. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. This finally becomes a podded fruit, ufually double; and when ripe, opening in the middle, and difcharging a number of oblong foliated feeds, which were placed like fcales over one another in the feed-veffel, and affixed to a placenta.

The fpecies of *plumeria*, enumerated by Mr. Tournefort, are thefe: 1. The *plumeria* with a rofe-coloured and very fweet flower. 2. The fnow-white-flowered *plumeria*, with long, narrow, and pointed leaves. 3. The *plumeria* with fnow-white flowers, and fhort obtufe leaves. *Tourn.* Inft. p. 659.

PLUMMER's *Æthiops.* This medicine is compofed of the fulphur auratum antimonii and calomel, commonly in equal parts; but this may be varied occafionally, according to the phyfician's difcretion. Thefe two powders muft be well levigated together, by which the bright red colour of the fulphur is changed into a dufky brown. We refer to the Medical Effays of Edinburgh, for the dofe, regimen to be obferved, and effects of this medicine; as alfo for the manner of preparing the fulphur of antimony according to Angelus Sala, which is faid to be preferable to the common method. See Med. Eff. Edinb abridg Vol. I. p. 205. and feq.

This medicine has been found greatly beneficial in cutaneous eruptions, in venereal infections, and in gleets remaining after the cure of a gonorrhœa. It operates by carrying off the excrements of diftempers by infenfible perfpiration or fweat It has alfo been found fuccefsful in obftinate glandular fwellings See Med. Eff. abrid ibid. and alfo Vol. II. p. 433.

PLUMMING, among miners, a term ufed to exprefs the ufing a mine dial, in order to know the exact place of the work where to fink down an air fhaft, or to bring an adit to the work, or to know which way the load inclines when any flexure happens in it.

It is performed in this manner: A fkilful perfon with an affiftant, and with pen, ink, and paper, and a long line and a fun dial, after his guefs of the place above ground defcends into the adit or work, and there faftens one end of the line to fome fixed thing in it, then the incited needle is let to reft, and the exact point where it refts is marked with a pen: he then goes on farther in the line ftill faftened, and at the next flexure of the adit he makes a mark on the line by a knot or otherwife; and then letting down the dial again, he there likewife notes down that point at which the needle ftands in this fecond pofition. In this manner he proceeds from turning to turning, marking down the points, and marking the line till he comes to the intended place; this done, he afcends and begins to work on the furface of the earth, what he did in the adit, bringing the firft knot in the line to fuch a place where the mark of the place of the needle will again anfwer its pointing, and continues this till he comes to the defired place above ground, which is certain to be perpendicularly over the part of the mine into which the air fhaft is to be funk.

PLUMOSE *antennæ*, in natural hiftory, a term ufed to exprefs the *antennæ*, or horns of certain moths and butterflies, which are formed in the manner of feathers, being compofed of a ftem and fibres, iffuing on each fide from it: thefe are jointed and moveable any way, and even the fmall fibres, at their fides, are jointed at their bottom, and are moveable, but they move all together. *Reaumur's* Hift. of Infects. See the article FEELERS.

PLUNGE, in the manege. See the article ESTRAPADE.

PLURIES, a writ that iffues in the third place after two former writs have been difobeyed; for firft goes out the original writ or *capias*, which if it has not effect, then iffues the *alias*; and if that alfo fails, then the *pluries*. Old Nat. Br.33.

It is ufed in proceedings to outlawry, and in great diverfity of cafes. *Tabl. Reg. Writs. Blount, Cowel.*

PLUVIALIS, in zoology, the name by which Latin authors call the *plover*, a bird of which there are two kinds, the green and the grey.

The *green plover* is fomewhat larger than the lapwing, and is all over, on the upper parts, of a blackifh colour, variegated with very numerous fpots of a yellowifh green; its breaft is of a mixed brownifh and yellowifh green, and its belly is white: this is very much efteemed at table.

The *grey plover* is of the fame fize with the green, and is, on the upper parts, of a black colour, variegated with a pale greyifh green; and its breaft, belly, and thighs, are white. This is very common in Italy, as well as in England, and is efteemed nearly equal to the green at table. *Ray's* Ornithology, p 229.

PLUVIALIS *major*, in zoology, a name given by fome authors to the *limofa*, a bird in fome refpects refembling our redfhank, but larger and longer legg'd. *Aldrovand.* l. 20. c. 66. See the article LIMOSA.

This bird is alfo called the *glottis* and *totanas*.

PLUVIALIS *levis*, in zoology, a name given by many to the common green *wood-pecker*, the *picus viridis* of authors, called alfo in Englifh the *rain-fowl*, from an obfervation of its always being moft clamorous when rain is coming on. *Ray's* Ornithology, p. 93.

PLYMOUTH *marble*, among our artificers, a term ufed for a fort of *marble* dug in great plenty about Plymouth, and in fome other parts of Devonfhire, where it lies in very thick ftrata, and whence it is brought in large quantities to us; and when wrought looks little lefs beautiful than fome of the Italian *marbles*.

It is very hard and firm, and of a beautiful texture; its ground is a bluifh white, and its variegations are principally a pale red, and in fmaller quantities brown and yellow: thefe lie in very orderly beds, and often there is a very agreeable glow of a faint red diffufed thro' the whole fubftance. It is remarkably even in its whole ftructure, and is therefore capable of a more than ordinarily elegant polifh.

PLYNTERIA, πλυντήρια, in antiquity, a feftival in honour of Aglaurus, the daughter of king Cecrops, or rather of Minerva, who had from that lady the name of Aglaurus. For the ceremonies obferved at this folemnity, fee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 425.

PNEUMATODES, a word ufed by Hippocrates to exprefs a perfon who fetches his breath fhort and quick; and fometimes for one who has his belly or ilia much diftended by flatulencies. *Pneumatias* is alfo ufed in the fame double fenfe.

PNEUMATOMPHALOS, a word ufed by Hippocrates to exprefs a perfon who has a windy or flatulent rupture of the navel.

PNEUMONANTHE, in botany, a name given by many botanical writers to a fpecies of *gentiana*, called alfo by fome the *calathian* violet. See the article GENTIANA.

PNEUMONICS, in medicine, a term ufed for fuch things as are good for the lungs.

PNIGITIS *terra*, in the materia medica of the antients, a name given at different periods of time, to two different fpecies of earth; the *terra pnigitis* of Diofcorides and Pliny, being a grey marle, and the *pnigitis* of Galen a black clay.

The laft of thefe is a very valuable aftringent, and is found in many parts of this kingdom, particularly in the neighbourhood of London, and well deferves to be introduced into the practice of phyfic. *Hill's* Hift. of Foff. p. 35.

PNIGMOS, in medicine, any kind of fuffocation, from whatever caufe; it is very often ufed to exprefs that of hyfteric fits in women.

PNIX, a word ufed by phyficians to exprefs the fuffocation from hyfteric fits, or any other caufe.

POA, in the Linnæan fyftem of botany, the name of a diftinct genus of plants of the grafs kind, the characters of which are, That the calyx is a glume compofed of two valves, containing feveral flowers difpofed in a two-rowed oval, or oblong fpike; the valves oval and pointed, but without awns. The flower is compofed of two oval and pointed valves; thefe are hollowed, compreffed, a little longer than the valves of the cup, and without beards or awns; the ftamina are three capillary filaments; the antheræ are fplit at their ends; the germen of the piftillum is roundifh; the ftyles are two, reflex and hairy; the ftigmata are hairy alfo; the flower adheres clofely to the feed, and does not open to let it out; the feed is fingle, oblong, and pointed at both ends, and fomewhat flatted. *Linnæi* Genera Plant. p. 20.

POAKE-*root*, in Virginia, is ufed to denote the folanum bacciferum. The Indians ufe it for a purge, tho' commonly deemed a poifon. Phil. Tranf. N° 454. Sect. 1.

POCHARD, in zoology, the name of a fpecies of wild duck, called by fome the *penelops* and *rothals*, and by many in Englifh the red-headed *widgeon*.

It is larger than the common *widgeon*, and is fhorter and thicker bodied. The back and wings are grey, and beautifully variegated with grey and black ftreaks. The lower part of the neck, as alfo the rump, are black, but the whole head, and a great part of the neck, are reddifh; the throat is white, variegated with yellow; and the breaft and belly fomewhat brown: but the great diftinction of this bird from all the other ducks is, that the wings are all of the fame colour without variegation. *Ray's* Ornithol. p. 288.

POCKET *(Cycl.)*—POCKET, in the wool trade, a word ufed to exprefs a large fort of bag, in which wool is packed up to be fent from one part of the kingdom to another.

The *pocket* contains ufually twenty-five hundred weight of wool.

POCKET *inftruments*, in furgery, are fuch as a furgeon ought always to have in readinefs, and may conveniently carry about him in a proper cafe: thefe are two lancets of different fizes; the one proper to open abfceffes, the other fmaller, for bleeding; a pair of ftrait fciffars, ufeful on many occafions; a pair of crooked fciffars, proper to be ufed in dividing fiftulæ, and in feveral other cafes; a pair of forceps with teeth at one end, to remove dreffings, and upon occafion to extract fplinters or thorns; thefe are alfo ferviceable to the furgeon in his anatomical exercifes; they are commonly made of fteel, but thofe of filver are much neater; a razor; a ftrait incifion knife; a crooked incifion knife; a ftrait double-edged incifion knife; a probe with one end broad and thin, proper for difcovering a fiffure in the cranium, and of many other ufes; and the other end rounded, to examine the depth and fituation of wounds and ulcers. The neateft probes are made of filver, tho' they are frequently made alfo of fteel, ivory, or whalebone; a grooved probe or director, to direct the edge of the knife or fciffars in opening finufes or fiftulæ; that by this means the fubjacent veffels, nerves, and tendons, may remain unhurt. The upper end of this inftrument, fometimes, is ornamented, and ferves only for a handle; fometimes it is made in form of a fpoon, to contain powder to fprinkle upon wounds or ulcers; fometimes alfo this is made forked at the end, to divide the frænum of the tongue; a fpatula to deprefs the tongue, in order to examine the ftate of the tonfils, uvula, and fauces, when they are affected with any diforders; it is alfo ufed to fufpend the tongue when the frænum is to be divided; for which purpofe it is to be made with

with a fiffure at its extremity, and fhould therefore rather be made of filver than of any other metal. Befide thefe, there fhould be an ordinary fpatula for fpreading plaifters, ointments, and cataplafms; and fometimes by means of their fulcated extremity they are of fervice in raifing up fractured bones of the cranium; feveral needles muft alfo be kept here, fome ftrait and others crooked, for the ftitching up of wounds, taking up of arteries, and many other ufes. *Heifter*'s Surg. p. 12.

POCKET *medicines*. See the article MEDICINE.

POCO *allegro*, in the Italian mufic, is not fo faft as *allegro*.

Poco *largo*, intimates to play or fing a little flow. See LARGO.

Poco-*meno allegro*, is ufed to fignify that the part it is joined to fhould be placed or fung in a little lefs gay manner than *allegro* requires.

Poco *prefto*, ferves to let us know that we ought to fing or play the part to which it is annexed, not quite fo quick as *prefto* requires it fhould.

POCUMMA, in botany, a name given by the people of Guinea, to a fpecies of plant which they ufe as an aftringent. Their manner of taking it is very fingular; for they put the leaves among their dough, and bake them into a mafs with the bread, and then eat the whole together in their food. Phil. Tranf. N° 232.

POD, among botanifts, a fpecies of *pericarpium*, confifting of two valves which open from the bafe to the point, and are feparated by a membranaceous partition, from which the feeds hang by a kind of funiculus umbilicalis. See PERICARPIUM.

PODAGRA, a fpecies of the gout. See the article GOUT.

PODAGRA *lini*, in botany, a name given by fome of the later Greek writers to *cufcuta*, or *dodder*, when found growing on the linum or flax. The Latins have called this *epilinum*, as they do the dodder growing on thyme *epithymum*; the earlier Greeks called this *linozoftes*. Where this dodder takes root in a field of flax, it generally occupies many plants; and where it twines round them it caufes protuberances and fwellings, and has therefore been refembled to the gout on that plant.

PODAGRARIA, in botany, a name given by many authors to the leffer wild *angelica*, called alfo *herba Gerardis*. *Parkin.* Theat. p. 943.

PODERIS, in antiquity, a robe hanging down to the feet; but it is chiefly ufed to exprefs a linnen garment, a furplice, a fhirt. The Jewifh priefts were covered with this kind of long furplices, during the time of their attendance in the temple; and this was the proper habit of their order. *Calmet*, Dict. Bibl.

The word is Greek ποδήρης, from πους, pes, and ἄρω, apto. Vid *Hederic*. Lex. man. Græc. in voc.

PODICEPS, in zoology, a name given by many to the feveral kinds of *colymbi*, or *divers*, as they are alfo called in Englifh *arfe foots*; from their legs being placed very backward on their bodies, by which means they have great advantages in fwimming and diving. *Ray*'s Ornithol. p. 256. See the article COLYMBUS.

PODISMUS, Ποδισμος, among the Greeks, a certain fpace, or number of feet laid out by furveyors; it was the fame with what the Romans called *pedatura*. *Pitifc.* in voc. See the article PEDATURA.

PODIUM, in the theatre of the antients, the wall that feparated the orcheftra from the fcene. Mem. de l'Acad. Vol. I. p. 190. See ORCHESTRA and SCENE, *Cycl.*

POEANOPSIA, Ποιανοψια, in antiquity, a name fometimes given to the feftival Pyanepfia. See PYANEPSIA, *Cycl.*

POENITENTES, in the church of Rome, a defignation given to heretics, who being admonifhed by the ecclefiaftical judge, have abjured their errors, and given fufficient fatisfaction to the bifhop or inquifition. Confifcation of goods is a punifhment common to all heretics; but if they confefs and abjure of their own accord, without being formally profecuted, this part of their punifhment is ufually remitted. *Hofm.* Lex. Univ. in voc. See INQUISITION, *Cycl.*

POGGE, or CATAPHRACTUS, in zoology, the name of a fmall fea-fifh, caught in the Englifh and fome other feas.

It feldom grows to more than five inches in length; its head is of a triangular figure, and flatted, and is very broad, and is furrounded at the fides with a number of tubercles; the forepart toward the mouth has a number of extremely fine hairs, and the hinder part armed with a number of prickles; the points of which are directed backwards. Its fnout is fhort, and armed with four points; the two anterior ones refembling a horned moon, and the others being prickles with their points turned backwards. The mouth is in the lower part of the head, and is of a femi-circular form, and has two beards at its angles, and a number of hairs under its chin.

The body of this fifh, near its head, is flatted and of an octangular form; near the tail it is hexangular, and is of a brownifh colour variegated with black fpots. It is covered all over with bony fcales, in the middle of which there rifes a crooked tumor; which being continued thro' the whole number, makes the body of an angular form: toward the tail it grows very flender. It has two fins at the gills, two more on the belly, and two on the back, all fpotted with black fpots; and its tail ends in a fmall rounded fin. It has no teeth, but very rough and rigid lips, and lives on fhrimps and other fuch food. It is a very well tafted fifh.

It is caught not unfrequently on the coafts of Yorkfhire, and in great plenty in the mouth of the Elbe. *Wilughby*'s Hift. Pifc. p. 212. See Tab. of Fifh. N°. 30.

There is an American *cataphractus*, much refembling this, but having three angles on the hinder part of its head, one on each fide, and the third in the middle; and its upper chap elliptic, and its mouth a little prominent. Its head is covered with a brown and bony helmet; and its back, fides, and tail, with fcales of the fame colour, engraven with fmall parallel lines, and of a rhomboidal figure. Its belly is covered with a thin limber fkin. *Grew*'s Mufeum, Soc. Reg. p. 117.

POGO, a name by which the inhabitants of the Philippine iflands call their *quail*: it is very like our common quail, but fmaller.

POINCIANA, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the rofaceous kind, and is ufually compofed of five petals arranged in a circular form, and filled up in the middle with a larger number of crooked ftamina. The cup is divided into five leaves, the lower of which is crooked and imbricated: from this arifes the piftil, which finally becomes a hard pod of a flatted fhape, which when ripe opens into two parts, and contains a number of roundifh feeds divided from one another by a fort of membranaceous partitions.

There is only one known fpecies of the *poinciana*, which is the plant called by many *crifta pavonis*, and purple-flowered *acacia*. *Tourn.* Inft. p. 619.

POINSON, in the manege, is a little point or piece of fharp-pointed iron, fixed in a wooden handle, which the cavalier holds in his right hand when he means to prick a leaping horfe in the croupe, or beyond the end of the faddle, in order to make him yerk out behind.

POINT, (*Cycl.*) in geometry, is the termination of a line, and cannot be conceived to have parts. See SURFACE.

Hobbes defines a *point* to be a body whofe magnitude is not confidered. But his falfe notions of a *point*, line, and furface, have led him into many errors. Monfieur de Crouzas alfo has fuppofed a line to be compofed of *points*, in his geometry and comment on the analyfe des infiniment petits. This fuppofition only tends to confound learners. See *Jo. Bernoulli* Oper. Vol. IV. p. 161, feq.

Conjugate POINT, in geometry, is ufed for that *point* into which the *conjugate* oval, belonging to fome kinds of curves, vanifhes. *Mac Laur.* Algebr. p. 308.

POINT *of contrary flexure*. The *points of contrary flexure* and reflexion of curves, are ufually determined by fuppofing the fecond fluxion of the ordinate to be nothing or infinite, that is, $\ddot{y}=0$, or ∞, or $dd y=0$, or ∞. See *L'Hopital* Analyfe des Inf. petits.

But this rule is liable to feveral exceptions, as is fhewn very fully and clearly by Mr. Mac Laurin in his Treatife of Fluxions, B. i. ch. 9. and B. ii. ch. 5. art. 866.

The ordinate y paffes thro' a point of contrary flexure, when, the curve being continued on both fides of the ordinate, $\dot{y}$ is a maximum, or minimum. But this does not always happen when $\ddot{y}=0$, or ∞. Mr. Mac Laurin obferves, in general, that if $\ddot{y}$, $\dddot{y}$, $\ddddot{y}$, &c. vanifh, the number of thefe fluxions being odd, and the fluxion of the next order to them having a real and finite value; then y paffes thro' a *point* of contrary flexure; but if the number of thefe fluxions that vanifh be even, it cannot be faid to pafs thro' fuch a *point*; unlefs it fhould be allowed that a double infinitely fmall flexure can be formed at one *point*. Lib. cit. art. 866.

The curve being fuppofed to be continued from the ordinate y, on both fides, if $\dot{y}$ be infinite, the extremity of the ordinate is not therefore always a *point* of contrary flexure, as $\dot{y}$ is not always, in this cafe, a maximum, or minimum; and the curve may have its concavity turned the fame way on both fides of the ordinate. But thefe cafes may be diftinguifhed by comparing the figns of $\dot{y}$ on the different fides of the ordinate; for when thefe figns are different, the extremity of y meeting the curve is a *point* of contrary flexure.

The fuppofitions $\dot{y}=0$, or ∞, and of $\ddot{y}=0$, or ∞, ferve to direct us where we are to fearch for the maxima and minima, and for *points* of contrary flexure; but we are not always fure of finding them. For tho' an ordinate or fluxion that is pofitive, never becomes negative at once, but by increafing or decreafing gradually, yet after it has decreafed till it vanifh, it may thereafter increafe, continuing ftill pofitive; or after increafing till it becomes infinite, it may thereafter decreafe without changing its fign. See *Mac Laurin*, art. 262, 867.

POINT *of reflexion*, in geometry, is commonly ufed inftead of *point* of retrogradation, or retrogreffion. See the article RETROGRADATION, *Cycl.*

The general rule given by the Marquis de L'Hopital, for finding the *point of reflexion* in curves whofe ordinates are parallel, is the fame as that for finding the *point* of contrary flexure, and confifts in taking the fecond fluxion of the ordinate of the curve, and fuppofing it nothing or infinite: but this rule admits of many exceptions. See *Mac Laurin*'s Fluxions, B. i. ch. 9. and B. ii. ch. 5.

POINT, in the manege. A horfe is faid to make a *point*, when in working upon volts, he does not obferve the round regularly; but pulling a little out of his ordinary ground, makes a fort of angle or *point* by his circular tread This fault is prevented by haftening the hand. See HASTEN.

POINT is alfo ufed to denote the toes of a bow of afaddle. See the article BOW.

POISON (*Cycl.*)—We are apt to extend the fignification of this word very far, our common acceptation of it taking in every thing which, taken into the body, is capable of deftroying or highly injuring it. Hence the number of *poifons* is greatly increafed upon the world, and the abufe of many things, naturally wholefome or ufeful in food or phyfic, brings them into the clafs of hurtful things. This, however, brings great confufion into the writings or difcourfe of fuch who ufe it; and the fenfe of the word *poifon* becomes very vague and uncertain from it. A draught of cold water drank by a perfon while very hot, has been known to caufe inftant death; and according to this rule, cold water fhould therefore be a *poifon*.

Poifons are diftinguifhed by fome authors by feveral names, according to the different time and manner of their taking effect.

Some are called *venena terminata*. Thefe are fuch *poifons* as perform their fatal office, according to the opinion of the world, at certain ftated or determinate periods of time: thus, according to the quantity given, or the nature of the fpecies of *poifon*, a man muft be killed by it at the pleafure of the giver, either in an hour, a day, a week, a month, many months, or years; the *poifon* in this laft cafe operating like a chronical difeafe, and carrying off the patient by a very tedious train of fymptoms.

Others are called *venena temporanea*, temporary *poifons*. Thefe will kill a man by degrees, every minute of his life growing worfe and worfe, from the time of taking them to the final period; but this is not at any ftated or certain time.

Others are called *delibutoria venena*. Thefe are fuch as kill without being taken internally, and are furely fatal if rubbed upon the fkin, put into gloves, or the like.

As to the firft of thefe kinds, it is very much to be doubted whether there be in nature any fuch thing as a *venenum terminatum*, or a *poifon* which fhall kill at the fixed time at which the giver pleafes; fince all the known *poifons* are only relatively fuch, and depend for their effect on the peculiar ftate of the body: the different conftitutions of men muft therefore vary the period of time at which death muft happen from the taking the fame dofe. At leaft, if it be poffible to contrive a terminatory *poifon*, it muft require the fkill of the ableft phyfician to prepare it, fince he muft at once know the true ftate of the perfon's body who is to take it, and the exact power of the *poifon*, in its feveral dofes, on other bodies.

Much, therefore, is required in the phyfician who is to cure a perfon who has fwallowed *poifon*; fince the nature of the medicine, and the true knowledge of the ftate of the patient's body, are both neceffary in order to know what fymptoms to expect and guard againft.

Of the number of thofe *poifons* which take a long time to kill, and that different, according to their dofe and the habit of the perfon, are the venom of the toad and of the mad dog, whether the faliva he communicated immediately to the blood by a wound, or fwallowed with food or with the fpittle. The *poifon* of the tarantula is alfo of this number; and to thefe may be added, that of the fmall pox, meafles, and other difeafes of that kind, which is evidently long dormant in the body, till certain peculiar occafions and accidents call it forth to appear in its proper form. The *poifon* of the hectic fever is alfo by fome referred to this, it being accounted an alkaline virus, mixed with a vifcid matter. The *poifon* of the French pox, *lues venerea*, is alfo of this kind, and is efteemed highly acrid and alkaline. The *poifon* of cantharides, the acid ones of nitre, falt, vitriol, fulphur; the folutions or cryftals of gold, filver, and the other metals; and the precipitates of mercury, and the very fatal common arfenic. To thefe are added many others, and among them fome which act merely mechanically, by their numerous fharp points and edges; fuch as the powder of diamonds, glafs, and the like: and to this clafs belong many of the delibutory *poifons*. *Stentzel* Toxicolog

Of the temporaneous *poifons* many are taken under the common denominations of food and drink, and feem at firft to be of no injury; but by degrees they impair the conftitution, and bring on difeafes and death. Coffee, Tea, and all the fpirituous liquors are accounted of this kind.

We may perhaps afcribe the prodigious multiplicity of *poifons*, and that equally numerous tribe of antidotes treated of by the antients, to the love of the marvellous: however, it cannot be denied, that fome things are very fuddenly and ftrangely deftructive to animal life, and that in very fmall quantities Among the reft, there is a *poifon* made ufe of by the Indians, fome of which was fent over to the royal fociety by Mr. de la Condamine: Dr Brocklefby has given us fome accounts of its effects on cats, dogs, and birds, who were foon killed by it, only by fprinkling a few drops of the folution of this *poifon* on wounds made by a lancet. The doctor gave alfo two drachms of fugar to a bird, and fhortly afterwards poured a little of the folution into its mouth; but two drops had fcarce touched its tongue, before the creature was convulfed, and could with difficulty be laid down before all motion was taken away.

Hence it appears, that fugar is no fpecific againft this *poifon*, even when only taken at the mouth. Phil. Tranf. N°. 482, Sect. 12.

The negroes ufe a *poifon* of an extraordinary nature The dofe is very fmall, and it hath no ill tafte; fo that, mixed with meat or drink, it is not perceivable. It caufes divers fymptoms, and the effects are various, according as the dofe is large or fmall. It kills fometimes in very few hours, fometimes, it is faid, in fome months, and at others in fome years. The fymptoms are according to the quantity given; if great, it caufes evacuations upwards and downwards; of excrements firft, then of humours, and laftly of blood with fainting fits and fweatings. Death follows in fix or feven hours. The negroes turn white. Phil. Tranf. N°. 462. p 3.

The antidote to this *poifon* is the root of the fenfible weed, as it is commonly called, or *herba fenfitiva*, in decoction. Id. ibid. p 4.

Vegetable POISONS. It has been a general complaint, and indeed too juft a one, that the qualities of plants are much lefs ftudied than their external appearances; and the beft modern authors have contented themfelves with nicely characterifing plants according to their flowers and feeds, and afcertaining the proper names to each, without at all enquiring how they might be beneficial or hurtful to mankind, or diftinguifhing whether they were fafe medicines or deftructive *poifons*. Nor, indeed, is the inveftigating the virtues of plants, yet untried as medicines, any eafy tafk; fince neither chemical analyfes, nor experiments on brutes, nor even the tafte and fmell, and other fenfible qualities of plants, can ever certainly affure us what effects they will have on the human body.

Chemical analyfes alter the fubftance too much to give any certain knowledge; and the effects things have on one animal are no affurance of what they will do to another, as is familiar to us in a thoufand inftances. Bitter almonds, and many other things, wholly harmlefs to us, kill birds; and goats will eat the tithymals, to give them an appetite when they want it, while thofe very plants are fatal to fifhes, and very dangerous to man. The fenfible qualities as often deceive us, of which we fhall give many inftances; and what fome have obferved of the botanical characters of plants, telling us their virtues, or that all of the fame clafs poffefs the fame qualities, is the moft erroneous, and, if trufted to, might prove the moft fatal of all opinions; fince the known *poifons*, hemlock, phellandrium, and water-dropwort, with the *poifonous* juice, are all umbelliferous plants, and confequently of the fame family with fennel and angelica.

Nothing can, indeed, affure us with any degree of certainty of the virtues of plants, but experiments made on ourfelves; but few are to be found who wifh fo well to the public, as to venture their own lives for its fervice: and perhaps the honeft Gefner is the only man who ever carried thefe attempts to any degree, and he unhappily died a martyr to them, perifhing by the dofe he took of the fcorpion-rooted doronicum; the very root which has of late with us been fo fatal, by being accidentally mixed with our gentian.

What we learn of the vegetable *poifons* muft therefore be either by the confequences of the rafh prefcriptions or miftakes of the ignorant pretenders to medicine, or by the misfortune of thofe who have unwarily eaten them.

We have accounts in the memoirs of the academy of fciences of Paris, of many things of this kind. An apothecary, a very honeft man, but of no knowledge in botany, had made his extract of black hellebore from the roots of the chriftophoriana, or bane-berries, a plant always accounted a *poifon*, and a fingle berry of which is capable of killing feveral animals; yet fo far had the fire divefted the roots of their *poifonous* qualities, that twelve grains of this given as extract of hellebore, proved of no ill effect. Mem. Acad. Scienc. Par. 1739.

Another apothecary having learned, that hermodactyls were the roots of a fpecies of colchicum, dried the roots of the common colchicum, and fold them in its place; yet there is no knowledge of any ill effects from them.

The enquiry into things of this kind has its ufe, and that no fmall one; fince *poifons* often differ only in dofe from medicines, and many of the vegetables efteemed *poifonous*, may perhaps be found ufeful remedies, with proper management and in proper quantities.

The laurel-leaves are well known to afford a *poifonous* water in diftillation, yet it is as well known that they have been long ufed in cookery, to give a tafte like that of bitter almonds to creams &c. and that without any ill effect. The rofe-bay, or oleander, is well known to be a *poifon* to goats, yet is taken by the country-men of ftrong and robuft habits as a purge, and that with very good fuccefs. Nay, opium, one of the greateft of all medicines, if it had firft been difcovered by perfons taking over-dofes of it, and dying by it, as they naturally muft have done, might very naturally have been recorded to us as a very fatal *poifon*.

The plumbago, or dentillaria of Rondeletius, is fo violent a cauftic, that a poor girl who once anointed herfelf with it, to

cure her of the itch, was flead alive by it; yet this properly managed, and infufed in oils, has proved one of the greateft of all remedies for cancers.

The fhrub ufed in dying, and called by the French *redoul*, by fome authors *coriaria*. and by others the myrtle-leaved *rhus*, is generally known to to the world only as a drug ufeful in the dreffing of leather; but Pliny, and fome other old writers, have given it the character of an ufeful external medicine, and a remedy againft *poifons*; yet with all this inattention of the moderns, and all the praifes of the antients, this plant is truly a very terrible *poifon*. The grown cattle refufe to feed upon it, but the young lambs and kids often eat of it in thofe parts of Europe where it is common; and if they eat the full-grown leaves, they are killed by it; if the young fhoots only, which is more ufually the cafe, they are then only affected with fpafms and a fort of drunkennefs, of which, after a few hours, they recover. Nor is this fingular to this *poifonous* plant, fince it is well known, that many plants, of very improper kinds for food, are yet eaten in their young fhoots: and Linnæus has recorded it of the Laplanders, that they even eat the young fhoots of the *poifonous* blue aconite, or wolf's bane; and even in France they eat the firft fhoots of the clematitis, or flammula repens, the full-grown leaves of which are of fo acrid a nature, that they ferve the beggars to eat ulcers in their arms and legs, to give them a pretended title to charity.

The *redoul* is not only a *poifon* to animals, but its fatal effects have been feen on the human fpecies. A girl in France, where it is very common, gathering its fruit among blackberries, eat of them, and died epileptic, in fpite of all the affiftance that could be given her: and another inftance is given from the Hotel Dieu at Paris, where an unhappy traveller, a robuft man, was brought in epileptic, and died fo; tho' the caufe was not known, except by a vomit which was given him bringing up fome of the berries of this pernicious plant, and fome more of them having been found in his ftomach when diffected. Mem. Acad. Scienc. Par. 1739.

POISON-*wood*, in botany. See TOXICODENDRON.

POLA, in zoology, the name of a flat fifh, fomething refembling the foal; but fhorter and fmaller, commonly called *cynogloffus* and *linguatula*. See CYNOGLOSSUS.

It is caught in the Mediterranean, and fold in Rome and Venice for the table. *Bellon.* de Aquat. Vol. I. p. 37.

POLAEDRASTYLA, in natural hiftory, the name of a genus of cryftals. The word is derived from the Greek πολὺς, many, ἕδρα, fides, the privative particle α, not, and στύλος, a column; and expreffes a cryftal compofed of many planes and having no column.

The bodies of this genus are cryftals compofed of two octangular pyramids, joined bafe to bafe, and confequently the whole body confifting of fixteen planes. Of this genus there are only two known fpecies: 1. A brown kind with fhort pyramids, found in confiderable plenty in Virginia on the fides of hills; and, 2. a colourlefs one, with longer pyramids. This has yet been found only in one place, which is the great mine at Goffelaer, in Saxony, and there ufually lies at great depths. *Hill*'s Hift. of Foff. p. 171.

POLE (*Cycl.*)—*Hop*-POLES, the upright pieces of wood that ferve for the hops to twift round and grow upon.

The number, length, and bignefs of the *poles* are to be regulated according to the bignefs of the hills, and their diftance, and the nature of the ground, and ftrength of the plants.

If the hills are wide, there muft be the more *poles*, fometimes four or five to a hill, or more than that; but if they ftand near, two may ferve for every hill. In hot, dry, and hungry ground, the *poles* fhould ftand nearer than in rich mellow land, where they are more fubject to grow grofs and heavy.

If the plants are ftrong, and the ground rich, the *poles* muft be both large and long, or elfe the crop will fuffer greatly: if the crop be poor, it is beft to have but few, and thofe fmall and fhort *poles*, otherwife the hop will eafily run itfelf out of heart, and the root will be impoverifhed.

The *poles* fhould never be made over long the firft year. The propereft wood for *hop-poles* is the afh or the alder, and if they have a fort of fork at the top, they will keep up the *hop* the better. The *poles* are to be difperfed between the hills, to be in readinefs; but they muft not be fet up till the plants begin to appear, that it may be known where they ought to be placed. This may be continued till the plants are a yard high, but it ought to be finifhed by that time, becaufe the plants will be ftunted or injured in their growth, if they have not fomething to fupport them when arrived at that heighth.

The *poles* muft be placed not in the hill, but near that part of it out of which each plant to be fupported grows. They muft be driven far enough into the ground, fo that they may rather break than be torn up. Their depth is to be judged by the nature of the ground, their own height, and their expofure to the wind. Let all the *poles* lean outward one from another, that they may feem to ftand at an equal diftance at the top, to prevent the choaking up the plants below; and they fhould always lean towards the fouth, that the fun may the better fhine in among them. A floping *pole* is always more ready to bear a quantity of *hops* than an upright one, and the fun fhines on more of the plants at once by means of it. It is always neceffary to keep fome fpare *poles*, by way of referve, to be ready in cafe of the others breaking; for in this cafe, the *hops* are foon fpoiled with lying on the ground. If a *pole* be over-burthened with *hops*, they may be unwound, and wrapped round a ftronger *pole* put in the place of the other.

The largeft fort of *hop-poles* fhould be twenty foot long, and nine inches in circumference, for hops at full growth; and they fhould be polled about fourteen days after the dreffing in of rich land. An acre of *hop* ground generally requires about three thoufand *poles*.

When the *hops* are grown to three foot high, they are to be conducted to fuch of the *poles* as are neareft, or have feweft *hops* on them; and they are to be wound about thefe *poles* according to the courfe of the fun, and tied to them loofely with fome rufhes, or with foft yarn: two or three ftrings are fufficient to each *pole*, and great care is to be taken that the young fhoots are not broken in the doing this; they are much more brittle in the morning than the heat of the day. During the months of April and May the plants are to be carefully attended, and kept turned round the *poles*; and when out of reach, a fork, ftick, or ladder are to be ufed to this purpofe.

About Midfummer they ufually leave running at length, and begin to branch; fuch as do not, fhould have the end broke off, to incline them to it, it being much to the advantage of the owner that they fhould branch out. From the middle of May to the end of fummer, the ground between the *poles* fhould be dug or turned up with a plough, to kill the weeds; and the earth about the hills raifed higher, to keep them moift. *Mortimer*'s Hufb. p. 177. See HOP.

POLEMARCHUS, Πολέμαρχος, among the Athenians, a magiftrate who had all the ftrangers and fojourners in Athens under his care, over whom he had the fame authority that the archon had over the citizens.

It was the duty of the *polemarchus* to offer a folemn facrifice to Enyalus, faid by fome to be the fame with Mars, but by others to have been only one of his attendants; and another to Diana, furnamed Αγροτέρα, in honour of the famous patriot Harmodius. It was alfo the bufinefs of the *polemarchus* to take care that the children of thofe who had loft their lives in their country's fervice, fhould have a competent maintenance out of the public treafury. *Potter*, Archæol. Græc. l. 1. c. 12. T. 1. p. 77.

POLEMONIUM, *polemony*, in botany, the name of a genus of plants, the characters of which are thefe: the flower confifts of a fingle leaf, and is of a rotated form, and divided into fegments at the edge. From the cup there arifes a piftil, which is fixed in the manner of a nail to the middle part of the flower, and finally becomes a roundifh fruit, or cafe, divided into three cells, which are full of oblong feeds.

The fpecies of *polemonium*, enumerated by Mr. Tournefort, are thefe: 1. The common blue flowered *polemonium*, called by fome *Greek-valerian*, with blue flowers. 2. The common white-flowered *polemonium*, or *Greek-valerian*, with white flowers. 3. The *polemonium* with variegated flowers, or *Greek-valerian*, with flowers ftriped with blue and white. *Tourn.* Inft. Bot. p. 146

POLETÆ, Πωληταὶ, among the Athenians, ten magiftrates, who together with three that had the care of the money allowed for fhews, had the power of letting out the tribute money, and other public revenues, and felling confifcated eftates; all which bargains were ratified in the name of their prefident. Befides this, it was their office to convict fuch as had not paid the tribute called Μετοίκιον, and fell them by auction. *Potter*, Arch. Græc. l. 1. c. 14. T. 1. p. 80.

POLGAHA, in botany, a name by which fome authors have called the cocoa-nut tree, or *palma Indica nucifera* of other writers. *Herm.* Muf. Zeyl. p. 50.

POLIA *lithargyrus*, a term ufed by Diofcorides to exprefs the white litharge, which we call litharge of filver.

The proper fenfe of the word *polia*, is hoary, or grey, and it very well expreffes the colour of this fubftance; but the commentators have not been fatisfied with this obvious meaning, but have made it *pelia*, and fome of them *ficelia*. See the article LITHARGE.

POLIEIA, Πολιεῖα, in antiquity, a folemnity of Thebes in honour of Apollo, furnamed πολιος, *i. e.* grey, becaufe he was reprefented in this city (contrary to the practice of all other places) with grey hairs. *Potter*, Archæol. T. 1. p. 426.

POLIIFOLIUM, in botany, the name of a genus of plants defcribed by Buxbaum, the characters of which are thefe: the flowers are monopetalous, of the bell-fafhioned globofe kind; the feed-veffel is divided into five parts, and contains a number of roundifh feeds; the leaves are like thofe of the poly-mountain, whence the name; the flowers refemble thofe of the arbutus, or ftrawberry-tree; and the fruit that of the ciftus.

The plant has been known among authors before, tho' ill-

 fpecies,

named and confounded with other genera; Ray has called it *fedum a but: fiore*. It properly belongs to the plants of the fhrub-kind, with dry fruits, and ought to be placed after the chamærhododendros, in the regular arrangements of plants.

Befide the common kind of this, there is an African one, the leaves of which are fhorter and rounder than thofe of this fpecies, and which may be called the fhort-leaved African fhrub *polyfolium*

POLIOPUS, in zoology, a name given by Aldrovand, and fome other authors, to the *grinetta*; a fmall bird of the moor-hen kind. See GRINETTA.

POLISHING (*Cycl.*)—POLISHING *of fhells*. This is an art of no long ftanding in the world, in its prefent perfection; and as the love of fea-fhells is become fo common among us, it may not be difagreeable to the reader to find fome inftructions in executing fo pleafing a method of adding to their natural beauty, and the rules for which are at prefent fo little known, tho' the effect of them be fo much efteemed.

Among the immenfe variety of fhells, which we are acquainted with, fome are taken up out of the fea, or found on its fhores in all their perfection and beauty; their colours being all fpread by nature upon the furface, and their natural *polifh* fuperior to any thing that art could give. Where nature is in herfelf thus perfect, it were madnefs to attempt to add any thing to her charms; but in others, where the beauties are latent, and covered with a coarfer outer fkin, art is to be called in, and the outer veil being taken off, all the internal beauties appear

Among the fhells which are found naturally *polifhed*, are the porcelanes, the caffanders, the dolia, or conchæ globofæ, the buccinums, the cornets, and the cylinders, or as they are generally, tho' improperly called, the rhombi; excepting only two or three, as the tiara, the plume, and the buttertub-rhombus; where there is an unpromifing film on the furface, biding a very great fhare of beauty within.

Tho' the generality of the fhells of thefe genera are taken out of the fea in all their beauty, and in their utmoft natural *polifh*, there are feveral other genera in which all, or moft of the fpecies are taken up naturally rough and foul, and covered with an epidermis, or coarfe outer fkin, which is in many rough and downy, or hairy. The tellinæ, the mufcles, the cochleæ, and many others are of this kind. The more nice collectors, as naturalifts, infift upon having all their fhells in their native and genuine appearance, as they are found when living at fea; but the ladies who make collections, hate the difagreeable outfides, and will have all fuch *polifhed*: it would be very adviseable, however, for both kinds of collectors to have the fame fhells in different fpecimens, both rough and *polifhed*; the naturalift would by this means, befide knowing the outfide of the fhell, be better acquainted with its internal characters than he otherwife could be, and the lady would have a pleafure in comparing the beauties of the fhell in its wrought ftate, to its coarfe appearance as nature gives it. How many elegancies in this part of the creation muft be wholly loft to us, if it were not for the affiftance of an art of this kind! many fhells in their native ftate are like rough diamonds, and we can form no juft idea of their beauties till they have been *polifhed* and wrought into form.

Tho' the art of *polifhing* fhells is a very valuable one, yet it is very dangerous to the fhells; for without the utmoft care the means ufed to *polifh* and beautify a fhell will often wholly deftroy it. When a fhell is to be *polifhed*, the firft thing to be examined is, whether it have naturally a fmooth furface, or be covered with tubercles or prominences.

A fhell which has a fmooth furface and a natural dull *polifh*, need only be rubbed with the hand, or with a piece of chamoy leather, with fome tripoli or fine rottenftone, and it will become of a perfectly bright and fine *polifh*. Emery is not to be ufed on this occafion, becaufe it wears away too much of the fhell. This operation requires the hand of an experienced perfon, that knows how fuperficial the work muft be, and where he is to ftop; for in many of thefe fhells the lines are only on the furface, and the wearing away ever fo little of the fhell defaces them. A fhell that is rough, foul, and crufty, or covered with a tartarous coat, muft be left a whole day fteeping in hot water: when it has imbibed a large quantity of this, it is to be rubbed with rough emery on a ftick, or with the blade of a knife, in order to get off the coat. After this, it may be dipped in diluted aqua fortis, fpirit of falt, or any other acid; and after remaining a few moments in it, be again plunged into comm n water. This will greatly add to the fpeed of the work. After this it is to be well rubbed with linnen cloths, impregnated with common foap; and when by thefe feveral means it is made perfectly clean, the *polifhing* is to be finifhed with fine emery and a hair brufh. If after this the fhell when dry appears not to have fo good a *polifh* as was defired, it muft be rubbed over with a folution of gum arabic; and this will add greatly to its glofs, without doing it any fort of injury. The gum-water muft not be too thick, and then it gives no fenfible coat, only heightening the colours. The white of an egg anfwers this purpofe alfo very well; but it is fubject to turn yellow. If the fhell has an epidermis, which will by no means admit the *polifhing* of it, it is to be dipped feveral times in diluted aqua fortis, that this may be eaten off; and then the fhell is to be *polifhed* in the ufual way with putty, fine emery, or tripoli, on the hair of a fine brufh. When it is only a pellicle that hides the colours, the fhells muft be fteeped in hot water, and after that the fkin worked off by degrees with an old file. This is the cafe with feveral of the cylinders, which have not the natural *polifh* of the reft.

When a fhell is covered with a thick and fatty epidermis, as is the cafe with feveral of the mufcles and tellinæ: in this cafe aqua fortis will do no fervice, as it will not touch the fkin; then a rough brufh and coarfe emery are to be ufed; and if this does not fucceed, feal-fkin, or as the workmen call it *fifh skin* and *pummice-ftone*, are to be taken in to affift.

When a fhell has a thick cruft, which will not give way to any of thefe means, the only way left is to plunge it feveral times into ftrong aqua fortis, till the ftubborn cruft is wholly eroded. The limpets, auris marina, the helmet-fhells, and feveral other fpecies are of this kind, and muft have this fort of management; but as the defign is to fhew the hidden beauties under the cruft, and not to deftroy the natural beauty and *polifh* of the infide of the fhell, the method of ufing the aqua fortis muft be this: A long piece of wax muft be provided, and one end of it made perfectly to cover the whole mouth of the fhell; the other end will then ferve as a handle, and the mouth being ftopped by the wax, the liquor cannot get in to the infide to fpoil it; then there muft be placed on a table, a veffel full of aqua fortis, and another full of common water.

The fhell is to be plunged into the aqua fortis; and after remaining a few minutes in it, is to be taken out and plunged into the common water. The progrefs the aqua fortis makes in eroding the furface is thus to be carefully obferved every time it is taken out: the point of the fhell, and any other tender parts, are to be covered with wax, to prevent the aqua fortis from eating them away; and if there be any worm-holes, they alfo muft be ftopped up with wax, otherwife the aqua fortis would foon eat thro' in thofe places. When the repeated dippings into the aqua fortis fhew that the coat is fufficiently eaten away, then the fhell is to be wrought carefully with fine emery and a brufh; and when it is *polifhed* as high as can be by this means, it muft be wiped clean and rubbed over with gum-water, or the white of an egg. In this fort of work the operator muft always have the caution to wear gloves, otherwife the leaft touch of the aqua fortis will burn the fingers, and turn them yellow; and often if it be not regarded, will eat off the fkin and the nails.

Thefe are the methods to be ufed with fhells, which require but a moderate quantity of the furface to be taken off; but there are others which require to have a larger quantity taken off, and to be uncovered deeper; this is called entirely fcaling a fhell. This is done by means of an horizontal wheel of lead or tin, impregnated with rough emery; and the fhell is wrought down in the fame manner in which ftones are wrought by the lapidary. Nothing is more difficult, however, than the performing this work with nicety: very often fhells are cut down too far by it, and wholly fpoiled; and to avoid this, a courfe vein muft be often left ftanding in fome place, and taken down afterwards with the file, when the cutting it down at the wheel would have fpoiled the adjacent parts.

After the fhell is thus cut down to a proper degree, it is to be *polifhed* with fine emery, tripoli, or rotten ftone, with a wooden wheel turned by the fame machine as the leaden one, or by the common method of working with the hand with the fame ingredients, when a fhell is full of tubercles, or protuberances, which muft be preferved. It is then impoffible to ufe the wheel; and if the common way of dipping into aqua fortis be attempted, the tubercles being harder than the reft of the fhell, will be eat thro' before the reft is fufficiently fcaled, and the fhell will be fpoiled: in this cafe induftry and patience are the only means of effecting a *polifh*. A camel's hair pencil muft be dipped in aqua fortis, and with this the intermediate parts of the fhell muft be wetted, leaving the protuberances dry: this is to be often repeated, and after a few moments the fhell is always to be plunged into water to ftop the erofion of the acid, which would otherwife eat too deep, and deftroy the beauty of the fhell. When this has fufficiently taken off the foulnefs of the fhell, it is to be *polifhed* with emery of the fineft kind, or with tripoli; by means of a fmall ftick, or the common *polifhing* ftone ufed by the goldfmiths may be ufed.

This is a very tedious and troublefome thing, efpecially when the echinated oyfters and murexes, and fome other fuch fhells are to be wrought; and what is worft of all is, that when all this pains has been taken, the bufinefs is not well done; for there ftill remain feveral places which could not be reached by any inftrument; fo that the fhell muft neceffarily be rubbed over with gum-water, or the white of an egg afterwards, in order to bring out the colours and give a glofs; in fome cafes it is even neceffary to give a coat of varnifh.

Thefe are the means ufed by artifts to brighten the colours, and add to the beauty of fhells; and the changes produced by

by *poliſhing* in this manner are ſo great, that the ſhell is often not to be known afterwards for the ſame it was; and hence we hear of new ſhells in the cabinets of collectors, which have no real exiſtence as ſeparate ſpecies, but are the *poliſhed* appearance of others well known. To caution the reader againſt errors of this kind, it may be proper to add the moſt remarkable ſpecies thus uſually altered.

The onyx-ſhell, which in its natural ſtate is of a ſimple pale brown, when it is wrought ſlightly, or *poliſhed* with juſt the ſuperficies taken off, is of a fine bright yellow; and when it is eat away deeper, it appears of a fine milk-white with the lower part bluiſh: it is in this ſtate that it is called the onyx-ſhell; and it is preſerved in many cabinets in its rough ſtate, and in its yellow appearance as different ſpecies of ſhells.

The violet ſhell, ſo common among the curious, is a ſpecies of porcelane, which does not appear in that elegance till it has been *poliſhed*; and the common auris marina ſhews itſelf in two or three different forms, as it is more or leſs deeply wrought. In its rough ſtate it is duſky and coarſe, of a pale brown on the outſide and pearly within; when it is eaten down a little way below the ſurface, it ſhews variegations of black and green, and when ſtill farther eroded it appears of a fine pearly hue within and without.

The nautilus, when it is *poliſhed* down, appears all over of a fine pearly colour, but when it is eaten away but to a ſmall depth, it appears of a fine yellowiſh colour with duſky hairs. The burgau, when entirely cleared of its coat, is of the moſt beautiful pearl-colour; but when only ſlightly eroded, it appears of a variegated mixture of green and red; whence it has been called the *parroquet*-ſhell. The common helmet-ſhell, when wrought, is of the colour of the fineſt agate; and the muſcles in general, tho' very plain ſhells, in their common appearance, become very beautiful when *poliſhed*, and ſhew large veins of the moſt elegant colours. The Perſian ſhell, in its natural ſtate, is all over white, and covered with tubercles; but when it has been ground down on a wheel, and *poliſhed*, it appears of a grey colour with ſpots and veins of a very bright and highly *poliſhed* white. The limpets in general become very different when *poliſhed*, moſt of them ſhewing very elegant colours; among theſe the tortoiſe-ſhell-limpet is the principal; it does not appear at all of that colour or tranſparence till it has been wrought.

That elegant ſpecies of ſhell called the junquil-chama, which has deceived ſo many judges of theſe things into an opinion of its being a new ſpecies, is only a white *chama* with a reticulated ſurface; but when this is *poliſhed*, it loſes at once its reticular work and its colour, and becomes perfectly ſmooth and of a fine bright yellow: and the violet-coloured *chama* of New England, when worked down and *poliſhed*, is of a fine milk-white with a great number of blue veins diſpoſed like the variegations in agates.

The aſſe's ear-ſhell, when *poliſhed*, after working it down with the file, becomes extremely gloſſy, and obtains a fine roſe-colour all about the mouth. Theſe are ſome of the moſt frequent among an endleſs variety of changes wrought on ſhells by *poliſhing*; and we find there are many of the very greateſt beauties of this part of the creation which muſt have been loſt but for this method of ſearching deep in the ſubſtance of the ſhell for them.

The Dutch are very fond of ſhells, and are very nice in their manner of working them: they are under no reſtraint, however, in their works, but uſe the moſt violent methods, ſo as often to deſtroy all the beauty of the ſhell. They file them down on all ſides, and often take them to the wheel when it muſt deſtroy the very characters of the ſpecies; nor do they ſtop at this, but determined to have beauty at any rate, they are for improving upon nature, and frequently add ſome lines and colours with a pencil, afterwards covering them with a fine coat of varniſh; ſo that they ſeem the natural lineations of the ſhell: the Dutch cabinets are by this means made very beautiful, but they are by no means to be regarded as inſtructors in natural hiſtory. There are ſome artificers of this nation who have a way of colouring ſhells all over with a different tinge from that which nature gives them; and the curious are often deceived by theſe tricks into the purchaſing them as new ſpecies.

There is another kind of work beſtowed on certain ſpecies of ſhells, particularly the nautilus; this is the engraving on it lines and circles, and figures of ſtars, and other things: this is too obvious a work of art to ſuffer any one to ſuppoſe it natural. Bonani has figured ſeveral of theſe wrought ſhells at the end of his work, but it is miſerably throwing away labour to do them; the ſhells are ſpoiled as objects of natural hiſtory by it, and the engraving is ſeldom worth any thing. They are principally done in the Eaſt-Indies.

Shells are ſubject to ſeveral imperfections; ſome of theſe are natural, and others accidental: the natural ones are the effect of age, or ſickneſs in the fiſh. The greateſt miſchief happens to ſhells by the fiſh dying in them. The curious in theſe things pretend to be always able to diſtinguiſh a ſhell taken up with the fiſh alive, from one found on the ſhores: they call the firſt a living, the ſecond a dead ſhell, and ſay that the colours are always much the fainteſt in the dead ſhells. When the ſhells have lain long dead on the ſhores, they are ſubject to many injuries, of which the being eaten by ſea-worms is not the leaſt: age renders the fineſt ſhells livid or dead in their colours.

The fineſt ſhells are thoſe which are fiſhed up at ſea, not found on the ſhores. The other natural defects of ſhells are there having morbid cavities, or protuberances, in parts where there ſhould be none. When the ſhell is valuable theſe faults may be hid, and much added to the beauty of the ſpecimen, without at all injuring it as an object of natural hiſtory, which ſhould always be the great end of collecting theſe things. The cavities may be filled up with maſtic, diſſolved in ſpirit of wine, or with iſinglaſs; theſe ſubſtances muſt be either coloured to the tinge of the ſhell, or elſe a pencil dipped in water colours muſt finiſh them up to the reſemblance of the reſt, and then the whole ſhell being rubbed over with gum-water, or with the white of an egg, ſcarce any eye can perceive the artifice: the ſame ſubſtances may alſo be uſed to repair the battered edge of a ſhell, provided the pieces chipped off be not too large. And when the excreſcences of a ſhell are faulty, they are to be taken down with a fine file. If the lip of a ſhell be ſo battered that it will not admit of repairing by any cement, the whole muſt be filed down to an evenneſs, or ground on the wheel.

POLITICAL (*Cycl.*)—POLITICAL *arithmetic*. According to Mr. Kerſeboom's computation, the inhabitants of Holland and Weſtfriezeland, in the year 1738, amounted to 980000. He has given us a table of the particulars, exhibiting the number of people of all ages, living at the ſame time, from their birth to extreme old age. This table having the chances of mortality within the ages mentioned, he calls the table of contingency of life and death.

This table is calculated upon three principles: 1. On correct obſervations upon the tables of aſſignable annuities in Holland, which have been kept there for above 125 years; wherein the ages of the perſons dying are truly entered. 2. Upon a ſuppoſition that there are yearly born in the two provinces 28000 living children. 3. That the whole number of inhabitants, in any country, is to the number of births as 35 to 1. From this table it appears, 1. That more than half the number of people in the two provinces are above 27 years old. 2. That by the obſervations made in England, out of 35 children born, 18 of them are boys, and 17 girls: the inhabitants of Holland and Weſtfriezeland, conſiſt of 504000 males, and 476000 females, the ſum of which is 980000.

Here follows the table of contingency of life and death.

Of above 90 years old	500	
Of 90 to 86 incl.	2500	
85 — 81	6500	
80 — 76	13000	
75 — 71	20300	
70 — 66	27300	
65 — 61	34300	
60 — 56	40800	
55 — 51	47000	
50 — 46	53000	
45 — 41	57800	
40 — 36	62500	
35 — 31	67600	
30 — 27	58400	
	491500	ſum above 27 years old.
Of 26 — 21	94300	
20 — 16	83400	
15 — 11	87200	
10 — 6	91800	
5 to birth	131800	
	488500	ſum under 27 years old.
	491500	
	488500	
	980000	ſum of all the inhabitants.

Mr. Kerſeboom obſerves from the aſſignable annuities for lives before-mentioned, that females, one with another, live about three or four years longer than the ſame number of males.

He alſo thinks there is no reaſon to differ from the proportions aſſigned by Mr. King (in Davenant's eſſays) of the ſtate and condition of the inhabitants of England; which is, that for every 100000 inhabitants there is

Married men and women	34500
Widowers	1500
Widows	4500
Unmarried youth and children	45000
Servants	10500
Travellers, ſtrangers, *&c.*	4000
	100000

If

If this propofition be admitted, then the number of each fort in Holland and Weftfriezeland, will be as in the following table:

In the two provinces of Holl. and Weft.		Amfter.
Married men and women	338100	86156
Widowers	14700	4218
Widows	44100	13858
Unmarried youth and children	441000	93990
Servants	102900	28318
Travellers, ftrangers, &c.	39200	14460
Total	980000	241000

The mortality of the feveral quarters of the year.

Spring to fummer	307 dead.
Summer to the autumnal equinox	286
Autumn to winter	287
Winter to fpring	286

The mortality of the different months of the year obferved for 31 years, one with another.

Dead in	
January	102
February	88
March	95
April	77
May	112
June	100
July	92
Auguft	95
September	99
October	93
November	95
December	99

Hence it appears, that April is the leaft, and May the moft fatal Month in the year; their proportion of mortality being nearly as 2 to 3: and that of the four feafons of the year, moft deaths happen in the fpring; that is, from the vernal equinox to the fummer folftice.

Mr. Kerfeboom adds, that thefe provinces may raife 220000 men able to bear arms, and feveral other curious obfervations. His book is intitled, *Verhandeling tot een proeve, om te weeten de probable menigte des volks in de proventie van Holland en Weftfriezlandt.* Hage 1738. 4°.

POLITICAL *divifion of antient Egypt.* See NOME.

POLIUM, *poley-mountain*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf, and is of the labiated kind; but the place of the upper lip is fupplied by the ftamina. The under lip is divided into five fegments. The piftil arifes from the cup; it is fixed in the manner of a nail to the hinder part of the flower, and furrounded by four embryos, which afterwards become fo many feeds remaining in the flower-cup, which ferve them as a capfule. The flowers of this plant are collected into heads, and grow at the tops of the ftalks.

The fpecies of *poley-mountain*, enumerated by Mr. Tournefort, are thefe: 1. The lavender-leaved *poley*. 2. The narrower-leaved lavender-*poley*. 3. The yellow-flowered common *poley*. 4. The common white-flowered *poley*. 5. The narrower-leaved longer-headed white-flowered *poley*. 6. The creeping *poley*. 7. The French erect fea-*poley*. 8. The procumbent Venetian fea-*poley*. 9. The purple-flowered tender woolly-leaved *poley*. 10. The white tender procumbent *poley*. 11. The ground ivy-leaved tender procumbent Pyrenean *poley*. 12. The purple-flowered, germander-leaved Spanifh *poley*. 13. The fmoother procumbent Portugal *poley*, with purple ftalks and white flowers. 14. The purple-flowered fhort-headed broad-leaved Spanifh *poley*. 15. The great white Spanifh *poley*. 16. The great yellow Spanifh *poley*. 17. The white-flowered rofemary-leaved fea-*poley* of Spain. 18. The red-flowered fhrubby fea-*poley* of Spain, with rofemary leaves. 19. The red-flowered, rofemary-leaved, dwarf mountain-*poley* of Spain. 20. The yellow-flowered procumbent Spanifh *poley*. 21. The longer-headed Spanifh *poley*, with variegated flowers. 22. The white-flowered, fhort-headed, narrow-leaved erect *poley*. 23. The white-flowered Spanifh *poley*, with hoary leaves, refembling thofe of toad-flax. 24. The white-flowered fhorter-leaved Spanifh *poley*, with toad-flax leaves. 25. The red-flowered dwarf-*poley-mountain*, with narrow green leaves and hoary ftalks. 26. The little narrow-leaved erect *poley*, with greenifh white ferrated leaves 27. The leffer procumbent white narrow-leaved *poley*, with ferrated leaves. 28. The red-flowered erect fmall *poley*, with fhort, narrow, and thick cluftered leaves. 29. The procumbent red-flowered cudweed-like mountain-*poley*, with divided leaves. 30. The white-flowered cudweed-like fea-*poley*. 31. The whole-leaved white Spanifh *poley*. 32. The larger erect, broad-leaved white *poley*, with ferrated leaves. 33. The great procumbent broad-leaved *poley*, with ferrated leaves. 34. The leffer procumbent broad-leaved white *poley*, with ferrated leaves. 35. The yellow Spanifh *poley*, with marjoram-like leaves. 36. The purple-flowered ferpyllum-leaved Spanifh *poley*. 37. The purple-fpiked thyme-leaved Spanifh *poley*. *Tourn* Inft. p. 206.

POLLACK, in ichthyology, a name which we give to two different fifh of the afellus or gadus kind, with the different epithets of *raw* and *whiting*. The *raw-pollack* is the fame fpecies that in fome parts of England is called the cole-fifh, and is the afellus niger of authors. The other is called the *whiting-pollack*; and is the *afellus virefcens* of Willughby and others.

Both thefe fifh are, according to the new Artedian fyftem, of the genus of the gadi; and as the names taken from their colours, black and green, are very little expreffive, the colours being not perfect, permanent, or entire, Artedi has devifed others for them, by which they may be diftinguifhed at fight from one another. The *raw-pollack*, or cole-fifh, he diftinguifhes by the name of the *gadus* with three fins on the back, with no beard at the mouth, with the lower jaw longer than the upper, and the lateral line ftrait. The other, or *whiting-pollack*, he diftinguifhes by the name of the *gadus* with three fins on the back, with no beard, with the lower jaw longer than the upper, and the lateral line crooked. Thefe two kinds of *pollack* are by thefe names not only diftinguifhed from one another, but from all the other fpecies of the fame genus, as the codfifh, &c. *Artedi* Gen. Pifc. p 35.

POLLARD (*Cycl.*)—POLLARD is a name given by fome hiftorians to a fort of bafe money current at one time in Ireland, and called more ufually *crocards*.

Thefe were coins of France, and other nations, which paffed in Ireland as pennies, tho' really not worth quite half fo much. They were made of copper, with a very fmall admixture of filver. See the article CROCARDS.

It was in the reign of Edward I. appointed lord of that kingdom in the life-time of his father Henry III. that the ufe of falfe and counterfeit money of this kind was fo extremely common in Ireland. While his father reigned in England this prince never extended his power fo far as to fet up any mint, or coin any money in Ireland; but at his acceffion to the crown he found his treafury empty, and the current coin of his kingdoms in a very bad condition: his abfence of near two years after his father's death, having fo encouraged the clippers and coiners of money, that little but clipped, or counterfeit money of the kingdom was to be met with; and five or fix different forts of bafe and mixed money had been imported privately, and uttered in England and Ireland as pennies, tho' they were not half the value of the penny fterling.

Thefe were the *crocards* and *pollards*, called alfo *mitres* *[illegible]*, *rofaries*, and by the like names, according to the things marked in the impreffions. To remedy this evil, and reftore the current coin of the kingdom to its antient purity and value, this prince eftablifhed a certain ftandard; and as the bafe money was an admixture of a very fmall quantity of filver, with a great deal of copper, he ordered that there fhould be in every pound of money weighing twelve ounces, eleven ounces and two penny weight and a quarter of pure filver, and only feventeen pence halfpenny farthing allay.

The faid pound to weigh twenty fhillings and three pence in account; the ounce twenty pence, and the penny twenty-four grains and a half. According to this regulation, the money of Ireland was alfo ordered to be made, and a new kind of money was ftruck there in the year 1279, under Stephen de Fulbourn, bifhop of Waterford, and lord deputy of Ireland. The pieces coined at this time in Ireland were groats, or four pennies, halfpence, and farthings; and as thefe were the fame in value, as to weight, with the Englifh coins, they would go equally in England and Ireland: and in the twenty-ninth year of the reign of the fame prince, that is, in 1300, the *crocards*, *pollards*, and other bafe money were decried; and it was made death, with confifcation of goods, to import any of them.

By this means the circulation of the bafe and mixed money was in a great meafure ftopped, and four new furnaces were erected in the mint of Dublin, to fupply the great demand that there was for good money; and Almander Norman de Line was appointed mafter of the coiners. This was a beginning of good money in Ireland; and in the year 1304, there were fent over from England twenty-four ftamps for coining of money there, *viz.* three piles with fix croffes, for pennies; three piles with fix croffes, for halfpence; and two piles with four croffes, for farthings. In the old way of coining with the hammer, before the mill and fcrew were invented, two kinds of punchions were in ufe, the one called the crofs, whereupon was engraved the head of the prince; and this was fo called becaufe, antiently, a crofs was the figure ftruck on this fide of coins inftead of the head of the prince: the other called the pile, contained the arms, or fome other figure, to be ftruck with an infcription on the back, or reverfe of the coins. The pennies and halfpence ftruck in this king's reign, have the king's head in a triangle full-faced. The beft preferved of them, found at this time, weigh twenty-two grains the penny; and the halfpence from ten grains to ten and a half. The farthings are fo fcarce, that it is very rare to meet with one in the collections of the moft curious. *Simon*'s Hift. of Irifh Coins, p. 15.

POLLARD, in zoology, a local name for the young and fmall fifh of the cole-fifh, or rawling-pollack kind. It is ufed in Cornwall, *&c.* *Willughby*'s Hift. Pifc. p. 169.

POLLEN *thuris*, in the materia medica, a term ufed by the Latin writers, to exprefs the *manna thuris*, or *manna libanotis*, of the Greeks, but that very improperly; for the word *pollen thuris* properly fignifies the frankincenfe reduced to a powder, but this was not what the antient Greeks called *manna thuris*, but the fmall fragments which were broken off from the large pieces, in the gathering or packing up.

The *manna* ufed in medicine by the Greeks and Arabians was not formed into large flakes, as ours is; but was compofed of fmall fragments or grains, and therefore they called by the fame name the fmall granulæ or fragments alfo of other things: it was thus that the broken frankincenfe was called *manna thuris*.

The cuftom of the times of faving all the fragments of this drug, made them collect even what was in fo fmall pieces as to refemble powder; but this, tho' mixed with the reft, was not properly the *manna thuris*. This gave occafion to the adulterating this commodity, and Diofcorides tells us, that even in his time they had learned the trick of putting the powder of the refin of the pine tree among it; and this growing worfe and worfe, they at laft difcarded it, and would purchafe only the fragments without the powder. Thefe fragments they called *thus minutum*, to diftinguifh them from what was then called *manna thuris*, tho' improperly, and which was the adulterated mafs of refin and fragments of olibanum

POLLICIPES, the *toe-fhell*, in natural hiftory, the name of a genus of fhells, the characters of which are thefe: they are multivalve flat fhells, of a triangular figure, each being compofed of feveral laminæ, which end in a fharp point. They ftand upon pedicles, and are furnifhed with a great number of hairs. We have only one known fpecies of this genus, and this always found in large clufters See Tab of Shells, N° 27.

POLLINCTORES, among the antients, an appellation given to thofe who wafhed and anointed the dead. *Pitifc.* in voc.

POLLINCTURA, a word ufed by fome authors to exprefs the embalming dead bodies.

POLLING, in gardening, the operation of difperfing the worm-cafts all over the walks, with long afh-poles: this, befides deftroying worm-cafts, is very beneficial to the grafs of the walks. See GRASS-*walks*.

POLLUCTUM, among the Romans, a feaft kept in honour of Jupiter Dapalis, Hercules, *&c.* at which facrifices were offered to the Gods. *Pitifc.* in voc.

POLLUTION (*Cycl.*)—POLLUTIO *nocturna*, in medicine, the name of a difeafe, which confifts in an involuntary emiffion of the feed in the night, in time of fleep. This, in different perfons, is very different in degree; fome being affected with it only once in a week, a fortnight, three weeks, or even a month, and others being fubject to it almoft every night.

The perfons moft fubject to this, are young men of a fanguineous temperament, and who feed high, and lead a fedentary life. When this happens to a perfon but once in a fortnight, or a month, it is of no great confequence; but when it happens almoft every night, it greatly injures the health; the patients look pale and fickly. In fome the eyes become weak and inflamed; fometimes they are affected with violent defluxions, and ufually, at laft, are circled round with a livid appearance of the fkin.

This diftemper is to be cured rather by a change of life than by medicines. When it has taken its rife from high diet and a fedentary life, a coarfer food, and the ufe of exercife, will generally cure it; but if any medicines are to be given, nitre alone will do more than almoft all the reft. This may be taken in large dofes, a fcruple at a time, with very little liquid with it, and muft be continued for fome time at night going to reft. The root of the water-lilly is greatly recommended by fome in this cafe; and by others, the feeds of the agnus caftus; but it is very doubtful, whether they have either of them any effect.

Perfons fubject to this difeafe muft never take any ftimulating purges, and muft avoid, as much as poffible, all violent paffions of the mind: and tho' exercife is recommended in moderation, yet if this be too violent, it will rather increafe the diforder than do any thing towards its cure. *Junck*'s Confp. Med. p. 486.

POLPHOS, a word ufed by fome authors to exprefs a bulb or bulbous root.

POLPOCH, in zoology, a fpecies of ferpent faid to be found in Jucatan, a country bordering upon New Spain. It can bite with the mouth and fting with the tail. *Hoffm.* Lex univ. in voc.

POLVERINE, the calcined afhes of a plant; a fubftance of the nature of our pot-afhes, or pearl-afhes.

It is brought from the Levant and Syria; but in the glafs trade, tho' it be of the nature of the other afhes they ufe, it is always to be preferred to any other. The barillia, or pot afhes of Spain, yield more pure falt than the *polverine* of the Levant, but the glafs made with it has always fome tinge of bluifhnefs: that made with the *polverine* is ever perfectly white, and this is the fubftance that ought always to be ufed for the fineft cryftal.

The method of procuring the pure falt from thefe afhes, is to fift them and throw them in a proper quantity into a large copper of boiling water, continuing the boiling till all the falt of the afhes be diffolved by the water, and adding to the water, before the *polverine* is put in, about ten pound of tartar calcined to a blacknefs. The lee or water thus impregnated with the falt, muft ftand a confiderable time to fettle; and when perfectly clear, muft be evaporated till it thicken, and begin to fhew a white dry falt about its edges: then the fire muft be kept very flow, and a fkimmer full of holes being funk in to the bottom of the copper, the falt will gather and harden upon it; and this muft be taken out every now and then, and the falt taken off and dried for ufe. Three hundred pound of *polverine* thus yield eighty or ninety pound of clear falt. When this is dried, it muft be flightly calcined in the glafs furnace, and then powdered and fifted through a coarfe fieve, and kept dry. *Neri*'s Art of Glafs, p. 2.

POLYADELPHIA, in botany, a clafs of plants, whofe ftamina are formed into three or more feparate bodies.

The word is formed of the Greek πολυς, many, and ἀδελφα, communities. Among the plants of this clafs are orange-trees, St. John's wort, *&c.*

POLYANDRIA, in botany, a clafs of plants with hermaphrodite flowers, and a large number of ftamina, or male parts, in each. See Tab. 1. of Botany.

The word is derived from the Greek πολυς, many, and ἀνηρ, male. The hermaphrodite flowers of this clafs have a large number of ftamina on each, always more than twelve, and thofe growing to the receptacle of the future feeds.

Of this clafs are the water-lilly, poppy, celandine, *&c.*

POLYANTHEMUM, in botany, a name given by fome authors to the water-crowfoot, from its great number of flowers. *Ger.* Emac. Ind. 2.

POLYCEPHALON, Πολυκεφαλον in antiquity, a kind of poetry, for the nature and origin of which, fee Mem. de l'Acad. Roy. des Infcrip. Vol. 14. p. 438.

POLYCOMBUS, in botany, a name given by Neophytus and others to the common knot-grafs, more ufually called *polygonum*.

The name *polycombus* is formed of the Greek πολυς, many, and κομβος, a joint; and as it is ufually applicable to this, and all the other jointed plants, it is ufed by fome for the name of the feveral fpecies of equifetum, or horfetail, as the word *polygonum* is.

Neophytus defcribes one fpecies of this, which he fays is called *oreon*, from its growing in mountainous places. This, he fays, looks like a young reed, and has feveral joints in the main ftalk, which are received into one another as fo many cups or boxes. He adds, that the leaves are like thofe of the pine tree: what he calls the leaves, are probably the tender branches; and then this defcription will agree very well with our great marfh horfetail, which grows in wet places in mountainous countries, and about the fprings in our hills. This is the horfetail to which the greateft virtues are attributed by this author; but the whole account of the hippuris, polygonum, and equifetum, is fo confufed, that there is little to be learnt from what the antients fay of them, without repeating the trials of their virtues.

POLYCROTA, in the naval architecture of the antients, a word ufed to exprefs fuch of their gallies as had three, four, five, or more tires of rowers, feated at different heights; they were diftinguifhed by this term from the *monocrota*, or thofe which had only fingle rows of oars.

The number of rows of rowers in the *polycrote* gallies has given occafion to fome to fuppofe thofe veffels of fuch a height from the water as is fcarce credible; we have, however, no warrant for this, but the commentators have given occafion to the opinion, from their not having been able to ftow the rowers in lefs room, and have meafured the height of the veffel by their own fkill in this fort of architecture, not by that of the people who built them. Meibom has found a way to take off a great deal from the imaginary height of thefe gallies. He has two inventions to anfwer this purpofe: by the firft of them, he fhews how the lateral rowers may be fo placed, that he who fits behind another may move his hands and oar under the feat of the rower who fits next before him; by which means three lateral rowers, which, according to Scaliger's way of reckoning, would require thirteen feet and an half, will be placed in the heighth of feven feet and an half.

By the fecond invention, he finds out a place in the veffel for almoft half the number of rowers; forafmuch as on the fides of the aforefaid rowers, he places others in the middle of the fhip, upon tranftra or tranfverfe feats, which he imagines thruft out their oars under the feats of the lateral rowers; by this contrivance he has gained no lefs than nine feet in the heighth of a quinqueremis.

The different feries of rowers were called by different names; the *thalamitæ* were thofe who fat in the loweft row; the *zygitæ* were thofe who fat in the tranftra, or crofs feats; and the *thranitæ* thofe who fat uppermoft of all in the veffel.

The moft furprizing account of a *polycrote* veffel among the antients,

antients, is that said to have been built for Philopater, of forty tires of rowers. The next to this is that of Ptolomy Philadelphus, which is said to have had thirty tires; and in these there sat more than three thousand rowers. It has been disputed by many, whether such immense vessels as these were ever built, or ever could be used if built. The monstrous heighth they have been calculated to be of, according to the schemes of the generality of commentators, has rendered it incredible that there ever were any such; but Meibom has found out such convenient ways of placing the rowers in them, and has taken off so great a part of this imaginary heighth necessary in them, that he is clearly of opinion, that there were such vessels actually built and used.

The triremis, according to the computation of this author, contained two hundred men; of which one hundred and eighty were rowers, and the rest were mariners: so that the Athenian fleet, of which Conon was commander, consisting of one hundred and eighty triremes, there were in it six and thirty thousand men. The quinqueremis of these times contained four hundred and twenty men, three hundred of whom were rowers, and the rest soldiers; so that there are three stupendous things to be observed in regard to the Roman fleet at Messina, and the Carthaginian at Lilybæum: one is, that the former consisted of three hundred and thirty, and the latter of three hundred and fifty vessels, most of which were quinqueremes, which, according to the most accurate computation, were a hundred and fifty feet long; the number of men they contained was, in the Roman, one hundred and thirty thousand, and in the Carthaginian, one hundred and fifty thousand. The apparatus and provisions necessary for such a numerous host, is wonderful in these early days of shipping, and the accounts would be doubted, were they not given by one of the best of historians, Polybius, who wonders, as indeed he very well may, at such an amazing equipage for sea service at such a time.

POLYEIDÆ *sphragis*, the name of a sort of troches or pastils greatly used among the antients. It consisted of alum, four drachms; myrrh and aloes, of each five drachms; pomegranate-peel, and bull's gall, of each six drachms: all which were rubbed to fine powder, and made into troches with the bull's gall, mixed with a sufficient quantity of the most austere wine.

POLYGALA, *milkwort*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the personated kind, consisting of one leaf, not perforated behind, and divided before into two lips; the upper lip is bifid, and the lower one elegantly fimbriated. The pistil arises from the lower part of the flower, and ripens at length into a fruit or capsule of a compressed figure, divided into two cells, and full of oblong seeds. The fruit is usually found surrounded with the cup of the flower, which consists of five leaves, two large and three small ones, which clasp round the seed vessel in the manner of so many wings.

The species of *polygala*, enumerated by Mr. Tournefort, are these: 1. The great blue-flowered *polygala*. 2 The great purple-flowered *polygala*. 3. The great white-flowered *polygala*. 4. The common or smaller blue flowered *polygala*. 5. The common purple-flowered *polygala*. 6 The common *polygala*, with white flowers. 7. The painted-leaved *milkwort*, with purple flowers. 8. The painted-leaved *milkwort*, with blue flowers. 9. The narrow-leaved erect annual *polygala*, with dusky-coloured flowers, variegated with streaks of pale red. 10. The short-leaved pointed *polygala* 11. The little mountain myrtle leaved *polygala*. 12. The shrubby Portugal *milkwort*, with very small leaves, and large flowers. 13 The greater African narrow-leaved shrubby *polygala*. 14. The lesser African shrub-*polygala*, with very narrow leaves. 15. The flax-leaved American *polygala*, with very large flowers 16. The box-leaved shrubby African *polygala*, with very large flowers. 17. The box-leaved shrubby *polygala*, with yellow flowers. 18. The box leaved shrubby *milkwort*, with purplish red flowers. *Tourn.* Inst. p. 147.

The virtues of this plant have been very happily enquired into by the gentlemen of the royal academy of sciences at Paris, on occasion of the trials they made of the virtues of the Senekka rattle-snake root, recommended by Dr. Tennent; and their judging, that as his was the root of a species of *polygala* or *milkwort*, the roots of our common *polygala* might possibly have the same effects.

Dr. Tennent gives his rattle-snake root, or Virginian *polygala*, in the dose of thirty-five grains in substance, or in three or four ounces of a strong infusion, or in a yet stronger, in a proportionably smaller dose The effects of this root being found very great, it was supposed that its place might possibly be supplied by this species of our own growth. It is very certain, that the place of growth may, in some plants, make a very great alteration in their virtues; and that the different species of the same genus may, in other instances, produce different effects in the human body, some species of plants agreeing in their external forms and generical characters, while they differ in their virtues and qualities.

There appeared on trial a considerable difference to the taste between the American and the European *polygala*-roots, that of Virginia being very aromatic, acrid, and bitter, and the European only slightly acrid, with a very feeble bitterness. Another thing that gave great suspicion as to the parallel virtues of the roots of these two species was, that Gesner was found, in his account of the virtues of the European *polygala*, to call it a very brisk cathartic; a quality which might render its use very improper in many of the diseases in which Mr. Lemery and Jussieu found the Virginian kind to prove a serviceable medicine. This last was found always very speedily to allay fevers of the pleuretic kind, without increasing in any great degree the discharges by stool.

The roots of the European *polygala* being very small and slender, gave also some trouble as to the procuring them in sufficient quantity; and in hopes it might become a general medicine, it was determined to try the effects of the whole plant, root, leaf, and branch, in the disease in which the Virginian kind had been given with the greatest success, that is, in pleurisies; and this was accordingly fairly tried.

The principal instances of their trials were two; the first to a woman of twenty-two years old, who had a violent fever, with a sizy blood, and pain in the side. She was twice blooded, and had immediate but not lasting relief from it, and was ordered the common ptisans given on these occasions. The malady increased, and the expectoration was but small, and that of a thick yellow matter: a third bleeding finally was judged necessary, but was of no more service than the others; and after this she had the same ptisan continued, but with the addition of a large quantity of the common European *polygala*, stalk, root, and leaf. This took place in two or three hours, the expectoration became vastly plentiful, and the matter thin and white from being thick and yellow. The woman, in fine, was cured, and the medicine was not observed to occasion any nausea, nor did it prove, as supposed, a violent purge.

The second instance was in a man of a stout robust habit, and of twenty-five years of age. He was violently attacked with a pleurisy, he was bled seven times, and was brought into one of the hospitals delirious, and seemingly very near death: he was there blooded in the foot, which restored his senses; and he took a large quantity of the decoction of the *polygala*, which caused him to expectorate in great abundance. The matter was first blackish, then reddish, and finally white, and the patient was perfectly cured. Mem. Acad. Scien. Par. 1739.

These are such remarkable instances of the good effect of an herb to be had every where in our own country, that they seemed very worthy to be recorded. The plant grows with us on dry grounds and heaths, and is about four inches long, not erect, but trailing upon the ground: the leaves are long and narrow, of a pale green, and the flowers are large and look beautiful: they stand in spikes, and are usually blue; but very often white, and sometimes red. The herb should be pulled up root and all for drying.

POLYGAMIA, in botany, a class of plants, which have a diversity of combinations of the male and female parts of their flowers, and many ways of fructification in the same species; some having male flowers, others female, each distinct and perfect in its kind; and others mixed, or hermaphrodite, with both male and female organs of fructification in each. See Tab. 1. of Botany, Class 1.

The word is formed of the Greek πολὺς, many, and γαμος, marriage.

Among the plants of this class are the orach, pellitory of the wall, the ash, &c.

POLYGAMY, (*Cycl.*) is the marriage of one man to more than one wife, or the marriage of one woman to more than one husband

The last of these is the greater crime, as being most incompatible with the being of society, and might therefore be punished with greater severity.

It has been much disputed among the Doctors of the civil law, whether *polygamy* be adultery. In the Roman law it is called *stuprum*, and punished as such, that is, in some cases, capitally. See STUPRUM. But a smaller punishment is more consistent with the Jewish law, wherein the prohibition of adultery was perpetual, but that of *polygamy* temporary only. See Selden, L. 1. c. 9 de uxore Hebraica.

In Germany, Holland, and Spain, this offence is differently punished. By a constitution of Charles V. it was a capital crime. In England it is felony, by stat Jac. 1. but with benefit of clergy. In Scotland it is punished as perjury. See the article BIGAMY.

POLYGLOTTA *avis*, in zoology, the name of a bird described by Nieremberg, and which, he says, he saw and heard with admiration, singing in all tones. It is of the size of our starling.

Its back is brown, and its breast and belly white; and near the neck and tail it is variegated with spots and streaks of white Its head has a streak of white, which represents a sort of crown of silver. It is mightily esteemed, and kept in cages by the Spaniards, as infinitely superior to all other birds in melody. It feeds on almost any thing that is given it, and is most fond of the warmer climates; but endures the more temperate ones without harm. *Ray's* Ornithology, p. 305.

POLYGONATUM, *Solomon's seal*, in botany, the name of a genus of plants, the characters of which are, that the flower consists of one leaf, formed in the shape of a bell; but having a long tube, having no cup, and being divided into several segments at the end. From the bottom of this flower rises a pistil, which ripens into a soft roundish fruit, which contains a great number of roundish seeds.

There are a great many species of this plant 1. The common broad-leaved one. 2. The red-stalked broad-leaved one. 3. The great broad leaved one. 4. The white hellebore-leaved one. 5. The red-stalked white hellebore-leaved one. 6. The large sweet-flowered one 7. The double-flowered sweet broad-leaved one. 8. The little broad-leaved one, with large flowers. 9. The low English single-stalked kind. 10. The narrow-leaved single-stalked kind. 11. The narrow-leaved branched kind. And, 12. The climbing American kind. *Tourn.* Inst. p 78.

The root of *Solomon's seal* is a vulnerary of the very first rank; it is famous in bruises for taking away the marks, and for healing up fresh wounds; in both which cases, it is applied in form of a pultice. It has also been greatly celebrated in the cure of hernias, and for assisting in forming a callus in broken bones.

POLYGONUM, *knot grass*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the apetalous kind, being composed only of a number of stamina arising from a funnel-shaped cup, divided into many segments at the edge. The pistil finally becomes a triangular seed, which is covered by a capsule that was originally the cup of the flower. To this it is to be added, that the flowers grow in the alæ of the leaves, and that the roots are fibrous.

The species of *knotgrass*, enumerated by Mr. Tournefort, are these: 1. The common broad leaved *knotgrass*. 2. The white-flowered broad-leaved *knotgrass*. 3. The long and narrow-leaved *knotgrass*. 4. The short and narrow-leaved *knotgrass*. 5. The stone-*knotgrass*. 6. The great *knotgrass*, with long stalks and long leaves. 7. The broad-leaved sea-*knotgrass*. 8. The broad-leaved white flowered sea-*knotgrass*. 9. The Spanish sea-*knotgrass*, with very long stalks, and white flower-cups. 10. The broad-leaved shrub sea-*knotgrass*. 11. The round-leaved creeping Portugal sea-*knotgrass*. 12. The little hoary, sea-*knotgrass*. *Tourn.* Inst p. 510.

The antients as well as moderns have described the common kinds of *knotgrass* under the name *polygonum*; but as they have also given the same appellation to another plant, much error has arisen by mistaking these synonyms. Pliny began the mistake, and others have since in great numbers fallen into it, and thought Pliny's example a sufficient excuse.

The word *polygonum* being formed of the Greek πολὺς, many, and γονυ, joint, or knot, signified properly any plant that had several joints or knots. It was originally given to the *knotgrass* very properly, scarce any plant having more joints; but it was afterwards given also to a kind of equisetum or horse-tail.

The description of this was, that the stalks were hollow; the branches long, slender, and resembling rushes, or the twigs of the broom, but without any leaves; and that they were so brittle, that they could not be used as wyths, to bind things with, which seems to have been a use the common *knotgrass* was very frequently put to, and for which it was found very proper, because of the toughness of its branches. This kind of *polygonum* of the antients is said to grow in woods, at the roots of trees, as the horse-tails of several kinds do at this time; and tho' the descriptions of this and the other *polygonum* are so extremely different, this having no leaves, and the other being described by all to have small, oval, and pointed leaves, yet Pliny has confounded the two plants together, because both called by the same name; and has formed out of the description of different authors of these different plants, one general account, which he gives under the head of *polygonum*, and which can serve no plant at all. He says, it grows at the roots of trees, and climbs up them; and that it has long, rush-like, and brittle stalks, beset with small oval leaves. He even compares the branches to the hairs of a horse's tail, and yet did not find out at the time, that he was blending the description of the hippuris, or horse-tail, called by some the *female polygonum*, with the common *knotgrass*, or *polygonum* originally so called; a plant as different from it as one plant can well be from another. *Pliny*, l. 26. c. 13.

The common great *knotgrass* is esteemed a very powerful astringent. It is generally used in infusion, and is said to have great virtue in stopping hæmorrhages of all kinds. *Dale* Pharm.

POLYGRAM, in geometry, a figure consisting of many lines.

POLYHEDROUS *figure*, in geometry, a solid contained under, or consisting of many sides. See POLYHEDRON, *Cycl.*

POLYHISTOR, is used for a person of great and various erudition. See POLYMATHIA, *Cycl.*

POLYMORPHOS, variously shaped, an epithet often given to the os sphenoides.

POLYNOMIAL (*Cycl.*)—To raise a *polynomial* to any given power, may be done by Sir Isaac Newton's binomial theorem. Among other methods of demonstrating this, we have one by Signior Castillioni in the philosophical transactions, numb. 464.

POLYOSTEON, a name given by authors to that part of the foot which consists of a great many bones.

POLYPE, or POLYPUS, in zoology, a small fresh water insect, which, when cut into a number of separate pieces, becomes in a day or two so many distinct and separate animals; each piece having the surprizing property of producing a head and tail, and the other organs necessary for life, and all the animal functions. See Tab. of microscopical Objects, Class 1.

The first discovery of this animal was owing to Mr. Leuwenhoek, who, in the year 170?, presented to the royal society of London, a description of it, and an account of its uncommon way of producing its young: but the discovery of its amazing property of reproducing the several organs from its various pieces, was not made till the year 1739, by Mr. Trembley, at the Hague.

The production of its young is, indeed, different from the common course of nature in other animals; for the young one issues out from the side of its parent, in form of a small pimple or protuberance, which lengthening and enlarging every hour, becomes, in about two days, a perfect animal, and drops from off its parent to shift for itself: but before it does this, it has often another growing from its side; and sometimes a third from it, even before the first is separated from its parent. They breed quicker in hot than in cold weather; and what is very extraordinary is, that there never has yet been discovered among them any distinction of sex, or appearance of copulation; every individual of the whole species being prolific, and that as much if kept separate, as if suffered to live among others.

If the method of this little animal's producing its young be very amazing, its reproduction of the several parts, when cut off, is much more so. The discovery of this was perfectly accidental; for Mr. Trembley, who had often met with the creature in the water, and from its fixed residence in one place, and some other observations, not being able to determine whether it were an animal or a vegetable, made the trial by cutting it asunder, when, to his amazement, he found, that in a few days each of these pieces was become a perfect animal, the head part having shot forth a tail, and the tail a head. A thousand other trials, by cutting the animal in different manners, first by Mr. Trembley, and afterwards, at his request, by Mons. Reaumur at Paris, and Mr. Folkes, Mr. Baker, and the other naturalists in England, were the result of this; and all succeeded in the same manner, by whoever they were tried.

It is not easy to say what is the size of this creature; for it can contract or extend its body at pleasure from the length of an inch or more, and the thickness of a hog's bristle, to the shortness of a single line, with a proportionable increase of thickness. Its body is round and tubular, at one end of which is the head, surrounded with six, eight, ten or more arms, with which it catches its prey; and at the other, the anus and tail, by which it fixes itself to any thing it pleases.

There have been many different species of it discovered, the most elegant of which, the *polype a panna be*, or plumed *polype*, of Mr. Trembley, seems much to resemble the wheel-animal (so called from having the appearance of two wheels in its head) which Mr. Leuwenhoek discovered living in a sheath or case, and affixed to the roots of duckweed.

All the species are found in clear and slowly running waters, adhering by the tail to sticks, stones, and water-plants, and live on small insects They are easily kept alive a long time in glasses, often changing the water, keeping the glasses clean, and feeding them with a small red worm, common in the mud of the Thames, or with other small insects.

The creature has its name from the Greek πολὺς, many, and πὸς, a foot, signifying an animal with many feet; but a more apposite one might easily have been invented, since it has in reality no feet at all. What were originally taken for feet, are what have since been called its horns, and of late more properly its arms, their office being to catch its prey.

The several strange properties recorded of this animal, tho' very surprising, are, however, none of them peculiar to it alone. The Surinam toad is well known to produce its young not in the ordinary way, but in cells upon its back. Mr. Sherwood has very lately discovered the small eels in four paste to be each, without exception, full of living young ones. And as to the most amazing of all its properties, the reproduction of its parts, we know the crab and lobster, if a leg be broken off, always produce a new one: and Mr. Bonet, Mr. Lyonet, Mons de Reaumur, and Mr. Folkes, have all found on experiment, that several earth and water worms have the same property, some of them even when cut into thirty pieces The *urtica marina*, or sea-nettle, has been also found to have the same: and the sea-star-fish, of which the *polype* is truly a species, tho' it had long escaped the searches of the naturalists, was always well known by the fishermen to have it also.

Cluster-Polype, the name of a species of small insect of the *polype* kind, called by the French naturalists *polype a bouquet*.

There is found on several of the water-plants, and on other substances, as sticks, boards, and the like, accidentally fallen into the water, a whitish substance that at first sight appears to be only a sort of mouldyness; but if the bodies on which this is found, be put into a vessel of clear water, and the matter examined with a magnifying glass, it is soon seen that this whitish substance is really a vast number of small animals, which are almost continually in motion. When this is brought before the microscope, the form and structure of the creatures is very evidently distinguished, and they are found to be minute roundish creatures, severally affixed to the end of a sort of stem or tail; and many of the stems are so interwoven and united together, that they form *clusters*, which have occasioned the name of the *cluster-polype* to be given to the animal, tho' in itself it is really and properly single from the beginning. There are several species of *polype* of this minute kind, that *cluster* themselves in this manner together; and according to these and other circumstances, the *clusters* are found larger or smaller, and more or less complex. Phil. Transf. N° 474. p. 171.

The smaller *clusters* should always be chosen for observation, as in the larger the bodies of the several animals that compose them are apt to hide and obscure one another; but the most beautiful and accurate of all observations is to be formed when they are single, as they are sometimes found; and this is the only opportunity of seeing distinctly in what manner the *clusters* are formed.

One of these single animals is not in length above the 240th part of an inch, and is of a shape nearly resembling that of a bell: the anterior part of this generally appears open when it presents itself properly; and the posterior part is fixed to the stem or pedicle, by the other extremity of which the creature fastens itself to any solid body that it meets with. The body is of a brownish colour, except at the smaller end, which as well as the tail is whitish and transparent; and when the anterior part is open, there may always be perceived about its edges, a very lively motion; and when the creature presents itself in a better manner, there may be seen on either side of the edges of the anterior part, somewhat resembling the wheels of a mill, continually moving with great velocity.

These creatures are able to contract their bodies, and often do it very suddenly, especially if any thing disturb the substance on which they are fixed: when they are thus contracted, the edges of their anterior parts are drawn just into their bodies; and when the fright is over, it is a very agreeable sight to behold these edges turning out again, and putting themselves in motion as before. If the edges of the anterior parts of the bodies of these animals be strictly observed while in motion, the water about them will be found to be full of extremely minute round bodies which are brought together by means of that motion, and serve the creature for its food: these may be often seen going down into the cavities of the body of the *polype*, and that very suddenly, as if forcibly driven down; and when swallowed too voraciously, are often thrown up again. These observations are best made when a small *cluster* of the *polypes* are examined together.

If these *polypes* are kept some time in the rain-water, they by degrees lose their brown colour, and become white and transparent throughout, except that a few spots of a dusky colour remain in their bodies; but if after this they are removed into other water of the same kind with the first, but newly taken out of the ditch, they in a little time recover their brown colour. When they become white, they plainly appear to be in a sickly condition, and cease to multiply; but when they have fresh water and recover their colour, they immediately begin to multiply again.

These creatures are not absolutely and immoveably fixed to the bodies on which they are placed, but they can at pleasure quit them and swim about: in this swimming state they are always found single and not in *clusters*; and they do not then appear in the same form as when they are fixed and open at their anterior ends. When they have swam about as long as they please, they either return to their *clusters* from which they separated themselves, or affix each singly to any thing they meet with: and this is a circumstance that merits to be carefully watched, because it is by means of this that we see in what manner the creature multiplies itself, and the *clusters* are formed.

As soon as a single animal of this kind is fixed to a stick, a stone, or any other substance, it begins to lengthen its stem or tail, which tho' very short while swimming, and when first fixed, very soon becomes of its pristine length while in the *cluster*; and after this the creature begins immediately to multiply by the most amazing means in the world; that is, by spliting itself to pieces lengthways. The first motion towards this operation is the drawing in the lips or edges; this is soon done, and the body then loses its bell-like shape, and becomes round; the motion which was before perceived at the edges ceases, and there is only a slight tremulation to be seen within the body; after this the anterior part of the body becomes flat and broad, and the whole body shortens in proportion; and soon after this the whole body gradually splits itself regularly into two, from the center of the anterior part to the center of the hinder end, where it joins the tail or pedicle, and there soon appear two round and perfect bodies joined to that pedicle which before supported only one. The anterior parts of the two bodies soon begin to open, and gradually shew their edges, which perform the same motion the single one did before. The motion is at first very slow, but it grows quicker by degrees as they open; and when they are perfectly expanded, it is as quick as it was in the original single body: it is at this time that the two bodies may be esteemed quite perfect. They are at first indeed less than the original *polype*, from which they were formed, but they grow to the same size in a very little time: the whole operation of dividing itself, takes up the creature about an hour; but to form a true idea of the manner in which it is performed, there must be many observations made, and the creatures must be examined in all views and lights while about it.

The lips of these *polypes*, when closely examined, appear to be composed of four or five transparent bands, all which have an undulatory motion. And when the newly divided *polype* is but slow in its motions, it is easy to discover that what afterwards appear to be like the wheels of a mill, are, in reality, only four or five oblong bodies, resembling a sort of fingers which alternately bend down, and extend themselves every instant. These are fastened to the bands of the lips on each side of the mouth; and when they are put into swift motion in the time of the full growth and vigour of the animal, they are not to be distinguished, as to form, nor can their motion be otherwise discovered than by its swiftness, which makes it resemble the quick turning of a wheel.

When the separation of the body of a single *polype* of this kind is compleat, one sees two regular and perfect bodies adhering side by side to the same pedicle, but soon after each of the new formed bodies begins to shew a pedicle of its own; these grow in a day's time to a moderate length, and unite at their bottoms to the end of what was the original single pedicle of the body while but one; they grow to this in the manner of the branches growing to the trunk of a tree. Twenty-four hours after the separation of the original body into two, these two begin to separate themselves in the same manner, each into two again; and these after a like time again separate: each of these separated animals has its own tail formed in a like period of time with the first; and the consequence is, that the first separation producing two, the second gives four, the third eight, and so the sixth sixty-four, the seventh 128, and so on; by which means a single animal, in a very few days, forms out of itself an immense *cluster*; each animal of which is perfect in itself, and independent of all the rest, and can, when it pleases, swim away and form a new *cluster*. They will multiply as fast in glass jars, as in their native free state in the waters, and *clusters* of them, begun near one another, will often join in such a manner as to form one complex *cluster* of an inch diameter: from these several *clusters* there detach themselves single *polypes* from time to time, which go off and fastening themselves to other bodies, become the authors of new progenies. Phil. Transf. N° 474. p. 175.

The original branch or stem of the first *polype*, remains always in the center of the *cluster*; but it is of no use, never afterwards having any body fixed to it.

There are, beside this species here described, four other known kinds of *polypes*, which divide themselves in the same manner by spliting into two lengthwise: those which come nearest to the first are slenderer, and their stems are more transparent. They are of a bluish colour, when many of them are seen together, and their stems or tails very aptly resemble spun glass. When this species is perfectly formed, the motion of its lips is less distinct than in the other; but it may be discovered in the same manner while they are newly separated and are but growing toward perfection, when it gradually becomes less and less distinct.

Another species of these *polypes* is smaller than the last, but more open at the mouth and deeper hollowed; and these are particularly distinguished from all the others, by having a motion in their stems and branches, which all the others want. The stems draw themselves up, and shorten all at once into the appearance of a spiral screw, and in a moment can dart themselves strait out to their full length again. All these multiply very speedily, but they have all enemies that destroy them in a very terrible manner, whole *clusters* making but single mouthfuls. The *funnel-polypes* are nearly allied to these creatures. Phil. Transf. N° 474. p. 180.

Funnel-Polype, a name given by naturalists to a small water-insect, in some respects approaching to the nature of the cluster-*polype* See *Cluster* Polype, supra

The *funnel polype* nearly resembles a funnel, from which it has its name. It is long and hollow, and very wide at the anterior end. These little animals are of three species, a green, a blue, and a white one: they are all too minute for the observation of the naked eye, and must be viewed with great caution, and in several different directions and attitudes, before their true form can be discovered; and their anterior end, particularly, when carefully observed, is of a much more

compound structure than might at first be imagined; there may always be observed, round the edges of this part, a sensible motion, resembling that of an indented wheel, or rather that of a screw turned very nimbly about. These, tho' they approach to the shape of the cluster-*polypes*, and resemble them in their having this motion about their mouths, yet never have any tendency to form clusters, but are ever found loose and single. There are always a number of little round bodies, which seem to be animals of a very minute size swimming about in the water in which these *polypes* live; and these are continually drawn into the mouths of the *polypes*, and serve them for food.

The manner of these creatures propagating themselves, is very amazing; they do it by dividing their own body into two; but this is not done longitudinally, as in the cluster-*polypes*, nor transversely, but diagonally from the edge of the head to the opposite edge of the tail; so that of the two thus formed out of one, the one has a head and no tail, the other a tail and no head; but these deficiencies are soon made up, and the head soon grows out of one, and the tail out of the other. Mr. Trembley, in his account of this insect, calls that of the two which has the old head, the superior *polype*; that which has the old tail the inferior. The first particulars observable in a *funnel-polype* that is going to divide, are the lips of the inferior *polype*, or those transparent edges that are so very conspicuous in the creature when perfectly formed. These new lips first discover themselves upon the *polype* that is going to divide, from a little below the old lips to about two thirds of the length of the *polype*, reckoning from the head: but these new lips are not disposed in a strait line, according to the length of the *polype*, but run sloping near half way round about. These lips are distinguished by their motion; but it is to be observed, that this motion is at first very slow, and requires an attentive eye and good glasses to discover it. Phil. Trans. N° 474. p. 180.

That portion of the body of the *polype*, which is bounded by these new lips, then gathers up itself, and these lips insensibly draw close together, and finally they close themselves. By this means there is formed a swelling at the side of the *polype*, which is found, on a close examination, to be the head of the new *polype*, bounded by the lips before-mentioned. Before this swelling is become very remarkable, it is easy to discover the true *polypes* that are forming themselves; and after this, when the swelling is greatly increased, these two distinct animals will be found joined to one another only by a very small part of their bodies. The superior *polype*, in this case, no longer adheres to the inferior one but by its posterior extremity, which is still fixed on one side of the inferior one. The superior one then begins to make motions, which tend to the separating itself from its fellow; and these soon finish the work, and he becomes perfectly disengaged, and swims away whither he pleases, and soon fixes on some other place. The inferior *polype* remains fixed in the place where both were before, and becomes a perfect animal; and the superior one, after taking a tour in the water, sometimes returns to the old place, and fixes himself by the tail to the body of the inferior one. All these animals are extremely minute, and are not to be seen distinctly, much less are their operations observed without the help of glasses; and as there is no taking them out of the water to bring them before the microscope in the common way, without absolutely destroying them, Mr. Trembley, who has observed them with more accuracy, than perhaps any other person ever did, has contrived to view them in a glass vessel, in their own water, by bringing them so near the sides of the glasses, that the microscope glasses are able to reach them properly from the outside. The substances on which they are fixed, are to be brought close to the edges of the vessel, by means of a set of quills framed properly together; and the microscope glasses to be supported on a moveable arm made for that purpose. Phil. Trans. N° 474. p. 183.

Ver-POLYPE. See VER-*Polype*.

POLYPODES, a word used by some as a name for the millepedes.

POLYPODITES, a name given by the antients to a wine impregnated with polypody, and sometimes for the juice of millepedes, expressed with wine.

POLYPODIUM, *polypody*, in the Linnæan system of botany, the name of a genus of the capillary plants, comprehending the *polypodium* and *lonchitis* of Tournefort; the *lonchitis* of Linnæus being a very different genus of plants. The character of the *polypodium* is, that the fructifications are disposed in round spots on the under part of the disk of the leaf.

The characters of this genus, according to Mr. Tournefort, are these: The flowers are not discovered, but the seeds grow on the back of the leaf: these are contained in membranaceous capsules, of a roundish figure, which are placed together in clusters, and have nothing round them, as those of the trichomanes have, but are left to be burst by the contraction of their own fibres.

The *polypodies* are not branched, but consist of single leaves, divided almost to the middle rib into oblong jaggs or segments.

The species of *polypody*, enumerated by Mr. Tournefort, are these: 1. The common *polypody*. 2. The common great *polypody*, with serrated leaves. 3. The lesser *polypody*. 4. The large *polypody*, with pointed leaves. 5. The broad thin-leaved *polypody*, called by Muntingius, and others, sensitive *polypody*. 6. The narrow-leaved *polypody*, commonly called *lonchitis aspera*, and rough *spleenwort*. 7. The Welch *polypody*, with leaves jagged at the edges of the pinnules. 8. The finely divided African *polypody*. 9. The great golden *polypody*. 10. The *polypody* with slender creeping roots. 11. The finely divided black *polypody*. 12. The *polypody* with leaves like the asplenium. 13. The thin-leaved pendulous *polypody*. 14. The *polypody* with pointed and rigid pinnules. 15. The pendulous *polypody*, with a reddish hairy down. 16. The smooth pendulous *polypody*. 17. The least pendulous *polypody*. 18. The curled *polypody*, resembling the ostrich's feathers. 19. The rough dentated *polypody*. 20. The slender undulated *polypody*. 21. The curled *polypody*, with cups. 22. The sweet *polypody*, with the taste of liquorice. 23. The *polypody* covered with silvery scales. 24. The brown finely serrated *polypody*. 25. The pellucid *polypody*. 26. The *polypody* with bluish punctated roots. *Tourn.* Inst p. 540.

The common *polypody* is the kind used in medicine; it is usually found about the roots of old trees, in woods, and by hollow road sides. There is a vulgar opinion, that such of it as grows upon the stump of an oak, is preferable to what grows on any other tree; but there is no foundation for this. The root is the part used in medicine; it is a gentle cathartic, and is particularly recommended in disorders arising from obstructions of the liver and spleen. It is by many esteemed an excellent medicine in scorbutic and hypocondriac complaints. The country people take it in infusion alone, but physicians usually prescribe it in compound decoctions and medicated ales. It has also been made an ingredient in many of the purging electuaries in the old dispensatories.

POLYPOSIA, a term used by the antients to express a copious drinking of wine.

POLYPUS (*Cycl.*)—POLYPUS, the *polype*, in zoology. See the article POLYPE.

POLYPUS, in natural history, a name given by some of the earlier writers to the thin-shelled nautilus, or nautilus papyraceus. The body and arms of this creature somewhat resembling those of the polype, it was supposed to be a species of polype inclosed in a shell, which it could quit occasionally, and go on shore to feed.

POLYPUS, in medicine.—Mr. Le Dran cured a *polypus* of the nose, which he could not extract wholly, in the following manner, which may be practised for destroying all such excrescences. He introduced one end of a large seton, put on the point of the fore-finger of the left hand, into the patient's mouth, till he brought it behind the velum pendulum; then sliding a pair of thin crooked forceps into the affected nostril, he catched hold of the seton, after covering what was to be introduced into the nose with a suppurant medicine. While he drew the cord, he endeavoured to preserve the velum pendulum from being hurt, by introducing his finger into the mouth, and supporting the cord upon it. He continued the suppurant till he was sensible, by the patient's breathing freely through the nostril, that the remains of the *polypus* was destroyed, and then he injected desiccatives to cauterize the ulcer. *Le Dran*, Tom. 1. obs. 6. ap Med Ess. Edinb.

Though Kerkringius, and others, have endeavoured to explode the notion of the formation of true *polypi* in the heart and blood vessels, yet Malpighi, Bartholine, Tulpius, Pecklin, and others, have given us incontestable instances of the existence of true *polypi* in the heart, in the strictest sense; and we have three unquestionable evidences of the like nature, in Phil. Trans. N° 464. Sect. 6.

POLYSACTINODOS, in natural history, a name given by Linkius, and some other authors, to those star-fish whose body is divided into more than five rays, that being the more usual and general number.

POLYSCHIDES *fucus*, a sea-plant, called in English *sea-hanger*. It is one of the largest sea-plants we know, growing often to ten foot or more in length. Its root is not flat in the manner of most of the other sea-plants, but is composed of several little hooks, all which lay fast hold of the stone on which it grows: these, in some measure, resemble the tendrils of the vine, and are somewhat broad and flatted at the end, where they are fastened to the stone, tho' round elsewhere, and are about half an inch long: these hooks grow from a broad flattish part at the bottom of the stalk, which is often four or five inches in diameter, and is usually hollow, being composed only of two membranes considerably tough and firm, with a cavity between them; from the center of this rises the stalk, which is often twisted and undulated at the edges; from the top of this stalk grows the leaf, which is divided into eight or ten segments; each of which is often again divided into two. These segments are very long; and as the plant floats in the water, give it much of the appearance of a broad piece of leather cut into several thongs: these all terminate in sharp points, and their colour is a brownish green. The nicest eye cannot distinguish the least nerve or fibre, either in the stalk or leaf of this plant; but on great numbers of these plants, that curious enquirer Mr. Reaumur, found flowers of the same kind with those which he originally discovered on

the common fences: they are composed of slender filaments, not exceeding the twentieth part of an inch in length; and these were the more easy to be overlooked, as they are of the same colour with the leaves of the plant. Those plants on which Mr. Reaumur found these flowers, were not, however, entirely covered with them, but they stood at about a twelfth of an inch distance from one another: it was in the month of July that Mr. Reaumur examined this plant; and at that time there were no seeds discoverable upon it; but doubtless at a proper season, and with proper care in the observer, they will hereafter be discovered as plainly in this as in many other of the sea-plants, usually supposed by authors to have wanted them. Mem. Acad. Par. 1712.

POLYTHALAMIUM, in natural history, a name by which some authors have called the *tubuli marini concamerati*, a sort of sea-shell found frequently fossile, with other shells, in Sweden, and brought over to us in the stones used for pavements, but not known in its recent state.

It is of the same general structure with the cornu ammonis, and thick nautilus, being composed of several cells or cavities, communicating with one another, by means of a siphunculus or pipe; but it is usually strait, tho' sometimes its end is twisted exactly in the manner of the cornu ammonis.

POLYTHALAMIUS, in natural history, a term invented by Breynius, to express a class of shells, the character of which is, that they are hollow, shelly bodies, either strait or regularly twisted into a spiral form, always wide at the mouth, and growing narrower to the other extremity; they are divided within into several cells or chambers, which are called *thalami*, each separated from the other by a diaphragm, or partition of shelly matter. The upper or largest chamber, contains the body of the animal, but all the others are perforated by a siphunculus, which gives them communication one with another, and which runs from the mouth to the very apex, growing slenderer all the way.

Of this class he distinguishes four genera, the orthoceros, lituus, ammonites, and nautilus, each of which see under their several heads. The two last of these, he observes, have been long well known to the world; the two first he gives as new, and of his own discovery.

Of the orthoceratitæ, which are stones cast in the shells of the orthoceros, there are at present distinguished nine kinds: these differ from one another principally in the position of the siphunculus, or in their external form; the cone which they describe, running quicker or more gradually to a point; or, finally, by the thalami or chambers being wider or narrower. *Breynius* de Polythalam.

POLYTHRIX, the *hair-stone*, a name given by some writers to those German agates which have received into their mass, while yet soft, either the branches of the confervæ, or other capillary water-plants, or else have thin streaks of a coarser matter frequent in them, and running in the form of hairs.

POLYTRICHUM, in botany, the name of a genus of mosses, the characters of which are these: The stalks are not much branched, and the capsules have calyptræ to cover them till mature. This calyptra is always hairy, and in many of the species is composed merely of long hairs, ranged lengthwise together, without any membrane; the others have membranaceous calyptræ, but covered with erect hairs. The leaves of those kinds are rigid, and have a membranaceous appendage, by which they touch the stalks and surround them; those of the others are softer, and have not this appendage. The basis of the pedicle which supports the head, is also in these surrounded by a sort of tube, round which there stand a number of membranaceous leaves; this is more visible in the larger than in the smaller species. The capsules in some of these mosses are square, in others they are roundish; and the square ones have usually an apophysis, by which they are joined to the pedicle, which the round ones never have, or at least very seldom. See Tab. of Mosses, N° 12.

The *polytrichum* of the first order, are those which have square capsules, which are joined to the pedicles by a round apophysis; of these the following are all the known species: 1. The common large, square-headed, great-leaved *polytrichum*, or great goldilocks. This is very common in woods, in boggy places, and on heaths. 2. The lesser and stiffer square-headed juniper-leaved heath-*polytrichum*. The leaves of this are short, and the whole plant much smaller than the former. It is very common on heaths. 3. The small hairy square-headed *polytrichum*; the leaves of this are of a bluish green in winter, and of a reddish brown in summer. It grows in dry barren places.

The second order of the *polytrichum* comprehends those which have round capsules, and usually want the apophysis, by which the others are joined to the stalk. The following are all the known species of this kind: 1. The branched alpine *polytrichum*, bearing heads from its tops. The leaves of this are narrow and somewhat hollowed, and when viewed by a microscope, appear serrated at the edges. It grows on the Welch mountains. 2. The branched *polytrichum*, bearing heads from its sides. This grows to two inches high, and is found in the same places with the former. 3. The dwarf round-headed aloe-leaved *polytrichum*. This has scarce any stalk, but lies upon the ground; it is frequent by way sides, and ripens its capsules early in the spring. 4. The dwarf long-headed aloe-leaved *polytrichum*. The stalks of this are a little longer than those of the former. It grows in wet places on heaths. 5. The larger short-shanked *polytrichum*. This is branched, tho' very low, and resembles at first sight one of the bryums, growing in round tufts. The leaves are of a deep green, and very pellucid; they have a middle rib visible in them, and are disposed in somewhat of a stellate manner at the ends of the branches. It grows in woods on the barks of old trees, and sometimes on walls. 6. The lesser short-shanked *polytrichum*. This is much smaller than the former, and produces its capsules a little later. It grows on trees and walls, and sometimes on the earth. 7. The short-shanked *polytrichum*, with strait and plaited leaves. This grows in tufts. Its stalks are an inch high, and its leaves of a dark green. It grows on rocks and old walls. 8. The fine-leaved curled *polytrichum*, with sharp hairy calyptræ. This is found in tufts composed of thick branches, surrounded with very numerous leaves, each ending in a hair at the end. It grows in woods, and ripens its capsules in March and April. 9. The dwarf fine-leaved *polytrichum*, with cylindric heads. This grows on sandy places in north America. *Dillen* Hist. Musc. p. 430.

Old writers are very full of the praises of this plant for its virtues in making the hair grow thick; but this seems to have been an opinion taken upon no better reason than the likeness of the stalks of the plant to hairs. They make a decoction of it in some parts of Germany, and wash the head carefully with it in the increase of the moon; but there is no great reason for supposing this liquor does any thing more than warm water would do.

POLYTROPHEROS, a name given by the Greeks to coarse bread, from its conveying much more nourishment to the body than the finer kind; which they called, by way of distinction, *oligotropheros*.

POLYZONOS, in natural history, a name given by the antients to a species of onyx, which had a dark or blackish ground, with a great number of white zones.

POMA, in the writings of the old Greek physicians, a word which has given the commentators a great deal of trouble rightly to explain. Dioscorides, in describing the *onyx indicus*, which we improperly call *blatta byzantia*, tells us that it was like the part of that shell usually called by the name of *byzantine blatta*, but that it was in reality the *poma* of another shell.

Some have understood Dioscorides, as if he meant that the whole shell of the fish, which he describes as being like the purpura, was what he called *onyx indicus*; but it is not easy to say why so correct an author should call a whole shell *poma conchyli*, nor what resemblance there could be between a shell like the purpura and a human nail, *onyx?* Actuarius, and many others, sensible that a part of a shell only was meant by this name, have translated it the *os nasi*; but the bone of the nose of a shell-fish is so odd an expression, that one scarce knows what to understand by it.

The purpura of the antients has a long tongue, with which it pierces the shells of the chamæ, and other fish that it feeds on; but whether this or the operculum, which all shells of this kind have, is meant by the word, is not to be ascertained by this phrase *os nasi*.

The true meaning of the word is to be made out before any thing can be judged of what is meant to be expressed by it here, where it is evidently used in a metaphorical sense.

Brassavolus says, that it means all sorts of shelly or crustaceous coverings of fishes; but this is an absolute error; for even the medical authors do not extend its sense so far as that. The Greeks called all shells by the name *ostraca*, and this author attributing a different virtue to the whole shell of the purpura, sufficiently speaks this *poma* to have been but a part of it.

The Arabian writers were sensible of this, and rendered it by the words *adsor althaib*, which signify fragments like nails. Serapio calls it *mukatha*, which signifies a morsel or piece of any thing cut from a solid body. The original sense in which the Greeks used the word *poma*, was to express the thing that closed the mouth of any vessel with a long and narrow neck. The Latins expressed this by the word *operculum*, and sometimes, as in Sulpicius Severus, by the word *umbo*.

The antients also used the word *poma* to express the lid or covering of a well, or of any hole. Now the purpuræ buccina, and all those other shells which the Greeks have called *stromboide*, may in some sort be compared to narrow and deep vessels, and they have all of them a sort of *poma*; or, as the Latins have expressed it, an *operculum*, to stop the mouth of the shell, and prevent the ingress or egress of any thing at the creature's pleasure. This *operculum* being what Aristotle has called *epicalymma*, is certainly also what Dioscorides means by the word *poma*; Aristotle has been very express in his description of it, and says that the tongue lies under it, and that all the *stromboide* shells gave it. The *onyx indicus*, therefore, was only the *poma*, or *operculum* of an Indian *stromboide* shell, of the buccinum or purpura kind, and was of a sweet smell, and thence had the term *aromaticus*, or *odoratus*. The name *onyx* is easily accounted for, as the *poma* of every shell of this kind is flat and thin, and does not unaptly resemble the human nail.

POMATIA, in natural hiftory, the name of a large fpecies of garden-fnail, fo called from its feeding on apples and other fruit. It is originally a native of Italy, but is become of late years as familiar with us in England, as if a native with us. It is a noble remedy in confumptive decays; and a perfon of diftinction in England having occafion to take great numbers, had feveral large parcels brought carefully alive from Italy, and turned loofe in his garden, where they multiplied to fuch a degree, that the neighbouring woods and hedges foon became full of them, and they have fince been propagated in many other places.

The *pomatia* is much larger than our common fnail, and of a paler colour: it is of a roundifh figure, and has five fpires or twifts at the head; thefe are placed very clofe, and its mouth is large and almoft circular, and has no duplicature or fold furrounding it, but it is as thin as the reft of the fhell.

POMEGRANATE, in botany. See PUNICA.

POMERIUM, in antiquity. See POMOERIUM.

POMOERIUM, among the Romans. Authors are not agreed as to particular circumftances relating to the *pomoerium*; fome will have it to be a fpace of ground without the walls; others a fpace within them; and others again think it was both within and without. But which ever of thefe is true, the *pomoerium* was a place efteemed facred, and kept free from houfes and every other kind of obftruction. Hift. Acad. Infcr. Vol. II. p 91, feq.

POMPEION, Πομπειον, in antiquity, a ftately edifice at Athens, in which were kept the facred utenfils, made ufe of at feftivals, and all things neceffary for the folemn proceffions prepared. It ftood at the entrance of the old city, which looked towards Phalerum, and was adorned with many ftatues of the Athenian heroes. *Potter*, Archæol. Græc. l. 1. c. 8. T. 1. p. 34.

The word *pompeion* is derived from πομπευω, *cum pompa incedo*, and was likewife ufed for any utenfil employed on thefe occafions.

POMPILUS, in zoology, the name of a fea-fifh, remarkable for following the rudders of fhips to vaft diftances. It has no fcales: it has a very broad line from the gills to the tail, under which are a number of dotted tranfverfe lines, reaching to the belly, above the line on the fide; the back is fpotted with different colours. The mouth is moderately large, but the teeth very fmall. Its forehead, between the eyes, is of a gold colour, and it has four fins, two at the gills and two on the belly; and befide thefe, one long one running all the length of the back, and another anfwering it from the anus to the tail. It tail is not forked. *Rondelet.* de Pifc. p. 250. *Gefner* de Pifc. p. 887.

POMPILUS is alfo ufed by fome authors for the nautilus, as well of the papyraceous, as the camerated kind. See the article NAUTILUS.

POMPION, in botany. See the article PEPO.

POMPONA, a name given by the Spaniards in America to a fort of *vanilla*, the pods of which are fhorter and thicker than thofe of the common kind, and of a ftronger fmell, tho' lefs agreeable. The pulpy matter alfo in thefe pods is more liquid than that in the common kind, and the feeds much larger, being as big as thofe of muftard. This is never brought to market alone; but the Indians who gather it, cunningly mix it among the right kind; but this fhould be taken care of by the buyer, fince this kind is very prejudicial, occafioning violent head-achs in men, and in women vapours and diforders of the womb.

It is not yet certainly known whether this be the fruit of a different fpecies of the *vanilla* plant, or whether it be only different from the common in age, or in the place of growth of the plant.

POMUM, *apple*, a well known fruit. See APPLE.

Among the various kinds of *apples*, fome are ufed for the defert, fome for the kitchin, and fome for cyder-making.

Thofe ufed for the defert, are the following, placed as they fucceffively ripen after one another: The white juncating, the margaret *apple*, the fummer pearmain, the fummer queening, the embroidered *apple*, the golden reinette, the fummer white calville, the fummer red calville, the filver pippen, the aromatic pippen, la reinette grife, la haute bonte, the royal ruffetting, Wheeler's ruffet, Sharp's ruffett, the fpine *apple*, the golden-pippen, the nonpareil, the l'api, or pomme d'api.

Thofe for the kitchin ufe, in the order of their ripening, are thefe: The codling, the fummer marygold, the fummer red pearmain, the Holland pippen, the Kentifh pippen, the courpendu, Loan's pearmain, the French reinette, the French pippen, the royal ruffet, the monftrous reinette, the winter pearmain, the pome violette, Spencer's pippen, the ftone pippen, and the oaken pippen.

Thofe moft efteemed for cyder are, the Devonfhire royal wilding, the redftreak *apple*, the whitfour, the Herefordfhire under leaf, and the John *apple*, or deux annes.

The feveral forts of *apples* are defigned either for ftandards, or in dwarfs or efpaliers; thofe that are defigned for ftandards fhould be grafted on crab-ftocks, and thofe for dwarfs or efpaliers, on the codling, or fome other fpecies, which does not fhoot freely. See the article GRAFTING.

The beft feafon for planting out thefe trees is, if the foil is dry, in October; but in a wet foil 'tis beft to defer it till February. The diftance at which they fhould be planted, is forty feet fquare, that the fun and air may have room to come every way at them: And 'tis a very good method in large orchards, to plough and fow the ground between them, till they are grown up. Good thriving trees of about three years grafting, are to be chofen for planting; and they fhould be taken from a foil as nearly as poffible of the fame nature with that they are to be planted into, or rather from one that is fomething poorer. In preparing thefe trees for planting, all the broken or bruifed roots are to be taken off, as alfo all fuch as crofs and gall one another, and all fmall fibres; for thefe feldom furvive a remove. Some of the moft luxuriant branches muft be alfo taken off at the fame time, and others fhortened, but the head fhould by no means be cut off. The holes for the planting them fhould be made about two foot deep, and of a breadth proportioned to the extent of the root; the bottom muft be made even, and the clods and lumps all broken. The tree is then to be fet in the middle of the hole, and placed as upright as poffible, and the earth carefully placed about its roots; and, finally, trod down about it with the feet; and if the weather be dry, every tree fhould have a good watering, which will fix the earth to the roots. A ftake fhould alfo be fixed by the fide of each tree to tie it to, that the wind may not fhake it and loofen the roots. The foot of each tree fhould be then furrounded with turf newly cut, with the green fide downwards; which will greatly help to keep the earth moift; and if the feafon be very dry, the waterings muft be repeated at different times; but it is a very common error to water new-fet trees too much; and this fhould be carefully avoided. The year afterwards dig in the earth about the roots, and bury the rotted turff, which was laid about the root when planted, and there needs no farther care; the orchard will then thrive of itfelf.

Dwarf ftandards are of the leaft value of all *apple*-trees, never producing well-tafted fruit; and are therefore the worft way of managing this tree.

Efpaliers are commonly planted to furround the quarters of kitchin gardens. Thefe quarters fhould be made as large as the garden-room will permit. The trees fhould be planted at fixteen or eighteen feet afunder, if on crab-ftocks, but if on paradife-ftocks, twelve feet will be fufficient; when thefe are planted in the manner above-defcribed, they fhould be headed to about four eyes above the graft, and they fhould never be of more than two years old from the grafting when planted. The fummer after they are planted, a number of fmall ftakes muft be provided, of about three feet long, to drive into the ground on each fide of the trees, four to each tree; and to thefe ftakes the new fhoots muft be faftened as horizontally as poffible. If the trees have taken kindly, probably about Michaelmas all the four eyes will have made fhoots; if fo, at Michaelmas, which is the right time for pruning, the two upper fhoots fhould be cut off to four eyes each, but the undermoft may be left with fix or eight; but the branches fhould never be fhortened in fummer, unlefs on occafion of filling up fome vacancy in the efpalier, and then this muft not be done after May.

In the fecond year, all the fhoots muft be trained horizontally, except the fore right ones, which muft be difplaced as faft as they are produced: at Michaelmus, the branches in the middle of the tree, or wherever there is want of wood, muft be fhortened; but after this be very careful of any great lopping, or fhortening of branches, but leave them at full length, training them all horizontally. *Miller's* Gardners Dict.

POND (*Cycl.*)—POND-*weed*. See POTAMOGEITON.

Fifh POND. See the article FISH.

PONENDUM *in ballium*, in law, a writ commanding that a prifoner be *bailed*, in cafes bailable. Reg.Orig. 13. *Blount*, *Cowel*.

PONENDUM *figillum ad exceptionem*, a writ by which juftices are required to put their feals to *exceptions* exhibited by the defendant againft the plaintiff's evidence, verdict, or other proceedings before them, according to Stat. Weftm. 2. *Blount*, *Cowel*.

PONENDIS *in affifis*, a writ granted by the ftatute of Weftm. 2. c. 38. which ftatute fhews what perfons fheriffs ought to impanel upon *affifes* and juries, and what not. Reg. Orig. 178. F. N. B. 165. *Blount*, *Cowel*.

PONTAGIA, a term ufed by Paracelfus, and his followers, to exprefs a mixing faline fubftances, with thofe which are bitter or ftyptic.

PONTEE, in the glafs trade, an iron inftrument ufed to ftick the glafs at the bottom, for the more convenient fafhioning the neck of it. *Neri's* Art of Glafs, Appendix.

PONTEE-*ftake*, in glafs making, is the iron whereon the under fervants place the irons from the upper workmen, when they have knocked off the broken pieces of glafs. *Neri's* Art of Glafs, Appendix.

PONTICA *gemma*, a name given by the antients to a ftone of the agate kind, with a white ground and red and black fpots, irregularly placed, and making a beautiful variegation in it. This feems to have been the fame ftone which fome of the moderns have called the *fmall fox ftone*, from its fpots refembling the eruptions in that difeafe. The antients mention feveral kinds of it, as they were fpotted with various colours.

PONTICA *vina*, a term ufed to exprefs acid, fæculent, and tartarous wines.

PONTICUM *mel*, a name given to a fort of poifonous honey

PONTICUS *mus*, in zoology, the name of a creature defcribed by the antients, and fuppofed to be the fame with our fquirrel. See SCIURUS.

PONTLEVIS in the manege, a diforderly refifting action of a horfe, in difobedience to his rider; in which he rears up feveral times, and rifes fo upon his hind legs, that he is in danger of coming over. It is cured by clapping fpurs fmartly to him, as the fore feet are returning to the ground.

POOL (*Cycl.*)—POOL-*fnipe*, in zoology, a name given in many parts of England to the redfhank.

POOR, or POWER, in ichthyology, a name given by the people of Cornwall to a fpecies of bearded gadus. See the article GADUS.

POOSPANSCUM, in natural hiftory, the name of a peculiar fpecies of foffil in the Eaft Indies. It is of the nature of the blende, or mock-lead, with us; but is not formed into fo large flakes, but more refembles the fteel-grained lead ores. It is found in the beds of rivers, and when calcined, it is ufed with the juices of certain herbs, for ulcers and other cutaneous diforders. Before calcination it is alfo ufed by the women to make their hair of a fine gloffy black colour, which it performs very neatly.

POPÆ, among the Romans, were fuch perfons as attended the facrifices, whofe bufinefs it was to provide victims, and to kill them after they had knocked them down. They were half naked, their fhoulders, arms, and upper parts of their bodies being uncovered as far as their navels, and the reft covered to the mid-leg with a linnen apron, or the fkins of the facrifices; and they wore crowns of laurel upon their heads. *Danet* in voc. See POPE, *Cycl.*

POPE, in zoology, a name by which the people in many parts of England call the *anas arctica clufii*. See the article DUCK.

POPLAR, *populus*, in botany, the name of a genus of trees, the characters of which are thefe: the flower is of the amentaceous kind, being compofed of a number of fmall leaves, furnifhed with a great quantity of apices; but thefe are barren. The embryo fruits are produced on thofe trees which produce none of thefe flowers; thefe are fpiked, and confift of many leaves, under which there lies a fort of bell, which contains the embryo feed veffel, which finally becomes a membranaceous pod of a compreffed figure. Thefe are difpofed in a fpiked form, and open into two parts, containing feeds winged with down. To this it is to be added, that the *poplar* has a peculiar and appropriated general appearance, by which it is obvioufly diftinguifhed from the willow. See Tab. 1. of Botany, Clafs 19.

The fpecies of *poplar* enumerated by Mr. Tournefort, are thefe: 1. The common white *poplar*, with large leaves 2. The common white *poplar*, with fmaller leaves. 3. The common black *poplar*. And, 4. The *poplar* with trembling leaves, called the *afpen-tree*. *Tourn.* Inft. p. 592.

The *poplar*, whether black or white, may be eafily propagated, either by layers, cutings, or fuckers, of which the white kind always produces a great many from the root. The beft feafon for the tranfplanting thefe fuckers is in October, when the leaves begin to decay; and they fhould be removed into a nurfery for two or three years, at the end of which time they will have got ftrength enough to be tranfplanted into the places where they are to remain.

When they are to be propagated by cuttings, it is beft to do that in February, cutting off large truncheons of eight or ten foot long; which being thruft down a foot deep in the ground, will take root very quickly, and if the foil be moift, will grow to a confiderable fize in a very few years.

The black *poplar* is not fo eafily raifed from thefe large truncheons, but fhould be planted in cuttings, of about a foot and a half long, planting them a foot deep in the ground. This will grow on almoft any foil; but does much better on a moift one than on any other. They are the fitteft of all trees for raifing a fhade quickly, as they will grow fourteen foot in heighth fometimes in one feafon, and in four or five years will be large trees. *Miller's* Gard. Dict.

POPLAR-*galls*. The black *poplar* is famous among naturalifts for producing a fort of *galls* or protuberances, of various fhapes and fizes, on its leaves and branches, which have been ufually miftaken for the lodgments of worms hatched from the eggs of an ichneumon-fly; but they are in reality produced by the operation of a viviparous infect, called the *puceron*, for the bringing up of its off-fpring. See PUCERON.

Thefe *galls* are of the bladder kind, being ufually fkinned over, and more or lefs hollow within, not woody, as thofe of the oak, &c. They proceed from different parts of the plant, fome from the pedicles of the leaves, and many from the young fhoots. They are very various in figure, fome being roundifh, others oblong, others crooked and contorted in various directions, and fome of them are in the figure of horns, like thofe of the turpentine tree, and of the fame origin.

When any of thefe *galls* are opened at a proper feafon, there is found in them a vaft number of infects of the puceron kind, all the family of one female parent, who formed the bladder or *gall* for their reception: if they are opened a little earlier than this, there is only one, that is the female parent, found in them: and finally, if they are examined later, they are found empty, the young brood having made their efcape out of them; and at this time the ftalks of the leaves are found twifted about and fwelled; and in thefe fwellings, which are a new fort of *gal's*, are found the young pucerons, which had efcaped out of the larger *gall* or bladder, which had ferved for their common home.

Mr. Malpighi obferved thefe fpiral tubercles on the pedicles of the leaves of this tree, and has given a figure of them in his twenty-ninth plate; but he had no knowledge of this animal which occafions them, nor, indeed, any idea of a viviparous creature being at all concerned in the formation of *galls* on vegetables; his whole fyftem being founded upon their being the effect of the eggs of a fly depofited in them: he has therefore defcribed thefe fpiral ones among the reft, as being of the fame origin, and filled with eggs; but if he had accurately examined the bodies themfelves, he would have found them filled with real living infects, not eggs of any kind.

Befides thefe *galls* on the ftalks and pedicles of this tree, there are alfo others found on the leaves themfelves; and thefe are always joined to and prolonged from the middle rib of the leaf, which is properly only the continuation of the pedicle, and feem only to be the middle rib diftended and fwelled, the rib being wanting in the part where they are, on the upper fide of the leaf, and on the under fide there being only a little flit or crack, but with its edges nicely joined in the place of it; and if the leaf be preffed between the fingers, this crack will open wider, and fhew the internal cavity of the *gall* or bladder that appears on the upper fide, and the little pucerons are feen living in it; but as foon as the leaf is left to itfelf again, the edges of this flit clofe, and the creatures find themfelves as well defended from all injuries as before. There is great reafon for thefe little creatures thus hiding themfelves, for they are, when expofed to the view of other infects, fed upon by many little animals; and it is a common thing, on taking one of them out of its cell, and fetting it on the furface of the leaf, to fee a little yellowifh bug immediately come up, and feize upon it, and fuck it to death with its trunk, which is extremely fine, but is eafily introduced into the body of this creature.

The care the pucerons take to hide themfelves, and their young, from thefe enemies, is not, however, always fufficient; for it is a very common thing to find a fmall red infect, of an oblong form, and endued with a very long trunk, lodged in the very cells, and eating them up in their habitations. This is fuppofed by Reaumur to be the bug before mentioned in its nymph ftate, and had doubtlefs been lodged in this place by its parent in the egg, in order to feed upon the young animals.

The pucerons which live upon the poplar have another method of fecuring themfelves from injuries. They have a method of forming a bladder of the very fubftance of the leaf itfelf, and this is very capacious, its cavity being much larger than that of any other kind: this is done by bringing the two edges of the leaf together, fo that the leaf has its whole length, tho' only half its breadth, and the edges are every where faftened together, while the whole fpace within remains free, and is a fit receptacle for the animals. The cavity is much largeft near the rib, and the leaves which are thus folded have not the colour or the glofs of the others; but are covered with a vaft number of little tuberofities of a reddifh colour, and of the bignefs of a pin's head. This is ufually effected while the leaves are young and green, and at firft there are only found a few fmall pucerons in them; by thefe may be feen the true caufe of the joining together of the leaf into a fort of fack or cafe. If two or three of thefe are found, as is very frequent on the under fide of the leaf of this tree, they are always found fixed in their fucking pofture, near the middle rib; and if the upper fide of the leaf be examined, there will be found on it a yellowifh or pale green tubercle, juft oppofite to every one of the infects. Thefe tubercles are fo many fmall bladders or leaf *galls*; and as they continually increafe in fize, and by that increafe force out the middle part of the leaf on which they are placed into a fwelling upwards, the confequence is, the drawing together of the edges, fo as to form a cafe or bag, of which the outfide of the leaf makes the external covering, and the infide the lining. The regularity of the placing of thefe tubercles in the center of the leaf is the reafon of the edges falling evenly together; and fometimes, when the tubercles are lefs regularly fituated, the joinings have feveral empty or open fpaces between them. Thefe two or three firft tubercles are afterwards furrounded by a vaft number of new ones, which are the effects of the progeny of the firft obferved infects; and thus the generality of the larger leaf or bladder-*galls* are formed, as well on the *poplar* as on the elm, the apple, and the other trees on which they are fo frequently found.

The pucerons which are found inhabiting the leaves of the *poplar* thus curled up, are of the fame fhape and figure with thofe of the other parts of the fame tree, and probably are the very fame fpecies; tho' fome fuppofe them different from the

dif-

different manner of their working. *Reaumur*'s Hift. Inf. Vol. VI. p. 39, feq.

POPLITÆUS, *(Cycl.)* a fmall mufcle, obliquely pyramidal, fituated under the ham. It is fixed above, by a ftrong narrow tendon, to the outer edge of the inner condyle of the os femoris, and to the neighbouring pofterior ligament of the joint; from thence it runs obliquely downward, under the inner condyle of the os femoris; its flat and pretty thick flefhy body increafing gradually in breadth, till it is fixed in the backfide of the head of the tibia all the way to the oblique line obfervable on that fide. *Winflow*'s Anat. p. 216.

POPPY, *(Cycl.)* PAPAVER, in botany. See PAPAVER.

We have many fpecies of this plant cultivated in gardens for the beauty of the flowers. They are all eafily propagated by fowing the feeds in autumn. When the young plants come up, they are to be cleared from weeds, and thinned to a proper diftance by pulling fome up where they ftand too thick; for they never thrive well if they are tranfplanted. They are to be left, according to their fizes, at fix, eight, or ten inches diftance.

They are very fhowy flowers, and make a fplendid appearance in gardens; but they are but of fhort duration, and are of an offenfive fmell, which makes them lefs valued at prefent than they have been.

Some fow thefe plants in fpring, but it is not fo well; becaufe they then have not time to get ftrength before autumn, when they are to flower; and for that reafon thofe fown in fpring ufually flower weakly. *Miller*'s Gard. Dict.

Red-POPPY. The common wild red *poppy* is one of the moft troublefome and mifchievous weeds the farmers are plagued with among their corn, and it is the moft difficult to thoroughly deftroy of almoft any other. Its feed will lie a long time in land unploughed, without ever fhooting; but they will be fure to grow with the firft crop of corn. Mr. Tull gives an inftance of the feeds of this plant being buried four and twenty years in a field of faint-foin, and at the end of that time, the land being ploughed for wheat, they all grew up among the corn, tho' they had lain dormant fo long before. *Tull*'s Horfehoing Hufbandry.

It has been the general opinion of authors, that the narcotic quality of the *red poppy* lay in its flowers; but Mr. Boulduc, in his courfe of experiments for the finding out an European plant which fhould yield us a juice of the nature of the opium of the Eaft, without its bad effects, found that the virtue of this plant, which is very great, lay much more in the heads than the flowers; and from four ounces of thefe heads, while frefh and green, he obtained five drachms of a folid extract, of the nature of opium, two, three, or four grains of which were a full dofe; and which poffeffed the virtues of opium, and might be given with great fuccefs and fafety in obftinate coughs and other fuch cafes. Hift. Acad. Par. 1712.

It is faid, that the extract of Britifh *poppies* is, in fome cafes, preferable to the opium brought from Turkey. We have, in the medical effays of Edinburgh, the method of preparing an extract and fyrup of *poppies*, by Mr. Arnot. See Vol. 5. Art. 11.

Yellow POPPY. The yellow horned *poppy*, called by authors *papaver corniculatum luteum*, is one of thofe vegetable poifons of our own growth, which may be very mifchievous by their not being generally known, or fufpected to be fo. We have an account of the effects of this plant in the philofophical tranfactions, in an inftance of a family in Cornwall, who eat of a pye made of the roots of this inftead of thofe of eryngo, or fea-holly, which it is the cuftom of the poorer people there to make into a coarfe fort of pye for their food.

The man of the houfe, on eating of this pye while hot, was feized immediately with a violent delirium, one effect of which was his thinking every thing he faw of a yellow colour, and taking every utenfil of the houfe to be made of gold. The man and maid fervant eat of the pye after their mafter, and were foon after as mad as he, coming into the room where his friends were attending him, ftripped naked, and dancing together. Thefe people alfo took every thing they faw to be gold; and a child in the cradle, to whom a fmall piece of the pye had been given, was thrown into a drowfy diforder, and convulfed about the mouth; but, after a few days, it recovered.

The grown people were all feized with moft violent purgings, and by that means efcaped, after being miferably worn down by this complaint.

The fymptom of fuppofing every thing gold, which ran through the whole family, and went even fo far as to the fuppofing their ftools gold, and ordering them to be faved, may poffibly be in fome meafure owing to the idea they had of the plant whofe roots they had been poifoned by; its flowers being as large as a rofe, and of a fine yellow, and the juice of the whole plant being alfo yellow. Phil. Tranf. N°. 242.

Horned POPPY. See GLAUCIUM.

POPPY-*feeds*. The *poppy-feed* is of a more delicious tafte than fweet almonds; it is oily and farinaceous. Dr. Alfton fays, he has eaten large quantities of the black as well as the white feed, and never found it fomniferous or noxious. See Med. Eff. Edinb. Vol. 5. Art. 12.

Thefe feeds are ufed in food in fome places, as is their expreffed oil, which is as wholefome as olive oil. Vid. Matthiol. p. 746. *Geoffr.* Mat. Med. Vol. 2. p. 713.

POPULAGO, *marfh-marygold*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the rofaceous kind, being compofed of feveral petals arranged in a circular form; from its center arifes a piftil, which afterwards becomes a membranaceous fruit, confifting as it were of feveral thin capfules collected into a head. Thefe capfules all bend a little downwards, and contain oblong feeds.

The fpecies of *populago*, enumerated by Mr. Tournefort, are thefe: 1. The common large flowered *populago*. 2. The fmaller flowered *populago*. And, 3. The *populago* with double flowers. *Tourn.* Inft. p. 273.

POPULARIA, among the Romans, were fteps or places where the people fat and beheld the games and horfe-races. *Pitifc.* Lex. Ant. in voc.

PORCALA, a name given by fome of the later Latin writers to the herb purflain, as if it had its name from being loved by the hogs.

PORCELAIN *(Cycl.)*—The moft juft and regular idea we can form of the *porcelain* or china-ware is, that it is an half vitrified fubftance or manufacture, in a middle ftate between the common baked earthen ware of our vulgar manufactures, and true glafs. This is the effential and diftinctive character of *porcelain*, and it is only by confidering it in this light, that we are to hope to arrive at the perfect art of imitating it in Europe.

This attempt is to be made on thefe principles in two different manners: the one by finding fome appropriated matter on which fire acts with more than ordinary ftrength in the time of its paffing from the common baked ftate of earthen ware into that of glafs. The other is, to compofe a pafte of two fubftances reduced to powder; the one of which fhall be of force to refift a very violent fire, fo as not to become vitrified in it; and the other a matter very eafily vitrifiable. In the firft cafe, the matter is to be taken out of the fire at the time when it is imperfectly vitrified; and in the other, the compound mafs is to remain in the furnace till the one fubftance, which is the more eafily vitrifiable, is truly vitrified; and being then taken out, the whole will be what *porcelain* is, a fubftance in part vitrified, but not wholly fo.

The firft method is that by which the European *porcelain* has generally been made, and tho' that of St. Cloud, and fome other places, has been very beautiful, yet it is always eafy to diftinguifh even the fineft of it from the china-ware, and the nature of the two fubftances appears evidently different: thefe owing all their beauty to their near approach to vitrification, are made to endure a long and violent fire, and are taken from it at a time when a very little longer continuance would have made them perfect glafs; on the contrary, the china-ware being made of a pafte, part of which is made of a fubftance in itfelf fcarce poffible to be vitrified, bears the fire in a yet much more intenfe degree than ours, and is in no danger of running wholly into glafs from it.

The two fubftances ufed by the Chinefe are well known by the names of *petunfe* and *kaolin*, and on examining thefe it appears very evident, that we have in Europe the very fame fubftances, or at leaft fubftances of the very fame nature, and capable of being wrought into a *porcelain* equally beautiful and fine. Mem. Acad. Scienc. Par. 1739. See the articles KAOLIN and PETUNSE.

Thefe are the two different femi-vitrifications, on one or other of which all the European manufactures have hitherto been founded; and it is eafy from the knowledge of thefe principles to determine, on breaking a piece of the china of any of our manufactures, by which of the two proceffes it is made. If it is made by fiezing the half-vitrified mafs of a fubftance which would foon after have been wholly vitrified, then the putting it in a crucible, into an equal degree of fire, will foon turn it wholly into glafs. This is the cafe of moft of our European *porcelain*; but if it be made of two ingredients, the one of which is not vitrifiable, or at leaft not by fuch fires, then the matter will melt, but will not vitrify: this is the cafe with the Chinefe *porcelain*, which, if kept in fufion a long time, yet when cold is china-ware ftill; fo that this is evidently made of two fuch different ingredients.

Befides thefe methods, there is yet another, of late invention, which makes a very beautiful china; and which, if it does not afford veffels equal to thofe of China, yet will afford them nearly approaching to thofe, and at a confiderable fmaller price. This method confifts in reducing glafs to china. See the article GLASS-*porcelain*.

The fine deep blue of the old *porcelain*-ware of China, is much valued by the curious; and it is much lamented, that the fame colour is not ufed at this time. The art feems at prefent to be loft; but perhaps it might be recovered by trials. It is certain that the Chinefe have cobalt among them, and very probably they ufed a blue colour prepared from this before they had any commerce with us: notwithftanding all the con-

conjectures about their materials for colouring, this seems the most probable substance; and there is a way of preparing a colour from this, much superior to that now in use, which we call smalt.

Cobalt is a mineral containing arsenic and a blue vitrifiable earth. The common way of preparing smalt is, by roasting this cobalt in a reverberatory fire. This disposes it to vitrify, and drives off the arsenic it contains in fumes, which collecting at the top, form true flowers of arsenic. It is very certain, however, from experiments, that if this arsenic could be preserved in the cobalt, the smalt would be of a much finer colour; for there are some kinds of cobalt which yield smalt without previous roasting; and as the arsenic is in a great measure contained in these, the smalts are much finer coloured. Arsenic added to smalt, while in fusion, greatly exalts its colour also; and there is a way of procuring smalt from cobalt without fire, only by dissolving it in an acid, and precipitating that solution with oil of tartar. The smalt thus precipitated to the bottom, is of a much finer colour than any prepared by fire; but it is much more expensive, and prepared in less quantity It is very possible, that the Chinese might have the art of making this kind of smalt before they knew us, and that to this was owing the fine blue of their *porcelain* ware: but when we trafficked with them, and they purchased smalt so much cheaper of us than they could make it themselves, they naturally discontinued the manufacture of their own finer kind, without considering how greatly inferior the colour was which the other yielded. If this be the case, it will be easy to revive this art, and the adding the true old china blue to our European manufactures, in imitation of *porcelain*, may give them a value which they have not at present.

The Chinese had once a method of painting the figures of fishes and other things on the insides of their vessels, in such a manner that they did not appear till the vessel was filled with water, or some other clear liquor. They called this sort of china-ware *kiatsim*, that is to say, the concealed blue china. The art is now in a great measure lost; but there may be some guess made as to the manner in which it might be done at this time. The vessels which are to be made in this manner, must be very thin: the colour must be laid on in form of the fish or other animals or figures, on the inside, after the vessel has been once baked. After this colour has had time to dry, the inside of the vessel must have a second coat of the same earth, or stone-ware, of which the vessel is made; and over this a varnish of the common kind. The consequence of this will be, that the figures of the fish, in a very strong colour, will be buried between two coats of the ware, which together form a compleat vessel. The outside is then to be ground down almost to the figures, and when they begin to appear, a new coat of the varnish must be laid over this. The figures will then be obscure, and scarce, if at all perceivable; but on filling the vessel with water, the transparence of the sides will be taken off, and the liquor will make a sort of foil behind, which will throw out the figures of the fish. This might be done in any ware tolerably clear and transparent. The *porcelain* of China would succeed best with it; but the pains and nicety required are too great, and all the attempts lately made by them have miscarried. See the article STAINING of *porcelain*.

The Chinese make a great variety of figures on the surfaces of the vases of white china-ware, and there is one kind of this greatly in esteem among them, in which there are flowers and other figures; yet the surface is quite smooth, and the substance extremely thin. The manner of making it is this: they first form the vessel of the finest materials, as thin as they can; then, when they have polished it inside and out at the wheel, they put into it a stamp of its own shape, but cut with all these figures: they press this down so firmly on the yet moist vessel, that the impression is received in a very perfect manner; and if the shape of the vessel be at all hurt, they take it to the wheel again to restore it. They then finish it with the knife and scissars; and when they have made it as perfect as can be, they cover it with the fine white varnish within and without. This fills up all the cavities of the impression, and gives a perfectly smooth and even surface; yet the thickness of this varnish in the traces of the figures gives it a different white, and the whole figures are as finely and accurately seen, as if painted on the outside. This is an artifice that might easily be brought to bear among us, and several of our finer wares would make a pretty figure with it.

There is a current opinion among the Chinese themselves, that the *porcelain*-ware of former times was greatly superior to that which they make at present; and that the burying china in the earth for a long time, adds to its beauty; but all this is founded on error. The truth is, that our merchants beat down the price of the ware, and thereby compel them to make a worse kind in general; but they are able to do as fine things now as ever What gave birth to the opinion, that burying *porcelain*-ware made it good, was, that finer pieces than ordinary are sometimes found buried. These are all precious vases; which the possessors buried by way of security in the times of civil war; and it is no wonder, that there are none but of the finest kind found buried on these occasions. Observ. sur les Coutum. de l'Asie.

PORCELLANA, in natural history, the *porcelain-shell*, or *concha venerea*, the name of a genus of shell fish, the characters of which are these: they are of the univalve kind, and have for their mouth a long and narrow slit, dentated on each side, and are of a conglobated, oblong, gibbose, or umbonated form.

This genus of shells originally had the name *porcellana* and *concha venerea* from the resemblance of its mouth to the *pudendum muliebre*, called by some of the Roman writers, *porculus* and *porcellus*, and always alluded to under the word *Venus*. We have of late so far misunderstood the name as to suppose it derived of the word *porcelain*, from an imagination, that the Chinese porcelain-ware was made of it. Gesner has fallen into the opinion, and Aldrovand seems to have been mistaken in regard to its other name, *concha venerea*, supposing it so called because of its beauty, and therefore sacred to Venus. Rondeletius calls it the *remora Mutiani*; and the murex of the same author. *Aldrovand* de Test. L. 3. p. 352. *Gesner*. *Rondelet*. de Test. L. 2. p. 101.

The name *concha venerea* may be apt to create confusion, because there is another shell of a very different kind, a bivalve, called *concha veneris*. This genus is therefore much better distinguished by the name *porcellana*. There is a prodigious difference among the species of this genus; some are heavy, others very light; some have the mouth placed in a longitudinal, others in a transverse direction. The gibbous *porcelain* is a very remarkable species, as is also the egg-*porcelain*, which has two buttons at the extremities; and the egg-*porcelain* called the *navel* is not less remarkable than these; this has, instead of a button, a long beak at each end.

The mouth of the *porcelain* must be narrow and oblong; this is the great characteristic, and is usually dentated either on both sides or on one.

The species of *porcelain* are so numerous, that it may be proper, in the enumeration of them, to arrange them under some regular heads. See Tab of Shells, N°. 16.

Some *porcelaines* are conglobated, and thick; of these the cabinets of the curious afford us the following species: 1. The map-*porcelain*, so called from its lineations, resembling the strokes of a map. 2. The lettered or Arabian *porcelain*: this is supposed in its lineations to bear some resemblance to Arabic characters. 3. The tyger's skin *porcelain*. 4. The serpent's skin *porcelain*. 5. The sea-louse *porcelain*. 6. The millepede *porcelain*, 7. The punctuated *porcelain*. 8. The grey *porcelain*. 9. The Chinese *porcelain*. 10. The *porcelain* whose end terminates in a spire; or the violet *porcelain*: this is but the former species with its outer coat taken off. 11. The reddish *porcelain*. 12. The variegated *porcelain*. 13. The tortoise-shell *porcelain*. 14. The guttated *porcelain*. 15. The *porcelain* with its middle divided into four zones. 16. The blue oval *porcelain*.

Some *porcelains* are thin, and of a pyriform figure. Of these we have the following: 1. The pear-*porcelain*, with an arched mouth, and variegated with yellow spots. 2. The pear-*porcelain*, with an arcuated mouth and two zones. 3. The egg-*porcelain*, with numbers of small protuberances, or obtuse umbos: this is called by some writers *ovum Rumphii*, or Rumphius's egg. 4. The cloth-web *porcelain*. 5. The oblong and thick *porcelain*. 6. The great Argus *porcelain*, so called from its being variegated with round spots, resembling eyes. 7. The lesser Argus *porcelain*. 8. The pseudo-argus, or bastard-eye *porcelain*. 9. The leveret *porcelain*. 10. The greenish small-pox *porcelain*. 11. The whitish *porcelain*, with rough protuberances. 12. The millepede *porcelain*. 13. The mouse *porcelain*. 14. The mole-*porcelain*. 15. The yellow *porcelain*, with four red zones. 16. The brown *porcelain*, with four yellow zones 17. The Panama *porcelain*, with amathystine circular streaks. 18. The green spotted *porcelain*. 19. The virgated agate *porcelain*. 20. The blue *porcelain*. 21. The blue spotted *porcelain*.

Some of the *porcelains* are gibbous. Of these we have the following species: 1. The milky *porcelain*, with rose-coloured protuberances and a dentated lip. 2. The white gibbose *porcelain*, with a smooth lip and no tubercles. 3. The yellow *porcelain*, with a smooth lip and no tubercles. 4. The *porcelain* called *Congo money* and *Guinea money*: this has a dentated mouth, and has six protuberances on the back. 5. The great gibbous *porcelain*. Hist. Nat Eclairc. p. 308.

PORCELLIONES, in the materia medica, a name given by some to the millepedes.

PORCELLO, in the glass trade, the instrument with which the workman, after having made the opening for the bowl of a drinking glass or other such vessel, with his passage, widens and renders it more capacious at pleasure. *Neri's* Art of Glass, p. 247.

PORCELLUS *Cassoviensis*, in medicine, the name of a disease to which the people of Hungary and Poland are very subject. It is a hard tumour of the belly, attended with wind and violent pains. It is truly an infarction of the spleen, and is to be cured by aperitives. Phil Trans. N°. 243. See SPLEEN.

PORCELLUS *Indicus*, in zoology, a name given by authors to the animal called with us the *Guinea pig*.

It is a creature properly of the rat kind, and is not improperly called by Mr. Ray *mus Americanus et Guinienfis porcelli pilis et voce*: the American or Guinea rat, with the hair and voice of a pig; tho' the fame author feems to doubt, whether it has not fomething of the rabbit kind in it, by adding after the word *mus*, that of *cuniculus*.

It is fmaller than the rabbit, and has a fhorter and thicker body; its ears are roundifh, low, thin, pellucid, and very wide open, and are almoft fmooth; and are obferved to be very nearly as large in the new brought forth creatures as in the full grown.

Its nofe and beard are very much like thofe of the hare; the long hairs which ferve for whifkers being difpofed in much the fame manner, and its upper lip is like that of the rabbit. It has no tail; its teeth are difpofed exactly as in the rat kind, and its hairs and grunting voice are wholly like thofe of the pig.

It is fometimes all over white, fometimes all over of a reddifh tawney; but moft frequently it is mottled with large fpots of both. Its fore feet have four claws, its hinder ones only three, of which the middle one is much longer than the others. It fits often upon its buttocks, in the manner of the rabbit, but it does not walk in the leaping manner of the rabbit kind; but as the hog, by fetting one foot before the other; and in walking bears upon the heel in the manner of the bear. It does not burrow in the earth; it brings forth fix, feven, or eight young ones at a time; and thefe are not blind at firft, as in the rabbit. It feeds on vegetables, and its flefh is very well tafted, and much refembles that of the hog. *Ray*'s Syn. Quad. p. 22?.

PORCO, a name by which fome authors have called the fifh more ufually known by the name of *caprifcus*, fuppofed to be the *porcus* of Pliny. *Willughby*'s Hift. Pifc. p. 153. See the article CAPRISCUS.

PORCUPINE, *hiftrix*, in zoology. See HISTRIX.

American PORCUPINE, *cuanda*, in zoology, the name of a fpecies of *porcupine* very different from the European kind.

It is of the fize of the larger monkeys, and is covered all over, except on its nofe, the lower part of its legs, and the extremity of its tail, with fpines of two or three inches long, and has no other hair but thefe. Thefe are yellowifh for that half which is next the body, thence they are of a deep blackifh brown, and at the very extremity they are white: they are hollow in the manner of quills; and Hernandez affirms, that the creature has a power of throwing them from its body to a confiderable diftance. The body is about a foot long, the tail fomewhat longer than that, and its farther half covered thinly with hairs much refembling hog's briftles. The ears are fmall, and are hid by the fpines which cover the head. It has two long teeth in each jaw before; the noftrils are very wide, the eyes round, prominent, and very bright and fparkling; the feet are like thofe of the monkey kind, and divided into four toes. See Tab. of Quadrupeds, N°. 15.

It climbs trees, but flowly and with difficulty, for want of a heel or hinder toe. It ufually twifts its tail about a bough, to keep it fafe from falling. It makes a grunting like that of a hog. It feeds on poultry, and its flefh is very well tafted. *Ray*'s Syn. Quad. p. 208.

PORCUS *aculeatus*, in zoology, the name of an animal, of which there are two fpecies, both of the porcupine kind; the one with a fhort, the other with a long tail. Each of them have alfo five toes on each foot, in which they differ from the European porcupines, which have but four. *Seba*. Vol. I. p. 81. and p. 84.

PORCUS *fluviatilis*, in ichthyology, a name given by the old Latin authors to the fifh we at this time call the *cornua* and *aurota*, and in Englifh the *ruffe*. It is a fpecies of the perca or pearch kind, and is diftinguifhed by Artedi by the name of the *pearch* with only one fin on the back, and with the cavernous head. See Tab. of Fifhes, N°. 20.

PORCUS *Guinienfis*, in zoology, the name of the Guinea hog. This creature is of the fame fhape and make with our hog, and of a reddifh tawney colour. Its head, however, is fomewhat more depreffed than in our kind, and its ears longer, and running into narrow points. Its tail is naked; but fo long, that it reaches almoft to its heels. Its hair is all fhort and fhining. It has no briftles on the back, but only near the rump; and on the fhoulders the hair is a little longer than elfewhere. It is a tame domeftic creature. *Ray*'s Syn. Quad. p. 96.

PORELLA, in botany, the name of a genus of moffes, the characters of which are thefe: the capfules contain a powder like thofe of the other moffes; and they have neither operculum, calyptra, nor pedicle; and their manner of fhedding their powder is not by feparating into two parts, like thofe of the felago and lycopodium, but by opening into feveral holes on all fides. See Tab. of Moffes, N°. 17.

Of this genus of moffes there is only one known fpecies; this is called by Dillenius the bluntly pinnated *porella*, and grows in wet places in Virginia, Penfilvania, Maryland, and other parts of North America. *Dillen*. Hift. Mufc. p. 459.

PORFILIGON, a word ufed by fome of the chemical writers to exprefs the fquammæ martis, or the fcales of iron which fly off in the fmith's hammering of it.

POROCELE, a word ufed by chirurgical writers for a callous hernia.

POROMPHALON, a word ufed by Hippocrates to exprefs a callous concretion, or a fort of tophus formed in the region of the navel.

POROTICKS, a term ufed by the antients for fuch medicines as would confume callufes.

PORPESSE, an Englifh name given indifcriminately to two different fifhes, the phocæna and the dolphin.

Artedi, who has been very careful in bringing together the fynonyma of authors, tells us, that this is properly the Englifh name only of that fpecies of the dolphin, the characters of which, according to his fyftem, is, that the body is almoft of a conic form, the back broad, and the body fubacute. This fpecies is the phocæna of Ariftotle, and the tirfio or turfio of Pliny and Rondeletius. Schoneveldt calls it the fmall northern or oriental *dolphin*, and the Swedes the *marfuin*. See the article DELPHINUS.

We have from Dr. Lifter an account of the tooth of this creature, after death, giving an envenomed wound. The accident happened to the Doctor himfelf, and he relates it thus: in diffecting a *porpeffe*, which had been four days dead, he fcratched accidentally the infide of one of his fingers; but that not fo deep as to fetch blood, or to occafion any great pain. He difregarded the accident; but at the end of four days the whole joint of the finger became tumid, and inflamed foon after the whole finger. After this the malady increafed, and in fpite of the affiftance of furgeons, the four next fingers were in four days more affected; and after thefe the whole hand up to the wrift, and the pain became violent. This was firft abated by the following fomentations: frog fpawn-water, fix ounces; bole armeniac, an ounce and half; white vitriol, four ounces. And afterwards this: burnt white vitriol and bole armeniac, of each four ounces; camphor, an ounce; and common water, a gallon. The wafhing the hand continually with thefe, took off the pain; and after this the unguentum nutritum, and a plaifter of diaphalma over the whole hand, perfected the cure. The Doctor obferves, that befide the blue look of the parts, which fufficiently indicated the poifon, there was a continual itching and burning heat, which was conftant day and night. The fkin of the whole hand and fingers came off, and the fingers did not fo far recover, as to have their full ufe for feveral months after. Phil. Tranf. N°. 231.

The fins of this fifh are cartilaginous and flexible, not fharp or prickly, as the antients have reprefented them. There is only one fin on the back, which is placed fomewhat below the middle: on the belly there is only one pair of fins; and the tail is formed into the figure of a crefcent by its forkednefs; and this tail lies parallel to the horrizon, when the fifh fwims, in the fame manner that the tails of all the other cetaceous fifhes do; whereas the tails of all other fifh ftand perpendicular to the horizon. The great contrivance of nature in this pofition of the tail in thefe fifhes is, that it may fupply the place of the hinder pair of belly-fins in other fifh, thofe of the cetaceous kind having none fuch. Thefe fins in other fifh ferve to balance the body, and keep it under water, and anfwers alfo in many refpects to the hinder legs of a quadruped; and hence we fee, that thofe fifh which have long bodies, and have not this hinder pair of fins, nor the horizontal tail, cannot fufpend themfelves quietly in the water, but are forced to keep groveling at the bottom. This is the cafe of eels, and all other fifh of that kind. The ufe of refpiration being as neceffary to the *porpeffe* as to quadrupeds, and it wanting this pair of hinder fins, to poize or elevate itfelf with, nature has abundantly provided againft the mifchiefs that would attend that defect, by giving it this tranfverfe tail; by a fudden jerk of which it can in a moment throw itfelf up to the furface from the deep water. The whale, and all the cetaceous fifhes requiring the ufe of refpiration, have alfo this manner of raifing their unweildy bodies allotted them by nature, inftead of the hinder pair of fins, which muft have been inconveniently large to be capable of this office.

The blood of the *porpeffe* is as warm to the touch as that of quadrupeds, and the blubber, or fat, which lies in great quantity under the fkin, covering the mufcular flefh of the back and fides, is to keep up the natural heat, and prevent the cold of the fea water from chilling the circulating fluid.

The ftomach of this fifh is of a very ftrange make; it is divided into two large bags, and has feveral other fmaller ones annexed to them. The food of the fifh feems to befpeak its living at the bottom of the water; for the common matter found in its ftomach, is the remains of fifh that live in or on the bottom. The young *porpeffes* are generally found to feed on the ammodytæ, or fand-eels.

The kidneys in this fifh are large, and adhere clofely to the back; and the urinary bladder is oblong, but very fmall in proportion to the fize of the animal. The penis in the male is long and flender, and has a very flender and fharp glans. This part does not appear externally; but lies buried in its fheath in the body, and is there doubled up in the fhape of the letter S; and the tefticles lie within the cavity of the abdomen, as they do in the hedge-hog. The diaphragm is mufcular, as in quadrupeds. The heart is large, included in a pericardium,

ricardium, and has two ventricles; and this part, as well as the lungs, agree in all refpects with thofe of quadrupeds. The fifh having no neck, the larynx is confequently very fhort. The pipe in the head, thro' which thefe fort of fifhes draw in their breath, and fpout out water, lies before the brain; it terminates outwardly in one hole, but it is within divided into two parts by a bony feptum, fo as to reprefent two noftrils; but at its lower end it again becomes one hole, and opens into the mouth by a common orifice furnifhed with a very ftrong fphincter mufcle, by means of which it may be fhut and opened at pleafure. Above this fphincter, the fides of the pipe are lined with a glandulous flefh; from which when preffed, a glutinous liquor is forced out of certain little holes in it into the infide of the pipe: above the noftrils is a ftrong valve or membrane, which ferves to ftop the pipe at pleafure, and prevent any water from getting into it, but when the fifh requires it within. The fiftula are fix blind holes, having no outlet, four tending toward the fnout, and two placed above the valve, which ftops the noftrils, and two beneath it; and two tending toward the brain, having a long and narrow cavity which feems intended for the ufe of fmelling, tho', on opening the brain, no fuch olfactory nerves or proceffus mamillaris, as other animals are furnifhed with for this purpofe, are to be found. The eyes are fmall, and the fnout is very long, and furnifhed with ftrong mufcles; the ufe of thefe is to enable it to root up the fand and dirt at the bottom of the fea, and feed on the fand-eels and other creatures it finds buried in it. The brain is large, and refembles that of man, and probably it has been an obfervation of this that has given occafion to the opinion of this animal having fo great a fhare of will and underftanding, and has given rife to the ftory of Herodotus, that Arion was carried to fhore on the back of one; and that of Pliny the elder, of one of thefe fifh fo fond of a certain boy, that he ufed to carry him daily from Baiæ to Puteoli, acrofs the fea to fchool, and wait to carry him back again at a certain time. Pliny the younger gives us alfo a ftory of this kind in his epiftles.

The teeth of the *porpefs* are in each jaw forty-eight in number; they are fhort and blunt, and refemble fo many pegs. The antients, particularly Ariftotle, have faid that the tongue of the *porpefs* or dolphin is tied down faft to the lower jaw, all along the middle. Rondeletius has difputed and contradicted this obfervation; but Mr. Ray proves it to be true, and that the modern author is in an error. Ariftotle denies this fifh ear-holes, and experience fhews that he is in the right; nor has it any noftrils, except thofe within the fiftula. The breaft bone is remarkably fmall. The name *porpefs* is given it becaufe of its refembling a hog; which it does in the fnout, the fat, the vifcera, and many other particulars. Phil. Tranf. Nº 74.

PORPHYRIO, in zoology, the name of a bird figured and defcribed by all the natural hiftorians from one another, but which, it feems, none of them ever faw; and there is fome room to doubt whether there be in nature any fuch bird. According to the accounts we have of it, it appears to be of the gallinula or moor-hen kind, and is all over of a fine deep blue, only the middle of the tail is at the extremity of a greyifh white. Its legs and feet are of a fine fhining purple. There have been fome fabulous things related of it, as its having five toes on each foot, and the like; but if there be any fuch creature, it feems to be a moor-hen of thefe remarkable colours. *Gefner* de Avib. *Ray*'s Ornithol. p. 238.

PORPHYRIO *Americanus*, in zoology, a name by which fome have called the *quachilto*, a very beautiful fpecies of Brafilian moor-hen. See the article QUACHILTO.

PORPHYRY, *(Cycl.) porphyrita*, in natural hiftory, the name of a genus of foffils generally, but improperly, added to the marbles, and called by us *porphyry*. They are ftones of a plain uniform mafs, fpotted or veined, with feparate concretions of great hardnefs, giving fire with fteel, not fermenting with acids, and very flowly and difficultly calcining in a ftrong fire. *Hill*'s Hift. of Foff. p. 494.

Of this genus there are only three known fpecies: 1. The purple kind, commonly known by the name of *porphyry*, among the workmen. 2. The hard red-lead-coloured kind, variegated with black, white, and green. And 3. The very hard flefh-coloured one, variegated with white, green, and black.

The *purple porphyry* is a fubftance which has been well known, and highly efteemed in all ages of the world. It has its name from the Greek πορφύρος, purple, as that remarkable colour always afforded a very obvious diftinction for it, from the other kinds. It is of an extreme firm and compact ftructure, remarkably heavy, and of a fine ftrong purple, variegated more or lefs with pale red, and white, and with a fmall number of little, and generally difregarded black flaky fpecks. Its purple is of all degrees, from the deep tinge of the violet to a pure claret colour; and its variegations are ufually difpofed in fmall fpots, ufually fmall and difunited, but fometimes running into one another, and making large blotches. It is very difficultly cut, becaufe of its very great hardnefs; but is capable of a very fine polifh. It is found in great quantities in Egypt; and we find was had thence alfo in very early times. It ferves us for ftones for the apothecaries and colourmen, to grind or levigate their powders on, and on any other occafion where great hardnefs is required.

The *red-coloured porphyry* is alfo an extremely beautiful and valuable fubftance, but is hitherto unknown among our lapidaries. It has the hardnefs, and all the other characters of the purple *phorphiry*, and greatly exceeds it in the variety of its colours. Its ground is exactly of the bright fine red of our minium or red lead, but is fomewhat deeper or paler in the different parts of the mafs: this is beautifully veined with green, in broad and regular lines; there are alfo fome confiderably narrow, and among thefe feveral perfectly white ftreaks, and a multitude of fmall black fpecks. It is of extreme hardnefs, and capable of a polifh equal to that of the femi-pellucid gems.

It is found in great plenty in the ifland of Minorca, but has never yet been regarded as a ftone worth importing into England.

The *flefh-coloured porphyry*. This is another very little known, but extremely beautiful ftone: it is of an irregular, but very compact and firm texture, and of a pale flefh colour, often approaching to white, and variegated with black, green, and white in large blotches, from half an inch to an inch broad; and fometimes, tho' very feldom, difpofed in regular veins. It appears very livid and gloffy where frefh broken, and is capable of an extremely elegant polifh; and is fo very tranfparent, efpecially in its green parts, that when polifhed one may fee deep into its fubftance. It is found in immenfe ftrata, in Arabia Petræa, and in upper Egypt, and in detached nodules is common to almoft all parts of the world: Germany abounds with them; and we have of them in many parts of England and Ireland. They are found in many places on our fhores, and in fome parts of Devonfhire far from the fea. *Hill*'s Hift. of Foff. p. 494 to 498.

Mr. Boyle tells us, that he caufed *porphyry* to be cut by means of emery, fteel faws, and water. He obferves, that in his time, the workmen in England were ignorant of the manner of working upon *porphyry*, and that none of them would undertake to cut or polifh it. See Works abr. Vol. I. p. 111.

PORPHYRY-*fhell*, in natural hiftory, a name given by authors to a fpecies of fea-fhell of the *purpura* kind, with a fhort clavicle and beak. See PURPURA.

PORPITES, the *hair button-ftone*, in natural hiftory, a name given by authors to a fmall fpecies of foffile coral; which is ufually of a rounded figure confiderably flatted, and ftriated from the center every way to the circumference. Thefe are of different fizes, and of different colours, as greyifh, whitifh, brownifh, or bluifh, and are ufually found immerfed in ftone. See Tab. of Foff. Clafs 7. and *Hill*'s Hift. of Foff. p. 641.

PORRUM, the *leek*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the lilliaceous kind, being compofed of fix petals, and of a bell-like fhape. The piftil which ftands in the middle of this flower, finally becomes a roundifh fruit divided into three cells, and containing roundifh feeds. To this it may be added, that the ftamina are broad, and are terminated by three filaments, the middle one having an apex. The flowers alfo are ufually collected into round heads, and the roots are long, cylindric, and tunicated, the feveral crufts often running up into flat or hollowed leaves.

The fpecies of *leek*, enumerated by Mr. Tournefort, are thefe: 1. The common headed *leek*. 2 The *leek* with variegated leaves, elegantly ftreaked like thofe of the painted grafs. 3. The broad-leaved fectile *leek*. 4. The wild vineyard *leek*. 5. The double-headed wild *leek*. And 6. The vitigineous wild *leek* of Gerrard. *Tourn*. Inft. p. 382

PORT *(Cycl.)*—PORT-*laft*, in a fhip, the fame as the gunwale; therefore they fay a yard is down a *port-laft*, when it lies down on the deck.

PORT-*ropes*, in a fhip. See ROPES.

PORTABLE *laboratory*. See LABORATORY.

PORTE-*etrier*, in the manege. See STIRRUP.

PORTEGLO, in the glafs trade, the inftrument with which the founder, or conciator, fcums the glafs while melting. *Neri*'s Art of Glafs, p 241.

PORTER *(Cycl.)*—PORTER, in the manege, fignifies to direct or pufh on a horfe at pleafure; whether forewards or upon turns, &c.

PORTERAGE, a kind of duty paid at the *cuftom-houfe*, to thofe who attend the water fide, and belong to the package-office. Thefe *porters* have tables fet up, afcertaining their dues for landing of ftranger's goods, and for fhipping out the fame. Merch. Dict

PORTISCULUS, among the Romans, an officer who had the direction of the rowers in a galley. He was otherwife called *paufarius* and *hortator remigum*. *Pitifc*. Lex. Ant. in voc. See PAUSARIUS and HORTATOR

PORTIUS *pifcis*, in zoology, a name given by fome to a fifh called by others the *mugil ater*, or black mullet. It is a very fcarce fifh, much refembling the common mullet in fhape, but all over of a fine black, and having feveral lines of a deeper black than the reft, running longitudinally from the gills to the tail. It has a very wide mouth, and has feven or eight prickles on the back, feparate from one another, and joined into a fin by a membrane in the ufual way; thefe are placed immediately before the back fin. *Willughby*'s Hift. Pifc. p. 276.

PORTOISE, aboard a ſhip, is the ſame with *port-laſt*, or the *gun wale*; and as they ſay *the yard is down a port laſt*, when it lies down on the deck, ſo for a ſhip *to ride a portoiſe*, is to ride with her *yard a port-laſt*, or ſtruck down to the deck.

PORTORARIUM, in anatomy, a name given by ſome authors to the duodenum.

PORTULACA, *purſelain*, in botany, the name of a genus of plants, the characters of which are theſe: the flower is roſaceous, or compoſed of ſeveral leaves diſpoſed in a circular form. The cup conſiſts of one leaf, and is bifid; from this ariſes the piſtil, which afterwards becomes, together with the cup, a fruit or ſeed-veſſel of an oval form, and uſually containing very ſmall ſeeds: this ſeed-veſſel has two ſhelly ſubſtances at its top, the outer of which has been the bifid part of the cup; the inner is no other than the piſtil enlarged; theſe ſeparate tranſverſely when the ſeed is ripened, the lower part of the cup ſtill remaining fixed to the ſtalk.

The ſpecies of *purſelain*, enumerated by Mr. Tournefort, are theſe: 1. The broad-leaved, or garden *purſelain*. 2. The narrow-leaved, or wild *purſelain*. 3. The broad-leaved garden *purſelain*, with gold yellow leaves. 4. The broad-leaved ſea-*purſelain*, with beautiful red flowers. 5. The red-flowered procumbent *purſelain* of Curaſſo, with long, thick, and ſhining leaves. 6. The procumbent *purſelain* of Curaſſo, with leaves like thoſe of the caper's buſh and red moſſy flowers. 7. The taller upright woolly *purſelain* of Curaſſo, with leaves like thoſe of kali, and pale red flowers. 8. The woolly procumbent *purſelain* of Curaſſo, with beautiful red flowers, and ſeed-veſſels ſomewhat pointed at the ends. 9. The woolly, procumbent, kali-leaved Curaſſo *purſelain*, with ſeed-veſſels hollowed at the ends.

The ſeveral ſpecies of *purſelain*, may be known when not in flower, by their having thick and fleſhy leaves placed alternately on their ſtalks. *Tourn.* Inſt. p. 236.

PORTUGALLICA *terra*, *earth of Portugal*, in the materia medica, the name of a fine aſtringent bole, dug in great plenty in the northern parts of Portugal, and eſteemed a remedy againſt poiſons and venomous bites, and good in malignant fevers. Whatever may be its virtues of this kind, however, it is manifeſtly an aſtringent of the very firſt claſs, and is uſed with great ſucceſs in fluxes of all kinds. It is well known in ſome parts of the world, beſide the kingdom where it is produced; but is not known in the Engliſh ſhops. The cheapneſs of our ſophiſticated bole armenic, having excluded this whole valuable claſs of medicines from our practice.

The characters by which the *Portugueſe earth* is known from the other red boles, are theſe: It is of a cloſe, compact, and regular texture, conſiderably heavy, and of a fine florid red, of a ſmooth and ſhining ſurface, eaſily breaking between the fingers and a little ſtaining the hands. It adheres firmly to the tongue, melts freely and readily in the mouth, and has a ſtrongly aſtringent taſte, but leaves a little grittyneſs between the teeth. It does not ferment with acids, and ſuffers ſcarce any change of colour in the fire. *Hill's* Hiſt. of Foſſ. p. 13.

PORTUMNALIA, among the Romans, a feſtival in honour of Portumnus, which was celebrated on the ſeventeenth of Auguſt. *Pitiſc.* in voc.

PORUS, (*Cycl.*) in natural hiſtory, a name given by authors to a peculiar kind of foſſile coral, of which there are many different ſpecies; theſe are all of a beautifully laminated ſtructure, and ſeem allied to the mycetitæ or fungitæ: they are ſeldom found looſe, but uſually bedded in hard marble, and with their pores filled up with ſparry or mineral matter. See Tab. of Foſſ. Claſs 7.

PORUS *cervinus*, in natural hiſtory, a name given by authors to a ſpecies of ſea-plant, found among the rocks in the coral fiſheries, and in other places. It grows at different depths, and ſeems to adhere to the rocks by a ſimple baſe, having no root, nor any thing in the place of one. It is branched in ſuch a manner, that with the help of a little imagination it has been forced into the reſemblance of a ſtag's horn. Its height is about an inch and half, often leſs when newly taken out of the ſea; it is of a fine ſnow white colour, but when it has lain ſome time to dry, it becomes of a duſky yellow. It is very thin, perfectly tranſparent, and ſeems compoſed of ſeveral fine membranes. When examined by the microſcope, an admirable ſtructure is diſcovered in it: the whole being compoſed of a membranous matter, in which are an infinite number of holes, and all theſe arranged into regular lines.

Count Marſigli has diſtinguiſhed this, which is the common kind of *porus cervinus*, or buckſhorn *porus*, by the name of *minor*, in order to prevent its being confounded with another leſs common kind, which Ferrante Imperato has deſcribed under the name of *porus cervinus*.

This larger kind is found alſo growing on the rocks in the coral fiſheries; but it always is found at great depths, never near the ſurface, as the other often is. It grows to the rock by a ſmall baſe, and from thence riſes to a ſhort trunk, which ſpreads itſelf out into ſeveral flat branches, divided every where into two, as thoſe of moſt of the ſea-fucuſes are; and theſe are ſo expanded as to form what people imagine, a reſemblance of a ſtag's horn. This grows to a little more than two inches in height, and is of a beautiful pale yellow, or ſtraw colour, even while growing, and looks gloſſy and ſhining, as if covered with a thin coat of varniſh. It is as thin as the fineſt paper; and when viewed by the microſcope, is found to be of a particular texture. It is ſometimes found growing to the ſhells of ſea-fiſhes; but of thoſe only which live in great depths of water. Count Marſigli has given elegant figures both of this and the ſmaller kind, not only in their natural ſtate, but as they appear to the microſcope. *Marſigli*, Hiſt. de la Mer.

POSCENIUM, or POSTSCENIUM, among the Romans, the back part of the theatre, where the actors retired to undreſs themſelves. *Danet.* in voc.

POSCENIUM was ſometimes uſed to ſignify a lady's dreſſing-room, where the paint and waſhes were kept and uſed, and where men were not allowed admittance. *Pitiſc.* in voc. See the article PARASCENIUM, *Cycl.*

POSIDIA, Ποσειδια, in antiquity, a feſtival in honour of Neptune, called Ποσειδων. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 426.

POSIDIUM, Ποσειδων, in chronology, the ſeventh month of the Athenian year. It conſiſted of thirty days, and anſwered to the latter part of our December and the beginning of January. See MONTH.

It had this name from the feſtival Poſidonia celebrated in it.

POSIDONIA, Ποσειδωνια, in antiquity, the ſame with *poſidia*. See POSIDIA.

POSIQUIT, in natural hiſtory, a name given by the people of the Philippine iſlands to a ſmall bird very common among them, and approaching to the nature of the canary bird, but ſmaller, and wanting its harmonious voice.

POSITI, among the Romans, an appellation given to the dead when placed at the door with their feet outwards, till the time of their interment. See BURIAL and BURYING. *Hofm.* Lex. in voc.

POSITION, *poſitio*, in muſic, is uſed for the putting down the hand in beating time. See THESIS.

POSITIONAL *libel.* See ARTICULATED *libel.*

POSSESSIO *fratris*, in law, is where a man hath a ſon and a daughter by one woman or *venter*, and a ſon by another *venter*, and dies, if the firſt ſon enters and dies without iſſue, the daughter ſhall have the land as heir to her brother, although the ſecond ſon by the ſecond *venter* is heir to the father: but if the eldeſt ſon dies without iſſue, not having made an actual entry and ſeiſin, the younger brother by the ſecond wife, as heir to the father, ſhall enjoy the eſtate, and not the ſiſter. 1 Inſt. 11, 15. Terms of Law.

POSSESSION (*Cycl.*)—POSSESSION, in mining, is the right to a meer of ground, which the miners enjoy, by having ſtones upon that ground; and it is taken generally for the ſtones themſelves; for it is the ſtones that give *poſſeſſion*. *Houghton's* Compl. Miner in the Explan. of the Terms.

POSSUM, a name by which many have called the *opoſſum*. See the article OPOSSUM.

POSTERIOR (*Cycl.*)—POSTERIOR *penis*, in anatomy, a name given by many authors to a muſcle more generally known at this time by the name of the *erector*. See ERECTOR.

POSTICUM, in architecture, the poſtern gate or back door of any fabric.

POSTOMIS, among the antients, a barnacle or iron inſtrument fixed on the noſe, or put into the mouth of a horſe to make him quiet. *Pitiſc.* in voc.

POSTURE (*Cycl.*)—POSTURES *of the body*. The continued unnatural *poſtures* of the body, are the occaſions of many very unhappy effects in the human frame; crookedneſs in ſhape, is very frequently the conſequence of them. See DISTORTION. And it is no uncommon thing to ſee ſchool-boys, who are forced to be continually bending to write upon their knee, or upon a low form, very terribly afflicted by means of the compreſſion which that unnatural and continued *poſture* has given the lower part of the breaſt and the viſcera contained in the epigaſtrium; and particularly thoſe unhappy youths, who, from being ſhort-ſighted, are expoſed to a greater degree of ſtooping than the reſt, have been found terribly afflicted with diſorders of the breaſt and of the lower belly.

On applying for relief in theſe complaints, the phyſician uſually forgets to enquire into the cauſe, and hearing nothing of the continued bending *poſture* of the body, which is the occaſion of all the diſorders, the medicines he gives prove ineffectual with ſome, and with others greatly heighten the diſorder. But when the preſcriber will be at the pains of informing himſelf of the cauſe in theſe caſes, and forbid the continuance of the *poſture* which has been the ſole occaſion of them; nature alone will often make the cure, or if not alone, yet very often with this caution the methods will prove ſucceſsful, which were ineffectual, or even hurtful without it.

Other ſchool-boys have been found ſubject to ſeveral diſorders of the head, the breaſt and eyes, and to many other complaints from which the uſual methods in the like caſes have been found wholly ineffectual to relieve them; or if they have been cured from time to time, they have been always found ſubject to relapſes: and in many of the ſchools of France, no remedy could be found for theſe complaints, till Mr. Winſlow found, on enquiry, that it was a common cuſtom among theſe youths to ſleep all night with their heads thrown back,

and lying over the bolster; and the giving orders, that they should be watched, and not suffered to sleep in that manner for the future, proved with most of them sufficient for the cure, without any further assistance, and that in many cases, even in maladies which had been of so long standing as to become in a manner habitual.

How frequently does it happen, that the not regarding things of this kind, which has been the cause of diseases, occasions the most unhappy events in the course of their cure? nay, sometimes irrecoverable misfortunes happen, without the physicians being able to guess why; and this sometimes after a seemingly perfect cure. A very remarkable instance of a thing of this kind Mr. Winslow gives, in the case of a woman to whom he was called to examine the cure of a fracture of the thigh. The person was lame after the cure, notwithstanding that there were all the common proofs of the fracture's having been perfectly well reduced, and that the bone had united in its proper shape and dimensions, and no way differed from that of the other thigh. He caused the person to be laid flat down, and when she was in that position, placing the knees, legs, and feet perfectly even, the thigh which had been set appeared perfectly like the other; but observing, that in a moment afterwards, the leg on the fractured side thrust itself up, as if of its own accord, out of the level of the other, and appearing then shorter than the other, he examined the hips; and perceiving that they were perfectly even while the leg was thus a little elevated, he again depressed it to the level of the other, and then the hips became uneven and oblique. It appeared very plain from this, that the thigh-bone had lost somewhat of its original length from the irregular coalescence of the fracture; and that the surgeon who had set it, for want of examining the attitude of the hips at the same time with that of the thighs, had deceived himself, by trusting the common method of examination, into a belief that the thigh was of the proper length: what adds greatly to the occasion of error in the common way of examining these reduced fractures, by comparing the length of the two legs is, that the patient, dreading pain, always gives into the deceit, and naturally depresses the hip, without considering why, till the leg, tho' really much shorter, appears of the same length with the other. Mem de l'Acad. Scienc. Par. 1740.

POT *(Cycl.)*—Pot, in our old writers, a head-piece of war. It is mentioned stat. 13 Car. II. c. 6. *Blount.*

Glass-Pots. See Glass-*pots.*

Pot-*ash* (*Cycl.*)—The art of reducing vegetables to this state is a very valuable one; the soap-maker, fuller, scowerer, dyer, and glass-man, as well as the chemist and apothecary, depending greatly on it in many particulars.

The authors who are farther to be consulted in this case, are Glauber, in his prosperity of Germany; but the chemical foundation of the whole appears in Boerhaave's chemistry, and the papers of Stahl on this subject.

This salt has been made in New England in considerable quantities from rotten wood. What gave the occasion of knowing it, was, that a white oak in that province decayed, and a third part of its substance became rotten. This rotten part was tried to burn, and was found to turn a'most wholly into a fine alkali salt, or pot-ash, much stronger than that which is made in the usual way. What was most observable in the making of this salt was, that while the wood was burning, it would melt of itself, and run down into hard lumps of salt; and this, none of the wood of the same tree, which was found, would do, but only the rotten part: and what was most rotten of all, yielded the greatest quantity of salt, and that the most readily; whereas all the common alkali salts of wood, made by incineration, are blackish at first; and a lixivium made of them, altho' often filtered, will still be of a brown colour, occasioned by some of the charcoal of the wood so closely united to the salt as not to be easily separated from it. This alkali made from rotten wood was very white, even before solution; and the lixivium made with it was not at all tinged with brown, but clear like pure water, only a very small quantity of ashes subsided to the bottom. The lixivium was easily decanted from this, without the trouble of filtration; and when evaporated to a driness, left the salt perfectly fine and pure. In the making this salt, as the fire grows more intense, the wood is seen to run together into great lumps, and bubble with a hissing noise.

The weight of the *pot-ash* prepared in the common way is very inconsiderable, in proportion to the wood used; but in this, the salt nearly equals the whole weight of the wood. In the common way of making the *pot-ash*, the salt is never distinguished by the eye among the ashes, nor even causes them to run into lumps; but in this case the salt always runs into large lumps, and is as easily distinguished from the rest of the ashes, tho' white, as salt of tartar of the purest kind would be.

It is very certain, that rotten wood in many places has been found, on trial, to yield much less salt than sound wood; but the sound wood of this tree being tried, was found to yield no more salt than other wood, and consequently much less than the rotten part of it. On examining this tree on the spot, it was thought by good judges, that it had been at some distance of time struck with lightening, it being evidently torn from the top to the bottom: on that side where the decayed part separated from the sound, there had been a channel of about five inches wide all the way down; but this was closed over by succeeding bark, and shewed no trace of the accident till on examining underneath, where the tree was found black for such a space, and the bark not of a piece with the rest.

From this it may be conjectured, that the wood having been for so long a time, as till the growth of this bark, exposed to the wind and weather, naturally became rotten from the wet it received; and that the lightening having penetrated the wood, had so altered and disposed the parts and pores of it, that they attracted and retained the nitrous salts of the air in great abundance, even as salt of tartar, and other the like salts, do; which, as Glauber observes, will be reduced, in continuance of time, to an absolutely nitrous salt, and the quantity also considerably increased.

The parts of this rotten wood were of a very different structure from those of ordinary wood in this condition; and tho' the lightening had not calcined it into a salt, yet it had, as appears, sufficiently altered it to give that tendency to imbibe, and a power to retain the nitrous particles from the air, as well as the alkalies of vegetables perfectly calcined will do. If it should be objected, that nitre alone will not calcine into an alkali, it is easily answered, that nitre with charcoal will; and the remaining wood might very well serve as charcoal in this process. Phil. Transf. N°. 360 p. 121.

Some sort of *pot ashes* have been found to contain a large quantity of sea-salt, which is probably mixed with them by the makers; not only as it is much cheaper, but as it makes them whiter, and more easily run into large masses. Med. Ess. Edinb. abr Vol. I. p. 165. Not.

The French have two kinds of *pot-ash*, the produce of their own manufactures; the method of making which M. du Fay, of the academy at Paris, describes in the following manner.

The first which is the common or coarser kind, is made of the beech or elm; the first of which trees they always find to yield the largest quantity.

They cut down the largest and most full grown trees, and cutting them into pieces of ten or twelve foot long, they lay them together in form of a pile, and burn them to ashes in the open air. They gather up the ashes, and make a very strong lixivium of them in water; into this liquor they throw pieces of old rotten and spungy wood, which is, from its texture, capable of imbibing a great quantity of humidity: they use so many of these pieces as are sufficient to soak up the whole quantity of their lixivium. When this is done, they dig a square pit in the earth; over this they lay some iron bars, to sustain a quantity of dry wood, to serve as fuel. When they have laid together a sufficient quantity of this, they pile upon it the rotten billets which have imbibed the lixivium; and when the dry wood underneath is set on fire, and heats the top of the pile, the lixivium loses its water by the heat, and the salt contained in it is seen running down through the fire, in form of a shower: this is received in the pit made on purpose for it. When all is melted out of the billets at first laid on, they bring others, which the fire acts upon in the same manner; and so on, till the whole pit is filled with *pot-ash*.

When this is done, they remove the fire as quickly as they can; and with rakes clear the surface of the *pot ash* as well as they can from pieces of charcoal and ashes which have fallen into it: but with all their care, they are not able to prevent a great deal, both of coals and ashes, remaining in it; as is easy to conceive from the manner of the process. The salt after this forms one solid cake or mass, and this they dig up out of the pit while it is yet hot; and barrel it up for fear of its receiving damage from the humidity of the air, which it is very ready to imbibe. This is the French *pot-ash* of the common or coarse kind.

The finer or purer kind is made of the same wood with the other, and the process is conducted in the same manner, so far as to the making of the lixivium; but, when this is prepared, instead of soaking it up with rotten wood, they pour it off into an iron caldron of a large size, and evaporate it, still adding more lixivium as the former boils away, till they have employed all they have made; they then continue the fire till the whole humidity is evaporated: they then take the dry mass of salt out of the bottom of the vessel, and put it into a furnace made with a close arched top; by means of which the flame is reverberated from all parts upon the salt. They here give it so much fire as serves to calcine it to a whiteness, and then the whole operation is finished.

It is seldom, however, quite white; but usually retains somewhat of the colour it had before its calcination. This the workmen say is owing to the nature of the wood the ashes were made from. They say that those trees which grow on the tops of high hills, yield a *pot-ash* of a pale blue colour; and those which grow in wet marshy places, yield a reddish salt. Trees which have stood in other soils and situations, they say, yield a white *pot-ash*; but they observe, that none yield it in so large a quantity as those which grow on the tops of mountains. Mem. Acad. Par. 1727.

POTAMOGEITON, *pondweed*, in the Linnæan system of botany, a genus of plants, the characters of which are these: the

the flower has no calyx or cup; but is compofed of four obtufe, roundifh, hollow, and open petals, which fall off before the ripening of the feeds. The ftamina are four plane, obtufe, and very fhort filaments; the antheræ are double and fhort; the piftillum has four germina, which are all oval and pointed: thefe have no ftyle, but obtufe ftigmata. There is no other fruit than four feeds fucceeding each flower; thefe are of a roundifh, but flatted figure, gibbofe, and pointed. *Linnæi* Gen. Plant. p. 55.

The characters of this genus, according to Tournefort, are thefe: the flower confifts of four leaves, difpofed in form of a crofs, and having no cup; the piftil becomes at length a congeries of four feeds, of an oblong figure, collected into a fort of head.

The fpecies of *potamogeiton*, enumerated by Mr. Tournefort, are thefe: 1. The roundifh-leaved *potamogeiton*. 2. The long-leaved ferrated *potamogeiton*. 3. The plantain-leaved alpine-*potamogeiton*. 4. The broad fhining-leaved *potamogeiton*. 5. The curled-leaved *potamogeiton*, called *frog's lettuce*. 6. The narrow undulated-leaved *potamogeiton*. 7. The leffer *potamogeiton*, with denfe fharp-pointed, and not ferrated leaves. 8. The narrow-leaved branched *potamogeiton*. 9. The graffy-leaved *potamogeiton*, with flatted ftalks. 10. The fmall graffy-leaved *potamogeiton*, with round ftalks. 11. The *potamogeiton* with flowers at the knots of the ftalks, called *water-milfoil*. 12. The pennated-leaved *water-milfoil*, called by fome *feathered water-milfoil*. *Tourn.* Inft. p. 233.

POTAMOPITYS, in botany, a name given by Buxbaum to a new genus of plants, fomewhat refembling the limnopeuce in its general external appearance; but greatly differing from that plant in its flower and fruit.

The ftalk is about four inches high, and is made up of feveral joints, fixed in the manner of fo many cups one into another. The leaves ftand in form of a ftar, eight, or thereabout, at every joint: thefe are narrow at the lower part of the plant; but toward the top, they are broader, and ftand fewer at a joint, fometimes only two. The flowers grow out of the alæ of the leaves, and are white and compofed of four petals, difpofed in form of a crofs: they ftand in a four-leaved cup, and have no pedicle. The piftil occupies the center of the flower, and is furrounded by four ftamina. The feed veffel is round, divided into four cells, and filled with flender and lunated feeds. It flowers in May, and is common in the marfhy grounds in Thrace, near the Bofphorus. Act. Petrop. Vol. 1. p. 243.

POTATOE. The moft advantageous way of propagating *potatoes* is, the planting them at large diftances, and digging or horfehoeing the ground feveral times between them.

Mr. Tull gives an example of this, in which the hoeing fucceeded much better than dung, and without the expence of it. A piece of ground was planted with *potatoes*, the greater part of it in the common way; but in one part, worfe than the reft, they had been fet at a yard diftance every way. The reft of the ground was dunged; this poor part had no dung, but was ploughed deep at feveral times four different ways, fo that the ground was ftirred and broken thoroughly every where about the *potatoes*. The confequence was, that tho' no dung was ufed here, and tho' the plants appeared much weaker than in the dung part, yet the crop was greatly better than that of the other part of the field. The roots here were all large, and in the other parts of the field, where the dung had been ufed without ploughing, they were fo fmall, that the crop was fcarce worth taking up.

This is one of many inftances of the no great ufe of dunging land, without properly ftirring it up; and ferves to prove, what the crops of corn and every thing elfe confirm upon trial, that the ftirring the earth fufficiently, without any farther trouble, will anfwer better without any other manure, than all the manure in the world without it. *Tull's* Horfehoeing Hufbandry.

POTENTILLA, in botany, a name given by many authors to the argentina, or filver weed; and by fome with the addition of the epithet major, or the greater *potentilla*, to the ulmeria, or meadow-fweet. *Ger.* Emac. Ind. 2.

POTERIUM, a word ufed by many for the prickly pimpernell. See PIMPINELLA.

POTHOS, in botany, a name ufed by Theophraftus, and fome other of the old writers, for the aquilegia or columbine. *Ger.* Emac. Ind. 2.

POTINCOBA, in botany, a name by which fome authors call water-pepper, or the fharp arfmart. *Pifo*, 221.

POTIRONE, in botany, a name given by the people of Burgundy to a ftinking kind of fungus, found about the roots of trees. They have alfo extended the name much farther, and ufe it for a fort of touchwood, or rotten wood of the oak, and other trees common in the forefts of thofe countries, which fhines in the night, and has the fame fmell with that fungus.

POTRIMPOS, the name of an antient Pruffian idol, worfhiped under oaks, and to which human facrifices of enemies were offered. Mem. de l'Acad. de Berlin, Tom. 2. p. 358. Peicunos and Picolos were idols of the fame kind.

POTTERN-*ore*, a kind of lead ore. See LEAD-*ore*.

POUCH, in the military art. A grenadier's *pouch* is a fquare cafe or bag of leather, with a flap over it, hanging in a ftrap of about two inches broad over the left fhoulder, in which he carries his granadoes.

POUDRE *des Chartreux*. See KERMES *mineral*.

POUNCE (*Cycl.*)—POUNCE, among writing-mafters, a powder made of gum-fandarac, which being rubbed on the paper, makes it lefs apt to imbibe the ink: it is therefore ufed in this manner by thofe who are curious in the art of the pen, by which means the writing appears more precife, fharp, and determinate.

The varnifh-makers alfo ufe to diffolve it in oil of turpentine, or in linfeed oil, or in fpirit of wine; from which mixture is produced a kind of liquid varnifh.

POUND (*Cycl.*)—In Scotland the *pound* is divided into two marks, or fixteen ounces, the ounce into fixteen drops, and a drop into thirty-fix grains. Tr. Pract. Geom. p. 153.

POUND *averdupois*. The Englifh *averdupois pound*, taken from the reputed ftandard, is about 7000 Troy grains, and the ounce about 437 and an half fuch grains. But it is to be obferved, that the ftandards kept at the Exchequer differ a little from each other.

The Scotch, Paris, or Amfterdam *pound*, is to the *pound averdupois* as thirty-eight is to thirty-five. Tr.Pract.Geom.p.153.

POUND *breach*, in law. If a diftrefs be taken, and impounded, though without juft caufe, the owner cannot *break* the *pound*, and take away the diftrefs; if he doth, the party diftraining may have his action, and retake the diftrefs wherever he finds it: and for *pound breaches*, &c. action of the cafe lies, whereon treble damages may be recovered. 1 Inft. 161. 2 W. & M. c. 5.

Alfo it is faid, that all *pound breaches* may be enquired of in the fheriff's turn, as they are common grievances, in contempt of the authority of the law. 2 Hawk. P. C. 67. *Blount.*

POUND *land*, of old extent. This is alfo called *librata terræ*, and is ufed in Scotland to denote a certain portion of arable land, containing four oxengate, or fifty-two acres. Tr. Pract. Geom. p. 87. See Ox-*gang*.

POUND *Troy*, in Scotland, which by ftatute is to be the fame as the French *pound*, is commonly fuppofed equal to fifteen ounces and three quarters Troy Englifh weight, or 7560 grains. But by a mean of the ftandards kept by the dean of gild of Edinburgh, it weighs $7599\frac{1}{16}$, or 7600 grains.

POUR *fair proclaimer, que null injett fines ou ordures en foffes ou rivers pres cities*, &c. in law, an antient writ, directed to the mayor or bailiff of a city or town, requiring them to make proclamation, that none caft filth into the ditches or places near fuch city or town, to the nufance thereof; and if any be caft there already, to remove the fame. It is founded on the ftatute 12 Rich. II. c. 13. F. N. B. 176. *Blount, Cowel.*

POUR *feifer terres la femme que tient en dower*, in law, an antient writ, whereby the king feized the land which the wife of his tenant *in capite* had for her dowry, after his difeafe, if fhe married without the king's leave; by virtue of the ftatute of the king's prerogative c. 3. F. N. B. 174. *Blount. Cowel.*

POUSSE-*pied*, in natural hiftory, the French name for a genus of fhell-fifh, called by writers of other nations the *policipes*. See POLICIPES.

Rondeletius has very improperly confounded this genus of fhells with the balani marini; but the two genera are extremely different, as well in their general figure as in this, that the *pouffe-pied* always has a pedicle to which it is affixed, and the balanus never has any. Every *pouffe-pied* is compofed of feveral pointed fhells or valves; the bafes of the larger of thefe are affixed to the pedicles. The outer furface of the fhell is of a moufe colour, and is rough like chagrin; but the infide is filled with a white flefh, which, when boiled, becomes very red, and is of a fine tafte and good nourifhment, being in nothing inferior to the flefh of cray-fifhes.

The *pouffepied* differs from the concha anatifera in this, that the anatifera is only compofed of five pieces; and the pedicle is longer and flenderer, and rarely adheres to that of any other fhell of the fame kind; and the fhell is only filled with a mucous fluid, and a few plumofe fubftances. On the contrary, the *pouffepied* is never found fingle; it is always feen in clufters, the pedicles joining and adhering to rocks under water, fo that it is bare only at the time of the tide being out. The union of the bafes of the pedicles of thefe fhells forms a fort of tree, of which the loofe part of each pedicle makes a fort of branch; and the tops of thefe are furnifhed with feveral triangular pieces, each of which has its plume belonging to it. This pedicle is fhorter and thicker than that of the concha anatifera, and is eatable; and, indeed, is the only part of the animal that is fo. The fifh contained in the fhell, is nearly the fame with the fifh in the concha anatifera, excepting the difference in the length and thicknefs of the arms, or branches of feathers. Hift. Nat. Eclairc. p. 359.

POUST, an Indian name for a very poor and coarfe kind of opium, made by boiling the ftalks and leaves of the opium poppy in water, and then evaporating the clear liquor to the confiftence of a folid extract.

POUTING, or *whiting*-POUT, in ichthyology, a name given to a fpecies of bearded gadus. See GADUS.

POWCHES, in a ſhip. The ſeamen call by this name the ſmall bulk-heads made in the hold, to ſtow corn, goods, or the like, that it may not ſhoot from one ſide to the other.

POWDER *(Cycl.)*—*Gun*-Powder. See Gun.

Powder-*flasks*, in artillery, are moſt commonly made of horn, of any convenient ſize and figure, to carry *powder* for priming of cannon: this is their chief uſe in armies.

Sometimes they are ſo made as to have a meaſure for the charge of the piece at top, but this is of more uſe to gentle men in fowling, &c. than to ſoldiers, who have the charges of their piece put into cartridges, which they bite off, and firſt prime, and then load.

Powder-*room*, in a ſhip, that part of the hold wherein the *powder* is ſtowed.

POWER *(Cycl.)*—If any *power* of a quantity be divided by a greater *power* of the ſame quantity, the quotient muſt be ne gative. For the rule for dividing any *power* of a quantity by another *power* of the ſame, is to ſubtract the exponent of the diviſor from the exponent of the dividend, and make the difference the exponent of the quotient.

For inſtance, $\frac{a^6}{a^4} = a^{6-4} = a^2$ and $\frac{a^m}{a^p} = a^{m-p}$. Hence if p be greater than m, the exponent $m-p$ muſt be negative. Thus if $p=m+n$, then $\frac{a^m}{a^p} = \frac{a^m}{a^{m+n}} = a^{-n}$.

It is obvious that $\frac{a}{a} = a^{1-1} = a^0$. But $\frac{a}{a} = 1$; and therefore $a^0 = 1$. In like manner $\frac{1}{a} = \frac{a^0}{a^1} = a^{-1}$; $\frac{1}{aa} = \frac{a^0}{a^2} = a^{0-2} = a^{-2}$; $\frac{1}{aaa} = a^{0-3} = a^{-3}$, ſo that the quantities a, 1, $\frac{1}{a}$, $\frac{1}{a^2}$, $\frac{1}{a^3}$, $\frac{1}{a^4}$, &c. may be expreſſed thus, a^1, a^0, a^{-1}, a^{-2}, a^{-3}, a^{-4}, &c.

This change of expreſſion is often of great uſe in the computation of fluxions and infinite ſeries.

When the quantity to be raiſed to any *power* is poſitive, all its *powers* muſt be poſitive. And when the radical quantity is negative, yet all its *powers*, whoſe exponents are even numbers, muſt be poſitive. For — × — gives +.

The *power* then can only be negative, when the exponent is an odd number. Thus the *powers* of $-a$ are $-a$, $+a^2$, $-a^3$, $+a^4$, $-a^5$, &c. Thoſe whoſe exponents are 2, 4, 6, &c. are poſitive, but thoſe whoſe exponents are 1, 3, 5, 7, &c. are negative. *Mac. Laur.* Algebr. p. 37, 38.

Hence if a *power* have a negative ſign, no root of it denominated by an even number, can be aſſigned; ſince no quantity multiplied into itſelf an even number of times can give a negative product. Thus the ſquare root of $-aa$ or $\sqrt{-aa}$ cannot be aſſigned, and is what mathematicians call an *impoſſible*, or *imaginary* quantity or *root*. See Root.

Obſerve, that every *power* has as many roots, real and imaginary, as there are units in the exponent of the *power*. This holds true of unity itſelf. *Mac. Laur.* Algebr. p. 128. See the article Unity.

Imperfect Power, in algebra, is uſed for a *power* that has a fractional exponent; thus $a^{\frac{1}{2}}\, a^{\frac{2}{3}}\, a^{\frac{3}{5}}\, a^{\frac{7}{8}}$, &c. are imperfect *powers*. *Mac. Laur.* Algebr. p. 44.

Theſe are otherwiſe expreſſed by placing the given *power* within the radical ſign $\sqrt{}$, and placing above the radical ſign the number that denominates what kind of root is required. Thus,

$$a^{\frac{3}{2}} = \sqrt[2]{a^3};\quad a^{\frac{5}{3}} = \sqrt[3]{a^5};\quad a^{\frac{m}{n}} = \sqrt[n]{a^m}.$$

Theſe imperfect *powers* are alſo called *ſurds*. See Surd, *Cycl.*

Negative Power, in algebra. See Negative *power*.

POWTER, *or Engliſh* Powter, the name of a peculiar ſpecies of pidgeon, called by Moore the *columba gutturoſa Anglica*.

It was firſt bred in England, and is of a mixed breed, between what is called the horſeman and the cropper. It is a very beautiful ſpecies, and is valued for its length of legs and body, neatneſs of crop, and ſlenderneſs in girth, added to the beauty of its feathers. This ſpecies is often eighteen, ſometimes twenty inches long from the end of the bill to the extremity of the tail. Its legs, from the upper joint of the thigh to the toe-nail, is ſometimes ſeven inches; the crop is large and round, eſpecially toward the beak, filling alſo behind, and making almoſt a perfectly orbicular figure. They are either blue-pied, black-pied, red-pied, or yellow-pied; the laſt colour is moſt valued. *Moor's* Columbarium, p. 35.

Pariſian Powter, a ſpecies of pidgeon called by Moore *columba gutturoſa Pariſiorum*.

It was firſt bred at Paris, and thence ſent to Bruſſels, whence it was afterwards brought into England. It reſembles the Engliſh *powter*, but is ſhort-bodied, ſhort-legg'd, thick in the girth, and long-cropp'd. It is admired for the beauty of its feathers, which is peculiar to itſelf; it reſembling in this a fine piece of that ſort of needle-work which the ladies call the Iriſh ſtitch, being chequered with various colours in every feather, except the flight, which is white. It has generally a good deal of red intermixed with the other colours, and the more it has of this the more it is eſteemed.

Horſeman POWTING, a name given to a mixed breed of pidgeons, produced between thoſe two kinds known by the names of the *cropper* and the *horſeman*, according to the number of times that the young are bred over from the *cropper*. They are diſtinguiſhed by the names of the firſt, ſecond, or third breed.

Theſe are a very agile and nimble pidgeon; and by their continually flying up and down about the dove-houſe, are apt to bring in other ſtray pidgeons, which cannot find their houſes. They are obſerved to breed often, and take great care of their young ones. *Moore's* Columbarium, p. 38.

POX *(Cycl.)*—*Small* Pox. Dr. Hahn endeavours to prove, that the *ſmall pox* was deſcribed by the old Greek phyſicians under the name of carbuncle.

Dr. Hahn's treatiſe on the antiquity of the *ſmall pox*, has been criticized by Dr. Werlhoff, who endeavours to ſhew, that Dr. Hahn's quotations from the old Greek writers concerning the carbuncle, cannot be underſtood of the *ſmall pox*, which is a diſeaſe we have no account of till the Saracens diſperſed it. Med. Eſſ. Edinb.

Dr. Hilſcher recommends cutting off the hair in the *ſmall-pox*, by which perſpiration may be increaſed. This method was practiſed on the king of Spain's ſon Don Carlos, and on a Saxon prince with ſucceſs. Med Eſſ.

Dr. Martin of Lauſaunne, recommends bathing the face and body with cloths dipped in tepid water every four hours during the eruption of the *ſmall pox*; aſſuring that it has excellent good effects. Hiſt. de l'Acad. des Sciences, 1737.

Dr. Haller tells us, that camphor aſſiſts greatly to fill the puſtules of the *ſmall pox* of the confluent kind with petechiæ. Commerc. Norimb. 1736. Hebd. 10. § 1.

Dr. Lobb diſapproves entirely of blood-letting in the *ſmall pox*, and thinks the diſeaſe may be prevented, or cured, without any eruption, and that a ſpecific may be found: he propoſes the Æthiops mineral as ſuch, and relates ſome examples of the diſeaſe being, in his judgment, prevented by the timely uſe of it. The biſhop of Cloyne ſeems to aſcribe the ſame virtues to tar-water. See Tar-*water*.

Dr. Wintringham ſays, he never obſerved antiphlogiſtic medicines, which open the belly, diluting clyſters or ſuch like, to have any bad effects in this diſtemper; but on the contrary, has always ſeen them ſerviceable to young, vigorous, plethoric patients; while too bound a belly frequently at laſt produces a dangerous diarrhœa. He propoſes in urgent caſes of the confluent *ſmall pox*, where from the reſorption of the variolous matter there is great danger of increaſing the ſecondary fever, that the puſtules ſhould all be opened, and treated as ſo many ulcers. See his Commentar. Noſologicum.

Bloody urine is looked upon as a forerunner of death in the *ſmall pox*; but we have inſtances of perſons recovering under ſuch ſymptoms. See Phil. Tranſ. N° 470. Sect. 11.

Great Pox. For the cure of the *lues venerea*, Dr De Sault, in his treatiſe on this diſeaſe, recommends frequent frictions with large quantities of mercurial ointment made with one third of quickſilver; to wit, from two or three drams to an ounce, or an ounce and an half every night, or every other night, taking care to keep the belly in a purging way, by clyſters, laxatives, or the ſtronger purgatives, if the mercury begins to affect the mouth. He ſays this method is ſure, and altogether ſafe, and he relates ſeveral hiſtories of cures performed by it, not only in the *lues venerea*, but in many other diſeaſes, particularly in obſtructed hardned glands, the liver, teſtes, &c. Med. Eſſ. Edinb.

Mr. Douglas greatly commends De Sault's method, and it is ſaid that it has been practiſed with ſucceſs in ſome of the hoſpitals in London. See A Letter on the cure of the venereal diſeaſe.

Dr. Werlhoff prefers frequently repeated ſmall doſes of mercury to a ſalivation, for the cure of the *lues venerea*. Commerc. Norimb. 1235. Hebd. 13. § 4

Mr. Macky, profeſſor of hiſtory in the univerſity of Edinburgh, ſent the Royal Society a voucher for the grandgor *(lues venerea)* raging at Edinburgh in 1497. It is a royal proclamation, ordering all who had the diſeaſe, or who had attended people under it, to repair forthwith to an iſland in the Frith of Forth. Phil. Tranſ. N° 469. § 5.

PRACTORES, Πράκτορες, among the Athenians, officers appointed to receive the money due to the city from fines laid upon criminals. *Potter*, T. 1. p. 81.

PRÆBIUM, a name uſed by medical authors to expreſs a doſe of any thing, or the quantity of a medicine to be exhibited at one time.

PRÆCIÆ, among the Romans, the ſame with *præclamitatores*; which ſee.

PRÆCIPE *(Cycl.)*—Precipe *in capite*, a writ iſſuing out of the chancery, for a tenant holding of the king *in capite*; *viz.* in chief, as of his crown. Magn. Chart. c. 24. Reg. Orig. 4. *Terms of law.*

PRÆCLAMITATORES, among the Romans, officers that went along the ſtreets of Rome before the *flamen dialis*, to oblige all people to give over their work on public holydays;

for if the *flamen* saw any one at work, the service of the gods could not be performed. *Danet.* in voc.

PRÆCLAVIUM, among the Romans, was used to signify the *prætexta*. See PRÆTEXTA, *Cycl.*

PRÆCO, among the Romans, the public crier, an officer whose business it was in the assemblies of the people to call the classes and centuries according to their order, and to order silence to be kept in the temples during the time of sacrificing.

The assistance of the *præco* or public crier, was used on many other occasions, as at public sales or auctions, funerals, games, in courts of justice, to publish things lost, &c. *Pitisc.* Lex. Ant in voc. See CERYX.

PRÆCOCIA *mala, apricocks.* The method of cultivating and propagating the several sorts of this fruit, is this: They are all to be propagated by grafting them on plumb-stocks, and will readily take with almost any species of plumb, provided that the stock be in a thriving condition. See GRAFTING.

The Breda and Brussels *apricocks*, are best to be made standard trees, all the rest are to be propagated against walls, and should have an east or west aspect. The borders under these walls should be four feet wide at least, and should be two feet deep in earth. If the place where they are planted be a loamy soil, the beds are to be raised pretty high above the level of the ground, and if chalk or gravel, it must be removed to a considerable width, to make room for fresh soil to be put in, but it need not be dug more than two feet deep. The best soil for them is fresh earth from a pasture ground, taken to ten inches deep, and laid with the turf among it to rot together, for a twelvemonth before it is used.

Such trees should be chosen for planting as are but of one year's growth from the budding, and where the soil is dry or moderately so, October is the best season for planting. For the manner of planting, see the article APPLE-*tree*.

No part of the head should be cut off at this time, unless there are some foreright shoots which will not come near the wall. In a good strong soil, or against a low wall, these trees should be planted at eighteen feet asunder; the stem is to be placed four inches from the wall, and the head inclined toward the wall, the branches should be then nailed up to the wall, and the surface over the earth must be covered with rotten dung, to keep out the frosts. In February the dung is to be removed, and the tree being held very steady the top is to be cut off to about three eyes above the bud, leaving the sloping side toward the wall. If the weather proves dry after this, they must be gently watered, and some turf or mulch laid round the root to keep off the sun's heat; and what branches are produced must be nailed up, except such as are produced foreright, which must be cut off.

At Michaelmas, when the trees have done growing, the branches must be again unnailed and cut off to a proper length, the stronger shoots being left of nine or ten inches long, the weaker five or six inches. After they are thus shortened, they must be again nailed up, and that as much in an horizontal direction as possible. The second and third summer the same rules must be observed, all the foreright shoots must be displaced as they are produced, nailing in the others horizontally to the wall; so that the middle of the tree may be kept open; and never shorten any of the shoots in summer, unless to furnish branches to some vacant spaces on the wall; and this should never be done later than April. The *apricock* produces its blossom buds not only on the last year's wood, but also on the cursons or spurs from the two year old wood; great care must therefore be taken not to injure or displace these.

The Brussels and Breda *apricocks* being planted for standards, require very little management, only in autumn or spring cut away all the dead wood, and such branches as cross one another. The Brussels *apricock* is the finest of all the kinds: it is ripe in the middle of August. *Miller's* Gardner's Dict.

PRÆCONISSUS, in natural history, the name given by Ludovicus Dulcis, and other writers of his time, to a gem famous for its imaginary virtues: it is described to have been of the nature of the sapphire, but somewhat approaching to the colour of the chalcedony: this seems to make it the leucosapphirus of other authors.

PRÆFECTURÆ, among the Romans, towns in Italy, which were neither municipal, nor had the privilege of choosing magistrates of their own, like the colonies; but were governed by a magistrate sent from Rome, who was called *præfectus*, and his government a *præfectura*. *Pitisc.* in voc.

PRÆFERICULUM, among the Romans, a vase with a large prominent mouth used in the sacrifices of Ops. *Pitisc.* in voc.

PRÆFICÆ, among the Romans, were mourning women hired to attend funeral solemnities; where they praised the deceased, made a lamentation, beat their breasts, and distorted their faces, to excite others to mourn. *Danet.* and *Pitisc.* in voc.

PRÆFINE, in law, that fine which upon suing out the writ of covenant on levying *fines of lands*, is paid before the time is passed. 22 and 23 Car 2. *Blount.*

PRÆFURNIUM, a word used by chemical writers to express the anterior part of a furnace, by which the coals, or fuel are put in, and the ashes taken out.

PRÆMORSUM *folium*, among botanists. See LEAF.

PRÆNOTION is used by Lord Bacon for breaking of an endless search, which he observes to be one of the principal parts of the art of memory. For when one endeavours to call any thing to mind, without some *previous notion* or perception of what is sought for, the mind exerts itself and strives in an endless manner: but if it hath any short notion before hand, the infinity of the search is presently cut off, and the mind hunts nearer home, as in an inclosure. Thus verse is easier remembered than prose; because if we stick at any word in a verse, we have a *previous notion* that it is such a word as must stand in a verse. Hence also, order is a manifest help to memory; for here is a *previous notion* that the thing sought for must be agreeable to order. *Bacon's* Works, abrid. Vol. I. p. 136. and Vol. II. p. 474. See PRÆNOTION, *Cycl.*

PRÆPOSITUS *sacri cubiculi*, among the Romans, an officer who was to take care of the emperor's bed-chamber. His office was the same with that of our lord chamberlain, and he had the privilege of marching next to the captain of the horse-guards. *Danet.* in voc.

PRÆSALTOR, among the Romans, an appellation given to the chief director of the *salii*. *Pitisc.* in voc. See SALII.

PRÆSEPIA, a word used by authors to express the sockets of the teeth.

PRÆSICIA, in antiquity, those parts of the intrails of sacrifices which were cut off, and offered to the gods. *Hofm.* Lex. Univ. in voc.

PRÆSUL, among the Romans, the name of the chief of the *salii* or priests of Mars. He was so called *a præsiliendo*; *i. e.* dancing at the head of the *salii*. *Hofm.* Lex. Univ. in voc. See SALII, *Cycl.*

PRAMNION, in natural history, the name of one of the semipellucid gems, so distinct from all the others as to make properly a peculiar genus of fossils. It is called by many of the antients *morio* or *morion*, and by our lapidaries the *black agate*.

It is a stone of a very great concealed beauty. Our lapidaries, who know it by the name of the *black agate*, are very indeterminate in the application of that name, calling by it not only this, but every black stone capable of a good polish by the same name, and never looking for its great character, its hidden colour. It is found in the shape of our common flints and pebbles, but seldom larger than an egg; it appears on a slight inspection, to be of a fine deep black, but held up against the sun, or the light of a candle, it discovers itself to be of a fine strong red, without the least admixture of any other colour. It is most frequently of a purplish tinge, like the amethyst, but is at times found of all the degrees of red, from the pale flower colour of the hyacinth to the deep red of the carbuncle. It is of great hardness, and capable of an elegant polish.

It is produced only in the East Indies; and we sometimes have it thence among other stones, but it is not much regarded with us. The Romans were fond of it for engraving on, as we find by Pliny, and by a much more undeniable proof, many of the valuable antiques being cut on it. *Hill's* Hist. of Foss. p. 471.

PRAMNOS, a name given by the antients to a sort of austere wine which looked of a black colour till held up against the light, and then appeared of a deep purple: it is recommended by Hippocrates in hæmorrhages.

PRASINUM *viride*, a word used by the antients for verdigrease.

PRASION. The antient Greek writers have expressed three very different plants by this name.

The most common signification of the word is the common *marrubium* or horehound. It is in many places used also to signify the leek, and often for that sort of marjoram which we call *origanum onitis*, or pot-marjoram. Pliny describes this plant, and says that it was called *onitis* and *prasius*, and had the appearance of hyssop. This is but a bad description of the plant, and much inferior to the Greek epithet, which calls it the *capitated*, or *corymbous prasium*, for it bears its flowers in a sort of heads or corymbi.

Hesychius tells us, that the sea-weeds of the fucus and alga kinds, the sea-oaks, and sea-wracks, are called by some of the Greek writers *prasia*; and Theophrastus in one part of his works seems to have given this name to those plants.

The antients having used the word *prasion* in this sense, explains a passage in Galen which cannot otherwise be well understood, that is, where he calls the *empetrum marinum*, *prasioides*, like the *prasion*.

Dioscorides had called it *fucoides*, like the sea-fucus, and he was very well understood; but Galen coming after him, and expressing his sense by the word *prasioides*, which was supposed to signify resembling leeks, or horehound, or origanum, his readers were perplexed to find out what alliance the epithet he had chosen to use could have, either to the plant, or to the epithet of Dioscorides; but when it is found that *prasion* signifies the same as *fucus*, the whole is very intelligible.

PRASIS, a word used by some authors to express what they call green chalk, an earth used by the painters, and known among us by the name of *terre verte*.

PRASIUM, in botany, the name of a genus of plants, the characters of which are these: the perianthium consists of one leaf, and is of a turbinated bell-like shape, and divided at the end into two lips; these stand erect, and are permanent; the

upper one is broad, and divided into three acute segments; the under one is somewhat smaller, and is divided only into two. The flower is composed of one petal, and is of the labiated kind. The upper lip is erect and hollow, of an oval figure and emarginated; the under lip is broad and reflex, and is divided into three segments, of which the middle one is the largest. The stamina are four subulated filaments pressed closely under the upper lips of the flower; they stand expanded, one pair of them are shorter than the other, and the longest do not reach to the verge of the flower. The antheræ are oblong and lateral. The germen of the pistil is square. The style is slender, and is of the length and situation of the stamina. The stigma is acute and bifid, one of the segments being shorter than the other. The fruit consists of four roundish berries, which lie in the bottom of the cup, and each contain one seed. *Linnæi* Genera Plant. p. 280.

PRASIUS, in natural history, the name of a gem much approaching to the nature of the emerald, but of a coarser green, and wanting its hardness, and having in its green a cast of yellow.

It is the stone which the antients called *prasites*; and when of a greater than ordinary admixture of yellow, the *chrysoprasus*, and of which the gem distinguished by later authors under the name of the *smaragdoprasus*, is only one of the varieties.

The *prasius*, even in its most perfect state, is much less beautiful than most of the other gems: it is found of various sizes, and not unfrequently considerably large: it is seldom met with smaller than a pea; from that to the size of a horse bean is its most usual standard, from this to the size of a nutmeg it is more rarely found; and the larger specimens are coarser and less frequent than these.

It is of various figures, but is never found in a columnar or crystal-like form; this is declaring against the sense of our dealers in gems, indeed, who frequently buy and sell columns of the shape of sprig crystal, under the name of the *smaragdoprasus*; but these are all truly no other than crystals tinged to a coarse and dead green, and without any mixture of yellow; so that they are more properly *pseudosmaragdi*, or bastard-emeralds, than any thing of the *prasius* kind.

The *prasius* is frequently of an orbicular form, flatted on one side and convex on the other, and often oblong or oval; but more usually it is of a perfectly irregular shape, made up of a number of flat faces, as we often see some of the coarser nodules of the debased crystals from the German mines; and it is usually of an obscure or much less polished surface than many other of the native gems. Its colour is a dusky green, with a mixture of yellow, and often of bluish; and its most valuable pieces are of the hardness of the garnet; and its worst, which are truly *prasii*, are considerably harder than crystal; the columnar *prasii*, as they are called, are, on the contrary, often as soft, or softer than pure crystal. It is like the other gems, found in the different specimens of all degrees of colour, from its usual dusky green to the mere colour of water; it is at times found also with more or less yellowness in the different specimens, or in the different parts of the same specimen, and has sometimes a milky cast among the green: authors have distinguished it according to these its different appearances, by four names.

1. The *prasius* or *prasites*, simply so called. This is the name given to the gem in its most perfect state, in which it has a considerable share of yellow with the green, and the green is of a more pure and grassy colour.

2. The *smaragdoprasus*. This is the name given it when there is less yellow in the colour and some mixture of blue with the green.

3. The *chrysoberyllus*. This is the name given to the *prasius* when it has the same bluish cast, with a greater admixture of yellow.

4. The *chrysoprasius*. This is the name given it when it has a large admixture of yellow, and its green is a pure but a very pale one.

And, finally, De Boot mentions another species, as he calls it, of *prasius*, which was more opake than the rest, and had but little green, and a large admixture of white among the yellow; but this is in reality only a species of nephriticus.

The finest of the *prasii* are found in the island of Ceylon; but there are many of them in New Spain. We have them also from Silesia and Bohemia; but these are very poor ones. *Hill's* Hist. of Foss. p. 597.

PRECATORES, in church history, a sect of heretics, who under the pretence of praying always, refused to work. *Hofm.* Lex. Univ. in voc.

PRECEDENCY. See the articles PRECEDENCE, *Cycl.* and CEREMONIAL, *Suppl.*

PRECIPITATION, *(Cycl.)* in assaying, is the separation of any part of a compound body while melting in the fire, or when cooling from fusion from the rest of the mass, in such manner that it sinks to the bottom, while the remainder continues at top and makes the surface. The heavy part thus *precipitated* from the rest, is called the *regulus* of that body.

This is an operation which almost always requires the addition of such ingredients as serve to take away the mutual connection and coherence of the parts of the body to be separated; that is, such as have a menstrual virtue, and keep others in a state of dissolution. For instance, the reguline part of antimony, and mineral sulphur, dissolve each other mutually, and constitute crude antimony; nor can they be separated from each other by fire alone without destroying the regulus; but if you add iron, copper, silver, &c. which are more thoroughly penetrated by sulphur, and are thus reduced to the state of ore, then the regulus of antimony is freed of its sulphur, and sinks to the bottom, as it is heavier than the additional bodies, when joined to the sulphur.

Such a *precipitation by fusion* happens in vitrifications, scorifications, and coppelings, while one part of the body turns into dross, or *scoriæ*, and the other metallic part, if there be any, keeping still its metallic form, is collected at the bottom of the spherical vessel. Therefore silver and gold, which are hardly subject to a perfect vitrification, constantly remain and shew themselves in their own form; and on this account, tho' they were in ever so small a quantity in a *coppel*, they always shew themselves very clearly to the eye when the *scoriæ* are absorbed; whereas so small a regulus of the other metals would have been as it were buried and hidden under so great a quantity of *scoriæ*.

Nor is *precipitation by fusion* less necessary to obtain almost all the other metals, which on this account are called less perfect, unless perhaps you except a very small quantity of native metal, which nevertheless can scarce be properly called pure. Beside, they are all to be had either in form of earth, or of that of a solid ore. In the first case you may make a glass by a bare fusion: in the second, if the sulphur and arsenic, which, together with the metallic part, constitute an ore, are dissipated in roasting; the ore destitute of the oily phlogiston, becomes glass in a pure fire, which glass may be mixed with unmetallic stones and earths; but by adding a phlogiston or inflammable principle to it, this metallic glass is again reduced to its metalline form; and so long as it keeps under this form it cannot be united with the glass of the other species, but sinks to the bottom of it, except only a very small quantity of it, which is detained by the clamminess of the glass. The *precipitating* body in this case, therefore, is truly the phlogiston, or inflammable principle: any body that takes away the connection, by the removal of which a *precipitation* is made, is properly called the *precipitating* body. *Cramer's*. Aff. p. 187.

Precipitation of solid bodies from fluid menstrua, is performed either by extracting, or evaporating over a gentle fire the dissolving menstruum out of the dissolved fixed body, or by adding such a body, as is greedily dissolved by that menstruum: as if one metal dissolved by an acid is *precipitated* by another metal, or by an alkaline salt: for instance, silver dissolved in aqua fortis is *precipitated* by copper, copper by iron, iron by zink, and all metals and semi-meals, either partly or entirely by pot-ashes, volatile, and urinous salts.

A *precipitation* is also made by pouring on a solution, such things as either cannot dissolve the body in hand, whether alone, or joined to a menstruum that contains the said body; or dissolve it in another manner; or in a lesser quantity than if the menstruum had been used pure. In the first case a total *precipitation* is performed, as may be seen in the *precipitation* of silver out of aqua fortis, by means of spirit of salt. In the second a great deturbation and *precipitation* is made, but a second solution soon follows, as it happens when iron being dissolved in aqua fortis, you add to it in a proper manner a liquor perfectly free from alkaline fixed salt; but then there remains usually a certain part which is not perfectly dissolved a second time. In the third case there is but a partial *precipitation* made. You have an instance of this, if mercury dissolved in aqua fortis, and the menstruum thoroughly saturated with it, is *precipitated* either by common salt, or sal armoniae, or by their acid spirit. A *precipitation* is also sometimes made only by adding a large quantity of fair water to dilute; such is that made on the regulus of antimony dissolved in spirit of common salt, or in aqua regia, when a large quantity of cold water is poured on this solution; for these menstrua do not dissolve this semi-metal, unless concentrated.

All these *precipitations* are promoted greatly by a gentle heat, by means of which the *precipitating* body enters more easily into the menstruum, and a considerable quantity of water is next necessary to dilute with, except in the *precipitations* of the first kind; for most commonly the more concentrated dissolutions assume the consistence of a paste so soon as the *precipitating* body is added to them, which hinders this from mixing equally with the solution. Id. ibid. p. 196.

Boerhaave makes the following observations on the different manner in which *precipitation* is performed by several different agents.

Thus 1. By water poured on oils dissolved in alcohol, where the liquor turns milky.

2. By water poured to solid resins dissolved in alcohol, where also the liquor turns milky.

3. By water in the distillation of oily spirits, if any water run after the spirit is drawn off.

4. By acids on acids; thus silver and mercury are *precipitated* out of spirit of nitre, in which they had been dissolved by adding spirit of salt.

5. By metals with metals, and other bodies. Thus for example, dilute an ounce of silver dissolved in spirit of nitre, with

with twelve times the quantity of rain water; put polished plates of copper into this liquor, and the silver will be precipitated and the copper dissolved: then put this solution of copper into another glass, and add to it polished plates of iron; the copper will be precipitated and case over the iron; finally the copper falls to the bottom, and the iron dissolves. Pour this solution of iron into a fresh glass, and drop upon it oil of tartar, per deliquium; the dissolved iron immediately falls to the bottom, and the alkali unites with the acid, and regenerates true nitre, after so many changes.

Thus does this salt travel from one body to another almost unaltered, tho' it is more attracted by one than another, till at length it rests in that which in this respect is the strongest, and is only thence expelled when oil of vitriol is poured upon the nitre thus regenerated. On these two principles *precipitation* depends, and is the true, and often abstruse cause of numberless wonderful operations, both in art and nature. Take a grain of white or red *precipitate*, rub it upon a polished and heated copper-plate, and wherever the matter has passed the copper will immediately look like silver; for the copper attracts the acid of the nitre from the calx of the mercury, and thus presently makes an amalgam upon the surface of the copper, and then acquires a silver colour.

6. Alkalies often *precipitate* things dissolved by acids. This happens frequently, but not always, nor in perfection: alkali *precipitates* copper dissolved by an acid, but the copper is afterwards dissolved by a salt made of the two.

7. Acids generally *precipitate* things dissolved by alkalies; but in this case also there are some processes which shew us exceptions.

8. Sharp salts, without being changed, and lying perfectly concealed, have strange and unexpected effects by means of *precipitation*. If an ounce of luna cornea, which is perfectly scentless, insipid, and unactive, and affords no sign of acrimony in the fire, be ground, and united in a strong heat in a glass retort with half an ounce of inodorous and perfectly insipid regulus of antimony, there instantly arises an extremely strong poison, or an exceedingly corrosive butter of antimony, the exhalation of which proves mortal. We see in this one instance how dangerous the art of mixing is, and with what care we ought to go about the compounding of bodies. *Boerh.* Chem. P. II. p. 338.

PRECIPITATE (*Cycl.*)—The different absorbent salts which are commonly used for the *precipitations* of metals, from their solutions in acid menstrua have no effect upon those metals as to the colour of the *precipitate*; but when the solution is clear and limpid, and the matter left on the evaporation of it would have been white, the *precipitate* in this case, by whatever salt it is made, will be white also. And when that solution has any particular colour, whether it be that of the metal alone, as in solutions of gold; or a colour that is the result both of the metal and menstruum, as is the case in the solutions of copper and iron, the *precipitate* obtained from the solution will always be of the colour the solution was of, whatever was the salt employed to make it. Tho' this is, however, the case in regard to the metals in general, yet it is to be observed that mercury dissolved in spirit of nitre, or reduced to the state of corrosive sublimate, and afterwards dissolved in water, affords phænomena perfectly different from all these: for tho' it gives no colour to the menstruum in which it is dissolved, but lets it remain limpid; and if the solution be evaporated to a driness, leaves only a white residuum, in the manner of the solutions of silver, tin, or lead; yet instead of giving a white *precipitate*, in the manner of those metals, it affords a differently coloured one, through a great many varieties, according to the nature of the salt used to make it. As mercury is soluble in more acids than one, and as the experiments made on one of the solutions of this metal often have different phenomena from the same experiments made on other solutions, Mr. Lemery, who has employed himself very nicely on this subject, chose the solution in spirit of nitre as the basis of a long series of experiments.

As this solution was a mixture of two bodies, it was first necessary to consider them separately, as to their colours. In this examination it is to be observed,

1. That spirit of nitre, when first made, and while it yet contains a great quantity of fiery particles, is of a red colour; and that afterwards, as these gradually evaporate and fly off, the spirit by degrees loses that colour.

2. That crude mercury, when exposed a long time to the action of the fire, becomes of a red colour.

3. That when a simple solution of spirit of nitre is evaporated, and the matter which remains after the evaporation is calcined, it changes from its white colour, which it had at first, to red, after passing through all the shades of yellow. Now since, in the change of its state from the white to the red colour, the mercury loses a great part of the acid particles which it had carried away from the solution, we might at first be apt to conclude, that its change of colour proceeded from this; but on the contrary, experience proves, that of whatever quantity of its acids mercury is divested after solution, provided that no fresh particles are admitted in their room, it always continues white so long as it contains acid enough to preserve it in this form, or keep it in the condition of a *precipitate*.

As we know that fire is itself a fluid of a peculiar nature, and which has a power like other fluids of insinuating itself into the pores of the other bodies, and there, like them, preserving its essential properties; and as we also know, that the mixture of the particles of fire, either singly with mercury, or with spirit of nitre, gives to either a red colour; it is very natural to conclude, that the quicksilver, when it has been penetrated by the acid of spirit of nitre, and afterwards acted upon by calcination, is not changed from white to yellow, and from yellow through all its changes to red, by any other means than by the particles of fire which introduce themselves into the *precipitate* as they drive the acid particles out: and this is evinced the more clearly by this experiment, that if fresh acid be added to this *precipitate*, now become red, in such proportion as to divest it again of the fiery particles, and lodge its own in their places, then the whole loses its red colour, and either becomes colourless, or else white as it was before.

The common white *precipitate* acted upon by a slow fire, thus loses its white colour, and advancing through all the degrees of yellow, becomes at last red, as in the former instance; but if, instead of this slow heat, there is a stronger fire employed, and that continued so long as to raise this *precipitate* in a matrass into the form of a sublimate, in this case it preserves its white colour, notwithstanding the violence of the fire and the loss of its acid particles, which in this process cannot but be very considerable; nay, and tho' the sublimation be repeated several times, the whiteness of the matter will not be altered by it. From this observation it may be seen, that when nothing is added to the matter in the place of the acid particles which are driven off, it suffers no change of colour by their loss; and that in cases where larger fires are used, and consequently the fiery particles are driven through the body of the *precipitate*, there is no change of colour made in it by them; but that in order to make this change of colour, the fire must be slow, and the particles must be driven in with a force that is not sufficient to drive them out again, and consequently must remain there. It is evident, that the deprivation of the acids alone, does not change the white *precipitate* red; because in this case, where there is no such change of colour, there is, however, a manifest deprivation of a great part of those acids; since there are always many globules of revived mercury found among the masses of the sublimate.

Experiment proves, that mercury becomes more or less able to resist the force of fire, as it is more or less highly impregnated with acids: and hence the same degree of fire applied to two quantities of mercury, differently charged with acids, shall have different effects, and shall give a red colour to that which is so sated with acids that it will not be raised in sublimation; and the other, which is less charged with them, shall be sublimed and left white. The white *precipitate* made in the common way, is at the utmost only able to bear a much smaller degree of fire than that necessary to make the common red *precipitate*; and crude mercury itself can only bear a much weaker than either, as is seen in the making the common calcined mercury, improperly called *precipitate per se*.

There is this, however, very remarkable in the making this calcination, that after the mercury has been calcined some time with the necessary gentle heat, it becomes able to bear a much stronger degree than it could at first. This is exactly the contrary of what is found in making the common red *precipitate*; in doing which the fire must necessarily be gradually diminished, for the same degree of fire which it at first bore, nay, which was necessary to it, if continued, would certainly sublime and evaporate it. The explanation of this is, that in each case the mercury becomes able to resist the force of the fire in proportion as it receives particles which increase its weight. This both fire and the acid are capable of doing to it; but the acid does it in so greatly superior a degree, that while in the one case crude mercury, receiving particles of fire into its body, becomes by their means capable of resisting a stronger heat; in the other, these particles of fire being only received in the place of acid ones before dissipated, which added much more to its weight than they, it becomes much less able to resist a violent heat by the change, and gradually, as it receives the fiery in the place of the acid particles, requires the heat to be decreased, otherwise it must be evaporated.

In fine, we see that crude mercury requires a long time to be reduced into a red powder by means of calcination; whereas the same mercury, when loaded with acids, may be converted into this red powder in a few hours; the one bearing a tolerably strong heat, the other only a very weak one.

It appears that the mercury loaded with acids yields, therefore, a more easy access to the particles of fire than the crude; and what proves this, and evidently shews that the acids accelerate the effect of the fire on this body is, that if the common white *precipitate* be exposed to the same gentle degree of heat with crude mercury, it becomes red much sooner; and as the difference here is only, that the one is plain mercury, the other mercury penetrated by acids, there can evidently be no reason for the latter turning red sooner, but its being so penetrated.

After thus examining the effects of fire on solutions of mercury, this author proceeds to examine the effects of the different

ent falts on the folution in aqua fortis; and in thefe difquifitions it appeared, that thofe falts which gave the mercury a yellow or a red colour, only produced this effect, as they had been expofed to a longer or a fhorter calcination, by which their acids had been driven out, and particles of fire received in their places, and retained there, infomuch that thefe all heat water on being put to diffolve in it, as they contain a larger or fmaller quantity of thefe particles. Now as it is evident that thefe falts give a heat to water, by no other means than by the fiery particles they contain, it is very naturally fuppofed, that they give the yellow or red colour to the diffolved mercury, by the fame means as we know that thefe are the colours that fire itfelf gives to this body. Thefe falts, before their calcination, make no fuch change in mercury: and it appears, that they act upon it as alkalies only, or bodies which have paffed a violent calcination; and that the fiery particles they contain make them act upon it as fire would; and upon the whole, that fire and alkalies produce the fame effects on the folution of mercury in aqua fortis.

On the other hand, thofe falts which have not been expofed to the action of fire, and which cool, inftead of heating the water they are diffolved in, or fuch as having been calcined have acquired but little of an alkaline nature by the procefs; that is, have collected few particles of fire in the place of the few acid particles which they have loft; thefe do nothing to the diffolved mercury but carry off a part of its acids, its whitenefs being not at all affected by them: nay, even falt of tartar, which is a very powerful alkali, if there be acids mixed with it to drive off the fiery particles it contains, and place themfelves in their room, becomes wholly like one of thefe falts, and makes no change in the colour of the mercury.

In fine, the volatile falts, if they are pure, always give a white *precipitate* from the folution of mercury; but as thefe falts ufually contain a large portion of oil, this generally becomes feparated from them in the operation, and mixing itfelf with the *precipitate*, makes it of a mixt colour between its own natural white and the natural colour of the oil. As thefe oils in the falts have paffed a ftrong fire, they are ufually burnt, and naturally of a blackifh colour; and therefore the refult of their mixture, with the white *precipitate*, is a dirty grey. On the other hand, when urine is ufed, as the oily matter attending its falts has not been burned by fire, and as it naturally, by becoming exalted, by fermenting with the folution, acquires a deep blood-red colour, the confequence is, that the *precipitate* is of the middle colour between this blood-red and its own natural white, and fhews itfelf of a pale damafk rofe colour.

Thefe are the effects of the abforbent falts, when added fingly to the folution of mercury; the next thing to be enquired into is, how they act when added one after another to the fame quantity of the folution? When we have given this folution a yellow colour, by adding falt of tartar, which, as an alkali, occafions that effect; if we afterwards pour upon this fpirit of fal armoniac, or other volatile falt diffolved in phlegm, and raifed by diftillation, the yellowifh or reddifh colour immediately difappears, and the whole becomes of a dirty greyifh colour, which afterwards becomes blackifh; but if oil of tartar, per deliquium, or any other powerful alkali be added, it does not again deftroy this colour, and produce what it naturally would, if fimply mixt with the folution, but only extends the dark or blackifh colour which the mixt matter before had received from the fpirit of fal armoniac.

If falt of tartar, or any other fixed alkali be added to a folution of mercury, which has before been rendered white by a mixture of common falt, or any other falt that has little alkali in it, the liquor becomes immediately yellow, and that colour remains unalterable by any frefh addition of falt whatever. Salt of tartar is therefore in this cafe to the other falts that the fpirit of fal armoniac is to falt of tartar. If oil of tartar and fpirit of falt be alternately added to a folution of mercury, the folution becomes alternately yellow and white, according to the laft liquor that was added; fo that thefe two oppofite liquors feem to be of equal force, each making the folution of the colour it naturally gives, when fuperior to the other in quantity. Thus far, however, only two different liquors have been mentioned; it is poffible to employ feveral others in the fame manner one after another, and by that means to produce many more changes of colour in the folution. All that is to be taken care of in this experiment is, that the weaker liquors be ufed firft, fince otherwife they cannot produce any change; and what is to be concluded from the whole is this: 1. That mercury when it is penetrated by acid fpirits, is naturally of a white colour. 2. That when it is changed to a red or yellow colour, it is wholly owing to particles of fire introduced into it. 3. That it never changes from white to red, or from red to white again, otherwife than by receiving or parting with the fiery particles it had before received. 4. That when the folution acquires a colour, the mercury lofes its acids, or part of them. 5. That every time it changes its colour it either lofes it acids, or gains frefh ones; and that this lofing and gaining its acids, is a condition without which the mercury can neither admit, or throw off the particles of fire. 6. That when an abforbent does nothing to the folution but take away the acids, without communicating any thing to the mercury in their place, it always gives a white colour to the *precipitate*, or to fpeak more properly, it makes the *precipitate* appear in its proper colour. 7. That it makes fome other colour appear, when in the place of the acids, of which it has robbed the mercury, it gives it other fubftances which colour it according to their nature and quantity. 8. That in feveral abforbents calculated to produce feveral colours, that which is the moft powerful alkali is always capable of deftroying all the reft; but that there does not neceffarily follow a change of colour, on the liquor becoming altered from a lefs alkaline to a more ftrongly alkaline nature. 9. That a liquor of a very ftrongly alkaline nature, added to the folution after one which was a weaker alkali, will make no change in the colour of the liquor, if it have no other effect than the abforbing more of the acids from the *precipitate*, and does not give it other particles in the room of thofe acid ones which it takes away; and, finally, that weak acids are capable of changing the *precipitate* from red to white, but that ftrong ones utterly deftroy all colours. Mem. Acad. Par. 1714.

PREDY, a fea word fignifying the fame as *ready*. Thus, *predy the fhip*, or *predy the ordnance*, is as much as to make things ready for a fight. *Predy the hold*, is to lay or ftow every thing there in its due order and proper place.

PREGNANCY, *graviditas*, (*Cycl.*) the ftate of a woman going with child. This is a time in which women fuffer many diforders, which tho' no way to be cured abfolutely but by childbirth, yet may be greatly mitigated by medicines. Before any one venture to do any thing, however, in thefe or the like cafes, it is very neceffary to be perfectly affured, whether the patient is with child or not; and this is known by the following fymptoms, in cafes where there is no occafion for diffimulation, or no other diftemperature joined with this; but when the woman chufes to conceal it, and there is a complication of diforders, the utmoft proofs amount but to prefumptive ones.

The ftoppage of the menftrual difcharges is the firft fign of it, provided that there be no other apparent caufe. But this, tho' the moft plain and obvious fymptom, is by no means a certain one; for a fuppreffion of this kind may happen from latent caufes. A fecond fymptom is, a particular naufea at the fight of meat, or even the fmell of it, while the perfon is otherwife well in health, and can eat heartily of other foods. A third fymptom is, a fwelling of the belly; which appears regularly round or globofe, not irregularly protuberant, as is the cafe in diforders of the liver, and other vifcera. This fwelling, alfo, increafes placidly, and without the legs fwelling, or any other fymptom, if the perfon is otherwife in health. After this, the twentieth week of *pregnancy* gives the moft certain of all the figns, the motion of the fœtus; but this is to be carefully diftinguifhed from motions of the bowels in flatulencies, which often fo much refemble it as to deceive the unwary.

If the mother has a mind to hide the fymptoms, the thing may, however, ufually be found out at this period; for if a cold hand be laid upon the belly when warm, or a warm hand when it is cold, the fœtus ufually foon ftirs, and the very figure and appearance of the belly will give very probable affurances to a perfon accuftomed to fuch infpections. In cafes of a certain conception, a living fœtus is only to be diftinguifhed from a mole or falfe conception by its moving; therefore when a perfon grows toward the full time, without ever perceiving the child to ftir, it is very much to be fufpected that it is a mole; which alfo is the more probable, if the menftrual difcharges have come on at times and irregularly, during the time, and the fwelling of the belly be irregular, the woman fubject to violent flatulencies, and efpecially if fhe go beyond the natural period of nine months.

Thefe fymptoms are not all, however, to be expected in every *pregnant* woman; for many of the laborious people of the lower clafs of life, go thro' their whole time in the midft of fatigue and trouble, and that without any of thefe fymptoms; fo that they are in a great meafure to be attributed to the courfe of life, not the courfe of nature, in the *pregnant* women of better fortunes. Thofe women are moft fubject to them who are of a tender and delicate frame, and thofe who are of a plethoric habit, an idle life, or given to intemperance, or fubject to paffions of various kinds, fear, anger, grief, or the like.

Thefe are the more natural and lefs troublefome fymptoms of *gravidation*, but this time is frequently attended with others more troublefome or hurtful, which art is able in fome degree to mitigate. Some are fubject to violent hæmorrhages at the nofe, which are to be treated in the common way, and are ufually as eafily cured as any other complaints of that kind. In others the hæmorrhoidal difcharges are very large during the time. Thefe are to be affwayed by giving powders of nitre, cinnabar and crab's eyes, once or twice a day. Some are alfo fubject to an hæmorrhage of the uterus itfelf, but this very rarely happens; when it does it may be owing to two caufes, and therefore appear in two manners. In the

firſt it flows as in the common way of the menſtrual diſcharges, during the firſt months of *pregnancy*, and by that means greatly diſturbs the regular calculation of the time. In the other caſe it ſtops during the firſt months, but comes on again about the middle of the time, or later than that, and in this caſe it uſually continues regularly to the time of delivery; both theſe caſes bring on great danger of miſcarriages. In theſe caſes nitrous cinnabarine and abſorbent medicines are to be given; to theſe are to be added corroborating ones, and bleeding in the arm muſt never be omitted.

Head-achs often alſo attend women during their *pregnancy*: theſe are principally owing to occaſional cauſes; ſuch as violent emotions either of the body or mind, an improper cooling of the lower parts of the body, or the drinking ſpirituous liquors. The method of taking off this troubleſome ſymptom is, by giving the attemperating and nitrous medicines, with laxatives of the moſt gentle kind, and externally the head ſhould be rubbed with ſpirit of wine and camphor, if the perſon can bear the ſmell of it, which often in this caſe they cannot.

A wearineſs and laſſitude of the limbs is another very common and very troubleſome accident attending *pregnancy*, and is to be remedied by proper bleedings and gentle exerciſe; and if theſe fail, the nitrous powders before given may be added to quiet the emotions of the blood, and this uſually takes effect.

A dry cough and difficulty of breathing are alſo not unfrequently attendant on this ſtate: theſe require the ſame methods; but when the difficulty of breathing comes on after meals, the ſaline and digeſtive powders may be given in ſmall doſes; ſuch as the vitriolated tartar, with the nitrous and abſorbent powders; and when it comes on only in the latter months, and ariſes merely from the preſſure of the diſtended uterus, there is no cure but patience till the time of delivery; when the ſymptom always goes off of itſelf on the ſubſiding of the womb. *Junk.* Conſp. Med. p. 701.

The French memoirs give us an account of a very unhappy ſtate of *pregnancy* in a young woman of ſeventeen, attended with ſymptoms not common to that ſtate. The child lay on the right ſide, and grew to ſo conſiderable a ſize that ſhe could not ſtir; it died ſoon after, and was taken from her dead and in ſeparate pieces. In the latter months of her *pregnancy* ſhe was troubled with a terrible oppreſſion in the breaſt and difficulty of reſpiration, attended with violent palpitations of the heart: her delivery gave her no eaſe as to theſe ſymptoms, but they continued increaſing in violence for five years. In this time, as ſhe was young ſhe grew in height, and had two children, which both lay on the right ſide alſo, and of which ſhe was delivered without any particular bad ſymptoms. After theſe five years the bad ſymptoms of her diſeaſe became at a ſtand, and in her thirty-ninth year ſhe died.

The body being opened after her death, the round and the broad ligament of the uterus were both found much ſhorter on the right ſide than on the other, and were more compact and thick on that ſhort ſide. The uterus was larger than uſual, and inclined a little to the right ſide; and the great lobe of the liver, which ought to be hollow behind, convex before, and narrow and ſtrait at the bottom, large and thick at the top, and wholly included in the cavity of the belly, was in this ſubject of a conic figure, nine inches long, and four inches broad at the baſe, which was its lower part, and two at the point; and half its quantity was depoſited in the cavity of the breaſt, and all the parts on the ſame ſide. The kidney, the diaphragm, and the lungs, appeared, as well in regard to one another as to the neighbouring parts, to have been all conſiderably puſhed upwards by the matrix. The too great force of the ligaments of the uterus on the right ſide, had drawn the uterus itſelf to that ſide, and determined the fœtus to that part; and unhappily that had been particularly large, and had extended the influence of its preſſure upon the viſcera above it, even to the lungs. The duration of the ſymptoms was owing to this, that the parts having been diſplaced for a long time together during the latter months of the firſt *pregnancy*, could not reſtore themſelves to their places again, even when the obſtacle was removed; ſo that the ſymptoms continued, even tho' the firſt cauſe was removed; and the growth of the young woman only increaſed them. Mem. Acad. Par. 1709.

The miſcarriage of *pregnant* women is principally owing to a plethora, and is moſt frequent with young plethoric women, in the firſt months of their firſt *pregnancy*. There are, however, ſeveral other cauſes which concur to it; ſuch are, any violent paſſions of the mind, as ſudden anger, fear, or the like; an habitual great diſcharge at the time of the menſes, a high-ſeaſoned diet, with much wine or other ſtrong liquors; the taking of ſtrong purges, or violent emetics; diarrhœas, eſpecially when of long continuance and of the aromatic kind, as they drain off the nouriſhment from the fœtus; a teneſmus, or violent motion to ſtool, and hence the uſe of ſtimulating glyſters may alſo bring on abortion; as alſo any commotions of the body, ſuch as running, leaping, the carrying heavy burthens, falls, or blows on the abdomen: a too frequent uſe of venery may alſo occaſion it, as may the effect of ſtrong emmenagogues, copious bleeding in the foot, the ſmell of burning oil or any other ſtinking ſubſtance, nephritic complaints, cachexies, a fluor albus, or other diſorder of the womb; the taking opiates, and the death or great debility of the fœtus while in the womb. The beſt methods of preventing abortion, are the uſe of the attemperating and particularly the nitrous medicines after every commotion of the blood; bleeding at proper times, corroborating medicines, and the milder carminatives; and to theſe are to be added a temperance in diet, and placid motion of the body. Egg-ſhells are by ſome greatly recommended, and by others the ſtones of reſins, which are, indeed, manifeſtly aſtringent.

Coſtiveneſs in the time of *pregnancy* is very common, and is uſually owing to the want of drinking and exerciſe; ſometimes, indeed, it is owing to the immediate preſſure of the womb upon the rectum; but this caſe is known from the others, as it is always attended with a teneſmus. This complaint is to be relieved by a lubricating diet, the drinking more liquids than before, and the uſing placid motion of the body, or gentle exerciſe. Gum ammoniacum is alſo found a very uſeful medicine in this caſe, and ſometimes gentle infuſions of ſenna are neceſſary; but theſe can only be given in very ſmall doſes. Some uſe ſuppoſitories that are not acrid or pungent, and others glyſters of water-gruel.

Flatulencies are another very frequent complaint with *pregnant* women: theſe are removed by the milder carminatives, ſuch as, orange-peel, pimpernel-root, and the ſeeds of aniſe, ſweet fennel, &c. taken in powders or in decoctions.

Diarrhœas, in *pregnant* women, are uſually from the ſame cauſes with thoſe in other perſons; but they require in this caſe a very peculiar regard, as they, when long continued and accompanied with a teneſmus, uſually bring on abortion. They are to be gently reſtrained, and finally ſtopped, in the following manner: ſtrengthening, carminative and ſtomachic medicines are to be given, ſuch as candied orange-peel, preſerved ginger, calamus aromaticus, galengals and zedoary, and the marmalade of quinces; and while theſe are taken internally, balſams and ſtomachic plaiſters applied to the ſtomach have alſo a very great effect.

The fluor albus. This is a complaint that very rarely affects women with child, eſpecially if their huſbands be honeſt; but when it does, it is very difficult of cure, becauſe the purging medicines neceſſary to be given in it are by no means to be allowed of in the time of *pregnancy*. In this caſe it can only be reſtrained by the uſe of correctives, depuratives, and carminatives: of this kind are infuſions of the bitter herbs, with pimpernel-root, balm, ſouthernwood, and white dead nettle-flowers; or theſe ingredients may be made into powders, and taken in red wine.

Beſides all theſe complaints, women in their *pregnancy* are ſubject to ſeveral others which depend upon the mere weight and preſſure of the uterus. Of this kind are:

Pains in the loins and back. Theſe are principally felt in the laſt months, when the belly is greatly ſwelled and drawn forwards; in others, at the ſame period, the belly itſelf is pained, and looks red in many places, as if it threatened to burſt. Theſe complaints are made worſe by all motion, and they admit of no cure but child-birth, which immediately takes off the whole pain.

Varicous tumors of the legs. Theſe are alſo very common and very troubleſome, and in phlegmatic habits have alſo very frequently œdematous tumors joined with them; and in other perſons livid marks appear upon them, ſuch as are ſeen in others after bruiſes. Theſe diſtemperatures of the legs attend *pregnant* women at all times from the ſecond month to the time of delivery, and are owing to the preſſure of the uterus upon the iliac or crural veſſels. Theſe always go off on delivery, but in many perſons return again at every *pregnancy*: in ſome caſes they are ſo ſlight as not to be worth regard in others they are very violent and painful; theſe are to be treated in the following manner: the common antiſpaſmodic powders are to be given internally once or twice every day, and externally, a moderate bandage, with camphorated medicines and friction; and if theſe fail, a liniment made of lime-water, oil of elder, and ſugar of lead, will be found of great ſervice; and when the perſon is delivered, gentle ligatures are to be uſed all up the leg, from the ankle to the knee. In order to prevent theſe tumors for the future, early in the time of *pregnancy* the perſon ſhould be blooded, the bowels are to be kept from coſtiveneſs; and it is a thing of the greateſt conſequence, that the perſon uſe herſelf to ſit upon a high ſeat, the low chairs in which *pregnant* women uſually love to ſit making the belly preſs greatly more on the crural veſſels than it would otherwiſe. Too much exerciſe alſo is to be avoided, and particular care taken that the womb is well cleanſed before the month of a former lying in is over.

Frequent deſire of voiding the urine often attends, and is very troubleſome to *pregnant* women; but eſpecially in the latter part of their time, particularly in the laſt weeks: if it happen ſooner, as it ſometimes does, it is owing to the womb's hanging too much downward, from a laxity of the ligaments. This is a complaint of no ill conſequence, and therefore, tho' troubleſome, is to be borne with patience, delivery being its proper cure.

A Strangury and temporary ſuppreſſions of urine happen alſo frequently

quently to *pregnant* women. In these cases powders of nitre and cinnabar are to be given internally, and externally emollient cataplasms are to be applied warm till the disorder ceases.

Hæmorrhoides. These in *pregnant* women often swell into a sort of bladders, and are attended with a violent burning pain, and sometimes with an ulcerous erosion, and are usually a very troublesome complaint to persons of plethoric habits. They are to be cured by giving internally nitrous and other attemperating medicines, and applying externally the unguentum linariæ, made of the herb toad-flax, cut and boiled in lard. A decoction or extract of yarrow is also a good medicine.

Swellings of the feet are another of the troublesome complaints that attend *pregnant* women. These, when they are confined to the feet, or do not extend above the knees, are of no great harm; but they sometimes reach up to the abdomen, and there leave the symptoms of an ascites: but even in this case, it is best to let the tumor alone during the time of *pregnancy*, or at the utmost only to attempt mitigating and allaying its symptoms; for the cure requires such medicines as cannot be safely given at that time. The patient must avoid standing as much as possible, and after delivery the cure is to be attempted in the common way. When women in their *pregnancy* lose their flesh, and become extenuated and thin, the child is usually found to be the lustier and more robust for it: the woman in this case should feed on jellies, and other the most nourishing foods, and should use very little exercise, avoiding all fatigue of body and mind. Others, on the other hand, are subject to grow remarkably fat during their *pregnancy*: these generally bring forth small and lean children. Women to whom their fat grows troublesome in this time, should bleed, use moderate exercise, a thin diet, and now and then take a very gentle dose of some laxative medicine.

Many are very weak and subject to frequent faintings during *pregnancy*: these should take at times a gentle dose of some laxative medicine, and in the intermediate days, the strengthening and stomachic medicines, with the milder carminatives.

A voiding of the waters too soon always threatens abortion, or an untimely delivery, which are to be guarded against by strengthening medicines of all kinds. Many women during *pregnancy* are troubled with large brown spots, or lichenes, in the neck and face: these principally happen to persons of bilious habits, and are in some attended with a continual paleness, in others with frequent flushings of heat and redness: the good women apply many remedies to these, but they are much better wholly let alone; for they always go off of themselves after delivery.

The too great motion of the fœtus is a complaint not uncommon with *pregnant* women; but this is principally owing to themselves, and is brought on by the violent passions of the mother, especially those of anger: the keeping the abdomen too hot will also occasion this, and sometimes it is owing to some indisposition of the fœtus itself. If any medicines are to be given in this case, it must be the attemperating ones, and such as can correct the acrimony of the bilious juices; nervous epithems may also be externally applied, and the person is to be kept in as tranquil a state as possible, both as to bodily motion and the passions of the mind.

The child's kicking in the uterus is a complaint very frequent in the last months of *pregnancy*, and in persons of tender habits it often occasions tears, and sometimes faintings. Some suppose that this threatens abortion; but this is wholly erroneous, for the fœtus has no power of contributing to its own birth. This is a symptom for which there is no remedy but patience, but it goes off before the time of delivery.

Weakness of the fœtus is known by its feeble motion in the womb, and usually depends on the bad constitution of the mother, or else on her having been subjected to violent frights, or to great sorrow. Internal medicines of the strengthening kind are proper in this case, and externally, balsamic and aromatic plaisters may be applied.

The secundines sometimes concrete or grow to the uterus, out of their proper order and place: this is a disorder we have but very slender opportunities of guessing at, and is principally caused by too much sitting still during the latter part of *pregnancy*. When this is suspected to be the case, internal medicines are of no use; and the externals are only the fat of tender animals, or spirit of wine impregnated with oils of annise or caraway, frequently rubbed in on the belly.

The winding of the navel-string about the neck of the child is often a very unhappy accident and proves fatal to it: the good women suppose this to be owing to the mother's reaching upwards, and straining her arms above her head near the time of her delivery; but this is an idle opinion, and the case is owing to no sudden accident, but is probably an unlucky turn of the string from the beginning. *Junker*'s Consp. Med. p 708. See LYING-*in*.

PRENANTHES, in botany, the name of a genus of plants, the characters of which are these: the flower is of the composite kind; the common cup is of a cylindric figure, and has a wide mouth; there are five equal squammæ, and three unequal ones, which are smaller, and placed at the base. The flower is compound, not imbricated; it is composed of equal flowers of the hermaphrodite kind, placed in a single circle; each single flower is composed of one petal, and is ligulated, truncated, and divided into five segments at the edge; the stamina are five very short and capillary filaments; the antheræ are cylindric and tubular; the germen of the pistil is placed below the flower; it is small; the style is capillary and longer than the stamina; the stigma is bifid and reflex; the cup, after the flower is fallen, joins its several segments lightly at the top; and the seeds are single, of a cordated figure, and winged with a slender downy filament; the receptacle is naked. There is one species of this plant in which the down has a pedicle. *Linnæi* Gen. Pl. p. 374.

PREPARATION (*Cycl.*)—PREPARATION, in anatomy, is used for the art of preserving the parts of animal bodies for anatomical uses.

It is also used to signify the parts themselves so preserved. Mr. Monro has given us an essay on the method of *preparing* and preserving the parts of animal bodies for anatomical uses. Med. Ess. Edinb. Vol. III. Art. 10.

The manner of preserving anatomical *preparations*, is either by drying them thoroughly in the air, or putting them into a proper liquor.

In drying parts which are thick, when the weather is warm, care must be taken to prevent putrefaction, fly-blows, insects, &c. This is easily done by the use of a solution of corrosive sublimate in spirit of wine, in the proportion of two drachms of sublimate to a pound of spirit: the part should be moistened with this liquor as it dries, and by this method the body of a child may be kept safe even in summer. Dried *preparations* are apt to crack and moulder away in keeping; to prevent this their surface should be covered with a thick varnish, repeated as often as occasion requires. Med. Ess. Edinb. abr. Vol. II. p. 8.

Tho' several parts *prepared* dry are useful, yet others must be so managed as to be always flexible, and nearer a natural state. The difficulty has been to find a proper liquor for this purpose. Mr. Monro says, the best he knows is a well rectified colourless spirit of wine, to which is added a small quantity of the spirit of vitriol or nitre. When these are properly mixed, they neither change their colour nor the consistence of the parts, except where there are serous or mucous liquor contained in them. The brain, even of a young child, in this mixture grows so firm as to admit of gentle handling, as do also the vitreous and chrystaline humours of the eye. The liquor of the sebaceous glands and the semen are coagulated by this spirituous mixture; and it heightens the red colour of the injection of the blood vessels, so that after the part has been in it a little time, several vessels appear which were before invisible. If you will compare these effects with what Ruysch has said of his balsam, you will find the liquor above mentioned to come very near to it.

The proportion of the two spirits must be changed according to the part *prepared*: for the brain and humours of the eye, you must put two drachms of spirit of nitre to one pound of spirit of wine. In preserving other parts which are harder, thirty or forty drops of the acid will be sufficient; a larger quantity will make bones flexible, and even dissolve them. The part thus preserved should be always kept covered with the liquor, therefore great care should be taken to stop the mouth of the glass with a waxed cork and a bladder tied over it, to prevent the evaporation of the spirit; some of which, notwithstanding all this care, will fly off; therefore fresh must be added as there is occasion. When the spirits change to a dark tincture, which will sometimes happen, they should be poured off, and fresh put in their room; but with somewhat less acid than at first.

The glasses which contain the *preparations* should be of the finest sort, and pretty thick; for through such the parts may be seen very distinctly, and of a true colour, and the object will be so magnified as to shew vessels in the glass which out of it were not to be seen.

As the glass when filled with the liquor has a certain focus, it is necessary to keep the *preparation* at a proper distance from the sides of it, which is easily done by little sticks suitably placed; or by suspending it by a thread in a proper situation. The operator should be cautious of putting his fingers in this liquor oftener than is absolutely necessary; because it brings on a numbness on the skin, which makes the fingers unfit for any nice operation. The best remedy for this is to wash them in water mixed with a few drops of oil of tartar per deliquium. Med. Ess. Edinb. abr. Vol. II. p. 9.

Dr. Christ. Jac. Trew prefers the rectified spirit of grain for preserving anatomical *preparations* to spirit of wine, or compositions of alcohol, amber, camphor, &c. because these soon change into a brown colour; whereas the spirit from malt preserves its limpid appearance. When any part is to be preserved wet, wash it with water till it is no more tinctured. The water is next to be washed away with spirits, and then the *preparation* is to be put among spirits in a glass, the mouth of which is to be closely covered with a glass head, over which a wet bladder and leaf-tin are to be tied. Com. Lit. Norimb. 1731. Semest. 1. Specim. 9.

PREPARATION *of insects*, in anatomy. See INSECTS.

PRESA, in the Italian music, is in general a character which shews when and where a performer in a concert is to begin to sing

fing or play: but in particular, in fugues or canons it is thus marked + over the note at which the fecond part, which is to follow or imitate the firft, muft begin. If the mark be repeated a fecond time, it is to fhew the place where the third part muft begin, to imitate the fecond; and fo on through all the parts. See USUS.

PRESBYS, in zoology, a name ufed by many of the antient naturalifts for the *regulus criftatus*, or golden-crowned wren. *Ray's* Ornithol. p. 163. See REGULUS *criftatus*.

PRESERVATION *of Corn*. A fuccefsful method of *preferving corn*, for the ufe of armies, and againft times of fcarcity, is a moft ufeful and curious object of enquiry.

It is well known that accident often preferves *corn* very long, when all the care in the world fuffers it to decay in a few years, the owner knows not why. One very remarkable inftance we have recorded in the memoirs of the academy of fciences at Paris, in 1708, of fome *corn* laid up in the citadel of Metz, in the year 1578, which had kept good to that time without any particular care. It was on this occafion that the fubject of *preferving corn* in general became the employment of the thoughts of the members of the academy, and Mr. Reneaume obferved,

1. That *corn* can never be too dry when it is brought into the granary, if intended for long keeping; and that in order to keep, it muft be preferved quite dry and quite clean.

2. That tho' fome have imagined that *corn* increafes in fize in the granary, and therefore fhould be cut after a wet feafon, and in dewy mornings; yet on the contrary, *corn* never fwells, if well preferved, but always fhrinks and wrinkles up a little: and that the *corn* of dry feafons is always obferved to keep much better than that of wet ones, which ufually heats and decays. And that as to dewy mornings, they are never to be chofen for reaping, unlefs on particular occafions; as when the feafon has been fo remarkably dry, that the *corn* is loofe in the ears: then, indeed, there is danger of its being loft by falling out while the reaper cuts the ftalk, and this is prevented by cutting it while the dew has wetted the hufks, or the grains of *corn*, and retains them in their places.

4. It is very certain, that any *corn* which is dry will, on laying it in a moift place, fwell and increafe in bulk, and will become larger by this means. The merchants generally are able to find this out, however, and do not care to buy fuch *corn*, well knowing that it is very fubject to mould and decay. There is another yet more artful method than this in too common ufe among the petty merchants, who buy up *corn* to fell it to the larger dealers, which is this: they heat a large piece of freeftone, and inclofing it in an iron box, they thruft it under the heap of *corn*, and carefully remove it about to every part, at the fame time gently moiftening the *corn*; the effect of this is a very confiderable fwelling of the *corn*, infomuch that what they buy as fixteen bufhels, they fell after this for feventeen; but there is no wonder that *corn*, treated in this manner cannot keep. This is an artifice often practifed alfo on oats, and is more profitable in that, as the oats will gain at leaft twice as much in quantity by it as wheat or barley.

5. If it is abfolutely neceffary at any time to lay up *corn* in a place that is damp, it is beft to lay it up in the ear, not in the loofe ftate, fince in that cafe the ftalk and hufks will abforb a great quantity of the moifture, and preferve the *corn* in fome degree from it. The leaving the chaff with the *corn*; that is, the threfhing, but not fanning it, may alfo be of ufe in many cafes, and this takes up but little room in a magazine, and it is much the fame thing to the proprietor, whether it be all fanned together, or be only fanned in quantities fufficient for a certain number of days, as it is wanted to be ufed; but tho' the trouble is the fame, the advantage is not fo, but is greatly on the fide of the latter practice: we all well know the ufe of chaff, and the like dry fubftances in preferving fruits for the winter; and this might alone give a hint that *corn* might fare the better for it; but we have alfo this additional mark of its ufe in preferving *corn*, that the zea or fpelta, called fpelt *corn* and white *corn*, and ufed for food in many parts of Germany, is always preferved in the hufk, and is found the leaft fubject to decay of all *corns*.

From thefe confiderations it is eafy to learn, what are to be the principal objects of our care in the preferving *corn* for the ufe of armies, &c. The granary muft be a well chofen place; and according to Vitruvius's rules, fhould always be at the top of a houfe, and have its openings only to the north or eaft, that the *corn* may not be expofed to the damp winds from the fouth and weft, which are very deftructive to it; whereas the contrary ones are very neceffary and wholefome to it, ferving to cool and to dry it from all external humidity, from whatever caufe. There muft alfo be openings in the roof to be fet open in dry weather, partly to let in frefh air, and partly to let out the warm effluvia which are often emitted by the *corn*. The covering of the roofs fhould always be of tiles, becaufe in the worft feafons, when the other openings cannot be fafe, there will always be a confiderable inlet for frefh air, and a way out for the vapours by their joinings, which are never clofe. If there happen to be any windows to the fouth, great care muft be taken to fhut them up in moift weather, and in the time of the hot fouthern winds.

There muft never be a cellar, or any other damp place under a granary, nor fhould it ever be built over ftables; for in either of thefe cafes the *corn* will certainly fuffer by the vapours, and be made damp in one and ill-tafted in the other. Mem. Acad. Par. 1708.

The accidents that attend *corn* in public granaries, are of the utmoft importance, and ought to be well underftood and guarded againft. See GRANARY.

Dantzic is the grand ftorehoufe, or repofitory of all the fruitful kingdom of Poland. The wheat, barley, and rye, of a great part of the country are there laid up in parcels of twenty, thirty, or fixty lafts in a chamber, according to the fize of the room; and this they keep turning every day or two, to keep it fweet and fit for fhiping. A thunder ftorm has fometimes been of very terrible confequence to thefe ftores. All the *corn* of the growth of former years having been found fo much altered by one night's thunder, that tho' over night it was dry, fit for fhiping or keeping, and proper for ufes of any fort, yet in the morning it was found clammy and fticking. In this cafe there is no remedy, but the turning all fuch *corn* three or four times a day for two months or longer; in which time it will fometimes come to itfelf, tho' fometimes not.

This effect of thunder and lightning is only obferved to take place in fuch *corn* as is not a year old, or has not fweated thoroughly in the ftraw before it was threfhed out. The latter inconvenience is eafily prevented by a timely care; but as to the former, all that can be done is carefully to examine all ftores of the laft year's *corn* after every thunder ftorm, that if any of this have been fo affected, it may be cured in time; for a neglect of turning will certainly utterly deftroy it Phil. Tranf. N°. 96.

PRESERVATION *of other vegetables*. This is to be done feveral ways in the feveral kinds, and many more might certainly be invented; for we are not yet arrived at the perfect method of *preferving vegetables* with their colours, odours, and all their fenfible qualities, as well as their natural form for a number of years. Fruits may be long *preferved* in fpirit of wine, firft well faturated with the fkins and tinging parts of thofe fruits; and many may be tolerably *preferved* in perfectly fermented liquors, which generate no more air. The more folid *vegetable* fubftances may be *preferved* by gently drying in the fun fhade, or other flack heat. Thus peas or beans may be dried young in a flack oven in their proper feafon, and may afterwards be boiled in the winter, and will eat young and tender, as if juft gathered. The ways of *preferving* fruits both dry and moift, with fugar, are now univerfally known; and there are in the feveral ways many fecrets in the hands of particular artifts, which it would be well to have generally known. *Shaw's* Lectures, p. 196.

PRESS *(Cycl.)*—PRESS, in the manege. A horfe is faid to refift, or *prefs* upon the hand, when either through the ftiffnefs of his neck, or from an ardour to run too much a head, he ftretches his head againft the horfeman's hand, refufes the aid of the hand, and withftands the effects of the bridle.

If your horfe is too fiery, and *preffes* upon the hand, endeavour to pacify him, by making him go more foftly, and pulling him backwards; and if it proceeds from a ftiffnefs of the fhoulders and neck, you muft fupply him with a caveffon made after the Duke of Newcaftle's way. See HEAVY.

PRESS is alfo ufed for pufhing a horfe forewards, by affifting him with the calves of your legs, or even fpurring him, in order to make him go on.

PRESS, or PRESSING, in the fea language. See MANNING.

PRESTER, *(Cycl.)* a word ufed by fome to exprefs the external part of the neck, which is ufually inflated in anger: with others it is a name for the ferpent *dipfas*.

PRESTESSE, in the manege, is ufed to denote the readinefs and diligence of a horfe in working a manege.

PRESTISSIMO, in the Italian mufic, intimates to perform extremely quick, haftily, and with fury.

PRESTO, in the Italian mufic, is ufed to fignify that the part it is joined to fhould be performed gayly, faft and quick, yet not with rapidity.

Non tropo PRESTO, or *men* PRESTO, in the Italian mufic, fignifies not too quick, or lefs than *prefto*.

Piu PRESTO, in the Italian mufic, is ufed to intimate that we fhould fing, or play the part to which it is annexed, a little brifker and quicker than the *prefto* alone requires. When *piu* is added to other words, as *adagio*, *grave*, *vivace*, &c. it adds in like manner to the flownefs, or quicknefs of the movements, refpectively.

PRESTO, PRESTO, in the Italian mufic, the fame with *preftiffimo*. See PRESTISSIMO.

PRESUMPTION, *præfumptio*, in rhetoric, the fame with *prolepfis*. See PROLEPSIS.

PRETERNATURAL *rains*. See the article RAINS.

PRIAPE *de mer*, in natural hiftory, a name given by the French to a peculiar fpecies of canalis, or tubulus marinus, called alfo by fome authors of that nation, the *arrofoir*.

It is an oblong, and thick-fhell of this kind, with a large head, which is pierced thro' with a great number of holes, fo as at once to refemble, in fome fort, the glans of the penis, and the head of a common gardener's watering-pot. This fpecies is found at Amboina. See CANALIS.

PRIAPEIA, *(Cycl.)* in botany, a name given by John Bauhine and fome other authors, to the fmall fpecies of tobacco called by Mr. Tournefort and others, *nicotiana minor*. See the article NICOTIANA.

PRIAPOLITHUS, a name given by fome authors to a ftone found about Caftro in Italy, which very aptly refembles the figure of the human penis.

PRICK *(Cycl.)*—PRICK, or PINCH, in the manege, is to give a horfe a gentle touch of the fpur, without clapping them hard to him. To *prick* or *pinch*, is an aid; but to *appuyer*, or bear hard with the fpur, is correction.

PRICKING *(Cycl.)*—PRICKING *of a horfe's foot*, in the manege, is the hurt received by a nail driven too far into the foot, fo as to reach the quick, or prefs the vein in the horfe's foot when he is fhod.

PRICKLE *back*, in natural hiftory, a fmall fifh fo called from the *prickles* on its fides and back. Vaft numbers of thefe little fifh are to be found in almoft all frefh waters, wherever it is poffible for fifh to live, as Mr Arderon informs us, Phil. Tranf. Nº. 482. fect. 15. who gives us fome account of thefe creatures. They are very deftructive to the fpawn of all forts of fifh; and they themfelves are tormented to death by a kind of loufe of an oval figure, with eight legs and a very tranfparent body. This loufe has little fins always in motion, whether it be fwimming about or fixed on the fifh

PRIDE *of the Ifis*, a name given by Dr. Plot to the common lampern, from its being found very plentifully and very delicate in that river.

It is to be obferved, that we diftinguifh between the lampern and lamprey, which, tho' words very nearly the fame in found, are yet the names of two different fifhes: what we call the lampern, is the *lampetra parva fluviatilis* of Willughby; this is the fifh found in the Ifis. The lamprey is the *lampetra* of Willughby, and others: they are both fpecies of the petromyzon of Artedi. See the articles PETROMYZON and LAMPETRA.

PRIDE *gavel*, a cuftom in the manor of Rodely in the county of Gloucefter; by which to this day a rent is paid to the lord, by certain tenants. in duty and acknowledgement to him for their liberty and privilege of fifhing for lampreys or lamprids in the river Severn. *Tayl.* Hift. Gavelk. 112 *Blount.*

PRIMIER *(Cycl.)*—PRIMIER *ferjeant*, the King's firft ferjeant at law.

PRIMING *(Cycl.)*—PRIMING-*iron*, in gunnery, a fmall fharp iron, which is thruft into the touch-hole of a great gun, and pierces into the cartridge that holds the powder, that fo they may put in the *prime*-powder, or touch-powder, to fire off the piece.

PRIMO *(Cycl.)*—PRIMO, in the Italian mufic, is often abridged thus, Pº. or Iº. and added to other words, as, *primo canto*, the firft treble; *alto primo*, the firft counter tenor; *tenore primo*, the firft tenor; *baffo primo*, the firft bafs; *fagotto primo*, the firft baffoon; *choro primo*, the firft chorus, &c.

PRIMULA, *or* PRIMULA *veris*, in the Linnæan fyftem of botany, the name of a genus of plants, the characters of which are thefe: the cup is a general involucrum, fmall, compofed of many leaves, and containing feveral flowers. The feparate perianthium of every flower is tubular, and of a pentagonal figure, compofed of one leaf, divided into five fegments, placed erect, and remaining when the flower is fallen. The flower is compofed of only one leaf, in form of a cylindric tube, of the length of the cup, terminated by a fmall hemifphere neck. The margin is fpread open, and divided into five fegments, which are obtufe, inverted in the fhape of a heart at their ends, and have a rim round their edges. The ftamina are five very fhort filaments, fituated within the tube of the flower. The antheræ are erect, pointed, and converge toward one another at their ends. The germen of the piftillum is globofe. The ftyle is flender, and of the length of the cup, and the ftigma is globofe. The fruit is a cylindric capfule, nearly of the length of the cup, covered, containing only one cell, and fplitting open. Its top is dented into ten fegments. The feeds are numerous and round. The receptacle is of an oblong oval figure and free. *Linnæi* Genera Plant. p. 63.

The characters of this genus, according to Mr. Tournefort, are thefe: the flower confifts of only one leaf, which is expanded wide at the mouth, and divided into feveral fegments. The cup is tubular, and from it arifes a piftil, which is fixed like a nail into the hinder part of the flower, and afterwards becomes a fruit, or an oblong cafe, clofely furrounded by the cup, and containing fmall roundifh feeds, affixed to a placenta.

The fpecies of *primula*, enumerated by Mr. Tournefort, are thefe: 1. The fweet yellow-flowered fingle *primula*, commonly called the *cowflip*. 2. The taller fingle *primula*, with a paler flower. 3. The fcentlefs *primula*, which has no cup to the flowers. 4. The fcentlefs *primula*, with double flowers. 5. The fweet *primula*, with indented or diffected cups. 6. The *primula*, with a foliaceous head inftead of flowers. 7. The yellow, mountain, hairy *primula*. 8. The red-flowered *primula*. 9. The white-flowered *primula*. 10. The great fcarlet umbellated *primula*, with a foliaceous ftalk and foliaceous flower. 11. The leffer yellow umbellated *primula*, with a foliaceous ftalk and flower. 12. The garden umbellated yellow *primula*. 13. The garden white umbellated *primula*. 14. The garden red umbellated *primula*. 15. The ferrugineous umbellated garden *primula*. 16. The common wild manyflowered *primula*. 17. The double many-flowered fpring *primula*. 18. The fweet proliferous *primula*. 19. The largeflowered proliferous *primula*. 20. The white-flowered proliferous *primula*. 21. The purple-flowered proliferous *primula*. 22. The ferrugineous-flowered proliferous *primula*. 23. The great-flowered, pale, whitifh, fingle *primula*. 24. The pure white fingle-flowered *primula*. 25. The green-flowered fingle *primula*. 26. The double green-flowered *primula*. 27. The green and white fingle-flowered *primula*. 28. The doubleflowered feparately divided *primrofe*, called *Hefket's primrofe*. 29. The deep green-flowered *primula*, with fimbriated edges. 30. The Conftantinople *primula*, with a pale purple flower. 31. The Conftantinople *primula*, with a large purple flower. 32. The Conftantinople *primula*, with fmaller purple flowers. 33. The Conftantinople *primula*, with a fcarlet flower. 34. The Conftantinople *primula*, with a ferrugineous flower with white fpots. 35. The Conftantinople *primula*, with white flowers. 36. The Conftantinople *primula*, with pale flefhcoloured flowers. 37. The Conftantinople *primula*, with yellow flowers. 38. The Conftantinople *primula*, with pale lemon-coloured flowers. 39. The Conftantinople *primula*, with a rufty whitifh flower. 40. The Conftantinople *primula*, with a bruwnifh flower.

The flowers of this plant are efteemed greatly cephalic and nervine. They are recommended in palfies, apoplexies, and all nervous diforders.

The *primula* may be known when not in flower, by their having rugged and wrinkled leaves of a thin confiftence. *Tourn.* Inft. p. 124, 125.

PRIMUS *(Cycl.)*—PRIMUS *Brachii moventium*, in anatomy, a name given by Vefalius, and fome others who have copied from him, to a mufcle generally known under the name of the *pectoralis*. See the article PECTORALIS.

PRIMUS *communium laryngis*, in anatomy, a name given by Cafferius and fome others to the mufcle more generally known by the name of the *fternothyroidæus*, or *fterno-thyroides*. See the article STERNOTHYROIDÆUS.

PRIMUS *hyoidis offis mufculus*, in anatomy, a name given by Fallopius and fome others to the mufcle of the *os hyoides*, called by Albinus *fternohyoidæus*.

PRIMUS *oculum movens*, in anatomy, a name given by Vefalius to one of the four *mufculi recti* of the eye, called by Albinus and others the *adductor*. It is called by Fabricius the *rectus interior*, and by fome the *bibitorius*.

PRIMUS *propriorum auriculæ mufculus*, in anatomy, a name given by Cafferius to one of the mufcles of the head, called by Albinus the *auriculam attollens*, and by Cowper and Winflow *fuperior auriculæ*, which fee.

PRINCE *(Cycl.)*—PRINCE *of the Senate*. There was one member of the Roman Senate diftinguifhed always from the reft by the title of *Prince of the Senate*. This title was given of courfe to that perfon whofe name was called over the firft in the roll of the Senate, whenever it was renewed by the cenfors. He was always one of confular and cenforian dignity.

After the inftitution of the cenfors. it became a cuftom to confer this title of *Prince of the Senate* on the oldeft fenator then living of cenforian dignity. Yet there were no peculiar rights annexed to this title, nor any other advantage, except an acceffion of authority, from a notion which it would naturally imprint of a fuperior merit in thofe who bore it. *Middleton* of Rom. Sen. p. 147, 149. See SENATE.

PRINCE *of pleafantry, prince de plaifance*, in the cuftoms of Flanders. See SPORTS.

PRINCE *of the horfe-comb*, in the cuftoms of Flanders. See SPORTS.

PRINCES *feather*, in botany, a name given to the amaranth. See AMARANTH.

PRINCES *metal*. Copper, tho' one of the lefs precious *metals*, yet has been found of fo great ufe in the common affairs of life, that fcarce any other has been fubject to fo many trials for its improvement, or the rendering it either more beautiful or more fit for certain purpofes.

One of the firft difcoveries in thefe attempts was the making it into brafs, by means of an addition of lapis calaminaris; and tho' it was not at that time known to be a ftone which contained any *metal*, yet the brafs was always found to weigh one third more than the copper which had been ufed in the procefs.

This yellow metal gave many people hopes of making copper approach yet nearer to gold, and without knowing that zink was the feparated metalline part of lapis calaminaris, the experimenters foon found, by happy accident or repeated chance mixtures, that it would give copper a yet finer and purer yellow; but it was alfo found, that this mixed *metal* was much more brittle than brafs made in the common way. This, however, did not prevent the world from ftill valuing it for fuch works as were to be finifhed by cafting, and did not require the hammer: and we, who firft had it in perfection,

called it *princes metal*, from Prince Rupert, whom fome fuppofed to have been the inventor of it; but the greateft perfection this *metal* was ever brought to, was by two Frenchmen, Mr. La Croix and Mr. Le Blanc. Their methods of making the compofition, tho' both beautiful, were very different. Mr. Le Blanc's was the brighteft, and of the moft elegant and lively colour; but Mr. La Croix's was greatly fuperior to that in ductility and foftnefs, fo that it was very eafily malleable.

Mr. La Croix invented a fort of varnifh or lacquer for his *metal*, which added a fomewhat deeper tinge to it, as it was naturally rather too pale; and had this farther advantage, that while it remained on the *metal*, it preferved it from ruft or decay. This is a very material point in regard to a *metal* of which copper is the bafis, fince that is, of all other *metals*, moft fubject to be injured by the air, or by the contact of liquids of almoft any kind. Mr. Le Blanc's *metal* is of a deeper, yet equally lively colour, and remarkably bright; and is of fuch a temper as to be admirably fitted for working. The whole hiftory of thefe *metals* is certainly, that they are compofed of zink and copper in different proportions the one to the other; but it is not eafy, without the help of numerous experiments, to determine what is to be the true proportion for either.

The microfcope, however, fhews a manifeft difference, which may lead fomewhat towards it; for the *metal* of La Croix is feen to be compofed merely of a number of irregular ftriæ, while the other is difcovered to confift of always two regular beds of them, which meet in the center of the piece; hence it is that this is always brittle, and will not well polifh. The fabrick of thefe *metals* was long kept a fecret; but it was always to be difcovered by melting it in a crucible in a ftrong fire, when it always fent up plain flowers of zink, and the remaining *metal* appeared no other than copper altered by calamine; that is, common brafs. Mem. Acad. Par. 1732.

PRINCIPALIS, in fome antient Latin writers of mufic, is ufed for the chord or note called ὑπατη by the Greeks. See the articles HYPATE, TETRACHORD, and DIAGRAM.

PRINCIPIUM *recti abdominis*, in anatomy, a name given by Vefalius to a mufcle generally known at this time under the name of the *pyramidalis*.

PRINCIPLE (*Cycl.*)—Some antient philofophers diftinguifhed between *principles*, αρχαι, and elements στοιχεια. *Principles* according to them, were neither compofed nor produced; but the elements were complex or compounded beings. *Plutarch*, ap. Ellet. in Mem. de l'Acad. de Berlin, 1746.

It would be endlefs to enumerate all the opinions of philofophers concerning the elements of bodies. A late author has given us a fummary of many of thefe opinions; and, laftly, adds his own, that fire and water are the only things which properly deferve the name of elements, or *principles* of natural bodies; fire being the active, and water the paffive *principle*. According to him, water is convertible into air, and into earth, by means of fire. Hence the four, vulgarly called elements, may be reduced to two. He endeavours to eftablifh his doctrine on the experiments of Boyle, Hales, and Mufchenbroek. Vid. *Eller*, in Mem. de l'Acad. de Berlin, 1746.

Original PRINCIPLE, *principium originale*, a name given by Tachenius and fome other authors, to falt, without confidering it as acid, alkali, or of any other particular kind, or any mode of exiftence. The falt of wood or vegetables, not being alkali till after burning, and fo on; but falt that is the bafe of thefe, being evidently exiftent in the bodies, and, in regard to wood, feeming indeed to conftitute its character as fuch, fince the evaporation of it caufes the wood to loofe all its ftrength and to decay: for we find that in rotten wood there is no alkali at all; and the Venetians, who fink their timber for fhip-building into water while it is green, prevent, by that means, the evaporation of thofe falts, and leave the wood little lefs durable than ftone. On thefe and the like principles, Tachenius fuppofes falt to be the true *original principle* of bodies; but many others allow this name only to water, or at leaft that water is, in almoft all natural bodies, the moft copious, the moft active, and the moft influencing part; yet even this is found to agree much better with fome bodies than with others. The birch and elder feed more kindly on a thin uliginous moifture; the elm, the pine, the fir, and cedar, chufe a ftronger liquor; yet thefe and many more, the moft widely different that can be from one another, are often feen to draw their whole fuftenance and bulk, whether annual or perennial, from the fame piece of ground, impregnated fo far as is poffible to be judged of with the fame fort of juices, and from the ambient air and dews, when as yet by our beft diligence we cannot diftinguifh the liquors or falts approaching clofely to their feveral roots; and if we wholly take away, and exchange all the earth from the roots of trees whofe barks, fap, and fruit, have very much differ ing falts, and are of very different kinds, yet we fhall find each tree to profper better by the exchange, inftead of being injured by it.

Hence we may fufpect, that the very contextures of the bodies of plants, from the firft germination of the feed, and as they form gradually from the invifible *principles* of their feeds, are, however fmall and imperceptible, the natural alembics, where the common water and air are changed into the different juices, gums, refins, &c. as the animal organization in the body of the cow changes the juices of every fort of grafs and efculent vegetable, into one and the fame milk. The fea-plants growing on fhells, or affixed to yet harder ftones, taking no nourifhment from the thing they grow on, but being as it were all root, and taking the whole from the ambient water; yet that water giving to different fpecies of them, tho' itfelf the fame to all, the different textures of herbaceous to fome; tough and horny to others; and to fome, abfolutely ftony; as to the corals, many of which have been efteemed by the generality of authors, abfolute ftones.

Trees of feveral different kinds are found in America growing out of the fame dry and hard rock, and the various kinds of fucculent plants; the poifonous ones and their oppofites, or remedies, as the euphorbium and the antieuphorbium; the moft acrid and pungent, and the moft foft and emollient, out of the fame barren lands of Arabia, where it could not be expected that any plant could grow at all. Hence it is eafy to apprehend, how the feeds in their time, and after them the roots, ftems, and leaves of trees, may be the proper ftrainers to feparate and prepare the feveral faps and juices, and to ferment the liquors into their feveral particular falts. See the article VEGETATION and SALT.

PRINCIPLE, in chemiftry. It is impoffible to difcover the virtues of any body, or to find how mixed bodies of different kinds ftand related to the human body, either for the prefervation of its functions entire, or the reftoring them when loft or impaired; or, finally, for the total deftruction thereof; till we know the *principles* of which they confift, and likewife the mixture and proportion of fuch *principles* in bodies to which their effects are chiefly owing. Wherefore having difcovered by various ways the parts into which a true chemical analyfis refolves bodies, we muft look upon fuch fimple parts into which all mixts are refolvable, and of which they feem to be compounded, as their true and genuine *principles*.

The antient chemifts having obferved, that in analyfing all bodies whatever, they obtained a fpirit, or mercury, fulphur, falt, water, and earth, concluded the number of *principles* to be five. If wine, for inftance, be diftilled in a proper alembic, a burning water or fpirit will firft arife, and next an infipid water, which they call phlegm; a thick vifcid mafs alone remaining in the ftill; this put into another veffel, or retort, and expofed to a more intenfe and violent heat, a fmall portion of phlegm comes over firft, then an acid water, which according to them is ftill fpirit or mercury, and next a fat oily fubftance, called fulphur: what remains ftill in the retort is next burnt to afhes in an open fire; thefe afhes are thrown into an earthen veffel, with a proper quantity of boiling water, which they impregnate with their falt; this water being filtred thro' cap paper, and afterwards evaporated, leaves the falt at the bottom of the veffel; and the other part of the afhes, which the water could not take up, or have any effect on, is termed the earth of the fubftance, or its caput mortuum.

Of thefe five *principles* the chemifts have reckoned two to be paffive, water and earth; and three to be active, fpirit, fulphur, and falt; and on thefe laft they have thought the whole virtue of the mixed body depended. In this analyfis we may obferve, that there is a twofold fpirit; one oily and inflammable, which rifes firft by a gentle heat, and is termed fpirit of wine, another acid penetrating like that of vinegar. Befide thefe, the chemifts give the name of fpirit to other penetrating volatile, or urinous liquors, obtained from the parts of animals; fuch as the fpirit of urine, hartfhorn, and fuch like fubftances: but the later chemifts have banifhed thefe fpirits from the number of their *principles*, as being nothing elfe than fulphur and falt diffolved in water. Thus fpirit of nitre, and others of that kind, are only acid falts in water; fpirit of hartfhorn, or urine, alkaline falts; and fpirit of wine, or of turpentine, an æthereal attenuated oil.

Some of the moderns deny likewife, that either fulphur or falt deferve the names of *principles* or elements, as not being the moft fimple fubftances producible by chemiftry. For fulphur, when heated with due care, may be refolved into falt, water, and earth; as is evident by diftilling fetid diftilled oils feveral times with quick-lime, which by this treatment yield in large quantities a volatile falt, diffolved in phlegm, together with a caput mortuum or earth. Æthereal oils alfo are only fat thick oils, like that of olives, attenuated by falts and diffolved in water; as may be proved by thefe two experiments. If oil of olives, or any other of that kind be mixed with a fermenting liquor, fuch as a folution of honey in water; the whole may be converted into an inflammable fpirit. And if a quart of fpirit of wine, diluted with fix quarts of common water, be expofed in a cold place to the open air, the volatile falts will fly off and leave drops of oil fwimming at top, which are in every refpect the fame with oil of olives or almonds.

Salt is no more a *principle* than fulphur; becaufe it may, by proper management, be at length reduced to earth and water.

Thus nitre by distillation may be almost wholly reduced to an acid spirit; but if it be burnt with tartar, or charcoal dust, it becomes an alkali salt, called fixed nitre: this, if suffered to run per deliquium, and afterwards filtred thro' cap paper, will leave a large quantity of earth behind; and if the same liquor be distilled to dryness, an insipid water will come over, and the salt remaining at the bottom of the retort, will be found to have lost a great part of its quantity; and if the operation be often repeated, nothing will at length remain but earth. Again, the vitrification of alkaline salts seems to be nothing but the conversion of them into earth; for glass has no qualities different from those of earth.

What we have proved by experiments, in resolving bodies, may be farther confirmed by others relating to the formation and composition of them; and particularly by Van Helmont's famous experiment of the willow. He took about two hundred pounds of earth dried in an oven, and put it into a vessel covered with an iron-lid full of holes: in this earth he set a branch of willow, weighing about five pounds; which soon took root, and grew so much, that in eight years time it weighed one hundred and sixty pounds; the earth it stood in having, during all this time, lost only a few ounces; so that the whole increase of the tree must have been owing to rain water, with a very small proportion of earth; and the salts and sulphurs therein must have been composed of two elements alone. The experiments of this kind, made by the illustrious Mr. Boyle on small sprigs of mint, marjoram, balm, pennyroyal, &c. set in small vials filled only with pure water, are yet more to be depended on. These increase in a short time to double their first weight; and being afterwards distilled, they yielded the very same principles they would have done, had they grown in the most proper soil. From all this it cannot but be allowed, that salt and oil owe their original to water and earth.

Water and earth do indeed, in the strictest sense, deserve the name of *principles*; but in the formation of mixed bodies a third *principle* must necessarily concur with them; for as they are of themselves wholly unactive, something must be supposed to give them their motion and activity: without this, water would immediately turn to ice; and as there are few bodies out of which fire may not be drawn, it is evdient that there must be some active, moveable *principle* in them all, to which the motion of the other parts is owing. Therefore, tho' this *principle* should not fall under our senses in the same manner as the others do, that can be no reason for doubting its existence, since it must concur in the composition of all bodies; which, if they were made of water and earth alone, would remain for ever without any virtue or energy. This they must receive from another *principle*; and according to the different combinations of all the three, bodies are formed with different properties and powers. We acknowledge, therefore, three simple substances in bodies, which are properly elements or *principles*; one active, which may be termed fire; and two passive, water and earth. From the most simple union, or connection of these three, salt arises; which consequently is to be looked upon as the most simple of all mixed bodies. The next to that in simplicity is sulphur or oil, made by an union of these three *principles*, and of salt. *Geoffroy*, Tract. p. 5.

Elementary earth is the same with the *terra damnata*, or *caput mortuum* of the chemists; being a simple, friable, porous substance, without smell or taste, consisting of particles of no regular figure, and altogether unfit for motion. The porosity of earth seems to arise from the irregular figure of its particles; and as these particles oftentimes touch one another only by their angles, the whole mass must necessarily be friable, and the want of taste and smell may be owing to the inaptitude of the particles of earth to motion.

In any analysis of bodies, the last thing is always this *principle* earth; and in their composition it seems to serve as a basis or foundation to the other parts of the mixture, and to it the dryness, solidity, and hardness of bodies is in a great measure to be ascribed. *Geoffroy*, Tract. p. 11.

Elementary water is a simple liquid, insipid, inodorous, pellucid substance: its fluidity is owing entirely to the action of fire, and when that action is very great, its parts are actually divided, and the whole turned to vapours; but when it is very small, they cohere strongly, and turn to ice. This element some chemists call *phlegm*, and it may be conceived to consist of small smooth particles, of an oblong or oval figure, and perfectly rigid and inflexible. From the minuteness of its particles it easily penetrates the pores of almost all bodies. An oval figure seems more agreeable to the fluidity of waters, as also to its motion, than a sperical one; and likewise to the solidity we observe in ice, the points of contact in spherical bodies being too few to form so strong a cohesion. Were its particles angular and flexible, they would be too weak to penetrate and dissolve salts, and would likewise be too much resisted; but as their surface is smooth, they can easily enter the substance of salts, and afterwards as easily separate their parts, that is, dissolve them by their rigidity and oval figure. The want of taste and smell in water seems to be owing to the smoothness, obtuseness, and smallness of its particles, which cannot vellicate the nerves of the tongue and nostrils. The fluidity of the water arises from the smallness, smoothness and figure of its particles, and from their easy motion by the fire contained in their interstices. Without the action of fire separating these particles, and keeping them in continual motion, their fluidity would presently be lost, how much soever their natural figure may dispose them to it, and they would become one solid mass. On the other hand, if the action of fire upon them be very great, they are farther separated from one another, and fly off in vapour and smoke. In fine, water is transparent, because its pores are so disposed, as readily to transmit the rays of light. *Geoff.* Tract. p. 10.

We reckon elementary fire the first *principle* of bodies, as being that from whence all the rest receive their activity: it is a simple and most subtle body, in a continual swift motion, filling and easily penetrating the pores of all other bodies. Its immense subtlety is evident from this, that it pervades all bodies whatsoever, and its swift motion from that rapidity which it is capable of communicating to them. Its force is in proportion to the quantity of it any where collected. In the sun, which may be looked upon as a vast congeries of this substance, its motion is most violent. In culinary fires, the quantity and motion of it are not so great, but still greater than in spirituous and volatile liquors, where it is hardly to be perceived, except when they are set on fire. Not only all motion, but also heat is owing to fire, which as it exists in bodies, is nothing else but the excessive motion of their parts. It is too subtle and active ever to be collected pure in chemical analyses; wherever it is found it is always united with water and earth in salts and sulphurs; and is sometimes concentred in bodies in so great quantities, as considerably to increase their weight; as is evident in calcined antimony, in which there is in the operation an addition made of almost a fifth part. *Geoffroy*, Tract. p. 9.

What the chemists call oil or sulphur, is not a simple substance, but a body compounded of earth, fire, water, and salt; but as it is usually separated entire in chemical analyses, it has been usually esteemed a chemical *principle* or element of bodies; and is, indeed, tho' a real compound, yet not without considerable difficulty to be reduced to its *principles*. It may be defined to be a fluid, viscid, inflammable, transparent body, without taste or smell, (tho' by mixing it differently with salts these different qualities are produced) compounded of fire, water, earth, and salt; and it may be conceived to consist of many flakes, or flocculi, each of which is again made up of very small flexible filaments, formed of the four *principles* before mentioned, by fermentations, as well in the bowels of the earth, as in the bodies of vegetables and animals; thus an aromatic plant growing in water will, by distillation, yield an oil, which could never have been obtained from the water in which it stood; and all oils may by art be resolved into water, earth, and salt: from these filaments variously concreted arise the flakes already mentioned, which are of different thicknesses; and in the pores thereof is lodged the element of fire, which also runs in little streams thro' their interstices. On these depend the specific levity, inflammability, and fluidity of oil; but as notwithstanding the intestine motion caused by the element of fire, the flocculi still adhere, in some measure, together; this fluid must necessarily be more viscid than any other.

From what has been said concerning the nature of alkaline salts, and the figure and structure of the oily flocculi, it is easy to conceive why all alkalies dissolve sulphurs; for since the alkaline particles are spherical and prickly, they cannot enter the interstices of these flocculi, without carrying away some of them from the rest, and thus by degrees thoroughly dissolving them. But the dense, rigid, and pointed moleculæ of acids being laid into these interstices, increase the density, and strengthen the texture of the flocculi; and from the diversity of these and of the acid spicula mixed with them, arise the different kinds of sulphurs.

Sulphurs formed in the earth, of fire, acid salt, water, and a very fine earth, are termed simple bitumens, and these bitumens dissolved in a large quantity of water, form the mineral oils or petrolea; but if they are mixed with earth and salt, the common solid bitumens are produced, differing from one another in degrees of purity, according to the quantity and grossness of the earth, or different degrees of mixture. Thus fossile or pit-coal, jet, amber, and the common bitumens, and bituminose earths are produced. If there be but a small quantity of earth and much acid salt, the common mineral sulphur or brimstone is formed: if the mineral original bitumen is joined to a fusible earth, capable of vitrification, it communicates to it a metallic form, that is the sound, brightness, softness, ductility, malleability, and all the other sensible qualities of metals.

This origin of mineral bitumens may be confirmed by many experiments. If a mixture of equal parts of oil of vitriol, and oil of turpentine, be digested together for a considerable time in a very gentle heat, and afterwards distilled in a retort, there will come over first a yellowish liquor resembling petroleum both in smell and consistence; and what remains in the retort is at first a soft bitumen, and afterwards turns into a hard black mass, easily inflammable, and smelling in the burning exactly like fossile coal. But if the distillation be continued, a white acid liquor will next be obtained, which by

by ſtanding lets fall a grey powder, which is true common brimſtone; a yellow ſubſtance of the like nature adhering likewiſe to the neck of the retort; what is left behind being a black, ſhining, light, ſubſtance, diſpoſed in thin diſgregated ſtrata or plates, like ſome of the foliaceous talcs, and in theſe iron may be diſcovered by the help of the loadſtone. Thus therefore all theſe bitumens may be artificially produced; and the moſt accurate analyſes of the natural ones, confirm the manner of their formation

Thus the chemiſts have ſhewn, that metals are nothing but bituminous ſubſtances, which have undergone a long digeſtion; for by depriving them of their ſulphur they are firſt reduced to aſhes, and afterwards to glaſs; this is eaſily ſeen in the imperfect metals; for if any of them be expoſed to a long heat, and eſpecially if to the rays of the ſun collected by a large burning glaſs, the ſulphureous *principle* flies off, and only a calx or aſhes will be left behind; which in a more vehement degree of fire are preſently vitrified, and by reſtoring the ſulphur this glaſs may be again reduced to metal.

The inflammable ſubſtances in animals and vegetables, conſiſt of a different combination of the *principle* of ſulphur and acid ſalt; for the oil or ſulphur in theſe is formed by a ſmall portion of earth joined to the elementary fire, water, and acid ſalt; this oil when joined to an acid ſalt produces gums; when joined to a fine acid, and a new acceſſion of fiery particles, it produces eſſential oils and inflammable ſpirits; but if the acids are more groſs, by reaſon of a larger quantity of earth joined to them, it forms reſins, as we learn from the artificial compoſitions of all theſe ſubſtances. By mixing ſpirit of wine with volatile ſpirit of urine, we obtain a mucilaginous concretion, or thin gum: oil of olives and ſalt of tartar melted together, make a kind of ſoap or thick gum; and if ſpirit of wine be digeſted for a long time with oil of vitriol, and then diſtilled, an inflammable oil is obtained, reſembling in ſmell and other qualities the eſſential oils of plants, a true reſin being left behind in the retort.

In animals this ſame oleaginous *principle* forms the fat and other glutinous or gelatinous ſubſtances; theſe laſt being compoſed of an acid volatile ſalt and oil, as appears from their analyſis: but fat is made of the ſame oil and acid ſalt; for, if oil of olives and ſpirit of nitre be mixed together, and digeſted, a ſubſtance will be formed in all particulars reſembling the fat of animals.

Sulphureous ſubſtances found in bodies are either fixed or volatile. The fixed ſulphurs are either ſolid, ſuch as, fat, reſin, and the bitumens; or fluid, as oils Volatile ſulphurs are ſuch as fly off with a ſmall degree of fire, and have an appearance compounded of that of oil and water Such are inflammable ſpirits obtained from the fruits and flowers of plants. *Geoff.* Tract. p 17.

Tho' ſalt be in reality a mixed body, yet in the common analyſis of bodies it is obtained intire, and has therefore paſſed with many for a true chemical *principle*: a great deal of pains is neceſſary to decompoſe and reduce it to its natural *principles*, but with accuracy and caution it is reduced to water and earth. It is the ſole origin of taſte, ſmell, and many other of the moſt obvious properties of bodies, and may properly be defined to be a mixed body, formed by the concretion of fire, water, and earth, into a ſolid, rigid, ſubſtance, ſoluble in water, and fuſible by fire. As its particles may be conceived to cohere by large ſurfaces only, ſalt cannot be friable, like earth; but requires a conſiderable force to ſeparate its parts, which fly off from one another with a ſenſible noiſe like thoſe of glaſs. It becomes the cauſe of taſte and ſmell, becauſe its particles terminate in ſtrong points, which vellicate the nervous membranes of the tongue and noſe.

Salt is properly of three diſtinct kinds, acid, acrid or alkaline, and neutral, or ſal ſalſus, compounded of the other two. *Geoff.* Tract. p. 12.

Acid ſalt is a congeries of inflexible ſolid parts, of an oblong figure, pointed at both ends. That its particles are rigid and hard, appears from the force with which it divides and diſſolves ſolid bodies; and their ſharpneſs and pungency are evident from the effect they have on the tongue, different from the corroſion of the acrid or alkaline ſalts. Acid ſalt is eaſily diſſolved by water; and after this ſolution, its parts are equally diſperſed through that fluid, and have the ſame motion with it. Hence it appears, that the particles of both theſe ſubſtances have nearly the ſame ſpecific gravity; and likewiſe, that the motion of the aqueous parts is great enough to overcome the cohеſion of the parts of the ſalt.

Concerning the manner in which the particles of acid ſalt are compounded of fire, water, and earth, nothing can with certainty be determined. It may be conjectured, however, that ſeveral particles of water being collected into one little maſs, are cemented together by ſome particles of fire and earth, lodged in the interſtices left between them; and that all theſe taken together are diſpoſed in one oval form, or that of two cones joined by their baſes. This configuration, however, is not the ſame in all acid ſalts; but the differences may all be reduced to three, the nitrous acid, the muriatic, and the vitriolic. *Geoff.* Tract. p. 13.

Salt alkali has its name from the Arabian *kali*, a plant, from whoſe aſhes a ſalt proper for glaſs-making was obtained; and from thence it came to be uſed for the fixed ſalts got from the aſhes of all plants, and afterwards for all ſalts and other ſubſtances whatever, that will ferment with acids.

Acrid or alkaline ſalt ſeems to be a congeries of ſpherical particles, with rough, prickly ſurfaces; becauſe of their great diſpoſition to motion, and their corroſive burning taſte. The points of their ſurfaces act on the nervous papillæ of the tongue like ſo many files; whereas acid ſalt is only pungent. But then by theſe points a larger ſurface is expoſed to the action of the fire than could otherwiſe be, and thus the particles of ſome alkaline ſalts are very volatile, or eaſily raiſed by a gentle heat. The origin of this ſalt is probably from a connection of acid points and terreſtrial particles; becauſe, in many operations in chemiſtry, ſuch ſalts ariſe from the mixture of acid ſalts and earth; as we ſee particularly in the preparation of fixed nitre and fermentation of urine.

Nitre being diſtilled, leaves a compound fixed ſalt behind, of the ſame nature with ſea-ſalt; out of which, by a nicer diſtillation, an acid liquor may be extracted without any volatile ſalt, or at leaſt but a very ſmall quantity: but if the ſame fixed ſalt be previouſly fermented, and then diſtilled, it yields a large quantity of volatile ſalt, and a very little fixed ſalt or acid; becauſe by fermentation or calcination, the acid and terreſtrial particles are intimately mixed, the acid ſpicula entering the pores of the earth, and ſo forming new molecules, which are denſe and cloſe toward the center, and prickly on the ſurface by the acid points ſticking out. Such are the particles of volatile alkalies, of which, if a great number be joined together, they muſt cohere very ſtrongly by means of their points, and form maleculæ of irregular figures; in the pores of which, watery, ſulphureous, earthy, or acid particles may be received and abſorbed.

Hence it is, that theſe ſalts are ſeldom pure; and as they are very often filled with particles of earth, they reſiſt the moſt violent degree of fire, and will ſooner melt than be raiſed by it. This is the true nature of fixed alkaline ſalt, ſuch as ſalt of tartar, or the ſalts got from the aſhes of plants, called lixivial ſalts. If they be impregnated with ſulphureous particles, they continue very volatile, and are raiſed by a ſmall degree of fire; as we ſee in ſalt of urine, hartſhorn, and others got from animals.

Acrid ſalts eaſily melt, when expoſed to a moiſt air, becauſe the particles of water contained in ſuch air readily enter their pores: when thus melted, they become properly lixivia, and are commonly termed oils, as oil of tartar per deliquium. Volatile alkaline ſalts, diluted with water, are called volatile urinous ſpirits; ſuch as the volatile ſpirit of urine, of hartſhorn, of blood, and others. *Geoff* Tract. p. 14.

Neutral ſalt is a kind of ſalt compounded of acid and alkaline moleculæ united together, and the figure of its particles is chiefly owing to the kind of acid that enters its compoſition. The impreſſion theſe particles make on the tongue is more dull and languid than that made by acid or acrid particles alone; becauſe the moleculæ formed by the union of theſe are larger in bulk, and conſequently leſs diſpoſed for motion; and therefore, tho' there is a greater quantity of aculei, or points, in one of theſe moleculæ than in one of the former; yet their bulk make them leſs capable of entering the pores of the ſkin, and vellicating the nervous papillæ, than when they are in a disjoined ſtate. The taſte of theſe ſalts is termed ſaline, and varies according to the differences both of the acid and alkaline particles that compoſe them, according to the thickneſs of the ſpicula, their number, and the other parts that may be mixed with them. That this is the true original of this kind of ſalts, is evident from the artificial compoſition of ſuch a ſalt from acid and acrid particles blended together, and from the reſolution of them into the ſame. Thus by pouring ſpirit of nitre, of ſea-ſalt, or of vitriol, on ſalt of tartar, new ſalts are produced exactly of the ſame appearance with nitre, ſea-ſalt, and vitriol; and by analyſing theſe three ſalts, the eſſential ſalts of plants, ſal armoniac, and others of the neutral ſalts, an acid and an alkaline ſalt may be obtained, in ſome fixed, in others volatile. *Geoff.* Tract. p. 15.

PRINOS, in botany, the name of a genus of plants, the characters of which are theſe: the perianthium is very ſmall and permanent; it is compoſed of one leaf, lightly divided into ſix ſegments The flower conſiſts of one petal, and is of the rotated kind; it has no tube, but its edge is divided into ſix oval ſegments. The ſtamina are ſix erect tubulated filaments, ſhorter than the flower. The antheræ are oblong and obtuſe. The germen of the piſtil is oval, and terminates in a ſtyle, which is ſhorter than the ſtamina. The ſtigma is obtuſe. The fruit is a roundiſh berry, containing ſix cells, and is much larger than the cup. The ſeeds are ſingle; they are very hard and obtuſe, convex on one ſide, and angular on the other. In ſome ſpecies the ſtamina are but five inſtead of ſix. *Linnæi* Gen. Pl p. 151. *Plukenet*, p 452. *Gronov.*

PRINTING (*Cycl.*)—The arts and ſciences, eſpecially ſtatuary and ſculpture, were arrived at ſo great perfection among the Romans, at the time when that empire was in its greateſt glory,

glory, that it is much to be wondered at that the art of *printing* was not found out among them; an art so nearly allied to that of the cutting seals and the dies of medals.

The making these dies, and the stamping their coins with them, was, in reality, no other than *printing* on metal; and their impressing their seals, cut in cornelians, agates, &c. on wax, was another species of *printing* on this substance. And finally, a third sort of *printing* among them, was the impressing the name of the workman on their pieces of fine earthenware.

Mountfaucon, in his antiquities, gives the figures and descriptions of several very large sigilla of the Romans, in which the names were all cut in hollow, in capital letters; and he imagines, that the use of these was to mark large earthen vessels with, while the clay was soft, and particularly those large vessels in which the Romans kept their wines. It does not seem that this diligent enquirer into antiquity ever met with any of these sigilla with the letters or characters in relief, or standing out in the manner of our modern types for *printing*, since he mentions none such; yet the remains of the Roman antiquities in terra cocta, or earthen-ware, shew that they had some such, tho' they were less common than the others; these vessels sometimes being marked with letters going in, tho' in general they have them all standing out, as must be the case when the impression was given from a sigillum cut in creux.

There is now, in the collection of the Duke of Richmond, a sigillum of the other more rare kind, which brings the discovery very near to that of *printing*: on this all the letters are raised, as is also the verge or rim of the seal, in the manner of our types used this day in *printing*. The stamp is made of true antient brass, and has on it the common green coat of ærugo which distinguishes the true antique medals. The plate is near two inches long, and near an inch in breadth, and has on the back part a ring for the convenience of holding it for making the impression. The letters stand in two rows; they are the common Roman capitals, very well made, and their faces all stand exactly on the level with one another, and with the surface of the verge of the seal. This seal was exactly of the nature of our method of *printing* so many letters at once. It contains the name of one Caius Julius Cæcilius Hermias, some private man, as we have no account of any person of this name upon record. It served him probably to set his name to any thing, to save him the trouble of writing; and the name being that of some private man seems also to prove, that these sigilla were very common among that people. It was evidently made to be used on parchment, or some other such thin substance; and the manner of using it must have been by first dipping it into ink, or some other coloured matter, not plunging it so far as to touch the ground, so that the letters only became marked, and gave their figures on the paper. The ground of this seal is very rough and uneven, and thence also it is plain, that the use of it was not to press down any soft substance, such as clay, or the like; because the imperfection of the ground would, in that case, have been seen, whereas in the use it was really intended for, the ground never gave any impression, and therefore there was no reason for bestowing any pains in the working it even.

The first use of *printing* among the later ages, was by wooden blocks in this very manner; and it was not till long after this invention, that we learned the way of using separate types for the letters; and these were then called *typi mobiles*, in opposition to the blocks, where the whole page was contained together, which were called *typi fixi*. This signet of the Duke of Richmond's, which was found near Rome, is truly and properly one of those *typi fixi*, and prints off its impression on paper with our modern printer's ink, as well as any set of letters cut in this manner can be expected to perform. This seems, therefore, the most antient sample of *printing* that we know of; for, by the appearance of the metal, it seems to be of the higher empire.

It is plain, by this stamp, that the very essence of *printing* was known to the Romans; for they had nothing to do, but to have made a stamp with lines three or four times as long, and containing twenty lines instead of two, to have formed a frame of types that would have *printed* a whole page as well as Coster's wooden blocks, used in *printing* the book called *speculum salutis*, which was the first book *printed*, in the year 1440, and consisted of pictures of stories out of the bible, with some of the verses underneath each page; being *printed* from a block of wood, like a wooden cut. This was the first essay of the fixed types, from which the moveable, or common separate types were soon deduced; and it seems strange, that the Romans, who were as sagacious a people as any in the world, should not as easily have fallen upon the use of separate types, in which the whole art of modern *printing* consists, from such signets as these, as the later ages from Coster's wooden blocks, which were plainly no other than larger works of the same kind.

Cicero, in his book *de natura deorum*, has a passage from which Toland supposes that the moderns took the hint of *printing*. That author orders the types to be made of metal, and calls them *formæ literarum*, the very words used by the first *printers* to express them. It is plain from Virgil, that brands, with the letters of the owner's name, were in use in his time for the marking of cattle. And we have an account of the same artifice that is now used for the painting of cards being used by the emperor Justin, who could not write. There was a smooth board, with holes cut through it, in form of the letters of his name; and when he had occasion to sign any thing, this was laid on the paper, and he marked the letters with a pen or stylus dipped in red ink and directed through the holes. Philos. Trans. N°. 479, p. 393.

PRINTS. To take off printed cuts, so that the outlines and principal strokes may be exactly copied for graving, may be thus performed: if the *print* be not above a year or two old, the paper need only be moistened with water in the manner usually practised for *printing* cuts; but if it be more antient, it should be laid to soak all night in water, and afterwards hung in the air till it becomes dry enough for the press. The paper thus prepared, is to be laid with its *printed* side next the plate, thinly cased over with white wax, which is thus to be committed to the rolling press, whereby an impression of the cut will be obtained. *Boyle's* Works abr. Vol. I. p. 136.

PRIORITES, in botany, a name given by the antient Greeks to a plant which they recommend in medicine; but they do not clearly explain what it was. It is the same with the cestrum and psuchrotrophon of the same writers; and they say it was called *betonica*, *serratula*, or *rosmarinus*, by the Romans. It is evident, from a strict enquiry into their accounts, that the serratula was the plant they meant; for Pliny says, that the betonica was only a Gaulish name for this plant, and the place of growth, which is described to be wet shady places, evidently excludes what we call *rosemary* from any title to the name.

Apuleius has greatly perplexed the cause by saying, that the *priorites*, or betony, has leaves like the docks; but he does not distinguish between the betonica and britannica, which last plant is the hydrolapathum, or great water dock, and has leaves like the other docks; and it is plain, that both Apuleius and Pliny borrow the account of the dock-like leaves from this passage, and attribute them to a plant the original author never meant them for.

PRISMATIC *antennæ*, in natural history, a term used to express the horns or *antennæ* of a peculiar genus of butterflies. As those of the common kind are slender and buttoned at the end, these become very thick a little way from their origin, and continue of that diameter through their whole length, till just at the extremity they turn a little and terminate in a sharp point. The anterior part of these is rounded, as in the other kinds; but behind they are made up of two planes meeting in an angle, and each of these has a row of hairs on it: these meeting at their summits, form an angular vacant space or alley below *Reaumur's* Hist. Inf. See FEELERS.

PRISON (*Cycl.*)—*Breaking of prison*, by the law of Scotland, is a punishable offence; but there are no particular laws against it in that country, so they are guided by the Roman laws in such cases. But tho' this law seems to make the punishment of this crime capital, yet this is thought too great severity in Scotland, where an arbitrary punishment, greater or less, according to the circumstances of the escape, and the violence with which it was accomplished, is thought sufficient and adequate. *Math.* de Crimin. Carpz. Part 3. *Bayne's* Crim. Law.

PRISTIS, the *saw-fish*, a fish of very large size, and armed with a very remarkable weapon like a saw, at his nose, from whence he has his name See Tab. of Fishes, N° 5.

This fish, from its large size, is generally reckoned a kind of whale, but erroneously; for it is truly of the same genus with the galei or hound-fishes It is ash-coloured on the back, and white on the belly; its head is of a heart-like shape, and flatted; its mouth is placed far below the end of the snout, and in the under part of the head, as in the zygæna; its lips are rough and sharp, like a file, but it has no other teeth; its head is terminated by a long and flat, bony substance, furnished on each side with jaggs or points like deep teeth of a saw. There are from twenty to thirty of these teeth on each side. The body is round, and grows small towards the tail. The sword of this fish is sometimes five feet long. It is found in the western ocean.

PRIVET, *ligustrum*, in botany. See LIGUSTRUM.

The leaves and flowers of *privet* are cooling, drying, and astringent, and consequently good in ulcers and inflammations of the throat and mouth, bleeding of the gums, and relaxation of the uvula.

PRIVET-*fly*, in natural history, the name of a species of *fly* very common on the shrub from whence it has its name. It is called the *erinopterus*, and is remarkable for having its wings deeply divided into segments, so that they seem composed of feathers like bird's wings. The creature as it sits looks like a small feather.

PRIZES (*Cycl.*)—The officers and seamen of the king's ships, and of other British ships having letters of marque, are intitled to the sole interest, and property of all ships and goods by them taken, and adjudged lawful *prizes* by the court of admiralty. Stat. 13 Geo. II. c. 4. sect. 1 and 2.

The *prize* is to be divided among the officers and seamen of the

the king's ſhips, as he ſhall appoint by proclamation. Among privateers, the diviſion is according to the agreement between the owners. *Ibid.*

The court of admiralty are to finiſh the examination of the perſons to be examined to prove the lawfulneſs of the *prize*, in five days after requeſt for that purpoſe made. The monition is to be executed in three days. And in caſe no claim of the capture be duly entered, giving twenty days notice after the execution of the monition; or if there be a claim, and the claimant does not give ſufficient ſecurity to pay double coſts to the captors, if the *prize* be adjudged lawful, then the court are to proceed to ſentence in ten days. *Ibid.* ſect. 3.

In caſe of doubt, or of witneſſes being remote, the court may releaſe the *prize*, on the claimant's giving good ſecurity to the captors for the payment of the full appraiſed value, in caſe the *prize* be adjudged lawful. *Ib.* ſect. 3. fin.

Judges and officers, on failure of their duty, in reſpect to the condemnation of *prizes*, forfeit 500 l. with full coſts of ſuit; one moiety to the king, and the other to the informer. *Ib.* ſect. 6.

The judges and officers of the court of admiralty in the king's plantations or dominions abroad, ſhall not receive above 10 l. in caſe the *prize* be under an hundred tons burthen; nor above 15 l. if it be of greater burthen. *Ib* ſect. 7.

Commiſſioners of appeals in cauſes of *prizes* are to be appointed under the great ſeal: and appeals may be made to them within fourteen days after ſentence. *Ib.* ſect. 8.

Agents for *prizes* are to be choſen by the captors. *Ib.* ſect. 10. The treaſurer of the navy is to pay to the officers and ſeamen on board ſhips of war, or privateers, in any action where any ſhip of war, or privateer, ſhall have been taken from the enemy or deſtroyed, 5 l for every man on board ſuch *prize* or ſhip deſtroyed, at the beginning of the engagement. *Ib.* ſect. 15.

The captures of Flota ſhips, or galleons, or regiſter ſhips bound from Buenos Ayres, or Honduras, can be tried only in the high court of admiralty. *Ib* ſect. 17.

This ſtatute enacts ſeveral penalties and forfeitures for taking *prizes* by colluſion. Privateers forfeit the *prize*, half to the king, and half to the informer; and the commander of a man of war forfeits 1000 l. to be divided between the king and the informer *Ib.* ſect. 19.

PRO (*Cycl.*)—PRO *partibus liberandis*, in law, an antient writ for the partition of lands between co-heirs. Reg. orig. 316. *Blount*, *Cowel.*

PROBOLIUM, among the Romans, a kind of ſpear, which hunters uſed in hunting boars. *Pitiſc* in voc.

PROBOSCIPLECTANUS, in natural hiſtory, a name given by ſome authors to a peculiar and very elegant ſpecies of penicillus marinus, which has ſomewhat of a funnel-like ſhape, and has its mouth ſurrounded by a number of thin hair-like filaments. See PENICILLI *marini.*

The firſt who has deſcribed this particular ſpecies, is the accurate Fabius Columna, from whom Klein has engraved a figure of it. *Klein* de Tub. Mar. p. 1.

PROBOSCIS, (*Cycl.*)—PROBOSCIS *of flies.* See the article TRUNK.

PROBULEUMA, Προβούλευμα, among the Athenians, a decree or vote of the Areopagus, or ſenate of Athens.

It was ſo called becauſe agreed upon by the ſenate, with a deſign to have it afterwards propounded to an aſſembly of the people, that it might receive from them a farther ratification, without which it could not be paſſed into a law, nor have any force or obligatory power after the end of that year, when the ſenators and other magiſtrates laid down their commiſſions. *Potter*, Archæol. Græc. l. 1. c. 18. T. 1. p. 100.

PROCERS, in glaſs-making, iron inſtruments hooked at the extremity, uſed to ſettle the pots in their places, whether ſet too near or too far off. *Neri's* Art of Glaſs, Append.

PROCESSUS (*Cycl.*)—PROCESSUS *majoris muſculus*, in anatomy, a name given by ſome of the writers of the ear to one of the muſcles of that part, called by Cowper and others the *internus auris*, and by Albinus, more properly, the *tenſor tympani.*

PROCESSUS *minimi muſculus*, in anatomy, a name given by ſeveral authors to one of the muſcles of the ear, called by Cowper and others *obl quus externus*, and by Albinus *tranſverſus auriculæ*. See TRANSVERSUS *auriculæ.*

PROCESTRIA, among the Romans, buildings adjoining to camps, eſpecially winter quarters or ſtanding camps, where ſutlers, ſtrangers, traders, and others that followed the army, reſided; for they were not permitted to mix with the ſoldiers, unleſs when the enemy was near. *Pitiſc.*

PROCHARISTERIA, Προχαριστήρια in antiquity, a ſolemn ſacrifice which the Athenian magiſtrates yearly offered to Minerva, when the ſpring firſt began to appear. *Potter*, Archæol. Græc T. 1. p. 427

PROCHEILA, a word uſed by ſome authors to expreſs the extremities of the lips.

PROCHYMA, a word uſed by the antients to expreſs that kind of muſt which flows ſpontaneouſly from the grapes without their being preſſed.

PROCICADA, in natural hiſtory, a name given by ſome to the inſect which the French call *procigale.* It reſembles the cicada in moſt reſpects, but it has not the power of making the noiſe that inſect does. See PROCIGALE.

PROCIDENTIA (*Cycl.*)—PROCIDENTIA *uteri.* The firſt ſtep towards a cure of a *procidentia uteri*, or falling down of the womb, is to reduce it to its natural ſituation, and to keep it there by means of peſſaries. But as ſome diſadvantages attend the uſe of common peſſaries, Dr. Thomas Simſon has contrived one, and given us the deſcription and figure of it in the medical eſſays of Edinburgh, Vol. III. art. 18. See alſo the abridgment of this work, Vol II. p 224.

PROCIDENTIA *ani.* See the article TENESMUS, under which this is treated of.

PROCIGALE, in natural hiſtory, a name given by Reaumur, and from him by all the French naturaliſts, to a ſpecies of four-winged fly, greatly reſembling the cigale, or cicada, but wanting its power of making a noiſe.

This creature has a trunk of the ſame form with that of the cicada, very long, and laid cloſely upon the belly, and contained in a caſe or ſheath of the ſame ſtructure with that of this inſect. The female alſo has the ſame inſtrument at its tail, prepared for boring holes in wood, and called in that creature the *piercer*, and it uſes it to the ſame purpoſe, depoſiting its eggs by means of it in the branches of trees.

There is alſo another very ſmall inſect mentioned by Reaumur, as reducible to this claſs, if properly of the fly kind; but its ſmallneſs makes the ſtructure of its wings ſcarce diſtinguiſhable with any degree of accuracy; and it is hard to determine whether it has four wings, or two wings, and two caſes of wings: this little fly is extremely common on roſe-trees; its wings are yellowiſh, and its body white; and it can hop as well as fly. It is hardly poſſible to find a roſe-tree in the ſummer-months that is not loaded with theſe inſects, and they are principally found about the extremities of the young branches. The trunk of this ſmall fly is of the ſame kind with that of the cicada, and its buſineſs on the roſe-tree is the laying its eggs, in the ſame manner as the cicada, in the wood of the branches. This operation, however, is performed by a very different inſtrument; for inſtead of the piercer which the female cicada has at the end of her body, this little fly has a ſaw placed on the third ring of the body, and as much differing in ſhape as in poſition from the ſaw of the ſerrate roſe-fly, for it is leſs elegantly faſhioned; it is pointed, however, at the end, and the creature preſſing upon it with the whole weight of its body, forces it into the wood, by which means it makes a cavity, in which to depoſite its eggs. Theſe eggs are ſo ſmall and ſo tender, that they are not to be taken out of their place without breaking them. They finally produce ſmall worms, of a white colour and tenderer nature than the eggs themſelves: theſe, after they have fed a proper time on the juices of the branch leave their holes, and become transformed into nymphs, which yet have the power of moving and feeding, and greatly reſemble the nymphs of the cicada in that they perfectly ſhew the lineaments of the fly contained within them, differing ſcarce in any thing from it, except that they have caſes over their wings, which are ſo ſmall as to leave the rings of the body almoſt entirely bare. *Reaumur's* Hiſt Inſ Vol. IX. p. 241.

PROCINDYNEUONTES, Προκινδυνεύοντες, among the Romans, a deſignation given to the Velites, becauſe they were moſt expoſed to danger. The term anſwers to what we call the *forlorn-hope* See VELITES and FORLORN-HOPE, *Cycl.*

PROCONNESIUM *marmor*, a name given by the antients to a ſpecies of marble called alſo *neuris* and *elaphoneſus*, and by ſome *Cyzicus*, from the works of a famous ſtatuary of that name, many of which were made of it. It was of a bluiſh white, lightly variegated with black; this colour uſually running in ſmall veins, and not unaptly reſembling in many inſtances the courſe of the veins of a human body in the naked ſtatues. It was alſo uſed in the ſumptuous buildings of the Romans.

PROCUBITORES, among the Romans, an appellation given to the Velites, becauſe when the enemy was near, they always formed the outguard. *Pitiſc.*

PROCYON, in aſtronomy, a fixed ſtar of the ſecond magnitude, in the conſtellation canis minor.

PRODUCTION (*Cycl.*)—*Marine* PRODUCTIONS. To inveſtigate the nature of *marine productions*, Count Marſigli moiſtened in ſea-water ſome branches of coral, newly taken up, and found that the tubercles ſo frequent on its branches, after a little time all opened themſelves into regular flowers, each terminated by eight points. Theſe were white, and were ſuſtained by a cup divided into the ſame number of ſegments; and on the taking the branches again out of the water, he found theſe flowers all immediately cloſe themſelves up again, and only make red irregular tubercles; and the vigorous branches of coral retained this property of opening and cloſing their flowers for ſeven or eight days after they were taken out of the ſea. The tubercles, when wounded, yield a milky juice, in which, doubtleſs there is contained the ſeed of the coral.

When this curious naturaliſt had found coral to be a true plant in its organizations, it appeared a very deſirable thing to enquire whether it would yield vegetable principles, or thoſe of another kind, in a chemical analyſis. This experiment

ment he carefully tried, not only on coral but on many other of the ftony plants, and found all of them yielded the fame principles with vegetables. All of them yielded on this trial, a phlegm, a volatile urinous fpirit, with always more or lefs of a fea-water fmell, and a thick reddifh black fœtid oil; and the remainder in the retort being calcined, always yielded a fixt alkaline falt like that of plants.

The fea *productions* all afforded more or lefs of every one of thefe principles; but thofe of which ever kind that had been kept a long time after they were taken out of the fea, afforded always much lefs fluid matter than thofe which were frefh. Mr. Geoffroy was very defirous of following the Count in thefe refearches; and as he had no opportunity of procuring any frefh coral from the fea, he put into a retort a pound of the common red coral, fold by the druggifts, which is what wants the outer bark, and has ufually been a long time out of the fea. This yielded two drams and fix grains of a reddifh volatile urinous fpirit, and two or three grains of a fœtid oil, and the remainder in the retort by the common treatment, yielded afterwards near two drams of a lixivial falt of a faline tafte: the matter remaining after the lixiviation appeared a fort of lime.

The fpirit appeared to Mr. Geoffroy to be wholly the fame with that which the Count had himfelf fent to the academy under the title of the fpirit of old coral; and it appeared fcarce at all different from fpirit of hartfhorn. It turned fyrup of violets green, and made a white coagulation with the folution of corrofive fublimate. Tho' this was much the fame with the Count's fpirit, the falts drawn from the caput mortuum were, however, different; that made by Mr. Geoffroy making a white coagulation with a folution of corrofive fublimate, and that of Count Marfigli having no fuch effect; both the falts, however, turned the fyrup of violets green, and Mr. Geoffroy judged the difference in the other trial to be only from the Count's falt having been lefs carefully made, and containing fome quantity of earth which weakened its power and prevented this effect from it. It follows from all this, that the corals and all the other fea *productions* of that clafs are properly plants, tho' of the hardnefs of ftones: and in the internal ufe of coral it may be proper to confider it not as a mere abforbent, but as a fubftance which contains alfo a volatile fpirit and oil, which may well be fuppofed to poffefs virtues above thofe of mere abforbent earth; and that there is great difference between the virtues of fuch coral as has been long kept, and fuch as is newly taken up from the fea. The Count, after analyfing coral in this manner, tried the fame procefs on feveral parts of the rocks on which the coral grew; but he found this to yield none of thefe active principles; fo that altho' the hardnefs of corals and of ftones feems the fame, there is great difference between them in their principles, their nature, and effects.

There is yet one queftion remaining to be determined in this point, which is, what is the nature of this milky juice contained in the tubercles or flowers, and perhaps not lefs in the other parts of coral. The Count has faid nothing as to its qualities, but Boccone fays it is hot, acrid, and almoft cauftic; whence perhaps it is the natural fap of the plant, and is analogous to the milky juice of the fpurges and fome other plants. It were to be wifhed that this liquor could be tried with acids and alkalies, and in other ways, and its analyfis known: this perhaps would make our knowledge of the nature of this ftony vegetable perfect. Mem. Acad. Par. 1708.

PROEDRI, Προεδροι, among the Athenians, magiftrates whofe bufinefs it was to propofe to the people the things they were to deliberate upon and determine at every affembly, after which their offices expired. *Potter*, Archæol. Græc. l. 1. c. 17. T. 1. p. 93.

They were fo called from the privilege they enjoyed, of always having the firft feats at affemblies.

PROEROSIA, Προηροσια, in antiquity, the fame with *prerofia*. See PREROSIA.

PROFUNDUS, in anatomy, a name given by Albinus, Hunaud, and others, to a mufcle of the wrift, generally known by the name of the *perforans*. Thefe authors called, in the fame manner, the *perforatus* of others the *fublimis*.

PROGALL-INSECT, an animal nearly approaching to the gall-infect clafs, but differing from it in fome refpects, and called by this name from its refemblance to thofe creatures; as the creatures fomewhat approaching to the fcarab or beetle clafs, but not regularly of it, are called *profcarabs*.

This clafs of animals pafs a great part of their lives in the fame manner with the gall-infects, faftened to the bark of a tree, and there remaining motionlefs; fome of them alfo in the manner of the gall-infects cover their young brood with their bodies; but they are eafily diftinguifhable as animals, in all the ftages of their lives, and in that they differ from the others. The annular depreffions of their bodies may in all their ftates be diftinguifhed, efpecially with the help of a magnifying glafs; whereas thofe of the gall-infects all difappear as they grow towards their utmoft bulk.

If the gall-infects are worthy of obfervation on account of the great value of one fpecies of them, the kermes; the *progall-infects* are at leaft equally fo on the fame account, fince the cochineal belongs to this clafs.

The moft common and obfervable fpecies of the *progall-infect* clafs, is that of the elm, and a defcription of that alone may give a fufficient light into the hiftory of the whole clafs, and fhew what characters are to be found in the infects properly reducible to it.

This infect is principally found in the forked branches of the elm, and commonly in thofe of one, or at the utmoft of two years growth; it is fometimes found in other parts of the branches and twigs, but that is much lefs frequently. It is in the months of June and July that this infect is at its full growth; at this time, however, it appears to the naked eye only as a fmall oval convex mafs, of a dirty brownifh red colour, furrounded with a fmall downy white thread. This reddifh oval mafs is the back of the animal, and by the help of glaffes we may fee the annular ridges and depreffions that characterize the infect clafs. This is all that gives an idea of its being an animal; for it is at this time in a ftate of perfect immobility, and fhews neither head, legs, or any other part that might give a proof of what it is; all thefe parts are enveloped and hid by the cottony band that furrounds it, which fuffers no part but the convex furface of the back to be feen.

It is giving but a very imperfect idea of this downy rim, to call it only a border or pad laid round the body of the animal. This matter, in reality, makes a kind of neft in form of a bafket, in which the body of the infect is in a great meafure lodged. Its belly, which is placed on this neft, is feparated by it from the bark of the tree, and lodged on a fort of downy bed; the threads of this down are fomewhat thick and ftrong. The principal ufe this bed or neft feems deftined for, is, the reception of the young, which are produced in the end of June or in July. If the animal be removed from its bed at this feafon, a vaft number of fmall living animals are found in the bottom and fides of the neft. Thefe are of a yellowifh white, and have two fmall horns; their fhape much refembles that of the young gall-infects; their hinder part is more fharp than their fore part, and they run about very fwiftly on fix very fhort legs.

At whatever time however the *progallinfect* is removed from its neft, there are never found any eggs; the creature is viviparous, and the young animal feems to be born with its head foremoft, which is contrary to the manner of the pucerons and fome other fmall animals.

If the body of the parent *progall-infect* be crufhed in the month of June, a great number of fmall oblong bodies are always protruded; thefe are probably the embryo animals, tho' all that the niceft attention can in this ftate difcover in them, is, two fmall black fpecks, which afterwards prove to be the eyes. The nefts of thefe infects are feldom found fo full of young ones as might be expected; but that is probably owing to the length of time taken up in bringing forth fo great a number, probably eight or ten days, and the young ones in a day or two are perhaps fit to efcape and run away; fo that one finds only the laft born there.

The branches of the elm examined with the help of glaffes at this feafon, fhew us multitudes of the young *progall-infects* running about them; thefe, however, continue in this ftate but a little while, they foon choofe their place for fixing for life, and there remain without motion afterwards. They do not lofe the power of moving, however, till the month of April following; for till that time, if the branch on which they are be cut off, when it becomes dry, and furnifhes them no more juices, they will leave it and go in fearch of another; but after April, if the branch be cut off, they die upon the place when it dries, being no longer able to remove themfelves.

Thefe infects, like the gall-infects, do not grow much till after the winter is over: toward the end of April they have ufually arrived at their deftined bignefs; their bodies in the beginning of this month, and in fome part of March, are fomewhat reddifh; but this colour is the lefs to be diftinguifhed, as the rings are all bordered with fhort grey hairs. Thefe hairs are confiderably thick, but the animal is found abfolutely without them again, when it has its cottony bed under it, having then divefted itfelf of them in quitting its fkin, which it changes for one whofe pores are more proper to give paffage to the matter of which that bed is to be made. At all feafons their belly is of a redder colour than their back; and that is in a great meafure owing to the belly being always free from thofe grey hairs. The legs are very fmall and flender, in proportion to the fize of the animal; they are fix in number. Its trunk or fucker is not eafily difcovered, but is placed however in the fame manner with that of the gall-infect, and is like it in fhape.

The cottony matter forming itfelf by tranfpiration from the feveral parts of the animal, forms by degrees the neft, and as this increafes, the animal itfelf increafes alfo in bulk, and becomes gradually more and more red. No obfervation has yet been able to determine the manner of the fecundation of thefe infects; they are never feen to couple one with another, and moft probably the male of this clafs, as of the gall-infects, is a fmall fly. *Reaumur*'s Hift. of Infects, Tom. 4. p. 83.

PROGALL-INSECT, otherwife called COCHINEAL. There have been many conjectures about *cochineal*; but the moft probable feems to be, that it is an animal of the *progall-infect* clafs.

The

The *cochineal*, in the ftate in which it is brought to us, is in fmall bodies of an irregular figure, ufually convex, and ridged and furrowed on one fide, and concave on the other. The colour of the beft is a purplifh grey, powdered over with a fort of white duft. All that the world knew of it for a long time, was, that it was gathered from certain plants in Mexico, and therefore it was naturally fuppofed to be a feed. *Reaumur's* Hift. of Infects, Tom. 4. p 88.

In the year 1692, Father Plumier gave Pomet, the French author of a hiftory of drugs, an account of its being an animal: this, however, was difregarded; but Meffrs. Hartfoeker, De La Hire, and Geoffroy, afterwards evidently proved it to be one; and after this there were printed the depofitions in form of a number of perfons upon the fpot, who all declare it to be a viviparous animal, and that it paffes a great part of its life fixed to the vegetable body on which it feeds; and that it was a creature fubject to no change, nor ever appearing in any other ftate. Thefe and many other qualities found in the *cochineal*, all analogous to thofe of the clafs of *progall infects*, give great room to believe that it is truly and properly an infect of this clafs.

There are two kinds of *cochineal*, the finer called *meftique*, the other termed the wild *cochineal*. The firft is gathered from fuch plants of the opuntia as are prepared and managed properly on purpofe for the production of the animal, the other is found wild on the wild plant, and is much inferior to the *meftique* in value. The *meftique* has its name from the name of the place, where it is propagated in the greateft quantity, Meftique, in the Province of Honduras. As to the other, it is not yet determined whether it be another fpecies of the animal, or whether the fame fpecies in a lefs thriving condition Ibid. p. 91.

The Indians plant about their habitations the opuntias, on which they propagate and raife the *cochineal*; they gather feveral quantities of it in the year, and what they are moft afraid of in regard to it, is, a cold or a wet feafon. In fuch cafes they cut off the leaves of the plant ftored with the infects, and take them into their habitations. Thefe are of fuch a nature as not to dry and wither immediately, like the lefs fucculent plants, but often keep their juices long enough to furnifh the creatures a fufficient nourifhment, till the dangerous feafon is over. The infects are at this time in a ftate to produce their young; and the Indians place them in a fort of little nefts, twelve or fourteen together, on different parts of the opuntias of their plantation. Ibid. p. 93.

The animal is feldom more than three or four days in this condition, before it produces its young ones; each produces many thoufands, each fcarce fo large as the fmalleft mite; the young brood foon quit their neft, and like the other gall and *progall-infects*, wander about the plant for a little time, and then fix themfelves upon it in feveral places. They do not eat the plant, but only introduce their trunks and fuck the juice, and wherever they fix themfelves, which is ufually in the more fucculent parts of the plant, there they remain till they have acquired their full growth, and are in a condition themfelves to produce young ones. Ibid. p. 94.

The figure of this infect is oval, and its utmoft fize is that of a fmall pea. It has fix legs armed with claws, two eyes, and a trunk by which it fucks its nourifhment. Ibid. p. 95.

The ants, and many other little animals, are very fond of eating the *cochineals*; and it is with great difficulty that the Indians defend the young brood from thofe devourers. Ibid.

The firft of the gatherings of the *cochineal*, is at the time the Indians carry the parent animals to the plants; when thefe have produced their young they die in the nefts, and the Indians take down the nefts and take them out. The fecond gathering is three or four months after this, a little fooner or later, according to the feafon. The young ones produced from the former crop, have now acquired their full growth, and are ready to produce their young. In this fecond gathering they take care not to take off the whole generation, but leave enough on the plant to multiply and give them a new crop afterwards. About three or four months after this, they have another gathering from thefe. Soon after this the rainy feafon comes on, and the young ones produced from what are left on the plants from this gathering, are what the Indians houfe, for the parents of the next year's crops. The laft of thefe crops is the leaft valuable, being generally foul and full of fmall infects of the new brood, among the right and full grown ones. Ibid. p. 96.

After the Indians have gathered the *cochineal* they kill it, otherwife they would loofe a great part of their harveft; for the parent race would live fome days after their being taken from the plant, and would produce their young, which would be nimble enough to run away in great numbers. Some to kill the creatures plunge them in hot water, and afterwards dry them in the fun; others kill them by a proper degree of heat. Ibid. p. 97.

The living *cochineals* are covered, like all other infects of this kind, with a kind of white powder; but in the water ufed to kill them they loofe much of this powder, and are therefore of a different colour from thofe killed by heat. Ibid. p. 98.

The accounts from the place where the *cochineal* is produced, give us all thefe particulars; but to decide the long difputed point, whether they are of the animal or vegetable kingdom, we have the means in our own hands even in this part of the world. We need only moiften and foak in water, or in vinegar, a number of *cochineals* till they are fwelled and diftended, to know that every one is the more or lefs perfect body of an infect; the moft imperfect and mutilated fpecimens always fhew the rings of the body, and from obferving others it will be eafy to find the number and difpofition of the legs; parts, or even whole ones being left on feveral, and often compleat pairs. Ibid. p. 100.

People of warm imaginations no fooner knew it to be an infect, but before they were perfectly acquainted with its form, they were for alloting it its proper clafs. Some would have it to be a worm, others a fpider, and others a beetle. Petiver is of the number of the laft, and has been fanguine enough to figure it in all the ftates he fuppofed it to have paffed, the hexapode worm, the nymph, and the perfect beetle; tho' we now find by pofitive accounts from the place, that it undergoes no change at all, and from its whole figure and hiftory, that it is properly of a clafs of animals then not known. Many have alfo been of opinion, that it was only a part of an animal, but a clofer and repeated obfervation would have fhewn them that it comes to us often more perfect than is imagined, and frequently wants only its horns and a leg or two, of being a perfect animal.

It is eafy to fee in fome of thefe the head, and fometimes a tubercle on each fide of it, which may very naturally be fuppofed the eyes, or elfe the roots of the antennæ or horns. The firft pair of legs are thus found to be very near the head of the animal, and placed exactly as in all the gall-infect and *progall-infect* clafs; a little above thefe one may diftinguifh alfo the remainder of the trunk fituated exactly as in the gall infects and *progall-infects*; the anus is alfo eafily diftinguifhed. Ibid. p. 101.

As the manner of the fecundation of the gall-infects was fo long unknown in Europe, it is no wonder that that of the *cochineal* fhould not be very early difcovered in Mexico: but we have an account among Mr. Ruyfche's pieces from whence almoft all the true hiftory of this animal is had, that at the feafon of the *cochineals* becoming big, there is feen continually among them a fmall butterfly, which is bred upon the fame plants, and by means of which the *cochineals* conceive This is fo ftrictly analogous to the manner of the gall-infect clafs, that there is no room to doubt the fact; and it is a farther great proof, how little truth was before in the gueffes concerning the clafs of animals this belonged to. Ibid. p. 103.

It would be an eafy miftake for any one not profeffedly a naturalift to miftake the male gall-infect for a butterfly, as it has white opake wings; and affuredly the male *cochineal* is an animal of the fame fpecies, a true two winged fly.

If a full grown *cochineal* be foaked a confiderable time in water or vinegar, and afterwards gently preffed, there will frequently be protruded from its hinder part a number of fmooth oblong bodies, which might be eafily miftaken for eggs; but a good microfcope will fhew in thefe the traces of the legs and other lineaments fufficient to prove it to be a true embryo fœtus. Ibid p. 104.

The wild *cochineal* differs from the *meftique* in being lefs pure, and confifting of animals of all ages and fizes, as being gathered with lefs care, and without the intent of propagating future crops; the larger fpecimens in this fometimes exceed the finer *cochineal* in fize, and when moiftened and fqueezed, fend forth vaft numbers of the fame oblong bodies. Ibid. p. 105.

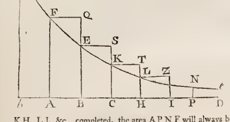
Duhamel, while he refided at St. Domingo, found in that ifland the fame animal which Father Plumier had before obferved there, and accounted the fame creature with the *cochineal* infect; be gathered fome of thefe animals from off the opuntias there, and fent them over to Paris; they were found to have all the exterior marks of *cochineal*; but it is much to be feared they are really no more than that to the *cochineal*, which the common peach and vine gall-infects are to the kermes of the ilex. Poffibly, however, a proper care and attention, and the bringing over the very creatures from Mexico to other parts of the world, might, with many tryals to determine what fpecies of the opuntia it is that they moft thrive on, be a means of propagating them to vaft advantage. Ibid. p. 108.

Joffelin, in his account of the products of New England, mentions a particular kind of fun-flower, called by fome a fpecies of *golden-rod*; the ftalks of which are covered about the knots in the fummer months with infects of the fize of large fleas. Thefe preferved in a proper manner, yield a very elegant fcarlet colour, and the author thinks might be made to fupply the ufe of *cochineal*.

PROGRESSION *(Cycl.)*—As a right line, or figure, may increafe continually, and never amount to a given line or area; fo there are *progreffions* of fractions which may be continued at pleafure, and yet the fum of the terms be always lefs than a given number. If the difference between their fum and this number decreafe in fuch a manner, that by continuing the *progreffion* it may become lefs than any fraction how fmall foever, that can be affigned; this number is the limit of the fum of the *progreffion*, and is what is underftood by the value of

of the *progression*, when it is supposed to be continued infinitely. These limits are analogous to the limits of figures, and they mutually assist each other. The areas of figures can, in many cases, be no otherwise expressed than by such *progressions*; and when the limits of figures are known, they may sometimes be advantageously applied for approximating to the sums of certain *progressions*.

Thus, for instance, let the terms of any *progression* be represented by the perpendiculars A F, B E, C K, H L, &c. standing at a given distance on the base A D; and let P N be any ordinate of the curve, F N e passing over the extremities of those perpendiculars. Suppose A P to be produced; then according as the area, A P N F, has a limit to which it may approach continually, but never exceed, or may be produced till it exceed any given space; there will also be a limit of the sum of the *progression*, or it may be continued till it exceed any given number. For supposing the rectangles F B, E C,



K H, L I, &c. completed, the area A P N F will always be less than the sum of those rectangles, but greater than their sum after the first. Therefore the area A P N F, and the sum of those rectangles, either both have limits, or both have none. The same is to be said of the sum of the ordinates A F, B E, C K, H L, &c. and of the sum of the terms of the *progression* represented by them. If the curve, F N e, for example, be the common hyperbola, b its center, b P the asymptote; and A B being equal to b A, if A F represent unity, the series of ordinates will represent the *progression* $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}$, &c. which may therefore be continued till it exceed any given number, as the hyperbolic area may be produced till it exceed any given space[a]. But if F N e be an hyperbola of any higher order, so that the ordinate P N be reciprocally as any power of the base b P, whose exponent is greater than unity, the area A P N F[b], and the sum of the *progression* represented by the series of ordinates, will have limits. Hence there is always a limit of the sum of the fractions that have unity for their common numerator; and the squares, cubes, or any other powers of the numbers, 1, 2, 3, 4, &c. whose exponents exceed unity for their successive denominators[c].

[[a] See HYPERBOLA. [b] Ibid. [c] See *Maclaurin*'s Fluxions, B 1. p. 290.]

When the area A P N F has a limit, we may not only conclude, that the sum of the *progression* represented by the ordinates has a limit; but when the former limit is known, we may by it approximate to the value of the latter: and *vice versa*, when the limit of the *progression* is given, the limit of the area may be found. See *Maclaurin*, Lib. cit. Art. 352, 353.

Progressions of fractions may be found at pleasure, that shall have assignable numbers equal to the limit of the sum of the terms. Thus a series or *progression* of any number of quantities continually decreasing being given, their successive differences form a new series of terms, the sum of which from the beginning is always equal to the excess of the first term of the first series above its last term. For instance, if A, B, C, D, E, &c. be the terms of the first series, it is manifest that the sum of the difference of A and B, B and C, C and D, D and E, is the excess of A above E. If the terms of the first series decrease in such a manner, that by continuing the *progression* they may become less than any quantity that can be assigned, then the first term of the first series is the limit of the sum of the second series. In like manner, the difference of the alternate terms of the first series, as of A and C, B and D, C and E, &c. form a new *progression* of terms, the sum of any number of which is equal to the excess of the sum of A and B, the first and second term of the series, above the sum of the last and penultimate terms; and the sum of A and B is the limit of the sum of the new series. In general, if a *progression* is formed by taking the difference of the first term A, and the term whose place in the series is expressed by any number n; of the second term B, and that whose place is $n+1$; of the third term C, and that whose place is $n+2$, and so on; then will the limit of the sum of this new *progression* be equal to the sum of the terms A, B, C, D, &c. which precede that term whose place is expressed by n. In this manner *progressions* may be found at pleasure, which may be continued without end, and have given numbers for the limits of their sums.

For example, let the first series be $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$, &c. the successive differences of the terms of which are $\frac{1}{2}, \frac{1}{6}, \frac{1}{12}, \frac{1}{20}$, &c. and the limit of the sum of this *progression* will therefore be 1.

If we multiply each term of this last series by 2, that the first term may be unit, we shall have $1, \frac{1}{3}, \frac{1}{6}, \frac{1}{10}$, &c. the denominators of which are the triangular numbers, unity being the common numerator, and the limit of the sum of this *progression* is 2. The successive differences of the terms of this latter series being each multiplied by $\frac{3}{2}$, that the term of the new series may be unity, give $1, \frac{1}{4}, \frac{1}{10}, \frac{1}{20}$, &c. which have the pyramidal numbers for their successive denominators; and the limit of the sum of this *progression* is $\frac{3}{2}$. In the same manner, the limit of the sum of the fractions having unity for their common numerator, and the figurate numbers of any order denoted by m for their successive denominators, is found to be $\frac{m-1}{m-2}$.

The same series $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$, &c. being again assumed, the differences of the alternate terms are $\frac{2}{3}, \frac{2}{8}, \frac{2}{15}, \frac{2}{24}$ &c. the limit of the sum of which *progression* is $1\frac{1}{2}$. Dividing each term by 2, the limit of the sum of $\frac{1}{3}, \frac{1}{8}, \frac{1}{15}, \frac{1}{24}$, &c. is $\frac{3}{4}$. If we take the differences of the first term, and that whose place is m, the second term and that whose place is $m+1$, &c. the common numerator of those differences will be $m-1$; and their successive denominators, the products of $1 \times m$, $2 \times \overline{m+1}$, $3 \times \overline{m+2}$, &c. and the limit of the sum of this *progression* is the sum of as many terms $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}$, &c. as there are units in $m-1$. Now if each term of the new *progression* be divided by $m-1$, that unity may be the common numerator, the terms $\frac{1}{m}$, $\frac{1}{2 \times \overline{m+1}}$, $\frac{1}{3 \times \overline{m+2}}$, &c. will arise, the limit of which is equal to the sum of the fractions $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}$, &c. (continued till their number be $m-1$) divided by $m-1$. In like manner, by assuming other alternate, or any equivalent terms of the series $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}$, &c. we may form new *progressions*, the value of which may be found. Thus, if we take the terms $1, \frac{1}{5}, \frac{1}{9}, \frac{1}{13}$, &c passing over three terms, and divide the successive differences of these terms by 96, we shall have the series $\frac{1}{5.24}, \frac{1}{5.9.24}, \frac{1}{9.13.24}, \frac{1}{13.17.24}$, &c. which is equivalent to the series C, given by Monf. de Monmort, in the philosophical transactions, N°. 353, p. 651. viz.

$$C = \frac{1}{1.2.3.4.5} + \frac{14}{5.6.7.8.9} + \frac{55}{9.10.11.12.13} + \frac{140}{13.14.15.16.17.}$$

+ &c. The sum of which will therefore be $\frac{1}{96}$. And if we take the alternate terms of the series $\frac{1}{2}, \frac{1}{12}, \frac{1}{30}, \frac{1}{56}$, &c. above mentioned and divide the successive differences of the terms by 2, we shall have the series $\frac{5}{2.12}, \frac{9}{12.30}, \frac{13}{30.56}$, &c. which is equivalent to the series $\frac{5}{1.2.3.4.}, \frac{9}{3.4.5.6}, \frac{13}{5.6.7.8}, \frac{17}{7.8.9.10}$, &c. mentioned in the said philosophical transactions, and marked A, the sum or limit of which, by the foregoing rule, will be $\frac{1}{4}$. So the limit of M. Monmort's series $B = \frac{1}{1.2.3.4.5} + \frac{4}{4.5.6.7.8}$, &c. will be $= \frac{1}{108}$ See *Maclaurin*'s fluxions, art. 356, where there is an error of the press, in p. 296. l. 11. and 15. for the series which in line 11. is said to be Mr. Monmort's series B, is the series A, p. 651. of the philosophical transactions, N°. 353 aforesaid; so in line 15, for A, read B.

This may suffice to shew how the sums of *progressions* so derived may be found. We refer for the farther application of these principles to the aforesaid treatise of fluxions, art. 357, &c. Mr. Stirling's[a] treatise of the summation of series, ought also to be consulted, as he has improved the method of approximating to the value of *progressions*, which often arise in the solution of problems. See also Mr. de Moivre's *miscellanea analytica*, and particularly the supplement to that work [[a] *Methodus differentialis*: sive *tractatus de summatione et interpolatione serierum infinitarum*. Lond 1730. 4°.]

PROGYMNASMATA, Προγυμνάσματα, in antiquity, certain preparatory exercises performed by all those who offered themselves to contend in the Olympian games. *Potter*, Archæol. l. 2. c. 22. T. 1. p. 448.

PROHIBITO, in the Italian music, is a term applied to such parts of a piece as are not proper, or according to just rule. Thus *intervallo prohibito* is every interval in melody that does not pass the ear easily or naturally, to give it some pleasure; such are the tritone, the sixth major, the seventh, ninth, &c. though under certain circumstances, even these have pleasing effects, in that by their harshness they render the subsequent concords more agreeable.

PROJECTILE (*Cycl.*)—The theory of *projectiles*, as delivered under this head in the Cyclopædia, and by almost all writers on gunnery since Galileo, proceeds on the supposition, that the flight of shot or shells is nearly in the curve of a parabola. Galileo, indeed, has shewn, that independently of the resistance of the air, all *projectiles* would in their flight describe a parabola; and did propose some means of examining what inequalities would arise from that resistance. So that it might have been expected, that those who came after him would have tried how far the real motions of *projectiles* deviated from a parabolic tract, in order to have decided how far

far the reſiſtance of the air was to be attended to, in the determinations of gunnery. But inſtead of proceeding thus cautiouſly, ſubſequent writers have boldly aſſerted, that no conſiderable variation could ariſe from the reſiſtance of the air, in the flight of ſhells and cannon-ſhot; and it is now become an axiom almoſt generally acquieſced in, that the flight of theſe bodies is nearly in the curve of a parabola.

This hypotheſis was ſupported by Anderſon in his Treatiſe *of the genuine uſe and effects of the gun*, publiſhed in 1674; alſo by Monſ Blondel in his *Art de jetter les Bombes*; and the ſame ſubject being treated of by Dr Halley in the Phil. Tranſactions, N°. 216. this learned gentleman, ſwayed by the conſideration of the great diſproportion between the denſity of bullets and of the air, thinks it reaſonable to believe, that the reſiſtance of the air to large metal ſhot is ſcarcely diſcernible, although in light ſhot he acknowledges it ought to be accounted for. But though this hypotheſis was readily admitted by thoſe who contented themſelves with ſpeculation only, yet Anderſon himſelf found it impoſſible to reconcile it to experience, without ſome modification. This led him to ſuppoſe that a bullet at its firſt diſcharge, flew a certain diſtance in a right line, from the end of which line only it began to bend into a parabola. By this means he defended, as he thought, the hypotheſis of a parabolic motion: but ſo ſtrange a ſuppoſition as that of the ſuſpenſion of the action of gravity, needs no confutation. Anderſon was deceived, by his not knowing how greatly the primitive velocity of the heavieſt ſhot is diminiſhed in the courſe of its flight by the reſiſtance of the air.

Practical gunners alſo unanimouſly agree, that every ſhot flies in a ſtreight line to a certain diſtance from the piece, which imaginary diſtance they call the extent of the point-blank ſhot. This flight in a ſtreight line, indeed, ſuppoſing it fact, would be not only a refutation of the parabolic hypotheſis, but a moſt unaccountable difficulty in itſelf, as implying a ſuſpenſion of the action of gravity. But the great velocity of cannon-ſhot, aſſigned by Mr. Robins, ſeems readily to clear up this affair. We need only ſuppoſe, that within the diſtance thus determined by practical gunners, the deviation of the path of the ſhot is not very perceptible in their way of pointing. Now as a ſhot of 24 lb. fired with two thirds of its weight in powder, will, at the diſtance of five hundred yards from the piece, be ſeparated from the line of its original direction, by an angle of little more than half a degree; thoſe who are acquainted with the inaccurate methods often uſed in the directing of cannon, will eaſily allow, that ſo ſmall an aberration as this, may, by the generality of practitioners, be unattended to, and the path of the ſhot may conſequently be deemed a ſtrait line, eſpecially as other cauſes of error will often intervene, much greater than what ariſes from the incurvation of this line by gravity. See new princip. of Gunnery, p. 82.

How raſh and erroneous the opinion of the inconſiderable reſiſtance of the air is, will eaſily appear from what is eſtabliſhed by that ingenious author, who has ſhewn that this reſiſtance to a cannon ball amounts to more than twenty times the weight of the ball. What errors may not be expected from an hypotheſis which neglects this force as inconſiderable? In effect, it will not be difficult to ſhew, that the track deſcribed by the flight of ſhot or ſhells, is neither a parabola nor nearly a parabola. For by that author's experiments it appears, that a muſket ball of three fourths of an inch diameter, fired with half its weight of powder from a piece 45 inches long, moves with the velocity of near 1700 feet in a ſecond. Now, by the common parabolic theory if this ball flew in the curve of a parabola, its horizontal range at 45°, would be found to be about 17 miles. But from practical writers, as Diego, Ufano, and Merſennus, it appears, that this range is ſhort of half a mile; ſo that a muſket ſhot at 45° elevation, with a reaſonable charge of powder, flies not the $\frac{1}{34}$ part of the diſtance it ought to do if it moved in a parabola.

Nor is this great diminution of the horizontal range to be wondered at, when it is conſidered that the reſiſtance of the air to this bullet, when it firſt iſſues from the piece, amounts to 120 times its gravity.

Again, if the flight of the heavieſt ſhot, in common uſe for land ſervice, as of iron bullets of 24lb. weight, be examined, it will appear, that ſuch a ſhot made with a full charge of powder has a velocity of 1650 feet in 1″. And the horizontal range at 45° of this ſhot, would, according to the parabolic hypotheſis, be about 16 miles; but by the experiments of St. Remy it appears, that the range is really ſhort of three miles; which is not one fifth of the diſtance it ought to fly, if it deſcribed the curve of a parabola.

And this deviation from the parabola, happens not only in theſe great velocities, but in ſuch as are much leſs; thus in velocities of about 400 feet in 1″; by ſeveral experiments it appears, that the range of a leaden bullet of three fourths of an inch in diameter, fired at different elevations with this velocity, did not at all anſwer the common theory. So that it ſufficiently appears that this theory, or the ſuppoſition of the inconſiderableneſs of the air's reſiſtance to *projectiles*, is falſe.

Indeed the falſeneſs of this hypotheſis almoſt appears at ſight, even in *projectiles* ſlow enough to have their motion traced by the eye; few there are who do not deſcend thro' a curve manifeſtly ſhorter and more inclined to the horizon than that in which they aſcended, and the higheſt point of their flight, or the vertex of the curve, is much nearer to the place where they fall on the ground than from whence they were at firſt diſcharged. Theſe things cannot be a moment doubted of by any one, who in a proper ſituation views the flight of ſtones, arrows, or ſhells, thrown to any conſiderable diſtance. See new princip. of Gunnery, Part 2. Prop. 6.

What is here advanced may be confirmed from the conſtant obſervation of all who are converſant in the practice of throwing bombs, *viz.* that the ranges at elevations below 45°, conſtantly exceed the ranges at elevations above 45°, which are reſpectively at an equal diſtance from 45°. Thus the range of ſhells at 15°, will go farther than one at 60°, and ſo a range at 20° exceeds one at 65°, *&c.* but it is known that in the parabolic hypotheſis theſe ought to be equal, which hypotheſis is therefore falſe.

There is an odd phænomenon in the motion of bodies projected with conſiderable force, which ſhews the great complication and difficulty of this ſubject. The phænomenon is, that bullets in their flight are not only depreſſed beneath their original direction by the action of gravity, but are alſo frequently driven to the right or left of that direction by the action of ſome other force.

If it was true that bullets varied their direction by the action of gravity only, then it ought to happen that the errors in their flight to the right or left of the mark they were aimed at, ſhould increaſe in the proportion of the diſtance of the mark from the piece only. But this is contrary to all experience; the ſame piece which will carry its bullet within an inch of the intended mark, at 10 yards diſtance, cannot be relied on to 10 inches in 100 yards, much leſs to 30 inches in 300 yards.

Now this inequality can only ariſe from the track of the bullet being incurvated ſideways as well as downwards; for by this means the diſtance between the incurvated line, and the line of direction, will increaſe in a much greater ratio than that of the diſtance; theſe lines being co-incident at the mouth of the piece, and afterwards ſeparating in the manner of a curve from its tangent, if the mouth of the piece be conſidered as the point of contact.

This is put beyond diſpute from the experiments made by Mr. Robins; who informs us, that having taken a barrel carrying a ball of three fourths of an inch diameter, and fixing it on a heavy carriage, he ſatisfied himſelf of the ſteadineſs and truth of its direction, by firing at a board one foot and a half ſquare, and miſſing it but once in 16 ſucceſſive ſhot. Now the ſame barrel being fixed on the ſame carriage, and fired with a ſmaller quantity of powder, ſo that the ſhock on the diſcharge would be much leſs, and conſequently the direction leſs changed, he found that at 760 yards diſtance the ball flew ſometimes 100 yards to the right of the line it was pointed on, and at other times 100 yards to the left. He found too that its direction in the perpendicular line was not leſs uncertain, it falling one time above 200 yards ſhort of what it did at another; altho' by the niceſt examination of the piece after the diſcharge, it appeared not to have the leaſt ſtarted from the poſition it was placed in. New principles of Gunnery, Part. 2. Prop. 7.

If it be aſked what can be the cauſe of a motion ſo different from what has been hitherto ſuppoſed? it may be anſwered, That the deflection in queſtion muſt be owing to ſome power acting obliquely to the progreſſive motion of the body, which power can be no other than the reſiſtance of the air. And this reſiſtance may perhaps act obliquely to the progreſſive motion of the body, from inequalities in the reſiſted ſurface; but its general cauſe is doubtleſs a whirling motion acquired by the bullet about its axis; for by this motion of rotation, combined with the progreſſive motion, each part of the bullet's ſurface will ſtrike the air in a direction very different from what it would do if there was no ſuch whirl; and the obliquity of the action of the air ariſing from this cauſe will be greater, according as the rotatory motion of the bullet is greater in proportion to its progreſſive motion.

PROLAPSUS *oculi*, in ſurgery, a diſtemperature of the eye, in which it is ſo violently inflamed and ſwelled, that it cannot be retained in its orbit or ſocket, but protrudes itſelf out of its natural ſeat. This diſorder is not only attended with great deformity, but alſo intenſe pains, blindneſs, and too often an obſtinate cancer are the effects of it. This is ſometimes ſo violent in degree, that the eye burſts out of its coats.

This diſorder ſometimes ariſes from inflammations, or redundancy of humors; and ſometimes from external violence, or from a cancer. Sometimes, when the diſorder is recent, and but in a moderate degree, it may be carried off by bleeding, bliſtering, and purging, with external applications, as fomentations and the like. When it will give way to none of theſe, the tumor muſt be opened, and the humors diſcharged, and this repeated as often as neceſſary; after every dreſſing, binding on a plate of lead hollowed in a proper degree.

When the natural figure of the eye, and its office of viſion are wholly deſtroyed by this diſeaſe, and the pains become

more intenſe, there is no way left but to make a large inciſion and let out the humors of the eye, and afterwards cut away ſo much of it, that the remainder may be covered with the eye-lid *Heiſter*'s Surg. p. 427.

PROLAPSUS *uvulæ*. The *uvula* is ſometimes ſo much enlarged and elongated, as to reach the larynx and pharynx, and obſtruct the actions both of reſpiration and deglutition, as well as of ſpeech. If it proceeds from a recent inflammation, the patient may be relieved by bleeding and cooling gargles, with ſal armoniac and alum; ſcarifications are alſo very uſeful in this caſe, to prevent its ſpreading and inflammation.

When, on the other hand, this part is too much enlarged and elongated by phlegmatic humors, it appears white and free from pain and inflammation, and is moſt relieved by a gargle of ſpirit of wine and water warm, or a decoction of red roſes, or the like aſtringent ſubſtances with ſpirit of wine, or ſpirit of ſal armoniac added in ſmall quantities to them.

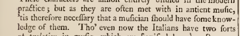
A powder of ginger, pepper, and pomegranate peel, may alſo be applied; but when all theſe methods prove ineffectual, the only remaining one is, to take off as much of the *uvula* as is neceſſary, either by ligature or by the ſciſſars. This latter is much the eaſier and better way; and the great caution neceſſary in it is, neither to take off too much nor too little of the *uvula*. For if too much be taken off, the patient's voice will be the worſe for it afterwards; and if too little, he will be very little the better for the operation.

This is a very common diſorder among the peaſants in Norway, and they have invented a machine with a hole in it, to let thro' a proper portion of the *uvula* when the whole is thruſt into the mouth, and a ſpring knife, which cuts off juſt as much as is let thro'. The ſurgeons have copied and improved on this invention. *Heiſter*'s Surg. p. 470.

PROLATION, *(Cycl.)* in muſic. The ſigns by which the modern antients uſed to ſignify a *prolation* to be made on any note, was a point in a circle or ſemi-circle, thus, ⊙, Є. This point was the length of a ſemi-breve and minim.

Prolation was either *perfect* or *imperfect*. *Perfect prolation* was marked after the cleff as above, and then the ſemi-breve contained three minims, for which reaſon they placed the figure 3, or $\frac{3}{2}$, or $\frac{3}{1}$, after the circle, to ſignify that three ſuch notes were required to a bar. See example A.

Imperfect prolation was marked with the ſame characters, but without points, and then the ſemi-breve contained but two minims. See example B.



A B

Theſe characters are almoſt entirely diſuſed in the modern practice; but as they are often met with in antient muſic, 'tis therefore neceſſary that a muſician ſhould have ſome knowledge of them. Tho' even now the Italians have two ſorts of *prolation* in muſic, which are ſignified by characters reſembling thoſe above deſcribed in the example A. The firſt they call *prolatione maggiore perfetta*, and it is marked thus, ⊙ and $\frac{3}{2}$. The ſecond they call *prolatione minore perfetta*, the characters of which are, Є, or $\frac{3}{1}$, or $\frac{3}{2}$, but oftener C and $\frac{3}{2}$; but in both caſes the ſemi-breve contains a whole bar, and its pauſe the ſame; the minim one third of the bar, and its pauſe the ſame; and ſo of the reſt in proportion.

Prolation is alſo uſed for a ſeries of ſeveral ſounds or notes on the ſame ſyllable or vowel.

PROLECTATIO, a word uſed in chemiſtry to expreſs an extraction of the finer ſubſtances of a mixed body by the attenuation of the ſubtler particles; ſo that theſe being rarefied, ſeparate ſpontaneouſly from the reſt, and leave the groſſer and leſs valuable part in form of a reſiduum behind.

PROLEPTICOS, an epithet uſed by the antients to expreſs a fever the fits or exacerbations of which were apt to return before their regular time.

PROLOGIA, Προλογια, in antiquity, a feſtival celebrated by the inhabitants of Laconia, before they gathered their fruits. *Potter*, Archæol Græc. T. 1. p. 427.

PROMACHIA, Προμαχια, in antiquity, a feſtival in which the Lacedæmonians crowned themſelves with reeds. *Potter*, Archæol. T. 1. p. 427.

PROMALACTERION, the name of the firſt apartment in the hot baths of the antients; this was a hot and cloſe room, in which the perſon was kept a while before he plunged at once into the warm water.

PROMETHEIA, Προμηθεια, in antiquity, an Athenian ſolemnity celebrated in honour of Prometheus, with torch-races, in remembrance that he was the firſt that taught men the uſe of fire. *Potter*, Archæol. Græc. T. 1. p. 427.

PROMYTHION, Προμυθιον, in rhetoric. See FABLE, *Cycl.*

PRONATOR *(Cycl.)*—PRONATOR *quadratus, ſive tranſverſus*, a ſmall fleſhy muſcle nearly as broad as it is long, lying tranſverſely on the inſide of the lower extremity of the fore arm

It is fixed by one ſide or edge in the long eminence, at the lower part of the internal angle of the ulna, and by the other in the broad concave ſide of the lower extremity of the radius. It is wholly fleſhy, without any mixture of tendinous fibres. It is ſituated tranſverſely; but that extremity which lies on the radius is nearer the carpus than that on the ulna. It is of a moderate thickneſs; the fibres neareſt the ſurface are longeſt, the reſt decreaſing in proportion as they lie nearer the interval between the two bones, and the interoſſeous ligament. It has a ligamentary or tendinous frænum belonging to it, one end of which is fixed in the interoſſeous ligament, the other in the inner edge of the baſis of the radius. *Winſlow*'s Anatomy, p. 190.

PRONATOR *teres ſive obliquus*, a ſmall muſcle broader than it is thick, ſituated on the upper part of the ulna, oppoſite to the ſupinator brevis, with which it forms an angle like the letter V.

It is fixed to the internal condyle of the os humeri, partly by fleſhy fibres, and partly by a tendon common to it with the ulnaris internus; from thence it paſſes obliquely before the extremity of the tendon of the brachiæus, and reaches to the middle part of the convex ſide of the radius; where it becomes flat, and is inſerted below the ſupinator brevis, by an extremity almoſt wholly fleſhy.

It is called *teres*, to diſtinguiſh it from the quadratus; but the name of *pronator ſuperior* is much more proper; but that of *pronator obliquus* is certainly propereſt of all. *Winſlow*'s Anatomy, p. 190.

PRONG-*hoe*, in huſbandry, a term uſed to expreſs an inſtrument uſed to *hoe* or break the ground near, and among the roots of plants.

The ordinary contrivance of the *hoe* in England is very bad, it being only made for ſcraping on the ſurface; but the great uſe of *hoeing* being to break and open the ground, beſide the killing the weeds, which the antients, and many among us have thought the only uſe of the *hoe*, this dull and blunt inſtrument is by no means calculated for the purpoſes it is to ſerve.

The *prong-hoe* conſiſts of two hooked points of ſix or ſeven inches long, and when ſtruck into the ground will ſtir and remove it the ſame depth as the plough does, and thus anſwer both the ends of cutting up the weeds and opening the land. The antient Romans had an inſtrument of this kind, which they called the *bidens*; but they were afraid of its uſe in their fields and gardens, and only uſed it in their vineyards. The *prong-hoe* comes into excellent uſe even in the horſehoing huſbandry; in this the *hoe*-plough can only come within three or four inches of the rows of the corn, turneps and the like; but this inſtrument may be uſed afterwards, and with it the land may be raiſed and ſtirred, even to the very ſtalk of the plant *Tull*'s Huſbandry

PRONOMÆA, a word uſed by ſome naturaliſts to expreſs what is uſually called the trunk, or proboſcis in inſects; an inſtrument ſomewhat reſembling the trunk of an elephant, which moſt of thoſe ſmall animals are provided with for the extracting the juices of plants, &c deſtined for their food.

PRONTIA *lapis*, a name given by the writers of the middle ages to a foſſile of which they relate ſeveral extraordinary things; but their reſembling it to the head of a tortoiſe, and giving it the virtue of preſerving people from injuries by lightning, ſeem to make it plain that the word is only a corrupt ſpelling of the *brontia* of the antients, of which Pliny has related the ſame things.

This was a ſpecies of echinites, ſuppoſed to fall from the clouds in thunder ſtorms. See BRONTIA.

PROOF *(Cycl.)*—PROOF, in the ſugar trade, a term uſed by the refiners of ſugar for the proper ſtate of the diſſolved ſugar when it ſhould be ſet to harden

The proceſs in the bringing ſugar to this ſtate may be underſtood by performing the whole work in little in this manner: Take ſix pounds of coarſe, or unrefined ſugar, diſſolve it over the fire in ſix pints of lime water; add to this the whites of four eggs beat up to a froth, ſtir the whole together; then boil the liquor to a higher conſiſtence than a ſyrup, or till, when expoſed to the cold it will concrete into grains. This is what the ſugar-bakers call *proof*. Pour this ſyrup into an earthen mould, with a hole at its bottom, ſtop the hole and ſet the veſſel in a moderately warm place.

The ſugar in a few days will ſet and harden, then open the hole at the bottom, and lay over the top of the ſugar ſome tobacco-pipe clay, made into a ſoft pap with water. The clay muſt be afterwards weted at times, and the water from among it will gradually be ſoaked up by the ſugar, and running thro' it will waſh away the treacle, without diſſolving the grained part. And thus all the treacle will by degrees be drained out of the maſs, and a loaf of white ſugar procured. *Shaw*'s Lectures, p. 149.

PROOF *ſpirits*, among diſtillers. See SPIRITS.

PROPAGATION *(Cycl.)* — PROPAGATION *of plants*. The number of vegetables that may be *propagated* from an individual, is very remarkable, eſpecially in the moſt minute plants.

It has been recorded, that in ſo large a plant as the common mallow, the annual product of one ſeed was no leſs than 200,000; but it has been ſince proved, by a ſtrict examination into the more minute parts of the vegetable world, that ſo deſpiſed a plant as the common wall maſs produces a much more numerous offspring. In one of the little heads of this plant

plant there have been counted 13824 seeds. Now alloting to a root of this plant eight branches, and to each branch six heads, which appears to be a very moderate computation, the produce of one seed is $6\times13824=82944$; and 8×82944, gives 663552 seeds, as the annual produce of one seed, and that so small that 13824 of them are contained in a capsule, whose length is but one ninth of an inch; its diameter but one twenty third of an inch, and its weight but the thirteenth part of a grain. Phil. Trans. N°. 478. sect. 12.

PROPEMPTICON, Προπεμπτικον, in poetry, a poem wherein are expressed ardent wishes and solemn vows for the safety of a person going upon a journey or voyage. Such is that of Horace, L. 1. Od. 3. addressed to Virgil on his setting out for Athens. It was otherwise called *apopempticon*. *Hofm.* Lex Univ. in voc. See APOPEMPTIC, *Cycl.*

The word is derived from προπεμπω, I send forward, or accompany on the way.

PROPHECY *(Cycl.)*—The *prophecies* in the Old Testament, particularly those relating to the Messiah, are allowed by all Christians to have been accomplished in Jesus Christ; but the dispute is, as to the sense or manner wherein they have received their accomplishment.

Opposite systems have been framed on this head; Grotius, Vitringa, Le Clerc, Whiston, Collins, Chandler, &c. Some hold the *prophecies* to have been accomplished in one sense, some in another, and some in both. Mr. Whiston's opinion is mentioned in the Cyclopædia.

A modern learned advocate for Christianity shews, that it was the custom of Jewish writers to say a thing was accomplished when they only made allusions to it, more or less remote; that however there are some formal *prophecies* which literally relate only to the Messiah; other typical *prophecies* which are also to be applied in a literal sense to the Messiah; and that others are only cited as accomplished allegorically, by way of *argumentum ad hominem*, to the Jews only who admitted this way of reasoning *Chandler*'s Defence of Christian. passim. Bibl. Angl. T. 12. p. 458, seq.

Grotius's method is to look for a literal accomplishment in the Jewish affairs about the time when the prophets wrote; or in the affairs of the neighbouring nations with whom they had wars. This method, disapproved by Vitringa and many others, is defended by Le Clerc, Masson, L'Enfant, &c. who even carry it further, so as to maintain that there is no *prophecy* in the Old Testament which has not had a literal accomplishment, and that if there be any wherein this is not known, 'tis thro' the defect of history. Vid. Hist. Crit. Rep. Lett. T. 6. Art. 2. p. 43, seq.

Grotius allows that the *prophecies* applied to the Messiah in the New Testament, tho' they had a literal accomplishment before, had another more sublime and peculiar accomplishment in Christ. This appears from his notes on Matthew and Isaiah, where he says expressly, that what he interprets literally of Jeremiah, agrees in a more sublime manner, and even more literally to Jesus Christ. See also his notes on Psalm XXII. 1. and his Treat. de Veritat. Relig. Christ. l. 5. c. 14. §. 17.

This opinion touching the double sense of *prophecies* is not new. The greatest allegorists, even those among the Jews who make use of this manner of interpreting, have allowed a double sense, as is shewn by Surenhusius; nor does Vitringa himself reject it. In lib. Conciliat. Vid. Bibl. Choif. T. 25. p. 411.

The dispute then between Grotius and his adversaries, is not whether there are two senses in the *prophecies*, but whether several *prophecies* of the Old Testament, which relate to Christ, had a literal, less sublime, and less perfect accomplishment before they were accomplished in Christ. The affirmative is maintained by him, the negative by them. Vid. Le Clerc. Bibl. Choif. T. 27. p. 391, seq.

As to the accomplishment of particular *prophecies*, we find endless disputes among critics and interpreters, concerning those of the conception of a virgin, the seed of a woman, the sceptre's departure from Juda, the root of Jesse, out of Egypt have I called my son, he shall be called a Nazarine, Daniel's seventy weeks, the Babylonish captivity, the dispersion and restoration of the Jews. Matth. xxii. 23. *Surenhus.* Liber Conciliat. Bibl. Choif. T. 25. p. 414. *Jaquelot* Diss. sur le Messie. Ouv. des Scav. Dec. An. 1698. p. 538. *Marshal* Tabul. Chron. Jour des Scav. T. 56. p. 325. *Saurin.* Diss. 41. Obs. Halens. T. 11. Obs. 12. §. 7. p. 304. *Whitby*, Comment. ad loc. Works of the learned, T. 5. p. 232. Hof c. 11. v. 1. *Olear.* Obs. Sacr. Bibl. Univ. T. 2. p. 342. Mem. de Trev. An. 1719. p. 1243. Matth. c. 2. v. 23. *Olear.* ubi supra, p. 343. *Wits.* Melet. Leidens. Mem de Trev. An. 1711. p. 1895. Ayrol. Liber LXX. Hebdom. resign. Giorn. de Letter, d'Ital. T. 19. p. 309. *L'Enfant*, Reflex. sur Disput. du Martianay. Nouv. Rep. Lett. T. 47. p. 492. *Limborch* de Verit. Relig. Christ. Bibl. Univ. T. 7. p. 304. *Menass. Ben. Israel.* Hope of Israel, Sect. 29. p. 36.

Few modern events of any considerable note, but one interpreter or other finds to be the accomplishment of some Scripture *prophecy*. The late war and death of the king of France, and numerous others are pretended to be found in Holy Writ.

The visions in the Old and New Testament, have been more tortured for accomplishments than the *prophecies* themselves. Such is the case of Ezechiel's temple, the temporal reign of Christ on earth, the destruction of antichrist, the loosening the great dragon, the opening of the seals, and many others. *L'Enfant* and *Beausobre* Vers. du Nouv. Test. Jour des Scav. T. 65. (Ed. Amst.) p. 350. *Vitring. Anacris.* Apocalyps. Jour. Liter. T. 10. P. 2. p. 474. *Meyer.* Diss. Theol. de Prophet Vision. Ezek. Jour. des Scav. T. 40. p. 3, seq. Nouv. Rep. Lett. T. 42. p. 269. *Wits.* Exerc. Acad Ouv. des Scav An. 1695. p. 17. *Whist.* Vind. Apost. Constit. p. 45. on Revelat Nouv. Rep Lett. T. 39. p. 586. Ouv. des Scav. Marf. 1689. p. 27. *Harmonie & accomplissement des propheties sur la durée de l'Anti Christ & les souffrances de l'Eglise*, p. 5. *avec un journal pour l'accomplissement de ces propheties pour let quatre derniers mois de l'année* 1687, *& les deux premiers de l'année* 1688. 12°. Amst. An. 1688. Bibl. Univ. T. 9. p. 354, seq. *Usher* de Christ. Eccles. Contin. Success. Bibl. Univ. T. 9. p. 13. *Harmonie & accomplissement*, ubi supra, p. 356, seq. *L'Enfant* and *Beausobre.* l c.

PROPOLIS, *(Cycl.)* a name given by authors to a certain substance more glutinous and tenacious than wax, with which the bees stop up all the holes or cracks in the sides of their hives. Beside the wax and the honey which the bees gather in their daily travels, they have occasion for this third substance at times, and that especially when they are placed in a new hive

They very well know that it is necessary to their well being, that they should be kept perfectly warm in their hives, and strongly defended against the injuries of weather: to keep out wind and rain they stop every little chink in the sides of their habitations with this matter; nor is this the only reason for it, they have other enemies of the insect tribe, which are on different occasions eternally seeking a way into their habitations; some of them feed on their honey, others on the wax, and others on their young offspring. To be guarded against these, they as firmly as possible block up all the accidental holes or cracks in the hive, and guard the principal opening, which serves as the gate of their city, by numbers which are always placed round about it, so that no enemy can come in that way. *Reaumur*'s Hist. of Insects, V. 10. p. 76.

These wary animals not only stop up in this manner all the cracks they can find, but even examine all the weak places of the hive, and will eat away a rotten or too weak part, and make up the deficiency with this *propolis*. This was elegantly seen in the case of some of Mr. Reaumur's glass hives, which were framed of wood, and had squares of glass in the proper places: these squares of glass were fastened in with slips of pasted paper. The bees finding this a much weaker part of the hive than any other, and capable of being eaten thro' by their enemies, soon gnawed to pieces all the paper and paste, and covered those parts with the *propolis* in the place of that matter.

It might seem that the bees might use wax on this occasion; but this would be no defence against those of their enemies, which devour and feed on wax; and nature has guarded them against these, by supplying them with a matter which spreads more easily, is of greater tenacity, and fixes itself much more strongly in the small crevices than wax could do It has been known from the earliest times, that the bees made use of this substance; Pliny mentions it, and tells us, that the authors of his time distinguished three kinds of it, the first they called *metys*, the second *pissoceron*, and the third *propolis*. The last of these names is only retained among the later writers, and seems to have stood with the antients for the pure substance, the other kinds differing from it only as they were more or less mixed with wax.

The *propolis* itself is a substance perfectly different from wax; it is found to be soluble in spirit of wine, or in oil of turpentine; and is soft when laid on by the bees, but grows hard afterwards; it may, however, even in its hardest state, be softened by heat. By all these observations it appears very plainly, that the *propolis* is a true genuine vegetable resin, of the nature of many others which we have in common use.

The authors who have treated of this substance, have described it very differently; George Pictorius, who has written of bees, says, that it is of a yellow colour and an agreeable smell, like that of storax, and that it would spread when warmed properly. Pliny and the old authors describe it as being of a rank and strong smell, and being used as a succedaneum for galbanum; and at present we usually find it of an aromatic and agreeable smell, insomuch that some rank it among the perfumes. The apothecaries, in some places, keep it as a medicine in their shops; but it is to be observed, that it is very various in its nature; for according to the descriptions of authors, it is sometimes sweet and sometimes stinking. The truth is, that the bees who collect it as a thing to be used for a cement, not for food, are not over curious of what plants they gather it from; and hence in different hives it is found of very different colours and consistences.

In general, the *propolis* is of a brownish red colour on the surface; the red sometimes predominating, sometimes the brown; but when broken it is yellowish, or approaching to the

the colour of wax. It very readily diffolves in fpirit of wine or oil of turpentine, and this folution is of a fine gold colour, and will ferve extremely well as a varnifh to colour filvered picture-frames, or other the like work, into the appearance of gold. It gives a fine gold-like appearance, indeed, to any white metal of a polifhed furface; all that it wants is a little more brilliancy, which is eafily given it by mixing a fmall quantity of maftich, or of fandarach in the folution. *Reaumur's* Hift. Inf. Vol. X. p. 77.

The bees having much lefs frequent occafion for this fubftance than for wax, are very feldom to be met loaded with it; they never bring any of it home, except when they are eftablifhed in a new hive, or when there happens fome crack or flaw in an old one. The morning is the time of their gathering the matter of which they make their wax; but the evening is the time of their going out for the *propolis*. When there is occafion for this fubftance in the hive, the bees will be found to return loaded with it in lumps placed upon the third joint of their hinder legs, in the very fame manner in which they carry their wax. It differs greatly from the rough wax which they carry, as that is made up of fmall round or oval granules; and this is one uniform fubftance of the nature of a foft refin or gum. This fubftance is not to be eaten firft, in the manner of the rough wax, in order to its being rendered fit for ufe; but is of immediate readinefs for fervice. It is one of the moft troublefome offices of the bees, to bring it home and apply it to the places where it is wanted. It is fo tough and vifcous, that it muft be with infinite difficulty that the poor bee gets it upon her leg; but the getting it off again, is a tafk left to others. As foon as one of the fwarm enters the hive loaded with this, feveral others immediately gather about her, and bite out pieces of a very minute fize from the lumps fhe is loaded with. This is a work of great trouble and difficulty for them; for their teeth are fo faftened in by the tenacity of the matter, that it is with the utmoft labour that they get off the little portion they have thus feized upon. This piece draws out, in the pulling it away, into a long thread, as any of the foft gum-refins would do. Often the matter is fo tenacious, that the bee which feizes on it, in order to feparate a piece, is not able to do it; but remains hung faft by the teeth to the leg of the other. Often two bees are at work at a time, one at the lump of *propolis* attached to each leg of the bee that brought it in: as foon as they have any of them diflodged a piece, tho' ever fo fmall, they immediately fly with it to fome place where there is a crack to be ftopped, and the moment thefe are gone, others fupply their place at the lumps; fo that both legs of the bee who brought in the load are very foon perfectly cleared of it, when the whole is employed to the proper purpofe. The great trouble of working and feparating this matter, and the fmall quantity that one bee is able to bring at a time, might feem to prove, that it would be an endlefs work to ftop the large holes fometimes found in the hives with it: but the great number of bees employed in this work at the fame time, are what makes it go off tolerably well, tho' each has unqueftionably a very hard tafk to perform in it.

It is the general opinion of thofe who have ftudied bees, that the willow and the poplar are the trees which principally furnifh them with this refin, which, when it has paffed through their management, we call *propolis*. It is very certain, however, that thefe are not the only trees which afford it, fince the bees are not found to want this neceffary material for their work, in places where there are no trees of that kind in the neighbourhood of the hives. *Reaumur's* Hift. Inf. Vol. X. p. 80.

Mr. Reaumur was very defirous of feeing the manner in which the bees collected this tenacious matter; but watched them in vain in the fields and upon the trees: although an accident gave him an opportunity of obferving them at their work on this occafion. He had taken off the cover of one of his glafs hives on fome occafion, and as there was much of the *propolis* fticking to its edges, which the bees had ufed to ftop the crevices when it was fixed in, the bees of a neighbouring hive foon found that here was this fubftance ready for them in large quantities together, and that they could have it at a very eafy rate: they therefore immediately detached a party to bring it off; and in confequence of this, it was eafy to obferve any one of them, during the whole courfe of his work. The manner of feparating it from the fubftance it lay upon, was by detaching very fmall pieces at a time with the teeth; thefe, when they had been with great labour loofened from the reft, were delivered to the foot of one of the fore-legs: they were here moulded into a roundifh lump, and, after a little working, delivered to the foot of a fecond leg; and finally, by this to the flat triangular piece which makes the third joint of the hinder legs, the part deftined in their common labours to receive the lumps of rough wax. It is here preffed down with fome violence, and afterwards fixed in its place by three or four ftrokes from the fame foot; and then another is feparated by the teeth in the fame manner, and by the fame means carried to the fame place, and added to the firft piece; and fo on till the whole work is finifhed. The bees which found this treafure loaded themfelves to an immenfe degree, carrying of a lump larger than a pea on each leg, and the time to take up thefe large parcels was at leaft half an hour: after carrying this load to the hive, and being relieved from it by the joint labours of feveral others, the bee which has been at all the pains of collecting it, joins a clufter of others in fome quiet part of the hive, where it refts for the remainder of that day.

The *propolis* is not only ufed by thefe animals for ftopping up holes and cracks in the fides of their hives; they often cover with it the furface of thofe crofs pieces which fupport the combs, and when they can find it in fufficient plenty, they cover over the whole inner furface of the hive with it, to defend it from the entrance of enemies of any kind which might eat their way through the fhell of the hive. The antients who obferved this lining of the hives, fuppofed that the bees ufed the *propolis* to faften their combs to the hive; but later obfervation has proved this to be an erroneous opinion, the combs being always faftened with lumps of wax only.

Befides the ufes of the *propolis* already mentioned, there is another very fingular one, which muft by no means be paffed over in filence: this is the embalming and preferving, by means of it, certain bodies which they know not to difpofe of otherwife. Notwithftanding the care that the bees take to guard the entrances of their hives, enemies of one kind or other will often get in: thefe ufually fare very ill; for the bees fting is a weapon very capable of punifhing fuch an intrufion, and the fwarm is fo numerous, that it is not eafy for the intruder to efcape repeated wounds. When a creature of fmall fize has thus entered, and thus been killed for it, the bees with great care and pains carry him out; for they will bear no fort of foulnefs in the hive. It fometimes happens, however, that an unlucky fnail, particularly of the large naked kind, crawls into the hive; in this cafe he never ceafes crawling over the combs fo long as he lives. It is no wonder that fo cleanly creatures as the bees are highly enraged at this nafty vifiter: they foon furround and kill him with their ftings; but then as he is a load too heavy to allow a poffibility of their carrying him out, they prevent the mifchiefs attending the ftinking of the carcafe, by covering it over with a thick coat of this *propolis*, which perfectly well preferves it from putrefaction. *Reaumur's* Hift. Inf. Vol. X. p. 84.

The common garden fnail, with the fhell, fometimes alfo vifit thefe induftrious and cleanly animals, and this creature they fecure in a different manner, and that at the expence of only a very fmall quantity of the *propolis*: but Reaumur had an opportunity of obferving their method of deftroying this enemy in a very accurate and eafy manner, in one of his glafs hives. The fnail had entered the hive early in the morning, and after crawling about for fome time, had fixed itfelf to one of the glafs fquares by the fame glutinous matter by means of which it is frequently found fixed to old walls and trees; when the bees found their enemy thus fixed, they furrounded him, and in a few minutes formed a border of *propolis* round the verge of the mouth of the fhell: this they continually added more and more to, till they had formed fo thick a coat round it, that the fnail could never move from the place again.

The fnail is eafily able to loofen the faftening which it gives itfelf to any place, becaufe this is done by means of a gum, which water will diffolve; therefore the firft fhower of rain, or the moifture which the animal is able to fecrete from its own body, releafes it in this cafe; but the faftening which the bees ufe to fix the fhell to the glafs being a refin, this remains untouched by water, and muft keep the animal fixed in its place till death, and even long afterwards.

It feems probable, that the bees are not over curious in the choice of the matter of the *propolis*; but that many vegetable refins indifferently ferve for this purpofe: it has been tried, however, whether they would ufe common turpentine, and fome other of the refins in ufe among us, by laying them before their hives; but without fuccefs. This is an experiment, however, that requires frequent repetition; fince there are many feafons at which the bee has no occafion for this matter. *Reaumur's* Hift. Inf. Vol. X. p. 80.

PROPOMA, a name given by the antients to a potion prepared of honey and wine boiled together: the proportions were four parts of wine to one of honey.

PROPTOSIS, in furgery, a name by which fome authors have called that diftemperature of the eye commonly called a *prolapfus oculi*. *Heifter's* Surg. p. 427. See PROLAPSUS *oculi*.

PROSCHÆRETERIA, Προσχαιρητήρια, in antiquity, a day of rejoicing, kept when a new-married wife went to cohabit with her hufband. *Potter*, Archæol. Grec. T. I. p 427.

PROSCLYSMA, a word ufed to exprefs an irroration, or fprinkling of any part with a fluid, as the throwing water in the face in cafes of fainting, &c.

PROSECUTION. To make men liable to criminal *profecutions* by the law of England, it is required that they have the ufe of reafon, and that they be *fui juris*. On the firft account the law indulges infants under the age of difcretion, ideots, and lunatics, whatever the nature of the fact may be; and even againft the perfon of the king, as it has been held of late: neither will it fuffer one who becomes *non compos*, after he has committed a capital offence, to be either arraigned or executed. See LUNATIC and INFANT, *Cycl.*

As to an offender's being *sui juris*, it is to be obferved, that neither a fon, nor a fervant, nor any other perfon, except a feme covert, is excufed on the account of acting by command or coercion of another. *Hawk.* P. C. B. 1. c. 1. See the article FEME *covert*.

PROSERPINA, in botany, a name given by fome authors to chamemile *Ger.* Emac. Ind. 2.

PROSEUCHE, in antiquity, properly fignifies prayer; but it is taken for the places of prayer of the Jews, and was pretty near the fame as their fynagogues. But the fynagogues were originally in the cities, and were covered places; whereas, for the moft part, the *profeuches* were out of the cities, and upon the banks of rivers, having no covering, except, perhaps, the fhade of fome trees, or fome covered galleries. *Calmet.* Diction. Bibl.

The word is Greek, Προσευχη petitio, precatio, oratio. Vid *Hederic* Lex. Man. Græc. in voc. Juv. Sat. 3 v. 296. In qua te quæro *profeuchâ*.

PROSLAMBANOMENOS, in the antient Greek mufic, was the firft note of their fcale, whether afcending or defcending. Phil. Tranf. N°. 481. p. 269.

It was ufual among the Greeks to confider a defcending as well as an afcending fcale; the former proceeding from acute to grave precifely by the fame intervals as the latter did from grave to acute. The not diftinguifhing thefe two fcales has led feveral learned moderns to fuppofe, that the Greeks, in fome centuries took the *proflambanomenos* to be the loweft note in their fyftem; and in other centuries to be the higheft. But the truth of the matter is, that the *proflambanomenos* was the loweft or higheft note, according as they confidered the afcending or defcending fcale [a]. The learned author of this remark [b], thinks this diftinction of the afcending or defcending fcales conducive to the variety and perfection of melody; but he fays, he never met with above one piece of mufic, where the compofer appeared to have any intelligence of that kind: and this piece was above 150 years old. [[a] Phil. Tranf. ibid. [b] Dr. *Pepufh*, ibid.]

The *proflambanomenos* was one of thofe founds which the antients called *ftabiles*, from their remaining fixed throughout all the genera and fpecies. Phil. Tranf. N°. 481. p. 270.

PROSODIA, Προσωδία, in antiquity, a facred fong, or hymn, fung in honour of the gods. It differed from the *profodia* with an omega, προσωδία, which was a fong fung in concert with fome mufical inftrument. Mem. Acad. Infcript. Vol. 14. p. 352.

PROSTATES, Προστάτες, among the Athenians, was ufed to fignify any patron to whofe protection fojourners in that city committed themfelves.

He was allowed to demand feveral fervices of them, in which, if they failed, or neglected to choofe a patron, an action was commenced againft them before the polemarchus, and their goods were confifcated. *Potter*, Archæol. Græc. l. 1. c. 10. T. 1. p. 56. See SOJOURNERS.

PROSTYPA, Πρόστυπα, in the fculpture of the antients, images carved in fuch a manner as to be only half raifed above the ground, or plain, on which they were formed.

They feem to adhere to it, and have only one fide expofed to view. To *proftypæ* is oppofed *ectypa*. *Hoffm.* Lex. in voc. See ECTYPA.

PROTEA, in the Linnæan fyftem of botany, a genus of plants which takes in the lepidocarpodendron, and the hypophyllocarpodendron of Boerhaave.

The characters of this are, that the calyx is a common perianthium, containing feveral flowers; it is made up of feveral little leaves laid in a loofe manner over one another, and the inner ones very long, expanded, coloured, and remaining when the flowers are fallen. The flower is monopetalous, or made of one leaf, in form of a fimple tube, divided at its fummit into four fegments, each as long as the tubular part, and all ftrait, obtufe, and bent backward. The ftamina are four extremely fhort filaments, inferted on the fegments of the flower, near its fummit; the antheræ are laid clofely on thefe. The germen of the piftil is below the proper receptacle of the flower. The ftyle is flender and very long, and the ftigma fimple. The fruit is one common large receptacle, which is flat and divided by hairy fcales. The feeds are fingle. *Linnæi* Gen. Plant. p 22.

PROTELARII, among the Romans, were the poorer fort of citizens, whofe eftate did not exceed fifteen hundred pieces of filver. They were diftinguifhed from thofe who were worth little or nothing; thefe laft being called *capite cenfi*. *Pitifc.* in voc. See CAPITE *cenfi*.

PROTHESIS, Πρόθεσις, among the Greeks, the ceremony of laying the dead near the door till the time of their interment, with their feet outwards; on which account the Romans called them *pofiti*. *Hofm.* Lex. in voc. See POSITI.

The word is derived from προτίθημι, *I expofe to view*.

PROTIPULA, in natural hiftory, a name given to a fpecies of fly refembling the tipula, or long-legs, in many refpects; but differing in regard to the effential character, which, in the tipula, is the having two beards growing on the anterior part of the head, and occafionally falling over the mouth, and clofing its aperture; thefe the *protipula* wants. See the article TIPULA.

PROTOGALA, the term ufed by the antients for what we call *beeftings*, the firft milk of a cow or other animal after her having brought forth young.

PROTOMEDIA, in botany, a name given by fome authors to the pimpinella or burnet. *Ger.* Emac. Ind. 2.

PROTOPASCHITÆ, Πρωτοπασχῖται, in church hiftory, Heretics, who after the manner of the Jews, celebrated the feaft of Eafter with unleavened bread. They were likewife called *Sabatiani*. *Hoffm.* Lex. univ. in voc. See SABATIANI.

PROTRUSORIS *ordo exterior*, in anatomy, a name given by Santorini to certain fafciculi of the great zygomatic mufcle, running under the flefhy part of the lower lip. See the articles ZYGOMATICUS *major*, and LABIORUM *attollens*.

PROTRUSORIS *interior ordo*, in anatomy, a name given by Santorini to a mufcle of the face, called by Albinus *orbicularis oris*; and by Cowper and Douglafs *conftrictor labiorum* and *fphincter labiorum*.

PROTRYGIA, Προτρύγια, in antiquity, a feftival in honour of Neptune, and of Bacchus, furnamed Προτρύγης, or Προτρύγαιος, ἀπὸ τῆς τρυγός, *i. e.* from new wine. *Potter*, Archæol. Græc. l 2. c 20. T. 1. p. 427.

PROVER, (*Cycl*) among jewellers, an inftrument by which they examine the fize and depth of diamonds It is a fpring in fhape not unlike a pair of caliber compaffes, kept at the proper diftance by means of a fpring. *Jeffreys* on diamonds, p. 18, and plate 6.

PROX, in natural hiftory, a name given by Ariftotle to the *cervus platyceros*, or broad-horned ftag The modern Greeks have called it *platonia*, and the interpreters of the oldeft writers have rendered the word by *dama*; but this we are to underftand as meant of the dama of our times, for the dama of the antients was our ifarus, or farius, a kind of goat, whofe fkin affords us the true chamoy leather. This has no title to the name platonia, or the platyceros; nor is the creature that Ariftotle defcribes under the name *prox*, nor of the ftag kind, as that certainly was.

PRUNELLA, or BRUNELLA, in botany, the name of a genus of plants, the characters of which are thefe: the flowers confift of one leaf, which is of the labiated kind. The upper lip is galeated, and the lower is divided into three fegments, the middle one being hollowed like a fpoon. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and furrounded by four embryos, which afterwards become four feeds, ripening in an open capfule which was the cup of the flower.

To thefe characters it may be added, that the ftamina have not that refemblance of the os hyoides that thofe of fage, clary, and the reft have; and that the flowers are always arranged in clofe fpikes. See Tab. 1. of Botany, Clafs 4.

The fpecies of *prunella*, enumerated by Mr. Tournefort, are thefe: 1. The broad-leaved Italian *brunella*, with flefh-coloured flowers. 2. The common blue-flowered *brunella*, with undivided leaves. 3. The common *brunella*, with undivided leaves and purple flowers. 4. The common *brunella*, with undivided leaves and white flowers. 5. The great flowered *brunella*, with blue flowers. 6 The great flowered *brunella*, with flefh coloured flowers. 7. The great flowered *brunella*, with white flowers. 8. The greateft Pyrenean *brunella*, with very large flowers. 9 The Portugal *prunella*, with a larger flower and fpike. 10. The narrow-leaved, or hyffop-leaved *brunella*. 11. The *brunello* with diffected leaves. 12. The cut-leaved *brunella*, with white flowers. 13. The leaft white-flowered cut-leaved *brunella*. 14. The cut-leaved *brunella*, with rofe-coloured flowers. *Tourn.* Inft. p. 182.

PRUNUS, the *plum*, in botany, the name of a genus of plants, the characters of which are thefe: the flower is of the rofaceous kind, being compofed of feveral petals, arranged in a circular form. From the cup of the flower there arifes a piftil, which finally becomes a fruit of a roundifh or oval figure. This is foft and flefhy, and includes a ftone pointed at each end, within which is the kernel. *Tourn.* Inft. p. 622.

The fpecies of *plum* enumerated by Mr. Tournefort, are thefe: 1. The double-flowered *plum* tree. 2. The *plum* with large, fweet, bluifh black fruit. 3. The *plum* with fmall fweet, bluifh black fruit. 4. The *plum* with large flefhy and fowerifh fruit. 5. The *plum* with oblong blue fruit. 6. The *plum* with hard black fruit. 7. The *plum* with very large bluifh-red, fweet, and fugar-like fruit. 8. The *plum* with the large, bluifh red, late ripening fruit, called by the French the *imperatrice*. 9. The *plum* with large, oval, red fruit, called the *red imperial plum*. 10. The *plum* with a large, oval, yellow fruit, called fimply the *imperial plum* 11. The *plum* with a very large, oval, yellow fruit. 12. The wax-coloured *plum*. 13. The *plum* with large, round, red fruit. 14. The *plum* with a large, round, yellow, fweet-tafted fruit. 15. The almond *plum*. 16. The *plum* with oblong, white, acid fruit 17. The fweet-tafted Brignole *plum*. 18. The *plum* with a remarkably red and fweet fruit. 19 The *plum* with large, round, blackifh, and very fweet fruit. 20. The *plum* with fmall, round, blackifh, and very fweet fruit 21. The *plum* with a fmall auftere fruit. 22. The *plum* with fmall and early ripe fruit. 23. The *plum* with fmall, yellowifh green fruit. 24. The common wild *plum*. 25. The tall,

early ripe, wild *plum*. 26. The wild *plum*, with large white fruit. 27. The wild *plum*, with red, harsh, and unpleasant fruit, called in England the *hedge-plum*, or *horse-plum*. *Tourn.* Inst. p. 612. See PLUM.

PRUSSIAN *blue*. In a paper of Dr. Woodward's, communicated to the royal society from another hand, there is given a short way of making the *Prussian blue*, which when tried over again by Mr. Brown the chemist, was found to answer perfectly well; and gave hints and occasions to several experiments which gave great light into the true nature of the bodies used in that preparation.

The method was this: four ounces of blood dried, and four ounces of salt of tartar were calcined together; two hours after which, a black spungy substance remained in the crucible, weighing four ounces; a solution of which being made in rain water, and afterwards filtered, left a remainder which when dried weighed nine drachms. An ounce of English vitriol was dissolved in six ounces of rain water, and eight ounces of crude alum in two quarts of water. These being mixed hot with the blood, became green; and on adding two or three ounces of spirit of salt, they became of a fine blue, which will subside, and leave the water clear at top. Mr. Brown found the process exactly answer, and the product was an ounce of a very fine colour, and perfectly fit for the painter's use.

Among the several experiments which were made by mixing, in different manners and proportions, the several liquors of which this colour was to be prepared, all produced a blue; but that in different degrees, some being deeper, and others much paler. In one experiment the alum was wholly left out, and a very pale blue was produced; in another, the alum and vitriol were used in equal quantities, and then the product was an extremely deep blue.

Upon the whole, the prescription seems given after repeated trials, and appears to be that very combination of the several ingredients, which must give the very finest colour they are capable of giving.

It would be curious to know what gave the first hint for the production of so fine a colour from a combination of such materials, especially when we come to consider, that the blood has the principal share in this surprising change. Blood of any kind, or flesh of any kind, would produce the same effects; but it is probable that flesh would not yield so strong or fine a colour. Beef has been tried, and found to yield a *blue*, but not so fine as the blood. Phil. Trans. N°. 381. p. 17.

The solution of alum, mixed with that of vitriol, produces no change of colour. If to these the spirit of salt is added, there is still no change; but as soon as ever the blood is added, the blue is produced. If instead of the lixivium with blood, there be added to these ingredients, a lixivium with salt of tartar only, there follows a precipitation, indeed, but of no colour; and when the spirit of salt is added to this, it clears up, and the precipitation is received again into the liquor.

The very same effect will follow if any volatile alkaline spirit is made use of as a precipitant, or any volatile salt dissolved in water; nor can the blood itself be supposed to communicate this change from any such properties, the heat of the fire it undergoes in calcination being sufficient to drive them off. In the calcination of the dried blood and salt of tartar it was observed, that there was a loss of just one half. It is difficult to determine with certainty, what quantity of either was lost in this operation; but it will easily be granted, that a much greater quantity of blood was lost than of the salt: and this is confirmed by experiment; for the same quantity of salt of tartar, calcined alone in the same heat, has been found to lose only one eighth part; whereas, when dried blood was calcined by itself, it lost more than six eighths. It appears that the blood in calcination parts with its tinging quality to the salt, or that quality is extracted from it by the salt, and passes with it in its dissolution with the boiling water.

To prove this, some dried blood was calcined alone, and a strong decoction of it made in water, and afterwards filtered: this, when mixed with the former solutions, produced little or no alteration; and on the addition of the spirit of salt, the whole became of an amber colour, without any precipitation. When this, mixed with oleum tartari, was added to the former solutions, it caused a precipitation, but no colour; and the spirit of salt being added to the liquor, made it clear again; but of no other colour than the amber tinge it had before.

The change of colour is not effected in any of the materials, except in that of the solution of the vitriol; so that the alum seems only to be of use in fixing the colour, as it is often used by dyers to that purpose: and the spiritus salis gives it a deeper dye; for if the lixivium with blood be poured to a solution of alum alone, there will fall a sediment a little inclining to the purple; which on adding some spirit of salt, changes to a brown. Much the same changes will also be produced if you pour the spiritus salis to the lixivium; but not the least appearance of *blue*: but when the lixivium is poured to a solution of vitriol, there is immediately a deep *blue* produced, and this is still heightened by the spirit of salt.

In all the recipes which have been given for making the *Prussian blue*, the liquors are ordered to be mixed together boiling hot, except the spirit of salt; and experience shews, that the colour is most readily and beautifully made that way: but in experiments made with all the liquors cold, the colours have been very well produced, only in less beauty; and they have required washing several times in fresh water, to bring them to their beauty.

If after the lixivium has precipitated the *blue* colour, on mixing with the solutions of alum and vitriol, a little more of the blood lixivium be added afterwards, the whole loses its *blue*, and becomes brown; but on adding some more spirit of salt, the matter becomes of a fine *blue* again.

As it appears from some of the before mentioned experiments, that the solution of vitriol is the only thing which makes the colour with the blood; and as this vitriol is no other than iron dissolved by a liquor running from the pyrites when long exposed to the weather, it should seem that the iron was the only substance that really produced the colour: and experiments confirm this to be the case. Phil. Trans. N°. 381. p. 20. See the article BLOOD.

PRYTANITIDES, in antiquity, a name given to those widows who at Athens, and throughout all Greece, had the sacred fire of Vesta committed to their care. The custom of the Greeks, in this respect, differed very much from that of the Romans; who allowed none but virgins to tend this sacred fire, whence they were called *vestals*. See VESTALS, *Cycl.*

They had the appellation of *prytanitides* from Πρυτανειον, a name common to all places sacred to Vesta. *Hoffm.* Lex. univ. in voc.

PSALMIST, in the church of Rome, one of the lesser ecclesiastical order, the same with what among us is called *clerk*, *precentor*, or *singer*. *Hoffm.* Lex. in voc.

PSEGMA, a name given by some of the antients to the flos æris, or flowers of brass.

PSELAPHIA, a word used by the antient medical writers to express friction with the hands, in cases where the distempered parts required it. This was always esteemed a part of the business of a physician, and was done with his own hand.

PSEN, Ψην, the name given by naturalists to the fig-gnat, a small species of gnat bred in figs while growing on the tree, and always remaining on the leaves of the same tree, and feeding on its juices. See CAPRIFICATION.

PSEPHISMA, Ψηφισμα, among the Athenians, a decree of the senate; the same with *probuleuma*. See PROBULEUMA.

PSEPHOMANTIA, Ψηφομαντεια, in antiquity, a species of divination, the same with *cleromancy*. See CLEROMANCY, *Cycl.*

PSEPHOPHORIA, in antiquity, the art of using the *psephi*, Ψηφοι, or counters. This was the first arithmetic taught children of every condition. Capitolinus, in his life of Pertinax, says, *Puer literis elementariis & calculo imbutus*. Those who taught this art were called *calculones*, if slaves, or lately made free; but those of better condition were called *calculatores* and *numerarii*. Every family, anywise considerable, had one of these masters, the title of whose charge was *a calculis*, *a rationibus*. See the next article.

PSEPHOS, Ψηφος, in antiquity, a name given to several things, as small stones, shells, and beans, used among the Greeks in giving their suffrages, and in their computations. Their origin is, by Mr. Mahudel, ascribed to the sons of Noah, who used this kind of calculation to assist their memory in numbering their flocks. Josephus assures us, that the Egyptians borrowed this method of counting from Abraham; and Herodotus relates, that these small stones were used both by the Egyptians and Greeks, only with this difference, that the latter placed them and cyphers from left to right, and the former from the right to the left. The art of using them in calculations was called *psephophoria*. See PSEPHOPHORIA.

Psephi were in use too among the Romans, who called them *calculi*. Whatever materials they consisted of, they were all of the same colour when used in calculations; whereas those used in giving suffrages were partly black and partly white. Lucky days were denoted by white, and unlucky by black ones. In passing of laws, there were characters engraved on them, as V. R. i. e. *uti rogas*; and A. i. e. *antiquo*. Those marked with V. R. approved, and those with A. rejected the law in question. Judges made use of calculi marked with the letter A. i. e. *absolvo*, when they absolved the accused person; but if they were for condemning him, they used such as were marked with the letter C. i. e. *condemno*: and if the evidence for and against the accused person was equal, so that they could neither condemn nor absolve him, they made use of calculi marked with N. L. i. e. *non liquet*. There was another kind of calculi used at public games, which were marked with figures: thus, if there were twenty athletæ ready to engage, they threw into a silver urn twenty calculi, every two of which were marked with the same figures, from 1 to 10. Then upon drawing, those who got the same numbers were obliged to engage together; on which account they were called *calculi athletici*.

The Greeks and antient Romans made use of very simple materials for their calculi, such as small stones, shells, and beans; and even in the time of the first Roman emperors, it was thought a piece of luxury to use any of ivory. It is questioned whether the Romans ever used any of silver or gold; because the

the paſſage of Petronius, which is the only one that can be alledged for their having done ſo, may be underſtood of the current coin or money, which Trimalcio, in the time of Nero, employed for calculi, *notari rem omnium delicatiſſimam, pro calculis albis aut nigris, aureos argenteoſque habebat denarios* If this is the true meaning of the author, the firſt gold and filver calculi muſt have been made in France, in the fourteenth century, under Charles VIIth. whoſe name, together with the arms of France, is found inſcribed on the oldeſt ſilver counters in that king's cabinet.

PSETA, in ichthyology, a name given by Athenæus to the fiſh we call the *plaiſe*, the *paſſer lævis* and *plateſſa* of authors. See the articles PASSER and PLEURONECTES.

PSETITES, in natural hiſtory, a name given by authors to a ſtone, having in it the figure of a turbot. There are ſtones found in ſome parts of Germany having the impreſſions of ſeveral kinds of fiſh as perfect as if drawn by a pencil, and it is not to be doubted, but that they in reality owe them to the fiſh themſelves; which at ſome time, perhaps while the earth was overflowed at the univerſal deluge, were received into beds of the matter of ſtone, yet unhardened, which taking its conſiſtence while they were in it, muſt cruſh them, and retain the marks of their bodies. They are uſually found in a whitiſh ſlaty ſtone.

PSEUDO-ACACIA, *baſtard acacia*, in botany, the name of a genus of trees, the characters of which are theſe: the flower is of the papilionaceous kind, and from its cup there ariſes a piſtil, ſurrounded by a fimbriated membrane. This finally becomes a flat pod, which burſts into two parts, and contains kidney-ſhaped ſeeds. To this it is to be added, that the leaves are placed in ſeries over againſt one another, on a middle rib, the end of which is terminated by a pod leaf.

The ſpecies of *pſeudo-acacia*, enumerated by Mr. Tournefort, are theſe: 1. The common prickly *pſeudo-acacia*, called the *common acacia*, and by ſome the *lotus tree*. 2. The broad-leaved American *pſeudo-acacia*, with roſe-coloured flowers. And, 3. The aſh-leaved American *pſeudo-acacia*, with violet-coloured flowers. *Tourn.* Inſt. p. 649.

PSEUDO-APIOS, in botany, a name given by ſome authors to the roots of the *bulbocaſtanum*, or earth-nut.

The peaſants in Burgundy, and other parts of France, turn up theſe in great quantities with the plough, and eat them. They call them *arnottas*, and ſome of the writers of the adjacent places, not diſtinguiſhing what they truly were, have avoided the common name, by giving them this of *pſeudo-apios*, formed of the name of a root to which they have no alliance, and taking away a name by which they would have been much better known; *arnotta* being only a corruption of the Dutch name *ertnote*, or earth-nut, a name by which they are called almoſt every where.

PSEUDO-ARGYRON, in mineralogy, a word uſed by the antients in two very different ſenſes; ſome make it the name of what Virgil calls *orichalcum album*, white braſs; and others of a mineral with which the common braſs was made.

It is very evident, from the joint teſtimony of the old Greeks and Romans both, that they had in uſe a kind of white metal made of copper, and they eſteemed it greatly above the yellow, or braſs.

Ariſtotle tells us of this white metal, and gives it great encomiums; he ſays, it was very white and very bright; and that it was made by melting copper together with a certain earth: but this he does not deſcribe, ſo that we are left in the dark as to what it was.

This ſhining white metal might very naturally be called *pſeudo-argyron*, or baſtard-ſilver; but beſide this, there is another native mineral ſubſtance, called by the ſame name by Strabo and others: and this is ſaid by Strabo to be uſed in making copper into braſs. Many authors have been much perplexed in endeavouring to make out what this latter kind of *pſeudo-argyrum* was; ſome have ſuppoſed it the molybdæna, others ſome of the brighter lead-ores, and others the micæ argenteæ, or ſilvery talcs, and ſome the ſilvery mundicks: all theſe might in ſome degree anſwer to the name, as to their outward appearance, but they could none of them have the effect of turning copper into braſs.

We are to look for ſomething that will do this firſt, and then find the reſemblance in the colour to ſilver. We well know, that nothing will turn copper yellow but calamine, which is the ore of zink, or zink itſelf. Zink is a metal that comes neareſt the appearance of ſilver of any other, and is ſometimes found native, and in its proper form. If any of the mines wrought by the antients afforded this native metal, there is no doubt but it was the thing called *pſeudo-argyros*, its colour and qualities all anſwering to the name; but if not, it is probable that no more was meant by the name than the common calamine found in their ſilver mines.

Many of the ores of ſilver are found to be very like the common calamine, and in the ſame mines one might be taken for the other at firſt ſight: this reſemblance might very naturally lead people to call the calamine found there *pſeudo-argyros*, or baſtard-ſilver; and the properties of this being the ſame with thoſe of all other calamine, it cannot but anſwer in the ſame manner in making braſs.

PSEUDO-CARPASUM, in botany, a name given by ſome authors to the plant called by the generality of writers *libanotis*.

This is a plant of a very ſtrong ſmell; and the *carpaſum*, or *carpaſium* of the antients, being a poiſonous gum, and the ſmell of the libanotis approaching to the ſame odour, occaſioned its being called the *baſtard-carpaſum*.

PSEUDO-DICTAMNUS, *baſtard-dittany*, in botany, the name of a genus of plants, the characters of which are theſe: the flower conſiſts of one leaf, and is of the labiated kind. The upper lip is of an arched form, and uſually is bifid; and the lower is divided into three ſegments. The cup is of the ſhape of a funnel, and from it there ariſes a piſtil, which is fixed in the manner of a nail to the hinder part of the flower. The four embryos which ſurround this afterwards become four oblong ſeeds, which ripen in the funnel-faſhioned caſe, which was the cup of the flower.

The ſpecies of *pſeudodictamnus*, enumerated by Mr. Tournefort, are theſe: 1. The *pſeudodictamnus*, with cups like thoſe of Molucca. 2. The *pſeudodictamnus*, with curled and wrinkled leaves. 3. The Spaniſh *pſeud dictamnus*, with very large, hoary, and whitiſh leaves. 4. The Spaniſh *pſeudodictamnus*, with very large, hairy, and blackiſh leaves. 5. The Spaniſh *pſeudodictamnus*, with fig-wort-like leaves. 6. The ſcentleſs, verticillated *pſeudodictamnus*. 7. The ſmaller, alpine, verticillated *pſeudodictamnus*. And, 8. The ground ivy-leaved African *pſeudodictamnus*. *Tourn.* Inſt. p. 188.

PSEUDOGELSEMINUM, in botany, a name given by Rivinus to a genus of plants, the ſame with the *bignonia* of authors. *Rivin.* 1. 151.

PSEUDO-*ipecacuanha*, in botany, the name by which ſome authors have called a poiſonous kind of American apocynum, the root of which ſomething reſembles the true *ipecacuanha*, and has ſometimes been unfortunately collected and uſed in its place. *Dale*, Pharm. p. 178.

PSEUDO-*pulex arboreus*, in natural hiſtory, the name of a genus of inſects deſcribed by Mr. Reaumur, and ſomewhat approaching in their form to the *pulex aboreus*; but having their wings covered with a ſquammoſe caſe, which thoſe creatures have not, and having broader and flatter bodies.

Theſe principally live upon the fig-tree and the box; they paſs through a ſort of metamorphoſis into a hopping fly, ſuppoſed by ſome of the nature of a graſs-hopper; but erroneouſly, for that animal has a caſe for its wings, and the other not.

It has not yet been determined by obſervation, whether theſe creatures are oviparous, as moſt other of the known winged inſects, or viviparous, as the *pulex arboreus*. That ſpecies which lives upon the box throws out a ſort of glutinous matter from the anus, with which it faſtens the leaf when curled up: this curled leaf, on being opened, always diſcovers the animal, with a long train of connected globules dragging after it, and forming, as it were, a ſort of tail; but when examined more carefully, this is found only to be a train of excrements ſticking together by means of their glutinous quality, and of a ſweet taſte, like that of manna. Theſe, like the others, are at length changed into a ſort of fly, remarkable for its manner of hopping, like the flea. *Reaumur's* Hiſt. Inſt. T. 1.

PSEUDO-*ſaliva*, in botany, a name by which ſome authors call the *phlomis*.

PSEUDO-*ſantalum*, *baſtard-ſaunders*, a name given by ſome botanical writers to the *lignum Braſilianum*, or Braſil wood. *C. Bauhin* Pin. p. 393.

PSEUDO-*ſenna*, *baſtard-ſena*, in botany, a name uſed by ſome authors for the common *colutea veſicarica*. It is called alſo by ſome *ſena pauperum*. *Boerhaave*, p. 468.

PSEUDO *theca*, in natural hiſtory, the name of a ſpecies of two-winged fly, approaching to the nature of the common waſp, but having no ſting. It has a blackiſh head, with two ſhort antennæ, or horns; large, black, reticulated eyes; a long forked mouth, and prominent ſhoulders. The body is long and ſlender, and conſiſts of many joints. The legs are rough and hairy. It is found about dirty ditches, being bred of a water-worm that loves muddy places.

This is, according to the later diſtinctions in the hiſtory of inſects, properly called a *waſp-fly*. There are bee-flies, as much reſembling the bees as this does the waſp.

PSEUDO-*tinea*, in natural hiſtory, the name of a very remarkable ſpecies of inſect deſcribed by Mr. Reamur, approaching to the nature of the *tinea*, or cloaths-moth, while in the worm-ſtate; but not making themſelves coats of the ſubſtance of leaves, cloath, &c. tho' they form a ſort of caſes for their defence againſt a very terrible enemy.

Theſe creatures are truly of the caterpillar kind, and have, in the manner of any of theſe inſects, ſixteen legs. They feed on wax, and for food enter the bee-hives; where they boldly engage the bees, and are not to be prevented by them from feeding, tho' at the expence of their habitations and the cells of their reſervoirs of honey: ſo that it is no uncommon thing for a ſwarm of bees to be forced to change their place of habitation, and make new combs elſewhere; leaving the old ones to this contemptible victor, whom they know not how to drive out or diſpoſſeſs.

Virgil and Ariſtotle, and all the authors who have written on bees, have complained of this deſtructive animal. It never

eats the honey, but feeds only on the wax; attacking principally those waxy cells where the female bee deposits her eggs for the future progeny.

The bees, who are a match for most other creatures, by means of their stings, would easily destroy these weak creatures, were it not for the impervious armour they are covered with. They form themselves a coat of armour of a double matter; the first, which immediately covers the body, is of a kind of silk of their own spinning; and the outer covering over this is of the bees wax: this is laid considerably thick, and the creature just thrusting out its head to feed, goes on devouring the cells undisturbed, while a whole army of the inhabitants are in vain buzzing about him, and attempting to pierce him with their stings. He never forsakes his covering, but lengthens and enlarges it as he goes; and gnawing down the sides of the cells in his march, without staying to eat them one by one, the havock and destruction he occasions are scarce to be conceived. When the time of the change of this creature approaches, it contracts its body within its double covering, and there changes into the nymph state; whence, after a proper time, it comes forth in form of a moth, with granulated horns and a crooked proboscis.

The bees have cunning enough to know their destructive enemy in this new form, and as this is a weak and defencelefs state, they attack and destroy all the moths of this species they can meet with. They seldom are so fortunate, however, as to kill the whole race as soon as produced; and if only one escapes, it is able to lay a foundation of revenge for the death of its brethren. All the flies of the moth kind lay a vast number of eggs, and this is behind-hand with none of them in that particular: the young ones produced from the eggs of one surviving female of this species, are sufficient to destroy many honey-combs; nay, many hives of them. The moth produced by this caterpillar flies but little, yet is very nimble in avoiding danger by running, which it does with great swiftness.

There are a species of these *pseud.-tineæ*, or wax-eating caterpillars, which infest the subterranean hives of wasps, and other creatures which make wax: the manner of living, feeding, and defending themselves from their enemies, is the same in all these species. These last, if they are at any time distressed for food, will eat their own dung; the wax having passed almost unaltered through their bodies, and being still wax, and capable of affording them more nourishment on a second digestion. These species, tho' they naturally live on this soft food, yet if by any accident they meet with harder only, they know how to live upon it; and can eat a way into the covers and leaves of books, and make themselves cases and coverings of the fragments of these substances. The accurate author of these observations describes also a kind of *pseudo-tineæ* which feed on wool, and another that eats leather; both making themselves houses also on the materials they feed on.

There is also another kind, very destructive of corn: these make themselves a covering by fastening together a great number of the grains, and there living and eating in secret. All these creatures, whatever be their food or habitation, finally become *phalenæ*, or moths; and may be distinguished, even in this state, from the other species, by having granulated horns of a remarkable structure, and all of them a proboscis, or trunk, more or less incurvated. *Reaumur*'s Hist. Inf. T. 1.

PSIDIUM, in botany, the name by which Linnæus calls a genus of plants, named *guajava* by Tournefort and others. *Linnæi* Gen. Pl. p. 211. See GUAJAVA.

PSILOCITHARISTA, among the antients, one who plays on the cithara, without singing in concert to it. *Pitisc.* Lex. Ant. in voc.

PSITTACUS, the *parrot*, in the Linnæan system of zoology, makes a particular and distinct genus of birds, of the order of the hawks; the distinguishing characters of which are, that the feet have two toes before and two behind. *Linnæi* Syst. Natur. p. 44.

The *parrot* is a very well-known bird, of which there are several very beautiful species.

Its head is large, and beek and skull extremely hard and strong. It might seem a wonder why nature has destined to this, which is not naturally a bird of prey, but feeds on fruits and vegetable substances, the crooked beak allotted to the hawk and other carnivorous birds; but the reason seems to be, that the *parrot*'s being a heavy bird, and its legs not very fit for service, it climbs up and down trees by the help of this sharp and hooked bill, with which it lays hold of any thing and secures itself, before it stirs a foot; and besides this, it helps itself forward very much, by pulling its body on with this hold.

Of all animals, the *parrot* and crocodile are the only ones which move the upper jaw; all creatures else moving the lower only. As some particular animals beside are fond of particular foods, so the *parrot* loves nothing so much as the seeds of the carthamus, or bastard-saffron; and eats them without any hurt, tho' they are a purge when given to other creatures.

The *parrots* are common both in the East and West Indies: they are a very brisk and lively bird in the warmer countries; but with us lose much of their vigour. They lay two or three eggs in the hollow of a tree.

In all the known *parrots* the nostrils are round and placed very high upon the beak, and very near one another.

Parrots are divided into three kinds: 1. The larger, which are as big as a moderate fowl, called *macaos* and *cocketoons*; these have very long tails. 2. The middle sized ones, commonly called *parrots*, which have short tails, and are a little larger than a pigeon. And, 3. The small ones, which are called *paroquets*, and have long tails, and are not larger than a lark or blackbird. *Ray*'s Ornithol. p. 72.

PSOAS (*Cycl.*)—PSOAS *major*, called also *lumbaris internus*, a long and thick muscle, situated on the abdomen, on the *lumbar* region, adhering to the vertebræ of the loins, from the posterior part of the os ilium to the anterior part near the thigh.

It is fixed above to the last vertebræ of the back, and to all those of the loins; that is, to the lateral parts of the bodies of these vertebræ, and to the roots of their transverse apophyses. The insertions in the bodies of the vertebræ are by a kind of digitations, and are very little tendinous: from thence the muscle runs down laterally over the os ilium, on one side of the iliac muscle; and passes over the ligamentum Fallopii, between the anterior inferior spine of the os ilium, and that eminence which, from its situation, may be called *iliopectinea*. Before it goes out of the abdomen it unites with the iliacus, and afterwards covers the foreside of the head of the os femoris. It is sometimes accompanied by a small muscle, called *psoas parvus*. *Winslow*'s Anatomy, p 204.

PSOAS *parvus*, a long slender muscle lying upon the *psoas major*: it is sometimes wanting; but tho' some have imagined it wanting in one sex more than the other, the conjecture seems without foundation. It is fixed above by a short tendon, sometimes to the last transverse apophysis of the back, or higher; sometimes to the first of the loins, and sometimes to both: from thence it runs down wholly fleshy, and more or less complex on the great *psoas*, in a direction a little oblique; and having reached the middle of the regio lumbaris, it forms a slender flat tendon, which gradually increasing in breadth like a thin aponeurosis, runs over the *psoas major*, and *iliacus internus* at their union; and from thence down to the symphysis of the os pubis and os ilium, and is inserted chiefly in the crista of the os pubis, above the insertion of the pectinæus. *Winslow*'s Anatomy, p. 250.

Beside this *psoas parvus*, there is another, still smaller, between it and the vertebræ.

PSORA, (*Cycl*) in botany, a name by which Aëtius and several others of the later Greek writers have called the *psorice* of the antient Greeks, that is, the *scabiosa* of the Latins, and our common scabious. It has been supposed by some, that the antient Greeks were not acquainted with our scabious; but that is an erroneous opinion, both the description and virtues of the psorice being the same with those of the scabious. See PSORICE.

PSORALIA, in botany, the name of a genus of plants of the leguminous kind, the characters of which are these: the perianthium is one-leaved, and is dotted with a sort of tubercles, and is divided into five acute segments, the under one being twice as long as any of the others. The flower is of the papilionaceous kind, and is composed of five petals. The vexillum is roundish, emarginated, and rises upwards. The alæ are lunulated, obtuse and small. The carina is dipetalous, lunulated, and obtuse. The stamina are diadelphous filaments, and the antheræ are roundish. The germen of the pistil is slender. The stile is pointed, and of the length of the stamina. The stigma is obtuse. The fruit is a pod of the length of the cup; it is of a compressed figure and pointed. The seed is single and kidney-shaped. It is very singular in this plant, that the cup is always dotted with tubercles, and the petals of the flowers are full of coloured veins. *Linnæi* Gen. Pl. p. 358. *Ray*'s Lugd. p. 372

PSORAS, in zoology, a name by which some authors have called a fish of the turdus kind, remarkable for the variety and beauty of its spots, and more usually known by the name *lepros*. *Willughby*'s Hist. Pisc. p. 320. See LEPROS.

PSORIASIS, a peculiar species of itch affecting the scrotum.

PSORICE, or PSORICE-*poa*, a name given by the botanical writers among the antient Greeks to the plant we call *scabiosa*, or *scabious*.

They have so well described this plant, that there is no room to doubt its being our scabious; and they have attributed the same virtues to it, and given it in the same distempers that we do. Yet some botanists of the later ages, having overlooked their descriptions of the *psorice*, have supposed that our scabious was wholly unknown to the antients: and others have thought that the stæbe of those writers was this plant. But this is as erroneous as the former opinion, for the stæbe of the antient Greeks was the name of the phleos, a kind of marshy gnaphalium, or cudweed; and with some, the name of the pheos or hippopheos, called by Dioscorides *hippophaes*, a prickly shrub, growing on the sandy shores of the island of Crete, and used by the fullers in dressing their cloths.

Pelagonius recommends the herb *psorice*, among several other known antiscorbutics, in a compound medicine, intended for the itch, or any other virulent eruption. Aëtius prescribes the same plant under the name of *psora*, and the modern Greeks call it *campiusa* or *scampiusa*; a name which, tho'

Fuch-

Fuchsius confesses he does not understand, yet is plainly no other than a barbarous term formed by these Grecians on the word scabiosa, the Latin name of the plant.

The change between scabiosa and scampiusa is scarce any thing, for the common custom of the Greeks of these times, was to change the Roman b into mp, in the words which they adopted from that language. *Pelagonius*, c. 300.

PSOROPHTHALMIA, *(Cycl.)* a name given by the antients to a scorbutic disorder of the eye-lids, very troublesome to the patient, and cured with difficulty.

PSUCHAGOGICA, a word used by the antients to express such medicines as were used in apoplexies and faintings, to recal life.

PSUCHROTROPHON, in the materia medica of the antients, a name given to a plant often recommended, but not perfectly understood as to what species it means. It is the same plant called *cestrum* by the Greeks, and has this first name only because of its growing in moist places; the word being formed of the Greek ψυχρος, moist, and τρεφω, to nourish or cause to grow.

Dioscorides has opened a way to great perplexity, by saying that this is the plant which the Romans in his time called the *betonica*, or *serratula*, and sometimes *rosmarinus*. The Romans seem from this to have been at that time very indeterminate in their names; but by the description it appears clearly, that the rosemary which we know by that name, could not be meant; and the question lying wholly between the betony and serratula, is decided in favour of the latter by the description, which, as it stands in Dioscorides, gives the plant the leaves of the oak. This may seem at first sight not to make much in favour of the serratula; but the resemblance is explained, as this author expressly does, to consist only in their being very deeply sinuated, and finely notched, or serrated, all round. The serratula of our times seems plainly meant as the plant. So that this plant we are to observe, is the cestrum and *pseuchrotrophon* of the Greeks, and the betonica, or vettonica, as well as the serrata of the Romans; and is sometimes called *rosmarinus*. Apuleius seems to perplex the whole affair in a strange manner, by saying, the betonica has leaves like the docks, and very large; but we are to observe, that he mistakes the betonica and britannica for the same plant, and says, that the betonica, or britannica, was called *cestrum*, &c. by the Greeks. The reason of his saying the leaves are like those of the dock, is easily seen after this; for Dioscorides says so of the britannica, and that very justly; it being only the common great water-dock, or hydrolapathum. Pliny has somewhere run into the same error, of giving leaves like the dock to the betonica; but the source of his error is plainly the same. We may observe from this, however, that very little dependence can be had on the accounts these authors give us of plants.

PSYCHROLUSIA, a word used by medical writers to express cold bathing.

PSYCTICA, a term used by medical writers to express cooling remedies.

PSYDRACIA, a term used by medical writers to express small tubercles on the head, which resemble pustules, and after a little time corrode and eat through the skin.

PSYGMATA, a name given by physicians to all refrigerating medicines, external and internal.

PSYLLIUM, *fleawort*, in botany, the name of a genus of plants, the flowers and fruit of which are like those of the plantain's, but the stalks are ramose and foliaceous.

The species of *psyllium*, enumerated by authors, are these: 1. The *psyllium* of Dioscorides, or Indian *psyllium*, with jagged leaves. 2. The great upright *psyllium*. 3. The larger procumbent *psyllium*. 4. The lesser *psyllium* of Caspar Bauhine. *Tourn.* Inst. Bot. p. 128.

The seeds of *psyllium* are recommended by many in jaundices and dysenteries; but the present practice receives it only as a mucilaginous feed

PSYLON, in ichthyology, a name given by Aristotle, and many other of the old Greek writers, to the tench, or cyprinus niger. See CYPRINUS and TINCA.

PTARMICA, *sneezewort*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the radiated kind, the disk being composed of floscules, and the outer circle of semi-floscules; these are placed upon the embryo-seeds, and are contained in a squammose cup. The embryos afterwards become slender seeds. To this it is to be added, that the leaves are either only denticulated at the edges, or else divided into large broad segments, wholly different at first inspection from the leaves of yarrow.

The species of *ptarmica*, enumerated by Mr. Tournefort, are these: 1. The common *ptarmica*, with long serrated leaves and white flowers. 2. The common *ptarmica*, with double flowers. 3. The Alpine *ptarmica*, with leaves partly whole, and partly serrated. 4. The low dwarf *ptarmica*, with leaves divided in the manner of those of wormwood. 5. The Cretric shrubby *ptarmica*, with the appearance of the santolina. 6. The purple-flowered tawny-leaved Alpine *ptarmica*. 7. The yellow-flowered sweet scented *ptarmica*. 8. The yellow sweet *ptarmica*, with long and thick tufts of flowers. 9. The Alpine *ptarmica*, with deeply divided leaves. 10. The feverfew-leaved Alpine *ptarmica*. 11. The tall Alpine *ptarmica*, with yellowish white flowers. 12. The other Alpine *ptarmica*, with less compact flowers. 13. The elecampane-leaved Virginian *ptarmica*. *Tourn.* Inst. p. 496.

The common *ptarmica* is frequent in our meadows, and flowers in June and July. The leaves are of an acrid taste, and are sometimes added to sallad instead of cresses, or the garden-tarragon. When dried and rubbed to powder, they are a good sternutatory; they are not over strong, but occasion a continued sneezing, which draws out a great deal of phlegm by the nose. The root has the same virtue more strongly.

PTELEA, in the Linnæan system of botany, the name of a distinct genus of vegetables, the characters of which are these: that the cup is the perianthium, divided into four small segments. The flower is composed of four petals, which are of an oval figure, and pointed at the ends; these are flat, larger than the segments of the calyx, and spread wide open. The stamina are four pointed filaments. The antheræ are roundish. The germen of the pistil is orbicular, but somewhat compressed. The style is short The stigmata are two, and are acute. The fruit is a circular membrane, placed perpendicularly, with a cavity in the middle, which contains the seed, which is single and oblong. The fruit of this genus is extremely like that of the elm, but the stamina are wholly different. *Linnæi*, Gen. Pl p. 49.

PTERIDION, in botany, a name used by some authors for a small kind of fern common in damp places. *Ger.* Emac. Ind. 2.

PTERIS, in botany, the name of a genus of ferns, the characters of which, according to Linnæus, are these: the fructifications are disposed into a line, which surrounds the whole margin of the under part of the leaf. In this disposition the *pteris* evidently differs from all the other capillary plants.

PTEROPHŒNICUS *Indiarum*, in zoology, a name under which Nieremberg has described a bird, which he says is called by the Spaniards there *commendadoza*, remarkable for the redness of the upper part of its wings.

It is of the shape and size of the starling, and not unlike it in colour, but for the singularity of the upper part of their wings, which in one part of their lives are of a yellowish or orange colour, and in the rest red. They are kept in cages and learn to imitate the human voice: they feed on vegetables, principally Indian corn, and are common as well in the colder as in the hotter climates; flying in large flocks, and often doing great damages to the people. They build in trees and are eaten there; but are no very valuable bird. *Ray's* Ornithology, p. 302.

PTEROSPERMADENDRON, in botany, the name of a genus of plants, established by Dr. Amman.

The name is derived from the Greek πτερον, a wing, σπερμα, seed, and δενδρον, a tree, to express a tree with alated seeds.

The characters of the genus are these: the flower is of the rosaceous kind, consisting of several petals arranged in a circular order. From the cup of the flower there arises a pistil, with an embryo fruit, which finally becomes a woody seed-vessel of the shape of a pod, which, when ripe, opens at the end, and is seen to be divided into five cells, containing alated seeds.

Of this genus the author describes two species. The first has leaves like the cork-tree, angulated and hoary underneath, and white flowers: the other has auriculated leaves, and a large flower and fruit The first of these is mentioned in Petiver's museum, N°. 249. under the name of a tree from Champana, with a woody fruit, containing alated seeds: and the other seems to be the tree called *folda*, in the Hortus Malabaricus, Vol. VI. T. 58.

Besides these two species, the author suspects there are four others, which have not yet been sufficiently examined in their various states, to determine whether they are properly of it or not. These are,

1. The poplar-leaved tree alcea, called the *green ebony* at St. Helena, and by the English *blackwood* and *ebony*, Pluk mant. T. 333. 2. The tree alcea, with large red flowers, and with leaves like the black poplar, hoary underneath, called by the English *redwood*, *ejusd.* 3. The quinquecapsular alcea of Florida, with bay-like leaves, lightly crenated, and with alated seeds. And, 4. a tree with pentangular fruit, and alated seeds, collected by Dr. Houston, at La Vera Cruz. Act. Petropol. Vol. VIII. p. 218.

PTERYGIUM, *(Cycl.)* in anatomy and surgery, a preternatural membrane, formed externally upon the coats of the eye, and extending itself over the cornea and pupil, and obstructing the sight. Sometimes this pellicle or membrane appears red, and is then called *pannus*.

It usually arises in the angles of the eyes from the temples toward the nose, and sometimes from above or below, extending itself by degrees over the pupil. Sometimes it only adheres to the cornea by a few slender fibres, and sometimes it is extended over the whole eye, and is every where firmly and intimately attached to it; and in this case the cure is rendered very difficult.

If the patient's constitution, or a beginning inflammation require it, bleeding and blistering are proper in this case; and when the membrane is but thin, gentle escharotics may perform

form a cure, such as burnt alum, vitriol, &c. mixed into a powder with sugar; or a solution of half a scruple of white vitriol in two ounces of celandine or other water.

If these methods prove ineffectual, the assistance of a surgeon must be called in; who seating the patient before him, with his head bent backwards upon his lap, while an assistant holds open the eyelids, takes hold of the thickest or loosest part of the pellicle with a hook, and elevating it a little, passes a threaded needle through it; and taking hold of both ends of the thread, makes a gentle elevation of it; then separates its upper and lower margin with a lancet, that he may afterwards cut off the rest immediately in a strait line near the lachrymal caruncle, with a strait and fine pair of scissars; then he draws back the thread and membrane towards the cornea, and if it adheres any where to the eye, frees it by degrees with the scalpell, or scissars, not wounding the cornea, nor leaving any of the membrane behind to give rise to a new production of it. *Heister*'s Surg. p. 420.

PTERYGOIDÆUS *major* (*Cycl.*)—This muscle lies on the inside of the lower jaw, almost in the same manner that the masseter does on the outside, and is of the same figure with that muscle, only smaller and narrower.

It is fixed above chiefly to the inside of the external ala of the apophysis *pterygoides*. This insertion is wholly fleshy, and from hence it runs down obliquely toward the angle of the lower jaw, and is inserted a little tendinous in the inequalities on the inside thereof, opposite to the insertion of the masseter. *Winslow*'s Anat. p. 253.

PTERYGOIDÆUS *minor*, an oblong small fleshy muscle, situated almost horizontally between the outside of the apophysis *pterygoides*, and the condyloide apophysis of the lower jaw, the subject being considered in an erect posture.

It is fixed by one extremity to the outside and edge of the outer ala of the *pterygoide* apophysis, filling the fossula which is at the basis of this apophysis, near the basis of the temporal apophysis of the sphenoidal bone; from thence it runs backward and a little outward into the void space between the two apophyses of the lower jaw, and is inserted anteriorly in the condyloide apophysis, at a small fossula immediately under the angle of the inner condyle. It is also fixed to the capsular ligament of the joint. *Winslow*'s Anat. p. 253.

PTOSIS, a distemperature of the eyelids, occasioned by a relaxation or tumor of those parts, the same as the phalangosis. *Heister*'s Surg p. 367. See PHALANGOSIS.

PTYALAGOGA, a word used by physicians to express such medicines as promote a copious discharge of the saliva, such as pellitory-root and the like.

PTYSMA, a word used to express whatever is brought up from the lungs by spitting.

PTYSMAGOGA, medicines which promote a copious discharge by spitting.

PUBERTY (*Cycl.*)—Dr. Kramer observes, that all boys at the time of *puberty*, between twelve and fourteen years of age, complain of uneasiness at their breasts, which are swelled and itchy, the nipples and areolæ round them inflaming with pain, and sometimes excoriation and exulceration of some of the lactiferous ducts. The best remedy for which, he says, is to press out the white serum then contained in them, after which they cure with a bit of plaister. Commerc. Norimb. 1735. Hebd. 30. sect. 2.

By the law of Scotland, persons under *puberty*, or under the years of discretion, are capable of committing the higher crimes, which being contrary to the law of nature, are obvious. But they are not chargeable with smaller offences arising from positive law or statute.

PUBIS (*Cycl.*)—The *os pubis* is the least of the three portions of the ossa innominata; the two together form the forepart of the pelvis, and anatomists distinguish in each, the body, the angle, and the branch.

The body of the *os pubis* is its upper part, situated transversely before the inferior part of the os ilium. Its posterior extremity is very thick, and by its union with the ossa ilium forms the oblique eminence which distinguishes these two portions of the ossannominata. It likewise contributes to the formation of the cotyloide cavity. Its anterior extremity ends in a small eminence, or tuberosity, called the *spine* of the *os pubis*, which is sometimes double. The upper edge has on its inner part an oblique ridge, which may be called the *crista* of the *os pubis*, and is continuous with that ridge which distinguishes the margin and the bottom of the pelvis. Before this crista is a broad, oblong, and oblique slope. The lower edge is obliquely notched, and forms the upper part of the foramen ovale.

The angle of the *os pubis* is its anterior portion, and makes part of that connexion called the *symphysis* of the *ossa pubis*. This portion is flat, and not very thick; and in some subjects toward the upper part of the fore-side, near the angular curvature, it has an eminence, which increases the size and extent of the spine already mentioned. The two *ossa pubis* connected together by this portion, form, on the foreside, an unequal convexity; but on the backside a pretty even concavity.

The branch of the *os pubis* is a flat thin apophysis, which running downwards, unites with the branch of the os ischium by a cartilaginous symphysis; of which, however, there remain only some light marks in adults. It compleats the formation of the foramen ovale. The branches of the two *ossa pubis* form, on the foreside, a pointed arch; which, however, in a natural state, is much more round than in a dried skeleton. *Winslow*'s Anatomy, p. 71.

PUCELAGE, (*Cycl.*) in natural history, a name by which some authors among the French have called the porcellane-shells. See the article PORCELLANA.

PUCERON, the name given by naturalists to a small insect of a peculiar nature frequently found on the young branches of trees and plants, and that often in such clusters as wholly to cover them. See Tab. of Insects.

The *puceron* is a small animal, but very numerous in the several genera and species; insomuch, that Reaumur has observed that there is scarce a vegetable to be found, either in the fields or gardens, that has not its peculiar species of *puceron* to feed on its juices. Mr. De la Hire, of the Paris academy, has left many curious particulars in regard to these animals in the memoirs of the year 1703; and Mr. Lewenhoek, and others since, have given figures and descriptions of several of the species.

Pucerons are all viviparous animals, and that after a very singular manner. It is to be observed, that the name is scarce more expressive of the creature, than some of the others given of late to insects; that of the polype to a creature which has no legs or feet at all, is very improper; and that of the *puceron* hardly less so, as it would naturally lead us to imagine, that the creature thus called was able to hop like a flea, whereas, in reality, it is very slow in its motions, and seldom so much as walks.

These creatures have six legs, which are extremely small and slender; and which, when the animal is at its full growth, are loaded with a weight so large, that they seem scarce able to support it. Some of the species arrive at a tolerable bigness for common observation; but the greater number are too small to be accurately seen without the assistance of glasses. Among these insects there are great numbers that in their full perfection have wings, and become a sort of little flies: these are distinguished from the others by the name of *alated pucerons*. *Reaumur*'s Hist. Inf. Vol. VI. p. 9.

Those species which never become winged, have nothing of the appearance of the caterpillar kind; having not long, but short bodies, and much resembling flies whose wings had been taken off. All the species have antennæ or horns; but these in the several kinds are very different from one another, some being very short, and others as remarkably long: and of these last kinds, some carry them strait before the head, as is the usual custom, and others carry them laid along over their backs; in some of these the horns are longer than the body. But beside these antennæ, the greater number of these creatures have two other horns or spines placed in a very singular manner behind them, near the tail. They are placed at some distance at their origin, but they become more distant as they go out from the body. These are much thicker and much shorter than the antennæ; and there are among the various kinds of them, some which actually want them, and others which appear to want them, tho' they have them in reality; and others have in the places of them certain round spots, which stand just where they should, and seem destined to perform their functions.

The several kinds of *pucerons* differ greatly in colour. The greater number of them are green; but many are brown, some yellow, and some are black. In August the rose-trees afford a vast number of them of a pale red, and some exactly of the colour of the damask rose; in some other months of the year we find green ones on the rose-trees. The sycamore and several other plants afford green ones in the summer, and red ones in November; and there seems no doubt, but that these are the same individual animals which change colour, the leaves and juices of the plants being not capable of affording them the same sort of nourishment at some times that they do at others. Some of them also are of a dusky colour, and others bright and shining, as if varnished over. Those of the willow, of the poppy, and some other plants, are of a cloth-like appearance, and some resemble velvet; others, as those of the apricot, and of the catch-fly, are shining as if covered with the finest lacquer. Some appear of the colour of browse metal, when it has its highest polish; such are those of the tansy, and some other plants. The largest kind are found on the oak and other trees. The gooseberry bush affords a species that are of the colour of mother of pearl; and in general, the skin or covering of those species which are thus bright and shining, is much harder and firmer than that of the others. The more usual species are all over of one colour, but there are some others which are spotted; that of the common wormwood is prettily speckled with black and brown; those of the sorrel are green in the middle, and black at each extremity; and there are several others, as of the willow, &c. that are variegated with these two colours.

It is not certain, however, that all the species are peculiar to the plants that they are found upon; for it has been observed, that when a plant of the common wormwood has been full of them, by some accident they have all left it to fix themselves upon plants in the neighbourhood, which had juices of a less disagreeable taste. These creatures always live in companies; we never find them singly on plants, and very seldom other-

wife than in extremely great numbers. In plants they faften themfelves on every part; but in trees, they only feize upon the leaves and young fhoots, and they ufually cover thefe entirely, leaving no part to be feen. *Reaumur's* Hift. Inf. Vol. VI. p. 13.

The elder is the tree on which they are of all others the moft plentifully produced, and on which they are obferved in their feveral ftages with the greateft accuracy and eafe. They often cover the thick green roots of this tree for many inches together, and fometimes for many feet; and they are always placed fo clofe together, that they touch in every part, and fometimes they lie two beds, one over another. Thefe are of a greenifh black. If they are obferved on the branches undifturbed, they are always found to be perfectly quiet, and feem to pafs their whole lives in inaction; but they are all this time doing the moft neceffary bufinefs of life, that is, fucking in their nourifhment from the juices of the tree. They do this by means of a fine flender trunk, which eafily efcapes the naked eye; but is always found by the microfcope, and it is by means of this that they pierce the bark of the tender parts of the vegetables, and get at their juices. The trunk is ufually of two thirds of the length of the body; but when they are moving on, it is always applied fo clofely under the belly, that it is not feen.

When there are two feries of thefe infects placed one over another, they are always more loofly placed in the upper feries, and thefe are ufually the larger and the nimbler in all their motions. In this cafe they have no power of fucking the plant; for befide that it is clofe covered with the other feries, their trunks are not long enough to reach and penetrate it from the heighth at which they ftand above it. Thefe, therefore, are fuch as have no farther need of nourifhment, but are employed in propagating their fpecies. Mr. De la Hire thought, that when thefe animals arrived at their winged ftate, they laid eggs on the ftalks and leaves of thofe plants on which we find them afterwards hatched without wings. The reafon of his fuppofing this, was doubtlefs the opinion of an analogy between thefe creatures, and the butterflies and flies, with the other animals of the winged clafs: but obfervation and facts agree but very ill with that analogy; for if the plants on which they abound be obferved nicely from day to day, their numbers will be found daily to increafe on the leaves and branches, and this without the leaft appearance of eggs: on the other hand, as the new-produced animals are of very different fizes, this fpeaks their being of different ages; and from hence it appears evident, that they are not produced in the manner of other infects, which, when perfect, have wings; but, on the contrary, that they are really produced alive from the parent. Mr. Reaumur faw them brought forth; and, indeed, the obfervations of Mr. Lewenhoek long before, made it evident that this was the cafe; for he faw, by the help of microfcopes, the young animals perfectly formed, tho' extremely minute, in the bodies of the full-grown females.

If the large and full-grown *pucerons* are watched on their native places, with moderately powerful magnifiers, there will foon be feen fome of them that have a fmall greenifh body ftanding out from near the anus. This is the moft plainly vifible in the elder *puceron*, which is itfelf ufually blackifh. This in its firft appearance is an oblong body, refembling an egg flatted a little; but as it more nearly approaches to its delivery from the body of the parent, there appear legs upon it, and it is clearly feen to be a perfect and very lively animal. The legs by degrees fly off from the fides and belly, along which they were laid, and the creature then makes feveral motions to affift the getting out of its head from the body of the parent; for thefe infects are always brought into the world with the hinder part foremoft. The parent is wholly paffive all the time of the birth, all her efforts being internal; fo that the body ftirs not out of its place, nor is the young one able to help itfelf till its whole body is very near out, as the legs are attached to the breaft at a fmall diftance from the head: and even when the head is out, the antennæ require the repeated motion of the young one, for a minute or two, to feparate them.

The whole operation of the delivery of one young one ufually takes up about feven minutes. Mr. Reaumur obferved the delivery of the *pucerons* of all kinds to be in the fame manner. He found it very eafy to make the obfervation, as the female *pucerons* are eafily diftinguifhed from the male by their being much thicker in the body, and by their fkin feeming always much diftended, and by the furrows which feparate the rings of the body being obliterated. They are a fort of animal which propagates fo quickly, that ufually there are many females on the fame leaf or branch of a plant in labour at the fame time; and their fœcundity is fo great, that when they have once begun to bring forth young ones, they feem to continue it inceffantly for a long time together. They will often bring forth fifteen or twenty fucceffively, and if their bodies be a little fqueezed afterwards, there are forced out of it a vaft number of others lefs mature; yet even in thefe the eyes may be diftinguifhed: and after thefe, there follow long chains, as it were, of lefs perfect ones, which feem like the beads of a necklace, and are oblong, and much refemble eggs. Thefe young ones are of different maturity, therefore, in the bodies of the parent; and in that refemble the eggs in hens and other birds, they always growing to a proper ftate for exclufion in this manner, one after another: whereas, in the quadrupeds, which are viviparous, the young ones of the fame brood, if ever fo numerous, always grow to their ftate of maturity for the delivery together, and are all excluded at the fame period. The young *pucerons*, when firft brought forth, are always paler coloured than the parent; but are of the fame fhape and ftructure, except that their bodies are fomewhat flatted.

We fee that they are able to move their legs before they are perfectly excluded from the parent, and as foon as they are fo, they walk and feek a place where they may fix their little trunk into the plant, for the receiving nourifhment. This they always choofe to do as near to fome others of their fpecies as they can, always loving to live in communities. The young one always places its head as near as poffible to the hinder part of the next to it, and thus they continue enlarging their bodies at every new birth. Thofe which live upon the leaves of trees and plants, always fix themfelves on the under fide, being there moft fheltered; and as their number is always very great, they frequently much alter the plant whofe juices they fuck; tho' fome fpecies, both of trees and plants, bear this much better than others. Id. ibid. p. 15.

Thefe little infects are extremely plentiful on many different trees, and are very eafily obferved in their feveral ftages and progreffions by a curious fearcher after them; but if at any time they are not fo eafily found, the perfon who feeks after them may be conducted to them by the ants, which he will find moving in great numbers on the trees and plants where they are, and pointing out the way to them

Mr. Lewenhoek, Hartfoeker, and others, have obferved this, and have fuppofed that the ants fed on them, by their frequenting the places where they are found; but that is far from being the cafe, the ants, on the contrary, feem to love them as friends. Goedart judged better of the matter, and efteemed the ants of great benefit to the nation of *pucerons*, in deftroying many of their bloody enemies. Goedart, however, erred greatly in fuppofing the ants to be the mothers of the *pucerons*; yet this is an error that has place among our gardiners to this day, they all fuppofing that the ants leave a flime behind them, out of which, according to the opinion of this laft author, they judge them to be produced. We may, however, eafily find out the reafon of the ants following the clufters of *pucerons*, without doing them any injury, when we confider that the ants love fugar and all fweet things, and the places about which the *pucerons* are have ufually the cavities filled with a thick faccharine matter, formed of the juices of the plant, extravafated by the wounds they make in it, and dried up to this confiftence by the heat of the fun.

The bladders of the leaves of the elm always contain a large quantity of a faccharine juice; but thofe of the black poplar have always a much fweeter and more delicious fluid in them; and very often on other trees, the extravafated faccharine juice may be feen among the clufters of thefe animals, and the ants crawling over their backs to feed upon it.

This liquor of the elm has not efcaped the obfervation of the fearchers after remedies from the vegetable world; but tho' great virtues have been attributed to it by many, none have yet given any true account of its origin. The moft natural opinion would feem, that it was the juice of the tree fimply extravafated; but experience fhews that it has another origin: it is really the excrement of thefe *pucerons*; they receive no folid food into their bodies, all that is conveyed into them coming through their trunk, which is an extremely fine pipe; and as none but a very thin and pure juice can be received through fuch an organ, it is no wonder that the creature which lives wholly upon it fhould void no folid excrements. If a parcel of the *pucerons* be watched, it will not be long before one or other of them will be found voiding a fmall round drop of this liquor by the anus, and after that, feveral more; which all falling upon one another, form the vifible drop on which the ants feed. The creature feems in fome pain on the voiding this, and very often the hinder legs may be obferved affifting in removing it from the anus.

Mr. Reaumur obferved, that it was common to find feveral drops of this liquor on the leaves of fome trees; and that, tho' they were fluid and limpid, when firft evacuated from the animal, they became more and more thick afterwards, refembling honey after a few days, and after that drying up fo as not to be eafily removed from the leaves: and Mr. Geoffroy obferved, that the liquor of the bladder of the elm became, when dried, as hard as the gum of the cherry-tree. The drops of this liquor is not fo frequently found on the leaves of plants as might be expected, and that becaufe many of them are immediately devoured by the ants, and many others are dried up by the fun; but they may always be found collected in fome quantity in the bladders of the elm, and other trees inhabited by thefe creatures, as there the liquor is defended from the heat of the fun, and is fafe from being devoured. *Reaumur's* Hift. Inf. Vol VI. p. 49.

The two horns which are placed on the hinder part of the body of this infect are as fingular in their ufe as in their appearance; they are hollow, and they at times excrete alfo a liquor

quor as limpid and clear as that of the anus. This ftands in round drops at the end of one or both of them at once, and refembles heads upon pins. This liquor, tho' limpid in fome fpecies, is, however, reddifh and thick in others; as particularly in thofe of the willow: and as this feems plainly to be an excrement, the creature is very fingular in having its different paffages for thofe of different kinds. The liquor voided by the aperture at the extremity of the body, which refembles the anus in other animals, appearing to be the urine; and this by thefe two horns, the fæces of the bowels. At any time when there is not a drop to be feen upon either of the horns, if the body of the animal be gently fqueezed, a drop will always be forced out either from one or both.

The *puceron*, like moft other infects, changes its fkin three or four times before it arrives at its full growth. Thefe exuviæ perfectly refemble the animal in its natural ftate, the legs and other parts being all in their proper places; but whatever is the colour of the fpecies of *puceron*, thefe fkins which it cafts are whitifh. They lie in great numbers about the leaves where the creatures are, and among them there is ufually found a cottony matter. This at firft fight might be miftaken for the fkins, reduced to a kind of powder; but on a clofer examination, it appears to be truly filamentous, and on a nice infpection is found to be the natural produce of many fpecies of the animal. All thofe kinds of *pucerons* which are not fmooth and gloffy, as if varnifhed, have more or lefs of this cottony matter about them: in fome the whole roughnefs of the furface is made of it; and in others, it ftands in white fpots on feveral parts of the body.

Thofe *pucerons* which inhabit the bladders or leaf-galls of the elm and other trees, and thofe which live in the folded leaves of the black poplar, are all of the nature of thofe which produce the largeft fhare of this matter: they have it hanging in long ftrings in an odd manner from their bodies, and often are fo compleatly covered with it, that they look as if they had been wetted, and then rolled in meal.

On examining the leaves of fome plants and trees inhabited by thefe animals, there is feen a fort of collection of this down into parcels, fo that they refemble the white feathers of a bird in miniature. The leaves of the beech-tree afford thefe plumes in the greateft perfection, and frequently they cover its leaves in whole clufters, and are an inch or more in length. Thefe plumes, or clufters of plumes, feem all to grow out of the leaf, and are much thicker at their bafe than at their extremity; a great number of the plumes that compofe them being fhorter than the reft, and not running to the extremity. The longer plumes divide themfelves into two clufters near their origin, and thefe never unite again afterwards: when examined by the microfcope, each plume appears to be compofed of feveral other plumes or threads, like thofe of cotton, which are undulated, but not twifted together. Tho' thefe clufters of plumes feem to be fixed to the leaf, yet when more clofely examined, that is found not to be at all the cafe; but that they really proceed from the body of a *puceron*. The different threads or plumes arife from the different parts of the body of the animal, and altogether they hide it abfolutely from fight as it ftands on the leaf. When the bottom of the tufts are examined, however, there are always found either the bodies of the *pucerons*, or their exuviæ; for when they quit their fkins, they quit thefe filaments with them.

Tho' thefe long threads might feem a confiderable load for fo fmall an animal, yet when the creature is touched it always moves very brifkly, and as it creeps along, generally leaves fome of its plumes in the way; but in its motion, no other part of it than the head, and the foremoft pair of legs are feen. *Reaumur*'s Hift. Inf. Vol. VI. p. 53.

The young brood of this fpecies are green, and only by degrees acquire this white down; which at firft appears only in form of a farinaceous powder, and by degrees lengthens out as we fee it. The old ones alfo, when they have newly changed their fkins, have it not at all; and when it afterwards grows upon them, it is by thefe degrees, and in this manner. The leaves of the common bramble alfo afford this remarkable fpecies of *puceron*; and the common meadow crowfoot is frequently covered with clufters of them at its lower part, refembling a white mouldinefs. The filaments that cover the bodies of this fpecies of *puceron*, are not at all of the nature of the filky matter fpun by other animals; but feem to be produced from every pore of the body, and to iffue thence in form of fmall round globules of a liquid matter, which harden with the air, and adhering to one another as they iffue out, form this fort of plume, a congeries of which make the tufts we fee.

The male and female *pucerons*, as they are ufually fuppofed to be, differ greatly from one another in form, even in their time of growing; but much more eminently at the time of their maturity, the male having then wings, which the females never have. Lewenhoek and others, who have treated of thefe animals, have fuppofed that they all became at length little flies, that is, were winged; but this is a great error.

The young male *pucerons* may be diftinguifhed from the females by having a fort of eminence on their fhoulders, of a fquare form; which is owing to the young wings. The feveral changes of the fkin which thefe animals have, make no great difference in their form till the laft, when the males appear with their wings at liberty. A little before this laft cafting off the fkins, the males are feen to have a fort of tuberofity alfo on each fide, which is owing to the wings, folded up there within the fkin; but the females, tho' much larger than thefe, have no fuch protuberance.

The winged *pucerons*, when they have caft off their laft fkin, and have their wings loofe, do not, however, fhew them immediately; for they are folded clofely together, and the creature then appears like what it was before, being all over green, and having only two eminences on the fide: but in a quarter of an hour, the head and fhoulders change from their green colour to a fine fhining black, and the wings unfold and expand themfelves, and then cover a large part of the body, and extend themfelves to a confiderable length beyond it.

Thefe now appear animals wholly different from what they were before, and many of the flies which we fee in our gardens are of this kind: the animal, however, tho' it appear fo very different from its fellow infects, is much more like them, when clofely examined, than could be imagined. It ftill carries the great character of the genus, which is the having two horns growing out from the hinder part of the body, and ftill has its trunk, and lives by fucking the juices of plants. *Reaumur*'s Hift. Inf. Vol. VI. p. 57.

Notwithftanding, however, the general opinion, that the winged *pucerons* are all males, and the unwinged ones females, it appears that their manner of generation is yet unknown to us. This opinion was founded too haftily by fome from a fuppofed analogy of thefe and other infects; but later obfervations prove, that this is not ftrictly the cafe: for that the winged ones, as well as the others, bring forth young ones. Some have fuppofed, that thefe winged and naked *pucerons* were the offspring of different families of feveral fpecies living together; but the contrary is proved by this, that the winged ones are found to produce fome winged and fome naked ones; and the naked to produce both kinds in the fame manner. Some have imagined, that they found the male *pucerons* among the others, obferving fome of a flatter fhape, in whofe bodies there were never found any young ones, as there always were in the others, even when they were very young; but thefe have been fince found to be only fuch females as had already brought forth their offspring.

The young *pucerons* being themfelves filled with embryos, and that in every individual, fo that all that have been ever examined appear mothers, has given many ftrange ideas of the manner of their generation: many have imagined them all to be hermaphrodites; and as no copulation has ever been obferved among them, they are by fome fuppofed to be able to impregnate each itfelf. The later opinion, however, is, that when a female is once impregnated by a male, fhe will bring forth young ones already impregnated with others, and thus to the third or fourth fucceffion; fo that copulation is only neceffary to thefe animals once in three or four generations, and the children and childrens children of an old *puceron* that has had congrefs with a male, will bring forth young ones without having ever had any fuch congrefs. *Reaumur*'s Hift. Inf. Vol. VI. p. 59. See the articles Wood-*puceron*, Oak-*puceron*, &c.

Bladder Puceron, a fort of *puceron* that lives in bladders on the leaves of trees. See Puceron, *fupra*.

We often obferve on the leaves of different trees, a fort of roundifh bladders, which only adhere to the leaf by a fhort pedicle: thefe are a fort of fmall galls, and their figure varies much in the different kinds; fome are lefs round than others, and many are very rough on the furface; and fometimes they are long, terminating in a point, and being broader at the bafe than in any other part, and fuftained by no pedicle, but fixed immediately to the leaves.

The elm and afh afford us more frequent inftances of thefe than any other trees, and very often on the firft of thefe they grow to the bignefs of a nut, and fometimes much larger; and when they are grown to their full fize, they often take up the whole furface of the leaf. When thefe bladders are opened, they are found to contain a large number of *pucerons*.

If thefe bladders are examined at the time when they are but newly rifen, which ufually is in the beginning of June, on opening them there is ufually found in them only one *puceron*, and that always a female big with young; and in others more advanced, the parent infect is found furrounded with different numbers of her young ones. Thefe bladders have all of them at firft only one female *puceron*; but afterwards they have more, as they become larger; and the largeft of all are ufually found filled with a prodigious number of young ones. The newly rifen bladders are always found clofe and firm in every part, the aperture at which the female *puceron* had entered, being ufually neatly and clofely ftopped up. The queftion is, how this bladder was formed?

We very well know, that winged infects of feveral kinds prick holes in the leaves and branches of vegetables, and depofit their eggs in them; and that thence arife all the various fpecies of galls, the eggs hatching within thofe tumors into worms or maggots, and thefe finally becoming winged infects like their parents.

Malpighi has given an excellent account of the feveral fpecies

of

of these galls; but he has not mentioned any of them being produced by a viviparous insect, for the bringing up her numerous family: he has not omitted the bladders on the leaves of trees among the numbers of galls, but he has had no true idea of their origin; nor could this, indeed, have been any way found out, but by the observation that the creatures contained within them were of the same nature and origin with those on the surface of the same or other leaves.

There seems no doubt, but that each of the female *pucerons* found in the bladders of these leaves, has been herself the occasion and the maker of that bladder in which she is found so close shut up.

It would be natural to suppose, that the creature formed herself this lodgment when she found herself loaded with young, and under a necessity of being delivered of them: but this is not the case; for a female *puceron* taken in this state, and placed upon a leaf, makes no attempt towards the making herself such a lodging; and there are taken out of the new-risen bladders many single animals of this kind, which are so far from being about producing their young, that they are not full grown. These, however, are always females.

The method of the formation of them seems to be this: as soon as the female *puceron* is produced, she fixes her trunk into the leaf to suck its juices; the consequence of this in all the *pucerons* is, that the surface of the leaf separates a little from the nervous part: in the common cases the creature takes no advantage of this, but only continues sucking the juices; but in this kind, the female, as soon as she has made the separation between the parts of the leaf, gets into the cavity that is formed there, by enlarging the orifice first made by the trunk, till it will admit her body. When once in, she works forward in a strait line, and the hole behind her soon closes up, as there was no rupture, but only a stretching open of the parts of the leaf. The female thus finds herself in a secure place, and the elevation she makes in the leaf is scarce perceivable, only appearing as an oblong small species of gall. The mark of the aperture at which she made her way in, is always to be seen at some distance behind her, tho' usually very neatly closed up: thus the whole continues till the creature produces her young. But then the scene is quite altered; the young ones begin to suck as soon as produced, and as they usually seize upon the sides of the small gall, already formed for that purpose, this derives more juices than otherwise would flow into it; and it begins to elevate itself much higher, and forms a tubercle of the shape of a nut or pear.

Its growth in this case is entirely analogous to that of the common galls on the branches of trees, *&c.* and all the difference in the shape of the several bladders, is owing to the manner of the young *pucerons* sucking: for if they suck much at its base, that enlarges and becomes the broadest part, as is the case in the conic and pointed ones; but if they let this alone, and suck only the sides and upper part, they swell while this does not, and consequently this forms a sort of pedicle to the growing bladder. *Reaumur*'s Hist. Inf. Vol. VI. p. 33.

Bastard-PUCERON. See FIG-*insect*, and GRUB *of the box*.

Earth PUCERON. See EARTH.

Grub PUCERONS. See GRUB.

PUCERON-*eater*, or *Lion* PUCERON. See LION *puceron*.

Oak PUCERON. See OAK.

Ver PUCERON. See VER *puceron*.

Wood PUCERON. See WOOD.

PUCKAUN *beady*, in natural history, a name given by the people of the East Indies to a peculiar species of orpiment, which they use in medicine.

They find it on the hills and on the banks of rivers. It is prepared by several tedious processes, and then is given with success in a diabetes.

PUDDINGS, in a ship, are ropes nailed to the arms of the main and fore yards, near the ends, and then at three or four due distances inwards one from another, in order to keep the robbins from galling or wearing asunder upon the yards, when the top-sail sheets are haled home.

They call also those ropes which are wound about the rings of anchors, to save the clinch of the cable from being galled with the iron, by this name; so that when the ring is so served, it is called the *pudding of the anchor*.

PUDDING-*stone*. See the article OCULATUS *lapis*.

PUDENDA (*Cycl.*)—It is remarkable, that among the fish-tribe all that are oviparous have no *pudenda*, properly speaking; that is, they have no penis or vulva, unless the ovaria of the females and the vasiculæ seminales of the males may be called by that name.

The viviparous fishes, on the other hand, as the cetaceous fishes in particular, and many kinds of the cartilagineous, have the penis and vulva, distinctly and properly so called. *Artedi* Ichthyolog.

PUDIANO, called also *pœdiano*, and by others *vermelho*, *apaimixira*, and *tetimixira*, a fish of the size of a middling pearch, but not so broad as that fish.

Its head is small, its nose pointed, and the upper part of its mouth furnished with very sharp teeth; its lower part with others extremely minute. Its eyes are prominent, and the rays of its back fin are rigid and prickly. Its scales are extremely small, and so closely laid, that it seems smooth to the touch. Its whole body is of a gold-yellow; but that the upper part of its head, and its back to the end of the back-fin, are of a very beautiful purple. The rim or edge of the belly-fin is also purple, and the rest of a gold-yellow. It is a wholesome and well tasted fish. *Ray*'s Ichthyol. p. 339. *Marggrave*'s Hist. Brasil.

PUDIANO *verde*, in zoology, the name of an American fish of a very remarkable colour, and very well tasted and wholesome. See Tab. of Fishes, N°. 60.

It is of an oblong shape, and its usual size is about ten fingers long, and three broad in the broadest part; for towards the tail it is but about half that breadth. Its mouth is small, and its upper jaw furnished with two long teeth, and a great number of short ones; and its under one with four long ones, and a like number of small ones. Its back-fin is very long, and is supported by prickly rays. It is of a yellow colour, and variegated with longitudinal streaks of blue. Its tail is not forked, and is of a reddish brown, variegated with a bluish green, and has a border of green at the end. Its scales are broad, and are so disposed, as to represent so many cubes. These are all of a fine yellow, and each has a rim of a bright blue all round its edges; and the whole fish is very elegantly variegated with blue, yellow, green, and white streaks. *Marggrave*'s Hist. Brasil *Willughby*'s Hist. Pisc. p. 340.

PUFF-*ball*, the common English name for the *fungus pulverulentus*, or lycoperdon. See LYCOPERDON.

The dust contained within this body, (which, when it is crushed, flies out in an inconceivably fine powder, in form of a cloud of smoak) when examined by the microscope, appears to be a multitude of regulary figured, tho' extremely small bodies. These require the most powerful magnifiers to distinguish them, and are found to be little globules of an orange colour, and somewhat transparent; and so small, that the cube of the diameter of a hair, would be equal to an hundred and twenty-five thousand of them. In other species of this mushroom, the globules are evidently seen to be so many *puff-balls*, being of a darker colour, and having each a little stalk or tail: by means of these stalks they penetrate into the ground, when shed from their parent plant.

The dust of these mushrooms is very hurtful to the eyes, and we have had instances of persons being blinded for a long time by it, with violent pain, swelling, and inflammation; and this is probably owing to the sharpness of these almost inconceivably minute stalks or tails. *Baker*'s Microscope, p. 255.

PUFFIN, in zoology, a name by which some call the anas arctica Clusii. See PUFFINUS, *infra*.

PUFFINET, in zoology, the name of a bird known among authors by that of the *columba Groenlandica*, or the Greenland or sea turtle-dove.

It is common on the northern coasts, and is black all over, except two small spots on its head: but it is pretended by some, that in winter it turns white. *Ray*'s Ornithol. p. 245.

PUFFINUS, in zoology, the name of a water fowl, with its three fore-toes connected by a membrane; but its hinder ones loose, and with a sharp and crooked beak. It is called in English the *puffin*.

It is larger than the tame pigeon: its head, neck and back are black: its breast and belly white: its beak is two fingers breadth long, and its base covered by a naked membrane, and has on each side a furrow, running from thence to the end of it: its wings are very long, and its tail a hand-breadth long, and black: it is extremely common in the Isle of Man, but is so fat, that its flesh is accounted unwholesome unless it is salted: it is also common in the Scilly islands. They breed only in the culf of Man, an uninhabited part of the first mentioned island, and each female lays only one egg.

They lay in rabbit holes, and as soon as the young are hatched, they follow their parents all day to sea, returning only in the evening. The people take them early in the morning, about the time of their going out, and that every man may remember how many he takes, he always cuts off one of the legs, and keeps it in his pocket; hence the vulgarly obtained opinion, that *puffins* have but one leg. *Ray*'s Ornithol. p. 252.

PUGNAX *avis*, in zoology, the name of the bird called in English the *ruffe*, and the female of which is the *reeve*. It has its Latin name from its quarrelsome disposition, the males being always fighting. See the article RUFFE.

PUGNITIUS, in zoology, the name of the common stickleback, or barnsticle, called also from its spines *aculeatus*, and by some authors *spinachia*, *turonilla*, and *centiscus*.

It is a very well known fish, and is found every where in new dug ditches, *&c.* where no body can perceive how it comes. Hence the vulgar have an opinion, that it breeds there equivocally and of itself, without the help of parents of its own kind; and that from it all other fishes are bred.

These are idle opinions: the smallest animalcule is not produced in putrid matter otherwise than by the egg of a parent animal; this origin will, therefore, hardly be believed of larger, and, as they are called, more perfect animals. These small fish are so far from peopling ponds with other fish, that they are very great devourers of the spawn of larger fish, and do infinite mischief in ponds.

There are two ſpecies of this little fiſh, the one larger, of two inches or more in length, and conſiderably thick. This has but five prickles, three on the back and two on the belly: this laſt is fixed to a penniform bone, very hard and ſtrong; for inſtead of belly-fins, this has two triangular bony laminæ. It has no ſcales, but its ſides are defended with a bony armature, reaching from the ſpines on the back to thoſe on the belly. It can raiſe or depreſs its ſpines at pleaſure. This ſpecies is common in our ditches; and they ſometimes ſwim in immenſe ſhoals together in the ſea.

The other is the ſmaller kind: this is ſhorter and much ſlenderer than the former, ſo that it appears proportionably of a longer figure. It has ten or eleven ſpines on its back, and theſe not ſet in an even row, but alternately bending one to the right, the other to the left; and it has bony laminæ inſtead of belly-fins, and two ſpines or prickles on them; and one behind the anus. This ſpecies has not the bony armature on its ſides that the larger has. It is common in our ditches. *Ray*'s Ichthyol. p. 341. ſeq.

PUGNITIUS *Lingus*, in zoology, the name of a Weſt Indian ſea-fiſh, caught about Chili and in ſome other places, and approaching in many particulars to the European *pugnitii*.

It is a ſmall animal; its body is ſquare, and of a tender conſtruction; of the thickneſs of a finger, and of five, ſix, or ſeven inches long, becoming gradually ſmaller towards the tail: its ſkin is ſmooth, and its back is black; its belly yellow: its head reſembles that of the pike, but that the noſe is ſomewhat longer: it has two fins at the gills, one of a triangular ſhape on the back; and from this to the neck there are placed a row of fifteen prickles, which bend a little backward, and are not connected by a membrane. On the middle of the belly it has alſo two ſpines at the two ſides, and one behind the anus: behind this there is a fin anſwering to that on the back, and the body is terminated by a fine ſmall tail. *Schonefeldt*'s Hiſt. Piſc. *Ray*'s Ichthyol. p. 340.

PULCHER *piſcis*, in ichthyology, a name given by Gaza to the fiſh commonly known by the name of the *uranoſcope*, or ſtargazer. See URANOSCOPUS.

It is a ſpecies of the trachinus, and diſtinguiſhed by Artedi by the name of the *trachinus*, with many beards on the lower jaw. See TRACHINUS

PULEGIUM, *penny-royal*, in botany, &c. a name given by authors to the common water-mint. Vid. *Linnæi* Gen. Pl. p. 271. *Tourn.* Inſt. Bot. p. 189. *Rivin.* Vol. I. p. 31, 32. See alſo the article MENTHA.

Penny-royal is among the firſt plants in eſteem in the preſent practice, as well as in former ages, as an attenuant and uterine. It promotes the menſes, and forwards delivery. It is good in flatulencies and ſuppreſſions of urine, and by many is greatly recommended in dropſies, jaundices, and other chronic diſtempers. It communicates its virtues very readily to water in infuſion, and its ſimple water drawn by the alembic, has, perhaps, more virtue than any other kept in the ſhops. Its eſſential oil is ſometimes, tho' rarely, uſed in the ſame intentions with the water.

PULEX, the *flea*. It is to Signior Redi that we owe the true hiſtory of the generation of this common and troubleſome animal.

The *flea* lays its eggs, and from each egg is hatched a ſmall worm: this worm ſpins itſelf a bag of ſilk, in the ſame manner that the ſilk-worm does; and out of this bag it comes at laſt in the perfect form of a *flea*, as the other does in its winged ſtate.

The *flea* depoſits its eggs on the bodies of dogs, cats, and other animals, and on the clothes of men, or the beds, and other places where they ſleep. Theſe eggs being round and ſmooth, ſlip eaſily down till they come into ſome fold of the clothes, or ſome other place, where they are hatched. In this place each egg produces a ſmall white worm of a ſilvery appearance; theſe worms feed on the white ſcurfy matter which is found in great plenty on the ſkins of dogs and other animals; and they are alſo found among the folds of linnen in drawers and other places: they are a fortnight in arriving at the full bigneſs of the worm ſtate, and will roll themſelves cloſe up into a ball, in the manner of the wood-louſe, when touched.

They ſoon after this ſpin themſelves their web, in which they lie a fortnight, and then come out perfect *fleas*.

The *flea*, if examined a day or two before its full growth in the bag, is found to have all its parts and lineaments; but it is ſoft and white. After this it gradually becomes hard and coloured, and when it comes out of the bag, is as ſtrong and large as it ever is to be.

PULEX-*eaters*, a name given by naturaliſts to a ſort of worms frequently found on the leaves of trees, where they devour the animals called *pulices arborei*. Vid. infra.

Of theſe there are ſeveral ſpecies, which owe their origin to the eggs of different creatures; for they are none of them in their ultimate ſtate in this their time of feeding. According to the different animals whoſe eggs they are hatched from, theſe are of different form and ſtructure: ſome are hexapodes, or endued with ſix feet; theſe belong to the beetle tribe, and finally change into beetles like the parent animal from whoſe eggs they ſprung: others have no legs, and are produced from the eggs of flies of various kinds: and finally, others are genuine caterpillars, tho' ſmall; but theſe are the moſt rare of all.

The two general kinds are the hexapodes, or beetle-worms, and the apodes, or fly-worms. The fly which gives origin to the laſt of theſe is a four-winged one, and takes care always to depoſit her eggs in a place where there are plenty of the *pulices*, uſually on the ſtalk or young branches of a tree in the midſt of large families of them. The worm, as ſoon as hatched, finds itſelf in the midſt of abundance of food, preying at pleaſure on theſe animals, which are wholly defenceleſs. The ſtalk of the elder and woodbine are frequently found covered over with theſe *pulices*, and among them there may uſually be found one or more of theſe deſtroyers feeding at will, ſucking in the juices from their bodies, and then throwing away the dry ſkins. Beſides the worms of this four winged fly, there is one of a two-winged waſp-fly, very deſtructive of theſe animals. *Reaumur*'s Hiſt. Inſ. T. 1.

PULEX-*arboreus*, in natural hiſtory, the name given by Mr. Reaumur to a very large genus of ſmall animals. They are a kind of half-winged creatures; they have granulated antennæ, and ſome of them, in their moſt perfect ſtate, have complete wings. Theſe are diſtinguiſhed from the others by the name of *muſca pulex*, or the *winged-pulex*.

The ſeveral ſpecies of theſe creatures are of different colours; ſome are brown, others yellow; but the moſt frequent are green. They all feed upon the leaves of trees, which become withered and curled up on their eroding them; and they are ſo common, that wherever a leaf of a tree is found curled up, or of a different form from the others, it is highly probable theſe animals are on it, or that it is their work. Among trees the willow and the roſe are the moſt infected by them; and among plants, the bean and the poppy. They live a ſocial life, multitudes of males and females being found together. The females are eaſily diſtinguiſhed from the males, by their being thicker in the body, and having larger bellies.

It is very wonderful, that of all the known animals of the winged kind, theſe are the only ones which are viviparous. This is eaſily ſeen beyond a poſſibility of doubt; for on examining a cluſter of them together, it is a common thing to ſee, by the help of a ſmall magnifier, a female in the act of parturition; and the author of this account frequently ſaw the young *pulex* protruded out, from a paſſage near the anus of the female, perfectly formed. He had ſuſpected this from the total want of eggs among ſo numerous a tribe of animals, and from their remarkably ſpeedy propagation, and was thus convinced of it by ocular demonſtration.

They are armed with a tender and flexile proboſcis, with which they ſeize hold of the young ſhoots of the tree: they live upon twiſting the proboſcis round it. Theſe creatures are always ſeen naked and expoſed, ſtanding on the outſide of the ſtalks and leaves, and ſucking in their juices for nouriſhment with their proboſcis. But there is another ſpecies of them, which are alike viviparous, and agree with them in all reſpects, except in their manner of living. Theſe get into the inner ſubſtance of the leaves, like the worms called *aſcarides*, and feed on the parenchyma, being defended from all injuries by living between the integuments. In this caſe, the leaves they bury themſelves in become ſcabrous and deformed, and produce a ſort of galls: ſo that Malpighi erred in ſuppoſing all the galls of trees to be produced by the animals hatched of the eggs of ichneumon flies; ſince theſe animals which are viviparous, and are of a very different kind from the worms of the ichneumon flies, equally produce them. A female of the ſpecies here treated of has been ſeen to bring forth ſeven young ones in one day; and thus, from reſiding alone in the tubercles which ſhe had formed on a leaf, ſhe in a little time becomes the mother of a numerous family; each of which raiſes its own tumor or gall on the leaf, which at firſt are ſmall and round, and of a beautiful red like kermes.

Such of theſe as are of the male ſpecies have a certain time of reſt, in which they lie buried in a ſilky matter, and afterwards become winged, flying nimbly about; whereas the females never are able to fly, but remain always half-winged. It is to be obſerved, however, that there is a different ſpecies of winged inſects frequently found flying about the female *pulices*, as well as their own males; ſo that all the ſmall-winged inſects about them are not to be thought of their own ſpecies. Theſe do not greatly differ in figure; but the one are harmleſs, and the others have ſtings, and hurt any part of the body on which they fix. *Reaumur*'s Hiſt. Inſ. T. 1. See PSEUDO-*pulex*.

Locuſta-PULEX. See CICADULA.

PULMONARIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a cylindric, pentagonal, perianthium, conſiſting of one leaf divided into five ſegments at the edge, and remaining after the flower is fallen. The flower conſiſts of one petal, in form of a cylindric tube, of the length of the cup, with its edge ſlightly divided into five ſegments, and its mouth open. The ſtamina are five very ſhort filaments, ſituated in the opening of the flower. The antheræ are erect, and converge one toward another. The piſtillum has four germina. The ſtyle is ſlender and ſhorter than the cup, and the ſtigma is obtuſe and emarginated. The cup, without ſuffering any changes, ſerves in the place of a fruit, containing in its bottom four roundiſh-leaved obtuſe ſeeds. *Linnæi* Gen. Pl. p. 59.

The characters of *pulmonaria*, according to Mr. Tournefort, are

are these: the flower consists of one leaf, and is funnel-fashioned, and divided into many segments at the edges. The mouth is wide, and resembles a sort of basin. The cup is tubular, and usually of a pentangular form, and divided into five segments. From this arises a pistil, which is fixed in the manner of a nail to the lower part of the flower, and is surrounded by four embryos, which afterwards ripen into so many seeds, which are contained in the enlarged cup. *Tourn.* Inst. p. 136

The species of *pulmonaria*, enumerated by Mr. Tournefort, are these: 1. The common spotted-leaved *pulmonaria*, resembling buglos. 2. The common broad-leaved white-flowered *pulmonaria*. 3. The blue-flowered Alpine *pulmonaria*, with soft and roundish leaves 4. The plain-leaved not spotted *pulmonaria*. 5. The echium-leaved *pulmonaria*. 6. The white-flowered *pulmonaria*, with echium leaves. 7. The red-flowered echium-leaved *pulmonaria*. 8. The blue-flowered, echium-leaved *pulmonaria*. 9. The narrow-leaved Alpine *pulmonaria*. 10. The soft *pulmonaria*, with the strawberry smell. 11. The annual Cretic *pulmonaria*, with bladder cups. 12. The *pulmonaria*, with roundish, plain, green, not spotted leaves.

The figure of the flower-cup is what principally distinguishes the *pulmonaria* from the buglofs, &c. and the plants of it may be usually known when not in flower, by their long, rough, and not divided leaves, which in almost all the species are spotted, so as to resemble the tabid lungs of an animal, whence it had its name. *Tourn.* Inst. p. 137.

The common spotted *pulmonaria*, or, as we vulgarly call it, *sage of Jerusalem*, is esteemed an excellent medicine in many of the disorders of the lungs. It has been known to do great service in spittings of blood, and stands greatly recommended, externally used, as a consolidator and healer of old ulcers, as well as fresh wounds.

PULSATILLA, *pasque-flower*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the rosaceous kind, consisting of several leaves disposed in a circular form. The pistil arises from the center of the flower, and is surrounded by stamina. The pistil becomes at length a fruit, to which there are fixed a number of seeds, each of which terminates in a slender filament. The *pulsatilla* has, like the anemone, a regular set of leaves growing from one part of the stalk under the flower; but differs from it in having its seed naked, and terminated by the long filament just mentioned.

The species of *pulsatilla*, enumerated by Mr. Tournefort, are these: 1. The purple *pulsatilla*, with thick leaves and a large flower. 2. The double violet-coloured *pulsatilla*, with fimbriated flowers. 3. The marsh *pulsatilla*, with more finely divided leaves and smaller flowers. 4. The finely divided-leaved or marsh *pulsatilla*, with paler coloured flowers. 5. The *pulsatilla* with small blackish flowers. 6. The smallage-leaved spring *pulsatilla*, with larger flowers. 7. The smallage-leaved spring *pulsatilla*, with smaller flowers. 8. The smallage-leaved autumnal *pulsatilla*. 9. The roundish-leaved *pulsatilla*. 10. The *pulsatilla* with red, obtuse-leaved flowers. 11. The white-flowered *pulsatilla*. 12. The double white Pyrenean *pulsatilla*. 13. The celeri-leaved yellow-flowered *pulsatilla*. 14. The wild parsnep-leaved yellow *pulsatilla*. 15. The yellow rough-leaved Alpine *pulsatilla*. *Tourn* Inst. p. 284.

PULSATOR, a name given by some writers to that species of beetle, commonly known among us by the name of the *death-watch*, and about which so many superstitious fancies prevail.

The manner of the creature's making its noise is this: it lifts itself up on its hind legs, and somewhat extending, or rather inclining its neck, strikes down its face with great strength and agility, upon any substance on which it happens to be placed. It is often found on the matted bottoms of old chairs, and seems to use the motion which makes this noise, in order to get its food. It is usually found standing on a part of the sedge where the outer covering is off, and the pithy part exposed; and it usually works at the side or edge of this place, in order to the getting off more of the outer bark. Where it is found there are usually several of these bald places in the sedge, which seem to have been places where it was before employed in getting its food. Every stroke the creature gives may be seen to have a sensible effect upon the sedge, and where it strikes a sound part, the impression is seen to be a dent as large as a silver penny.

The creature is called by some *scarrabæus galeatus*, from a sort of galea, or helmet, which it wears. It is about a quarter of an inch long, and is of a dusky brown colour. Its helmet is very broad in comparison of its bulk, and when the creature is at rest, it draws in its head under this covering.

PULSE (*Cycl.*)—It is certain that the climate will alter the *pulse* of persons, and on this is founded the observation of *pulses* being naturally various in the people of different nations. The *pulses* of Frenchmen are said to be more equal and quick, and those of the British, Dutch, and Germans, more irregular and uncertain; and this is to be jointly attributed to the air of the country, and to the manner of living.

In general, the higher and nearer the sun is, the quicker is the *pulse*; and the lower and farther off, the slower. In rainy seasons, the *pulse* is more free and quick, because of the smaller pressure of the atmosphere. It is more impetuous in the spring; more equal after a quiet sleep; weak and uncertain in men very intent upon business.

Melancholy renders the *pulse* extremely inconstant, probably through the great thoughtfulness of such men; in bilious tempers it is high and strong; in sanguine, more equal and regular than in any: in the phlegmatic, equal enough; but more slow: in children, especially infants, the *pulse* is very small; and in old men it is extremely uncertain: in glutonous people it is dull and slow, unless by drinking it is made stumbling and vertiginous: this sort of *pulse* also frequently foretells sudden death By too sparing a diet it becomes small and slow, and always abates upon fasting. By the passions the *pulse* may be also greatly altered; but most of all by fear, joy, and anger. In fevers the *pulse* is varied according to the beginning, heighth, and declination. In scorbutic and hysteric persons it is very uncertain: in hydropical persons it is much stopped and interrupted by stagnant humors: in the gout it is free and expedite: in the plague, as in the asthma, it is mightily oppressed, unless freed by the hot fit. In general, any variation of the *pulse* certainly denotes some alteration in the habit of the body.

The *pulse* is unequal either in regard to time or strength; that is, it either strikes quicker and slower, or stronger and weaker. The first is common in most acute distempers, and does not threaten any immediate danger; but the latter, both in acute and chronic cases, is always a dangerous symptom: very often it is the forerunner of death, which happens two or three days after this is first observed. It is said to be interrupted when the strokes are much smaller and weaker than at other times, or their intervals much greater. This first shews a great decay of strength; and the latter, which is, as it were, a cessation for a time, denotes approaching palsies, apoplexies, and the like terrible distempers, and sometimes death itself

The intense *pulse* is when the stroke is very hard, the parts being, as it were, upon the bent; or else this strength is made up by the multiplicity and frequency of less mications, as in the heighth of acute fevers.

The remiss *pulse* has strokes less quick and strong, and in sickness shews more danger than the other. The superficial *pulse* shews an exact temperament of body, as also a free and easy temper of mind.

The deep *pulse* shews a disposition to melancholy, asthmas, and lethargies, and is more frequent in the aged than in young people.

The leaping *pulse* often shews no great danger, but the trembling *pulse* is usually a fatal symptom, after which very few people recover.

But of all others the wandering *pulse* is the most terrible and fatal; this is felt sometimes in one part of the artery, and sometimes in another, and sometimes in no part at all. This is a certain fore-runner of death, and that usually very speedily following; and if great power in nature gives a short reprieve after this, it is only a very short relief. *Abercromb.* de variat. Pulsus.

The *pulse* has been observed to beat faster in persons electrified. Phil. Trans. N°. 478. p. 59. See ELECTRICITY, *Cycl.*

PULSILOGIUM, a name given by authors to a pulse-watch, or instrument to measure the celerity of the pulse. Sanctorius was the first inventor of this machine; but several have since spoke very largely in praise of it, and Sir John Floyer wrote a treatise on this subject.

PULSUS *latus.* See LATUS *pulsus.*

PULVERATICUM, in Roman antiquity, the fee paid to purveyors for their trouble; also a sum exacted from the provincial cities by their garrisons. *Pitisc.* in voc.

PULVILLUS, in surgery, a term used to express a little pledget-bolster, or compress

PULVINARIA, in Roman antiquity, cushions upon which the statues of the gods were laid in the temples, at the time that thanks were given for some signal victory. *Danet* in voc.

PULVIS (*Cycl.*)—PULVIS *e bolo compositus*, a powder prescribed in the late London pharmacopœa, and intended to be used in the place of the *confectio Fracastorii* or *diascordium*. It being supposed that this medicine was by its author meant as an alexipharmic, and being now principally used as an astringent, it was thought necessary to make this separate medicine.

This powder is composed of bole armenic, half a pound; cinnamon, four ounces; and tormentill-root and gum arabic, of each three ounces, made together to a powder. *Pemberton's* Lond. Disp. p. 311.

PULVIS *bezoarticus*, the name given in the late London dispensatory to the powder commonly called *Gascoign's powder*.

This is now ordered to be made only of crab's claws, one pound; prepared pearls and red coral, of each three ounces; and oriental bezoar, an ounce. The amber and hartshorn are left out of the composition, as improper or inefficacious ingredients; and the whole ordered to be kept also without the bezoar, and called by the name of *pulvis e chelis cancrorum compositus*, the name the Gascoigne's powder used to be known by. *Pemberton's* Lond. Disp p. 313.

PULVIS *e cerussa*, a medicine prescribed in the late London pharmacopœa, in the place of the white troches of Rhases or Razi. See TROCHE.

The late compositions of that medicine had been much more com-

complex than the original receipt of that author, and the college have therefore retrenched the number of ingredients in them; and as the medicine is always to be powdered for use, it is now ordered to be kept in the form of powder.

It is thus prefcribed there: take cerufs, five ounces; farcocolla, an ounce; gum tragacanth, half an ounce; make the whole into a fine powder. *Pemberton*'s Lond. Difp. p. 312.

Pulvis *contrayervæ compofitus*, the name given in the late London difpenfatory to the compofition ufually called *lapis contrayervæ*.

The preparation is alfo there made much lefs complex, by leaving out the lefs powerful abforbent powders, and ufing the compound powder of crabs claws in the place of all.

This is now ordered to be made only of the compound powder of crab's claws, a pound and half; and contrayerva-root, five ounces. *Pemberton*'s Lond. Difp. p. 313.

Pulvis *e myrrha*, a form of medicine prefcribed in the late London difpenfatory, to fupply the place of the troches of myrrh. The compofition is the fame but for the omiffion of one or two of the ingredients, fuppofed not of the fame virtues with the reft, or very difagreeable to the tafte.

It is ordered to be made thus: take of dried leaves of rue, of dittany, of crete, of myrrh, each an ounce and half; of affafœtida, fagapenum, Ruffia caftor, and opopanax, each an ounce, beat altogether to a fine powder. *Pemberton*'s Lond. Pharm. p. 314.

Pulvis *e fcammonio*, a name given in the late London difpenfatory to the purging powder commonly called the *Earl of Warwick's powder*.

It is, however, wholly altered here, the cryftals of tartar and diaphoretic antimony being left out, and the medicine ordered to be made only of four ounces of fcammony, and three ounces of burnt hartfhorn reduced together to a fine powder. *Pemberton*'s Lond. Difp. p. 315.

Pulvis *e fuccino*, *amber-powder*, a form of medicine prefcribed in the late London pharmacopœa, to ftand in the place of the troches of amber, or *trochifci de carabe* of former difpenfatories.

The compofition of the powder is this: take prepared amber and gum arabic, of each ten drachms; juice of hypociftus, balauftines, and Japan earth, of each five drachms; olibanum, half an ounce; ftrained opium, a drachm; mix all together into a fine powder. *Pemberton*'s Lond. Difp. p. 316.

Pulvis *fœcundans*, in natural hiftory, a name given by late writers to that fine powder which is contained in capfules upon the ftamina or threads in the flowers of plants, and is called by fome Englifh writers the *maledufl*, and in general the *farina* of flowers.

This duft was for many ages looked upon as a recrement of the plant; but it has of later times been found to confift wholly of organical bodies, which are in reality the embryo plants; and entering into the feeds in the capfules, while yet buried in the ftyle, they fœcundate them, and put them in a ftate to vegetate and produce their fpecies. On the moft accurate examination, however, with microfcopes, the farina, or *pulvis fœcundans* of plants, has never been found to carry any likenefs to a *plantula feminalis*, or the rudiments of the plant which was to be produced by it. All that the microfcope does in this cafe, is but increafing the apparent magnitude of the particles of the powder; but they are found, when thus viewed, to be no other than a congeries of globules, which are all alike in the fame fpecies, and compofed of fibres and vafcules wrought together in fuch a curious manner, to the keeping whole as long as neceffary, and burfting when neceffary, that it appears evident they are deftined for fome very great ufes. See Tab. of microfc. Obj Clafs 2.

Verdrefius, in the Acta eruditorum, has given a very curious detail, and has figured and defcribed fifty kinds of this duft, moft of which are confiderably different from one another; tho' fome are nearly alike. He obferves, that in all the number of flowers he examined, he found no farina, or *pulvis fœcundans*, that did not refemble one of thefe fifty; and that, therefore, whoever engages in this curious refearch, fhould firft obferve thefe, and then refer the others to one or other of them, as they next approach them, and mention their differences, if any, by way of characters, by which they might always be known. Act. Erudit Ann. 1724. p. 410.

The author of this curious treatife, from a multitude of experiments, feems to think thefe globules of duft rather to reprefent the tefticles of male animals, than any other part of the organization of any known body. The numerous fibres they are compofed of, which are convoluted and twifted in a moft remarkable and intricate manner, and the veficles contained in their fubftance among thefe fibres, fhew a great refemblance to the teftes in ftructure, and in their apparent ufes.

The principal farinæ he defcribes, are thofe of the yellow water iris, or flag-flower, which are of an oval figure, fomewhat hairy, and covered either in part or entirely with a thin membranous coat. The tulip farina, which is flat, broad, and fomewhat angular at one end, tho' rounded at the other. The honey-fuckle farina, which is broad and truncated at one end, and roundifh, but fomewhat pointed at the other. The farina of the iris-leaved yellow lilly, which is oblong, pointed at one end, and rounded at the other; and when feparated perfect from its capfule, has a tail at the rounded or largeft end. The farina of the hypericum, which is oblong and flender, truncated at both ends, and marked with a deep longitudinal furrow on one fide, refembling the channel in the midft of the feeds of corn or oats, and ferving to the fame purpofe, the opening of the granule. The marfhmallow farina, which is like the mallow and holy oak, a very beautiful object, being round granules, furrounded with a regular circle of fpines or prickles. The Indian crefs has a farina, which in moft lights appears of a triangular figure. The lyfimachia, or willow-herb, has a farina refembling that of the hypericum, but fhorter and thicker, truncated at both ends, and with a longitudinal furrow, tho' but a flight one. That of the fcabious is fmoother than moft others, and approaches moft of all to a globular figure. That of wormwood is alfo globular, and fmall, and when feparated entire, has a ftalk or pedicle like that of the yellow lilly. The farina of the clematitis is very fingular, it being of a globular figure, but confifting of one globule enclofing another; or of a pale-coloured globule, contained in a thick brownifh hufk, which opens in one determined part, and lets out the globule it contained. That of the white jeffamine confifts of half globules, or a fort of hemifpheres, flat on one fide, and regularly rounded on the other.

The farina of tobacco is oblong and flender, and pointed at both ends, fometimes very fharply, fometimes more obtufely, according to its ftate of ripenefs. This has alfo an oblong furrow running from end to end on one fide, which is the place where it is to open, as the hypericum and fome others have. The farina of the paffion flower confifts of very large dufky-coloured globules, which, when feparated entire, have tails or pedicles; but thofe very fhort. That of the gourd is a more elegant object than almoft any other: it is round, and furrounded with a row of flat and obtufe rays, refembling the mallow farina, except that they are not pointed. The cucumber, tho' a plant nearly allied to this, yet produces a fimple, fmall, and roundifh farina. The cabbages of fome kinds have farinæ compofed of fimple, oval bodies; in others thefe globules are more oblong, and refemble very perfectly the naked grains of wheat, having the fame fort of furrow running longitudinally from end to end. The duft of the hyacinth is very long and flender, often crooked, and always obtufe at one end, and pointed at the other. The farina of fome of the fpecies of clary is very large, perfectly round and fmooth, and has the mark of an opening in one part. It is probably like that of the clematitis, one globule contained within another, and this the opening thro' which the inner one is to pafs. The author of thefe curious obfervations has given good figures of thefe and of the other of the fifty of his farinæ, to which we refer the reader. Act. Erudit. Ann. 1724 p. 411.

Puteolanus Pulvis, in natural hiftory, the name of a foffile fubftance, found in form of powder, and famous for its confolidating under water. The accounts of it feem, however, to be a little erroneous.

The fubftance itfelf is a pale greyifh powder, compofed of particles fo extremely minute, as to efcape the diftinction even of the beft glaffes, and appear, when viewed by the microfcope, only a loofe, very fine, irregular powder. It has among it a few fmall fpangles of talc, and being fhook up in a vial of water, leaves a whitifh muddinefs in it, which is very long in fubfiding. If wetted with falt-water, it immediately dries into a firm folid mafs, like a ftone. It does the fame alfo in common water; but the mafs is lefs firm.

The antients were well acquainted with this fubftance and its properties. It is faid, indeed, that on running down into the water, it becomes a hard ftone, while it remains under it; but this is probably a miftake, arifing from this, that the powder was continually running down the hills into the fea, and lodging on their fides in large quantities in many places; when thefe maffes became wet with the waves, in ftorms or high tides, and afterwards deferted by them, they naturally hardened into fo many maffes of a fort of ftone: and thefe were probably what authors have feen and defcribed, for they never, probably, fearched for thefe maffes under water. The principal ufe of this powder among the antients, was in mixing with their cements for buildings funk into the fea. It is at prefent well known in France and Italy, as an ingredient in that fort of plaifter they call *pozzolane*.

The remarkable quality of its coalefcing on its being mixed with water, is probably owing to its having in its compofition a quantity of a certain earth known in almoft all ages and countries for coalefcing into a kind of plaifter without previous burning. The antients knew this earth by the name of *gypfum tymphaicum*; and we, by that of *calx nativa*. It is very common on the fides of hills in many parts of Italy. *Hill*'s Hift. of Foff. p. 573.

PUMICE *(Cycl.)*—There have been many different conjectures about the nature and origin of this fubftance; but the very earlieft writers of antiquity, and the moft judicious of the later ages, agree, that it is no native foffile, nor in its original condition but a mere cinder, or remainder of fome other foffile body, calcined by a violent fire.

This may have been either fubterranean and unfeen, or perhaps fince extinguifhed; or that of the well-known burning

in-1

mountains, on and about which *pumices* are conftantly found, and that in vaft abundance. The more violent explofions of thefe may alfo, at one time or other, have toffed vaft quantities of *pumices* to places fo diftant as to make people forget from whence they came; or into feas, whofe tides and ftorms may have carried them to other fhores, near which no fuch repofitories of *pumices* are fituated; and this might very much puzzle and miflead people about its true nature and origin

The great quantities of *pumi es* found in this manner, far from fires by which they might have been formed, floating on the furface of the fea, thus thrown on it, or perhaps raifed by the burfting of vulcanos from its bottom; and fomething altered from their original form and colour, by being wafhed and rounded by the motion of the waves, and by rolling againft one another, gave rife to an opinion in fome, that thefe were of another kind, and were different from thofe *pumices* found on the burning mountains, and that they were formed by the concretion of the froth of the fea. Many have fuppofed, that the authors who have favoured this opinion ranked the alcyonia among the bodies they call *pumices* fo formed; and Theophraftus has been very unjuftly cenfured of the fame fault, tho' not guilty of it. *Hill*'s Theophraftus, p. 48.

There are whole mountains in the principality of Heffe, which confift of rocks of the *pumice* ftone, as it is there vulgarly called. This is a fpungy and cavernous ftone, of a grey colour, and very much refembles the *pumices* in external appearance; but on examination, proves to be a very different fubftance, and there is not the leaft ground for fuppofing, that it owes its prefent appearance to the action of fire, as the common *pumices* thrown out of the burning mountains certainly do. It is very neceffary, in order to treat accurately of the nature of the *pumice*-ftone, to diftinguifh rightly between thefe ftones and fuch as have been burnt into their fpungy ftate. Yet this is generally neglected, and thefe are called *pumices* as well as the reft, and all are fuppofed to be of the fame origin.

PUMPING *at fea*, is ufually done by fpells, that is, by relieving the men with frefh ones, and counting how many ftrokes they *pump* each watch. By this means they know if the fhip be ftanch, or how her leaks increafe.

When all the water is drawn up, and there comes up nothing but wind and froth, they fay the *pump fucks*.

PUMPKIN. See the article PEPO.

PUNARU, in zoology, the name of a fmall fifh of the alauda kind. It has an oblong body, and a thick head, obtufe at the fnout. The mouth is fmall, and in the lower jaw there are only two oblong teeth, which are fharp and pointed like needles. The eyes ftand high in the head, the pupil is black, and the iris yellow; and over thefe there are two fhort red filaments. The gills are large, and have two oblong fins placed behind them. The back fin reaches from the head to the tail, and is prickly at the edge. The belly-fin reaches from the anus to the tail. The fkin and fins are all brown.

Befides this, there is another fpecies, variegated on its fides with lines of a dufky purple. Its jaws befet with very fmall teeth, and its fins not prickly. Both kinds are found among the rocks about Brafil, and fometimes get into the fhells of the larger fhell-fifh. *Marggrave*'s Hift. Brafil.

PUNAY, in natural hiftory, a name given by the people of the Philippine iflands to a very beautiful fpecies of turtle, common in their woods.

It is of the fize of a fmall parrot, and is of a fine green colour; but the extreme feathers of its wings are tipped with white, and the lower part of its belly is of a faffron colour. Its beak is yellow.

PUNCH (*Cycl.*)—PUNCH, in the manege, a well fet, well knit horfe, called in French *gouffaut*. He fhould be fhort-backed, and thick fhouldered, with a broad neck, and well lined with flefh.

PUNCTICULARIS *febris*, a name given by fome authors to a fever attended with fmall eruptions.

PUNCTURE (*Cycl.*)—Among the number of the moft fimple wounds are reckoned thofe which are made by *puncture*, or ftabbing on the external parts, and not penetrating to a very great depth. In thefe wounds, after the blood has been ftopped at the firft dreffing, by the application of dry lint, the common digeftive, or *linimentum Arcæi*, is to be fpread upon a pledget and applied once every day; or if the difcharge is but fmall, every other day, covering the dreffings with a plaifter and comprefs, and fecuring the whole with a proper bandage. At each dreffing, care muft be taken to remove every thing that will give way readily; the pus or fanies is to be gently wiped off with fine raggs; and unlefs a great difcharge of matter make it neceffary, too frequent dreffings do rather harm than good. The firft dreffings that have been applied, efpecially when there has been a flux of blood, fhould by no means be removed forcibly; but be left till they will fall off of themfelves, which they will do after a fuppuration is formed: and by this caution, much pain, and, perhaps, a frefh hæmorrhage, are avoided.

When a *puncture*, however, penetrates very deep, the cure is attended with many difficulties; efpecially if it is made perpendicularly down, and has no depending orifice: for, in this cafe, the blood and matter are eafily collected at the bottom, and protract the cure, and frequently form fiftulæ. To prevent thefe confequences, it will be proper to prefs the wound from the bottom upwards, to apply a comprefs toward th bottom of the wound externally, and to apply a bandage over all, which preffes much tighter upon the lower than upon the upper parts. If all this precaution, however, prove of no effect, which, indeed, is too often the cafe, it is the moft proper method to make a large opening at the bottom of the wound, before any fiftulæ are formed there. In order to make this opening to the greater advantage, it will be proper to get a particular fort of probe or needle, very blunt at top, and at the other end provided with a large eye, or hole, through which a linnen rag may be paffed. This probe is to be paffed to the bottom of the wound, and the blunt end of it preffed outwards toward the fkin, till you can feel it with a finger: when you can feel it, cut down upon it if you can fafely, and make a large opening; fpread the rag that you have run through the eye of the probe with fome vulnerary balfam, and draw it through the wound after the manner of a feton, and leave it there, dreffing up both the orifices with the fame balfam, and covering the whole with compreffes and the proper bandages. In every fucceeding dreffing, that part of the rag that is left out of the wound is to be fpread with frefh ointment, and the lower part drawn down till this takes place in the new wound. This method is to be continued till the wound is well cleanfed, the difcharge greatly diminifhed, and all in a readinefs to heal: the feton is then to be removed, and the wound healed as ufual. *Heifter*'s Surg. p. 35.

PUNICA, the *pomegranate*, in botany, the name of a genus of trees, the characters of which are thefe: the flower is of the rofaceous kind, being compofed of feveral petals, arranged in a circular form. The cup is of the fhape of a bell, and divided into feveral fegments at the edges; this finally becomes a fruit of a roundifh figure, coronated at the end, and divided into many cells within, which contain many kernels full of juice, affixed to a placenta, and feparated from one another by very fine membranes: thefe contain feeds of an oblong figure.

The fpecies of *pomegranate*, enumerated by Mr. Tournefort, are thefe: 1. The common cultivated *pomegranate*. 2. The common wild *pomegranate*. 3. The cultivated *pomegranate*, with fweet fruit. 4. The cultivated *pomegranate*, with fruit of a middle tafte between fweet and four. 5. The large fruited *pomegranate*, with large, crifp, amathyftine kernels. 6. The great double-flowered *pomegranate*, or balauftine. 7. The *pomegranate* with a double variegated flower. 8. The *pomegranate* with fmall double flowers. And, 9. The low dwarf American *pomegranate*. *Tourn.* Inft. p. 636.

PUNICUS *lapis*, a name given by the writers of the middle ages to a ftone of a fpungy texture, the powder of which was good in difeafes of the eyes.

This feems to have been no other than the pumice, the writers of thefe times having been ftrangely incorrect in their orthography; and all the virtues afcribed to this ftone, as alfo the places where it was found, which are the Æolian iflands, &c. feeming to have been copied from Pliny's account of the pumice.

PUNK, in natural hiftory, the inward part of the excrefcence or exuberance of an oak. It is ufed by the Indians in Virginia for medicinal burning, as the Eaft Indians ufe moxa. Phil. Tranf. N°. 454, fect. 1. See MOXA.

PUPIL (*Cycl.*)—PUPIL *contracted*. The diftemper of the eye called by furgeons a *contraction of the pupil*, is fo total or clofe a contraction of that part as will not let it tranfmit light enough to the bottom of the eye, to enable the patient to fee objects diftinctly. Sometimes this diforder is from infancy, and fometimes it arifes from an intenfe inflammation of the eye, or other caufes.

The cure of this is extremely difficult; but Mr. Chefelden has invented a method by which he has often proved very fuccefsful in his attempts to relieve it. The method is this: the eyelids being held open by a fpeculum oculi, he takes a narrow fingle-edged fcalpell, or needle, almoft like that ufed in couching for a cataract, and paffing it through the fclerotica, as in couching, he afterwards thrufts it forward through the uvea or iris, and in extracting it cuts through the iris.

If the diforder is not accompanied with a cataract, it will be beft to cut through the iris in the middle; otherwife, when there is a cataract, the incifion fhould be made a little higher in the uvea, that the cataract may not obftruct the ingrefs of the rays of light. The cataracts that accompany this diforder are ufually very fmall, and fometimes their adhefion to the iris is fo firm, as to render it impracticable to couch or fupprefs them. *Heifter*'s Surg. p. 417.

PUPPETS, in natural hiftory, the name given by Swammerdam to the nymphæ of animals, which he diftinguifhes from the chryfalifes by this fimple name, calling thefe the *gilt puppets*, from their golden colour.

It has been a general diftinction eftablifhed by writers between the nymph and chryfalis, that in the former the limbs and lineaments of the future animal might be feen, but in the latter not. But Swammerdam has proved, that the lineaments of every trace, and every part of the animal, is to be feen under the

the chryfalis as well as under the nymph ftate, with proper attention in the examination, and that therefore the diftinction is founded on a very vague and uncertain bafis. The far greater part of the infect kingdom are hatched from the egg in the worm ftate, and become, after a time, changed into thefe chryfalifes and aureliæ; but fome are hatched perfect, and in their own form, from the egg. Among thofe which undergo the change into the chryfalis ftate, the principal diftinction is into worms that have legs, and worms that have not any. The breaft of thofe worms which have no feet is never changed at all, and among thofe worms which have many feet, the fix fore feet are never changed, but ferve the animal as well in its flying ftate as in its creeping one. The wings, the horns, the feet, &c. grow up under the fkin by degrees.

In all worms, of whatever kind, thefe parts may be diftinguifhed more or lefs plainly under the fkin, at the different times of their growth, in different degrees of forwardnefs. Even the frog may be thus traced, by proper care, in the tadpole, and all its changing from the tad-pole ftate to that of the perfect animal, is no other than as in the butterfly, the developing and unfolding its parts, as they require a proper age, confiftence, and maturity.

Mouffet, and other writers on infects, call the aurelia a feparate and peculiar thing, and exprefly neither an egg nor an animal. Harvey alfo miftakes the matter as grofly, in calling the aurelia an egg, and faying, that the bloodlefs animalcules are produced by transformation; but thefe are expreffions much to be lamented in the works of fuch great men, and have been the means of darkening and perplexing the knowledge of the aurelia ftate in infects, and muft be overthrown before any true judgment can be formed of that ftate.

All the change happening in the *puppets*, or nymphæ, which was fuppofed by Harvey to be the production of one animal from another, is in reality no more than the exfudation of a certain abundant moifture which leaves the animal dry, and all its parts firm and capable of expanding and extending themfelves, and bearing the weather.

Goedartius has alfo propagated another groundlefs error, which, by its confequences, tends to overthrow all the true knowledge of thefe changes. This is, that the caterpillar may change before its time, and that in this cafe it becomes a very different animal in the winged ftate. This tends wholly to overthrow the conftant and uniform law of nature, according to which, all the lineaments of the perfect animal are formed even in the egg, and have only to grow and enlarge in the worm and chryfalis ftate; and can therefore be fubject to no change in either.

What has led Geodartius into this error, was real obfervation, only not carried fo far as it fhould have been. In fome of the infects which fuffer the chryfalis ftate, the males are winged and the females not. In thefe the courfe and order of nature is as invariable as in the reft, all the males being of the winged, and all the females of the reptile kind; but this author, not knowing this great difference in the fexes, when he had been ufed to fee a winged creature come out of the chryfalis of a worm he knew very well, and found inftead of it a creeping animal without wings, fuppofed the creature, which was only of a different fex, to be of a different fpecies.

Some difference alfo is found in the fize of the fly produced from the chryfalis of the fame fpecies of caterpillar, according to its changing fooner or later into that ftate. All the difference, however, is, that if the caterpillar eats its fill firft, the fly is the larger and the fairer; and if it goes into the chryfalis earlier, then the fly is the lefs perfect: and of whatever fize the fly is when produced out of the chryfalis, in that it remains; for it can grow no more after it has paffed this latter change.

From the knowledge of the propagation of this fort of animal, this author goes up to that of larger creatures, and is firm in the opinion, that there is properly no fuch thing as generation at all; that all that our blindnefs calls fo, is only a fenfible production by the growing of parts at firft very minute. All the parts of the butterfly may be feen, by a proper infpection, in the caterpillar; and as to the imaginary tranfformation of the caterpillar into the chryfalis, it may be retarded and made to come on fo eafily, as to become the object of the fenfes, and finally ftopped in the progrefs, fo as to appear half caterpillar, half chryfalis. *Swammerdam*'s Hift. Infect.

PUPPIS OS, a name given by fome authors to the os frontis. The future in this bone is alfo called by many anatomifts the *futura puppis*.

PUPULÆ, a name ufed by fome to exprefs the extremities of the fingers.

PUR *autre vie*, in our law-books, is ufed where lands are held for the life of another.

PURCHASE-*book*, among traders, is the name given to a book which is a kind of journal, containing an account of all the purchafes made, or things bought in the day.

Purchafe, in the fea-language, is the fame as *draw in*: thus when they fay, *the capftan purchafes apace*, they only mean it draws in the cable apace; alfo when they cannot draw or hale in any thing with the tackle, they fay, *the tackle will not purchafe*.

PURETTA, a name given by fome writers to the common fhining black fand, ufed to ftrew over writing, and erroneoufly called by fome *fteel-duft*.

It is a natural mineral fubftance, found on the fhores near Genoa and in other places.

PURGATIVE (*Cycl.*)—We have had attempts of adjufting the dofes of *purgative* medicines fcientifically. Dr. Cockburn endeavoured at the folution of this problem; but, it is faid, on wrong principles. Dr. Balguy has alfo given us an effay on this fubject in the Med Eff. Edinb. Vol. IV. art 5.

He affumes, that part of the medicine is fpent on the firft paffages, where it acts as a ftimulus; and that the other part is carried into the blood, and has its effect there by thinning and rarifying it. This being premifed, 1ft. If the medicine acts only in the firft paffages, the dofe will be as the fize of the perfon into the conftitution. 2d. If the whole medicine paffes into the blood, the dofe will be as the fize into the fquare of the conftitution; and therefore, 3d. You are to dofe fo much of the medicine as is fpent on the ftomach and inteftines directly, as the conftitution; and fo much as is carried into the blood, as the fquare of the conftitution, and the fum into the perfon's fize, is the quantity required.

The fame rules hold in vomits. How far in either cafe the practice of phyfic may be thereby improved, we leave to the judgment of the learned. The folution of the problem fuppofes a great poftulatum, no lefs than the art of meafuring a perfon's conftitution!

PURGATION, *purgatio*, in rhetoric, is ufed for that kind of defence which takes place when the accufed perfon owns the fact, but denies that he did it with defign, or with any bad intention. *Voff.* Rhet. l. 1. p. 148.

PURIFICATION, in pharmacy. See TRYING.

PURPURA, the *purple-fifh*, in natural hiftory, the name of a genus of fhell-fifh, the characters of which are thefe: it is a univalve fhell, jagged and befet from head to tail with fpines, tubercles, umbos, or ftriæ. The mouth is fmall and roundifh; the tail is fhort, and ufually the bafe runs out into a long beak.

It has been ufual with moft authors to confound together the genera of the murex and *purpura*, and to ufe the words as fynonymous: but tho' there is fome external refemblance between many of the fhells of the two genera, yet they are eafily diftinguifhed by this, that the mouth of the *purpura* is lefs long, and is lefs dentated and alated than that of the murex. The body and the head of the fhells of this genus are not fo elevated as thofe of the murex kind, and are not covered with points or buttons at the mouth. If a fhell is therefore found to have a fmall, fmooth, and round mouth, and a body covered with undulated leaves, as it were, like thofe of favory or endive, and fometimes with long points, and its tail, whether long or fhort, be hollowed and fomewhat bent, this may be called a *purpura* and not a murex.

The antients diftinguifhed three kinds of *purpura*, one which had a long and crooked tail, made hollow like a tube or pipe; a fecond which had either no tail at all, or at the moft a very fhort one; and a third which had no fpiral head, or, as we fhould exprefs it, no clavicle.

On examining the whole family of the *purpuræ*, we may diftinguifh four remarkable fpecific differences among them. The firft of thefe comprehends thofe *purpuræ* which have the body of the fhell garnifhed with a fort of undulated foliage in clouded ridges, and have a fhort and crooked tail. The fecond comprehends thofe which have the body of the fhell covered with acute points, and have a long tail. The third comprehends thofe which have as long a tail as the former, but have a fmooth body, or at the utmoft have only a few flight protuberances and wrinkles on it. And the fourth takes in thofe which are fmall, and have an elevated clavicle, a fhort crooked tail, and the body of which is covered either with flender fpines or hairs. See Tab. of Shells, N°. 14.

This fpecies of fifh, as well as the murex, ferved among the antients to dye the fine purple colour they were fo fond of, and fome of the buccina have been of late found to have the fame juice. The *purpura* and murex are both fifhed up in great plenty in the gulph of Tarentum; but the fmall quantity of the coloured juice which each fifh contains, and the neceffity of ufing it before the animal dies, makes it impoffible to bring it to any regular article of traffick. The antients ufed this colour only on cotton and woollen ftuffs, whereas our cochineal, which was unknown to the antients, ftrikes equally well on filks and ftuffs.

The *purpura* lives on other fifh. It ufually hides itfelf at a fmall depth in the fand, fometimes even in frefh-water rivers, and as it lies hid, it thrufts up a pointed tongue, which wounds and kills any thing that comes over it. We frequently find fea-fhells with round holes bored through them, as regularly as if made with a boring inftrument: thefe are generally allowed to be made by the tongue of the *purpura*, in order to its feeding on the fifh within.

The *purpura* has two horns like that of a fnail; and Fabius Columna fays, that they have eyes in thefe, not placed at the ends, as in the fnail, but in the middle of each horn.

Of the ramose, or branched *purpuræ*, with short tails, we have the following species preserved in cabinets. 1. The rough *purpura*, with a flesh-coloured lip, armed with three rows of branches. 2. The yellow *purpura*, with three rows of high branches. 3. The tribulus, or whitish *purpura*, with three rows of less jagged branches. 4. The fine armed *purpura*, with the branches jagged in the manner of the foot of a toad, with a distinct clavicle. 5. The less rough *purpura*, with six rows of branches. 6. The curled lettuce *purpura*, jagged from the head to the base, and having six rows of branches.

Of the spinose *purpuræ* with long tails, we have these: 1. The great spinose *purpura*, with very long spines. 2. The small spinose *purpura*, with three rows of shorter spines. 3. The small rough *purpura*.

Of the *purpuræ* covered with tubera, having a long beak and long tail, we have the following: 1. The woodcock *purpura*, with a long tail and no spines. 2. The less spotted woodcock *purpura*. 3. The small brown woodcock *purpura*.

Of the thick costated, or ribbed *purpuræ*, with crooked beaks, we have the following species: 1. The marble costated and tuberous *purpura*, with blue fasciæ. 2. The spinose marbled *purpura*.

Of the hairy *purpuræ*, with long clavicles, we have the following species: 1. The grey *purpura*, with three rows of spin s or hairs, with an erected clavicle and strait beak. 2. The crooked beaked hairy *purpura*, with several setose fimbriæ.

Of the thin oculated *purpuræ*, with compressed clavicles and short beaks, we have the following species: 1. The sea-porcupine, or oculated *purpura*. 2. The porphyry *purpura*. Hist. Nat. Eclairc. p. 298.

The *purpura* is a shell-fish very well known, and has been known also in almost all times to afford a purple liquor; but as there has been no method discovered of bringing this liquor into use in dying, the fish has been neglected, and its juice never attempted to be brought into use.

The juice which gives this beautiful purple colour is, while it remains in the body of the animal, and while that is in health, wholly white; but no sooner is it exposed to the sun, than it begins to change colour, and in less than five minutes goes through the several changes of pale green, yellowish, and a beautiful emerald green: after this it becomes of a deeper and duskier green, then bluish, reddish, and finally a deep and very beautiful purple. Sometimes the juice is found naturally green in the animal; this is probably from the creature's being in a diseased state: but when it is naturally thus, it immediately becomes red, and afterwards purple, on being exposed to the sun, its several preceding changes seeming to have been made already in the body of the animal.

If a piece of linnen be rubbed over with this juice, and part of it exposed to the sun, part not, that only will turn red which is so exposed, the other remaining green without any alteration; and it is observed, that the stronger the sun shines, the quicker the change appears, and probably the colour is in proportion also the more beautiful and lively. And it is very remarkable, that if a needle, or any other opake body, be laid upon the linnen which is yet green, and is to become red on being exposed to the sun; after such an exposure the whole shall be changed red or purple, excepting only that small spot which is covered by the needle, which will still remain green.

A plate of glass, tho' it be three inches thick, will not prevent the colour from changing purple by being laid over it; but the thinnest piece of metal will keep it wholly green. The one being opake, and the other pellucid, are evidently the only reasons for this difference.

If the coloured linnen be successively covered by three pieces of paper, the one blacked with ink, the other in its natural state, and the third rubbed over with oil, it will change colour on being exposed to the sun in different degrees; and that exactly in proportion to the degree of transparence in each of the papers: most of all in that which was covered with the oiled paper, something less than that covered by the paper in its natural state, and least of all in that which was covered with the blacked paper, as that is least transparent.

The common heat of a fire, or that of a red hot iron, produce no change at all in the colour when green. The vapour of burning sulphur produces a little; but the green which had not changed to purple by these experiments, immediately changed to it on being exposed to the rays of the sun.

These experiments were all made in the months of January and February, by Mr. Du Hamel, in Provence; and the sun having power to change the colour so speedily there in these cold months, probably in a warmer climate or season the air would have been sufficient for the purpose, without the open sun; since it seems, from experiment, that both the solar rays, and the light alone in a cloudy day, can act upon this colour. The light and heat of the sun both act on this colour: light is always sufficient to produce the effect; but the heat may easily be too great, or too little, and to do the whole in perfection it must be at a certain middle degree.

This beautiful purple, if it can ever be brought into use in dying, will have one very great advantage from its viscosity. The pieces of cloth that had been stained by it retained their colour, in spite of several boilings in different liquors, which Mr. Du Hamel made them pass through; and the colour, on examination, was found not to be superficial, but penetrated the whole body of the stuff which was tinged by it. There are many inconveniences which must naturally attend the use of this substance as a dye, but they may, perhaps, all be got over by care and application. It is very certain, that it is of too viscid a nature easily to penetrate many substances; but it is also certain, that this might be obviated by dissolving it in some proper liquor. It appears very plainly, that the antients had a method of thus dissolving their purple; but we neither know what was their purple, nor what was its dissolvent; nor, which would be of much more consequence to us at present, what is the proper dissolvent for our own. Mem. Acad. Scien. Par. 1736.

Persian PURPURA, the same with the Persian-shell, a species of dolium. See DOLIUM.

PURPUREA *febris*, the *purple fever*, in medicine, the name given by authors to a species of *fever*, called also by some a *miliary fever*.

It is an acute, continual, and exanthematous *fever*, in which nature seems to be endeavouring to drive out the subtle morbific matter to the surface of the body, by increasing her secretory and excretory motions. *Junker's* Consp. Med. p. 325.

This *fever* is divided into two kinds; of the which, one is called *purpura rubra*, or the *red purple fever*; and the other by a very odd form of expression, the *purpura alba*, or *white purple fever*.

The white *purple fever* is usually malignant; it is easily complicated with the petechial *fevers*, and in some places has of late years been found often to affect lying-in women.

The red *purpura* is much more benign and mild than this, and, indeed, often is attended with no danger.

These two species of *purpura* seem to differ as much as the small-pox and measles do from one another, the white *fever* of this kind being usually as much more fatal than the red, as the small-pox is more fatal than the measles; but as there are cases in which the small-pox is mild and benign, and the measles are sometimes dangerous, so in these diseases, out of the natural course, the white is sometimes mild, and attended but with a slight *fever*, while the red is fatal, and attended with a very high one. As the small-pox also has white pustules, and the measles only protuberances on the skin; so the white *purple fever* has also regular white pustules, while the red has only such protuberances as those of the measles. *Junk's* Consp. Med. p. 327.

Signs of these diseases. The white kind seizes the patient with a general shivering and coldness, and a straitness of the præcordia, with great anxiety of mind, and afterwards shews itself in alternate changes of heat and cold; and before the appearance of the eruptions, the patients are worse in respect of their anxiety and other symptoms, and complain of a troublesome itching under the skin. The pustules usually first appear on the fourth day, sometimes later; and at their approach, there is first perceived a general redness of the skin, and after this the redness is collected into spots, in the middle of each of which there appears a white pustule; and these are often so copiously spread over the body, that they almost touch one another. These pustules are pellucid, and contain only a clear water, and their eruption is usually attended with an acute fever; when these pustules have stood four days, they dry away, and the places appear scaly, and the disease terminates. Sometimes in people of humid habits, and such as have no *fever*, these pustules sweat out a white water.

The red *purple fever* seizes the patient in nearly the same way with the white, that is, with shiverings and heat succeeding one another. It is also attended with a tension and pain in the back, and with a straitness of the breast and a cough. The *purple* eruptions appear on the fourth, or on the seventh day, or later even than that, in form of small protuberances, like millet-seeds; and are attended at the time of their eruption, with an itching within the skin: the *fever* is not violent, and the sweat is copious, and of an ill smell. In some cases this disease is attended with no *fever* at all, and people go about their business with it, only complaining of an itching all over them. Some have violent pains of the head at the time, and are sleepy and anxious they know not why; but these symptoms usually go off as soon as the eruptions appear properly: these remain fully out a few days, and then die away of themselves, and the person finds himself as well as before.

The *purple fever* of both kinds seems to have been more frequent of late than in the times of the earlier writers on medicine. The white kind in particular, some years ago, was in a manner epidemic in Saxony, and carried off great numbers, and particularly seized the lying-in women. Wherever the petechial *fevers* are frequent, there the white *purple fever* is usually also common. It often also mixes itself with the small pox, and makes the case always greatly worse, and all the symptoms more violent. The red *purple fever* is most frequent with young men, and such as lead sedentary lives, and are subject to violent passions; labouring people are scarce ever found affected with this disease. Among women, those of tenderer constitutions are most subject to it; and especially such

as have been before subject to hysteric complaints. And the persons most subject of all others to it, are those of both sexes who live at ease and within doors, and by this means always are sending off the humours to the surface of the body.

Causes of it. These are, a bad quality in the air, contagion from persons who have the disease, the driving back of sweats, and even the forcing them too violently by hot medicines; this too often happens to women in child-bed, and to persons in petechial *fevers*. To these are to be added also, the curing the rheumatic and catarrhal disorders by a too cold regimen and method, and an omission of habitual bleedings, or by suppression of the menses, or discharges by the hæmorrhoidal veins.

Prognosticks in it. The going back of the eruptions in the white *purpura* is very often fatal, and in the mildest circumstances is usually attended with aphthæ, alienations of the mind, and terrible anxieties; and, if by means of medicines, the eruptions appear again, and yet the symptoms occasioned by their going in do not disappear, there is great reason to suspect danger. The white *purpura* attending the petechial *fever* is very dangerous when the eruptions appear on the fourth day, but is less so when they appear later. The white *purpura*, when not attended with a *fever*, is less dangerous than otherwise; but it is usually attended with terrible anxieties of mind, and with spastic motions.

The red *purpura*, when the eruptions are struck back, is not attended with such sudden danger as the white; but people usually have some convulsive motions attending it, and a great languor and debility of motion, and sometimes with inflammations of the fauces, and with dangerous quinseys; sometimes with a dry cough, sometimes with a heat of urine, or with arthritic complaints, or a spurious pleurisy, or a hemicrania; but all these symptoms go off as soon as the eruptions appear again.

Method of cure. This is to be the same both in the red and the white *purpura*, and is not different from that in other inflammatory *fevers*, namely, a gentle but continual perspiration must be kept up, and this alone will often cure the disease. On the days before the eruption of the spots, powders are to be given of nitre, diaphoretic antimony, and the absorbents, as crabs-eyes, and the like; and when the eruptions are out, which usually happens on the fourth day, the same powders must be given interchangeably, with gentle sudorific draughts, from all which, fumitory water, however, is to be carefully excluded. This method is to be continued, only giving the doses less frequently in the decline of the disease; and when it is wholly gone off, gentle purges, with some mercurial admixture, are to be given, thoroughly to cleanse the primæ viæ; and the patient is by degrees to be hardened to the air. It is to be observed, that all irritations of the bowels are as bad in these cases as in the small-pox or measles, and that even the use of the most gentle clysters is scarce to be allowed. Great care is to be taken that no cold air be admitted to the patient during the time the eruptions are out, and he should not be removed, nor have the bed made in all that time. People who are often subject to returns of the red or white *purpura*, would be right to use cupping with scarification frequently, by way of prevention; and when the cause of the disease is the suppression of some habitual evacuation, great care is to be taken to supply the place of that by bleedings, if it cannot be recalled in the accustomed way. This is to be done at different times, to prevent relapses; and in general, a method of using gentle exercise, so as to promote a moderate sweat, is greatly preferable to the method used by some of cloathing too warm, which rather promotes the disease by inviting the humors to the surface. *Junker's* Consp. Med. p. 329.

PURPURINA, a name used by Caneparius, and some other authors, for the *aurum mosaicum*, or *aurum musivum* of the shops, the present preparation of which differs from that of that author only in the proportions of the ingredients. *Pemberton's* Lond. Disp. p. 221. See AURUM *musivum*.

PURPURISSUS, in the antient writers, both Greek and Roman, the name of a compound colour or fucus of a fine purplish red, used to paint womens cheeks.

It seems by the composition to have been somewhat like our rose-pink, as it is called by the colourmen. It was made of the *creta argentaria*, or fine white kind of chalk, dissolved in a strong purple tincture of some of the roots or woods which dyed red; and when the coarser part was subsided to the bottom of the vessel, the liquor, while yet thick, was poured off into another vessel; and what subsided from this, which was as fine as flour, was of a beautiful pale purple, and was the *purpurissus* saved for use.

PURSE (*Cycl*)—PURSE, in the Turkish dominions, is a term appropriated to a certain sum of money. When the Turks speak of large sums, they always count by *purses*. In this, however, there is some difference; for the *purse* in Egypt is twenty-five thousand medines, and in other parts of Turky it is only twenty thousand. *Pocock's* Egypt. p. 175.

PURSLAIN, in botany. See PORTULACA.

PUS (*Cycl*)—A very small portion of *pus* absorbed into the blood-vessels, raises a putrid fever as certainly as yest does a fermentation in wort. This fever is not owing to its stimulating the solids to quicker and greater vibrations, but to its increasing the intestine motion and accelerating the animal process, hastening the change of the juices to that subtle acrid state which renders them unfit to be retained in the body, and disposes them to run off in colliquative evacuations, such as sweating and purging, which constantly attend these putrid or hectic fevers, or rising to internal ulcers. Med. Ess. Edinb. Vol V. art. 77. See PUTREFACTION.

When *pus* is laudable and mild, it is one of the most powerful digesters, suppurants, and incarners; when it stagnates too long, or when the liquors and vessels are faulty, it may become an acrid, stimulating, eroding sanies; when absorbed into the blood, it affects all the liquors, stimulates the vessels, and is capable of producing violent disorders.

PUSHERS, a name given to Canary birds when new flown. See BRANCHER, CANARY, and PASSERES *Canariensis*.

PUSILLATUM, a word used by some medical writers to express a coarse powder, or any medicinal substance, beat into small pieces for infusion, or the like purposes.

PUSU, in botany, the name of a famous plant growing in China, and greatly esteemed there. This and the ginseng these people a long time kept to themselves; but at length it was discovered, that the one was esteemed a certain prolonger of life, and the other a preservative against all diseases.

They, in their manner of speaking, say, that the *pusu* gives immortality: we have not been so happy to obtain any of this famous plant for the trial, but the ginseng having been brought over, and found not to possess those great virtues they ascribe to it, and the people in China, who are possessed of the *pusu*, dying, as well as those who have it not, we find, that the virtues of both are so greatly exaggerated by the Eastern dialect, that there is not much to be expected from them. *Redi's* Exper.

PUT, in the manege, called in French *mettre*, is used for the breaking or managing of a horse: thus,

To put a horse to corvets, or caprioles, is to teach him those parts of the manege.

To put a horse upon his haunches, called in French *asseoir*, is to make him bend them handsomely in galloping in the manege, or upon a stop See HAUNCHES.

To put a horse to the walk, trot, or gallop, is to make him walk, trot, or gallop.

To put a horse upon the button. See BUTTON.

PUTEAL, among the Romans, a small kind of edifice, raised in the place where a thunder-bolt had fallen. Mem. Acad. Inscript. Vol. III. p. 85, seq. See BIDENTAL.

PUTICULI, among the Romans, ditches or holes in the earth, a little without the Esquiline gate, in which the poorer sort of people were buried. *Pitisc.* in voc.

PUTORIUS, in zoology, the name by which authors call the polecat; a creature of the weasel kind, but larger than the common weasel, and of a blackish colour, and remarkable for its stinking smell.

The whole circumference of the face is white, at the extremity of the angles of the mouth there begins a broad line of a yellowish hue, which surrounds the head, and is white in several parts. Its long hairs are black, its short ones yellowish; and the throat, the feet, and the tail, are blacker than any other part of the body. The upper jaws stand out a little beyond the lower. The ears are broad and short, and are fringed, as it were, with white. Its stink is occasioned by an extremely fetid matter, secreted by two glands, which it has in common with all the creatures of this kind, within the anus.

It feeds on flesh, frequently stealing hens and other poultry, and sometimes contenting itself with their eggs. *Ray's* Syn. Quad. p. 199.

PUTORIUS *serpens*, in zoology, a name given by some to that species of serpent called by others *dryinus*. See DRYINUS.

PUTREFACTION (*Cycl*)—In *putrefaction* there is a great intestine motion; when carried to a height, and when the *putrefying* substance is much compressed, it is accompanied with heat and smoke, and sometimes flame. Air is necessary to it; and the visible texture of the *putrifying* mass is changed.

Putrefaction is the most subtle of all dissolvents. It effectually disjoins and separates all the component parts of *putrifying* bodies, except sea-salt. In this powerful solution, the intestine action of the minute particles of bodies creates, collects, or is by some way or other the cause and means of heat.

The fluids of the human body are much disposed to *putrefaction*, and out of the body become highly *putrid*, even in cool air, and without any stirring or agitation; and our blood and some of our juices, out of the circulation, but within the body, change to *putrid* matter.

The changes wrought in bodies by *putrefaction*, are no where more remarkable than in the *putrefaction* of vegetable substances, which by means of this change are brought nearly into the condition and nature of animal substances.

To prove this by an easy experiment, take a large quantity of cabbage-leaves, and press them hard down with weights in an open tub, with holes bored in its side; set them in a warm place, and the leaves will soon conceive a heat in the middle, and at length the whole, or nearly the whole, will be converted into a soft pappy substance. This substance distilled in a glass retort, yields the same kind of volatile salt and oil as

animal subſtances do: neither is it particular to this plant, but all equally do this; the acid and the alkaline, the ſweet and the bitter, the aſtringent and emolient. Hence we may learn, how it is that nature, in our bodies, converts vegetable into animal ſubſtances; and it is very remarkable, that not a grain of fixed ſalt can be procured from this *putrified* maſs. *Shaw's* Lect. p. 134.

PUTREFACTION *of water*. It is ſaid to be the peculiar quality of the Thames water, that it will ſtink and yet be wholeſome; and after this will recover itſelf again. Many ſailors have been obliged to drink it ſtinking, ſo that they held their noſes while they poured it down their throats, yet no ſickneſs enſued from it. It generates a ſort of ſpirit alſo in this ſtinking ſtate, which will take fire at the approach of a lighted candle as if ſpirit of wine were touched by the ſame.

PUTTOCKS, or PUTTOCK-*ſhrouds*, in a ſhip, are ſmall ſhrouds which go from the ſhrouds of the main-maſt, fore-maſt, and mizen-maſt, to the top-maſt ſhrouds; and if there be any top-gallant-maſts, there are *puttocks* to go from the top-maſt ſhrouds into theſe. Theſe *puttocks* are at the bottom ſeized to a ſtaff, or to ſome rope which is ſeized to a plate of iron, or to a dead-man's eye, to which the lanniards of the fore-maſt ſhrouds do come.

PUWAKHAGA, in botany, the name by which ſome authors call the faufel-tree, of whoſe fruit the expreſſed juice called *terra Japonica*, or Japan earth, is made. *Herm.* Muſ. Zeyl. p. 51.

PYANEPSION, Πυανεψιων, in the Athenian chronology, a month of thirty days, in which the feſtival *pianepſia* was celebrated. *Potter*, Archæol. Græc. T. 1. p. 464. See the article PYANEPSIA, *Cycl.*

PYCIELT, in botany, a name given by Hernandez, and ſome other authors, to a peculiar ſpecies of tobacco, diſtinguiſhed by Mr. Tournefort by the name of *nicotiana major lato et rotundo folio*, the broad roundiſh leaved great tobacco. See the article NICOTIANA.

PYCNI, πυκνοι, in the antient muſic, was uſed for ſuch ſounds or chords of a tetrachord as might enter the ſpiſſum, or πυκνον.

Theſe were the hypatæ [a], the parypatæ [b], and the lichani [c], of the ſeveral tetrachords. The hypatæ were called *barypycni*, βαρυπυκνοι; the parypatæ *meſopycni*, μεσοπυκνοι; and the lichani *oxypycni*, ὀξυπυκνοι: becauſe the firſt were the loweſt notes; the ſecond, the middle notes; and the third, the higheſt of the ſpiſſum [d]. Such chords as could never enter the ſpiſſum were called *apycni*, απυκνοι. [[a] ὑπατοειδεις. [b] παρυπατοειδεις. [c] λιχανοειδεις. [d] *Wallis's* Append. ad Ptolem. Harm. p. 165.]

Hence in the Greek ſcale or diagram [a], containing eighteen chords, there were five *barypycni*, as many *meſopycni*, and an equal number of *oxypycni*, together with three *apycni*. The *apycni* and *barypycni* were ſtabiles or fixed chords; but the *meſopycni* and *oxypycni* were moveable, or mobiles [b]. [[a] See DIAGRAM. [b] *Wallis* ibid. p. 165, 166.]

PYCNON, πυκνον, in the antient muſic. See SPISSUM.

PYE, in mechanics. See the article CRABB.

PYGAIA, in the materia medica, a name by which ſome authors have called the ipecacuanha, or vomiting Indian-root. *De Laet* Ind Occid. 566. *Purchas.* Pilgr. Vol. IV. p. 1311.

PYGARGITES, in natural hiſtory, a name given by Pliny and ſome other of the old writers to the eagle-ſtone, when it was variegated with white, in the manner of the tail of the eagle called *pygargus*.

Some have called this ſtone *pygarus*, and others have applied the name to a ſtone very different from the aetites, and only reſembling the colour of the eagle. From hence it has happened, that two very different ſtones have been confounded together; but the virtues of both being merely ideal and imaginary, the world is not greatly the worſe for the want of the neceſſary diſtinctions.

PYGARGUS, a ſpecies of eagle, called alſo by ſome authors *albicilla*, and *ilianularia*.

It is a large and fierce bird, of the ſize of a common turkey. Its beak is yellow, and covered with a yellow membrane at its baſe. It has large hazel-coloured eyes. Its feet are yellow, and its claws extremely ſtrong and ſharp. The head is white, and there are no feathers, but ſome fine hairs between the eyes and noſtrils. The upper part of the neck is of a reddiſh brown, and the rump black: all the body beſides this is of an obſcure ruſt colour, and its wings are partly black, partly grey. Its tail is long, and the upper half of it is white, and the reſt black. It is from this white part that it has its name *albicilla*.

Authors who have written on this ſubject ſeem not all agreed to call the ſame bird by this name. The *pygargus* of Aldrovand ſeems different from this, and the *pygargus prior* of Bellonius ſeems no other than the male of that kind of hawk called in Engliſh the *hen-harrier*. *Willughby's* Ornithol. p. 31

PYGARGUS *accipiter*, in zoology, a name by which many authors have called the ſubbuteo, a bird of the hawk kind; the male of which is called in Engliſh the *hen-harrier*, and the female the *ringtail*. *Ray's* Ornithol. p. 40. See HENHARRIER and RINGTAIL.

PYKER, or PYCAR, in our writers, a ſmall ſhip or herring-boat. 31 Edw. III. c. 2. *Blount. Cowel.*

PYLÆA, Πυλαια, in antiquity, a name given to the aſſembly of the Amphictyons, as well when they met at Delphi as at Thermopylæ. The concourſe of people at theſe aſſemblies was ſo great, that the term *pylæa* came to be uſed for any very numerous aſſembly, or croud of people. Mem. Acad. Inſcr. Vol. IV. pp. 287, 290.

PYLAGORE, Πυλαγορες, in antiquity, a name given to the Amphictyons, becauſe they aſſembled at Thermopylæ, or Pylæ. See AMPHICTYONS, *Cycl.* and *Suppl.*

PYLORUS (*Cycl.*)—Kerkring gives us an account from his own knowledge of the entire ſtoppage of this part, by a Dutch ſtiver accidentally ſwallowed, the conſequence of which was the death of the patient in a few days. On the other hand, he mentions an inſtance of another perſon's ſwallowing a copper coin, which without any other effect than violent nauſeas and ſickneſs, was, at the end of about a month, diſcharged by purges; but ſo corroded by the juices of the ſtomach, that it was ſcarce to be known, all the letters and marks being eaten down to the ſame common ſurface on both ſides. *Kerkring's* Specileg. Anat.

PYNANG, in botany, a name by which ſome authors call the faufel, or areca tree; a kind of palm, from the expreſſed juice of which the drug commonly, but improperly, called *Japan-earth* is made. *Bont.* p. 90.

PYRACANTHA, in botany, a name given by ſome authors to the lycium, or box-thorn.

PYRALIS, the *fire-fly*, a name given by authors to a ſuppoſed inſect, which they ſay is produced in the violent fires of the glaſs and metal furnaces. Plin. l. 2. c. 36.

PYRAMIDALIS (*Cycl.*)—PYRAMIDALES *abdominis*. Theſe are called *ſuccenturiati* by Fallopius; they are ſituated on the lower part of the recti, and ſeem only a portion or appendix of it. They are partly incloſed within the vagina of the recti, running cloſe by each other along the linea alba, to which they are fixed at different diſtances by oblique tendinous indentations, the uppermoſt of which was ſometimes very long.

When theſe muſcles are wanting, the lower extremities of the recti are always thicker than uſual: often there is only one found, and ſometimes, tho' rarely, three. *Winſlow's* Anat. p. 168.

PYRAMIDALIS *oculorum*, in anatomy, a name given by Molinet and ſome others to one of the muſcles of the face, called by Douglaſs and Cooper *aperiens palpebram*, and by Albinus *levator palpebræ ſuperioris*.

PYRÆIA, or PYRETHEA, among the Eaſtern nations of antiquity, were great incloſures uncovered, and dedicated to the ſun, in which a perpetual fire was kept up in honour of this luminary, which was worſhipped by moſt of them. *Calmet.* Dict. Bibl. See CHAMANIM.

PYRENE, in natural hiſtory, the name of a ſtone found always in the ſhape of the ſtone of an olive. It is of the lapis judaicus kind, being no other than the petrified ſpine of ſome ſpecies of echinites. See ECHINUS *marinus*.

PYRETHRUM (*Cycl.*)—PYRETHRUM, in the materia medica, a root of which the druggiſts ſell us indiſcriminately two kinds; the one the root of a corymbiferous plant, called by authors *pyrethrum flore Bellidis*, or the daiſy-flowered pellitory of Spain; the other, the *pyrethrum umbelliferum*, or umbelliferous pellitory: and it is a diſpute among the learned, which of the two is the genuine and proper kind. The deſcription left us of it by Dioſcorides, as it is differently written, ſerving as well to prove the one ſo as the other.

The roots of the daiſy-flowered pellitory are what we moſt frequently meet with. They are of three or four inches long, of the thickneſs of one's little finger, greyiſh and wrinkled without, and whitiſh within, and of an acrid and burning taſte. Thoſe of the umbelliferous pellitory are of the ſame length, but ſomewhat thinner, of a browniſh grey without, and white within, and are furniſhed with a ſort of beard at top, ſomewhat like the roots of the meum. It is of an acrid taſte, and much reſembles the other in its virtues. They are both uſed in the tooth-ach, and are preſcribed by ſome in diſeaſes of the head and nerves, and are found to be diuretic and violently ſudorific, but they are very ſeldom given.

PYRGUS, among the Romans, a dice-box of the ſhape of a medius, open above, and having a great many ſhelves or partitions within it; ſo that when the dice were thrown into it out of the frittillum, they were thereby overturned many times before they could reach the bottom, in which there was an opening for them to fall through upon the table. *Pitiſc.* in voc. See FRITTILLUM.

PYRHOPOECILOS, in the natural hiſtory of the antients, a ſtone ſo called from its having a great many ſpots of the colour of fire. *Pitiſc.* in voc.

PYRIATERION, a word uſed by the antients to expreſs a ſweating room.

PYRIATOS, a word uſed by ſome authors to expreſs a brick when heated, in order to be applied to the body wrapped up in a cloth by way of a dry fomentation.

PYRICAUSTUM, a word uſed by medical writers to expreſs a burn or ſcald.

PYRICUBIUM, in natural hiſtory, the name of a genus of foſſile bodies, uſually comprehended, with many others of very different figure and ſtructure, under the general name *pyrites*. See Tab. of Foſſils, Claſs 5.

The diftinguifhing characters of the *pyricubia* are thefe: they are compound, inflammable, metallic bodies, of a cubic figure, or refembling a die, being compofed of fix fides.

Of this genus there are only two known fpecies: 1. The great *pyricubium*, of a foliaceous ftructure; and, 2. The fmaller folid *pyricubium*. See Tab. of Foff. Clafs 5.

The firft of thefe is a very elegant foffil, and is fo regularly fhaped, and fo highly polifhed by nature, that it has been often fuppofed to be wrought by art. It is but moderately hard, but is very heavy, and is of a foliaceous ftructure. It is exactly of the figure of a die, being compofed of fix regular fides, placed at right angles; but tho' ever thus regular in fhape, it is not at all fo in fize: the moft common fpecimens of it are about a third of an inch in diameter; but it is found much larger, even to three inches, and fo fmall as to the tenth of an inch. It is perfectly polifhed and fmooth on all its furfaces, and is of a very beautiful whitifh green, with a faint admixture of yellow. It is found in the German and Hungarian mines, and in the Eaft Indies.

The fecond fort, or the fmall folid *pyricubium*, is a foffil of much lefs beauty, tho' equally regular in its fhape and appearance. It is very heavy, and extremely firm and hard, and is not of a foliaceous or flaky ftructure; but of one regular and uniform mafs, and when broken appears very bright and gloffy. It is ever found in the regular form of a cube, or regular folid body, made up of fix flat fides placed at right angles. Its ufual fize is about the eighth of an inch diameter, but it is found fmaller than a pin's head, and fometimes fo large as to be near an inch. It is perfectly fmooth on all its furfaces, and is naturally of a pale yellowifh green, and as bright on the outfide as within; but very often it is found of a ferruginous or dufky furface, owing to a fort of rufting, which is an accident to which the feveral fpecies of naturally bright pyritæ are moft of them alfo fubject.

It is very common in Germany and Italy, and in fome parts of America, as alfo in our own country. With us it is commonly found immerfed in flate, fuch as we cover houfes with; but in Germany and other places it is ufually found loofe among the earth of mountains. With us it is ufually of a bright furface, in Germany it is more frequently dufky. *Hill's* Hift. of Foff. p. 619.

PYRIFORMIS (*Cycl.*)—This is alfo called *pyramidalis*, and is a fmall oblong mufcle, of the figure of a flat pear, or *pyramid*, whence it has its names.

It is fituated almoft tranfverfely between the os facrum and ifchium, being covered and hid by the firft two glutæi. It is fixed to the interior lateral part of the os facrum by flefhy fibres, and to the neighbouring part of the anterior or concave fide of that bone, by three digitations lying between the anterior holes. It is alfo fixed by a fmall infertion to the ligamentum facro-fciaticum, and edge of the great finus of the os ilium. From thence it runs tranfverfely toward the joint of the hip, its fibres contracting in breadth; it terminates in a fhort tendon, which is inferted in the middle of the internal labium of the upper edge of the great trochanter, by two or three branches. The upper part of this tendon receives feveral fibres from the glutæus medius, and its lower part is united to the gemellus fuperior, and tendon of the obturator internus. Sometimes there are two *pyriformes*, feparated only by the nervus fciaticus. *Winflow's* Anat. 209.

PYRIPHLEGES, a word ufed by the old writers in medicine to exprefs a perfon labouring under an extreme degree of a febrile heat.

PYRIPLACIS, in natural hiftory, the name of a genus of pyritæ, the characters of which are thefe: they are compound, inflammable, metallic bodies, found in loofe detached maffes of a fimple and uniform, not ftriated internal ftructure, and are covered with an inveftient coat or cruft.

Of this genus of foffils there are three known fpecies: 1. A flatted kind, with a fcabrous coat. 2. A globofe one, with a cracked and furrowed coat. And 3. A flatted one, with a very thick, brownifh-white cruft. See Tab. of Foff. Clafs 5.

The firft of thefe is a dufky brownifh-green mafs, furrounded and every way covered by a ferruginous coat, of the thicknefs of a fhilling or more, which is rendered very rough and fcabrous, by having received multitudes of fmall pebbles and particles of fand into its fubftance while yet moift, which are become firmly bedded in it, and make a part of its fubftance. This is common in the gravel-pits about London.

The fecond is of an orbicular figure, and is of a very coarfe ftructure, being compofed of vifible granules, and is of a pale yet dufky green colour. It is covered with a brownifh yellow or ferrugineous coat, of the thicknefs of half a crown, or fometimes much more. This is ufually fomewhat irregularly raifed in tubercles on the furface, which are divided by a fort of fine lines: thefe are truly fo many cracks in the fuperficies, all which, when the body has been fome time expofed to a damp air, fly more afunder at their edges, and become deeper, opening into the body of the mafs. This fpecies is found of all the intermediate fizes between an ounce and eight or ten pounds in weight. It is very common in the chalk-pits of Kent, and in many other parts of the kingdom; and tho' moft frequently found in chalk, yet is fometimes met with among gravel, or lying loofe upon the furface.

The third is a very fingular fpecies, yet from its unpromifing appearance has been overlooked by all the enquirers into thefe fubjects; having never been defcribed in the writings, nor preferved in the mufeums of the late collectors of foffils. It is very hard, and moderately heavy, and is ufually of a flatted, orbicular, or oval figure; and its moft frequent fize is between two and three inches in diameter. It is of an irregular, uneven, and rough furface, full of fmall prominences, very harfh and rough to the touch, and looks merely like a lump of greyifh hard clay. When broken, it is found, however, to confift of a nucleus of the fame fhape with the whole body, and every way equally furrounded with a cruft of a thicknefs equal to its whole diameter, or nearly fo.

The nucleus is of a deep and dufky brownifh-green colour, and of a plain fimple ftructure; being compofed of no vifible moleculæ. The cruft is of a pale, greyifh-brown, earthy fubftance, appearing like an indurated earth, and glittering in fome few places with fmall gloffy particles. This is found in great plenty in fome of the clay-pits about London. *Hill's* Hift. of Foff. p. 613.

PYRIPOLYGONIUM, in natural hiftory, the name of a genus of foffils, the characters of which are, that they are compound metallic bodies, of a regular figure, confifting of twelve planes. See Tab. of Foff. Clafs 5.

There is only one known fpecies of this genus, tho' fubject to great varieties in its appearance; and this has been by authors hitherto confounded, with many other bodies of very different nature and figure, under the general name pyrites.

The *pyripolygonium*, when perfect, is an extremely elegant and beautiful foffil; but this is a ftate it is very rarely found in. It is moderately firm, of a compact texture, and very heavy; tho' its natural figure be a regular body, compofed of twelve planes, yet it is fubject to great imperfections and irregularities. It often feems to want one or more of its fides, and not unfrequently, from the accidental breaking of fome of its angles, to have more than its number; and very often has a great many other fmaller and lefs perfect bodies of its own kind, growing to its larger and lefs perfect fpecimens. It is found from the twentieth part of an inch, to four inches in diameter; but its moft common fize is about a third of an inch. It is naturally of a polifhed and fhining furface, and of a pale whitifh yellow; but fometimes it is brownifh, or of an iron colour.

It is not unfrequent in Cornwall and Devonfhire; but is much more common in Germany. *Hill's* Hift. of Foff. p. 621.

PYRITES, (*Cycl.*) in natural hiftory, a name ufed by Dr. Hill as the claffical term for the lefs regularly figured bodies of the number of thofe ufually called, too indeterminately, by that name. See Tab. of Foff. Clafs 5.

According to this diftinction *pyritæ* are compound, inflammable, metallic bodies, found in detached maffes, but of no determinately angular figure. Of this clafs there are two general orders of bodies; the firft, thofe which are of a plain and fimple internal ftructure; and the fecond, thofe which are regularly ftriated within: and of each of thefe there are two genera. Thofe of the firft are:

1. The *pyriplaces*. Thefe are *pyritæ* of a fimple internal ftructure, and covered with an inveftient coat or cruft.

2. The *gymnopyres*. Thefe are *pyritæ* of a fimple internal ftructure, and naked, or not covered by any inveftient coat or cruft.

The genera of the fecond order, or the ftriated *pyritæ*, are,

1. The *pyritricha*. Thefe are the *pyritæ* of a fimply ftriated ftructure.

And, 2. The *pyritrichiphylla*. Thefe are the *pyritæ* whofe furfaces are covered with foliaceous flakes, made by a continuation and expanfion of the ends of the ftriæ. *Hill's* Hift. of Foff. p. 612.

The feveral fpecies of each of thefe genera, fee under the feveral generical heads, PYRITRICHUM, &c.

Diofcorides mentions only one kind of *pyrites*, which is the common yellow fpecies. Avifenna and the other Arabians mention two yellow forts, a white one, and a ferrugineous one. None of thefe authors made any diftinction between the marcafites and *pyritæ*, but this fort of matter, whether formed into fmall nodules, or continued ftrata, was called indifferently by one or other of thefe names.

The four kinds of this ftone mentioned by the Arabians are called from their colours, the golden, the filver, the braffy, and the ferrugineous *pyrites*. The oldeft authors are of the opinion of Diofcorides, and mention only one kind, deducing them all from the fame principles, and fuppofing their variety of colours to be only owing to accidents. Ariftotle and Theophraftus thus mention the *pyrites* as one thing, under the name *mylia*, which having been tranflated *molaris lapis*, has been underftood by fome to mean fome fort of mill-ftone, or other coarfe ftone fit for fuch purpofes; and by that means the whole fenfe of the authors has been perverted and mifunderftood.

Pliny mentions two kinds of the *pyrites*, the gold and the filver kind: he tells us, there is a ftone, with fome refemblance of brafs in its appearance, which is found in Cyprus, and about Acarnania; and that it is of two kinds, yellow and white. It is clear from this, that this author had con-

sulted some other of the Greeks besides Dioscorides and Theophrastus, from whom he principally furnishes himself with these accounts; but he makes no mention of the rust-coloured or ferrugineous *pyrites*, which is as common as any of the others, even in the country where he wrote: and thence it is evident, that he did not write from his own observation, tho' in some places we are not able to trace him up to his originals, which may be lost. Avisenna tells us, that cadmia was made of the *pyrites*, that is, the cadmia fornacum, or tutty. Pliny and Dioscorides do not in all respects agree as to the several kinds of factitious cadmia; and tho' Pliny does not mention this particular kind of it, Dioscorides tells us of such a sort made in some places by burning the stone called *pyrites*.

The principal contents of *pyritæ* may be in general guessed at from their colour. The white *pyrites* usually contains arsenic, the yellowish contains sulphur and iron, and the fully yellow sulphur and copper. The colours, therefore, make a very essential mark for the distinction of the several kinds of this fossil The yellowish *pyrites*, that is, such as contains iron and sulphur, is found in the strata of several kinds of stone, in clay, and in the earth lying over the mines of several metals. The white, or arsenical *pyrites*, and the fully yellow, are less common, but are usually met with about mines. *Agricola* de Metall.

It is a matter of great difficulty to ascertain the time of the formation of fossils. Many of them seem to have remained in their present state, unaltered, from the beginning of the world; but many have also been formed in later times, and continue to be formed to this day. Of the number of these last the stalactitæ, or stony icicles, hanging down from the roofs of grottos are known to be; and it is equally certain, that the *pyritæ* also are so formed, for many of the stalactitæ in the caves dug by the German miners are found to be coated over in several parts with *pyritæ* [a]; and even in our own kingdom, pieces of wood buried in clay that contains *pyrites*, such as is commonly dug to make tiles, if taken up again after a number of years, is always found impregnated with this substance, forming veins in it, and sometimes nodules on its surface. [[a]Act. Erudit. Ann. 1726. p. 273.]

The *pyritæ* affixed to stalactitæ are finer than the other kinds, and it appears very evident to such as have thoroughly considered the process of nature in them, that they are not formed of particles brought together by water, in the manner of the *pyrites*, in wood buried under clay, or in the manner of these stalactitæ themselves; but are composed of infinitely minute particles, brought together by their mutual attractions on a proper basis, and which had been before floating in the air.

The antients in general supposed, that copper was contained in the *pyrites*; but they had no opinion that iron was a part of it, tho' it is certain that iron is the basis of almost all of them, and copper has a part only in a very few: but this was the effect of judging from appearances, instead of having recourse to experiments. Our own Lister has the honour of being the first author who has treated properly of them, and found out their true and general basis to be iron; but he carries it too far when he supposes them to be all properly iron ores: for this is not the case, many of them, which contain no other metal beside iron, yet holding it in small quantity, and in such a combination of other principles, that it is scarce extricable from them, and some kinds contain no iron at all. *Lister* de Font. Medic. Angliæ.

Berger, who has written on the Caroline baths, has taken up the subject, and improving upon Lister's plan, has given a much more just account of them. He allows that iron seems the basis of great numbers of the *pyritæ*, and that this is evident from the observation, that the remaining matter of many, of them, after burning away the sulphur, is found to be attracted by the magnet; but he observes also, that in many copper is mixed with the iron, and that tho' iron is in general found in even those kinds which give the most obvious proofs of copper, yet there are some in which there can no iron be found.

This author observes also, that besides the metalline particles, whether iron or copper, there is also contained in the *pyritæ* an unmetallic earth, which is in the composition of this stone most equally mixed and perfectly blended with the particles of these metals, and with those of the salts and sulphurs contained also in the mass. Sulphur also he acknowledges to make a great part of many of the *pyritæ*, particularly of all the yellowish and full yellow kinds. The white or silvery *pyrites* contains less sulphur than any of the others, and the yellow or venereal *pyrites*, tho' it contain much arsenic, yet does not fail to contain sulphur also in considerable quantity. *Berger* de Font Carolin.

The mention of gold and silver in the *pyrites* is very common among authors, but the colour of these stones seems principally to have given ground for that opinion In reality these metals are very seldom found naturally making parts of the *pyrites*, and when they are, it is only in a very inconsiderable quantity. But in those specimens found about the mines of gold and silver, the particles of those metals assembled into visible masses are sometimes found imbedded in lumps of the *pyrites*; and such pieces of this stone may then well be said to contain those precious metals. The occasion of this accident, however, is no more than this, that the *pyrites* is formed in mines and other places at this day; which is plain from its being in some places found adhering to the sides of stalactitæ, as has already been mentioned: and in like manner it might adhere to particles of gold and silver, and thereby give ground to the supposition of their being parts of it.

The common *pyritæ* of our clay-pits and sea coasts are used in the making of coperas or vitriol; but among these there is found a very great difference, some of them turning themselves very easily to vitriol, when only exposed to moist air; others doing it with more difficulty; and some not at all, tho' exposed many years. Some also yield all their vitriol at once, on pouring warm water on them; while others must lie exposed to the air at several different times, and roasted in the mean while in order to obtain it. The settled observations on this subject, as collected from experiments, are these:

No *pyrites* which contains any copper, or any arsenic, will of itself turn into vitriol, but requires a previous roasting.

The sulphureous iron *pyrites*, void of copper or arsenic, all turn to vitriol on being only exposed to the air; and that the sooner or later, as they are of a more or less compact substance. The fibrous or radiated *pyritæ* are usually of this kind; but this is no general rule, for there are some radiated ones which remain whole years unaltered in the air.

Copper and arsenic always resist the shooting of the salts of the *pyrites*, or its turning to vitriol; but these are not the only agents that resist this change, for in some merely ferreous and sulphureous *pyritæ* the change is not made but with much time and difficulty. *Henkell*, Pyritol.

It is remarkable also, that vitriol is found in some *pyritæ*, if water be poured upon them immediately after the roasting; while others will not yield any till they have been afterwards exposed to the air. It even seems, that we are to look into the air for the cause of the appearance of vitriol in the coperas stones. This it may greatly assist in effecting, as it carries a quantity of moist vapours in it: for it is well known, that the acid of sulphur has not the power to resolve iron into the form of a salt without the addition of water; nay, oil of vitriol, or of sulphur, being moderately concentrated, tho' it be then diluted with much more water than it is united with while yet in sulphur, does not even dissolve filings of iron unless there be four times or six times as much water poured to it. Water alone, however, tho' a great and necessary agent, cannot be supposed to effect the whole change; for tho' there are some of the *pyritæ* that yield their vitriol by means of it, yet there are others that do not; and some *pyritæ* are presently turned into vitriol, when exposed to the air, which had before remained for many years under water unaltered. Of this kind there are many on the shores of the sea in most parts of Europe. In England particularly we have them in great plenty in Sheppey Island in Kent. These *pyritæ* will long resist the change into vitriol, when in the air, and yet they evidently contain no copper nor arsenic.

There is also a kind very common on the shores, which resembles wood in texture and appearance; and has probably once been wood, but has now its pores filled with the *pyrites*: of these many lie buried a foot or more deep in the sand under the sea water; and in that state they never shoot into vitriol, but are of a firm texture and considerable hardness, and when broken look very bright within, and have no taste of vitriol, nor give any mark that they contain any: yet these, if they are taken up and exposed to the air for a fortnight, lose all their brightness and their hardness, and mouldering to pieces, become so rich in vitriol, that it forms itself into regular crystals on their surfaces. Now if moisture alone was sufficient to produce this effect, there is no reason why they should not have been resolved into vitriol under a very moist sand. The great cause we are able to assign, appears to be the vague acid, so common in the fossile world, and filling also the region of air; but an ingenious reasoner will still own, that tho' this may do much, yet there must be some other cause, yet undiscovered, for the production of vitriol in these fossils; since this, as well as the moisture of the air, ought to act more equally than we find by experience it does on these stones, if all were owing to it. *Henkell*, Pyritol.

In the exposing these copperas stones to the air, if it be a moist season, no farther care need be taken of them than the piling them up in a heap; but moistening them now and then is a necessary circumstance in dry seasons, and in this case the water should be sprinkled on them in small quantities at a time, and the heaps now and then turned and new made. Much depends on this management, the same quantity of stones yielding twice as much copperas, with proper care, as they would without it

When the matter of the *pyrites* is mixed with the lead ores, the method of separating the metal by assaying is this: roast two centners of the ore, as in the usual method, and keep a stronger fire than when the ore is pure. The *pyrites*, especially when it is merely iron, hinders an ore from easily growing clammy, or turning into large lumps, or entirely melting. When the ore is sufficiently washed, let it cool, beat it to powder, and repeat the roasting to a third fire, till when it is red hot in the fire, there is no smell of sulphur: then mix the

ore

ore with six centners of the black flux, and two of sandiver, and finish the work in the common way, only making the fire greater, and continuing it longer, toward the end of the operation. *Cramer*'s Art of assaying, p. 292. See the article Lead-*ore*.

PYRITICUM *liquamen*. See Liquamen *pyriticum*.

PYRITRICHIPHYLLUM, in natural history, the name of a genus of fossils of the class of the pyritæ, the characters of which are these: they are compound, inflammable, metallic bodies, found in loose masses not of any regularly angular figure, and of a striated texture, with foliaceous ends to the striæ, appearing on the surface or within the mass. See Tab. of Foss. Class 5.

Of this genus there are only two known species; one having the foliaceous ends of the striæ on the outer surface of the mass, and the other having a smooth external surface, and the foliaceous ends of the striæ covering the sides of internal hollows. *Hill*'s Hist. of Foss. p 617.

The first is a fossil of great beauty, of a very firm texture, remarkably heavy, and usually found in large masses of an orbicular or oblong figure: these masses are sometimes composed wholly of the matter of the pyrites, and in others they are only coats of that substance surrounding stones.

It is of a very closely striated texture, and the striæ are broad, but unequally so, and their extremities at the surface of the mass are beautifully formed into several series of thin foliaceous plates, which usually cover all the superficies, and stand up to several heights and in different angles, but mostly leaning one way; they are of unequal thicknesses, being composed of different numbers of plates, and are usually notched at the ends. The whole is of a somewhat deep green, with a cast of olive or amber colour, and when it is fresh broken, is very bright and glittering.

The second is a fossil of equal beauty with the former, tho' of a very different appearance; it is very hard and very heavy, and is always found in detached masses; but those of a very singular kind, for they are always more or less hollow. These masses are of various figures and appearances, sometimes round and like pebbles, but more frequently full of odd protuberances, like the flints in our chalk pits; and sometimes the masses of it are found running over the surfaces of stones in form of crusts, which are variously protuberant in different parts, and rise into frequent beautiful tho' irregular tubercles.

The outer surface of this species is usually very bright and glossy, and perfectly smooth, as if wrought by art, even on the tubercles themselves. It is usually a sort of crust even in its most solid masses, seldom being above half an inch thick, and of a very beautifully striated texture, the striæ being remarkably fine and slender. These, tho' they unite so at their superficies as to form a very smooth surface, yet at their other ends, where they terminate at the hollows of the masses, are expanded into very elegant series of foliaceous plates, usually approaching to a square figure, and not standing erect, as in the other species, but lying horizontally and almost perfectly flat over one another: these are composed of flakes not thicker than those of many of the foliacious talcs. The whole is usually of a gold yellow, and very bright and beautiful; but the outer surface often contracts a dull brownish hue on being long exposed to the air.

The first of these is found in many of the English and German mines, the other has been yet only found in the mines on Mendip hills in Somersetshire, but there in considerable plenty. *Hill*'s Hist. of Foss p. 618

PYRITRICHUM, in natural history, the name of a genus of pyritæ, the characters of which are these: they are compound, inflammable, metallic fossils, always found in detached masses of no regularly angular figure, and of a simply striated internal structure. See Tab. of Foss. Class 5.

Of this genus of pyritæ there are three known species, 1. A globose one, with an irregular surface. 2. A globose one covered with angular tubercles. 3. A silver-coloured globose one, with a smooth surface.

The first is considerably hard, and very remarkably heavy, and is usually of a roundish form, tho' sometimes oblong; sometimes it is full of irregular prominences on the surface, and sometimes is a complex mass, consisting of a great number of roundish masses of smoother or rougher surfaces joined together. It is very various in size; the more common specimens of it are of six or eight ounces weight, tho' there are others of less than an ounce, and some of several pounds. The prominences on the surface are usually broad and depressed, and these are frequently marked with irregular short lines, and raised in ridges. When broken, it is found to be of a very regular striated structure; the striæ are not very broad, and usually run from the center to the circumference. It is of a pale whitish green within, and is covered with a brown or ferrugineous crust.

The second is a very firm and hard body, usually of an orbicular figure, and sometimes, tho' rarely, oblong; it is of a very remarkably rough surface, being covered with pyramidal tubercles, with very obtuse ends. These are of a quadrangular figure, and have very broad bases: they sometimes incline, or bend a little; but more usually they stand perfectly upright, and are placed so close together, that they croud and injure one another's figure at their bases. The whole is of a ferrugineous or rust colour without, and of a yellowish colour within, beautifully striated, and very bright and glittering.

The third is an extremely elegant and beautiful species, it is but moderately hard, tho' remarkably heavy, and is usually of a regularly orbicular form, tho' sometimes it varies from it like the other pyritæ. Its most frequent size is about an inch and half in diameter; but it is sometimes found as small as a nut, or a schoolboy's marble, and sometimes of more than two pounds weight. Its surface is usually smooth and even, and it is never covered with any coat or crust. It is of a very regularly striated internal structure, and of a beautiful silvery green colour: the striæ are moderately broad and run very evenly from the center to the circumference; and very often there is a small and firm central nucleus, which is much harder than the rest of the mass, and is of a plain not striated structure.

All the three species are found plentifully in different parts of the kingdom: the first in all sorts of strata, and often loose on the ground; the second, principally in the chalk pits of Kent and Sussex; and the last in Essex and Hampshire, and very frequently in the German mines. *Hill*'s Hist. of Foss p. 617.

PYRMONT-*waters*. The country all about where these springs are, abound with materials which give virtue to the waters; and the quarries of stone, wherever they are dug, send up spirituous and martial exhalations as well as the springs that run from them, and the water among them has in general a vitriolic taste. Iron is found all about the place also, under the appearance of a yellowish earth or ochre, which contains so much of that metal, that it may be worked as an ore of it to great advantage. Ferrugineous stones are also found in great abundance in the neighbourhood of the place; these may be also worked as iron ores, and the selenites is found in the strata of earth that make up the hills thereabout, in great abundance, and in beautiful perfection.

The waters themselves, tho' they shew evident marks of an alkali, yet have also an acid principle in them, of the nature of the common acid of sulphur, except in this, that in these waters the acid carries with it a subtle mineral oil or fattiness; and mixing with the common alkali salt, which is found in all mineral waters, these together form a neutral salt: but as in the composition of this salt there is much more alkali than acid, it is necessary that the water should shew alkaline rather than acid qualities. The analysis shews also, that the waters contain a stony matter embodied in them, which is pure, insipid, colourless and tasteless, and seems to be in nothing different from common crystal. The earth about the springs contains also a great number of lumps of a clayey matter, of the size of a walnut, and of a yellowish colour; in all of which, when broken, there is found pure crystal in small shoots, sometimes in its own regular figure, and sometimes irregular and mutilated.

A water containing these principles thus combined, cannot but possess those virtues we find so eminent in this; these are, the opening obstructions, correcting the sharpness of the humors, and restoring the solids to their due state. *Seipp*, Nova Descrip. Font. Pyrm.

The history of these waters is accurately given by Hoffman in his observations on them, both in their natural state and in mixture with other bodies.

He first observes, that they contain a volatile and subtle principle, greatly more penetrating and strong, as well as in larger quantity, than any other mineral water; but that this is not to be expected in them any where but upon the spot, for those who transport them to other places are constrained to let a part of this fly off to preserve the rest. If either glass or earthen vessels be filled at the spring, and immediately corked and fastened down, the consequence is, that they will burst on the first motion or heat of the weather. They are, therefore, forced to fill them only in part at first, and let them stand a while for this subtle spirit to exhale, and then a while after the filling them up, to cork and fit them for carriage.

2. If they are drank upon the spot in a morning on an empty stomach, they affect the nose with a pungent tingling, and disturb the head for many hours afterwards.

3. If they are taken at the spring, they purge but very little; but if taken in another place, after transportation, they purge considerably more, and render the stools black. It is observable also, that if they are left in an open vessel a few days, their virtue wholly exhales, and they no longer purge nor render the stools black.

4. If tea-leaves, balaustine-flowers, or galls, are put into this water, they first change it to a blue, from that to a purple, and finally to a black. This is a ready proof, that black is only a deep purple, and purple only a deep blue: a little spirit of vitriol added to this liquor destroys all the colour, and renders it limpid as before.

5. If any acid be mixed with *Pyrmont water*, there is raised an effervescence, and bubbles of air are carried up in great quantity; and this whether the stronger acids, such as spirit of vitriol, or aqua fortis, be used; or the weaker, as vinegar, lemon-juice, or Rhenish wine.

6. If an alkaline liquor be added, whether it be volatile, as the spirit of sal armoniac; or fixed, as the oil of tartar, there is

is no ebullition raised, but the liquor becomes turbid and milky. If spirit of vitriol be afterwards added to this, to saturate the additional alkali, the liquor becomes limpid again.

7. Cow's milk mixed in equal quantity with *Pyrmont water* does not coagulate, but, on the contrary, becomes thinner than before, and is preserved from turning sower so soon as it otherwise would in hot weather. This is a proof that there is no predominating acid in these waters.

8. If syrup of violets be added to *Pyrmont water*, it turns it to a beautiful green. This is a proof of the alkaline nature of these waters; and it is farther proved by adding spirit of vitriol, or any other acid, to this green liquor, which on that becomes limpid again.

9. Four pints of this water evaporated over a gentle fire, yield no more than two scruples of a dry residuum. Oil of vitriol being poured on this, acid effervescence arises, and with it an acrid and pungent vapour, like that produced by mixing oil of vitriol and common salt. If spirit of vitriol be used instead of the oil, the effervescence is in a less degree, and the salt is in part changed to a bitter saline mass, the remainder separated from which proves to be a calcarious earth no longer fermenting with the spirit of vitriol.

10. If a quantity of *Pyrmont water* be exposed twenty four hours to the open air in a bason, it will at the end be found to have lost all its virtues, tasting wholly insipid, and being turbid instead of the fine clearness it had before, and a yellow ochreous earth is precipitated to the bottom; after this the liquor will no longer shew any of those qualities which were before its distinguishing characters, it will no longer ferment with acids, nor turn black with galls, nor green with syrup of violets.

It appears from the whole, that the *Pyrmont waters* possess a pure, extremely penetrating, and elastic mineral spirit, and that in a very large proportion; and to this their virtues are principally to be attributed. This mineral spirit, while it remains engaged in a calcareous earth, imitates the properties of an alkaline substance; and when joined with a subtile martial earth, it emulates the properties of vitriol, giving the stools a black colour, and turning a tincture of galls into ink: and while this remains in the water in these forms of an alkaline or vitriolic principle of so great subtilty, it cannot but give them very great virtues in strengthening the tone of the viscera, opening obstructions, and stimulating in a proper manner the excretory ducts, so as to make them duly perform their office; but as soon as by the standing of the water open, or by any other accident, this subtle element is evaporated, all the virtues of the water must be gone with it.

The great quantity of this powerful spirit contained in the waters makes them more fit for the robust and strong constitutions, when depraved by illness, than for the weak and tender ones; but even the tenderest people may take them, only observing to take but a small dose, or to dilute them with an equal quantity of common water immediately before the taking them.

Hoffman also recommends the *Pyrmont water* mixed with equal quantities of milk, on his own experience, in scorbutic and gouty cases. *Hoffm.* Opera, T. 5. p. 143, seq.

Near the famous well at *Pyrmont*, is a stone-quarry under ground, from some parts of which a sulphureous steam comes out, which commonly rises to a small height. Animals held in this steam are soon suffocated, but recover if quickly taken out. When a man stands in this steam, but with his head over it, it proves an excellent sudorific. Dr. Seip proposes to perform cures in several diseases with it. See Phil. Transf. N°. 448. sect. 4. and Misc. Berolin. Tom. V. part. 2. sect 4.

Imitation of PYRMONT *water.* This medicinal water may be imitated very nicely by art in the following manner: take a quart of the purest and lightest water, add to it thirty drops of a strong solution of iron made in spirit of salt, a drachm of oil of tartar per deliquium, and thirty drops of spirit of vitriol, or a little more or less, as is found necessary, not to let the alkali of the oil of tartar prevail too strongly, tho' it must prevail a little. Shake all briskly together, and on tasting it will be found extremely to resemble the true *Pyrmont water*.

The basis on which this is founded is the analysis and trial of the true *Pyrmont water*, by which it is found to contain a subtle aqueous fluid, a volatile iron, and a predominant alkali, all joined together into one brisk pungent spirituous water. The artificial *Pyrmont* thus made, if the proportions are carefully minded, will extremely resemble the natural, and will have the same effects as a medicine. *Shaw's* Lectures, p. 90.

PYROBOLUS, in natural history, a name given by many authors to the stone more generally called *pyrites*; others have called it *siderites*, *pyrobalanus*, *pyropus*, and *othonna*, and the Greeks *mylias*. Among the translators and interpreters of the works of authors who have treated on these subjects, there has been great confusion concerning this stone, few of them understanding any thing of the subject, and rendering its descriptions so injudiciously, that they may rather be thought to belong to other stones. See PYRITES.

PYROCTOGONIUM, in natural history, the name given by Dr. Hill to a genus of fossils usually comprehended by authors, with many other bodies of a different figure and structure, under the general name pyrites.

The characters of the *pyroctogonium* are these: it is a compound, inflammable, metallic body, of a regular octohaedral figure, or composed of eight planes.

There is only one known species of this genus, which is a very singular and elegant fossil, being composed of eight triangular planes; these being the sides of two quadrilateral pyramids, with broad bases, which being joined base to base, constitute the *pyroctogonium*. See Tab. of Foss. Class 5.

This figure is very regular and determinate in the perfect specimens of this body, but there is scarce any fossil which is more subject to imperfections and accidental variations. Its most perfect state is when the two pyramids of which it is composed are placed evenly one over against the other; but this is but rarely the case, they are often placed unevenly, or slanting; their planes are frequently of very irregular lengths and breadths, and not unfrequently the specimens are found mutilated and imperfect, and very often a number of them cohering in a cluster one with another, and very much mutilating or injuring one another's figure. They are found of all the sizes between that of a pin's head, and an inch in diameter; but the large ones are scarce, and the most usual standard is a third of an inch. They are naturally of a smooth and polished surface, and of the colour of wrought iron; when broken they are bright and sparkling, and of a paler colour than without. When nicely examined as to their internal structure, they are found to be composed like the marcasites, of a number of irregularly arranged foliaceous flakes or plates.

It is found very frequently in Cornwall, Devonshire, and most other of our counties where there are mines. It is sometimes met with loose in the earth, sometimes lodged in the bodies of marcasites, or in the solid fossils, and varies sometimes from its iron colour to a dusky yellow. It is sometimes also found with many specimens connected into a mass; these are seldom uniform in size, and cohere in various directions, often greatly injuring one another's figure. Sometimes also, as in the case of the crystals, they form a large mass, of which the outer surface only is concreted into or covered with regular figures, the whole inner part being a confused substance.

Masses of this kind are not unfrequently found of a regularly orbicular figure, and beset all over with regularly figured *pyroctogonia* of various sizes. *Hill's* Hist. of Foss. p. 620.

PYROLA, *winter-green*, in botany, the name of a genus of plants, the characters of which are these: the flower is of the rosaceous kind, consisting of several petals arranged in a circular form. The pistil arises from the flower-cup, and ends in a sort of proboscis: this afterwards becomes an umbilicated and striated, roundish, quinque capsular fruit, usually containing a number of very small seeds.

The species of *pyrolæ*, enumerated by Mr. Tournefort, are these: 1. The larger round-leaved *pyrola*. 2. The smaller round-leaved *pyrola*. 3. The *pyrola* with sharp-pointed and serrated leaves. And 4. The shrubby *pyrola*, with flowers resembling those of the arbutus. *Tourn.* Inst. p. 256.

PYROLAMPIS, the *glow-worm*, a small insect remarkable for its shining in the night.

The male and female differ greatly in this species of insect. The male has wings, and is a small fly; the female has no wings, but is a large crawling worm.

The body of the male is oblong, and somewhat flatted; the wings are shorter than the body; the head is broad, dun, and flat; the eyes are large and black. This has no light issuing from it, and is not commonly supposed to be at all of kin to the *glow-worm*. See Tab. of microscopical Objects, Class 1. voc. *Cicindela volens*.

The female is what we expresly call by this name. This is a very slow-paced animal, without wings, and somewhat resembling a caterpillar; the head is small, flat, hard, and black, and sharp towards the mouth; it has short antennæ, and six moderately long legs; the body is flat, and is composed of twelve rings, whereas the body of the male consists only of five; it is of a dusky colour, with a streak of white down the back. It is often seen in the day-time, but is not known till in the dark; at which time it is easily distinguished by the glowing light, or lambent flame, that is seen near the tail, issuing from the under part of the body.

PYROMACHUS, a name given by some to antimony when reduced to a stony hardness; and by others to copper, when fused with sulphur, and thus rendered less ductile.

PYRONOMIA, a term used by the chemical writers to express the art of regulating fire, so as to make it subservient to all their processes in a determinate degree.

PYROPHAGI, *fire-eaters*, a name given by some to those juglers and mountebanks who deceive people into a belief that they swallow fire.

PYROPHORUS, the name usually given to that substance called by some the *black phosphorus*. See PHOSPHORUS.

It is made in this manner: take four or five parts of alum, and one part of wheat-flour, calcine this together to a brown or blackish mass; powder this and put it into a vial, stop it loosly with a paper, and set it in a sand heat, so as to make it continue glowing hot for some time; after this, remove the whole

whole from the fire, fuffer it to cool gradually, and finally ftop the bottle very clofe down.

A little of this powder being poured out of the bottle, and expofed to the open air, immediately takes fire, and appears like a glowing coal; but the powder muft be frefh made to have a good effect, for the fun's rays, or the moifture of the air being admitted to it, gradually take away its virtue.

Almoft any animal or vegetable fubftance may be fubftituted inftead of wheat-flour in this procefs, and it will fucceed equally well; but no other falt will do in the place of alum. *Shaw's* Lectures, p. 406.

PYROPHYLACIA, a term ufed by Kircher and fome others to exprefs thofe magazines of fire which are placed in the cavities of mountains and other hollows of the earth, and ferve to fupply the feveral volcanos in the different parts of the world. See VOLCANO.

PYROSCOPIA, among the Greeks, a kind of divination, being the fame with pyromancy and ignifpicium. See the article PYROMANCY, *Cycl.*

PYROSIS, a word ufed to exprefs an intenfe heat and rednefs in the face, fuch as that of perfons who travel in extremely hot weather, and the like.

PYRRHALA, in zoology, the name of a bird well known in England by the name of the *bulfinch*, and called by fome authors *rubicilla*.

It is a beautiful bird, and fings very fweetly; but does great mifchief in gardens and orchards, deftroying the buds of the fruit-trees.

PYRRHOCORNIX, in zoology, a name given by authors to a bird of the crow-kind, defcribed by fome authors as a diftinct fpecies; but Mr. Ray, and other very judicious naturalifts, efteem it the fame with the coracias, or Cornifh chough, or only differing in age or by other accidents. *Ray's* Ornithol. p. 86. See CORACIAS.

PYRROPŒCILOS, in the natural hiftory of the antients, the name by which they call the granite of Arabia, commonly known to this day under the name of the *oriental granite.*

The name is derived from the Greek πῦρ, fire, or fire-coloured, and ποικιλος, fpotted; and the antients having ufed the epithet fiery to yellow, as well as red, fome have imagined the granite muft be a yellow ftone; but it is evident that red is the colour meant by it here. *Hill's* Hift. of Foff. p. 500.

PYRSEPHORUS, πυρσηφορος, in the Athenian feftival, hephæftia, the fame with lampadephorus. See LAMPADEPHORUS.

PYRUS, the *pear-tree*, in botany, the name of a genus of trees, the characters of which are thefe: the flower is of the rofaceous kind, and is compofed of feveral petals arranged in a circular form. The cup finally becomes a flefhy fruit, ufually of a turbinated fhape, umbilicated, and divided within into cells which contain oblong feeds. *Tourn.* Inft. p. 629.

The fpecies of *pear*, enumerated by Mr. Tournefort, are thefe: 1. The double-flowered *pear*. 2. The fmall, branched, very fweet-fcented fummer-*pear*. 3. The fummer-*pear*, with very fmall and fweet-fcented fruit. 4. The fweet-flavoured fummer-*pear*, partly of a deep red, and partly of a yellow colour. 5. The fmall, yellowifh, fweet-flavoured *pear*. 6. The round, feffile, fweet-flavoured fummer-*pear*, variegated with black fpots. 7. The round, feffile, fweet flavoured, fugar-tafted fummer-*pear*, of a purplifh green colour. 8. The oblong, iron-coloured, fweet-flavoured fummer-*pear*, with tender pulp. 9. The fmall fummer-*pear*, of a whitifh green colour. 10. The greater whitifh fummer-*pear*. 11. The whitifh, fugar-tafted, very fweet-flavoured, fummer-*pear*. 12. The whitifh fummer-*pear*, with a long pedicle. 13. The oval fummer-*pear*, variegated with iron-coloured fpots. 14. The oblong, reddifh, fugar-tafted, fummer-*pear*. 15. The fmall, roundifh, vinous, fummer-*pear*, of a reddifh yellow colour. 16. The fugar-tafted turbinated fummer-*pear*, with tender pulp. 17. The oblong, fmall, afh-coloured fweet-flavoured fummer-*pear*. 18. The globofe, feffile, fugar-tafted, fummer-*pear*, of a whitifh yellow colour. 19. The fugar-tafted, globofe, whitifh fummer-*pear*. 20. The globofe, feffile, fweet-flavoured fummer-*pear*. 21. The turbinated, feffile, red-coloured, and punctated fummer-*pear*. 22. The turbinated, feffile, fweet-flavoured, fummer-*pear*, partly yellow, and partly variegated with red fpots and veins. 23. The long, red, fummer-*pear*, of a fomewhat acid tafte. 24. The globofe, greenifh purple, fummer-*pear*. 25. The globofe, fugar-tafted, fweet-flavoured, fummer-*pear*, of a yellowifh colour, blended with red and white. 26. The great oblong fummer-*pear*, partly red and partly white. 27. The long fummer-*pear*, of an extremely bitter tafte. 28. The autumnal-*pear*, with very fweet fruit, which diffolves in the mouth. 29. The feffile, fugar-tafted, fweet-flavoured, autumnal-*pear*, of a greenifh yellow colour, and diffolving in the mouth. 30. The turbinated autumnal-*pear*, of a green colour, variegated with blood-coloured veins. 31. The roundifh autumnal-*pear*, of a reddifh iron colour, fometimes fpotted. 32. The long, green, fweet-flavoured autumnal-*pear*, which diffolves in the mouth. 33. The tuberous, feffile, autumnal-*pear*, of a greenifh yellow colour, variegated with black fpots, with fugar-tafted tender pulp. 34. The tuberous, feffile, fugar-tafted, autumnal-*pear*, with hard pulp. 35. The globofe, iron-coloured, very fweet-tafted autumnal-*pear*, with tender pulp. 36. The turbinated, feffile, autumnal-*pear*, with yellowifh fruit, diffolving in the mouth. 37. The globofe, iron-coloured, autumnal-*pear*, with vifcid pulp. 38. The Englifh *pear*, with long fruit, variegated with iron-coloured fpots. 39. The very fweet-flavoured, fugar-tafted, pale-red, oblong, autumnal-*pear*. 40. The great afh-coloured, oblong, autumnal-*pear*. 41. The roundifh, fweet-flavoured, red, autumnal-*pear*. 42. The fmall, globofe, punctated, autumnal-*pear*, of a greenifh red colour. 43. The fmall, tuberous, feffile, darkifh-coloured, autumnal-*pear*. 44. The tuberous, turbinated, punctated, autumnal-*pear*, of a yellowifh or whitifh colour. 45. The turbinated, yellow, or ftriated, fubacid, autumnal *pear*. 46. The turbinated, fading yellow, and fomewhat bitter, aromatic tafted, autumnal-*pear*. 47. The turbinated, feffile, yellow, autumnal-*pear*, with a fomewhat bitter aromatic tafte. 48. The turbinated, feffile, yellow, autumnal-*pear*, with ftriated ribs. 49. The tuberous, angular, autumnal-*pear*, of a yellowifh, fading green colour. 50. The tuberous autumnal-*pear*, with a thin, pellucid fkin, partly red, and partly yellow. 51. The oval, fomewhat angular, autumnal-*pear*, with a very tender fkin of a faint yellow. 52. The large winter *pear*, of a reddifh yellow colour, and fhaped like a pyramid. 53. The pyramid like winter-*pear*, partly purple, variegated with black fpots, and partly yellow. 54. The great oblong, turbinated, iron-coloured, Windfor-*pear*, umbilicated on both fides. 55. The great quince like winter-*pear*, partly yellow, and partly purple. 56. The very fweet-flavoured, yellow, winter-*pear*, with a thick pedicle. 57. The great feffile, winter-*pear*, of a yellowifh grey colour. 58. The globofe, feffile, winter-*pear*, of an afh-colour, variegated with large dark fpots. 59. The long yellow winter-*pear*. 60. The fmall winter-*pear*, of a yellow colour, variegated with red fpots, and a bitter tafte. 61. The oval, fugar-tafted, winter-*pear*, of an iron colour, with a faint admixture of purple. 62. The citron-fhaped, hard, and very fweet-flavoured, winter-*pear*. 63. The globofe, feffile, fugar-tafted, fweet-flavoured, winter-*pear*. 64. The turbinated and unequally tumid winter-*pear*, partly purple, and partly yellow. 65. The great globofe winter-*pear*, of a yellow colour, variegated with red fpots. 66. The turbinated, feffile, winter-*pear*, of a fubacid tafte, a yellow colour, and covered with a multitude of fharp points. 67. The turbinated, feffile, yellow, fugar-tafted, winter-*pear*, of a fweet fmell, and diffolving in the mouth. 68. The tuberous, turbinated, greater fugar-tafted, winter-*pear*, diffolving in the mouth. 69. The oblong, fugar-tafted, fweet-flavoured, winter-*pear*, of a partly deep and partly faint iron colour. 70. The oblong, winter-*pear*, of a very pale red colour. 71. The oblong, yellowifh green, winter-*pear*, of an aufterely fweetifh tafte. 72. The oblong, tuberous, fubacid, winter-*pear*, of a punctated yellow colour. 73. The tuberous, fugar-tafted, punctated, yellowifh green, winter-*pear*. 74. The long, whitifh green, winter-*pear*, diffolving in the mouth. 75. The long, yellowifh green, winter-*pear*, diffolving in the mouth. 76. The feffile, yellowifh green, winter-*pear*, fpotted, umbilicated on both fides, and diffolving in the mouth. 77. The globofe, pale green, tuberous, punctated, winter-*pear*, diffolving in the mouth. 78. The great pyramidal, whitifh, fugar-tafted, fweet-fcented, winter-*pear*, diffolving in the mouth. 79. The feffile, iron-coloured, very fweet-fcented, winter-*pear*, diffolving in the mouth. 80. The globofe, citron-fhaped, punctated, yellow, winter-*pear*, diffolving in the mouth, and very fweet-fcented. 81. The long, fugar-tafted, yellowifh green, winter-*pear*, diffolving in the mouth. 82. The feffile, winter-*pear*, partly purple, and partly yellow. 83. The great, double-headed, winter-*pear*. 84. The tuberous and angular winter-*pear*. 85. The oval, paler green, winter-*pear*, with a very long pedicle, and befet with tubercles. 86. The wild *pear*. 87. The great wild *pear*. *Tourn.* Inft. Bot. p. 628, feq. See the article PEAR.

PYULCUM, a word ufed by the antients to exprefs an inftrument ufed in their times to draw out the pus from the bottom of deep finufes, probably a fort of canula.

Q.

QUACHILTO, in zoology, the name of a very beautiful Brafilian bird, of the moorhen kind, called alfo *yacacintli*, and *porphyrio Americanus*.

It is of a fine blackifh purple colour, variegated with white. Its beak is white, while young; but becomes red as it grows older, and has a naked fpace at its bafis, refembling, in fome fort, the coot. Its legs are of a yellowifh green. It lives about the waters, and feeds on fifh; yet is a very well tafted fifh. It imitates the crowing of a common cock, and makes its mufic early in the morning. *Marggrave*'s Hift. Brafil.

QUADRANGULARIS *pifcis*, the *fquare-fifh*, in zoology, the name of a fifh, which in its moft ufual fize, is about fifteen inches long, four inches high in the middle, and three inches and an half over. The forehead is fquare, a little hollow, and, by the eminency of the eyebrows, two inches and an half over. The nofe blunt, and not very fteep, with two holes in the place of noftrils, and the mouth very fmall. The back is a little convex toward the tail, and on the fides a little obtufely angled; as is alfo the belly, which is plain and flat, and a little rifing toward the tail. It has five fins, two near the gills, two near the tail, and the tail-fin, which is confiderably long. Part of the head and tail are covered with a foft fkin, the reft of the body with a kind of cruft, adorned all over with little round knots, reduced for the moft part into hexagonal figures, and fubdivided into equilateral triangles. *Grew.* Muf. Reg. Soc. p. 110.

QUADRANS, (*Cycl.*) a word ufed by fome authors to exprefs a fourth part of a pound, that is, three ounces Troy weight, or four of the averdupois.

QUADRATING *of a piece*, in gunnery, is examining whether the piece be duly placed in its carriage, and that the wheels be of an equal height.

QUADRATO, or QUADRO, in the Italian mufic, is a name given to the note B, when it comes in the natural or diatonic order, and is thus marked ♮. It is a femitone minor higher than the B mol, or ♭, and in refpect of that may be called *fharp*. See FLAT and SHARP, *Cycl.* and *Suppl.*

QUADRATULUS, in ichthyology, a name given by Rondeletius to the fifh called by other authors the *plateffa*, and *paffer lævis*, in Englifh the *plaife*.

This is properly a fpecies of the pleuronectes, and is diftinguifhed from the reft of that genus by Artedi, by a name expreffing that it has the eyes and fix tubercles on the right fide of the head, and fmooth fides, and a fpine at the anus. See the article PLEURONECTES.

QUADRATURE *of the hyperbola*. See HYPERBOLA.

QUADRATUS (*Cycl.*)—QUADRATUS, in zoology, a name by which fome authors have called the flat fifh, called *paffer* by moft writers, and in Englifh the *plaife*. *Rondelet.* de Pifc. p. 331.

QUADRATUS, in anatomy, a fmall, flat, flefhy mufcle, of the figure of an oblong fquare, fituated tranfverfely between the tuberofity of the ifchium and the great trochanter. It is fixed by one extremity along that obtufe line which runs from under the acetabulum, toward the lower part of the tuberofity of the ifchium; from whence it runs directly towards the great trochanter, and is inferted in almoft all the lower half of the oblong eminence in that apophyfis, but chiefly in the fmall rifing or tuberofity in the middle of that eminence. *Winflow*'s Anat. p. 211.

QUADRATUS *lumborum, five lumbaris externus*, a fmall, oblong, flat mufcle, irregularly fquare, narrower at its upper than at its lower part, lying along the fides of the vertebræ lumborum, between the laft falfe rib and the os ilium. It is fixed below to the external labium of almoft all the pofterior half of the crifta of the os ilium, to the ligamentum facro-iliacum, and a little to the os facrum, by a flefhy plane, the fibres whereof run obliquely backward; from thence it runs up between the facro-lumbaris and pfoas, by both which it is partly hid, and is inferted in the extremities of all the tranfverfe apophyfes of the loins by oblique tendinous digitations. It is alfo fixed by a broad infertion in the twelfth rib, on the infide of the ligament which lies between it and the longiffimus dorfi, by which that rib is connected to the firft vertebra of the loins. *Winflow*'s Anat. p. 249.

QUADRATUS *mufculus*, in anatomy, is alfo a name given by Winflow to the mufcle of the lips called by Albinus and Cowper *depreffor labii inferioris*.

QUADRIGÆ, among the Romans, chariots drawn by four horfes, which were harneffed all a-breaft, and not two and two. *Pitifc.* in voc.

QUADRISETÆ, the *four-haired fly*, a term ufed by the writers in natural hiftory to exprefs thofe flies of the feticaudæ or hair-tailed kind, which have four hairs or briftles growing from the tail, as the others have three, two, or one.

QUADRULA, in natural hiftory, a word fometimes ufed in the fame fenfe as teffela, and fpoken of the cubic pyrites. Sometimes it is ufed alfo as the name of thofe little fpangles of fhining matter that are mixed among fand. Thefe are generally fragments of talc, and are of various colours, white, yellow, and blackifh.

Solinus has ufed the word *quadrula* to exprefs the fragments of yellow talc that are found in that fand called *ammochryfos*, or golden fand. He miftakes thefe fhining particles for maffes of real gold, and makes the fand itfelf a kind of precious fubftance ranked among the gems, and brought from Perfia; but in this he does not agree with the reft of the antients.

QUADRUPEDS, (*Cycl.*) in natural hiftory. The effential character of *quadrupeds* is, that they have a hairy body and four feet, and that the females are viviparous, and give fuck to their young. *Linnæi* Syftem. Natur. p. 33.

Alated QUADRUPEDS. Among the many fabulous things with which natural hiftory has been loaded, ftories of flying *quadrupeds* feem to claim a very high rank; the gryphon, the *quadruped* dragon, and a great many other imaginary animals, having been introduced fo ferioufly among the defcriptions of real animals, that too many have been taught to believe them. Scheuchzer, in his *Phyfica facra Jobi*, has done much toward difcountenancing fuch relations, and Hyacinthus Gemma, who has written exprefly de fabulofis animalibus, has added much on the fame occafion: yet all is not done. The world have late hiftories of lemmas and bafilifks, which never exifted but in the imagination of the relator, or in the fubtle contrivances of the fabricator; as is evidently the cafe in the bafilifks, which we find in the mufæums of the curious, and which are all made out of the wray-fifh. And the generality of readers are fo fond of any thing that is marvellous, that thefe things are fure to be remembered, while perhaps all the truths in the book are forgotten.

Tho' moft of the ftories of *alated* or flying *quadrupeds* are falfe, yet there are evidently fome animals which fhew, that this property is not denied to all *quadrupeds*. We have bats in every part of this kingdom, and the Eaft and Weft Indies are not without them; and whoever accurately examines this creature, will find that it has nothing of a bird but that one property of flying; and that what are called its wings, and ferve it in the office of wings, are in reality only its fore-feet extended, and webbed with a peculiar kind of membrane.

There is a fpecies of flying lizard very common in Java, and called by many the *flying dragon*. Bellonius had led the world into a great error in regard to this animal, having miftaken it for a two-legged creature, and defcribed and figured it as fuch; but Bontius, and others fince his time, have fet us right about it from their own obfervation, and Pifo, as well as many others, have defcribed it truly as a *quadruped*.

Thefe creatures are properly enough called flying animals, as they can fufpend themfelves a long time in the air, and move about in it at pleafure; but lefs accurate writers have added to the numbers of flying *quadrupeds* the common fquirrel, and feveral other creatures which live in woods, and being very light in their bodies, and very ftrong in their legs, can leap or throw themfelves forward to a great diftance, and by this means pafs from one tree to another. Of this kind the moft eminent is that fpecies called the *flying fquirrel*, which has a fort of membrane which it expands on each fide to catch the air, and fupport it from falling in its leaps; which by this means it makes very long, and feems to fly, efpecially when it throws itfelf from the top of a very high tree to a low fhrub.

Upon the whole, the ftandard of the flying or *alated quadrupeds* feems to be properly enough reducible to this: that the words flying and *alated* are not fynonymous terms, and that there are three kinds of flying among the *quadruped* clafs. The firft abfolute and fwift, flying as perfect as in birds; this peculiarly belongs to the bat, which is the only *alated* or winged *quadruped*, properly fpeaking. 2. An imperfect flying by means of certain membranes ferving as wings, but imperfectly, and not turning quick, or enduring long flights; fuch is the flying of the lizard, which is not properly an *alated* animal. And laftly, the imperfect flying of the fquirrel kind, which even in that fpecies called, by way of eminence, the *flying fquirrel*, is not properly flying, but only long leaping; the creature being able to turn but very little out of a right line, and only to fufpend itfelf during a fhort time in a leap from a high place to a lower. Phil. Tranf. N°. 427. p. 34.

QUADRUPLATORES, among the Romans, were informers, who had the fourth part of the confifcated goods for their pains. *Pitifc.* in voc.

QUÆRENS *non invenit plegium*, a return made by the fheriff upon a writ directed to him with this claufe, viz. *Si A. fecerit B. fecurum de clamore fuo profequendo*, &c. F. N. B. 38. *Blount*, *Cowel.*

QUÆSTOR,

QUÆSTOR, among the Romans. See QUESTOR, *Cycl.* and *Suppl.*

QUAHVITLA, in botany, a name used by some authors for the tree from which the resin commonly called *gum copal* is procured. *Hernand.* p. 46.

QUAIL, *coturnix*, in ornithology, a bird of the gallinaceous kind. See COTURNIX and GALLINACEOUS.

The *quail* is a bird of passage, and with us frequents the corn-fields, and sometimes the meadows. They begin to sing in April, and they make their nests in the month of May, building on the ground.

Quails are to be taken by means of the call, during their whole woing time, which lasts from April to August. The proper times for using the call are at sun-rising, at nine o'clock in the morning, at three in the afternoon, and at sun set; for these are the natural times of the *quail's* calling. The notes of the cock and hen-*quail* are very different, and the sportsman who expects to succeed in the taking them, must be expert in both; for when the cock calls, the answer is to be made in the hen's note; and when the hen calls, the answer is to be made in the cock's. By this means, they will come up to the person so that he may, with great ease, throw the net over them and take them. If a cock-*quail* be single, on hearing the hen's note he will immediately come; but if he have a hen already with him, he will not forsake her. Sometimes, tho' only one *quail* answers to the call, there will three or four come up; and then it is best to have patience, and not run to take up the first, but stay till they are all entangled, as they will soon be.

The *quail* is a neat cleanly bird, and will not run much into dirty or wet places: in dewy mornings they will often fly instead of running to the call; and in this case, it is best to let them go over the net, if it so happens that they fly higher than its top, and the sportsman then changing sides, and calling again, the bird will come back, and then will probably be taken in the net.

The calls are to be made of a small leather purse, about two fingers wide, and four fingers long, and made in the shape of a pear; this is to be stuffed half full of horse-hair, and at the end of it is to be placed a small whistle, made of the bone of a rabbit's leg, or some other such bone: this is to be about two inches long, and the end formed like a flageolet, with a little soft wax. This is to be the end fastened into the purse, the other is to be closed up with the same wax, only that a hole is to be opened with a pin, to make it give a distinct and clear sound. To make this sound, it is to be held full in the palm of the hand, with one of the fingers placed over the top of the wax, then the purse is to be pressed, and the finger is to shake over the middle of it, to modulate the sound it gives into a sort of shake. This is the most useful call, for it imitates the note of the hen-*quail*, and seldom fails to bring a cock to the net, if there be one near the place.

The call that imitates the note of the cock, and is used to bring the hen to him, is to be about four inches long, and above an inch thick; it is to be made of a piece of wire turned round and curled, and covered with leather; and one end of it must be closed up with a piece of flat wood, about the middle of which there must be a small thread or strap of leather, and at the other end is to be placed the same sort of pipe, made of bone, as is used in the other call. The noise is made by opening and closing the spiral, and gives the same sound that the cock does when he gives the hen a signal that he is near her.

QUALIFICATIONS *of members of parliament.* A knight, baronet, or any other under the degree of a baron, may be elected knight, citizen, or burgess. 4 Inst. 46, 47.

An alien, tho' made a denizen, cannot sit in parliament [a]; even persons naturalized by act of parliament are usually restrained from sitting as members [b]. Persons under the age of twenty-one years are not capable of being elected members of parliament. The election is void, and minors, tho' chosen, presuming to sit and vote, are under the same penalties as if they had sat and voted without being chosen [c]. [[a] 4 Inst. 47. [b] Vid. Stat. 12, 13 Will. III. 4 Ann, c. 8. and 1 Geo. I. [c] 7 and 8 Will. III. c. 25.]

None of the judges of the king's-bench, common-pleas, or barons of the exchequer, that have judicial places, can be chosen knights, citizens, or burgesses of parliament. 4 Inst. 47. None of the clergy can be elected knight, citizen, or burgess of parliament; because they are of another body, the convocation. 4 Inst. 47. Moor 783.

A person attainted of treason or felony is not eligible; for he ought, according to the writ, to be *idoneus, discretus & sufficiens.* 4 Inst. 48.

The king cannot grant a charter of exemption to any man, to be freed from election of knight, citizen, or burgess of the parliament. 4 Inst. 49.

For the incapacities of sheriffs, mayors of towns, and the reasons why they may or may not be elected knights, citizens, or burgesses, vid. 4 Inst. 48. *Bro.* Abr. Tit. Parliament. *Cromp.* Jurisd. 3 16. *Rushw.* Collect. Vol. I. p. 684. *Townsh.* Coll 185.

QUALITY (*Cycl.*)—QUALITY *of curvature*, in geometry, is used to signify its form, as it is more or less inequable, or as it is varied more or less in its progress through different parts of the curve. *Newton's* Meth. of Flux. and Inf. Ser. p. 75. *Maclaur.* Flux. Art. 369. See CURVATURE, Appendix.

QUAMOCLIT, in botany, the name of a genus of plants, the characters of which are these: the flower is of the monopetalous or one-leaved kind, and is funnel-shaped and divided into several segments at the end. From the cup there arises a pistil, which is fixed in the manner of a nail to the lower part of the flower; this afterwards changes into an oblong fruit, containing small seeds, usually of an oblong figure. See Tab. 1. of Botany, Class 2.

The species of *quamoclit*, enumerated by Mr. Tournefort, are these: 1. The finely divided pennated-leaved *quamoclit*. 2. The purple-flowered American *quamoclit*, with fingered leaves. 3. The six-leaved American *quamoclit*, with purple umbellated flowers. 4. The American *quamoclit*, with large heart-like leaves. 5. The purple-flowered American *quamoclit*, with large angular leaves. 6. The trifid, or ivy-leaved American *quamoclit*. 7. The pale red American *quamoclit*, with leaves like those of nightshade. *Tourn.* Inst. p. 116.

Quamoclit differs from bindweed, or convolvulus, in the shape of the flower.

QUANDROS, a name given by the writers of the middle ages to a stone, to which they attribute great virtues, and which, they say, is found in the head of a vulture.

QUANTITY (*Cycl.*)—QUANTITY *of curvature* at any point of a curve is determined by the circle of curvature at that point, and is reciprocally proportional to its radius. *Newton* Meth. of Flux. and Inf. Series, p. 60. *Maclaurin's* Fluxions, B. 1. ch. 11. See CURVATURE, Appendix.

QUANTITY *of action.* See ACTION.

QUANTITY $\left\{\begin{array}{l}\textit{impossible,}\\ \textit{imaginary,}\end{array}\right\}$ See the article ROOT.

QUAPACHTOTOTL, in zoology, a name under which Nieremberg has described a bird, which, he says, imitates the human laugh. He says its body is eight inches long, and the tail as many; the beak of a bluish black, and bent and crooked; the breast grey and the belly black; the tail of a brownish black, and the wings, neck, and head of a yellowish brown. *Ray's* Ornithol. p. 298.

QUARRY (*Cycl.*)—In many parts of England we find sea-shells buried in hard stone, and under great beds of earth.

Near Broughton, in Lincolnshire, all the *quarries* abound with them. At the east end of this town there is a *quarry* of a soft stone, which they dig through to get at a bed of clay, which is of a peculiarly glutinous quality, and hardens like mortar in drying: this is used for cementing other stones together, and in this are innumerable fragments of shells of cockles, scallops, sea-echini, and corals; and among these fragments there are found some whole shells of their natural colours, and often wholly unburt; tho' some of them are bruised and pressed quite flat by the great weight of earth that lies upon them. On the south side of the town there is a *quarry* of a blue stone, which was doubtless in the times before the deluge a blue clay, of the same nature with that just mentioned. This contains in its body vast numbers of the same sorts of shells, and of many other kinds; but they are all so firmly bedded in the stone, that it is not easy to get them out whole: but there is this very remarkable, that they only lie in the superficial part of the stone, the stratum being very thick, but not one shell found in it beyond the depth of two foot from the surface.

The surface of this stratum of stone is not even and smooth, but is waved and ridged irregularly, like a bed of snow, or like the waves of the sea in the time of a small wind. This has just the appearance that the surface of a mass of half hardened matter must have, if the wind blew fiercely upon it from one quarter; and by the direction of these undulations, it is easy to see from what quarter the wind blew at that time. In that part of the stone which forms this undulated roughness, there are as many shells as any where else; and these lie partly buried and partly standing out of the stone, just as we see the fresh water shell-fish lie half in and half out of the mud of the bottom of a pond or river that is dried up in summer.

It is very observable, that in this case, as much of the shell as is within the stone is perfectly well preserved, and as hard as stone; whereas that part which stands out is either wholly decayed, or at the best of the nature of a rotten shell, which falls to pieces on being touched with the hands. The part of the shell within the stone is usually converted into a mass different from the shell in all things but figure; but that which stands out always preserves the true texture of the natural shell, and is made up of many flakes and crusts as the natural shells of the kind to which it belongs are.

Among the shells buried in the substance of the stone, some have their shell perfect on them, others have only a thin crust of a whitish stony matter in the place of it, and others are wholly naked, and have no shell nor any covering at all: these are properly only casts of stone in the places where shells once were, all the matter of the shells themselves having been dissolved and washed away. In some of these there is a thick white substance in the place of the shell, between the cast and the bed of stone: these come out the most easy and perfect of

of any, and the matter which supplied the place of the shell remains fastened to the bed of the stone; others separate themselves very perfect after frosty nights.

Some of the cockles and other bivalves are found closed, others are found half open, as shell-fish naturally open their shells when deserted by the water. In these the cavity is always filled with the matter of the stratum, and both petrified together. In some places they lie in heaps together in the stone, and there they usually enter into and injure one another. Some are found shut so closely, that the matter of the stone-bed could not get into their cavity; and of these, some are at this time wholly empty, others are filled, or partly filled, with crystals and spars: these bodies must have been found in them only from the crystaline and sparry matter rising through the earth in vapour, and penetrating the very substance of the shells after their being lodged in the stone.

In this *quarry* there is also found a very remarkable shell, resembling a ram's horn, bent in the same manner, and with the same lineations. This is wholly different from the common cornu ammonis class, and has an operculum to close its mouth with, in the manner of the wilks and other such shells. This operculum is often found entire with the shell, or near it, in the same bed of stone.

This species of fossile shell is found in prodigious numbers together, and usually lies near the surface of the bed of stone, a part being buried in the stone, and a part standing out of it; many of them stand more than half way out, and the shell of these is so much more durable than that of the common kinds, that it is usually very firm and strong, even in such places where the other kinds moulder all away. These are usually found entire, but in some places they are crushed flat, and otherwise bruised and injured.

From these and the like observations made on the whole surface of the earth, and to great depths in its bowels, where ever men have dug on any occasion, arise plain proofs of the universality of the deluge; and from many of these observations it seems very plain, that in the time of the deluge the earth suffered great violence in many parts, that the bottoms of seas were in some places raised into mountains, and in others the tops of mountains sunk into seas, and the beds of shells still preserved in the fossile world were very often crushed and bruised by large masses of earth and pieces of rock thrown upon them.

Some think that it appears from the consideration of the *quarries* and strata of earth, *&c.* in the present world, that the antediluvian earth had seas and shores, mountains and plains, rivers and vallies, as ours has; and that waters from within the earth were let out upon its surface, and the whole crust of the then world subsided under these; that the contents of the seas, such as shells, corals, and the like, were after this tossed variously about over the surface of this drowned world, and left in different parts of it; and that this present earth afterwards partly arose out of the common flood, as islands are now formed in some seas, and partly was deserted by the waters, when called off again by the same almighty hand that brought it on: and as the strata of the earth were at that time soft, it is no wonder that matter then soft enough to let in the shells, *&c.* afterwards hardened, together with the shells it had received, into stone; and that in process of time, the stony particles eternally floating in the air and waters that pervade all the strata, deposited their small parts in the interstices of these shells, and finally the whole became stone.

It is no wonder that all sorts of marine productions, shells, parts of sea-fishes, corals, and the like, are found at this time in beds and *quarries*, in hills and mountains, and also in the bowels of the earth; for it is certain that they were produced in the antediluvian sea, and were either elevated with the hills and mountains in the time of the deluge, or they fell into holes, clifts, and chasms in the earth, which must be formed in vast numbers during the time of that terrible catastrophe, and in these they remain buried to this time; while others lodged on what was then the surface, became afterwards covered with more strata, deposited from what was still suspended in the waters, and so were buried at great depths from the present surface; when others rolling about among the last sediments of the same waters, while yet so unfixed as to be carried away with their violence, were finally left on or near the surface.

The *quarries* about Broughton seem to have been but little disturbed; and to have been originally the mud which formed the bottom of some large fresh water lake; for the shells found in greatest plenty of all there, are fresh water shells. These seem to have remained in their original mud while turned to stone; and the other shells, natives of the sea, which are buried there among them, seem to have been some of that immense number and variety that must have rolled along the bottom of that bed of waters; and the viscid nature of the clay detained many of these among its own proper inhabitants, and preserved them together in its strong state.

Beside the parts of animals, these *quarries* have vegetable matters also in them: the leaves and branches of whortles are not uncommon, and pieces of wood turned black and resembling charcoal are also found there. These have been preserved in the same manner with the leaves of fern on the slates of our coal-pits, and the plants and fishes found in hard stone in many of the German mines. Many of these vegetable remains are also found in loose nodules of stone resembling pebbles: these are not less easily accounted for than the rest; for it is not strange to conceive, that leaves and pieces of plants might be, in that general confusion, received into lumps of clay, which might afterwards be rolled into roundness by the motion of the water, and finally received into chasms of the earth, and there petrified. Phil. Trans. N°. 266, p. 685.

QUARTAN, (*Cycl.*) in medicine, the name of a species of intermitting fever, which returns upon the patient every fourth day, including the days of both the paroxysms, with a cold fit succeeded by a hot one. In this nature is endeavouring to relieve herself from some noxious matter adhering to some of the hypocondriac viscera, and to prevent the injury that might thence happen to the part, the *quartan* is, by authors, distinguished into the simple and the continual.

The simple *quartan* is the most regular of all the species of intermitting fevers: it almost constantly seizes the patient about four or five in the afternoon with a cold fit; but this is not so violent as in the quotidian or tertian, nor does it occasion any of the shaking of the limbs: it is, however very sensible, and usually lasts about two hours. This is preceded and accompanied by a general languor or faintness; but is not so frequently attended with vomitings as the other intermittents in the time of their cold fit, nor is there any tendency to a diarrhœa; but, on the contrary, the bowels are usually costive, not only on the day of the fit, but on the intermediate ones. The hot fit slowly succeeds the cold one, and is not so violent as in the tertian; but rather is troublesome from the sensation of driness it brings on, and is seldom succeeded by any sweating. The hot fit usually continues about four hours, sometimes six, and sometimes much longer than that in the first fits. During the heat the head is vertiginous, and afflicted with a heavy pain, not a very acute one. When the fit is over, the patient returns to tolerable good health again, and remains in that state for the two succeeding days, saving that he has a soreness in the limbs, and a weariness and general lassitude. The fit afterwards returns at the very hour it first came on at, and rarely varies at all from this: when it is observed to anticipate its usual time, there is just reason to fear its becoming continual. The persons most subject to *quartans* are those of a middle or advanced age; it rarely happens to young people unless epidemic, and of all other persons, those are most subject to it who live a sedentary life, and are of a melancholy disposition.

Causes of it. The general cause of a *quartan* is a morbid viscous matter, lodged in the hypocondriac viscera, and having communication by that means with the vena portæ. The liver, spleen, and glands of the mesentery are frequently the seats of this, rarely the primæ viæ. That these viscera are affected in *quartans*, is evident from the connection these diseases have with their other affections, such as dropsies, jaundice, and the like. The occasional causes are very frequently a quotidian or tertian fever improperly treated, obstructions or omissions of habitual discharges of blood, whether by bleeding, or by the menses, or hæmorrhoids; a heavy diet, without sufficient drink; a sudden chilling of the abdomen in a humid air, after the body has been violently heated. The principal time for these fevers is the autumn, whence they have been called by some *autumnal fevers*; and nothing more endangers their frequent return, than the abuse of strong liquors, or of acids, which coagulate the blood.

Prognostics. The tenacity of the morbific matter in these fevers, tho' in but a very small quantiy, yet renders them very difficult of cure. They often last many weeks or months, in spite of all medicines, and in some ages have been accounted the greatest scandal to physicians. When it seizes a person in the spring season, it is naturally of shorter duration; but when it comes on in its more usual season, the autumn, it generally holds the patient till the spring. *Quartans* are very apt to return upon people at the same season of the year at which they first seized them, especially when they have been but injudicially treated in the cure. It is often, indeed, rather suppressed than cured, and then returns usually at shorter periods, and often almost immediately on feeding heartily, which is commonly the case with those who have been freed from it by the bark injudiciously given.

It has been already observed, that this disease does not naturally tend to any sort of evacuation, and when such discharges are unnaturally provoked by medicines, as by vomits, purges, and violent sudorifics, it is easily changed into a hectic, or some other dangerous chronic malady. A *quartan*, when properly cured, usually carries off with it all tendency to hypocondriac complaints, to which the patient may before have been subject; but, on the contrary, when improperly suppressed, it too often brings on schirrosities of the liver and spleen, and of the mesariac glands, with œdematous swellings, hectics, asthmas, and other complaints.

A violent appetite after the fit of a *quartan*, or a tertian fever, is a sign that the disease will be very difficult of cure. Eruptions on the skin in the time of *quartans*, usually presage the going off of the disease; and sometimes hard tumors, and bad ulcers in the legs and feet, come on during the time of the ill-

illness; these generally presage the going off of the original disease, but they have in themselves a worse complaint in the place of it: and it is observed also, that œdematous tumors, which have their rise from ill-cured *quartans*, are much more obstinate and difficult of cure than any others.

Method of cure. The use of the bark is now universal in all intermittents, and the ignorant as well as the judicious give it; but there are many authors who are greatly against the sole use of it in *quartans*. Stahl says, that in this case the mucous matter lodged in the hypocondric viscera, which is the cause of the disease, should be first attenuated and incided by the neutral and digestive salts, as vitriolated tartar and the like; and with the gums, as ammoniacum and sagapenum, with the roots of arum and pimpernel; and by diluents, which would also take off the obstinate costiveness of the bowels. That when the matter is by this means fitted for evacuation, it should be thrown off by purges and diuretics, such as black hellebore, mercurius dulcis, and the tartar pills; and afterwards the cure to be compleated by restoring the viscera to their due tone, by means of bitters and subastringents, as gentian, centaury, and the jesuit's bark given in small quantities. By this means cures are much more regularly and happily effected than by bark alone. *Junker*'s Consp. Med. p. 373--376.

Bartholine, in his medical observations, gives us a very remarkable instance of a cure performed on a person long afflicted with a *quartan*, and who had tried all the common methods in vain. He was advised by some body to drink plentifully of very new beer; he did so, and going to bed, sweat very largely upon it, and was absolutely cured by it.

Quartans have sometimes been cured by mercurials. Med. Ess. Edinb. abr. Vol. 2. p. 317.

The *quartan* ague is said to be cured by a medicine composed of euphorbium, resin of jalap, merc. dulc. and sugar.

Continual QUARTANS, in medicine, the name given to a species of compound fever, which has the paroxysms of a common *quartan*; but in which the heat never goes wholly off, but continues till the time of the succeeding fit. In all respects, except the regular returns of the paroxysms, this disease greatly resembles a hectic.

Signs of it. Every fourth day there is a regular paroxysm, which begins with a coldness and shivering: this, however, does not return exactly to an hour, as the simple *quartan* does in its fits; but usually the succeeding fit anticipates the time of the former. When the cold fit is over, there comes on a violent day-burning; the heat is much greater the first day than the succeeding ones, but continues in some degree till the fourth day, when the cold fit returns again, and the patient is seldom able to keep long together out of bed in the whole time. There is a continual thirst and driness of the mouth, and the saliva is very little in quantity and very frothy; the appetite is bad, and the patient usually has more inclination to salted and cold foods than any other; the head is disordered rather than aking, and there is a continual desire to sleep, but what sleep the patient has is troubled and unsound, and gives very little refreshment; the urine during the whole course of the disease, resembles that of hectical patients, and is reddish and turbid, depositing, after a time, a rose-coloured sediment.

Persons subject to it. This disease is frequently brought upon persons who have had a common *quartan*, by the injudicious treatment of that distemper, and particularly by the taking hot medicines in it before the approach of the fit; the too free use of astringents has also in many cases changed that disease into this. People of a middle or more advanced age are more subject to it than youth; and of these, such are principally seen to be afflicted with it as are of a melancholic habit and sedentary life.

Prognostics in it. This disease, tho' in itself less dangerous than many others, yet very easily changes, under improper management, into a hectic, and sometimes into a dropsy. This is the case not unfrequently when it is treated with large repeated doses of astringents; on the other hand, when it is treated with vomits and a hot regimen, it easily passes into an acute and dangerous inflammatory fever.

Method of cure. Toward the time of the fit there should be given powders composed of the digestive salts, such as vitriolated tartar, with crabs-eyes, saturated with lemon juice. So long as the heat continues violent, the person is to be kept quiet, and to drink plentifully of warm and weak liquors; and in the following days, when the heat is observed to be decreased, gentle purges are to be given, with gentle aperitives, and resolvents, such as the decoctions of dandelion and succory roots; and toward evening, a gentle dose of some anodyne, as the storax pill and the like. The common violent methods by vomits, bleeding, stimulating purges, and hot alexipharmics, have no place in the cure of this disease; but, on the contrary, violently disturb nature, and add to the complaints. Absorbents in large quantities are also to be avoided, least the viscid matter which is the cause of the disease should be increased by their effects: and when the patient is happily cured, he is not immediately to abstain from medicines, since relapses are very frequent. Digestives and stomachics taken for some weeks after, is the way to prevent them. *Junker*'s Consp. Med. p. 209, 401.

QUARTARIUS, a measure among the antients, being the fourth part of a sextary, and nearly equal to a quarter of a pint of our wine-measure.

QUARTATION, (*Cycl.*) in metallurgy, is the separation of silver from gold by means of aqua fortis; which is an operation that has something singular in it.

If silver and gold are mixed together into a mass, and the gold is not less than one third part of the mass in weight, the best aqua fortis poured upon it is not at all capable of dissolving the silver; but if you add more silver to this mass, by melting it again in the fire, with such a necessary addition of that metal alone as shall bring the gold in the mass to the proportion of less than one third of the whole, and suffer it to cool, then aqua fortis poured on it will corrode the silver from it: this is also by so much the more strongly performed, as the quantity of gold is less than in the proportion of one third of the whole mass; but experience has taught us, that aqua fortis dissolves silver mixed with gold quickly enough when the gold constitutes but one, and the silver three parts of a mixed mass of them: and in this case, if the solution is not too impetuously performed, the gold usually remains in such a proportion, in the same figure that the whole mass had before the separation of the silver by this menstruum; so that in this case, there is no reason to apprehend the gold's being torn into minute particles, and dissipated in some measure; tho' this can hardly be prevented when the silver exceeds the three quarter proportion, in regard to the gold in the mass. The artificers. therefore, always make it their study to observe very exactly this proportion of the gold being one fourth part of the mixture; and thence it is that the operation itself has been called *quartation*.

From this operation we may learn how fallacious the examination made with aqua fortis alone of the gold rubbed on the touchstone, must necessarily prove. *Cramer*'s Art. aff. p. 195.

QUARTER (*Cycl.*)—QUARTER; in corn measure, seems to have signified originally the fourth part of a ton in weight, or capacity. See WEIGHT.

QUARTER-*chord*, in mining, is seven yards and a quarter, which the miner hath cross-ways of his vein on either side, for liberty to lay his earth, stones, and rubbish on, and to wash and dress up his ore. *Houghton*'s compl. Miner in the Explan. of the Terms.

QUARTER *of a ship*, is that part of the ship's hull which lies from the steerage-room to the transom.

Close QUARTERS, in a ship, those places where the seamen *quarter* themselves, in case of boarding, for their own defence and clearing the decks, &c.

Fat QUARTER, in a ship. See FAT, *Cyl.*

QUARTER-*masters*, or QUARTEERS, in a man of war, those officers whose business is rummaging, stowing, and trimming the ship in the hold; to overlook the steward in his delivery of victuals to the cook; and in pumping or drawing oot beer, or the like. They also are to keep their watch duly, in conding the ship, or any other duty.

QUARTER-*point* of the compass. See POINT, *Cycl.*

QUARTER-*wind*, at sea, that which comes in abaft the main-mast shrouds, even with the *quarter* of the ship.

QUARTER, in the manege. To work from *quarter* to *quarter*, is to ride a horse three times in end upon the first of the four lines of a square; then changing your hand to ride him three times upon the second; and so to the third and fourth, always changing hands and observing the same order.

QUARTERS *of a saddle*, are the pieces of leather or stuff made fast to the lower part of the sides of a saddle, and hanging down below the saddle.

QUARTERS *of a horse*, are the shoulders and fore-legs, called *fore-quarters*; and the hips and hinder legs, called *hind-quarters*.

QUARTERS *of a horse's foot*, are the sides of the coffin, comprehended between the toe and the heel on one side and t'other of the foot. The inner *quarters* are those opposite to one another, facing from one foot to the other; and these are always weaker than the outside *quarter*, which lie on the external sides of the coffin.

QUARTER-*cast*. A horse is said to be *quarter-cast* when, for any disorder of the coffin, we are obliged to cut one of the *quarters* of the hoof; and when the hoof thus cut grows anew, it is called *new quarter*.

False QUARTERS, a cleft in the horn of a horse's *quarters*, extending from the cronet to the shoe, which voids blood, and occasions a great deal of pain, and makes the horse lame.

QUARTERING *the men*, in the sea language, the disposing of the ship's company at the time of an engagement in such a manner, that each may readily know where his station is, and what he is to do: as, some to the master, for the management of the sails; some to assist the gunners, to traverse the ordnance; some for plying the enemy with small shot; some to fill powder in the powder-room; others to carry it from thence to the gunners in cartridges, &c.

QUARTUM *par constringens*, in anatomy, a name given by Spigelius and some others to the muscle called by Albinus and Riolanus *orbicularis oris*; and by Cowper and some others, *constrictor labiorum*.

QUARTUS *hyoidis musculus*, in anatomy, a name given by

Vesalius, Fabricius, and many other anatomists, to a muscle now generally called the *coracohyoidæus*.

QUARTUS *oculum movens*, in anatomy, a name given by Vesalius to one of the muscles of the eye, called by some *rectus inferior*, and by others *humilis*.

It is the *depressor oculi* of Albinus, being one of the *quatuor recti oculi* of that author.

QUATERNA *folia*, among botanists. See LEAF.

QUATOTONI, in zoology, the name of an American bird of the wood-pecker kind, having a red crest on its head, and two white lines running down the sides of the neck to the breast. It is called by Nieremberg *picus imbrifœtus*.

QUATRICHROMA, in the Italian music, is what we call a *demi-semi-quaver*, thirty-two whereof make a bar in common time. See TIME, TRIPLE, and BISCHROMA.

QUAVITL, in botany, a name given by some authors to the cocoa-tree. *Hern.* p. 79.

QUAUHAYOHUATLI, in botany, a name by which some authors have called the tree whose fruit is the cassia fistula of the shops. *Hern.* p. 87.

QUAUHTZONECOLIM, in zoology, the American name for a bird called by most a *quail*, but esteemed by Nieremberg a species of partridge.

It is of the size of the European partridge, and of a brownish colour, and ornamented with a crest upon its head. There are also in America two other species of partridge much allied to this, the one with a yellow body, and black and white head; the other small and brown, and without a crest. *Ray*'s Ornithology, p. 304.

QUEEN *(Cycl.)*—QUEEN-*bee*, a term given by late writers to what used to be called the *king-bee*, or king of the bees; a large and long-bodied bee, of which kind there is only one found in every swarm, and which is always treated with the greatest respect by the rest.

This is, indeed, the parent of the swarm, and from the fœcundity of this one female, a whole hive is easily and soon repeopled.

It is to be observed, that the autumn and winter seasons destroy a great number of the bees; so that a hive, which was full in the summer, is often found so thinly peopled before the end of winter, that the bees seem only a few inhabitants in a very large city: by midsummer again this same hive shall, however, be found so well filled with inhabitants, that there shall be a necessity of sending out a colony in the name of a new swarm, and yet the hive will remain as full as it can well hold. This increase might well appear very amazing, if all the remaining bees of the hive were supposed to be females, and to join in it; but how much more so when it must be acknowledged, that it is all owing to one female, and that this *queen-bee*, or bee-mother, alone, has given origin to such an immense progeny?

The form of this bee, and there being only one such in a hive, naturally led all who saw it into an opinion of something singular in its nature, and the antients determined that it must be the king over the rest: they made it an absolute monarch, and have supposed that all the business of the hive was done by its immediate orders; and that the several parties of bees allotted to work in the making the combs, in the filling their cells, in the stopping the crevices of the hives, and in carrying away the filth, *&c.* had all their several stations allotted them by this wise and provident monarch. This was giving great talents to the monarch-bee; but this was mere fancy, and it is plain, that if this creature rules, it is over a people who all perfectly well know their several business: but it rather appears, that there is no sovereignty at all, but that this creature is respected in a very high degree by the rest as the common parent of the whole nation.

There were not wanting among the antients, however, some who believed this large bee to be a female, and these pretend that she brought forth only females like herself, which succeeded her in her reign. They had a very different opinion as to the origin of the common bees, not supposing them generated of animal parents like themselves, but produced out of corruption, and born of the flesh of a bull or cow. Among the later writers this opinion, notwithstanding the sanction of the poet Virgil, has been laughed out of the world; yet it was long before the true origin of bees, even after this, was known. The author of the female monarchy, tho' well apprized of this great bee being of the female sex, yet supposed that she only produced young ones like herself; and pretended that the common bees copulated together for the production of other bees like themselves: this, however, has been since found to be wholly erroneous, the female, or *queen-bee*, giving birth to all, and these common bees being of no sex at all.

Many of the authors who have not given into the idle opinion of the bees being bred of putrid flesh, have yet given them an origin not less idle and ridiculous. They pretend that the bees are exempted from the pain of producing either eggs or young; and that their offspring are formed of the juices of flowers, the different kinds, as the drones, females, *&c.* owing their rise to juices of different kinds. These, and a number of other false notions, have been propagated in regard to bees; but their true origin could not well be found till we were in a condition to see what passes at certain times within the recesses of the hive, which is done by the use of that excellent invention the glass hive. By this, and by the help of dissections, we may easily inform ourselves perfectly of the true state of the case.

The parts of generation are the subjects of our enquiry for this purpose, and tho' the bodies of these animals are so small, these are usually sufficiently large to be distinguished, often taking up more room in the abdomen than all the other parts together. Thus, if the large long-bodied bee be opened, the abdomen will be found to contain vast numbers of oblong bodies, which any one acquainted with insects will easily distinguish to be eggs: vast numbers of these are large enough to be observable by the naked eye, but when the assistance of glasses is called in, there are discerned a vast number of other smaller eggs, which exceed all computation. It is easy to determine from this, that this creature, so long esteemed a male, is in reality a female, and is in condition to give birth to a very numerous posterity.

In order to distinguish this, however, a proper time must be chosen for the dissection, and the most proper of all is when the creature is just ready to deposit her eggs. This is in the months of April and May, and the most certain time of all is when she is in a hive where a new swarm have been received about ten days before: if she be dissected at other times, the eggs are less visible; and particularly in winter, there requires a good glass to shew the rudiments of them. This is a disagreeable experiment, indeed, because it is always the destruction of a future swarm; all the eggs we see in the dissected female being what would have produced bees to labour for our benefit.

When the body of one of the drones is opened, there is found, instead of these vast numbers of eggs, a part seeming proper for a male organ of generation; and in the abdomen a number of vessels running in several windings and contortions, and filled with a milky humour. These seem destined for the important use of impregnating the eggs in the belly of the female, and it is very natural to determine from this that these are the males.

The common bees, when dissected, at whatever time of the year, never shew the least marks of any sex at all. The intestines of these bees are found at times to be more or less distended with honey, and with rough wax; but there are never discovered any eggs, nor any of the winding seminal vessels, so that it is plain they have no share in propagating the species: and the observation of the swarms from time to time, with the assistance of glass hives, gives proof to what the dissections seem to make sufficiently certain without this evidence.

The female bee resides within the center of the hive, always living in one of the spaces between the combs; if she occasionally comes out to the surface, and is seen walking over the edge of a comb, she is to be well observed at those times; for her only business is the laying her eggs in some of the empty cells of that part of the comb, which done, she always retires again.

In order to see the female, or mother bee, employed in this operation, we are to observe in the morning hours, between seven and ten, what passes in a glass hive into which a swarm have been received a few days before. The speed with which the common bees labour in making their combs on this occasion is almost incredible, and they seem not only to labour to have cells to deposit their honey in, but to know that the parent bee is at this time loaded with eggs for the production of a numerous progeny, and that she has an immediate necessity of cells for the depositing them in. This necessity is so urgent, that she is often forced to deposit them in cells not yet finished; tho' the bees labour so vigorously, that they often will erect a whole large comb in one day. If the hive be narrowly watched at these times in the morning hours, the female bee will be soon found employed in her work, and will be seen dropping her tail by turns into several cells every day. If the combs be examined a day or two after this, they will also be found to contain the eggs; one of these is placed in each cell, and appears in form of an oblong white body, fixed either to the solid angle of the base, or to one of the angles composed by the rhombs which form the triangular base of the cell, and is always attached in such a manner, that it lies nearly in an horizontal position.

The flat glass hives are the most favourable for the making these observations, since in those the combs are so narrow and so numerous, that the whole is taken in view at a time, from one side or the other; and there are always several combs to be made choice of for the operation; in the morning hours of April and May, the female mother bee will be usually seen walking very soberly over one or other of these combs, attended by a guard of about twenty of the common bees, all placing themselves in such a manner, that their faces are turned toward her, and all paying her the greatest marks of homage and adoration. As she walks along in this state, she examines every cell as she passes over, and such as she finds yet empty, and fit for her purpose, she rests at; and introducing the hinder part of her body at the top, plunges it so deep in that her tail touches the bottom. Then she deposites one egg and no

more,

more, and this is at that time covered with a glutinous matter, which faſtens it to the place where it is laid: from this cell the female paſſes to ſeveral others, where ſhe depoſits her eggs in the ſame manner.

Some authors who have written of the polity of bees, have repreſented the time of the female bee's laying her eggs as a ſeaſon of feſtivity and rejoicing in the hive; but this does not at all appear to be the caſe, the few bees which attend her on this occaſion ſeem the only ones that know any thing of the matter, and their behaviour favours more of homage and reſpect than of joy: they are continually ſtroking and bruſhing her clean with their legs and with their trunks, and offer her from their own mouths the fineſt honey, when ſhe has occaſion for food. The reſt are all employed in their proper offices, and the work of the hive goes on as uſual; and, indeed, it is well that it does ſo, for this time of rejoicing would be of very bad conſequence to the affairs of the hive, if carried on as ſuppoſed, ſince the female bee is thus employed, more or leſs, during the whole ſummer months.

When the female bee has laid ſix or ſeven eggs, ſhe always takes a time of reſpite or repoſe; and during this time, the bees which form her levee are doubly buſy in their careſſes, ſome bruſhing her head and breaſt with their trunk, but ſeveral being always employed together to cleanſe the hinder rings of the body, which have been fouled by being thruſt into the cells. When this is done, ſhe begins again; but Mr. Reaumur obſerves, that he never could ſee a female lay more than ten or twelve eggs at one time: he ſuppoſes that his preſence diſturbed the creature, and finally drove her into the inner parts of the hive, where ſhe might continue her works in cells leſs expoſed. It is not difficult to compute the number of eggs which the female lays every day, from the ſwarm which is ready to leave the hive at the end of May: this ſwarm uſually amounts to at leaſt twelve thouſand, and as the hive out of which theſe depart is not the leſs peopled by their loſs, it is evident that they were all the produce of the eggs depoſited by the female in the preceding months of April, with a part of March, and a few of the firſt days of May. On a moderate computation on theſe principles it will appear, that the female bee cannot lay leſs than two hundred eggs every day, for a long ſpace of time together; and this, tho' ſeemingly a monſtrous increaſe, is yet much leſs than that of ſome other of the winged inſects, in one of which, a two-winged fly, that author counted no leſs than twenty thouſand living worms, all ready to be depoſited by the parent, and to become flies of the ſame kind.

It has been ſtrongly objected againſt this ſyſtem, that tho' the female bee lays eggs, ſhe is not the only one that lays; and many will not give up the opinion of the common bees alſo laying ſome eggs, tho' but a few in number; obſerving, that if each of theſe lay only four or five eggs, it would be enough to give birth to a whole ſwarm, without ſuppoſing that this prodigious fœcundity belonged to the female bee alone: but this is running into the old error of the female producing only females like herſelf; whereas if we obſerve the cells in which we ſee the female depoſit her eggs, we ſhall in the ſequel find the common bees produced from theſe eggs, and iſſuing out of theſe cells: this is a ſufficient proof to any fair reaſoner, ſince it appears very plain, that if the female produces them, they do not produce one another. It is alſo evident, that not only theſe common, or working bees, but alſo the drones, or male bees, are produced from the eggs of this ſame female; and there is this remarkable forecaſt in the female, that ſhe always depoſits the eggs which are to give origin to theſe, in peculiar cells, proper for the reception of the worms which are to be hatched from them. It is to be obſerved, in examining a hive, that there are always ſome combs, or ſome parts at leaſt of combs, the cells of which are much larger than thoſe of the other parts or combs: theſe large cells are deſtined for the reſidence of the larger worms, which are to produce the drones or male bees. It has been obſerved as a miraculous ſingularity by ſome, that the female bee always knows before hand, whether the egg ſhe is going to lay will produce a male or a common bee; and that according to this knowledge, ſhe never depoſits the eggs for a male in a ſmaller cell, nor that of a common bee in a large one; but there is, in reality, leſs wonder in this than is ſuppoſed, for the eggs of which the drones are to be hatched are much larger while in the body of the female than thoſe of which the common bees are to be produced, and the whole occaſion of this choice in regard to the placing of them is, that when the creature finds a large egg coming forth, ſhe ſeeks one of the large cells to depoſit it in; and when the common ſmall eggs are coming, ſhe contents herſelf with the common cells.

It is very natural to believe, that the female bee lays a third kind of eggs; and that beſides producing many thouſand common, or working bees, and many hundreds of the males or drones, ſhe ought to lay one egg at leaſt capable of producing a female like herſelf, which is to be the mother of a future progeny, and the *queen* of the preſent race; ſince without ſuch a one for their leader, the young brood would never leave the hive in nature of a colony, and ſettle themſelves elſewhere.

What we thus perceive ought to be the caſe, is alſo found in reality to be ſo, and the female, beſides the other kinds of eggs, is found by a ſtrict obſervation to lay alſo eggs of this kind. We might perhaps only expect one female bee to be produced for each ſwarm, but as nature has ſeemed every where prodigal in the manner of the increaſe of her works, ſo it is in this caſe alſo. What millions of ſeeds are produced on a common elm-tree, for one that ſtrikes and ſucceeds ſo well as to grow up to be a tree? And of the number of young produced from the ſpawn of a carp, how few live to the ſize of a parent? Thus it alſo is in regard to the female bees; nature, tho' it has allotted only one of this kind, as abſolutely neceſſary to the new ſwarm, yet has given abundance of chances for that one to ſucceed, by the female's uſually laying at leaſt ten eggs for the production of the female offſpring, and often not leſs than twenty: there are, indeed, ſome ſeaſons when not one female is produced; but in theſe ſeaſons there is no ſwarm going out from the old hive, the creatures being informed by nature, that they have no buſineſs for combs and cells when they can have no offſpring to rear in them.

The working bees are not only very obedient to, and very careful of their *queen*, or female parent; but they are alſo very ſolicitous about her progeny. This is very evident in the ſtructure of the cells, which they prepare for the reception of thoſe eggs which are to be hatched into females. It has been before obſerved, that they prepare larger cells for the eggs which are to become drones, or male bees, than for thoſe which are to produce workers like themſelves. The large cells deſtined for the drones are, however, of the ſame ſhape and figure with the others, differing only in ſize; but this is not the caſe with thoſe deſtined for the female offſpring: theſe are not only very large, but very clumſily contrived, for the ſake of ſtrength; their ſides being much thicker than thoſe of the reſt, and their figure oval. The bees are extremely ſparing of their wax on all other occaſions, but for the conſtruction of theſe royal cells, as they may not improperly be called, they are as remarkably profuſe: one of the royal cells will weigh more than an hundred and fifty of the common kind. The bees are no more ſparing of the room than of the materials in the conſtruction of theſe royal habitations: they are often placed near the center of a comb, and a vaſt number of other cells are deſtroyed for their baſe; often alſo they hang down from the reſt of the comb, in form of ſtalactitæ from the roofs of ſubterraneous caverns.

A cell of this kind, when firſt formed, repreſents an acorn cup; but it is ſoon lengthened beyond the poſſibility of retaining that figure, and it remains thus till the creature is hatched from the chryſalis or nymph ſtate, and comes out of it; after which the bees, to loſe no room in the hive, form other common cells upon it, and the only remaining mark of the female cell, is the appearance of a knot in the place where it once ſtood.

The number of cells deſtined to receive the eggs which are to produce female bees are ſo few, and they are commonly placed in ſuch cloſe parts of the hive, that there is no great probability of the ſeeing the female employed in laying her eggs in them: there is no reaſon to doubt the fact, however, ſince when we know that ſhe lays eggs for the production of the male and the working bees, there is no wonder that ſhe ſhould alſo lay ſome for the production of females like herſelf.

It might ſeem much harder to conceive how ſo vaſt a number of bees ſhould be produced from this one, as we know are produced from her; but when one of the females is opened, the vaſt number of eggs diſcovered in each of her ovaries makes the prodigious increaſe no way wonderful.

Swammerdam obſerved, that the number of veſicles in the ovary of the female bee, was aſtoniſhingly great; he eaſily counted an hundred and fifty in each ovary, and could count about ſeventeen eggs in each veſicle large enough to be diſtinctly viſible; each ovary contains, therefore, two thouſand five hundred and fifty eggs, and both ovaries five thouſand one hundred. When we find ſo many eggs at once diſtinguiſhable by their ſize, it will be eaſy to conceive, according to the common courſe of nature in the propagation of inſects, that there may be more than as many too ſmall to be yet diſtinguiſhable; and at that rate, the number of twelve thouſand bees, which is the quantity that compoſes a moderate ſwarm, is not wonderful for the product of the eggs of one female for one ſeaſon. *Reaumur*'s Hiſt. Inſ. Vol. X. p. 111—126.

QUEI, in natural hiſtory, a name given by the Chineſe to a peculiar earth found in many parts of the Eaſt.

It is of the nature of an indurated clay, and in ſome degree approaches to the talcs, as our ſteatites and the galactites do. It is very white and abſterſive, uſed by the women of China to take off ſpots from the ſkin, and render it ſoft and ſmooth, as the Italian ladies uſe talc of Venice. They ſometimes uſe the fine powder of this ſtone dry, rubbing it on the hands and face after waſhing. Sometimes they mix it in pomatum. *Kircher*'s China Illuſtrat.

QUEM *redditum reddit*, in law, an old writ which lay where a rent-charge, or other rent, which was not rent-ſervice, was granted by fine holding of the grantor. If the tenant would not attorn, then the grantee might have had this writ. Terms of law.

QUEMI, in botany, a name ufed by fome authors for the nigella, or geth. *Ger.* Emac. Ind. 2.

QUERCERA, in medicine. See EPIALOS.

QUERCUS, the *oak*, in botany, the name of a genus of trees, the characters of which are thefe: the flower is of the catkin kind, and is compofed of a great number of apices affixed to an axis by flender capillaments, and ftanding in thick clufters. Thefe are male or barren flowers, and the embryo fruit grows in other parts of the fame tree: thefe finally ripen into acorns furrounded with their cups, and containing a kernel which readily fplits into two parts. To thefe characters it is to be added, that all the *oaks* have finuated leaves.

The fpecies of *oak*, enumerated by Mr. Tournefort, are thefe: 1. The broad-leaved *oak*, with fhort pedicles, called by authors the *male-oak*. 2. The broad-leaved *oak*, with longer pedicles, called by authors the *female-oak*. 3. The ever-green broad-leaved *oak*. 4. The common *oak*, with very long pedicles. 5. The fmall *oak*, called the *phagus* and *efculus* by the old writers. 6. The *oak*, with large acorns and echinated cups. 7. The *oak* with fmall acorns and rough cups. 8. The Burgundy *oak*, with rough acorn cups. 9. The dwarf *oak*, which feldom grows to more than a foot high. 10. The woolly-leaved *oak*. 11. The fmall gall-bearing *oak*. 12. The *oak* with prickly, not woolly leaves, producing fmall galls. 13. The fmaller prickly-leaved *oak*. 14. The dwarf gall-*oak*, with cluftered galls. *Tourn.* Inft. p. 82. See OAK.

QUERCUS *marina*, the *fea-oak*, in botany, the name of one of the broad-leaved dichotomous fea-fucufes.

It is not agreed among the late botanifts what was the *fea-oak* of Theophraftus; and the moft antient botanifts, Clufius and Cæfalpinus fuppofe it to have been a fpecies of the fhrubby coraline; but that feems by no means to have been the cafe, fince Theophraftus fays his *fea-oak* had a long, thick, and flefhy leaf, whence we may much more naturally conclude it to have been of the fucus clafs. *Park.* Herb. 294. Gen. 1378, &c. *Dale*, Pharmac. p. 56.

QUERFAA, in the materia medica of the Arabians, a name given by Avifenna and others to cinnamon, when gathered with the wood of the young branches.

It was a common practice in the early times not to ftrip the fmall bark from medicinal trees, but to cut off the little boughs and ufe them bark and wood together. This the Greeks called *xylo-cinnamomum*, or woody cinnamon, and the Arabians *querfaa*, *querfe*, or *kerfe*.

QUERQUEDULA, in zoology, the name by which authors call the teal.

This is the fmalleft of all the duck kind. Its beak is black, and its head and the upper part of its neck of a reddifh brown; but there runs on each fide of the head a green ftreak from behind the eyes quite to the back part, and between thefe there is a black fpot under the eyes; there is a white line which feparates the reddifh colour from the green. The lower part of the neck, the fhoulders, and the fides are very beautifully variegated with black and white ftreaks. The breaft and belly are of a dufky greyifh white. The wings have fome white in them, and the legs are of a pale brown. There is a black fpot on the rump in the male, which is wanting in the female. The head alfo in that fex is lefs beautifully coloured. *Ray's* Ornithol. p. 290.

QUERQUEDULA *criftata*, the *crefted teal*, a name given by Bellonius and fome others to a fpecies of duck, remarkable for a tuft of feathers of an inch and an half long, hanging down from the back part of its head, and thence called the *tufted duck*; but more known among authors by the name *capo negro*. *Bellonius* de Avib. See CAPO *negro*.

QUESTOR (*Cycl.*)—The *queftorfhip* was called the firft ftep of honour, and the *queftors*, who were generally employed in the provinces abroad, affigned to them feverally by lot, no fooner returned from their provincial adminiftration, than they took their places in the fenate; and from that time forward, from the rank of equeftrians, or what we commonly call knights, became fenators for life. *Middleton* of Rom. Senate. p. 6, 7. See SENATE and SENATOR.

QUI *tam*, in law, is ufed where an information is exhibited againft any perfon on a penal ftatute at the fuit of the king, and the party who is informer, when the penalty for breach of the ftatute is to be divided between them; and the party informing profecutes for the king and himfelf. *Finch* 340.

QUICKSILVER (*Cycl.*)—This mineral is frequently found native in the earth, in its own fluid form; fometimes lying in large quantities together in the accidental cavities of ftone, and running out in a ftream as the miners break the maffes: but this is lefs frequent; its more common appearance being in fmall parcels, and often in fingle globules, fcarce large enough to be feen by the naked eye, lodged in great abundance in the pores of a foft foffile ftone, of a pale bluifh colour, from which it is eafily feparated by pounding and wafhing. It is alfo found in fome places lodged in the fame manner in fome of the harder ftones, and in various fpecies of earths.

Tho' *quickfilver* be, however, often found native, yet we much more frequently find it in the form of an ore; its particles being penetrated by, and intimately mixed with fulphur, and the concrete being by no means to be known for *quickfilver* to the naked eye, but being a red mafs of a ftony hardnefs, called *cinnabar*: and we are very fure that it is *quickfilver* penetrated by fulphur that makes this ore, fince we are not only able to feparate *quickfilver* eafily from it; but by a mixture of *quickfilver* and fulphur, we are able to make a red ftony mafs perfectly the fame with this.

The cinnabar is of a different form and appearance, according to the quantity of fulphur it contains, being ufually ftriated, and that fometimes with broader, fometimes with finer ftriæ; and the quantity of *quickfilver* in this is very great, the richeft maffes containing fix parts *quickfilver* to one of fulphur; and the poorer ufually half. It is fometimes found in large and pure maffes, and fometimes in fmaller particles, lodged in different earths and ftones. Thefe are fometimes few in number and placed feparately, and fo of little value; but in other maffes they are placed very thick in congeries, and are then feparated by pounding and wafhing, and worked for *quickfilver*.

Befide this pure ore of *quickfilver*, there is another much lefs rich; but which is worked in fome places to confiderable advantage: as the former is a mixture of *quickfilver* and fulphur alone, this is a mixture of thofe two, and of many other fubftances, and appears in form of a moderately hard ftone, ufually of a dufky orange colour; but not rarely of a greenifh brown, and fometimes blackifh. This has very little brightnefs, and nothing of the ftriated texture of the cinnabar.

The manner of feparating *quickfilver* from its ores, is by pounding them, and wafhing off the fuperfluous matter by repeated affufions of water; then adding iron filings to the remainder, the whole is diftilled in large iron retorts, and the mercury comes over pure into the receiver. In fome places where the ore is very rich, they only powder it, and put it into long-necked earthen veffels, which they ftop with bundles of mofs: thefe they invert into other veffels buried in the ground, and then making a fire about them, the *quickfilver* becomes feparated and drains through the mafs into the underpots. *Hill's* Hift. of Foff. p. 627.

It is very difficult to bring *quickfilver* to the great teft of the burning-glafs, by which all the other imperfect metals are eafily tried; but with proper cautions fomething is to be learned of it by this means:

If *quickfilver* be expofed to the focus on a piece of charcoal, on a tile, or in a coppel, the effect is the fame, it very foon is wholly diffipated in form of a thick fmoak; but if precipitate *per fe*, that is, mercury calcined alone by a long digeftion on a flow fire, be placed in the focus, it feems at firft to melt and run, but immediately after is diffipated in a thick fmoak, leaving a fmall quantity of an extremely fine powder upon the tile, in form of a fhort down. This powder, on being continued in the focus, finally runs together into a yellowifh glafs; in feveral parts of which there may be diftinguifhed fmall white, fhining, metalline particles, which feem to be *filver*.

If the precipitate *per fe* be expofed to the focus on a piece of charcoal, it is feen to melt and run into fmall globules of pure mercury, which foon after begin to fume and are diffipated entirely. It appears, therefore, upon the whole, that there is in *quickfilver* an oil, which may be feparated by long digeftion over a flow fire; and that the matter diverted of that, is no longer mercury, but a mere calx or a red earth, this being properly the bafis of this metal; that this calx does not vitrify in the manner of the other calxes of the metals, being too volatile for that, and eafily flying off in the fire; and finally, that this oil of mercury is not different from the other oils, even thofe of the vegetable kind, fince common charcoal could fupply its place by means of its oil, and reftore the calx to running mercury again. As to the fmall remainder of earth, after the diffipation of the calx of mercury, which run into glafs with metalline fpecks, it is much to be queftioned whether it be not owing to fome impurity in the mercury. Mem. Acad. Par. 1709.

The mines of Friuli afford at prefent very large quantities of *quickfilver*, fome native, or virgin, which they call *jung-frau*, and obtain either out of natural beds in the rocks, or by wafhing the ore in which it lies difperfed in fmall globules; but the far greateft part is not vifible to the eye in the form of *quickfilver*, nor can be feparated from the ore without the help of fire. Kircher, in his Mundus fubterraneous, gives a moft frightful defcription of this mine; but it is not more terrible than others of the fame kind. It is remarkable, that the entrance into it is not high up in the hills, as is ufually the cafe; but upon a level ground, and in the ftreets of the town. This fubjects them to great inconveniences from water, but they have admirable machines for the draining it out again. The defcent is by ladders near ninety fathoms down.

There are no damps in thefe mines, but the mifchiefs of the mercury itfelf getting into the bodies of the workmen are much greater and more general, tho' not fo fudden, as the effects of the damps in our lead and coal mines, and the like places.

The elaboratory belonging to thefe mines has furnaces capable of working fifty retorts at a time. There are generally fixteen of thefe furnaces at work at once, fo that eight hundred retorts are the general number in conftant ufe.

The retorts ftand in double rows on each fide the furnace, a row of thirteen below, and a row of twelve above.

The antients all esteemed *quicksilver* a poison, and it must be allowed to have dismal effects; the unhappy people employed in preparing it seldom live more than three or four years, and then die miserably: and such as take it internally, or by way of unguents, without great care, often suffer for their imprudence.

Under proper regulation, however, it is a most powerful and noble medicine, opening obstructions, and attenuating viscid humors in the very remotest parts of the body.

The preparations of *quicksilver* now in use are, 1. Æthiops mineral. 2. Factitious cinnabar. 3. Corrosive sublimate. 4. Mercurius dulcis. 5. Mercurius calcinatus, commonly called *precipitate per se*. 6. White precipitate. 7. Red precipitate, or red corrosive mercury. 8. Coralline mercury. 9. Turbith mineral. See MERCURY, &c.

Water in which *quicksilver* has lain for some time, tho' insipid, is said by Van Helmont to destroy worms; and Mr. Boyle seems to recommend it as an innocent and effectual cosmetic. Works abr. Vol III. p. 345.

QUID *juris clamat*, in law, a writ that lies where I grant the reversion of my tenant for life by fine in the king's court, and the tenant will not attorn; then the grantee shall have this writ to compel him. Terms of Law.

QUIJUBATUI, in zoology, the name of an American species of peroquette.

It is of the size of a lark, and in general of a yellow colour. Its eyes are black, and its beak grey. The edges of its wings are of a dusky green, and its tail long and yellow. It is a very beautiful bird, and very easily tamed. *Marggrave's* Hist. Brasil.

QUIL, in zoology, the name of a small animal of the ferret kind, frequent in the West Indies, and famous for its combat with serpents. See the article QUIRPELE.

QUILAQUIL, in natural history, the name given by the people of the Phillipine islands to a very beautiful species of parrots, which is commonly found wild in the woods there. It is all over of a fine green colour, and is smaller than the common parrots, and has a broad black bill and black legs. It is a very wild bird, and will not learn any thing.

QUILLOBO, in botany, a name given by some to a species of ketmia, called also *quingombo*. See QUINGOMBO.

QUINA *folia*, among botanists. See LEAF.

QUINCE, *cydonia*, in botany, &c. See CYDONIA.

The fruit of the *quince* is astringent and stomachic, but its chief use in the shops is in the *syrupus cydoniarum*, or syrup of *quinces*, prepared from its juice with sugar, which is a very pleasant syrup.

QUINGOMBO, in botany, the name given by the people of Congo to a species of ketmia, distinguished by Mr. Tournefort by the name of the *ketmia Brasiliensis folio ficus fructu pyramidato sulcato*, the fig-leaved Brasilian ketmia, with a pyramidal sulcated fruit. See KETMIA.

QUINNET, in mining, the name of a tool used in the cleaving rocks by means of gunpowder. This is a sort of wedge fitted to the flat side of what is called the *gun*; that is, a cylindric piece of iron, only flatted in one part, to receive this, and drilled through. When a proper hole has been made in the rock by the borer, the powder is put in, and then the orifice being stopped by the gun, and that wedged in by this *quinnet*, the powder being fired by a train communicating with the hole drilled through the gun, exerts all its force on the rock, and splits it in several directions at one explosion. Philos Transf. N°. 167. See MINING.

QUINQUANGULAR-*leaf*, among botanists. See LEAF.

QUINQUEFOLIUM, *cinquefoil*, in botany. See CINQUEFOIL.

QUINQUENNES, in some old historians, a name given to a certain people of India, among whom the women began to bear children at five years old, and seldom lived to more than eight years. Pliny gives us this account, and Solinus, who repeats it from him, increases the miracle by telling us, that they were a nation of women who had no men among them.

QUINQUEPRIMI, among the Romans, the five principal men in the senate of every municipal town. *Pitisc* in voc.

QUINQUEREMIS, in the naval architecture of the antients, a name given to a galley which had five rows of oars. They divided their vessels in general into monocrota and polycrota; the former had only one tire of rowers, the latter had several tires of them, from two or three, up to twenty, thirty, or even forty; for such a vessel we have an account of in the time of Philopater, which required no less than four thousand men to row it.

Meibom has taken off from the imaginary improbability of there ever having been such a vessel, by reducing the enormous height supposed necessary for such a number of rows of oars and men to work them, by finding a better way of placing the men than others had thought of. The *quinqueremes* of the antients had four hundred and twenty men in each, three hundred of which were rowers, and the rest soldiers. The Roman fleet at Messina, consisted of three hundred and thirty of these ships; and the Carthaginian, at Lilybœum of three hundred and fifty of the same size. Each vessel was an hundred and fifty foot long. Thus an hundred and thirty thousand men were contained in the one, and an hundred and fifty thousand in the other, with the apparatus and provisions necessary for such expeditions as they were intended for. This gives so grand an idea of the antient naval armaments, that some have questioned the truth of the history; but we find it related by Polybius, an historian too authentic to be questioned, and who expresses his wonder at it while he relates it. *Meibom* de Trirem.

QUINQUEPARTITE-*leaf*, among botanists. See LEAF.

QUINQUERTIONES, among the Romans, an appellation given to those who had gained the victory in the *quinquertium* or *pentathlon*.

QUINQUERTIUM, among the Romans, was the same with the Grecian *pentathlon*, comprehending the five exercises of running, leaping, throwing, darting, and wrestling. See the article PENTATHLON, *Cycl.*

QUINQUINA (*Cycl.*)—The most accurate account we have ever received of the tree which produces the *quinquina*, or Peruvian bark, is from Mr. de la Condamine, who in travelling through some parts of America, chose the route of Loxa, where the finest bark is gathered, and where the greatest number of the trees are found; and taking instructions from Mr. de Jussieu, as to what enquiries were most necessary to be made, informed himself very much at large about it.

The finest bark, and the greatest quantity, he informs us, was gathered on Cajanuma, situated two leagues and an half to the south of Loxa; and this is the very place where the first bark that was sent into Europe was gathered. He found means to remain a night on his journey on this mountain, and in his return took a branch from one of the trees which had both flowers and ripe fruit on it, as is the case with this tree throughout the whole year, and this branch was the ground of his figures, as the observations he made in the journey were of his accurate account of the tree.

The natives reckon three species of bark, the reddish, the yellowish, and the white. The last of these has very little virtue, and the other two are nearly equal in goodness, tho' the world gives it in favour of the red. These two are the barks of trees which have no difference in their leaves, fruits, or flowers; and which even the people who are continually employed in the service cannot distinguish at sight, but pierce the bark with a knife, to see the difference, the yellowish being thus found to be tenderer and paler coloured than the other. The trees which produce these two sorts grow indiscriminately one by another, and the bark is gathered indifferently from both; and in drying the distinction between them becomes yet less visible, since both acquire a brownish colour.

The tree which produces the white *quinquina* has rounder and rougher leaves, the flower also is whiter, and the fruit larger, and its outer covering whitish. This tree usually grows near the top of the mountain, and is not found among the other kinds; they usually being found about the midway of the height, and principally in hollows, or in the more close or sheltered places. Some have suspected, that this difference of the trees which produce white, and the other barks, was only owing to the more cold and exposed situation it had on the top of the mountain; and thus much is well known as to the bark in general, that the warmer the place is where it grows, the greater are its virtues.

The *quinquina* tree never grows in the plains; it is a constant inhabitant of the mountains, and is easily known from the trees it grows among by its erect growth, and its height when of any considerable age, as it always carries its head above the rest. These trees are never found in clumps or clusters together, but always separate and single among other kinds. They grow to a very considerable size, when suffered to remain long enough; some are as thick as a man's body, but the more usual are about nine inches in diameter.

It is very rare, however, to find any large ones at this time on the mountain where the bark is gathered, the great demand for it having made them bark all the trees, and these having all perished by it; for the old trees never recover the barking, tho' the young ones frequently do.

They use no other instrument for barking the trees than a common knife, which the workman thrusts through the bark at as great a height as he can reach, and then bearing hard upon it, brings it down to the bottom, cutting all the way. If there be any difference, as some have pretended, between the bark that was at first imported, and that which we now receive, it must be wholly owing to the different ages of the trees it was then and is now procured from; that having been the bark of old trees, and there being now none but young ones: this gentleman having scarce seen any there that were thicker than a man's arm, or above twelve or fifteen feet high; and those which they cut young always throw out new shoots from the bottom.

In the times when the bark was first brought into use, the world preferred the thickest pieces, now they set the greatest value on the thinnest; but the latter preference is most reasonable; since it is not founded on fancy, but on the experiments made by the English and other nations of the different virtues, and the result of chemical analyses.

There was once an opinion, that there were certain seasons to be observed for the gathering the bark, and that it ought always to be done in the decrease of the moon; but experience

rience has ſhewed theſe to be idle opinions, and it is now gathered at all times if the weather be dry. When the bark is taken off, it is laid in the ſun till perfectly dry; the omitting this circumſtance, and packing up the bark while moiſt, has occaſioned it often to become mouldy, and ſpoil, and the merchants have attributed this to the taking it off in a wrong time of the moon, when it was wholly owing to its being put into the ſkins while too moiſt.

The leaves of the *quinquina*-tree ſtand on pedicles of about half an inch long: they are very ſmooth and gloſſy, and of a beautiful green; but ſomewhat paler on the under ſide than the upper. They are perfectly ſmooth at the edges, and are of an oblong figure, pointed at the end, and rounded at that part which joins to the ſtalk. They are from two and an half to three inches in length, and from an inch and an half to two inches in breadth. The middle rib of the leaf is rounded on the upper ſide, and is uſually of a reddiſh colour, eſpecially towards the pedicle; and the whole leaf often becomes red, when perfectly mature. All the ſmall branches towards the top of the tree terminate in one or more cluſters of flowers, which, before they are open, reſemble in their ſhape and their bluiſh grey colour, thoſe of the common lavender. Mem. Acad. Scienc. Par. 1738.

When theſe open, they change their colour: each ſtalk that ſuſtains one of theſe cluſters of flowers ariſes from the ala of one of the leaves, and divides into a great number of ſmall branches, each of which is terminated by a cup divided into five parts, which ſuſtains a flower reſembling that of the hyacinth. It is compoſed of a pipe of three quarters of an inch long, which at the end is divided into five, and ſometimes into ſix ſegments. Theſe are of a beautiful deep red within, and are ſerrated round the edges in a very elegant manner. From the bottom of the tube of the flower there ariſes a white piſtil, terminated by a long green head; this ariſes above the level of the ſegments of the flower, and is ſurrounded by five ſtamina, which ſuſtain apices of a pale yellow colour: theſe remain hid within the flowers. The tube is of a dirty red, and is covered with a ſort of whitiſh down. When the flower is fallen, the cup ſwells in the middle into the form of an olive, which by degrees grows into a fruit divided into two cells, which in drying become ſhorter, and the whole fruit rounder than in its natural condition.

This fruit finally opens longitudinally into two capſules, ſeparated by a membranaceous ſeptum, and coated by a thin yellowiſh ſkin; the ſeeds are of a reddiſh colour, and in ſhape are flattiſh, and, as it were, foliaceous; they are not more than a twentieth part of an inch in diameter, and are thickeſt in the middle, becoming thinner at each ſide. The plantula ſeminalis lies in the very center of the ſeed, between two pellicles: theſe ſeeds, which reſemble in ſome degree thoſe of the aſh in miniature, are faſtened in the manner of ſo many ſcales to a placenta of an oblong figure, pointed at the two extremities, ſo as ſomewhat to reſemble a ſeed of the common oat, but that it is longer and flatter. This is joined to the ſeptum, and has on that part a longitudinal furrow; but on the other ſide is convex, and ſomewhat rough all over. Mem. Acad. Scienc. Par. 1738.

By this deſcription it appears, that they were very ignorant of the nature and characters of this tree, who, in its firſt knowledge among us, called it a ſpecies of ſebeſten.

The uſe of this febrifuge ſeems to have been very long known to the natives, and their manner of taking it was by pounding the bark, and laying it to infuſe in water, and drinking the infuſion; their hatred to the Spaniards, their conquerors, made them keep it a long time a ſecret from them; and when the thing became known among the inhabitants of Loxa, it ſtill remained a ſecret to the reſt of the world, and its great value was never generally known till the year 1633; when the lady of the viceroy of Peru, the counteſs de Chinchon, being long ill of an intermittent fever, which would give way to none of the known remedies, the corregidor of Loxa ſent to the viceroy a quantity of the *quinquina* bark, which he aſſured him would cure the lady, tho' all other means had failed. Upon this the corregidor was ſent for to Lima, and after having given the medicine to many other perſons with ſafety and ſucceſs, the lady at length took it, and was cured. She immediately on this ſent for a large quantity of the bark, had it powdered, and herſelf diſperſed it to thoſe who had occaſion for it; whence it obtained the name of the *counteſs's powder*: but this lady being ſoon tired of the office, gave it in charge to the jeſuits; and they continuing to give it to the ſick with the ſame ſucceſs, it then was called the *jeſuits powder*. Theſe reverend fathers ſoon found means to ſend a quantity of it to Cardinal Lugo, who diſperſed it with the ſame ſucceſs at Rome; and after him the apothecary to the college gave it gratis to the poor with the ſame good effects, and under the name of the *jeſuits* or the *cardinal's powder*: afterwards the better ſort were made to pay its weight in ſilver for it, to defray the expences of its importation, while the poor ſtill had it gratis. Lewis XIV. at that time dauphin of France, was cured by it of a fever which had not given way to other medicines.

In the year 1640, the count and counteſs of Chinchon being returned to Spain, their phyſician, Juan de Vega, who brought a great quantity of it over with him, ſold it at a conſiderable price; and ſoon after this, large quantities were ſent over by the galleons, but the great demands from Europe cauſing the inhabitants of Loxa to adulterate it with other barks, it had like to have loſt part of its juſt praiſe. The *quinquina*-trees are found at this time on all that chain of mountains adjoining to Cajanuma, and in many other parts of America.

QUINTAIN, (*Cycl.*) the name of an old Engliſh ſport, intended for a trial of the agility of men on horſeback. It is loſt in many parts of the kingdom, but was ſtill in uſe at Deddington, in Oxfordſhire, in the time of Dr. Plot. The method of performing it is this:

They firſt ſet up a poſt perpendicularly in the ground, and then place a ſlender piece of timber on the top of it, on a ſpindle, with a board nailed to it at one end, and a bag of ſand at the other. Againſt this board they antiently rode with ſpears, but afterwards only with ſtaves, which violently brought about the bag of ſand; ſo that if they did not make good ſpeed away, it ſtruck them on the neck or ſhoulders, and ſometimes knocked them down. The great point aimed at was always the breaking of the board, and he that did that, was accounted the greateſt maſter.

It ſeems to have had its name from the Latin *quintus*, fifth, as one of the antient ſports uſed every fifth year among the Olympian games; or becauſe it was the ſport of the fifth or laſt day of theſe games. *Plot's* Oxford. p. 204.

QUINTESSENCE (*Cycl.*)—QUINTESSENCE *of wine*, a term uſed by Glauber to expreſs an eſſential oil of wine, which he directs to be made by a careful diſtillation, and which he is very fond of, as having a power to meliorate, improve, and even to ſpecificate the poorer wines into the nature of thoſe from which it was obtained.

This is one of the ſchemes of Glauber, generally eſteemed an impracticable one, tho' very plauſible in theory; but tho' in general there is a diſagreeable flavour in the *quinteſſence* drawn after his method, which is different from the true flavour of the wine, and ſpoils the liquor it is added to; yet by proper care there is a poſſibility of ſucceeding ſo far as to render this extraneous flavour almoſt imperceptible, and produce an oil that will mend poor wines extremely, and give a truly vinous flavour to ſuch as are in themſelves taſteleſs: but whatever may be done by this method, may alſo be done with much more certainty, and much leſs trouble, by the concentration of wines by freezing. This may be eaſily practiſed in the wine countries; and by this means Burgundy, Champaign, and other the moſt valuable wines, may be reduced into thick extracts and robs, by the means of which wines may be made in England; a very ſmall quantity of theſe concentrated wines being ſufficient to convert the whole of any of the poor taſteleſs and inſipid wines, which are of themſelves of little or no value, into the very wine from which the rob was made, and that in ſuch perfection, that the niceſt judge cannot find out the difference.

Theſe robs of wine made and preſerved upon the ſpot, would alſo be of infinite uſe in the wine countries, as they might be kept to improve the wines of bad years. *Stahl*, de Concentr. Vin. *Shaw's* Chem. Eſſ.

QUINTUS *femoris*, in anatomy, a name given by Fallopius and many others to one of the muſcles of the thigh, now called the *pſoas magnus*. See PSOAS.

QUINTUS *oculorum*, in anatomy, a name given by Veſalius and ſome others to one of the muſcles of the eyes, more expreſſively called by others *obliquus ſuperior oculi*, and *opifex circumgyrationis oculi*.

QUINVA, in botany, a name by which ſome authors have called the amaranth, or cockſcomb. *Moriſon*, Hiſt. Vol. II. p. 602.

QUINZY, or ANGINA (*Cycl.*)—This is defined by medical writers to be an inflammatory ſtaſis of the blood about the throat, in which nature ſeems to have aimed at the diſcharging part of the load of a plethora, either by an hæmorrhage of the noſe, or by ſpitting of blood; but effecting neither, the *quinzy* is produced.

Authors have divided the *quinzy* in general into two kinds, the true and the ſpurious. The true *quinzy* is that in which the tumor is internal, and is attended with a fever. The ſpurious is that in which the tumor ſhews itſelf more outwardly, and is not attended with a fever.

The antients alſo divided the *quinzy* into four other kinds, which they called by as many names.

1. The *cynanche*. In this the tumor neither manifeſts itſelf outwardly nor inwardly, but is attended with a very violent fever.

2. The *paracynanche*. This was the name given it when the tumor appeared externally in the muſcles of the larynx, and was highly inflammatory.

3. The *ſynanche*. In this kind the tumor appears externally alſo, and there is a leſs difficulty of breathing; but a greater of ſwallowing than in the other kinds.

4. The *paraſynanche*. This name denoted an inflammation of the muſcles of the pharynx, attended with a fever.

We at this time diſtinguiſh alſo the *quinzy* into the idiopathic and ſymptomatic. The firſt, where it is itſelf the diſeaſe, and owes its origin only to a plethora. The ſecond, where it is

is but the accidental ſymptom of an inflammatory fever, or ſome other diſeaſe about the time of its criſis.

Signs of a quinzy. The firſt ſymptom of this diſeaſe is a difficulty of ſwallowing, joined with a tumor in the throat, and a ſenſation of a pricking pain; to theſe ſymptoms there ſucceeds an inflammation and violent heat in the fauces: and in a few hours theſe ſymptoms increaſe to ſo great a degree, that the patient becomes unable to ſwallow; the tongue ſwells violently, and the veins appear black and tumid under it, the face becomes red and tumid, and the temporal veſſels are diſtended, and the eyes become ſwelled and ſeem as if they would ſtart out of the head; then reſpiration becomes very painful, and there is danger of abſolute ſuffocation. The hands become pale and cold to the touch; and the fleſh is at times very hot, and ſoon after very cold again; and in the progreſs of the diſeaſe the patient is uſually found to be very low ſpirited.

The idiopathic *quinzy* ſeldom happens to any except young people of a remarkably plethoric habit of body; and people are moſt ſubject to it who have been uſed to frequent bleedings at the noſe, and who live ſedentary lives, and feed high. The moſt frequent cauſes of this diſeaſe are a ſuppreſſion of hæmorrhages by the noſe, a ſudden cooling of the body after exceſſive heat, drunkenneſs, an improper uſe of ſtrong ſternutatory powders, violent and loud calling, and finally, luxations of the neck.

As to the ſymptomatic *quinzy*, the moſt common of all cauſes of it is the improper uſe of bleeding in acute fevers and other inflammatory diſeaſes.

Prognoſtics in quinzies. The more violent the attack of this diſeaſe is, the greater is the danger with which it is attended. The ſpurious *quinzy* is always more favourable than the true one, and the mildeſt of all the kinds is the paracynanche, as the cynanche is of all others the moſt fatal. Thoſe who die of this diſeaſe rather die of convulſions than of ſuffocation. When the matter cannot be diſcuſſed, there uſually happens a ſuppuration; and in this caſe the event is very dubious and uncertain.

Method of cure. Immediately on the attack of the diſeaſe, a clyſter is to be given. Warm urine or brine will ſerve the purpoſe, or, if equally ready, the pulp of colocynth, or aloes ſhould be boiled in the liquor. After this there muſt be a large quantity of blood taken from the arm, or foot, which is by ſome eſteemed much better; and if the ſymptoms do not then remit, the raninæ venæ are to be opened ſoon afterwards. In a milder attack it is not neceſſary to bleed in the time of the fit, but the common remedies for allaying the inordinate emotions of the blood take place; ſuch as powders of nitre, crabs-eyes, and cinnabar, and on occaſion a gentle anodyne or opiate may be added to theſe; as a ſmall doſe of the ſtorax pill, or the like. Theſe things are alſo to be given in the more violent caſes, and through the whole courſe of the diſtemper, provided that the difficulty of ſwallowing does not prevent it. After bleeding and theſe powders, the uſe of gargariſms is very great: of theſe there are three kinds; 1. The reſolvent or nervine and diſcutient: theſe are prepared of orrice and elecampane-root, hyſſop, chamæmile flowers, and anniſe and caroway ſeeds, and the like. 2. The lenient, or demulcent, which ſerve to allay the inflammatory heat: theſe are prepared of the mucilaginous and cooling things, as quince-ſeeds in red roſewater, with ſyrup of raſpberries, mulberries, and nitre, with jews-ears and album græcum, which two laſt are looked upon by many as ſpecifics. And, 3. The aſtringents: theſe are made of the traumatic herbs, ſuch as mouſe-ear, ſelf-heal, and the like, with biſtort and comfry-root, pomegranate rind, galls, terra Japonica, and alum.

The gentle aſtringents are to be firſt uſed, and it muſt be with great caution that we proceed from thoſe to the more powerful ones. While theſe are uſed internally, the external uſe of emolient and diſcutient plaiſters is alſo to be brought in; ſuch are melilot and diachylon with the gums: and in caſes where the heat is violent, inſtead of plaiſters, linnen-cloths wetted with ſpirit of wine and camphor, with a little ſaffron, are to be applied. If all theſe things fail, and the ſwelling riſes and breaks, the patient is always relieved by the breaking, and is to uſe afterwards, by way of gargariſm, wine ſweetened with honey of roſes. The bowels are always to be kept looſe by glyſters, or gentle purges; and finally, where the danger of ſuffocation is imminent, bronchotomy is the laſt relief. *Junker*, Conſp. Med. p. 154, ſeq.

Beſide the common occaſions of this diſeaſe, we have in the philoſophical tranſactions an account of a ſtone breeding at the root of the tongue, and cauſing one. The patient was almoſt choaked, and the tumor, which was large outwardly, tho' not tending to ſuppuration, yet was ready to break within, and ſhewed matter ready to be diſcharged. On breaking it with the finger, there iſſued out above a quarter of a pint of matter, and with it a ſmall ſtone, very hard, and of the ſame nature and ſubſtance with thoſe formed in the kidneys.

In this diſtemper, beſides high bleeding, ſome recommend a gargariſm compoſed of ſublimate mercury, half a drachm; cream of tartar, two drachms; diſſolved in a pint of ſpring water. Med. Eſſ. Edinb. abr. Vol. II. p. 431.

We have the hiſtory of an uncommon *angina*, or *quinzy*, by Mr. Monro in the medical eſſays of Edinburgh abridged, Vol. II. p. 400.

QUIRICIA, a name given by ſome to the ſtone called *quiris* by the generality of writers. See QUIRIS.

QUIRINACIUM *opium*, in the materia medica, a name given by ſome to the gum we know by the name of aſſa fœtida.

It is a barbarous phraſe of the middle ages, and is founded on the name ὄπιον κυρηναικόν of the Greeks, which expreſſed the Cyrenean gum, that being the name they gave to the original aſſa, which was a ſweet-ſcented gum, not the ſtinking aſſa-fœtida. We call both theſe aſſa, but the Greeks diſtinguiſh the ſtinking kind by the name *ſcordolaſaron*. See the article ASA.

QUIRINUS *lapis*. See QUIRIS.

QUIRIS, a name given by the writers of the middle ages to a ſtone famous among them for its imaginary virtues, but of which they have left us no deſcription.

They call it alſo *quirinus* and *quiricia*, and pretend, that if put under any one's pillow, it will cauſe them to divulge all their ſecrets by talking in their ſleep.

QUIRPELE, in zoology, the name of a ſmall animal, called by ſome authors the *Indian ferret*, *viverra Indica*, and by others *quil*.

Garcias and ſome authors give very remarkable accounts of the enmity this creature has to ſerpents of all kinds. They tell us, that when this little creature intends an attack upon one of theſe animals, it firſt prepares againſt danger by gnawing a quantity of the root of the *lignum colubrinum*, or ſnake-wood; and when it has thoroughly impregnated its *ſaliva*, it wets with it firſt its fore-feet, and with them daubs over its head and its whole body; and that thus prepared, it boldly attacks the ſnake, and never leaves off till it has killed it. Garcias aſſures us, that many of the Portugueſe have been eye-witneſſes of theſe combats.

It is probable enough, that this creature may attack a ſnake when thoroughly hungry, knowing its fleſh to be good food; but I fear the ſtory of the antidote is to be ſuſpected. *Ray's* Syn. Quad. p. 197.

QUITY, in botany, a Braſilian name uſed by ſome authors for the ſapindus, or ſoap-berry tree of the Weſt Indies. *Margg:* Hiſt. Braſil. p. 113.

QUOD (*Cycl.*)—QUOD *ei deforciat*, in law, a writ for tenant in tail, tenant in dower, by the courteſy, or for term of life, having loſt their lands by default againſt him that recovers, or his heir. Reg. orig. 171. Stat. Weſtm. 2. c. 4. *Cowel*, Terms of Law.

QUOD *permittat*, in law, a writ that lies where a man is diſſeiſed of his common of paſture, and the *diſſeiſor aliens*, or dies ſeiſed, and his heir enters; then if the diſſeiſee die, his heir ſhall have this writ.

QUOIL (*Cycl.*)—*Weather*-QUOIL, at ſea. See WEATHER.

QUORUM (*Cycl.*)—QUORUM *nomina*. In the reign of King Henry VI. the king's collectors, and other accomptants, were much perplexed, in paſſing their accounts, by new extorted fees, and forced to procure a then late invented writ of *quorum nomina*, for the allowance and ſuing out their quietus, without the allowance of the king. *Blount*.

QUOTIDIAN, (*Cycl.*) in medicine, the name of a ſpecies of fever which attacks the patient every day, at firſt with a chilneſs, and with a febrile heat ſucceeding this, by which nature commonly attempts to eaſe herſelf of the load of ſome morbific matter which uſually adheres in the primæ viæ. This differs greatly from the continual *quotidian* fever. See the article *Catarrhal* FEVER.

It is diſtinguiſhed from the double tertian by this, that the *quotidian* regularly obſerves its times of attack and of duration every day; but in the double tertian, the ſingle fits do not correſpond one with another, but only the alternate ones, that is, the paroxyſm of the third day correſponds with that of the firſt, that of the fourth with that of the ſecond, and ſo on.

Signs of it. This fever uſually attacks the patient in a morning, and moſt frequently about ſix or ſeven o'clock. The firſt ſymptom is a very violent chilneſs or coldneſs, which uſually laſts about an hour, and is attended either with a vomiting, or with a diarrhœa, or both. This cold fit is ſucceeded by a violent hot one, in which there is an intolerable thirſt and pain of the head. The whole duration of the fit is uſually ſix hours, and when the heat remits a little of its violence, then ſweats uſually come on. This returns regularly at the ſame hour the next day, and ſo on, unleſs diſturbed by any means; in which caſe, it anticipates or poſtpones the accuſtomed time.

Perſons ſubject to it. This is the leaſt frequent of all the intermittent fevers. Perſons of phlegmatic habits are more ſubject to it than thoſe of any other temperament; and it ſeizes old people oftner than young, and women much more frequently than men.

Cauſes of it. The firſt cauſe of this diſeaſe is a viſcous and mucous matter lodged in the primæ viæ. This is often attended with a ſpiſſitude of the blood in the vena portæ. The occaſional cauſes which bring on this ſpiſſitude of the blood and foulneſs of the primæ viæ, are a coarſe and thick diet, a ſedentary

dentary life, and a natural turn to melancholy. The caufes of this, and of the tertian, feem to be the fame, only that in this they are ftronger.

Method of cure. The general cuftom of curing intermittents by vomits and the Peruvian bark alone, is cenfured by Stahl, and many other writers, as being faulty in two extremes; the vomiting throwing off the offending matter with too much violence, and the bark locking it up in the body. Vomits, when injudicioufly given, often give violent reachings, without bringing up any part of the matter of the difeafe; and the bark, and other aftringents, bring on obftinate coftivenefs, flatulencies, ftraitnefs of the breaft, and many other diforders; fuch as, the jaundice, dropfy, œdematous fwellings, and many other the like complaints, which often fucceed the too large or injudicious ufe of it: for this reafon, thefe authors prefer a regular method, by inciding the tough matter in the primæ viæ, with tartarum vitriolatum, and the like, then the giving a gentle emetic; after this, gentle diaphoretics and diluents, fuch as all warm and weak liquors; and afterwards ftrengthening the ftomach and bowels by bitters and fubaftringents, among which the bark has its place, tho' in fmaller quantities than when trufted to alone in the ufual way. *Junker*'s Confp. Med. p. 360.

R.

R.

RABBIT, *cuniculus*, in zoology, a well known animal of the hare kind. See the article LEPUS.

The female, or doe *rabbit* goes with young thirty days, and then she kindles; and if she take not buck presently she loses her month, or at least a fortnight, and often kills her young and eats them.

In England they begin to breed at a year old, but in some places much sooner; and they continue breeding very fast from the time when they begin, four, five, six, or seven times a year being common with them. They have usually from four to seven in a litter, and hence it is that a small number at first will soon stock a whole warren, if left to breed a little while undisturbed. The does cannot suckle their young till they have been at buck again; this therefore is to be done presently, else there is a fortnight lost of the time for the next brood, and the present brood also probably lost. When the buck goes to the doe, he always first beats and stamps very hard with his feet, and when he has copulated with her he falls backwards, and lies as it were in a trance; in this state it is easy to take him, but he soon recovers from it.

The buck *rabbits*, like our boar cats, will kill the young ones, if they can get at them; and the does in the warrens prevent this, by covering their stocks, or nests, with gravel or earth, which they close so artificially up with the hinder part of their bodies, that it is hard to find them out. They never suckle the young ones at any other time than early in the morning, and late at night, and always, for eight or ten days, close up the hole at the mouth of the nest, in this careful manner, when they go out. After this they begin to leave a small opening, which they encrease by degrees, till at length, when they are about three weeks old, the mouth of the hole is left wholly open, that they may go out; for they are at that time grown big enough to take care of themselves, and to feed on grass.

People who keep *rabbits* tame for profit, breed them in hutches, but these must be kept very neat and clean, else they will be always subject to diseases. Care must be taken also to keep the bucks and does apart till the latter have just kindled, then they are to be turned to the bucks again, and to remain with them till they shun and run from them.

The general direction for the chusing of tame *rabbits* is, to pick the largest and fairest, but the breeder should remember that the skins of the silver haired ones sell better than any other. The food of the tame *rabbits* may be colewort and cabbage leaves, carrots, parsneps, apple rinds, green corn, and vetches, in the time of the year; also vine leaves, grass, fruits, oats, and oatmeal, milk-thistles, sowthistles, and the like; but with these moist foods they must always have a proportionable quantity of the dry foods, as hay, bread, oats, bran, and the like, otherwise they will grow pot-bellied, and die. Bran and grains mixed together have been also found to be very good food. In winter they will eat hay, oats, and chaff, and these may be given them three times a day; but when they eat green things, it must be observed that they are not to drink at all, for it would throw them into a dropsy. At all other times a very little drink serves their turn, but that must always be fresh. When any green herbs, or grass, are cut for their food, care must be taken that there is no hemlock among it, for though they will eat this greedily among other things, when offered to them, yet it is sudden poison to them.

Rabbits are subject to two principal infirmities. First, the rot, which is caused by the giving them too large a quantity of greens, or from the giving them fresh gathered with the dew or rain hanging in drops upon them. It is over moisture that always causes this disease, the greens therefore are always to be given dry, and a sufficient quantity of hay, or other dry food, intermixed with them, to take up the abundant moisture of their juices. On this account the very best food that can be given them, is the shortest and sweetest hay that can be got, of which one load will serve two hundred couples a year; and out of this stock of two hundred, two hundred may be eat in the family, two hundred sold to the markets, and a sufficient number kept in case of accidents.

The other general disease of these creatures is a sort of madness: this may be known by their wallowing and tumbling about with their heels upwards, and hopping in an odd manner into their boxes. This distemper is supposed to be owing to the rankness of their feeding; and the general cure is the keeping them low, and giving them the prickly herb, called *tare-thistle*, to eat.

The general computation of males and females is, that one buck *rabbit* will serve for nine does; some allow ten to one buck; but those who go beyond this always suffer for it in their breed.

The wild *rabbits* are to be taken either by small cur dogs, or by spaniels bred up to the sport; and the places of hunting those who straggle from their burrows, is under close hedges, or bushes, or among corn-fields and fresh pastures. The owners use to course them with small greyhounds, and though they are seldom kill'd this way, yet they are driven back to their burrows, and are prevented from being a prey to others. The common method is by nets, called *purse nets*, and ferrets. The ferret is sent into the hole to force them out, and the purse net being spread over the hole, takes them as they come out. The ferrets mouths must be muffled, and then the *rabbit* gets no harm. For the more certain taking of them, it may not be improper to pitch up a hay net or two, at a small distance from the burrows that are intended to be hunted: thus very few of the number that are attempted will escape. The method by the dog, called the *lurcher* and *tumbler*, is also a very good one. See FERRET and LURCHER.

Some who have not ferrets smoak the *rabbits* out of their holes with burning brimstone and orpiment. This certainly brings them out into the nets, but then it is a very troublesome and offensive method, and is very detrimental to the place, as no *rabbit* will, of a long time, afterwards come near the burrows which have been fumed with these stinking ingredients.

The testicle of a *rabbit* is a very good object for examining the structure of this part of generation in animals. The whole substance of the testicle in this animal is made up of vessels, which lie in round folds in the manner of the smaller intestines, but then both ends of each roll meet at their insertion, which seems to be made into the *ductus nervosus*; and every one of these little rolls is curiously embroidered with other vessels, which, from their red colour, appear to be arteries and veins. The several little rolls lie in ranges, disposed with an uniformity which is very agreeable to the eye. Every one of these rolls is not a single and entire tube, but each consists of several tubes, beside the veins and arteries which embroider it. This is best distinguished by the cutting one of the rolls transversly, and then examining the cut end with a glass, which will then appear to be made up of the cut and open ends of four, five, or more parallel tubes, which together form the roll, or single tube, as it appears to the eye, being all wrapped up in one common and very thin membrane. These are so tender that they cannot be explicated and viewed distinct, as De Graeff tells us those of the testicles of a rat, and of some other animals, may. These however, as well as the others, are only made up of a congeries of vessels, and the liquors, which are their contents, without any intermediate substance, or any thing of that parenchyma, which many authors have talked of. The testicles of a bull have the greatest appearance of a fleshy texture of those of any known animal, yet even these afford no particle of parenchyma, or flesh, when examined by glasses in any sort of preparation, whether boiled, raw, soaked in spirits, or in whatever other state. The testicles of various animals are very variously composed, but all in this general manner of vessels variously rolled and folded together; and even the human testicles are of the same sort, being composed solely of rolls of vessels, without any intermediate substance, be it called by whatever name, but only consisting of vessels and their liquors. Philos. Trans. Nº 52.

RABCHORCADO, in zoology, the name of an American bird, described by Nieremberg with many fabulous circumstances. All that seems certainly known is, that its tail is very remarkably forked. *Ray's* Ornithol. p. 305.

RABEBOIA, a name given by some to the roots of the flammula major.

RABICH, a name given by Leo Africanus to a tree or shrub growing very plentifully in many parts of Africa, the fruit of which is much esteemed by the natives. He says that the tree *rabich* is prickly, and that the fruit is round and like a cherry, but smaller, and of the taste of the jujube. *Leo Africanus*, lib. 3.

RABIEL, a name given by some authors to dragons blood. See SANGUIS *draconis*.

RABIRA, a word uſed by ſome of the chemical writers to expreſs tin. See TIN.

RABOLANE, in zoology, a name given by many to the lagopus, a bird found on the ſnowy mountains, and called by ſome the *white partridge*. *Ray*'s Ornitholog. p. 127. See the article LAGOPUS.

RABRI, a name given by ſome authors to bole armenic.

RACE, in natural hiſtory. See CIBDELOPLACIA.

RACHISAGRA, a term uſed by ſome phyſicians for the gout in the ſpine of the back.

RACING, the riding heats for a plate or other premium.

The firſt thing to be conſidered in this ſort of gaming is the chuſing a rider; for it is not only neceſſary that he ſhould be very expert and able, but he muſt alſo be very honeſt.

He muſt have a very cloſe ſeat, his knees being turned cloſe to the ſaddle ſkirts, and held firmly there, and the toes turned inwards, ſo that the ſpurs may be turned outward to the horſe's belly. His left hand governing the horſe's mouth, and his right the whip. During the whole time of the *race* he muſt take care to ſit firm in the ſaddle, without waving or ſtanding up in the ſtirrups. Some jockies fancy this is a becoming ſeat; but, it is certain, that all motions of this kind, do really incommode the horſe. In ſpurring the horſe, it is not to be done by ſticking the calves of the legs cloſe to the horſe's ſides, as if it were intended to preſs the wind out of his body; but, on the contrary, the toes are to be turned a little outwards; that the heels being brought in, the ſpurs may juſt be brought to touch the ſides. A ſharp touch of this kind will be of more ſervice toward the quickening a horſe's pace, and will ſooner draw blood than one of the common coarſe kicks. The expert jockey will never ſpur his horſe until there is great occaſion, and then he will avoid ſtriking him under the fore bowels between the ſhoulders and girth; this is the tendereſt part of a horſe, and a touch there is to be reſerved for the greateſt extremity.

As to whipping the horſe, it ought always to be done over the ſhoulder on the near ſide, except in very hard running, and on the point of victory; then the horſe is to be ſtruck on the flank with a ſtrong jerk; for the ſkin is moſt tender of all there, and moſt ſenſible of the laſh.

When a horſe is whipped and ſpurred, and is at the top of his ſpeed; if he claps his ears in his pole, or whiſks his tail, it is a proof that the jockey heats him hard, and then he ought to give him as much comfort as he can, by ſawing the ſnaffle backwards and forwards in his mouth; and by that means forcing him to open his mouth, which will give him wind, and be of great ſervice. If there be any high wind ſtirring in the time of riding; the artful jockey will let his adverſary lead, holding hard behind him, till he ſees an opportunity of giving a looſe; yet, in this caſe, he muſt keep ſo cloſe behind, that the other horſe may keep the wind from him; and that he ſitting low, may at once ſhelter himſelf under him, and aſſiſt the ſtrength of the horſe.

If the wind happen to be in their back a juſt contrary method is to be taken with it; the expert jocky is to keep directly behind the adverſary, that he may have all the advantage of the wind to blow his horſe along, as it were, and at the ſame time intercept it in regard to his adverſary.

When running on level carpet ground, the jockey is to bear his horſe as much as the adverſary will give him leave, becauſe the horſe is naturally more inclined to ſpend himſelf on this ground: on the contrary, on deep earths, he may have more liberty, as he will there ſpare himſelf.

In riding up hill the horſe is always to be favoured, by bearing him hard, for fear of running him out of wind; but, in running down hill, if the horſe's feet and ſhoulders will bear it, and the rider dares venture his neck, he may have a full looſe. If the horſe have the heels of the reſt, the jockey muſt always ſpare him a little, that he may have a reſerve of ſtrength, to make a puſh at the laſt poſt.

A great deal depends on the jockey's knowing the nature of the horſe that is to run againſt him, for by managing accordingly, great advantages are to be obtained: thus, if the oppoſite horſe is of a hot and fiery diſpoſition, the jockey is either to run juſt behind him, or check by joul with him, making a noiſe with the whip, and by that means forcing him on faſter than his rider would have him, and conſequently ſpending him ſo much the ſooner: or elſe keep juſt before him, in ſuch a ſlow gallop, that he may either overreach, or by treading on the heels of the fore horſe, endanger tumbling over.

Whatever be the ground that the adverſary's horſe runs worſt on, the cunning jockey is to ride the moſt violently over; that by this means, it will often happen, that in following, he either ſtumbles or claps on the back ſinews.

The ſeveral corrections of the hand, the whip, and the ſpur, are alſo to be obſerved in the adverſary, and in what manner he makes uſe of them; and when it is perceived, by any of the ſymptoms, of holding down the ears, or whiſking the tail, or ſtretching out the noſe like a pig, that the horſe is almoſt blown; the buſineſs is to keep him on to this ſpeed, and he will be ſoon thrown out or diſtanced.

If the horſe of the opponent looks dull, it is a ſign his ſtrength fails him; and if his flanks beat much, it is a ſign that his wind begins to fail him, and his ſtrength will ſoon do ſo too.

After every heat for a plate, there muſt be dry ſtraw, and dry cloths, both linnen and woollen, ready to rub him down all over, after taking off the ſweat with what is called a ſweat knife; that is, a piece of an old ſword blade, or ſome ſuch thing. Some adviſe the ſteeping the cloths in urine and ſalt-petre the day before, and letting them be dried in the ſun for this occaſion. After the horſe has been well rubbed with theſe, he ſhould be chafed all over, with cloaths wetted in common water till the time of ſtarting again. When it is certainly known that the horſe is good at the bottom, and will ſtick at the mark, he ſhould be rid every heat to the beſt of his performance; and the jockey is, as much as poſſible, to avoid riding at any particular horſe, or ſtaying for any, but to ride out the whole heat with the beſt ſpeed he can. If, on the contrary, he has a fiery horſe to ride, and one that is hard to manage, hard mouthed, and difficult to be held, he is to be ſtarted behind the reſt of the horſes with all imaginable coolneſs and gentleneſs; and when he begins to ride at ſome command, then the jockey is to put up to the other horſes; and if they ride at their eaſe, and are hard held, they are to be drawn on faſter; and if it be perceived, that their wind begins to rake hot, and they want a ſob, the buſineſs is to keep them up to that ſpeed: and when they all are come within three quarters of a mile of the poſt, then is the time to puſh for it, and uſe the utmoſt ſpeed in the creature's power.

When the race is over, the horſe is immediately to be cloathed up, and rode home, and immediately on his coming into the ſtable the following drink is to be given him. Beat up the yolks of three eggs, and put them into a pint and half of new milk made warm; let there be added to this three pennyworth of ſaffron, and three ſpoonfuls of ſallad oil, and let the whole be given with a horn. After this he is to be rubbed well down, and the ſaddle place rubbed over with warm ſack, and the places where the ſpurs have touched, with a mixture of urine and ſalt, and afterwards with a mixture of powder of jet and Venice turpentine; after this he ſhould have a feed of rye bread, then a good maſh, and at ſome time after theſe as much hay and oats as he will eat. His legs after this ſhould be bathed ſometimes with a mixture of urine and ſalt-petre.

RACK (*Cycl.*)—RACK, or *Arrack*, is properly a ſpirit procured by diſtillation, from the fermented juice of certain trees in the Eaſt Indies. See ARAC, *Cycl.*

Various and contradictory accounts have been delivered, as to the real ſubject that gives origin to this fine ſpirit. The vulgar ſuppoſe it to be rice; ſome the juice of the Eaſt Indian ſugar canes; and others a mixture of the juice of this cane and of the toddy tree; finally, ſome affirm, that it is prepared from the fleſh of animals, and other more coſtly ingredients.

The juice of the cocoa trees, and palm trees, are what afford us the fineſt *arracks*; but there are many other juices diſtilled into the ſame kind of liquors, though wanting the fine flavour of what is made from theſe. *Shaw*'s Eſſay on Diſtillery.

The manner of making the *arrack* is this. The juice of the trees is not procured in the way of tapping the trees, as we do; but the operator provides himſelf with a parcel of earthen pots, with bellies and necks, like our ordinary bird bottles; he makes faſt a parcel of theſe to his girdle, and any way elſe, that he commodiouſly can about him. Thus equipped, he ſwarms up the trunk of a cocoa tree; and when he comes to the boughs, he takes out his knife, and cutting off one of the ſmall knots, or buttons, he applies the mouth of the bottle to the wound, faſtening it to the bough with a bandage; in the ſame manner he cuts off other buttons, and faſtens on his pots, till the whole number is uſed; this is done in the evening, and deſcending from the tree, he leaves things to themſelves till the next morning, when climbing up again he takes off the bottles which are moſtly filled, and empties the juice into the proper receptacle. This is repeated every night, till there is a ſufficient quantity produced, and the whole being then put together, is left to ferment, which it ſoon does.

When the fermentation is over, and the liquor, or waſh, is grown a little tart, it is put into the ſtill, and a fire being made, the ſtill is ſuffered to work, as long as what comes over has any conſiderable taſte of ſpirit.

The liquor thus procured is the low wine of *arrack*, and this is ſo poor a liquor, that it will ſoon corrupt and ſpoil, if not diſtilled again, to ſeparate ſome of its phlegm; they therefore immediately after pour back this low wine into the ſtill, and rectify it to that very weak kind of proof ſpirit, in which ſtate we find it. The *arrack* we meet with, notwithſtanding its being of a proof teſt, according to the way of judging by the crown of bubbles; holds but a ſixth, and ſometimes but an eighth part of alcohol, or pure ſpirit; whereas our other ſpirits, when they ſhew that proof, are generally eſteemed to hold one half pure ſpirit. Ibid.

This ſhews how very uncertain a way of judging of the ſtrength of ſpirits, this by the bead or bubble proof is. And we

we may from this learn, that it would be much better to have the *arrack* rectified to the pure alcohol in the Eaft Indies, in which cafe it would be brought over in one fixth, or one eighth part of the room, and might be lowered to its ftandard with common water here. All that it contains befide this fixth or eighth part of fpirit, being only a poor phlegm, or an acidulated water, valuable only for having been brought from Goa or Batavia. It may appear ftrange to fome, that this fpirit fhould be proof, according to the way of judging by the bead or bubble, and yet be fo far below the ftrength, which we ufually underftand to be in proof fpirit. But the truth is, that this ftanding crown of bubbles, may be owing only to the tenacity of the oil that is held in the fpirit. Our malt diftillers know very well, that the more oil they work over with the fpirit, the ftronger proof it will hold, at a fomewhat weaker ftandard of ftrength than it ought to have, and this cafe of the *arrack* fhews the fallacy of the other. The finer and more fubtile any oil is, the lefs it refufes to mix with any aqueous menftruum: thus we fee that the effential oils of fome vegetables, or at leaft fome portion of them, is fo fine and fubtile, as to mix without turning milky, even with water itfelf, which is the cafe in many of our fimple diftilled waters. Hence, it is no wonder, that fo fubtile an oil, as is contained in that thin and dilute vegetable juice of which *arrack* is made, fhould readily mix with fuch a mixture, as that of one part alcohol, and fix or eight of water, which tho' weak, confidered as a fpirit, is much more likely to retain and embody an oil, than fimple water alone. The oil of the cocoa is thus fufpended imperceptibly in the fpirit; and that in fuch quantity, as to give a tenacity to the whole, that difpofes it to form a froth or lather at the top when fhook, and the bubbles of that froth to hang well together. Sometimes indeed there come over into England, and more frequently into Holland, *arracks* that are of the ftrength of brandy and rum: thefe chiefly come from the Dutch fettlements, and are a piece of frugality of the Dutch to fave freight: it is a wonder the faving fpirit had not gone a little farther, and the method of reducing *rack* to alcohol been found out on the fame plan.

Befide the common forts of Goa and Batavia *arrack*, there are two others lefs generally known; thefe are the bitter *arrack* and the black *arrack*. The bitter *arrack* is fuppofed to have been impregnated with fome kind of bezoar, as that of the porcupine or monkey, which being not generated in the ftomachs, as thofe of other animals, but in the gall bladder, are of a very ftrongly bitter tafte, and very readily communicate it to other things.

Some, on the contrary, are of opinion, that there is nothing added to this, but that the tafte is owing to the juice of the trees, from which the *arrack* is made; and many think that it is obtained from the juice of that tree which bears the fruit, whofe infpiffated juice is what we call terra Japonica.

The black *arrack* is a very coarfe fpirit, and is ufually drawn higher than any of the finer kinds are, being not drank like them, but employed for coarfer purpofes. The Turkifh *arrack*, or as it is ufually called *rackee*, feems to be of this kind. The finer, and better kinds of *arrack*, though ever fo good, when put on board, are apt to grow foul, and black in the carriage; if the leager, or cafk, in which they are brought over, be decayed on the infide, or the liquor come to touch any nails, or rufty iron of any kind; for the fpirit prefently diffolves a part of the ferrugineous matter; and thence, upon account of the tincture of the oak, which it had before obtained from the wood of the cafk, it will appear inky. *Arrack*, that is thus accidentally tinged black, is not to be confounded with fuch *arrack* as is originally black, and of the coarfe kind named before. This, which has obtained the colour by accident, is not the worfe in tafte for it, and the tinge may be taken off, and the liquor recovered by putting into the cafk a large quantity of new or fkimmed milk; and working it well about, as the vintners do, in order to whiten their brown wines. When the bottoms are large, they are to be committed to a conical filter of flannel, through which the *arrack* runs fine. This art of purifying foul *arracks* with milk, would be very pardonable, if our dealers only impofed that upon us: but they have a fhameful way of lowering this fpirit with water, and that to fuch a degree as is fcarce credible.

The weaknefs of fome genuine *arracks* greatly contributes to the countenancing this cheat. This is the principal deceit ufed in regard to this commodity; for it is not eafy to find any other fpirit taftelefs enough to mix with it, without difcovering the cheat with us; and in Holland they are not only more deftitute of clean fpirits than here, but the price of *arrack* itfelf is fo low there, that it is hardly worth while to do it if they had proper materials.

The extravagant price that *arrack* bears in England, has given great occafion to the diftillers to endeavour the counterfeiting it. All the attempts which, for cheapnefs fake, have been made with malt fpirit, have naturally proved unfuccefsful: but the thing is not impracticable, though thefe methods have failed. The firft requifite muft be the making a perfectly taftelefs fpirit, and the next the treating the juices of vegetables, fo as to obtain their flavour, to add to it, or elfe the obtaining a pulverable dry fubftance, which would at once mix with the fpirit, and prevent the trouble of a fecond procefs of diftillation. It is poffible, alfo, that the Englifh juices of trees, which will bleed freely, fuch as the birch, maple, fycamore, and the like, may, on proper trials, be found to afford this fort of fpirit in fome degree of perfection.

RACKOON, in zoology, the name by which we commonly know an American animal, called *coati* by the Brafilians. It is fomething fmaller than the beaver, and is of the fhape of the beaver in its body, and its legs are as fhort as in that creature. Its hair is like that of a fox, very long, foft, and placed thick together, and black at the ends, and brown toward the body. Sometimes from this mixture of colour the back appears plainly grey; and Marggrave mentions another fpecies, which is of a deep yellow or ochre colour. *Ray's* Syn. Quad. p. 179.

The head is very like that of the fox in fhape; but that the ears are fhorter, roundifh, and naked, and therefore has a black line drawn acrofs the eyes. The eyes are large, the nofe is black, and rounded at the extremity, like that of a dog; its tail is longer than its body, and is very like that of a cat, having annular marks of different colours. Its feet are each divided into five flender toes; by the help of which it climbs trees as expertly as a monkey, and ufes the fore feet as hands, to reach up its food to its mouth. It is a very cleanly animal; and if there be water any way near, it always wafhes its food, be it what it will, before it eats it. It feeds on vegetables, but is alfo very fond of eggs, and will even feize birds if it can catch them. It is very common in many parts of the Weft Indies, and is a creature eafily tamed.

RADAINUS, among the writers of the middle ages, the name of a black ftone fomewhat tranfparent, and faid to be found in the head of a cock; and, by others, in the head of a fea fifh. They fay the method of finding the ftone was to put the creature's head into an ant-hill, where thefe infects having eaten away the flefh, the ftone was eafily found among the bones.

RADIALIS (*Cycl.*)—Radialis *externus primus & fecundus*, two mufcles clofely united together; appearing, at firft fight, like one mufcle, lying along the external angle of the radius, between the os humeri and the carpus, being flefhy near the former, and tendinous near the latter.

In many fubjects we find thefe two mufcles entirely diftinct from one end to the other; and they may, in that ftate, be named *radialis externus primus*, and *radialis externus fecundus*, regard being had to the infertion of their tendons. Sometimes the two flefhy portions adhere clofely together, appearing to make but one body, but the tendons are always diftinct and feparate. The firft is inferted above in the crifta of the external condyle of the os humeri, below the infertion of the fupinator longus. The fecond is inferted in the fame condyle below the infertion of the firft, and in the neighbouring articular ligament. From thence the two flefhy bodies run down very clofe together, and having reached the middle of the outfide of the radius, each of them terminates in a long tendon.

The two tendons accompany each other to the extremity of the radius, and having paffed under a particular annular ligament; they are divided as it were into two cornua, from whence the antients, who looked upon them as but one mufcle, called it bicornis. One of thefe tendons is inferted anteriorly in the bafis of the firft metacarpal bone, the other nearly in the fame part of the fecond bone, and the tendon of the firft is fometimes double, appearing like another bicornis. *Winflow's* Anatomy, p. 193.

Radialis *internus*, a long mufcle, very like in fhape to the ulnaris externus, but fituated more obliquely. Its flefhy portion is fixed by a fhort tendon to the outer and upper fide of the inner condyle of the os humeri, from thence it paffes obliquely toward the radius, and running along about two thirds of that bone, it forms a long tendon, which continues in the fame courfe; and at the lower extremity of the radius, paffes under a particular annular ligament, and under the infertion of the mufculus thenar. This tendon is at length inferted chiefly in the infide of the bafis of the firft metacarpal bone, and alfo often in the fecond, and a little in the firft phalanx of the thumb; having firft paffed through the channel of the os trapezium which fuftains the thumb. *Winflow's* Anatomy, p. 191.

RADIATED *flowers*, (*Cycl.*) in botany, a term ufed by Mr. Tournefort, and others, to exprefs flowers, like that of the great daify, fun flower, &c.

A *radiated* flower has two parts; its middle part which is called the difk, and which is wholly made up of flofcules; and the outer part, which is called the circle or border, which is wholly made up of femi-flofcules, or elfe of plain flat leaves; but that is lefs common. The flofcules and femi flofcules both ufually adhere to the embryos, and to the thalamus of the flower, being contained in one general cup. Thefe embryos finally ripen into feeds; fometimes furnifhed with down, fometimes with foliaceous heads, and fometimes without either, and fometimes marginated. Of thefe feeds fome are wrapped round with a kind of cafe or capfule, others are feparated from one

one another by small perpendicular leaves. See Tab. 1. of Botany, Class 1. *Tourn.* Inst. p. 480.

RADIATED *leaf*, among botanists. See LEAF.

RADICAL (*Cycl.*)—RADICAL *numbers*, *numeri radicales*, in the Italian music, are 2, 3, 4, 5, 6, 7, 8, 9, and sometimes 10, which are often met with in musical compositions, to denote the accords of the thorough basses. 2 stands for the second and its duplicates; 3 for the third; 4 for the fourth, &c.

RADICAL *leaf*, among botanists. See LEAF.

RADICATUM *folium*, among botanists. See LEAF.

RADII (*Cycl.*)—RADII *pinnarum*, in ichthyology, the little slender bones supporting the membrane, forming the fins in fishes, and called by Artedi *officula radiata pinnarum*, from their running from the base to the summit in the form of rays. See FIN.

Of these *radii* some are prickly, others not. The prickly ones are always hard and rigid, the others are always soft and flexile, whether they terminate single, or are split into two or more branches at the extremity. The prickly ones are always formed of single bones; the others always of two bones, each applied closely and evenly to one another. When the fish is alive, it is not always easy to separate these, but when it is boiled, they are easily parted at the base, and sometimes all the way up. The fish, which have the single and prickly fins on their back, belly, or at the anus, are these: the percæ, the spari, the labri, the amiæ, the trachuri, the mugiles, the sudes, the trachini, the zei, the mulli, the ligyri, the gasterostei, the scorpœnæ, the caprisci; in these the *radii* are all single, and are more or less prickly. In the mackrel, the *radii* of the first fin of the back, and those of the belly fins, are absolutely simple, but they are scarce observably prickly.

The following genera of fishes are those which have the *radii* of the fins all double at the base, and soft and flexile: the syngnathi, the cobitides, the cyprini, the clupeæ, the coregoni, the osmari, the esoces, the pleuronecti, the gadi, and the congers. The softer and the more flexile these bones are, the more numerous, transverse, and lucid internodia they have in them. The cyprini give us many instances of this, as also the clupeæ, the coregones, and the esoces. Those which have fewer of these internodia, or transverse lines, are somewhat more rigid, though not aculeate, or prickly: this we see in the pleuronecti and gadi. Beside these *radii*, there are certain other small bones which are of an oblong figure, and serve to sustain the bases of the back fins, and the fin at the anus. The back fins, and those at the anus, are not joined by their rays to some one large muscle, or large bone, as the pectoral and ventral fins are; but every *radius*, or bone in these fins, is affixed to an oblong bone, erected perpendicularly between the apophyses of the vertebra and the back of the fin. The rays are joined at their base to these bones by an articulation, and fastened in by means of a cartilage; and these bones do not adhere to the apophyses of the vertebra, but are placed regularly between them. These bones are always single, and in many kinds of fish, as in the pleuronecti, they are hollow at the bottom. Between these bones, and the first rays of the back fin, in mackrel, there are found certain other little bones, placed semicircularly and transversely, but their apices are striated, and turn a little upwards. This is an observation yet made only in a few fish, but it is worth while to examine whether it is found in those other fish also, which have sulci at the back fins. *Artedi*'s Ichthyolog.

RADISH, *raphanus*, in botany. See RAPHANUS.

There are several varieties of the root of the common garden *radish*, which is the only species cultivated by our gardeners: these are called by them the small top'd *radish*, the deep red, and the striped *radish*, &c. All these are only varieties arising from the culture. The small topped is the kind, the seed of which is most saved, and which is most valued about London, because it does not take up much room. They are sown at various seasons, but the earliest is generally at the latter end of October; if these are not destroyed by frosts, they become fit to eat in March. These are commonly sowed about walls, pales, or hedges, where they may have some defence against the cold. The second sowing is commonly about Christmas, if the weather be mild enough to let the ground be worked. These are also to be sown under a shelter, and, if they are not destroyed, will be fit to eat in April; and to have a constant supply, there should be a new sowing every fortnight, from the middle of January to the beginning of April. The later crops should be sown on a moist soil, and in an open situation. *Miller*'s Gard. Dict.

RADIUS (*Cycl.*)—RADIUS *of curvature*, or *Radius of the curvature of a curve*, is the *radius* of a circle that has the same curvature in a given point of the curve, that the curve has in that point.

RADIUS, among the Romans, a name given to the iron rod with which the boys rolled the trochus. See the article TROCHUS.

RADIUS, in anatomy. The *radius* is nearly of the same length with the ulna, bigger at one end than at the other, irregularly triangular, a little bent, and situated sideways along the ulna, and has its name from the resemblance it bears to the *radius*, or spoke of a wheel. Anatomists describe in this bone a middle portion, and two extremities. One extremity is small, and like a kind of head set upon a neck; the other is large, resembling a pedestal, or basis; and the bone might therefore be very properly divided into the head, body, and basis.

The head, or small extremity of the *radius*, is very short or low, the top of it is concave, and the circumference cylindrical, and both the glenoide cavity, and whole circumference, are covered with the same smooth shining cartilaginous crust, and about one quarter of the circumference is broader than the rest. The neck is small, and its situation a little oblique; it ends by a lateral tuberosity, which lies directly under the broad part of the head, being rough in the middle, and on one side, and smooth and superficially cartilaginous on the other.

The basis, or great extremity of the *radius*, is much broader than it is thick, and has two broad sides, and one narrow one. One of the broad sides is a little hollow, and pretty even; the other is unequally convex, and divided by longitudinal eminences, or bony lines, into three or four longitudinal channels; but these are much more distinct in fresh bones, than in the dried sceleton. The narrow side is hollowed lengthwise, and between it, and the other two, are formed two angles, by which the three sides are distinguished; and opposite to it, the other two meet in a third angle. This narrow side ends in a semilunar cavity, bordered by a smooth cartilage, and lying almost in the same direction with the tuberosity. The broad sides end at their common angle by an obtuse point, or production, which has been called the *styloide apophysis* of the *radius*, and is in reality a continuation of one of the bony lines already mentioned. The whole basis ends in an oblong, triangular glenoide cavity, the cartilage of which is continued over the hollow edge of the narrow side. This is an articular cavity, resembling an arch, and ending on one side at the styloide apophysis, and hollowed on the other by the cavity of the narrow side. It appears divided into two portions by a small transverse line, and in the natural state, the hollowed side is lengthened out by a cartilaginous production, which is lost in the dried sceleton.

The middle, or body of the *radius*, is a little incurvated, the concavity lying between the tuberosity in the head, and the semilunar cavity in the basis. It has three sides; one rounded, which is the convex side of the curvature, and two concave; three angles, two of which are obtuse, distinguishing the two concave sides from the convex, and the third acute, lying between the concave sides, opposite to the convex side. In each of these sides there are several muscular impressions. The head and basis of this bone are epiphyses in children, and in some subjects remain such for a long time afterwards. The *radius* is connected with the ulna, os humeri, and carpus. It is articulated with the ulna, at its two extremities, by a double lateral ginglymus, the cartilaginous substance of the head turning in the small sigmoide cavity, and the semilunar cavity in the basis turning upon the small head at the lower extremity of the other bone, and thus the small extremity of one of these bones is joined to the great extremity of the other. It is articulated with the os humeri by the application of the cavity in the top of its head to the small head at the lower extremity of the other bone: by this conformation it would be capable of moving in all directions; but as it is tied to the ulna at both extremities, its motions on the small condyloide head, at the lower extremity of the os humeri, are confined to two kinds; that of rotation, when it turns on the sides of the extremities of the ulna; and that of flexion and extension in common with the ulna; and both these motions may be performed at the same time. *Winslow*'s Anatomy, p. 80.

Cartilages of the RADIUS. At the basis of this bone there is a particular cartilage, or triangular production, very thin, longer than it is broad, and rather flat than concave. It is fixed by the basis, or shortest side, to the lateral sigmoide notch of the basis of the *radius*; the other side touches the flat extremity of the small head of the ulna, but is not affixed to it. This may properly enough be called the inter-articular cartilage of the wrist. It is tied to the *radius* by very short ligaments, and sliding on the small head of the ulna, it follows all the motions of the *radius*. It is therefore a sort of articular production of the lower side of the basis of the *radius*, and in the natural state fills the void space which, in the sceleton, appears between the end of the ulna and neighbouring bone of the carpus. *Winslow*'s Anatomy, p. 140.

Ligaments of the RADIUS. Many of the ligaments of the bones of the fore arm are common to them, and to the os humeri, and others to them, and the bones of the head: two however there are which are proper to this part of the arm, the one called the interosseous ligament of the fore arm, the other the coronary ligament of the *radius*; and

and to these may be added the annular ligaments, which serve only for the passage of tendons, and other ligamentary expansions, which may be called muscular ligaments. The interosseous ligament of the fore arm is like that of the leg; it is fixed by one edge along the sharp angle of the *radius*, the other along that of the ulna. It is principally made up of two very strong planes of fibres, which cross each other at oblique angles, and leave holes at different distances for the passage of blood vessels. This ligament ties the two bones closely together, and the two planes serve for the insertion of several muscles. The coronary ligament of the *radius* is a sort of ligamentary hoop, surrounding the circular circumference of the head of that bone. It is very strong, and comes near the solidity of a cartilage, and the side next the *radius* is very smooth. The capsular ligament of the joint of the elbow runs down from its insertion in the os humeri, and is fixed in the olecranum, round the edge of the great sigmoide cavity, including both the apex of the olecranum, and of the coronoide apophysis.

The true common ligaments, by which the os humeri is connected to the bones of the fore arm, called lateral ligaments, are the two fasciculi, which, after being inserted in the condyles of the os humeri, are expanded like a goose's foot; that which is fixed in the inner condyle is called the brachio-cubital, the other the brachio-radical.

Of the ligaments by which the bones of the fore arm are connected to those of the hand, one is like a roundish cord fixed in the styloide apophysis of the ulna, and from thence passes over the os cuneiforme of the carpus; and another pretty broad ligament is fixed on the point of the *radius*, and by its other extremity in the bones of the carpus. From this styloide ligament of the *radius*, along each edge of the basis of that bone, are ranks of ligamentary fibres, lying much in the same direction with the ligament itself, and continued all the way to the styloide ligament of the ulna. There are also several small annular ligaments placed at different distances on the convex side of the basis *radii*, from its styloide apex to its articulation with the extremity of the ulna; these are at least six in number, and some of them are double or triple. The first of these is fixed in the styloide apex; the second in the groove near that apex; the third in the small, narrow, or middle groove; the fourth in the groove next the former; the fifth in the corner of the notch of the basis, at its articulation with the ulna; and the sixth in the extremity of the ulna, near the styloide apophysis. These are all almost wholly covered by the great oblique ligament, and are fixed as strongly in it on one side, as they are in the bones on the other. *Winslow*'s Anatomy, p. 141. seq.

RADIUS *articulatus*, in natural history, a name given by Mellius, Gmelin, and some other authors, to a kind of figured fossils, of which there are a great many very different species, some of which have been described by authors among the belemnitæ, under the names of *alveoli belemnitarum*. Mr. Gmelin, who has taken great pains to inform himself, as well of the nature and figure of these stones, from the subjects themselves, as of their history, and the various accounts of them from other authors, observes, that the place where they are most frequent is Sweden, and that there they are no where so common as in the isle of Oeland. Volkman figures some also which he found in Silesia, and Helwing others which he collected in Prussia: he also found great numbers of them himself in Russia.

They are usually immersed in lime stone, and though at first sight they may all appear alike, yet, on a careful examination, they will be found to differ very greatly. The most obvious general distinction, established by Mr. Gmelin, is, that some of them are strait, and others crooked.

The strait ones may be divided into two genera. The first of these comprehends, according to this gentleman, two species: the first smooth, and with a converging alveolus. This consists of several patellæ of a roundish figure, and disposed in a parallel manner over one another. Each of these patellæ is convex on one side, and concave on the other; and the convex part of one is in the articulation, which joins them into one body, always received into the concave part of another, whose convex part is again received into the concave of a third, and so on throughout the whole body. The diameter of the largest of this species is about two inches, and that of the least an inch. The circumference is not perfectly circular, but in one part is cut in manner of a crescent. This hollow is made for the reception of another cylindric stone, which is not articulated, and which Mr. Gmelin calls an *alveolus*. This alveolus runs through all these crescents in a strait and continued course, and standing out beyond the patellæ, of which the body is composed, is surrounded with a series of fasciæ, more or less elate: these answer to so many of the patellæ, and from these indeed it seems to have obtained this figure; but when this alveolus has, by any accident, been disengaged from its *radius*, it is easily rendered smooth by attrition and other accidents, and is usually found smooth when loose. Acta Petropol. Vol. 3. p. 248.

These are general characters, and are observed in all the specimens of this species; but there are other accidental varieties found in the different ones. Some have the patellæ and the alveolus standing out beyond them, all covered with a thin crust of a matter plainly testaceous, and in some the shelly matter is also found between the junctures of the patellæ. Sometimes also there are seen, at every junction of the patellæ, certain little forked bodies, standing upon the outer part of the alveolus, and seeming to join the several patellæ together. Sometimes the *radii* are found without the alveolus, but then there is always a cavity, or the remains of a cavity, in form of a canal, answering to every lineament of the alveolus; and this is ever covered with a shelly crust on its inner surface. Many of these *radii* are found remarkably compressed, bent, or distorted, which is an accident accounted peculiar to the fossils formed in animal moulds, and shews, with the shelly matter, that the whole must be the remains of some sea fish. Often also, when the whole substance is not injured in its form, the alveolus alone is oddly bent and distorted, whence it appears that it was originally of a tenderer texture than the rest, and there are also evident marks of its having been once hollow.

These are the characters and varieties of this species of *radius*, and there do not seem to be any distinct species under this, unless we are to account for such, those in which the patellæ are a little thicker, or a little thinner, or where they stand closer, or farther asunder. They are found from twelve to eighteen inches in length, but never seem to have been found with the posterior extremity perfect. They all lose themselves in the stone, keeping through their whole extent, as far as they can be traced, the same cylindric figure, without tapering toward either end. It is true, that in some of the stones where they are immersed, and which are polished for various uses, they often seem to grow gradually smaller, so as to terminate in a point; but this may be owing to their being cut in a slanting, not a truly horizontal position, and the bodies themselves may be truly cylindric all the while. Possibly, however, there may be of these, as of the belemnitæ, some cylindric, and others conic; or perhaps all may be conic, but that we have not been able perfectly to trace them.

The second species of the first genus, is the strait articulated *radius* which contains an alveolus, and is of a striated texture. This is composed of patellæ, which stand close, and are firmly joined together. These are convex on one side, and concave on the other, and their several diameters sensibly decrease toward one end. These contain also an alveolus. The patellæ, of which this species is composed, are of an elliptic figure, and each is surrounded with numbers of circular striæ. Ibid. p. 256.

The second genus of the *radii* comprehends those which are strait, and which have a siphunculus running all the way through their middle. These are composed of patellæ of equal diameters, laid parallel on one another, and are convex on one side, and concave on the other; and by this shape are adapted mutually to receive, and be received by one another. The siphunculus in these may often be traced very fairly, and seen to have been once hollow, though in this fossile state it is filled up with the matter of the stone in which the body is lodged; but sometimes they are almost obliterated, either in the whole length of the *radius*, or in one part or other of it. Another species of this is sometimes found, which seems only composed of circular rings, or segments of cylinders, not patellæ: this also has a siphunculus running its whole length, and both this, and the former, have often the remains of a thin coat of a shelly matter upon them.

These are the genera, and subordinate distinction of the first class of the articulated *radii*, that is the strait ones. The second class contains those which are crooked or twisted. The bodies of this class are much more rare than those of the former. They consist of patellæ, which are nearly round, only a little inclining to an elliptic figure; they are convex on one side, and concave on the other, and are each bored through with a small aperture, through which a siphunculus passes, running through the whole length of the body. Sometimes this is placed regularly in the middle, sometimes nearer to one side. There seem to be two species of this; the one composed of very thin patellæ, and the other of considerably thick ones.

The regular and nice configuration of these bodies, shews very plainly that they cannot be of mineral origin, but the several patellæ of which each is composed, the siphunculus of communication, obvious in several, and the shelly matter yet found remaining on many, prove them to have been once shell-fish of the univalve or tubular concamerated kind; the description of which, so far as it can be gathered from these remains, must have been this. The shell must have been either cylindric or conic in figure, of a smooth surface, and divided into several chambers or cells; but this so, that the septa which form the concamerations are not continued, and whole, but in some part of the periphery are cut in, in the shape of a crescent. Through these crescents, which standing

ftanding all together, make a continued canal, there has paffed another fhelly body of a cylindric or conic figure, alfo divided into concamerations; and that in fuch a manner, that the fepta which form the cells are pierced with a fmall aperture on one fide, which grows gradually fmaller as the fhell extends in length; and finally, through thefe apertures in the concamerations, there paffes another fhell pointed at the end, and like the reft divided into its concamerations, and pierced along its middle with a fiphunculus. Mem. Acad. Petrop. Vol. 3. p. 263.

This fhell is therefore a compages of three fhelly bodies, inclofed one within another; and it muft be fuppofed, in order to carry an analogy with other fhell-fifh, that thefe three fhelly bodies have communications with one another, by means of certain flits or perforations. The communication of thefe, one with another, feems alfo evident, from their being all found in their foffile ftate, filled with the fame ftony matter; this has, doubtlefs, been all received in at the fiphunculus of the inner fhell, and thence has been thrown into the fecond, and from this into the third fhell, fo as to fill up all the concamerations of the outer, as well as of the inner parts. This muft have been the cafe with thefe; and the feveral various fpecies that are at this day found foffile, muft have owed their origin to as many different fpecies of the fhells. The crooked, and twifted, or wreathed kinds, which have the fiphunculus, ufually placed near the fide, greatly approach in their ftructure to fome of the cornua ammonis.

RADIX (*Cycl.*)—RADIX *entrochorum*, the *root of the entrochi*, a name given by fome authors to a foffile fubftance, ufually found among the entrochi, and feeming to have been the bafis from which they have grown. It is plainly a part of the *ftella marina arborefcens* petrified, as thofe ftones alfo are: but people, who from a proper examination of the animal world, had miffed the true origin of thefe ftones, and called them rock plants, have efteemed this part of the fifh the bulbous root of the plant. This foffil is rarely found whole, but the fragments of it are very common. When entire, it is about the fize of a walnut; the top of it being flat, and in fome degree refembling the end of an entrochus, with a central hollow, but not having the leaft appearance of the rays of thofe ftones. Thefe foffils, though not properly judged of as to their origin, have yet been defcribed by a great number of authors. Agricola, in particular, compares the form of them to a wheel. The body of this kind well refembles indeed the nave of a wheel, the fhape of it being conical toward one end, till you come to the top, and then a little flatted, with a hole in it. There is alfo a like hole in the oppofite broad end of the fame foffil, feeming fit for an axle to pafs through; and there are five hollow ftirts, or feet, iffuing fideways, at equal diftances from the broad bottom, and equally carried on in the fame direction, fo as not amifs to reprefent the fpokes. At the end of each of thefe rays, or fpokes, there is a hollow, of the fame nature with thofe in the middle of the common entrochi, but this is cut acrofs by a feam, or ftreak of the fame ftone, which paffes directly over its center, and covers about a third part of it; this goes no farther than the mouth of the hole, but it cuts it into two, and fhews it in the form of two eyes. Thefe radii, or fpokes, are very feldom found fo perfect as here defcribed. Lifter mentions them as being formed like crefcents at the end, which may very eafily happen from the breaking off a part of the terminating part. Phil. Tranf. N° 129.

The *radix entrochorum* is never of a fmooth furface, but is wrought all over with trigonal, tetragonal, pentagonal, and hexagonal plates. The ufual ftructure is this: the upper part of the conical end is wrought round with fix large hexagonal plates. Thefe reach half way of the ftone, then follow a fecond round made up of eleven pentagonal plates; thefe are pretty large, and reach almoft to the broad bottom, which is a little convex. The bottom itfelf and the feet contain plates of all the fhapes, but they are ufually very fmall. The fubftance of this foffil is always a whitifh opake fpar, of the fame nature with the trochites. It has outwardly a rufty coat, and is blueifh within, like fmall fhells. It is generally found in clay, and is fo filled up with it, as to appear folid; but on the picking this out with a pointed inftrument, the whole appears to be only a hollow fhell, of about the thicknefs of a half crown piece.

The fmall fcales of pentangular and other figures, which make up thefe bodies, are often found loofe in the clay where the entrochi are alfo found; but they have fo little refemblance to any thing of the entrochus kind, that few have thought of referring them to that foffil, till they have met with the *radix* entire. There are a vaft variety of thefe plates, fome are convex, others concave; fome have edges plain and fmooth, others ferrated, and fome have, on the convex parts, the figure of a ftar, confifting of fix emboffed rays, with a ftud between every two of them, in the manner of the wires, or appendiculæ, growing from the afteriæ, which are a fort of foffils, evidently very nearly allied to the entrochus kind in all refpects.

RADIX *alba*, a word ufed by Diofcorides, to exprefs the root of the dracunculus.

RADULA, the *rafpatory*, a chirurgical inftrument ufed to cleanfe foul bones.

RAERS *of a cart*. See the article CART.

RAGS. In fome counties of England, particularly in Oxfordfhire, it is a common thing to ufe old woollen *rags* by way of manure upon land. Taylors fhreads anfwer this purpofe, in fome degree; but the old *rags* of cloaths, which have been worn by men and women, are much better, which is owing to the falts they have imbibed from the perfpiration of the body they ufed to cover. *Plot*'s Oxfordfhire, p. 250.

RAG-*bolts*, in a fhip, are fuch as have jags or barbs on each fide, to keep them from flying out of the hole wherein they are driven.

RAG-*ftone*, a name given by our artificers to a kind of ftone, which they ufe for fetting an edge upon knives, chifels, and other tools. It is a greyifh coloured ftone, containing a large quantity of talcky particles, and fplits eafily into thin flakes. It is a foft ftone, and is ufed only to finifh the fetting an inftrument after the edge has been prepared by grinding or rubbing the tool upon fome other ftone of a coarfer texture. We have this from Newcaftle and many other parts of the north of England, where there are very large rocks of it in the hills.

RAG-*wort*, *jacobæa*, in botany. See JACOBÆA.

There are two or three fpecies of this plant cultivated in the gardens of the curious; and one very common in moft places, which is the maritime kind, remarkable for its white leaves. This had been long ufed to be nurfed up, with great care, in our green houfes; but of late fome ftraggling feeds of it having propagated themfelves on a wall, and there ftood the winter's cold without hurt, we were taught that the plant did not require the care it had been ufed to be treated with.

All the kinds may be propagated by fowing their feeds in March, on a bed of light earth, watering it frequently in dry weather. In May the plants may be taken up, and planted in pots, and fet in a warm fituation till October, when the tenderer kinds are to be taken into a green-houfe. Thefe require much pruning in fummer to keep them in fhape, for they grow very faft, and in winter will die if they are not often watered. *Miller*'s Gardners Dict.

The grey, or white leaved kind, is eafily propagated by cuttings, planting them in light earth, and frequently watering them till they have taken root, and then the plants are to be removed into a warm fituation. This method is vaftly better in regard to this particular plant, than the raifing from feeds; becaufe, when fo raifed, it is very apt to degenerate, and lofe the whitenefs of its leaves, which are its principal beauty. See JACOBÆA.

RAHAS, in ichthyology, a name given by fome authors to the *torpedo*, or cramp fifh. It is a fpecies of the ray fifh, diftinguifhed by Artedi, by the name of the *raia tota levis*, the wholly fmooth ray. See TORPEDO, *Cycl.*

RAIA, in the Linnæan fyftem of zoology, the name of a diftinct genus of fifhes of the general order of the chondropterygii. The diftinguifhing characters of this genus are, that the body is flatted, and the apertures of the gills are five on each fide. *Linnæi* Syft. Natur. p. 51.

In the Artedian fyftem of ichthyology, the characters of this genus of fifhes are thefe. They are of the chondropterygious kind. The apertures of the bronchia are five on each fide, and are fituated on the breaft a little below the mouth. The head and the whole body are of a remarkably depreffed or flatted figure. The fides are terminated in broad fins, which are in the place of pectoral ones in other fifhes. The eyes are placed in the upper fide of the head, and the mouth generally in the lower. There is on each fide of the head a foramen behind the eyes. And the tail is generally long and flender.

Of thofe *raiæ* which have obtufe or granulous teeth, the following are the fpecies. 1. The oblong *ray* with one row of fpines, along the middle of the back. This is the *rhinobatus* and *fquatino-raia* of authors. 2. The prickly *ray*, with teeth like tubercles, and a tranfverfe cartilage in the belly. This is the *raia clavata* of authors, and our *thornback* and *maid*. 3. The fmooth bodied *ray*, with a long fpine ferrated on one fide in the tail, which has no fin. This is the *paftinacha marina* of authors. 4. The fmooth bodied *ray*, with generally two fpines ferrated behind in the tail, without a fin. This is the *altavela* of the Italians. 5. The fmooth bodied *ray* with a fingle long ferrated fpine in the tail, with a fin on it. This is the fifh, called by authors the *aquila marina*.

Of the *rays* with fharp teeth, the following are the known fpecies. 1. The *ray* with the whole back armed with fpines, with two rows of them on the tail, and a fingle row about the eyes. This is the *ray* called the white horfe *ray*, or *raja tota afpera* of authors. 2. The *ray* with the back and belly fmooth, but with a row of fpines about the eyes, and three rows of them upon the tail. This is the *raja lævis oculata* of authors. 3. The variegated *ray* with two prickly tubercles on the middle of the back. This is the *raja oxyrhincos major* of authors. It fometimes has two fins,

fome-

fometimes only one on the tail. 4. The *ray* with the middle of the back fmooth, and with only one row of fpines on the tail. This is the *fkate* fifh or *flair*. It is of a greyifh colour, variegated with blackifh fpots, and grows very large. 5. The wholly fmooth *ray*. This is the famous *torpedo*, or cramp fifh. See the article TORPEDO, *Cycl.*

Rays are generally divided by authors into the fmooth and the prickly. The fmooth are what we call the *fkates* and *flairs*: the prickly we call *thornbacks*, and the young ones of both kinds *maids*. But Willughby thinks they are more regularly divided into two orders, the one containing thofe which have teeth, the other thofe which have none. *Willughby's* Hift. Pifc. p. 68.

RAJANIA, in botany, a name given by Linnæus to a genus of plants. The different fpecies of which are made to compofe two genera in Plumier, under the names of *jan-raia* and *bryoniæ* fpecies. The characters of the genus are thefe. It produces feparate male and female flowers; in the male flower the perianthium is divided into fix fegments, which are oblong, and pointed, and ftand clofe in the bafis, fo as to form a fort of bell, and expand more at their points. There are no petals, and the ftamina are fix briftly filaments fhorter than the cup, and terminated by fimple apices. In the female flower the perianthium is one leaved, campanulated, and ftands upon the germen, but afterwards withers away. This alfo is divided into fix fegments at the edge. There are no petals, and the germen of the piftil is compreffed, and edged, with a membrane on one fide. The ftyles are three in number, and are of the length of the cup. The ftigmata are fimple and obtufe. The fruit is roundifh, and has a membrane growing on one fide, which, in fine, fpreads almoft round it; in this is contained a fingle feed of a roundifh colour. *Linnæi* Gen. Pl. p. 479. *Plum.* 29 and 98.

RAIL (*Cycl.*)—RAIL, or *water* RAIL, in zoology, the name of the *rollus aquaticus* of authors, a bird of the moorhen kind, but fmaller than the common moorhen. See ROLLUS.

Fife RAILS, in a fhip. See FIFE.

RAIN (*Cycl.*)—Vehement *rains* in many countries are found to be attended with barrennefs and poornefs of the lands, and mifcarriage of the crops in the fucceeding year: and the reafon is plain; for thefe exceffive ftorms wafh away the fine mould into the rivers, which carry it into the fea, and it is a long time before the land recovers itfelf again. The remedy to the famine, which fome countries are fubject to from this fort of mifchief, is the planting large orchards and groves of fuch trees, as bear efculent fruit; for it is an old obfervation, that in years, when grain fucceeds worft, thefe trees produce moft fruit of all. It may partly be owing to the thorough moiftening of the earth, as deep as their roots go, by thefe rains, and partly to their trunks ftopping part of the light mould carried down by the rains, and by this means furnifhing themfelves with a coat of new earth. Phil. Tranf. N° 90.

Preternatural RAINS. We have numerous accounts in the hiftorians of our own, as well as other countries of *preternatural rains*, fuch as the *raining* of ftones, of duft, of blood, nay, and of living animals, as young frogs, and the like. We are not to doubt the truth of what thofe who are authors of veracity and credit relate to us of this kind, fo far as to fuppofe that the falling of ftones and duft never happened; the whole miftake is, the fuppofing them to have fallen from the clouds; but as to the blood and frogs, it is very certain that they never fell at all, but the opinion has been a mere deception of the eyes. Men are extremely fond of the marvellous in their relations; but the judicious reader is to examine ftrictly whatever is reported of this kind, and is not to fuffer himfelf to be deceived.

There are two natural methods by which quantities of ftones and duft may fall in certain places, without their having been generated in the clouds, or fallen as *rain*. The one is by means of hurricanes; the wind which we frequently fee tearing off the tiles of houfes, and carrying them to confiderable diftances, being equally able to take up a quantity of ftones, and drop them again at fome other place. But the other, which is much the moft powerful, and probably the moft ufual way, is for the eruptions of volcano's, and burning mountains, to tofs up, as they frequently do, a vaft quantity of ftones, afhes, and cinders, to an immenfe height in the air; and thefe being hurried away by the hurricanes and impetuous winds, which ufually accompany thofe eruptions, and being in themfelves much lighter than common ftones, as being half calcined, may eafily be thus carried to vaft diftances, and there falling in places where the inhabitants know nothing of the occafion, they cannot but be fuppofed by the vulgar to fall on them from the clouds. It is well known, that in the great eruptions of Ætna and Vefuvius, fhowers of afhes, duft, and fmall cinders, have been feen to obfcure the air, and overfpread the furface of the fea for a great way, and cover the decks of fhips; and this at fuch a diftance, as it fhould appear fcarce conceivable that they fhould have been carried to; and probably, if the accounts of all the fhowers of thefe fubftances mentioned by authors be collected, they will all be found to have fallen within fuch diftances of vulcano's; and if compared, as to the time of their falling, will be found to correfpond in that alfo with the eruptions of thofe mountains. We have known inftances of the afhes from Vefuvius having been carried thirty, nay forty leagues, and peculiar accidents may have carried them yet farther. It is not to be fuppofed that thefe fhowers of ftones and duft fall for a continuance, in the manner of fhowers of *rain*, or that the fragments or pieces are as frequent as drops of water; it is fufficient that a number of ftones, or a quantity of duft, fall at once on a place, where the inhabitants can have no knowledge of the part from whence they come, and the vulgar will not doubt their dropping from the clouds. Nay, in the canton of Berne in Swifferland, the inhabitants accounted it a miracle that it rained earth and fulphur upon them, at a time that a fmall vulcano terrified them; and even while the wind was fo boifterous, and hurricanes fo frequent, that they faw almoft every moment the duft, fand, and little ftones torn up from the furface of the earth in whirlwinds, and carried to a confiderable height in the air, they never confidered, that both the fulphur thrown up by the vulcano, and the duft, &c. carried from their feet muft fall foon after fomewhere. It is very certain that in fome of the terrible ftorms of large hail, where the hail-ftones have been of many inches round, that on breaking them there have been found what people have called ftones in their middle; but thefe obfervers needed only to have waited the diffolving of one of thefe hail-ftones, to have feen the ftone in its center difunite alfo, it being only formed of particles of loofe earthy matter, which the water, exhaled by the fun's heat, had taken up in extremely fmall moleculæ with it; and this only having ferved to give an opake hue to the inner part of the congelation, to which the freezing of the water alone gave the apparent hardnefs of ftone.

The *raining* of blood has been ever accounted a more terrible fight, and a more fatal omen than the other *preternatural rains*, already mentioned. It is very certain that nature forms blood no where but in the veffels of animals, and therefore fhowers of it from the clouds are by no means to be credited. Thofe who fuppofe that what has been taken for blood, has been actually feen falling through the air, have had recourfe to flying infects for its origin, and fuppofe it the eggs or dungs of certain butter-flies, difcharged from them as they were high up in the air. But this feems a very wild conjecture, as we know of no butterfly whofe excrements, or eggs, are of fuch a colour, or whofe abode is fo high, or their flocks fo numerous, as to be the occafion of this.

It is moft probable that thefe bloody waters were never feen falling, but that people feeing the ftanding waters blood coloured, were affured, from their not knowing how it fhould elfe happen, that it had *rained* blood into them. A very memorable inftance of this there was at the Hague in the year 1670. Swammerdam, who relates it, tells us, that one morning the whole town was in an uproar on finding their lakes and ditches full of blood, as they thought, and having been certainly full of water the night before, they agreed it muft have *rained* blood in the night; but a certain phyfician went down to one of the canals, and taking home a quantity of this blood coloured water, he examined it by the microfcope, and found that the water was water ftill, and had not at all changed its colour, but that it was full of prodigious fwarms of fmall red animals, all alive, and very nimble in their motions, whofe colour, and prodigious number, gave a red tinge to the whole body of the water they lived in, on a lefs accurate infpection. The certainty that this was the cafe, did not however perfuade the Hollanders to part with the miracle; they prudently concluded, that the fudden appearance of fuch a number of animals was as great a prodigy, as the *raining* of blood would have been; and are affured to this day, that this portent foretold the fcene of war and deftruction which Lewis the fourteenth afterwards brought into that country, which had before enjoyed forty years uninterrupted peace.

The animals which thus colour the water of lakes and ponds, are the *pulices arborefcentes* of Swammerdam, or the water fleas with branched horns. Thefe creatures are of a reddifh yellow, or flame colour; they live about the fides of ditches, under weeds, and among the mud, and are therefore the lefs vifible, except at a certain time, which is in the end of May or beginning of June; it is at this time that thefe little animals leave their receffes to float loofe about the water, to meet for the propagation of their fpecies, and by that means become vifible in the colour they give the water. This is vifible, more or lefs, in one part or other of almoft all ftanding waters at this feafon; and it is always at this feafon that the bloody waters have alarmed the ignorant.

The *raining* frogs is a thing not lefs wonderful in the accounts of authors who love the marvellous, than thofe of blood or of ftones, and this is fuppofed to happen fo often, that there are multitudes who pretend to have been eye-

witnesses of it. These *rains* of frogs always happen after very dry seasons, and are much more frequent in the hotter countries than the cold ones. In Italy they are very frequent, and it is not uncommon to see the streets of Rome swarming both with young frogs and toads in an instant, in a shower of *rain*; they hopping every where between the people's legs as they walk, though there was not the least appearance of them before. Nay, they have been seen to fall through the air down upon the pavements. This seems a strong circumstance in favour of their being *rained* down from the clouds, but when strictly examined, it comes to nothing; for these frogs that are seen to fall, are always found dead, lamed, or bruised by the fall, and never hop about as the rest; and they are never seen to fall, except close under the walls of houses, from the roofs and gutters of which they have accidentally slipped down. People, who love to add to strange things yet stranger, affirm that people have had the young frogs fall into their hats in the midst of an open field, but this is idle and wholly false.

People, who cannot agree to their falling from the clouds, have tried to solve the difficulty of their sudden appearance, by supposing them hatched out of the egg, or spawn, by these rains. Nay, some have supposed them made immediately out of the dust; but there are unanswerable arguments against all these suppositions. Equivocal generation, or the spontaneous production of animals out of dust, being now wholly exploded. The fall from the clouds must destroy and kill these tender and soft bodied animals; and they cannot be at this time hatched immediately out of eggs; because the young frog does not make its appearance from the egg in this form, but has its hinder legs enveloped in a skin, and is what we call a tadpole; and the young frogs are at least an hundred times larger at this time of their appearance, than the egg from which they should be hatched.

It is a certainty that the frogs, which make their appearance at this time, were hatched, and in being long before, but that the dry seasons had injured them, and kept them sluggishly in holes, or coverts, and that all the *rain* does, is the enlivening them, giving new spirits, and calling them forth to seek new habitations, and enjoy the element they were destined, in great part, to live in. Theophrastus, the greatest of all the naturalists of antiquity, has affirmed the same thing. We find that the error of supposing these creatures to fall from the clouds was as early as that author's time, and also that the truth, in regard to their appearance, was as early known; though, in the ages since, authors have taken care to conceal the truth, and to hand down to us the error. We find this venerable sage, in a fragment of his on the generation of animals which appear on a sudden, bantering the opinion, and asserting that they were hatched and living long before. The world owes, however, to the accurate Seignior Redi the great proof of this truth, which Theophrastus only has affirmed; for this gentleman dissecting some of these new appearing frogs, found in their stomachs herbs, and other half digested food, and openly shewing this to his credulous countrymen, asked them whether they thought that nature, which engendered, according to their opinion, these animals in the clouds, had also been so provident as to engender grass there also for their food and nourishment.

To the *raining* of frogs we ought to add the *raining* of grasshoppers and locusts, which have sometimes appeared in prodigious numbers, and devoured the fruits of the earth. There has not been the least pretence for the supposing that these animals descended from the clouds, but that they appeared on a sudden in prodigious numbers. The naturalist, who knows the many accidents attending the eggs of these, and other the like animals, cannot but know that some seasons will prove particularly favourable to the hatching them, and the prodigious number of eggs, that many insects lay, could not but every year bring us such abundance of the young, were they not liable to many accidents, and had not provident nature taken care, as in many plants, to continue the species by a very numerous stock of seeds, of which perhaps not one in five hundred need take root, in order to continue an equal number of plants. As it is thus also in regard to insects, it cannot but happen, that if a favourable season encourage the hatching of all those eggs, a very small number of which alone were necessary to continue the species, we must, in such seasons, have a proportionate abundance of them. We had lately in London such a prodigious swarm of the little beetle, we call the *lady cow*, that the very posts in the streets were every where covered with them. But thanks to the progress of philosophy among us, we had no body to assert that it *rained* cow ladies, but contented ourselves with saying that it had been a favourable season for their eggs. The late prodigious number of a sort of grub which did vast mischief among the corn and grass, by eating off their roots, might also have been supposed to proceed from its having *rained* grubs by people fond of making every thing a prodigy; but our knowledge in natural history assured us, that these were only the hexapode worms of the common hedge beetle, called the *cock chafer*.

The *raining* of fishes has been a prodigy also much talked of in France, where the streets of a town at some distance from Paris, after a terrible hurricane in the night, which tore up trees, blew down houses, &c. were found in a manner covered with fishes of various sizes. No body here made any doubt of these having fallen from the clouds; nor did the absurdity of fish, of five or six inches long, being generated in the air, at all startle the people, or shake their belief in the miracle, till they found, upon enquiry, that a very well stocked fish-pond, which stood on an eminence in the neighbourhood, had been blown dry by the hurricane, and only the great fish left at the bottom of it, all the smaller fry having been tossed into their streets.

Upon the whole, all the supposed marvellous *rains* have been owing to substances naturally produced on the earth, and either never having been in the air at all, or only carried thither by accident.

In Silesia, after a great dearth of wheat in that country, there happened a violent storm of wind and rain, and the earth was afterwards covered, in many places, with small round seeds. The vulgar cried out that providence had sent them food, and that it had *rained* millet; but these were, in reality, only the seeds of a species of veronica, or speedwell, very common in that country, and whose seeds being just ripe at that time, the wind had dislodged them from their capsules, and scattered them about. In our own country, we have histories of *rains* of this marvellous kind, but all fabulous. It was once said to *rain* wheat in Wiltshire, and the people were all alarmed at it as a miracle; till Mr. Cole shewed them, that what they took for wheat was only the seeds, or kernels of the berries of ivy, which being then fully ripe, the wind had dislodged from the sides of houses, and trunks of trees, on which the ivy which produced them crept.

And we even once had a *raining* of fishes near the coast of Kent in a terrible hurricane, with thunder and lightning. The people who saw small sprats strewed all abouts afterwards, would have it that they had fallen from the clouds; but those who knew how far the high winds have been known to carry the sea water, did not wonder that they should be able to carry small fish with it so small a part of the way. Philos. Transf.

RAINS, in the sea language, that tract of the sea to the northwards of the equator, between four and ten degrees of latitude, and lying between the meridian of Cape Verde and that of the eastermost islands of the same name. They call this tract the *rains*, because there are almost continual calms, constant *rains*, and thunder and lightning to a strange degree there; and the winds, when they do ever blow, are only small uncertain gusts, and shift about all round the compass; so that ships are sometimes here detained a long while, and can make but very little way.

RAIN *fowl*, an English name given by many to the common green wood-pecker, or *picus viridis*, from an observation that it is always most clamorous when *rainy* weather is coming on. The Latins have, for the same reason, called it the *pluvialis avis*. See the article PICUS.

Animalcules in RAIN-*water*. The accurate Mr. Lewenhoek has observed, that there are no living creatures to be discerned in fresh *rain-water*, but that after it has stood some days, it will be found to abound with great numbers of animalcules, so small, that they are to a mite what a bee is to a horse. In some days more animalcules much larger are discovered.

Another very remarkable kind is discovered in *rain-water*, after standing some time; these have two little horns, which are in continual motion. The space between the horns is flat, though the body is round, but tapering a little toward the end, where there is a tail four times as long as the body, and of the thickness of the thread of a spider's web. These are so small, that many hundred of them are not equal to a grain of sand; and if they meet with any little filament in the water, they are usually entangled in it, and use great efforts to disengage their tails.

Another animalcule there also is in *rain-water*, of an oval figure, with the head at the smaller end. These have several feet extremely minute and fine, and they can, at pleasure, contract their bodies into a round shape, which they usually do as the water dries away. A third sort Mr. Lewenhoek observed also, twice as long as broad, and eight times smaller than the last; these also had small feet, and were very nimble. But the briskest of all were a yet greatly smaller kind; these were not of a thousandth part of the size of a louse's eye, and they moved round with incredible swiftness. *Baker*'s Microscop. p. 82.

RAISE, in the manege, is used for working; thus to *raise* a horse upon corvets, caprioles, or pesades, is to make him work at corvets, caprioles, &c.

RAISE is likewise used for placing a horse's head right, and making him carry well, and hindring him to carry low, or to arm himself.

RAISINS (*Cycl.*)—RAISIN *brandy*, a name given by our distillers to a very clean and pure spirit, procured from *raisins* fermented

fermented only with water. Thus treated, they yield a ſpirit ſcarce at all diſtinguiſhable from ſome of the wine ſpirits; for there are as many kinds of wine ſpirits, as there are of grapes. The coarſer the operation of diſtilling is performed in this caſe, the nearer will be the reſemblance of the wine ſpirit; that is, there will be moſt of this flavour in the ſpirit, when as much as can be of the oil is thrown up with a galloping heat.

The diſtillers are very fond of the wine ſpirit, with which they hide and diſguiſe the taſte of their nauſeous malt, and other ſpirits; and in defect of that ſpirit, this of *raiſins*, made in this coarſe manner, will go almoſt as far. It is indeed ſurpriſing how extenſive the uſe of theſe flavouring ſpirits is, ten gallons of *raiſin* ſpirit, or ſomewhat leſs of the wine ſpirit, being often ſufficient for a whole piece of malt ſpirit, to take off its native flavour, and give it an agreeable vinoſity. It is no wonder, therefore, that the diſtillers, and ordinary rectifiers, are ſo fond of this, as it is a good cloak for their defects, and the imperfection of their proceſſes.

When *raiſin brandy* is intended for common uſe, the fire ſhould be kept ſlower and more regular in the diſtillation, and the ſpirit, though it hath leſs of the high flavour of the grape, will be more pleaſant and more pure. *Shaw's* Eſſay on Diſtillery.

RAKE (*Cycl.*)—Rake, in the manege. A horſe *rakes*, when being ſhoulder-ſplait, or having ſtrained his fore-quarter, he goes ſo lame, that he drags one of his fore legs in a ſemicircle; which is more apparent when he trots, than when he paces.

Rake, in mining, is the ſame with a vein. See Vein.

RAM, (*Cycl.*) *aries*, in zoology, the male of the ſheep kind. See the article Ovis.

Ram *head*, on board a ſhip, the name of a great block belonging to the fore and main halliards. It hath in it three ſhivers, into which the halliards are put, and at its head the tyes are reeved into an hole made there for that purpoſe.

RAMADAN (*Cycl.*)—The *ramadan* happens at different ſeaſons of the year, and when it is in the ſummer, is very hard on the labourers, who are not allowed to drink, but only to waſh their mouths. This month once in thirty-three years is in every ſeaſon of the year, the Turkiſh month being lunar, and they beginning at the day they can ſee the moon; whereas the Jews begin their account from the day the moon makes, which is a day before the Turks. *Pocock's* Egypt, p. 184.

RAMAG, a word uſed by ſome of the chemical writers to expreſs aſhes.

RAMAGE *falcons*. See the articles Brancher and Falcon.

RAMAI, in natural hiſtory, a name given by many old writers to bole armenic.

RAMALIS *vena*, a name given by ſome anatomical authors to the *vena portæ*.

RAMED, a name given by ſome chemical writers to rhubarb.

RAMESAN, an oriental term for a month of faſting, very religiouſly obſerved among the Turks. See Ramadan.

RAMEX, a word uſed by ſome as a name for a hernia, or rupture.

RAMIGRI, a word uſed by ſome writers as a name for colophony.

RAMINGUE, in the manege. A horſe gets this name that is reſty, and reſiſts or cleaves to the ſpurs; that is, defends himſelf with malice againſt the ſpurs; ſometimes doubles the reins, and frequently yerks to favour his diſobedience. See the articles Ticklish and Double.

RAMOSE *leaf*, in botany. See Leaf.

RAMPIN, in the manege. See Toe.

RAMPION, in botany. See Rapunculus.

RAMULOSE *leaf*, *ramuloſum folium*, among botaniſts. See the article Leaf.

RAMUS, (*Cycl.*) in the anatomy of plants, a name given to the firſt or lateral branches, which go off from the petrolium, or middle rib of a leaf. The ſubdiviſions of theſe are called *ſurculi*, and the final diviſions of theſe, into the moſt minute of all, are by ſome called *capillamenta*; but in general, both theſe kinds are comprehended under the name of *ſurculus*. Act. Erudit. 1722.

RAN, in our old writers, is uſed for open or public robbery, ſo manifeſt that it cannot be denied. Ran *dicitur aperta rapina quæ negari non poteſt*. *Lamb.* 125. Leg. Canut. c. 58. Hence it is to this day vulgarly ſaid of one, who takes the goods of another injuriouſly and violently, that he has taken or ſnatched all he could *rap* and *ran*. Terms of Law. *Blount*, *Cowel*.

RANA, the *frog*, in zoology, a very well known animal of the amphibious kind, the characters of it are; that the body is naked, and is in one part of its life furniſhed with a tail.

The feet of the *frog* are webbed, for the better ſwimming, and it has very ſtrong muſcles in the hinder part of its body to aſſiſt it in leaping. The lungs of the *frog* are different from thoſe of all other animals; they are only a ſort of membranaceous bladders, with ſeveral tubercles, by means of which they reſemble the fruit of the firs, or pines: theſe, when once inflated, do not immediately become flaccid, as in other animals, but remain in that ſtate as long as the creature pleaſes. The creature can remain a long time under water, and has been kept ſo for ſeveral days by tying it down, and received no hurt from it. It is a very long lived animal; and even if its belly be opened, and the inteſtines, and all the viſcera, taken out, it will continue its leaping, and all its other motions, as if nothing had happened to it, for a conſiderable time; but if the nerve of one of the hinder legs be cut, it loſes all power of uſing that limb on the inſtant. *Ray's* Synop. Quad. p. 247.

The *frog* differs from all creatures in the manner of its generation. It no way reſembles any of the quadrupeds in this particular, and though in ſome ſort it approaches to the nature of fiſhes, yet it differs from them alſo in many things. The egg of the *frog* is a ſmall black ſpot, enveloped in a mucilaginous ſubſtance; in this egg is contained the embryo *frog*, which, on the breaking of the egg in hatching, comes forth in form of a tadpole. This young animal is for ſome time nouriſhed by the gelatinous matter which envelops the eggs, but it does not conſume the whole of it; for the particles of water making way by degrees into it, divide its parts, and it ſoon becomes expanded, frees itſelf from the living animals, and floats on the ſurface of the water, or at a ſmall depth in it, in form of a thin cloud: this, though it now no longer ſerves for food to the young creature, is however of ſome ſervice to it, ſerving it as an aſylum, or place of reſt and ſafety, when tired with ſwimming.

The egg of the *frog* therefore is, in ſome degree, analogous to that of an inſect of the winged kind, which is to go through a metamorphoſis before it arrives at its perfect ſtate; for it hatches into the tadpole, as the egg of a butterfly into a caterpillar, and arrives at that its ultimate ſtate, after a determinate time ſpent in the other. In this it differs from the generation of fiſhes, the eggs of whoſe ſpawn hatch into perfect fiſhes, which go through no change; and it differs from all in the gelatinous ſubſtance, which envelops the egg, and ſerves as the firſt food to the fœtus.

The eggs are indeed, when nicely examined, found to be encloſed in a double liquor, a more pellucid and thin one within the gelatinous one, which ſerves as the general covering to the whole ſeries of eggs; and it is this thin one which it principally feeds on when firſt hatched, and which ſerves to the ſame purpoſes as the white of an egg in the fowl kind.

There is alſo an opinion that the male ſperm of the *frog* is depoſited on the ſpawn of the female after it is laid. *Ray's* Syn. Quad. p. 249.

Rana *arborea*, the *tree frog*, in zoology. See Ranunculus *viridis*.

Rana *piſcatrix*, the *toad fiſh*, *frog fiſh*, or, as it is called by ſome, the *ſea devil*, a very remarkable ſpecies of fiſh, of a middle nature between the cartilaginous and bony fiſhes. In ſhape and figure it reſembles a tadpole. Its head is extremely large, being equal, or more than ſo, to the reſt of the body, and of a circular figure. The opening of its mouth is ſurpriſingly great, and its lower jaw is above a finger longer than the upper. Both jaws, but particularly the under one, are armed with a great number of long and ſharp teeth, and the longer ones of the under jaw are all moveable inwards. The back is flat, and of a bluiſh green colour, mottled with a few white ſpots. The eyes are pearly in the iris, and a tranſverſe ſtreak of white is drawn acroſs the pupil. In the upper part of the head, at half a finger's breadth diſtance from the angle of the upper jaw, are placed two briſtles, the fore one is ſix fingers long, the hinder one four; and in the middle of his back, lower down, are three more, which ſerve in the place of fins. Over the upper jaw there are, on each ſide, two ſharp thorns, and there are thorny tubercles all about the eyes; and on the middle of the back, not far from the tail, there is a fin with ten rays. The tail is not forked, but the rays are branched, and all ſtand out a little beyond the fin, and are hooked. In the under part of the body, juſt under the throat, there are two fins like a mole's feet, each compoſed of five rays, or fingers. There are two others on the edge of the body, and the extremity of all theſe, as alſo of the tail, is black. It has only three branchiæ on one ſide. It has either no noſtrils, or elſe they are hid within the head, and has a ſort of membranous rim running all round the commiſſures of its ſides and belly. Its fleſh, when boiled, taſtes like that of the *frog*. See Tab. of Fiſhes, N° 8. and *Willughby's* Hiſt. Piſc. p. 85.

RANCE, in natural hiſtory. See Cibdeloplacia.

RANGIFER, the *rein deer*, an animal very common in all the northern nations, and called by ſome authors *tarandus* and *machlis*. It is of the ſhape of a ſtag, but its body is thicker, and its whole make much more robuſt and ſtrong. The breaſt is thick, covered with very long hairs. The legs very

very hairy and the hoofs moveable, for the creature expands and opens them in going; it is an extremely swift, as well as strong animal; its horns are very long, and finely branched, and particularly run out immediately from the forehead into two fingered branches; in the middle there is a little branch, like the joints in the stalks of some plants; and thence again they are divided into broad fingered segments. They differ from the horns of the elk in their length, and from those of the stag or red deer in their breadth, and from both, in the multitude of branches, and in their colour which is white. The lower branches, which fall very near the forehead, are said to be used by the creature to break the ice, when the waters are frozen over, that he may get drink. It feeds on shrubs and plants, and on the moss, which it finds on the earth and upon the barks of trees.

It is of prodigious use, as a beast of carriage to the Laplanders, and almost all the other nations far north. Scheffer alledges from Tornæus, that the *rein deer*, though a cloven footed animal, and plainly of the deer kind, does not chew the cud. This, however, is wholly disbelieved by the more accurate naturalists. *Ray's* Sept. Quad. p. 88.

RANINÆ *venæ*, a name given by anatomists to the larger veins under the tongue.

RANIO, in natural history, a name given by some writers to bole armenic.

RANK (*Cycl.*)—RANK *keel*, in a ship. See KEEL, *Cycl.*

RANUNCULUS, *crowfoot*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the rosaceous kind, consisting of several leaves disposed in a circular order, and usually standing in a many leaved cup. The pistil arises from the center of the flower, and finally becomes a fruit of a roundish, oval, or spiked shape, to the axis of which there grow, as to a placenta, a great number of seeds, which are usually naked.

The species of *ranunculus* enumerated by Mr. Tournefort are very many, and for the sake of order, in so large a number, they are divided into several sections. 1. Those which have the appearance of the anemonies. 2. Those which have roundish leaves. 3. Those usually known by the name of the Asiatic *ranunculuses*. 4. The smooth leaved *ranunculuses*. 5. The aconite or geranium leaved *ranunculuses*. 6. The fine leaved *ranunculuses*; and 7. The long leaved *ranunculuses*. *Tourn.* Inst. p. 285.

The species of the *anemony ranunculuses* are these. 1. The yellow wood *ranunculus*. 2. The single yellow flowered wood *ranunculus*, with smaller and more deeply divided leaves. 3. The common white wood *ranunculus*, called the white wood anemony. 4. The purple flowered wood *ranunculus*, commonly called the purple wood anemony. 5. The purplish red wood *ranunculus*. 6. The double purple wood *ranunculus*. 7. The double white wood *ranunculus* with a border of leaves. 8. The common double white wood *ranunculus*. 9. The trifoliate white wood *ranunculus*, commonly called the trefoil wood anemony. 10. The large leaved blue flowered wood *ranunculus* of the Apennine mountains. 11. The smaller leaved Apennine blue wood *ranunculus*. 12. The wood *ranunculus* with small blue flowers. 13. The double violet coloured wood *ranunculus*. Ibid. p. 286.

Of the roundish leaved *ranunculuses*, the species are these. 1. The round leaved wood *ranunculus*, commonly called Tragus's sweet *crowfoot*. 2. The spring wood *crowfoot* with marsh marygold or thora leaves. 3. The Virginian wood *crowfoot* with soft leaves and small flowers. 4. The large *crowfoot* with asphodel roots, and sowbread leaves. 5. The smaller *crowfoot* with asphodel roots and sowbread leaves. 6. The larger round leaved spring *crowfoot* called little celandine or pilewort. 7. The smaller round leaved spring *crowfoot* called the common pilewort. 8. The smaller round leaved spring *crowfoot*, or celandine, with spotted leaves. 9. The smaller round leaved spring *crowfoot*, or little celandine, with double flowers. 10. The smaller round leaved spring *crowfoot*, or celandine, with two rows of petals. 11. The mountain *crowfoot* with leaves like those of the parnassia. 12. The alpine *crowfoot* with water caltrop leaves. 13. The ivy leaved water *crowfoot* with very small white flowers. 14. The American water *crowfoot* with asarabacca leaves, and flowers in umbels at the joints of the stalks. 15. The little smallage leaved rock *crowfoot* with tuberose reticulated roots. 16. The ground ivy leaved knotty rooted Portugal *crowfoot*. 17. The round leaved creeping *crowfoot* with echinated seeds. 18. The marsh *crowfoot* with echinated seeds. 19. The cretic echinated starry *crowfoot*. 20. The broad leaved bullated asphodel rooted *crowfoot*. 21. The small flowered round leaved Portugal *crowfoot*. 22. The double flowered broad leaved autumnal *crowfoot*. 23. The trifoliate spring *crowfoot* with single blue flowers. 24. The trifoliate spring *crowfoot* with violet coloured flowers. 25. The trifoliate spring *crowfoot* with pale purplish flowers. 26. The trifoliate spring *crowfoot* with single bright red flowers. 27. The trifoliate spring *crowfoot* with single flesh coloured flowers. 28. The trifoliate spring *crowfoot* with single greyish flowers. 29. The trifoliate spring *crowfoot* with single large white flowers. 30. The trifoliate spring *crowfoot* with smaller single white flowers. 31. The trifoliate spring *crowfoot* with single white flowers edged with red. 32. The trifoliate spring *crowfoot* with double blue flowers. 33. The trifoliate spring *crowfoot* with double purple flowers. 34. The trifoliate spring *crowfoot* with double flesh coloured flowers. 35. The trifoliate spring *crowfoot* with double variegated flowers. These plants, properly named trifoliate *crowfoots*, are the spring garden flowers, commonly called *hepaticas*.

Of the third set of *ranunculuses*, commonly called the Asiatic *ranunculuses*, the species are these. 1. The knobby rooted Asiatic *ranunculus* with very small single scarlet flowers. 2. The branched knobby rooted *ranunculus*. 3. The knobby rooted *ranunculus* with yellow flowers, being variegated with red. 4. The knobby rooted *ranunculus* with white flowers. 5. The knobby rooted *ranunculus* with snow white flowers. 6. The knobby rooted *ranunculus* with pale yellow flowers streaked with red. 7. The knobby rooted *ranunculus* with single yellow flowers. 8. The knobby rooted *ranunculus* with single flowers, of a deep yellow, with red bottoms and red edges. 9. The single whitish flowered Asiatic *ranunculus*. 10. The single *ranunculus* with a red lead coloured flower with yellow edges. 11. The rose coloured *ranunculus* with white edges, and streaks of white in the flower. 12. The butterfly *ranunculus* with yellow flowers spotted with red. 13. The single crimson sweet scented *ranunculus*. 14. The piony *ranunculus*, or the large bloody purple flowered kind. 15. The Aleppo *ranunculus* with flowers streaked with yellow and red. 16. The *ranunculus* with a very wide, open, red lead coloured flowers. 17. The lemon coloured and red *ranunculus*. 18. The white proliferous *ranunculus* with crimson stamina. 19. The asphodel rooted *ranunculus* with blood coloured flowers. 20. The asphodel rooted *ranunculus* with a reddish purple flower. 21. The asphodel rooted *ranunculus* with yellow flowers with red veins. 22. The double *ranunculus*, variegated with yellow and red, called by the French the *seraphique*. 23. The proliferous asphodel rooted *ranunculus* with red coloured flowers. 24. The asphodel rooted *ranunculus* with a very large blood coloured flower. 25. The asphodel rooted *ranunculus* with yellow flowers streaked with red. 26. The asphodel rooted *ranunculus* with double greenish white flowers. 27. The asphodel rooted *ranunculus* with small double white flowers streaked with red. 28. The asphodel rooted *ranunculus* with great double white rose-like flowers. 29. The asphodel rooted *ranunculus* with great double violet coloured flowers. 30. The great Constantinople *ranunculus* with scarlet flowers. 31. The great Constantinople *ranunculus* with elegantly variegated flowers. 32. The Roman giant *ranunculus* with a red lead coloured flower. 33. The giant Roman *ranunculus* with very double flowers, variegated with red and yellow. *Tourn.* Inst. p. 288.

Of the set of tender leaved *crowfoots*, the species are these. 1. The late flowering rue leaved *ranunculus* with double gold yellow flowers. 2. The early rue leaved *ranunculus* with bright red flowers. 3. The tender leaved asphodel rooted mountain *ranunculus*. 4. The horn like leaved *ranunculus* with foliated seeds, collected into spikes, called by many the smaller cow wheat. 5. The common corn *ranunculus* with echinated seeds. 6. The greater narrow leaved woolly *ranunculus* with asphodel roots. 7. The lesser narrow leaved woolly grumose rooted *ranunculus*. 8. The smallage leaved asphodel rooted woolly *ranunculus*. 9. The fumitory leaved Alpine *ranunculus*. 10. The purple mountain *ranunculus* with hairy cups. *Tourn.* Inst. p. 289.

Of the set of aconite or crane's bill leaved *crowfoots*, the species are these. 1. The upright acrid meadow *crowfoot*. 2. The upright acrid meadow *crowfoot* with spotted leaves. 3. The single many flowered meadow *crowfoot*. 4. The upright *crowfoot* with pale hairy leaves. 5. The upright or sweet or not acrid meadow *crowfoot*. 6. The great sallad *crowfoot*. 7. The common hairy creeping field *crowfoot*. 8. The common hairy creeping meadow *crowfoot* with leaves variegated with white. 9. The round rooted meadow *crowfoot*. 10. The lesser round rooted meadow *crowfoot*. 11. The little field *crowfoot* with trifid leaves. 12. The annual hairy field *crowfoot* with extremely small flowers. 13. The double flowered erect garden *crowfoot*. 14. The great hairy creeping double flowered *crowfoot*. 15. The garden *crowfoot* with bending heads. 16. The double flowered sweet *crowfoot*. 17. The double flowered round rooted *crowfoot*. 18. The tuberose rooted proliferous double *crowfoot*. 19. The grumose rooted *crowfoot* with leaves like those of the common round rooted kind. 20. The Cretic asphodel rooted *crowfoot*. 21. The round leaved procumbent alpine *crowfoot* with small flowers. 22. The low round leaved alpine *crowfoot* with larger flowers. 23. The tall hairy white flowered mountain *crowfoot*. 24. The low hairy mountain *crowfoot* with Narcissus flowers. 25. The purple flowered hairy mountain *crowfoot*. 26. The aconite leaved moun-

mountain *crowfoot* with large white flowers. 27. The aconite leaved mountain *crowfoot* with ſmaller white flowers. 28. The aconite leaved mountain *crowfoot* with double white flowers. 29. The aconite leaved mountain *crowfoot* with large ſingle yellow flowers. 30. The *crowfoot* with leaves like thoſe of the knotty rooted crane's bill. 31. The hairy mountain *crowfoot* with very broad leaves. 32. The crane's bill leaved downy mountain *crowfoot*. 33. The yellow flowered fine leaved mountain *crowfoot*. 34. The woolly mountain *crowfoot* with leaves like thoſe of the common meadow *crowfoot*. 35. The rock *crowfoot* with large flowers. 36. The roundiſh leaved rock *crowfoot*. 37. The very hairy Montpelier *crowfoot*. 38. The ſmallage leaved hairy marſh *crowfoot*. 39. The ſmooth ſmallage leaved marſh *crowfoot*. 40. The purple flowered ſmallage leaved marſh *crowfoot*. 41. The water *crowfoot* with ſome of the leaves roundiſh, and others capillaceous. Ibid. p. 290.

Of the capillaceous leaved *ranunculuſes*, the ſpecies are theſe. 1. The capillaceous or fine leaved water *crowfoot*. 2. The white flowered floating water *crowfoot* with peucedanum leaves. 3. The fennel leaved *crowfoot* with roots like thoſe of black hellebore, called by authors the fine leaved black hellebore. The *conſiligo*, the *hellebore* of Hippocrates, and the *bupththalmum*, or ox eye. 4. The ſmaller or lower fennel leaved *crowfoot* with very large flowers, and jointed ſtalks. 5. The camomile leaved red flowered field *crowfoot*, commonly called the adonis flower, the pheaſant's eye, or red maithes. 6. The longer leaved chamomile *crowfoot* with orange coloured flowers. 7. The chamomile *crowfoot* with ſmall yellow flowers. 8. The betony leaved mountain *crowfoot*. Ibid. p. 291.

Of the ſet of long leaved *crowfoots* the ſpecies are theſe. 1. The graſſy leaved mountain *crowfoot*. 2. The double flowered graſſy leaved mountain *crowfoot*. 3. The bulboſe rooted graſſy leaved *crowfoot*. 4. The ſingle flowered hairy graſſy leaved *crowfoot*. 5. The many flowered hairy graſſy leaved *crowfoot*. 6. The white flowered dwarf Alpine *crowfoot* with graſſy leaves. 7. The plantain leaved mountain *crowfoot*. 8. The marſh *crowfoot* with very large plantain like leaves, commonly called the water plantain. 9. The marſh *crowfoot* with narrow plantain like leaves, called the narrow leaved water plantain. 10. The low procumbent plantain leaved water *crowfoot*, called the narrow leaved procumbent water plantain. 11. The plantain leaved water *crowfoot* with very narrow leaves. 12. The American plantain leaved water *crowfoot* with white flowers and purple cups. 13. The American water *crowfoot* with arrow head leaves. 14. The *water plantain* with very large arrow headed leaves, commonly called the great water arrow head. 15. The arrow headed *water plantain* with narrower leaves. 16. The great long leaved marſh *crowfoot*. 17. The broad plantain leaved ſpearwort with hairy edges. 18. The leſſer long leaved water *crowfoot* or ſpearwort. 19. The ſpearwort, or long leaved water *crowfoot*, with ſerrated leaves. 20. The *Bayonne ſpearwort* of Parkinſon. 21. The white flowered ſmall *ſpearwort*. 22. The graſſy leaved *crowfoot* with caudated flowers, and ſeeds arranged into long and ſlender heads, commonly called mouſe tail. Ibid. p. 292.

Several of the more beautiful ſpecies of this plant have long been cultivated in the Engliſh gardens, and are moſt of them hardy plants, and will thrive very well againſt hedges, and in ſhady borders, where they require no other care than to take up their roots every other year when their leaves decay, and part them, planting out the off-ſets into other borders.

Beſide thoſe we have been long uſed to, there have been ſome of late times brought from Turkey and from Perſia, which produce ſemi-double flowers of great beauty, and annually ripening their ſeeds; there are numbers of varieties, or as the gardeners call them new flowers continually raiſed from them. Many of theſe are finely ſcented; and the roots, when ſtrong, produce eight or ten flowers on each. The double flowered *ranunculuſes* not producing ſeeds, they are only to be propagated by parting their roots, taking off the off-ſets, which they uſually produce in great plenty.

The proper ſeaſon for planting their roots is in October. The beds in which they are planted are to be of good light ſandy earth, at leaſt a foot deep. Common paſture land is the beſt for this uſe, to which if it prove too clayey, there ſhould be added a proper quantity of ſea ſand. This mixture ſhould be turned often, and the larger ſtones and clods taken out; but it muſt not be ſkreened, or ſifted very fine, for that has been the occaſion of the loſs of many roots, both of this and other plants, by cohering into a hard clod with the wet, and rotting the roots.

The beds being prepared, ſhould lie about a fortnight to ſettle, and then drawing ſtrait and tranſverſe lines over the beds, the plants muſt be planted regularly at four inches diſtance, about an inch below the ſurface and the earth, carefully drawn over them with a rake. In November the heads will appear, and then about half an inch depth of freſh earth ſhould be added, which will greatly ſtrengthen the plants. And if it ſhould be very ſevere weather, when the heads appear above this ſecond covering, they ſhould be defended with mats laid over arched hoops. In the beginning of March the flower ſtones will appear; and when the flowering is paſt, and the leaves are decayed, the roots are to be taken up, and laid by for the October following. *Miller's* Gard. Dict. in voc.

RANUNCULUS *viridis*, in zoology, the name of an animal common in many parts of the world, and uſually known by the name of the *tree frog*, or *rana arborea*.

The creature is eaſily diſtinguiſhed from the common frog, by its being much ſmaller, and of a green colour: it uſually ſits upon the leaves of trees and ſhrubs, and makes a great noiſe in an evening, but that is rather like the ſinging of a ſmall bird than the croaking of a frog.

Theſe creatures have been kept alive many years together in glaſs veſſels, giving them flies and other ſmall inſects; and in winter, when theſe are ſcarce, they uſually become very lean and feeble; but in ſummer, when they are plentiful, they will grow fat again, as if at their liberty. This is eſteemed a poiſonous creature. *Ray's* Syn. Quad. p. 251.

RAPA, *turnep*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of four leaves, which are diſpoſed in form of a croſs. The piſtil ariſes from the cup, and is at length changed into a long pod, divided into two cells, by an intermediate membrane, and ending in a long fungous horn, both of which contain roundiſh ſeeds. To this, it may be added, that the root is large, fleſhy, and eſculent.

The ſpecies of *turnep*, enumerated by Mr. Tournefort, are theſe. 1. The round white rooted *turnep*. 2. The round blackiſh rooted *turnep*. 3. The round green rooted *turnep*. 4. The round red rooted *turnep*. 5. The round rooted *turnep*, yellow both on the outſide and within. 6. The long rooted manured *turnep*. *Tourn.* Inſt. p. 228. See the article TURNEP.

RAPAX, in ichthyology, a name given by Schoneveldt to the *corvus piſcis* of ſome writers, a ſpecies of chub or cyprinus, called *rappe* by the Germans, and by Geſner and others *capito fluviatilis rapax*. See the article CYPRINUS.

Broom RAPE. See OROBANCHE.

RAPHA, in anatomy, the ridge or line which runs along the under ſide of the penis, and reaching from the frænum to the anus, divides the ſcrotum and perinæum in two.

This line is not uſually cut in the grand operation of cutting for the ſtone, becauſe it is both harder than the reſt of the ſkin thereabouts, and alſo becauſe you muſt then cut upon the interſtices of the muſcles, which will make the re-union the more difficult.

RAPHANIS, in botany, the name by which the Attics, among the Greeks, called the radiſh; for the word *raphanos raphanus* with them, does not expreſs the radiſh, but the cabbage. The Greeks, of all other places, concurred in calling the radiſh *raphanos* and the cabbage *crambe*; and it is owing to this, that we have many authors who confound together theſe two plants, though ſo very unlike one another in appearance and uſe. It is generally to be underſtood, that wherever Theophraſtus mentions the word *raphanos*, he means by it the cabbage; and the ſame being obſerved, in regard to all the other Attic writers, the whole danger of confuſion and error will ceaſe.

A moderate knowledge either in the language or the ſubject might have prevented errors on this occaſion; yet Pliny, in his account of the radiſh, has been miſled by the word *raphanos* in Theophraſtus, which is that author's name for the cabbage, and has tranſlated all his account of the cabbage, and given it as part of the hiſtory of the radiſh. Theophraſtus ſays, that the Greeks diſtinguiſhed three kinds of the cabbage; the ſmooth leaved, the curled leaved, or criſp cabbage, and the wild cabbage: and Pliny has tranſlated this verbatim, and made it a part of his hiſtory of the radiſh. To this he has added ſome accounts from the Latin writers of their *raphanus*, which is the common radiſh; and putting theſe together, he has compoſed an account wholly unintelligible to all, but thoſe who ſee through the occaſion of the error. The virtues of the radiſh he has alſo intermingled with thoſe of the cabbage, interſperſing among the accounts he took from the Latin authors of the *raphanus*, the virtues and qualities of Theophraſtus's *raphanos*, that is the cabbage. The opinion of the cabbage and the vine being enemies to one another, and not growing any where together, is as old as Theophraſtus, and has a place in his account of that plant; but Pliny has perplexed the caſe, by tranſlating this quality as belonging to the radiſh, which no other author ever gave it; though ſcarce any, who have read the antients, have omitted it in the hiſtory of the cabbage.

RAPHANISTRUM, in botany, the name of a genus of plants, the characters of which are theſe. The flower is compoſed of four leaves, placed in the manner of a croſs. The piſtil ariſes from the cup, and is at length made a long pod, jointed in ſeveral places, and reſembling a faſciated column, and containing roundiſh ſeeds, one lodged in every joint of the pod. See Tab. 1. of Botany, Claſs 5.

The ſpecies of *raphaniſtrum*, enumerated by Mr. Tournefort, are theſe. 1. The common *raphaniſtrum*, with ſmooth, larger,

larger, and fmaller jointed pods. 2. The *raphaniftrum* with white ftriated flowers, and fmall articulated ftriated pods. 3. The white flowered field *raphaniftrum*. 4. The yellow flowered field *raphaniftrum*; and 5. The *raphaniftrum* with the largeft ftriated and articulated pods. *Tourn.* Inft. p. 230.

RAPHANUS, *radifh*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of four leaves, difpofed in form of a crofs. The piftil arifes from the cup, and becomes at length a long horn-like pod, very thick and fpungy, and filled with two rows of roundifh feeds, feparated by a very thin intermediate membrane.

The fpecies of *radifh*, enumerated by Mr. Tournefort, are thefe. 1. The great orbicular or round *radifh*. 2. The white flowered great orbicular or round *radifh*. 3. The black *radifh*. 4. The fmaller or common garden *radifh*. *Tourn.* Inft. p. 229.

The Athenians expreffed the cabbage by the word ῥαφανος, *raphanus*, but all the other Greeks called the *radifh* by that name. Pliny not obferving this has run into ftrange errors. See the article RAPHANIS.

RAPISTRUM, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of four leaves, and is of the cruciform kind; and the piftil which arifes from the cup, finally becomes an unicapfular hufk of a fomewhat globofe figure, which contains a fingle feed.

The fpecies of *rapiftrum*, enumerated by Mr. Tournefort, are thefe. 1. The fingle feeded *rapiftrum* of Cafpar Bauhine. 2. The greateft round leaved fingle feeded *rapiftrum* of Cornutus; and 3. The field *rapiftrum*, with pointed, auriculated leaves. *Tourn.* Inft. p. 211.

RAPPE, in zoology, a name given by fome to the *capito fluviatilis* rapax of Gefner, more frequently known by the name of the *corvus pifcis*. *Willughby*'s Hift. Pifc. p. 256. See the article CORVUS *pifcis*.

RAPUNCULUS, *rampion*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of only one leaf, and is of the bell fhape, but very wide open at the mouth, and fo deeply divided into fegments, that it appears a ftar fafhioned one. The piftil is divided into two horns, and the cup afterwards becomes a membranous feed veffel, divided into three cells, and containing a number of very fmall feeds.

The fpecies of this plant, enumerated by Mr. Tournefort, are thefe. 1. The blue fpiked *rampion*. 2. The deep violet coloured flowered *rampion* with fpotted leaves. 3. The white flowered fpotted *rampion*. 4. The yellow flowered fpiked garden *rampion*. 5. The round headed long leaved *rampion*. 6. The Cretic pyramidal *rampion*, called by many authors *petromerula*. 7. The alpine horned *rampion*. 8. The grafs leaved *rampion*. 9. The fcabious headed blue flowered *rampion*, called by fome *fheeps fcabious*. 10. The white flowered fcabious headed *rampion*. *Tourn.* Inft. p. 113.

RAPUNTIUM, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of a tubular form, fulcated, and divided into feveral long and narrow fegments, in the manner of fingers. The piftil is enclofed in the cup, which afterwards becomes a dry fruit, divided into three cells, and containing numerous, and ufually very fmall feeds affixed to a placenta divided into three parts.

The fpecies of *rapuntium* enumerated by Mr. Tournefort are thefe. 1. The great fpiked fcarlet flowered *rapuntium*, called the red cardinal flower. 2. The great fcarlet American *rapuntium* with white lines in the flowers. 3. The blue flowered American *rapuntium*. 4. The white flowered American *rapuntium*. 5. The golden red leaved American *rapuntium* with a fmall blueifh flower. 6. The talleft American *rapuntium* with Cirfium leaves and greenifh flowers. 7. The fhining Cirfium leaved American *rapuntium* with double fcarlet conglobated flowers. 8. The purple flowered American *rapuntium* with throatwort leaves. 9. The fmall violet coloured burning *rapuntium*. 10. The purplifh blue burning *rapuntium*. 11. The white flowered burning *rapuntium*. 12. The leffer narrow leaved African *rapuntium* with violet coloured flowers. 13. The pinafter leaved Æthiopian *rapuntium* with hooded, violet coloured flowers. 14. The coronopus leaved Æthiopian *rapuntium* with hooded blue flowers. 15. The blue hooded flowered Æthiopian *rapuntium* with dentated leaves. 16. The low Canada *rapuntium* with toad flax leaves. *Tourn.* Inft. p. 163.

RARUM, *non-fpiffum*, in the antient mufic. See the article APYCNON, ἀπυκνον.

RASA, a word ufed by fome authors to exprefs refin of any kind. See RESIN.

RASAKETI, a name given by fome of the chemifts to *æs uftum*, or burnt copper.

RASCETA, a word ufed by the Arabian phyficians to exprefs the wrift or ankle.

RASE, *rafarium*, in our old writers, feems to have been a meafure of corn now difufed: toll fhall be taken by the *rafe*, and not by the heap or cantel. *Ordin. for bakers*, &c. c. 4. Pat. 12 Ed. 3. *Blount*.

RASE, in the manege. To *rafe* or glance upon the ground, called in French *razer le tapis*, is to gallop near the ground, as our Englifh horfes do.

RASILIS *ærugo*, in the materia medica of the antients, one of their kinds of verdigreafe. It was prepared in the following manner: they fet fome fharp vinegar over the fire in a ftrong earthen veffel, and covered it with a brafs pot inverted, well cleaned, and without any vent hole. And after fome time the veffels were to be feparated, and the verdigreafe which was found concreted on the infide of the brafs pot, was fcraped off, and put up for ufe.

RASPBERRY, in botany, the Englifh name of a fpecies of *rubus*. See the article RUBUS.

The *rafpberry* bufh is often found wild in fome of our northern counties, but is cultivated in gardens throughout England for the delicacy of its fruit. We have three kinds common about London. 1. The common. 2. The late red; and, 3. The white *rafpberry*.

Thefe fhrubs fend up great plenty of fuckers from their roots, and are very eafily propagated by them, they fhould be taken up in October, and before they are replanted their fibres fhould be fhortened; but the buds, which are at a fmall diftance from the ftem of the plant, muft not be cut off, becaufe thefe produce new fhoots the next fummer. They fhould be planted two feet afunder, and fet in rows, which fhould be five feet diftant from one another. The foil they thrive in beft is in a frefh fandy loam, which fhould neither be too moift nor over dry. The time for dreffing them is in October, when all the old wood which produced fruit the preceding fummer fhould be cut down to the ground, and the young fhoots fhortened to about two feet in length. The fpaces between the rows fhould then alfo be dug up, and fome other rotten dung buried in them. In the fummer they muft be kept clean from weeds, and once in three or four years there fhould be new beds made, and the old ones deftroyed, for they feldom bear well after that time. *Miller*'s Gardeners Dict.

RASPECON, in ichthyology, a name given by fome to the uranofcope or ftargazer. It is properly a fpecies of the trachinus; and is diftinguifhed by Artedi, under the name of the trachinus, with feveral cirri or beards growing from the lower jaw. See TRACHINUS.

RASSE *coronde*, in natural hiftory, a name given by the Ceylonefe to a peculiarly fine kind of cinnamon, which is the bark of a tree, growing no where but in that ifland. The name they give it fignifies fharp or biting cinnamon. This choice kind is exported annually, in confiderable quantity, by the Dutch Eaft-India company, who prohibit the mixing any other kind of cinnamon with it under a very fevere penalty. Phil. Tranf. N° 409.

RASTIS, a word ufed by fome chemical writers as a name for tin. See TIN.

RASTOL, or RASOES, a name given by fome of the chemical writers to copper.

RASTUL, a word ufed by fome of the chemical writers to exprefs falt in general.

RASURA; a word ufed by the pharmaceutic writers, to exprefs the fhaving woods, or other hard fubftances, to make them readily yield their virtues by decoction. Phyficians alfo ufe it to exprefs the corrofion of acrid humours.

RAT, in zoology. See the article MUS.

RAT, in the fea language, is ufed to exprefs a part of the fea, where there are rapid and dangerous currents, or counter currents.

RAT-*goofe*, in zoology, the name of a fmall fpecies of wild *goofe*, common in fome of the northern counties of England. See the article GOOSE.

Mufk RAT. See MUSK.

RAT-*tails*, or ARRESTS, in the manege, fignify callous hard fwellings upon the hinder legs under the hough, running along the finew. See the article ARRESTS.

RAT-*tailed*. A horfe is thus called that has no hair upon his tail. See HORSE.

RAT-*tailed worms*, in natural hiftory, a fpecies of fly-*worms*, with long tails, refembling thofe of *rats*, whence they have their name. They are of feveral fizes, and found alfo in different places, but all change into two winged flies, having very much the refemblance of bees, and commonly called bee flies. See Tab. of Infects, N° 49. and *Reaumur*'s Hift. Inf. Vol. 4. p. 439. See the article DRONE-*fly*.

RATIO (*Cycl.*)—When a *ratio* is given, expreffed in large numbers, it is often very ufeful to find an approximated value of it, in fmaller numbers. Mr. Huygens and Dr. Wallis have given methods for this purpofe, but that of Mr. Cotes, being the moft convenient in practice, we fhall here infert it. Suppofe the *ratio* 2,718281828495 to 1, or of 1 to 0,367879441171 were propofed to be reduced to fmaller terms, fo that no lefs numbers fhall exprefs it nearer. The operation may be as follows:

Ratios greater than the true.		*Ratios* less than the true.	
1	0×2	0	1
2	1	2	0
3	1×2	2	1×1
8	3	6	2
11	4×1	8	3×1
76	28	11	4
87	32×1	19	7×4
106	39	87	32
193	71×6	106	39×1
1264	465	1158	426
1457	536×1	1264	465×1
21768	8008	1457	536
23225	8544×1	2721	1001×8
25946	9545	23225	8544
49171	18089×10	25946	9545×1
&c.	&c.	&c.	&c.

Divide the greater term 2.71828, &c. by the lesser 1, or the greater 1 by the lesser 0,367879, &c. and again the lesser by the remainder, and this again by the last remainder, and so on: the quotients arising will be 2, 1, 2, 1, 1, 4, 1, 1, 6, 1, 1, 8, 1, 1, 10, 1, 1, 12, 1, 1, 14, 1, 1, 16, 1, 1, &c. These being found, two rows or columns of *ratios* must be made, the one containing the *ratios* greater than the true, and the other such as are less; beginning the computation from the *ratio's* 1 to 0, 0 to 1, which are most remote from the truth, and from thence proceeding to such as approach continually nearer. Let then the terms 1 and 0 be multiplied by the first quotient 2, and write the products 2 and 0, under the terms 0 and 1; then adding, there will arise the *ratio* 2+0 to 0+1, or 2 to 1. Multiply the terms of this *ratio* by the second quotient 1, and add the products 2 and 1 to the terms 1 and 0 in the first column, there will arise the *ratio* 2+1 to 1+0 or 3 to 1. The terms of this *ratio* being multiplied by the third quotient 2, and the products 6 and 2 added to the terms 2 and 1 of the second column, will give the *ratio* 8 to 3. These multiplied by the fourth quotient 1, and the products 8 and 3 added to the preceding terms 3 and 1 in the first column, will give the *ratio* 11 to 4. Whose terms multiplied by the fifth quotient 1, and the products 11 and 4 added to the *ratio* 8 to 3 give the *ratio* 19 to 7; whose terms being multiplied by the sixth quotient 4, and the products 76 and 28 being added to 11 and 4, give the *ratio* 87 to 32. And thus we may go as far as we think fit; proceeding alternately from one column to the other. This being done, we shall find *ratios* greater than the true, to be 3 to 1, 11 to 4, 87 to 32, 193 to 71, 1457 to 536, 23225 to 8544, 49171 to 18089, &c. And the *ratios* less than the true will be, 2 to 1, 8 to 3, 19 to 7, 106 to 39, 1264 to 465, 2721 to 1001, 25946 to 9545, &c. And these are the principal and primary *ratios*, which continually approximate to the *ratio* proposed.

But if the whole series of *ratios* greater than the true, be required, so that no *ratios* greater than the true, and expressed in smaller terms, shall come nearer the truth; and if also the whole series of *ratios* less than the true, and such, as that no *ratios* less than the true, and expressed in smaller terms, shall approach nearer to the truth, be desired, then other secondary *ratios* must be inserted between the primary already found. And these take place where the quotients surpass unity. They may be found by changing the multiplication by the quotient as above directed, into a continual addition of the terms, as often as there are units in the quotient. Thus, the first quotient being 2, the terms 1 and 0 are to be twice added to the terms 0 and 1. The sums will give the *ratios* 1 to 1 and 2 to 1. These last terms 2 and 1, the second quotient being 1, must be once added to the terms 1 and 0, and the sum will give the *ratio* 3 to 1. Also the terms 3 and 1, the third quotient being 2, are to be twice added to the terms 2 and 1; and the sums will give the *ratios* 5 to 2, 8 to 3. These last terms 8 and 3, the fourth quotient being 1 must be once added to the terms 3 and 1, and the sums will give the *ratio* 11 to 4. These terms 11 and 4, the fifth quotient being 1, must be once added to the terms 8 and 3, and the sums will give the *ratio* 19 to 7. Lastly, these terms 19 and 7, the sixth quotient being 4 must be four times added to the terms 11 and 4. The sums will give the *ratios* 30 to 11, 49 to 18, 68 to 25, 87 to 32. And so we may proceed as far as we think fit. The operation being performed, we shall find the whole series of *ratios* greater than the truth to be 1 to 0, 3 to 1, 11 to 4, 30 to 11, 49 to 18, 68 to 25, 87 to 32, &c. and in like manner, the whole series of *ratios* less than the truth will be 0 to 1, 1 to 1, 5 to 2, 8 to 3, 19 to 7, &c.

Example of the operation.

Ratios greater than the true.		*Ratios* less than the true.	
1	0×2	0	1
2	1	1	0
3	1×2	1	1
8	3	1	0
11	4×	2	1×1
19	7	3	1
30	11	5	2
19	7	3	1
49	18	8	3×1
19	7	11	4
68	25	19	7×4
19	7	87	32
87	32×1	106	39×1
&c.	&c.	&c.	&c.

See *Cotes* harmonia mensurarum, p. 7, &c.

The ingenious author has not given the demonstration of his method; but Dr. Saunderson has shewn the reason of it, in the fifth book of his algebra, to which we refer the reader.

By means of this method, the approximated values of the *ratio* of the circumference, to the diameter of a circle, may be found in small terms. Thus the proportion of the circumference of a circle to its diameter, being according to Van Ceulen's numbers, when abridged, 314159265359 to 100000000000; dividing the greater by the lesser, &c. as before directed, we shall find the quotients 3, 7, 15 and 1, which will give the following *ratios*, 3 to 1, 22 to 7, 333 to 106, and 355 to 113; the second is that of Archimedes, and the fourth that of Adrian Metius.

This proportion of 113 to 355 approaches very near the truth, only erring by 2 in the seventh decimal, when reduced to that form, for 355 : 113 :: 3, 1415129 : 1 now it ought to be 3,1415927 to 1. To remember this proportion the better, we may make use of the following artifice. Take the three first odd numbers 1, 3, 5, and write each twice, thus 113355, then will the three first figures of this number 113, be the diameter, and the three last, 355 the circumference. These approximations are of use in many practical parts of mathematics. See instances thereof in Huygen's *descriptio automati planetarii* among his posthumous works, tom. 2. p. 174. Edit. Amst. 1728, where he describes his method, and demonstrates it. In music, it is the foundation of the different schemes of geometrical temperatures. See the article TEMPERAMENT.

RATIO *modularis*. See LOGARITHM.

RATIONIS *os*, a term used by some anatomical writers to express the *os sincipitis*.

RATIONARIUM, among the Romans, a book which contained the accounts of the empire. *Pitisc*. Lex. Ant. in voc. It was otherwise called *breviarium*. See BREVIARY.

RATSBANE. See the article ARSENIC.

RATTLE *snake*, a very dreadful species of serpent, whose bite is fatal, if not timely remedied, and which is distinguished from all other serpents by the *rattles* in its tail. This is composed of several scaly substances, and is said to encrease by the creature's age; every year adding one scale to it. It moves over the rocks and mountains with prodigious swiftness, but is less nimble on even ground, than many other snakes.

It grows to four or five feet long, and sometimes, though rarely, more; and one of more than four feet long, having been dissected, and accurately described by Dr. Tyson, the account that gentleman gives of it may not be unacceptable to the reader. The body where largest, which was near the middle, measured six inches and a half round. Its neck only three inches. Its head was flat, as that of the viper; and as the jaws are very broad and protuberant, and the nose sharp, it somewhat resembles the head of an arrow. At the end of the nose are placed the nostrils, and between these and the eyes there are two other holes which may be mistaken for ears; but they only go into a hollow of the bone of the skull, without any perforation into the brain. The viper has nothing of these holes. The eyes are round, and wholly resemble those of the viper. The whole body of the creature greatly also resembles the viper, but for the singularity of the *rattle*; and over the eyes there are two large scales, looking like eye-brows.

The scales which cover the head are very small, thence they become gradually larger as they reach toward the middle of

of the body, and from the middle to the tail they grow lefs and lefs again; and all in fhape much refemble the broad and flat feeds of the common garden parfnip. There is fome variety in the colours of this creature, whether according to the difference of age or fex, or from leffer accidents. The moft ufual colours are thefe: the fcales are of a dufky greenifh, like the feathers of the back of the green-finch, and are variegated with fmall black fpots in great number; there alfo are four large ones of the fame colour. *Ray's* Syn. An. p. 291. *Tyfon's* Nat. Crotaph.

The back is of a mixt colour, of a dead yellowifh brown, variegated with blotches of black and yellow, and with a number of fmall dots of the fame colours; the larger blotches being laid in great regularity, and making a very beautiful teffelated figure; the fcales become darker as they approach the tail, where they are almoft black; and thofe on the ridge of the back, all along, are raifed into a fort of fharp prominence in their middle, like the fcales of a crocodile; thofe on the fides are plain and flat. The belly is all along covered with oblong parallellogram fcales, laid tranfverfely; thefe are very bright and gloffy, and are yellow, fpotted with black.

The head is fmall, in proportion to the body, but the mouth is capable of opening to a prodigious width. The tongue is wholly like that of the viper, compofed of two oblong portions, joined toward the bafes, but feparate as they approach the end. The teeth are of two kinds, the fmaller ones defigned for its eating with, the larger and longer for biting and poifoning what it feizes. Thefe are only placed in the upper jaw, but all the teeth of the mouth are of the canine kind, as the creature, never chewing its prey, has no ufe for dentes molares, or grinders.

The poifonous teeth are fituated on the outfide of the jaw, in the anterior part of the mouth; not fixed in the fockets of the jaws, as the others, but fixed to two bones. Thefe, in their natural ftate, are not vifible, even when the creature's mouth is opened, unlefs it be with an intent to wound; for they lie back under a membranaceous covering, and the creature has a power of erecting, and wounding with them at pleafure, as the lion and cat kind can retract, or thruft out their claws. Thefe teeth are crooked, and have a hollow at their bottom, and at their point a very plain and evident flit, looking like the neb of a writing pen. The teeth are hollow all the way from this flit to their bottom, and on preffing the gums in a dead *rattle-fnake*, the poifonous juice may be feen to afcend by degrees up the tooth, and at length to be difcharged out of the flit at the point. This makes it very plain in what manner the poifon is conveyed into the flefh, when the creature bites.

The *rattle* is affixed to the laft vertebra of the tail, and is compofed of a feries of fmall bones; that next the tail is ufually of a blueifh grey colour, the reft of a pale brown. Thefe bones are hollow, very thin, hard, and dry, and of a brittle texture, and very fonorous. They are all of the fame figure, reprefenting, in fome degree, the os facrum in the human fceleton, and all are nearly of the fame fize. The laft of thefe is feen to have a rigid extremity, in manner of a tail, and all the others have the fame, though it is not diftinguifhable in them, as in the joining it runs under two others; and by means of this ftructure they are all moveable with the fmalleft force, and the found is the more vigorous, as each of thefe tails ftrikes on two of the hollow joints, when put in motion.

The age of the creature is known by the number of joints of this *rattle*, which are found to be from one to twenty, or more. The ufe of this feems not to the creature, but to other animals, that they may be alarmed at the approach of fo terrible an enemy, and get out of its way in time. Pifo, and fome others, affirm, that this *rattle* put up a man's fundament, is as fatal a thing as the creature's bite. The power of doing mifchief, which nature has allotted to this animal, feems not only by its bite, but, according to the joint accounts of almoft all authors, it appears to have a power of deftroying even by a look. *Ray's* Syn. Anim. p. 322.

The charming, or fafcination of the *rattle-fnake*, as this is ufually called, has exercifed the wits of many naturalifts in vain, and many have difbelieved the fact. Sir Hans Sloan mitigates the matter, by fuppofing the creature firft to feize or bite its prey, which it then fuffers to efcape, as far as the poifon will let it, watching its death, that it may devour it without trouble; and that it is in this poifoned ftate that people have feen the fquirrels, &c. dancing about before the *rattle-fnake*, and dying convulfed; all which they have attributed to the power of charming in the eye of the *fnake*, not conceiving that it was the effect of the creature's having before bitten them. This, though a very plaufible account, yet however wants experience to confirm it, and the general teftimony of people, who have feen the facts, makes againft it.

The fame author gives us, however, from Colonel Beverley, the whole procefs of the charm. The colonel acquaints us, that fome company he was with once faw a hare, about half grown, fiting quietly in an orchard, and ftriking at her, fhe only removed a few yards; when wondering at the caufe, they faw a *rattle-fnake*, at about ten feet diftance, eying the hare as his deftined prey. The poor creature was, by this time, in agonies and convulfions, often getting up on its legs, as if intending to run away, but always immediately falling down again, and growing worfe and worfe, foon loft the ufe of its hinder legs, and panting vehemently, fell on its fide. In about half an hour more the hare feemed to have done with all ftruggles, and to be dead, on which the *fnake* uncoiled itfelf, and moved gently towards it, but the poor hare ftarting again, he ftopt; but when all was again quiet, he moved up to it, and, raifing his head, looked all over his prey; his colours looking at that inftant more beautiful than before, and his eyes fparkling. The hinder part of the hare had been toward the *fnake* all this time, and it had perifhed without much looking at its enemy. The *fnake* wetted the body all over with his flaver; and then, with great difficulty, taking firft the head into his mouth, fwallowed that, and afterwards the whole body, fucking it gently down, and not getting in the fhoulders without great difficulty.

It is certain, upon the whole, that there is much in this account to favour Sir Hans Sloan's opinion of the hare's having been firft bitten, though that was not feen, fince the convulfions, and lofs of the ufe of the hinder legs, feem a very natural effect of poifon; but we are affured, by perfons who have been eye-witneffes to the fact, that a bird hopping about in all this agony and terror, has, on the frightning the *rattle-fnake* away, flown off without any difficulty; fo that the whole feems yet not underftood. *Sloan's* Hift. Jamaica. *Beverley's* Virginia.

RAUCA *avis*, in zoology, the name of a bird defcribed by Nieremberg, as common about the lakes and rivers of America, and of the king-fifher kind, but nearly as large as a duck, and black on the crown, and white on the breaft and belly. Its neck is naturally very long in proportion to its body, yet it can occafionally contract and fhorten it in a very wonderful manner. It is a native of Mexico, and is efteemed very good for the table. Mr. Ray has placed this among the birds, the accounts of which he is diftruftful of. *Ray's* Ornitholog. p. 300.

RAUCEDO, *hoarfenefs*, in medicine, the name of a difeafe which confifts in the conftriction of the glandulous coat, and other glandular parts, near the top of the wind-pipe, by means of which the due quantity of lymph, deftined to lubricate the wind-pipe, is not fuffered to flow to its place. This diftemper differs in degree, being milder when from external caufes, and greatly more obftinate and troublefome when from internal.

Signs of it. The *hoarfenefs* of the voice in fpeaking fufficiently manifefts this complaint, but it is ufually alfo attended with a flight cough in the milder kind; and when of the feverer fort, is not unfrequently accompanied with catarrhal and fcorbutic effects; and not uncommonly, in its worft ftates, with a complication of venereal taints. The perfons moft fubject to *hoarfeneffes* are young and middle-aged men, and fometimes women, who have for fome time been afflicted with obftructions of the menfes.

Caufes of it. The general caufe of an *hoarfenefs* is an interception of the lymph deftined to lubricate the wind-pipe; and the occafional caufe of this is ufually an obftruction of the glandular parts, toward the top of that organ, in the fimple *raucedo*; but in the complicated kind, in which there is a fcorbutic or venereal taint, an erofion of the epiglottis is very often the caufe. Befide thefe, there are many accidental and external caufes, which will bring on a *hoarfenefs*; fuch as the falling of any fmall particle of extraneous matter, if it be only a grain of duft, into the windpipe; a vehement cough will alfo bring it on, as will a frequent loud fpeaking, and too fat foods, and acrid or bilious humors ftagnating about thefe parts. It is eafy to conceive, that the more complicated this difeafe is, the more difficult will be the cure; and accordingly *hoarfeneffes*, which have fcorbutic or venereal taints for their bafis, are with great difficulty removed.

Method of cure. Lubricating medicines are firft to be given, to obtund the acrimony of the humors, and relax the frictures of the glandular parts. To this purpofe are properly taken oil of almonds, and the pectoral fyrups, with barley water, mucilaginous broths, and decoctions of the pectoral herbs, or infufions of them drank in the manner of tea. When there is a coryza, or cough attending it, thefe are to be treated in the ufual way, and the *hoarfenefs* will ufually go off with them. When acrid and bilious humors are in the cafe, the abforbents and nitrous medicines are to be given, with gentle diaphoretics; powders compofed of crabs eyes, nitre, and diaphoretic antimony, are of great ufe in this cafe. The bowels, in all thefe cafes, are to be kept gently relaxed; and where there is a fcorbutic, or venereal taint for the bafis, thofe difeafes muft be attacked in the common way, and then the *hoarfenefs* will be regularly taken off. A relaxation of the wind-pipe is ufually accufed as being the caufe of a *hoarfenefs*, and that not without

ſome foundation; ſince where the humors are collected, there will be ſuch a relaxation; but when we conſider all the circumſtances of the diſeaſe, and obſerve that relaxing medicines are the only cure for it, we muſt acknowledge, that though a relaxation of ſome part of the aſpera arteria may be in the caſe, yet that the origin of the complaint is from a conſtriction of ſome part of it; and it appears, that the longer this complaint remains with people, the greater the conſtriction becomes; ſo that after a courſe of years, the voice is not only *hoarſe*, but is in a manner ſuppreſſed ſo, that it can ſcarce be heard. *Junker*'s Conſp. Med. p. 505.

RAVEL *bread*, a ſort of *bread*, called alſo *blackwhytlof*, as being of a middle fineneſs betwixt white and brown.

RAVEN, *corvus*, in ornithology. See CORVUS.

It is rare to find this creature white, yet it happens ſometimes. Boyle[a] mentions one. There was alſo one ſhewn to the Royal Society not long ago.—[[a] Works Abr. Vol. 2. p. 46.]

Night RAVEN, an Engliſh name for a heron which flies in the night, and makes a very odd and hoarſe noiſe. It has been applied by ſome to the bittern, or *ardea ſtellaris*, but improperly, belonging of right to the *ardea cinerea minor*, or ſmaller grey heron, called *nycticorax*. *Ray*'s Ornithol. See NYCTICORAX.

RAVIS, the ſame with *raucedo*. See RAUCEDO.

RAUTY *mummy*, or RAUTY *muddum*, *ſtone mummy*, a name given by the people of the Eaſt-Indies to a kind of foſſile ſubſtance, much valued for its medicinal virtues. It is of the nature of the ſelenites, and is found upon the high rocks, and ſuppoſed to be generated of the dew which falls from the heavens; but this is an idle opinion, and the formation of it is evidently the ſame with that of the European rhomboidal ſelinites. They beat it to powder, and after boiling it in milk, they give it in caſes of the venereal kind. In a common clap, they give half a ſcruple night and morning. *Woodward*'s Cat. Foſſ. Vol. 2. p. 9.

RAY, *raia*, in ichthyology. See RAIA.

RAY, in our old writers, a word appropriated to cloth never coloured, or dyed. 11 Hen. IV. c. 6. *Blount*, *Cowel*.

RAY (*Cycl.*)—RAY *of curvature*, in geometry, is uſed to ſignify the ſemi-diameter of the circle of curvature. See CURVATURE, *Appendix*.

RAYCHE, in ichthyology. See RAYTE, infra.

RAYTE, or RYCHE, in ichthyology, a name given by Joannes Cuba, Albertus, and others, to the common ſkaite, or ſkaire. See the article RAIA.

RAZE, in the manege. A horſe is ſaid to have *razed*, whoſe corner teeth ceaſe to be hollow; ſo that the cavity, where the black mark was, is filled up; that is, even, ſmooth, and *razed*, or ſhaven, as it were, and the mark diſappears. See the articles TEETH and MARK.

RAZOR *bill*, in zoology, the common Engliſh name of the alka, a web-footed bird with no hinder toes, common on our ſea ſhores. See ALKA.

RAZOR-*fiſh*. See the article DACTYLUS.

REAR (*Cycl.*)—REAR *half files*, in the military art. See FILE *leaders*.

REAR *up*, in the manege, called in French *cabrer*, is ſaid of a horſe that riſes upon his hinder legs, as if he would come quite over.

REARED, or *Wale*-REARED. See WALE-*reared*.

REBUS, (*Cycl.*) a word uſed by the chemical writers ſometimes to ſignify ſour milk, and ſometimes for what they call the ultimate matter, of which all bodies are compoſed.

RECEIVER (*Cycl.*)—It is to be obſerved, that a very ſmall crack in the *receiver*, uſed in pneumatical experiments, does not render them uſeleſs; for, upon evacuating the internal air, the external preſſing the glaſs on all ſides, brings the edges of the glaſs cloſer together. But in caſe of conſiderable flaws, a plaſter may be applied, made of quick lime, finely powdered, and nimbly ground, with a proper quantity of the ſcrapings of cheeſe, and water enough to bring the mixture to a ſoft paſte; which, when the ingredients are well incorporated, will have a ſtrong and fetid ſcent; and then it muſt be immediately ſpread upon a linnen cloth, and applied, leſt it begin to harden. *Boyle*'s Works Abr. Vol. 2. p. 417.

RECEIVERS, in chemiſtry, veſſels of earth, glaſs, &c. for receiving any diſtilled liquor. See Tab. of Chemiſtry, N° 22, 23, and 34.

RECEPTACULUM (*Cycl.*)—RECEPTACULUM *ſeminum*, in botany, the name given by authors to the baſe of the flowers and ſeeds in the ſyngeneſiæ, or compound flowered plants. This is alſo called, by ſome writers, *thalamus floſculorum*. The flowers ſtand on this in conſiderable numbers, and without any pedicles. The diſk of the *receptacle* is of various ſhapes in the various plants; in ſome it is flat, in others concave, in others convex; in ſome globular, and in many pyramidal. Its ſurface is ſometimes naked, and ſometimes paleaceous. In thoſe plants, in which the ſurface is naked, it is either abſolutely ſmooth, or furniſhed with ſmall tubercles, or with a few hairs. In thoſe in which it is paleaceous, it is all over beſet with narrow pointed paleæ, which are erect, compreſſed, and ſtand between the flowers.

RECEPTARII, a term of reproach uſed to ſuch phyſicians as write pompous receits for loads of medicines, more conſulting the good of the apothecary than the patient; as alſo for ſuch as give receits for general medicines, to be uſed at the diſcretion of people wholly unacquainted with the nature of diſeaſes.

RECESSUS, (*Cycl.*) a word uſed by ſome medical writers to expreſs an abſceſs, or apoſthumation.

RECIMUS, among the Romans, a kind of ſquare mantle, or veil worn by women on their head. Salmaſius will have it to have been a ſort of gown uſed by the Roman ladies, and tucked up before with a ſquare pin, of a purple colour. *Danet*. in voc.

RECIPROCAL, (*Cycl.*) in mathematics, is applied to quantities, which multiplied together produce unity [a]. Thus $\frac{1}{x}$ and x, y and $\frac{1}{y}$ are *reciprocal* quantities. And $\frac{1}{x}$ is ſaid to be the *reciprocal* of x, which, *vice verſa*, is the *reciprocal* of $\frac{1}{x}$.—[[a] Maclaurin de Lin. Geom. propriet. general. p. 10.] See the Appendix to his Algebra.

RECITANTE. See FAVORITO.

RECLASSE, *auricula*, in botany. See AURICULA.

The characters of a good flower of this ſort are theſe. 1. The ſtem of the flower muſt be lofty and ſtrong. 2. The foot-ſtalk of the flower muſt be ſhort, that the umbel may be regular and cloſe. 3. The pipe, or neck of each flower ſhould be ſhort, and the flowers large and regularly ſpread, being no ways inclinable to cup. 4. The colours muſt be very bright, and well mixed. 5. The eye of the flower muſt be large and round, and of a good white or yellow, and the tube or neck muſt not be too wide.

Theſe are to be raiſed from ſeeds; to procure which the beſt flowers ſhould be made choice of, and theſe muſt be expoſed to the open air, and to ſhowers, that the ſeeds may be perfect. The time of their ripening is June, and they are known to be ripe by the ſeed veſſel becoming brown and opening. This ſeed may be ſown any time between Auguſt and Chriſtmas; and the beſt ſoil for it is good freſh light ſandy mould, mixed with very rotten cow dung, or tanners bark. With this the boxes or pots muſt be filled, and the ſeeds lightly ſcattered on it, and covered an inch deep with rotten willow mould. Cover the ſurface with nets, or otherwiſe, to preſerve the ſeed from birds, and give the boxes half the day's ſun. In March the young plants will appear, and they muſt then only have the morning ſun till ten o'clock. They muſt be carefully watered after this, a little at a time, and in July they will be ready to tranſplant. They muſt be ſet in the ſame ſort of earth, at three inches diſtance, and ſhaded carefully, till they have taken root. The ſpring following theſe young plants will flower, and then the fineſt of them ſhould be marked, and each removed into a pot of the ſame earth, in which they are to be kept till the next ſpring, when it will appear what they truly are.

The fine flowers, thus obtained, may afterwards be propagated from ſlips, or off-ſets taken from the old roots in April when they are in bloom; and theſe muſt be managed juſt as the young plants from ſeed, and the ſecond year will produce perfect flowers.

Theſe are the rules for the propagating theſe plants; but in order to have them flower in perfection, the following rules muſt alſo be obſerved.

1. The plants muſt be preſerved from too much wet in winter, and muſt have free air, and not too much ſun. 2. In the beginning of February, if the weather be mild, the earth in your *auricular* pots muſt be taken off as far as may be, without diſturbing the roots, and new freſh earth laid in its place. 3. The pots muſt be covered with matting in the night, to defend them from froſts while the plants are budding. 4. When the ſtalk begins to be long, they muſt be defended from haſty rains, yet not kept too much under cover, which draws up the ſtalk too long, and makes it weak; and they muſt be watered frequently, a little at a time, and none of the wet muſt be ſuffered to fall on the plant. Laſtly, when the flowers begin to open, the pots ſhould be removed to a ſtage of ſhelves, one over another, placed under cover, open to the morning ſun, but ſheltered from the midday's ſun. Here they may remain till their flowers are paſt, and then they muſt be ſet out to have the benefit of the rains and free air, for the ripening of the ſeed, which muſt be ſaved carefully, and ſpread on papers, and laid to dry. *Miller*'s Gardners Dict.

RECLINATE *ſtalk*. See the article STALK.

RECOGNITORS, *recognitores*. The jury impanelled upon an aſſize are called *recognitors*, becauſe they acknowledge a diſſeiſin by their verdict. *Bract*. lib. 5. *Cowel*.

RECOLATION, a method of fining the decoctions of vegetables, &c. by repeated percolation, or ſtraining them ſeveral times ſucceſſively through a linnen or woollen bag.

RECOMPOSITION, in chemiſtry, the compounding of bodies from their ſeparated parts, or principles, ſo as to compoſe

compose the original whole again. This is extremely difficult to effect universally, but in some cases it may be done, and that so perfectly, that the *recomposed* body shall not be distinguishable by the senses from that which never had been separated by the fire. If the art of chemistry were perfect, we should thus be able, at least in some degree, to *recompose* all the bodies we divide; but this is far from being the case at present. We can by no means do this in vegetable and animal bodies, where there is a vascular structure, and therefore we are carefully to distinguish between the regeneration of organized, and that of unorganized bodies. *Shaw*'s Lectures, p. 168.

RECONCILIATION *of penitents*, in church history. See PENITENTS, *Cycl.*

RECRUITS, in the military art, new men raised to supply the places of such as have lost their lives in the service, or are rendered unserviceable by age or wounds.

RECRUIT *horses*, are the *horses* brought up for compleating the regiments of horse or dragoons every year.

RECTIFICATION (*Cycl.*)—That the *rectification* of spirits may, in all cases, proceed with the greatest exactness, a due regard to it must be had even from the first fermenting the substance from which they are to be made, and continued through all the stages of distillation, the low wines, proof spirit, and alcohol. The management of the fermented liquor, to this purpose, is principally the letting it stand to subside after the fermentation is over, and the drawing it off clear and thin, not too rich for the still. The still is not to be overfilled with this. Great care must be taken to prevent its burning, and the faints that run last must be kept separate, not mixed with the rest of the liquor distilled, which is now called the low wines. In the *rectifying* these into proof spirit, great caution must be used that the fire be kept regular, not raised by sudden spirits, which always throw up the oil in large quantities, which is to be left behind. In the succeeding *rectification* of the proof spirit into alcohol, the same cautious management of the fire is necessary; and, in both this and the last, the faints are not to be suffered to run in among the spirit, but to be saved separate. They may be all mixed together at last, and reduced to a spirit fit for burning in lamps; but the keeping out of the *rectified* liquor will keep away the coarsest and most stinking part of the oil of the ingredients.

By these easy means, without any additional trouble or charge, we might be furnished with a spirit greatly exceeding what we commonly meet with. And in general, the art and mystery of our sellers of the several sorts of English brandies, seem to consist in this prudent management, and in the adding a little of the *oleum vini*, or oil of wine lees, to the spirits thus procured pure: this gives the flavour of foreign brandies, and is so extensive in its use, that half an ounce of it is sufficient for a hogshead of pure spirits.

Malt spirit is that which principally requires all this care in the *rectification*, because its oil is more nauseous and offensive than that of any other spirit; but all others will be greatly the better for being treated in the same manner, and it is indeed necessary that they should for some particular uses.

It is remarkable, that no one method of combinatory *rectification*; that is, of the *rectification* performed by means of salts, and other additions, is suited to all the several kinds of spirits, scarce indeed will any one way serve for any two spirits; but this method, by simple and careful distillation, is equally suited to all. Melasses spirit, cyder spirit, wine spirit, or brandy, rum, and arrack, are all improved by it, and all of them are then known to be perfectly *rectified*. When in the state of alcohol, they not only prove totally inflammable in a little vessel floating upon cold water, but when poured into the purest spring water, they have not the least power of making any change in it, nor leave any marks of oilyness, or that unctuosity, which, on the mixture of the less pure spirits, floats on the top, and in certain lights gives the rainbow colours. *Shaw*'s Essay on Distillery.

RECTIFYER, (*Cycl.*) in the distillery, the person whose employment it is to take the coarse malt spirit of the malt stiller, and re-destill it to a finer and better liquor. The art of the *rectifyer* might be entirely set aside, if the malt stiller could make his spirit perfect at a second operation; which seems very practicable, if the malt stillers could be got to forsake their old track. The great things to be recommended for the improvement of their art, would be first the brewing in perfection, and secondly the keeping their wash after the manner of stale beer, till it has entirely lost its malt flavour, and required a pungent acid vinosity; and then thirdly leaving out the lees, to distil with a well regulated fire. It is scarce to be thought how pure a spirit is to be obtained from malt this way; but the great art would be, the finding a way to make malt liquors artificially stale, bright, and flavourless, though otherwise vinous. *Shaw*'s Lectures, p. 223.

RECTUS (*Cycl.*)—RECTI *abdominis*. These are long narrow muscles, thicker than the oblique; they lie near each other, like two large bands from the lower part of the thorax to the os pubis, the linea alba coming between them. Their breadth diminishes, and their thickness increases gradually from above downward. The superior extremity of each of these muscles is fixed to a part of the lower extremity of the sternum, to the three lowest true ribs, and to the first false rib, by the same number of digitations, of which that which is farthest from the sternum is the broadest.

The body of the muscle lies in the vagina formed by the aponeurosis of the broad muscles of the abdomen: exteriorly it is divided into several portions, resembling distinct muscles placed end-wise, by transverse tendons termed enervations, which commonly are all above the umbilicus, very seldom below it, and adhere very closely to the vagina. These insertions are pretty irregular: they do not always penetrate the whole thickness of the muscle; and, in that case, they do not at all appear, or but very little, on the inner surface. Sometimes those which are seen on the surface do not run quite cross the whole breadth of the muscle.

The lower extremity of this muscle ends in a thin tendon, fixed in the internal labium of the upper edge of the os pubis near the symphysis, and there it touches the tendon of the other *rectus*. Above the umbilicus, these muscles are at some distance from each other, according to the breadth of the linea alba, but below it they come nearer the linea alba, being there narrower, and near their lower extremity, that line is almost entirely hid by their thick edges. *Winslow*'s Anatomy, p. 168.

RECTUS *anterior*, a muscle called also *gracilis anterior*, as long as the os femoris, and lying directly along the foreside of the thigh. The greatest part of it is fleshy, and its middle is broader than the two extremities. It has its name *rectus* from the strait diameter in which it lies, and its other *gracilis* from its thinness and flatness. It terminates above by a pretty strong tendon, which is divided into two branches, one short and strait, the other long and bent; the short branch running up in a strait line, is inserted in the anterior inferior-spine of the os ilium. The long branch is inflected backward over the supercilium of the acetabulum, and runs in the direction of it from the spine, toward the great ischiatic sinus: it is strong and flat, adhering very closely to the bone, and covered by the orbicular ligament and the glutæus minimus; and, according to the common method of dissecting, is therefore usually cut off, and the small branch of the tendon only left observable. From hence the muscle runs down wholly fleshy, and partly penniform, some of its fibres meeting above and separating below. It is narrow at the upper extremity, and grows gradually broader towards the middle, afterwards contracting in the same manner, and at the lower extremity of the os femoris, ending in a flat tendon. Through its whole course it lies between the two vasti, and covers the crureus; and its inferior tendon is inserted in the upper edge of the patella, from whence it sends down a small plane of tendinous fibres, which adhere very closely to the convex side of that bone, and having reached the great ligament seem to be lost therein. *Winslow*'s Anatomy, p. 212.

RECTUS *musculus*, in anatomy, a name given by Fabricius, in his treatise of the eyes, to the muscle, which serves to elevate the upper eye-lid, called by Cowper and others *aperiens palpebram*, and by Albinus *levator palpebræ superioris*.

RECTUS *internus major*, in anatomy, a name given by Winslow to one of the muscles of the head, described by Fallopius, under the name of the *musculus nonus capitis*; and by Winslow, the *musculus rectus anterior longus*.

RECTUS *capitis major*, a small, flat, short muscle, broad at the upper part, and narrow at the lower, and situated obliquely between the occiput and second vertebra of the neck. It is fixed below the branch of the bifurcated spine of the second vertebra of the neck, at a tuberosity, which is often found at the upper part of the branch; from thence it ascends a little obliquely outward, and is inserted in the posterior part of the inferior transverse line of the os occipitis, at a small distance from the crista, being a little covered by the obliquus superior. *Winslow*'s Anatomy, p. 236.

RECTUS *minor capitis*, this muscle has a small insertion below in the posterior eminence of the first vertebra; from thence it ascends laterally, and is inserted immediately under the posterior part of the inferior transverse line of the os occipitis, in a superficial fossula on one side of the crista occipitalis. Ibid. p. 237.

RECTUS *capitis anticus brevis*, a small flat muscle, about the breadth of one finger, situated laterally on the part of the body of the first vertebra. It is fixed below to the basis or root of the transverse apophysis of that vertebra, near the anterior eminence; from thence it runs obliquely upward, and inward, to a transverse impression in the lower side of the apophysis basilaris of the occipital bone immediately before the condyle on the same side, being covered by the anticus longus. Ibid.

RECTUS *capitis anticus longus*, a muscle in some degree of a pyramidal figure, lying along the anterior and lateral parts of the vertebræ of the neck, all the way up to the basis cranii. It is fixed to the anterior parts of the transverse apophysis,

apophyses, of the third, fourth, fifth, and sixth vertebræ in a digitated manner, from thence it runs up obliquely inwards, and towards the lateral parts of the bodies of the vertebræ, passes on the foreside of the first and second, without being inserted in them, and approaching gradually toward the same muscle, on the other side, it is inserted near it in the fore part of the lower side of the apophysis basilaris. Id. Ibid.

Rectus *capitis posticus major*, in anatomy, a name given by Albinus, in his history of the muscles, to a muscle called *magnus rectus capitis* by Winslow, and described by Vesalius by the name of the *tertius capitis moventium*; and by Spigelius, and others, under that of *rectus major*.

Rectus *capitis posticus minor*, a name given by Albinus to a muscle of the head, called by Riolanus and others *posticus minor*, and by Winslow *rectus parvus*; Vesalius has described it under the name of *quartus caput moventium*.

Rectus *exterior oculi*, in anatomy, a name given by Fabricius and others to one of the muscles of the eye, called by Riolan and others the *superbus*, and by some the *elevator oculi*; it is the *abductor* of Albinus, one of his *quatuor recti*.

Rectus *inferior oculi*, in anatomy, a name given by Fabricius, and some others, to one of the muscles of the eye, called by others *humilis*, and by Albinus the *depressor*. It is one of the *quatuor recti oculi* of that author.

Rectus *interior oculi*, in anatomy, a name given by Fabricius to one of the muscles of the eye, called by Molinet the *bibitorius*; and by Cowper, Albinus, and others, the *adductor oculi*. See Adductor, *Cycl.* and *Suppl.*

Rectus *superior oculi*, in anatomy, a name given by Fabricius to one of the muscles of the eye, called the *attollens* by Albinus, and by others the *elevator oculi* and the *superbus*. See the article Elevator *oculi*.

RECUPERATORES, among the Romans, were commissioners, appointed to take cognizance of private matters in dispute, between the subjects of the state and foreigners, and to take care that the former had justice done them.

It came at last to be used for commissioners, to whom the prætor referred the determination of any affair between one subject and another. *Pitisc.* in voc.

RECURVIROSTRA, in zoology, the name of a very remarkable bird, so called from the remarkable bending upwards of its beak, and named *avosetta* by the Italians.

It is a little larger than the common lapwing, weighing usually about ten ounces; its beak is three fingers breadth long, very slender, black, and flatted, and bending upwards, which is peculiar to it alone. Its head is moderately large and very round, and both that and the upper part of the neck is black, only that there is a small variegation of grey just behind the head. Its breast, belly, and throat are all of a snowy whiteness, and its back is variegated with black and white; its wings are also variegated with black and white; its tail is all white; its legs very long and blueish, and feathered half way down below the knees. It is very common in Italy, and is not unfrequently seen about the eastern shores of England. *Ray's* Ornithol. p. 241.

RED (*Cycl.*)—To make a deep *red* in glass, the following method is that most practised by the glass-men. Take crystal fritt twenty pounds, broken pieces of white glass one pound, calcined tin two pound, mix these well together, and put them into a pot to melt and purify; when these are melted, take steel calcined, scales of iron from the smith's anvil, both powdered very fine, of each an equal quantity; put leisurely an ounce of this mixed powder to the before-mentioned metal, mix all well together, and let them stand six or eight hours in fusion, to incorporate; take out a proof after this, and if there be too little of the powder, it will appear of a dusky yellow; then more of the powder must be added, and then add three quarters of an ounce of calcined brass ground to a fine powder; mix them thoroughly together, and the mass will be of a blood *red*; continue stirring the whole together, and frequently taking out proofs of the colour; when it is right, work it immediately, otherwise it will lose its colour and become black. The mouth of the pot must in this process be left open, else the colour will be lost. *Neri's* Art of Glass, p. 100.

Blown red, in the porcelain manufacture, a name given to a peculiarly coloured china ware of a spangled *red*, or to the colour alone that spangles it. It is an ornament easily introduced into use in our own manufactories of porcelain ware, and is done in the following manner. The colour is to be prepared of common copperas, calcined to a *red* colour in a charcoal fire, in a crucible, with another luted on the top of it inverted, and with a hole in its bottom. The signal of the calcination being finished, is, when the black clouds cease to come up through the hole, and a fine white thin vapour arises in their place. The vessels are to be then suffered to cool, and the *red* matter in them is to be reduced to a fine powder; while the vessels to be coloured with this are yet wet. The operator is to provide a glass pipe, and covering one end of it with a piece of fine gawse; he is to dip this into the powder, and taking it carefully out, with what little is sticking to it, he is to blow against the vessel at some distance from it: thus the finest part of the powder only will reach the vessel, and will be laid on in form of glittering spangles, very small, but all distinct. This is a sort of colouring much esteemed by the Chinese themselves, and they have a way of using the common blue in the same manner; but few of the vessels, thus painted, come over to us. Observ. de l'Asie.

Red *game*, an English name of a bird, common in the mountainous parts of Yorkshire, and some other of our northern counties. It is of the shape of a partridge, but much larger, and of a mixed colour of red and black, and is feathered down to the ends of the toes. See the article Gor-*cock*.

Indian Red, a name used by the colourmen and painters for a kind of purple ochre, brought from the island of Ormus in the Persian gulf, and used as a red colour. It is called among the authors on these subjects *terra persica*. *Hill's* Hist. of Foss. p. 58.

Red *land*, in agriculture, a term much used by husbandmen, to express a sandy soil of a reddish hue, interspersed for the most part with pieces of sand stone of the same colour, or somewhat deeper.

There are several varieties of this soil, one of which is almost entirely made up of sand; another with an admixture of clay with the sand, the whole making a loose loamy earth; and a third, full of fragments, of a poor sandy iron ore, and often containing shining specks of selenitæ. *Moreton's* Northamp. p. 40.

Red-*lead*. See the article Minium.

Red-*shank*, in zoology, the name of a water bird, called by authors *gallinula erythropus*, and *callidrys*. It is about the size of the common plover. The back is of a greyish or brownish green, usually spotted with black; its neck grey, and its throat variegated with black and white; the breast is white, with a few loose streaks of black. The wing feathers are variegated with black, brown, and white; the breast is two fingers breadth long, slender, and shaped like the beak of the woodcock; reddish at the base, and blackish lower down. Its legs are of a fine beautiful red, and the hinder toe is very short and small. *Ray's* Ornithol. p. 221.

Red *start*, in zoology, the English name of the *ruticilla*, a very beautiful bird, with a white spot on his head and a red tail. See the article Ruticilla.

Red *weed*, in botany, a name given to a plant common in Bermudas, and some other places; and called by our first travellers to that part of the world the *summer island redweed*. Its berry is of a fine red colour, and affords a tincture little inferior to that of cochineal, and possessing all its virtues in medicine; the only misfortune of this, and some other very fine vegetable colours, is, that they fade soon. The juice of the fruit of the opuntia, or prickly pear, is as fine a dye as can be procured from the cochineal, but it will not stand; the insect feeding on this, however, we find affords a colour of the same nature, that will stand. The fruit of the *red weed* is in the same manner liable to be eaten by insects as that of the prickly pear, and it is worthy a trial, whether its colour obtained at second hand from those insects, will not stand as well as the cochineal does, and whether the insects may not be propagated in a sufficient abundance to serve the markets in the same manner. Phil. Transf. N°40.

Red *wing*, in zoology, the name of a bird of the turdus, or thrush kind, called also in some places the *wind thrush*, or *swine pipe*, and by authors the *turdus iliacus*, or *tylas*.

It is a little smaller than the common thrush, and is less spotted. Its back, neck, and head are of the same colour with those of the common thrush; but its sides, under the wings, and the feathers which line the wings, are of an orange colour, or dusky red; its belly and breast are whitish, and its throat yellowish, with brown spots: the wings are of a sort of chesnut colour, a little variegated. It feeds on insects, as worms, and the like; and is a bird of passage, coming to us at the same time with the fieldfare, and leaving us also when that bird does. It is not well known where they breed, though some have guessed it to be in the mountains of Germany and Bohemia. They have a bitterish taste, and are less valued than the fieldfare. *Ray's* Ornithol. p. 139.

REDDLE, (*Cycl.*) the common English name for the substance, called in Latin *rubrica*, and used in painting, and for marking sheep, &c. *Hill's* Hist. of Foss. p. 48. See the article Rubrica.

REDIMICULUM, among the Romans, a girdle, which going about the neck, divided on the breast, and passing down each side, went round, and kept the robe tight to the body. See *Pitisc.* in voc.

REDUCTION, (*Cycl.*) in metallurgy, is the bringing back metalline substances, which have been changed into *scoriæ* or ashes, or otherwise divested of their metallic form, into their natural and original state of metals again. *Cramer's* Art of Assaying, p. 185.

All metals and semi-metals may be reduced by proper management, whatever have been their changes, except only zink, which having been burnt to ashes, admits of no *reduction*. But the mixture of gold, and silver, was never yet

yet radically diſſolved by any experiment, whatever ſome may have imagined. Even ſome earths will turn into metals by the admixture, and intimate union of a phlogiſton, or inflammable principle; but theſe metals never need any ſuch principle to aſſiſt their *reduction*. Ibid. p. 186.

REDUNDANT (*Cycl.*)—REDUNDANT *interval*, in muſic, is uſed for an interval exceeding the truth by a comma. See INTERVAL.

Some apply *redundant* to an interval exceeding a diatonic interval by a ſemitone minor; but this is more uſually called a ſuperfluous interval. See the articles SECOND, *Cycl.* and, INTERVAL, *Suppl.*

REDUVIA, in medicine, a word uſed by ſome for a whitlow, and by others for a painful crack, or other diſorder about the nails, either of the fingers or toes.

REED, *arundo*, in botany. See ARUNDO.

REED, *calamus*, likewiſe denotes a ſort of meaſure, otherwiſe called *canna*. See CANNA.

REED *ſparrow*, the Engliſh name of a bird by many eſteemed of the picus, or wood-pecker kind, having ſhort legs, and climbing up *reeds*, &c. as the other upon trees; but it wants the great character of that genus of birds, having its toes placed only one behind, and three before, as in the generality of other birds. There are two ſpecies of this bird, a greater and a leſſer; the firſt called by authors *junco*, and *cinclus*, and the other *cannevarola*, and by ſome *paſſer arundinaceus minor*. *Ray*'s Ornitholog. p. 99. See the articles JUNCO and CANNEVAROLA.

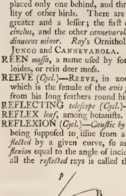
REEN *moſſa*, a name uſed by ſome for the mountain coralloides, or rein deer moſs.

REEVE (*Cycl.*)—REEVE, in zoology, the name of a bird which is the female of the *avis pugnax*; the male of which, from his long feathers round his neck, is called the *ruffe*.

REFLECTING *teleſcope* (*Cycl.*)—See TELESCOPE.

REFLEX *leaf*, among botaniſts. See LEAF.

REFLEXION (*Cycl.*)—*Cauſtic by* REFLEXION. Rays of light being ſuppoſed to iſſue from a given point, and to be *reflected* by a given curve, ſo as to make the angle of *reflexion* equal to the angle of incidence; a curve that touches all the *reflected* rays is called the *cauſtic by reflexion*.



Thus, let S be the given point from whence the rays iſſue, S L any incident ray, P L p the tangent at L, L C the radius of curvature at L, L m the *reflected* ray conſtituting the angle C L m, equal to C L S; then if the *reflected* rays always touch the curve $h\,m\,e$, it is the cauſtic by *reflexion*.

Again, let S P, perpendicular to the tangent L P, meet it always in P, a point of the curve D P; let H M E be the curve, by the evolution of which D P is deſcribed, and let P M touch H M E in M; join S M, and produce it to m, ſo that S m be equal to 2 S M: then will m be a point in the cauſtic of the curve B L, when S is the radiating point.

Hence, if perpendiculars be always drawn from the radiating point to the tangents of the *reflecting* curve, and a new curve be ſuppoſed to be the locus of the interſections of the perpendiculars and tangents, then will the evoluta of that new curve be ſimilar, and ſimilarly ſituated to the cauſtic by *reflexion* of the propoſed *reflecting* curve. See *Mac Laurin*'s Fluxions, Art. 409.

The point m may be thus found. Let C R be perpendicular to L R, the *reflected* ray, and let $L s = L S$; then if L R be biſected in q, $q\,m$ will be a third proportional to $q\,s$ and q R; that is, $q s : q R :: q R : q m$, or $s q \times q m = \overline{qR}^2 = \overline{qL}^2$. Id. Art. 410.

Mr. de l'*Hopital*, in his Analyſe des Inf. Petits, Sect. 6. has treated of cauſtics by *reflexion*.

Point of REFLEXION, in geometry. See POINT *of reflexion*.

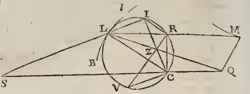
REFRACTED (*Cycl.*)—REFRACTED *angle*, in optics, the angle contained between the *refracted* ray and the perpendicular.

REFRACTION (*Cycl.*)—REFRACTION *to the perpendicular*, in optics, is when a ray falls from a leſs denſe into a more denſe medium, and ſo approaches nearer the perpendicular.

REFRACTION *from the perpendicular*, in optics, is when a ray falling inclined from a more denſe medium into one leſs denſe, in breaking departs further from the perpendicular.

Cauſtics by REFRACTION. When rays of light, iſſuing from a given point, are *refracted* at any curve, ſo that the ſine of the angle contained by the *refracted* ray, and the perpendicular to the curve, is always to the ſine of the angle contained by the incident ray, and that perpendicular, in one conſtant ratio, the curve that touches all the *refracted* rays, is called the *cauſtic by refraction*.

Let S be the radiating point, S L any incident ray on the curve B L l, L R the *refracted* ray, C the center of the curvature at L, C I perpendicular on the incident ray in I, C R perpendicular to the *refracted* ray in R; join S C



and I R; let R Z, perpendicular to R I, meet C I in Z; join L Z, meeting S C in Q; and let Q M, parallel to R Z, meet the *refracted* ray L R in M; then will the point M be in the cauſtic. See *Mac Laurin*'s Fluxions, Art. 413.

The point M may alſo be determined, by deſcribing a circle L I R C on the diameter L C, and by drawing V C parallel to S L; then applying R C in this circle, ſo that it may be to C I, in the given ratio of the ſine of *refraction*, to the ſine of incidence, joining V R, that meets C I perpendicular from C to the incident ray in Z, joining L Z that meets S C in Q, and drawing Q M parallel to V R. When L Z is parallel to S C, the *refracted* ray is the aſſymptot to the cauſtic. Ib. Art. 414.

The Marquis de l'Hopital has treated of *cauſtics by refraction*, in his Anal. des Inf. Pet. Sect. 7.

REFRANGIBLE, whatever is capable of being refracted. See REFRANGIBILITY, *Cycl.*

REFRIGERATORY, (*Cycl.*) a term uſed for a veſſel of cold water, through which the worm of the alembic paſſes in the common method of diſtillation, by means of which the vapours are condenſed. It is alſo uſed for the bucket head of the common ſmall alembic, containing water for the ſame purpoſe.

REFUTATION, *refutatio*, in rhetoric, that part of the anſwer made to an opponent, which diſproves what had been advanced by him. *Voſſ.* Rhet. l. 5. p. 382.

REGENERATED *tartar*. See TARTARUS *regeneratus*.

REGERENDARIUS, among the Romans, an officer who ſubſcribed and kept a regiſter of all petitions preſented to the præfect. *Pitiſc.* in voc.

REGESTOLA, in zoology, a name uſed by ſome authors for the mattageſs, or larger butcher bird, a very ſmall hawk, not exceeding the ſize of a common thruſh, but very fierce and voracious. *Aldrovand*, de Avib. See MATTAGESS and LANIUS.

REGIMEN, (*Cycl.*) in medicine, a regulation of diet, with intent to reſtore, or to preſerve health. In chemiſtry, it ſignifies the due regulation of fire.

REGINA *aurarum*, in zoology, a name given by Nieremberg to a bird called by the Mexicans *cozeacoauhtli*. It has obtained its name from its being able to fly againſt the ſtrongeſt winds. It is of the bigneſs of an eagle, and its whole body is of a blackiſh purple, variegated with a browniſh yellow, and a deep black. Its wings are variegated with black, yellow, and grey. Its legs are red. Its claws very ſtrong and ſharp; and its beak like that of the parrot. It has ſome rugoſe ſkin on the forehead, and about the beak, and its tail is black above, and grey underneath. It feeds on ſnakes, rats, and other vermin, but will alſo eat human dung. It flies very high. It is a native of Mexico, and breeds in ſpring. Its feathers are ſaid to be a remedy for many diſeaſes. But the truth of this account is much to be doubted. *Ray*'s Ornitholog. p. 302.

REGION (*Cycl.*)—REGIONS *of the ſea*. As the naturaliſts, in their deſcriptions of the ſubterranean parts of the globe, diſtinguiſh the earth into three regions of different depths, in which different temperatures are obſerved; ſo in deſcribing the ſea, they allow it two regions; the one extending from the ſurface of the water, down ſo low as the rays of the ſun can pierce, and extend their influence; and the other, from the loweſt bounds of that to the bottom. It is eaſy to ſee, that theſe regions rather regard quality than ſpace, and that their boundaries are far from being regular, or equal in all places, and at all times. The places expoſed to the hotteſt ſunſhine will have the largeſt upper *region*; thoſe where the ſun has leaſt power, will have the ſmalleſt; and the ſame part of the ſea will have its upper *region* more or leſs deep, according to the ſeaſon of the year. This upper *region* of the ſea is always more or leſs hot; the lower *region*, except in ſome few particular places, is every where cold; and the water, where the upper *region* is large, is always remarkably ſtill and quiet in the lower. *Boyle* of Coſmical Qualities.

Subterranean REGION. The earth is not only divided on its ſurface into *regions* and countries, but philoſophers, who have had occaſion to diſcourſe of its inner parts, have alſo divided them into three diſtinct *regions*, according to their different depths from the ſurface. The temperature of the ſubterranean parts of the globe is diſtinguiſhed according to the diviſion of theſe *regions*, but is not ſo regular and

preciſe

precise as some have supposed. The first *region* of the earth is very variable, both as to bounds and temperature. The second *region* seems for the most part cold, in comparison of the other two; but in several places, which, by reason of their distance from the surface of the earth, it would be natural to call the middle *region*, the temperature of the air is very different at the same seasons of the year, which shews that it depends on something more than bare depth from the surface. The third *region* of the earth is universally observed to be warm, but by no means regularly, or uniformly: the same depth in some places, giving only a moderate warmth, while in others it gives a very considerable heat. Borrichius tells us of a certain abbe fond of chemistry, and particularly curious in the matter of long digestions by regular heat, who found a way of making a furnace perpetually warm, by piercing the earth to a certain depth, and using the heat of this third *region* of it. His method, we are told, was to bore a hole with a pike twenty feet deep, and pour into it ten or twelve pounds of quicksilver; this made its way into the strata, and through them in a body into the chambers of heat in this third *region*, where the heat having a vent upwards, made by this opening, never failed to ascend in a perpetual and regular stream, and gave that regular digesting heat that no artificial fire could equal. But this is an alchemical story. *Boyle* of Cosmical Qualities. *Borrich.* de Ortu Chem.

REGION, in antient Rome, a part or division of the city. They were only four in number till Augustus's time, who divided the city into fourteen *regions*, over each of which he settled two surveyors, called *curatores viarum*, who were made annually, and took their divisions by lot. These fourteen *regions* contained 424 streets, 31 of which were called great or royal streets, which begun at the gilt pillar that stood at the entry into the open place in the middle of the city.

The extent of these divisions varied greatly, some being from 12000 or 13000 to 33000 feet and upwards in circumference. Authors, however, are not agreed as to the exact limits of each. See *Kenn.* Rom. Antiq. Not. l. 1. c. 2. p. 34. seq. *Pitisc.* Lex. Antiq. in voc. *regio*. *Danet*, Dict. in voc. *Pancirol.* Descript. Urb. Rom. T. 3. p. 283.

REGRADATION, *regradatio*. See DEGRADATION, *Cycl.*

REGULAR *leap*, in music. See LEAP.

REGULUS (*Cycl.*)—The separation of silver out of the *regulus*, made from the silver ore by means of lead, is to be performed in this manner. Put two coppels of the same bigness, perfectly dry, and capable of containing at least one third more than the *regulus*, under a muffle in an assay-furnace; make a strong fire, and let them be red hot for a quarter of an hour, then free the *regulus* from its scoriæ, by striking it gently with a hammer, and put it carefully into one of the hot coppels, and into the other put, at the same time, the same quantity of granulated lead alone, as was used in the making the *regulus*. When the *regulus* boils and smoaks diminish the fire a little, and let the coppels be kept moderately, but not violently red hot. When it has stood so long, that the skin of litharge, continually produced from the lead, and covering the surface of the *regulus*, disappears, and the coppel shews the scoriæ only of the lead with the pure silver, either in fusion, or hard and bright in the middle, let the coppel continue only a minute or two longer on the fire; then take it out with a pair of tongs, take away the metal in grains, and if any scoriæ, or fragment of the coppel adhere to it, wrap it together in a paper, and squeeze it between the cheeks of a vice, or a pair of tongs, to break off that brittle matter without hurting the *regulus*. If this *regulus* be pure silver, it will now be very white, but if it contain any gold, it will shew it by its yellowness.

To determine exactly how much silver the quantity of ore contained, weigh it nicely in a fine balance, and take out the small *reguline* lumps from the other coppel, and weighing that, deduct its weight from that of the other, because so much silver that owes to the lead used in making it, and the remainder is the proportion of silver contained in the ore. *Cramer's* Art of Assaying, p. 211.

REGULUS *cristatus*, the *crested* or *golden crown wren*, the name of a very beautiful little bird, the smallest of all the European birds. Its whole weight is not more than a dram, and the crown of its head is adorned with a very beautiful saffron coloured, or orange red spot, which is called its crest, and by some its crown, and from this golden crown the bird has obtained the name of the *regulus*, *tyrannus*, *basilcus*, and other appellations of royalty.

This crown the bird can at pleasure draw together, by wrinkling its forehead, and by this means hide it from sight. The edges of this crown are of a pale yellow, and its end circumscribed by a black line. It is of an oblong figure, and is extended strait from the origin of the beak to the back part of the head. The sides of this little bird's neck are of an extremely glossy greenish yellow, and the ambit of its eyes white. Its neck and back are of an obscure yellowish green, and its breast of a dusky white, sometimes of a pale greenish cast. Its wing feathers are brown, with their edges yellowish without, and whitish within; and the middle ones are so tinged in part with black, that when they are folded in the shutting of the wing, they make a black spot in its middle; and the tips of one series of the feathers being white, they make also a white transverse streak on each wing. The tail is brownish, the feet yellow, and the beak half an inch long, and very slender and black. They are common about the Peak in Derbyshire, and in some other parts of England. They sit usually on the tops of oaks, and other high trees. They lay six or seven eggs, not larger than peas. *Ray's* Ornitholog. p. 163.

REGULUS *non cristatus*, in zoology, the name of a bird more commonly known by the name *luteola*, and by some called *asilus*. *Ray's* Ornitholog. p. 164. See LUTEOLA.

REJECTIO, a word used by medical authors for the casting any thing up preternaturally by the mouth, whether it be by vomiting or by spitting.

REINS (*Cycl.*)—REINS, in the manege, a name given by the Duke of Newcastle to two straps, or ropes of a cavesson, which he ordered to be made fast to the girths, or the pommel of the saddle, with intent that the rider should pull them with his hand, in order to bend and supple the neck of the horse.

False REIN is a lath of leather passed sometimes through the banquet, to bend the horse's neck, which is disapproved of by the Duke of Newcastle; by reason it slacks the curb, and makes the bit no more than a trench that has no curb.

REIS *effendi*, in the Turkish affairs, an officer of state answering to our chancellor.

RELAIS, in fortification, a French term, the same with *berme*. See BERME, *Cycl.*

RELATION, *relatio*, in rhetoric, is sometimes used to signify the same with recrimination. See RECRIMINATION, *Cycl.*

REMANCIPATION, *remancipatio*, among the Romans, a form of divorce observed in marriages that had been contracted by *coemption*. This was done by delivering the wife into the husband's hands; so the marriage was dissolved by the husband's redelivering the wife into any person's hands, agreed upon between them. *Pitisc.* in voc. See COEMPTION.

REMISSION (*Cycl.*)—REMISSION, *remissio*, ανεσις, in the antient music, was used to signify the passage of the voice from acute to grave; being opposite to intention. *Aristoxen.* p. 10—13. *Aristid.* Quint. p. 8, 9.

REMOLADE, or CHARGE, in the manege. See the article CHARGE, *Cycl.*

REMORA (*Cycl.*)—This is a small oblong fish, whose body is of a cylindric figure, and tapers off to a thinness at the tail. Its mouth is triangular, and the upper part is shorter than its under. Its head is flat, and marked with streaks, so as to look like the palates of some fishes: these run transversely, and are carried on to the back, making a striated substance of two fingers breadth, by which it fastens itself to any other substance, as the body of a larger fish, the hulk of a ship, or the like. The eyes are small and yellow, with a black pupil. It has no teeth, but in their places a multitude of small prominences. It has two fins under the gills, and two more lower on the body. Beside these it has two longitudinal fins, one on the back, the other on the belly, running the length of the body to the tail. The whole fish is of a greyish colour, and it is caught in the East and West Indies, and in many other seas. See Tab. of Fishes, Nº 14. and *Marcgrave's* Hist. Bras. p. 117.

REMORA *mutiani*, in natural history, a name given by some to the genus of shells called *concha venerea*, and *porcellana*. See PORCELLANA.

REMOTION, *remotio*, in rhetoric, the same with what is otherwise called *metastasis*. See METASTASIS.

REMOULIN, in the manege, is used to denote a star upon a horse's forehead.

REMPHAN, in antiquity, the Egyptian name for the planet Saturn. Some think that *remphan* was the moon. See the article CHIUN.

REMURIA, among the Romans, a festival instituted in honour of Remus by his brother Romulus. Mem. Acad. Inscr. Vol. 1. p. 45.

RENALIS *lapis*, in natural history, the name given by many authors to a sort of siderochitum, or crustated ferrugineous body of that kind, containing a nucleus of a different matter from that of the crusts. It is found about Prague, and in some other places, lying near the surface in strata of a yellow clay. Its usual bigness is that of a ripe peach, and its crusts are of a dusky ferrugineous brown colour; and its internal nucleus of a pale yellowish green, composed of a marley earth, and usually of a kidney-like shape, whence its name.

RENDS, in a ship, are the same as the seams between her planks.

RENES (*Cycl.*)—RENES *succenturiati*. Valsalva has endeavoured to prove the *renes succenturiati*, or *glandulæ renales*, to be organs of generation, or assistant to them. Valsalva claimed this discovery. Mr. Ranby suspected that the duct which

which the Italian journals mentioned, as the principal part of this discovery, was no other than an artery sent off from that of the capsula on each side, to the testicles of men, and ovaria of women. Morgagni explained Valsalva's doctrine more fully. Valsalva gives the following reasons for his opinion. He observes the seminary vessels of several fowls to come out from these capsulæ, before they are sent from the testicles. In the viper and water tortoise, he remarks such membranous connections between the *renes succenturiati*, and testicles, as make it probable that such excretories are sent through the capsulæ to the testicles. He affirms, his having seen vessels, which were neither nervous, sanguiferous, or lymphatic, going from the human capsulæ to the testicles. His observations are much the same as to females. To these he subjoins the consent and sympathy observed between the loins and genital parts. To confirm all, he cut away one testicle, and extirpated the *kidney* of the opposite side, of a whelp. The wounds healed, but the creature was of a very lax habit, and so far from attempting coition, that he did not seem fond of bitches when they were proud. Acad. Bonon. Comment. p. 376. & seq. See also Phil. Transf. N° 387. Sect. 3. where we have an inquiry into this discovery, made by Valsalva, of an excretory duct from the glandula renalis to the epididymis by Mr. John Ranby. And in N° 395. Sect. 12. there are mentioned, by the same gentleman, two newly discovered arteries in women going to the ovaria; which he thinks to be probably the same with what Valsalva took for excretory ducts of the glandulæ renales. Valsalva's discovery was first mentioned in the *giornale di leterati* of Venice for 1719, and inserted in the Phil. Transf. N° 385. Sect. 9.

RENETTE, in the manege, is an instrument of polished steel, with which they found a prick in a horse's foot.

RENIFORM *leaf*, among botanists. See LEAF.

RENTAL, a roll wherein the rents of a manor are written and set down, and by which the lord's bailiff collects the same: it distinguishes the lands and tenements, and the names of the tenants, the several *rents* arising, and for what time, usually a year. Comp. Court Keep. 475.

REPART, in the manege, is to put a horse on, or make him part a second time.

REPAND *leaf*, *repandum folium*, among botanists. See the article LEAF.

REPHON. See the article REMPHAN.

REPOLON, in the manege, is a demivolte, the croupe in, closed at five times. The Italians are mighty fond of this sort of manege. In making a demivolte, they ride their horses short, so as to embrace or take in less ground, and do not make way enough every time of the demivolte.

REPRISE, in the manege, is a lesson repeated, or a manege recommenced. Thus we say to give breath to a horse upon the four corners of the volte with only one *reprise*, that is, all with one breath.

REPROOF, *objurgatio*, in rhetoric, is distinguished from *invective*. See the article INVECTIVE.

REPRODUCTIVE *system of preservation*. See the article ANNIHILATION.

RERE *county*, a word used in the statutes of Westm. 2. c. 39. And 2 Ed. 3. c. 5. And seems by those statutes to be some public place, which the sheriffs appointed for the receiving of the king's money after his county court was done. *Terms of Law*. *Blount*.

REPUDIUM, among the Romans. See DIVORCE.

RESCUSSOR, in law, the party that commits a *rescous*. 2 Cro. 419. *Blount*.

RESEDA, *base rocket*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the polypetalous anomalous kind, consisting of several dissimilar petals; from the cup of which there arises a pistil, which finally becomes a membranaceous capsule usually of a trigonal form, or else square, though sometimes oblong and cylindric, and containing roundish seeds.

The species of *reseda* enumerated by Mr. Tournefort are these. 1. The common *reseda*. 2. The French *reseda* with curled leaves. 3. The broad leaved *reseda* with yellow flowers. 4. The white flowered *reseda* with leaves like the calcitrapa. 5. The common small *reseda*, called by many authors the phyteuma. 6. The common lesser *reseda* with leaves not so deeply cut. 7. The common whole or uncut leaved small *reseda*. *Tourn*, Inst. p. 423.

RESIANT *rolls*, are rolls wherein the *resiants* of a tithing, &c. are set down. Comp. Court Keep.

RESIDUARY *legatee*, is he to whom the *residuum*, or what remains of an estate, after funeral charges, debts, and legacies are paid, is left by will.

RESIN (*Cycl.*)—According to Theophrastus *resin* was obtained by stripping off the bark from pines, and by incisions made in the silver fir and the pitch pine. The inhabitants of mount Ida, he tells us, stripped the trunks of pines, on the sunny side two or three cubits from the ground. He observes, that a good pine might be made to yield *resin* every year, but the indifferent pines only every other year, and the weaker trees once in three years; and that three runnings were as much as a tree could bear. It is remarked by the same author, that a pine doth not at once produce fruit and *resin*; but the former only in its youth and the latter in its old age.

RESISTANCE (*Cycl.*)—RESISTANCE *of fluids*. The greatest part of authors have established it as a certain rule, that, whilst the same body moves in the same medium, it is always *resisted* in the duplicate proportion of its velocity; that is, if the *resisted* body move in one part of its track, with three times the velocity with which it moved in some other part, then its *resistance* to the greater velocity will be nine times the *resistance* to the lesser. If the velocity in one place be four times the velocity in another, the *resistance* to the greater velocity will be sixteen times the *resistance* to the lesser, and so on. This rule, though excessively erroneous, when taken in a general sense, is yet undoubtedly very near the truth, when confined within certain limits.

In order to conceive the *resistance of fluids* to a body moving in them, it is necessary to distinguish between those fluids which being compressed by some incumbent weight, perpetually close up the space deserted by the body in motion, without permitting, for an instant, any vacuity to remain behind it; and those fluids in which (they being not sufficiently compressed) the space left behind the moving body remains for some time empty. These differences, in the resisting fluids, will occasion very remarkable varieties in the laws of their *resistance*, and are absolutely necessary to be considered in the determination of the action of the air in shot and shells; for the air partakes of both these affections, according to the different velocities of the projected body.

If a fluid was so constituted, that all the particles composing it were at some distance from each other, and there was no action between them, then the *resistance* of a body moving therein, would be easily computed, from the quantity of motion communicated to these particles: for instance, if a cylinder moved in such a fluid in the direction of its axis, it would communicate to the particles it met with a velocity equal to its own, and in its own direction, supposing that neither the cylinder, nor the parts of the fluid were elastic; whence, if the velocity and diameter of the cylinder be known, and also the density of the fluid, there would thence be determined the quantity of motion communicated to the fluid, which (action and re-action being equal) is the same with the quantity lost by the cylinder, consequently the *resistance* would be hereby ascertained.

In this kind of discontinued fluid, the particles being detached from each other, every one of them can pursue its own motion in any direction, at least for some time, independent of the neighbouring ones; wherefore, if, instead of a cylinder, moving in the direction of its axis, a body, with a surface oblique to its direction, be supposed to move in such a fluid, the motion the parts of the fluid will hereby acquire, will not be in the direction of the *resisted* body, but perpendicular to its oblique surface; whence the *resistance* to such a body will not be estimated from the whole motion communicated to the particles of the fluid, but from that part of it only, which is in the direction of the *resisted* body. In fluids then, where the parts are thus discontinued from each other, the different obliquities of that surface, which goes foremost, will occasion considerable changes in the *resistance*; although the section of the solid, by a plain perpendicular to its direction, should in all cases be the same. And Sir Isaac Newton has particularly determined, that in a fluid thus constituted, the *resistance* of a globe is but half the *resistance* of a cylinder of the same diameter, moving in the direction of its axis with the same velocity.

But though the hypothesis of a *fluid*, thus constituted, be of great use in explaining the nature of *resistances*; yet, in reality, no such fluid does exist within our knowledge: all the *fluids* with which we are conversant are so formed, that their particles either lie contiguous to each other, or at least act on each other in the same manner, as if they did; consequently, in these fluids, no one particle, contiguous to the *resisted* body, can be moved, without moving at the same time a great number of others, some of which will be distant from it; and the motion thus communicated to a mass of the *fluid* will not be in any one determined direction, but will in each particle be different, according to the different manners in which it lies in contact with those, from which it receives its impulse; whence, great numbers of the particles, being diverted into oblique directions, the *resistance* of the moving body, which will depend on the quantity of motion communicated to the fluid in its own direction, will be hereby different in quantity, from what it would be in the preceding supposition, and its estimation becomes much more complicated and operose.

If the fluid be compressed by the incumbent weight of its upper parts (as all fluids are with us, except at their very surface) and if the velocity of the moving body be much less than that with which the parts of the fluid would rush into a void space, in consequence of their compression; it is evident, that in this case the space left by the moving body will be instantaneously filled up by the fluid; and the parts of the fluid, against which the foremost part of the body presses in its motion, will, instead of being impelled forwards in the direction

direction of the body; circulate, in some measure, towards the hinder part of the body, thereby to restore the equilibrium, which the constant influx of the *fluid* behind the body would otherwise destroy; whence the progressive motion of the fluid, and consequently the *resistance* of the body, which depends thereon, would be, in this instance, much less than in our first hypothesis, where each particle was supposed to acquire, from the stroke of the *resisting* body, a velocity equal to that, with which the body moved, and in the same direction. Sir Isaac Newton has determined, that the *resistance* to a cylinder, moving in the direction of its axis, in such a compressed fluid as we have here treated of, is but one fourth part of the *resistance*, which the same cylinder would undergo, if it moved with the same velocity, in a fluid, constituted in the manner we have described in our first hypothesis, each fluid being supposed to be of the same density.

But again, it is not only in the quantity of their *resistance* that these fluids differ, but likewise in the different manner, in which they act on solids of different forms moving in them. We have shewn, that in the discontinued fluid, which we first described, the obliquity of the foremost surface of the moving body would diminish the *resistance*; but in compressed fluids this holds not true, at least not in any considerable degree; for the principal *resistance* in compressed fluids arises from the greater or lesser facility, with which the fluid, impelled by the forepart of the body, can circulate towards its hindermost part; and this being little, if at all, affected by the form of the moving body, whether it be cylindrical, conical, or spherical, it follows, that while the transverse section of the body, and consequently the quantity of impelled fluid is the same, the change of figure in the body will scarcely affect the quantity of its *resistance*.

And this case, that is, the *resistance* of a compressed fluid to a solid, moving in it with a velocity much less than what the parts of the fluid would acquire from their compression; this case, I say, has been very fully considered by Sir Isaac Newton, who has ascertained the quantity of such a *resistance*, according to the different magnitudes of the moving body, and the density of the fluid. But he very expressly informs us, that the rules he has laid down are not generally true, but upon a supposition that the compression of the fluid be increased in the greater velocities of the moving body: however, some unskilful writers who have followed him, overlooking this caution, have applied his determinations to bodies moving with all kinds of velocities, without attending to the different compressions of the fluids they were *resisted* by; and by this means they have accounted the *resistance* of the air to musket and cannon-shot, to be but one third part of what it is found to be by experience.

Indeed, from all we have said, it appears plain enough, that the *resisting* power of the medium must be increased, when the *resisting* body moves so fast, that the fluid cannot instantaneously press in behind it, and fill the deserted space; for when this happens, the body will be deprived of the pressure of the fluid behind it; which in some measure balanced its *resistance*, and must support on its forepart the whole weight of a column of the fluid, independent of the motion it gives to the parts of the fluid; and besides, the motion in the particles driven before the body, is, in this case, less affected by the compression of the fluid, and consequently they are less deflected from the direction, in which they are impelled by the *resisted* surface; whence this species of *resistance* approaches more and more to that described in our first hypothesis, where each particle of the fluid being unconnected with the neighbouring ones, it pursued its own motion, in its own direction, without being interrupted or deflected by their contiguity; and therefore, as we before observed, that the *resistance* of a discontinued fluid to a cylinder, moving in the direction of its axis, was four times greater than the *resistance* of a fluid sufficiently compressed of the same density, it follows, that the *resistance* of a fluid, when a vacuity is left behind the moving body, may be near four times greater than that of the same fluid, when no such vacuity is formed; for when a void space is thus left, we have shewn the *resistance* to approach, in its nature, to that of a discontinued fluid.

This then may probably be the case in a cylinder moving in the same compressed fluid, according to the different degrees of its velocity; so that if it set out with a great velocity, and moves in the fluid till that velocity be much diminished, the resisting power of the medium may be near four times greater in the beginning of its motion than in the end. In a globe the difference will not be so great, because, on account of its oblique surface, its *resistance* in a discontinued medium, is but about twice as much as in one properly compressed; for its oblique surface diminishes its *resistance* in one case, and not in the other: however, as the compression of the medium, even when a vacuity is left behind the moving body, may yet confine the oblique motion of the parts of the fluid, which are driven before the body, and as in an elastic fluid (as is our air) there will be some degree of condensation in those parts; it is highly probable, that the *resistance* of a globe, moving in a compressed fluid with a very great velocity, will be between that of a globe and of a cylinder, in a discontinued medium; that is, (in proportion to its velocity) we may suppose it be more than twice, and less than four times the *resistance* of the same globe, moving slowly through the same medium; whence, perhaps, we shall not much err in supposing the globe in its swiftest motions to be resisted near three times more, in proportion to its velocity, than when it is slowest.

And as this increase of the *resisting* power of the medium will take place, when the velocity of the moving body is so great, that a perfect vacuity is left behind it, so some degree of augmentation will be sensible in velocities much short of this; for even when, by the compression of the fluid, the space left behind the body is instantaneously filled up; yet, if the velocity, with which the parts of the fluid rush in behind, is not much greater than that, with which the body moves; the same reasons we have urged above, in the case of an absolute vacuity, will hold in a less degree in this instance; and therefore we are not to suppose, that, in the increased *resistance*, which we have hitherto treated of, it immediately vanishes, when the compression of the fluid is just sufficient to prevent a vacuum behind the *resisted* body; but we must consider it as diminishing only, according as the velocity, with which the parts of the fluid follow the body, exceeds that with which the body moves.

Hence then we conclude, that if a globe sets out in a *resisting* medium, with a velocity much exceeding that with which the particles of the medium would rush into a void space, in consequence of their compression, so that a vacuum is necessarily left behind the globe in its motion; the *resistance* of this medium to the globe will be near three times greater, in proportion to its velocity, than what we are sure, from Sir Isaac Newton, would take place in a slower motion. We may further conclude, that the *resisting* power of the medium will gradually diminish, as the velocity of the globe decreases, till at last, when it moves with velocities which bear but a small proportion to that, with which the particles of the medium follow it, the *resistance* becomes the same with what is assigned by Sir Isaac Newton in the case of a compressed fluid.

And from this determination we may learn how false that position is, which asserts the resistance of any medium to be in the duplicate proportion of the velocity of the *resisted* body; for it plainly appears, by what we have said, that this can only be considered as nearly true in small variations of velocity, and can never be applied in the comparing together the *resistances* to all velocities whatever, without the most enormous errors. See new Principles of Gunnery, by Mr. *Robins*, Part 2. Prop. 1.

As to the *resistance* of the air, it has been thus determined from experiments. Mr. Robins, in his New Principle of Gunnery, pag. 74, 75, &c. having taken a musket barrel, and charging it successively with a leaden ball of three quarters of an inch diameter, and about half its weight of powder, and taking such precaution in weighing of the powder, and placing it, as to be sure, by many previous trials, that the velocity of the ball could not differ by 20 feet in 1′ from its medium quantity. It was fired against a pendulum (described under the head GUNNERY, *Append.*) placed at 25 feet, 75 feet, and at 125 feet distance from the mouth of the piece respectively. In the first case it impunged against the pendulum with a velocity of 1670 feet in 1′; in the second case with a velocity of 1550 feet in 1′; and in the third case with a velocity of 1425 feet in 1′; so that in passing through 50 feet of air, the bullet lost a velocity of about 120, or 125 feet in 1″; and the time of its passing through that space being about $\frac{1}{32}$, or $\frac{1}{30}$ of 1″, the medium quantity of *resistance* must, in these instances, have been about 120 times the weight of the ball; which, as the ball was nearly $\frac{1}{12}$ of a pound, amounts to about 10 lb. avoirdupoise.

Now if a computation be made, according to the me hod laid down for compressed fluids in the 38th Propos. of lib. 2. of Sir Isaac Newton's Principia, supposing the weight of water to be to the weight of air, as 850 to 1, it will be found that the *resistance* of a globe of three quarters of an inch diameter, moving with a velocity of about 1600 feet in 1″, will not, on those principles, amount to any more than a force of $4\frac{1}{6}$ lb. avoirdupoise; whence we may conclude (as the rules in that proposition for slow motions are very accurate) that the *resisting* power of the air in slow motions is less than in swift motions, in the ratio of $4\frac{1}{6}$ to 10, a proportion between that of 1 to 2, and 1 to 3.

Again, charging the same piece with equal quantities of powder, and balls of the same weight, and firing three times at the pendulum, placed at 25 feet distance from the mouth of the piece, the medium of the velocities with which the ball impinged was 1690 feet in 1″. Then removing the piece 175 feet from the pendulum, the velocity of the ball, at a medium of five shots, was 1300 feet in 1′. Whence the ball, in passing through 150 feet of air, lost a velocity of about 390 feet in 1′; and the *resistance*, computed

puted from these numbers, comes out something more than in the preceding instance, amounting to between 11 and 12 pounds avoirdupoise: whence, according to these experiments, the *resisting* power of the air to swift motions is greater than in slow ones, in a ratio which approaches nearer to the ratio of 3 to 1, than in the preceding experiments.

Next, to examine this *resistance* in smaller velocities, the pendulum being placed at 25 feet distance, was fired at five times, and the mean velocity with which the ball impinged was 1180 feet in 1″. Then removing the pendulum to the distance of 250 feet, the medium velocity of five shot at this distance, was 950 feet in 1″; whence the ball, in passing through 225 feet of air, lost a velocity of 230 feet in 1″, and as it passed through that interval in about $\frac{2}{11}$ of 1″, the *resistance* to the middle velocity will come out to be near $33\frac{1}{3}$ times the gravity of the ball, or 2 lb. 10 oz. avoirdupoise. Now the *resistance* to the same velocity, according to the laws observed in slower motions, amounts to $\frac{7}{11}$ of the same quantity; whence in a velocity of 1065 feet in 1″, (the medium of 1180 and 950) the *resisting* power of the air is augmented in no greater proportion than of 11 to 7; whereas in greater degrees of velocity, as before, it amounted very near to the ratio of 3 to 1.

That this *resisting* power of the air to swift motions, is very sensibly increased beyond what Sir Isaac's theory for slow motions makes it, seems hence to be evident. It being, as has been said, in musket, or cannon shot, with their full charge of powder, near three times the quantity assigned by that theory.

The *resistance* of a bullet of three quarters of an inch diameter, moving in air with a velocity of 1670 feet in 1″, amounting, as we said, to 10 lb. the *resistance* of a cannon ball of 24 lb. fired with its full charge of powder, and thereby moving with a velocity of 1650 feet in 1″ (which scarce differs from the other. See GUNNERY, *Append.*) may hence be determined. For the velocity of the cannon ball being near the same as the musket bullet, and its surface above 54 times greater, it follows, that the *resistance* on the cannon ball will amount to more than 540 lb. which is near 23 times its own weight. And from hence it appears how rash and erroneous the opinion of those is, who neglect the consideration of the *resistance* of the air as of no importance in the doctrine of projectiles. See PROJECTILE.

RESPIRATION (*Cycl.*)—The alternate motion of the thorax and lungs in *respiration* is evident, but it is not easy to determine the mechanism by which these motions are performed. Dr. Martin thinks this has not been accounted for in a satisfactory manner, either by Swammerdam, Borelli, Ballivi, Pitcairn, or Boerhaave, and has given us an essay on this subject in the Medic. Ess. Edinb. Vol. 1. Art. 12.

Dr. Hoadley [a] endeavours to prove, that the external intercostal muscles serve for *inspiration*, while the internal intercostals are their antagonists, depressing their ribs in *expiration*. He thinks it proved by Dr. Hales's experiments [b], that there is air in the cavity of the thorax, between the lungs and the pleura, and endeavours to take off the force of Dr. Houston's asserting that he saw the lungs and pleura contiguous. He grants, however, that sometimes there may be little or no air. He accounts for *respiration* much in the same way with those who assume the contiguity of the lungs and pleura. He joins with those who think the impetus, which the internal surface of the lungs sustains in common *respiration*, to be very little. The uses of *respiration* are, to discharge from the venal blood and chyle, such parts as are unfit to render them arterial blood, and to admit air into the blood. From this doctrine he accounts for the phænomena of the diseases of the lungs. He subjoins the picture and description of an ingenious instrument for illustrating the manner in which *respiration* is performed. —[[a] Lectures on Respiration. [b] Veget. Statics exp. 112, 113. and *Hæmastat.* p. 83.]

Organs of RESPIRATION, in fly worms. These afford us not only great matter of admiration in their general structure, but by their almost endless variety in the different species of these creatures, give ample room for the forming classes and genera from them.

The first class of these creatures is of those with variable heads, whose organs of *respiration* are principally behind, the large sensible stigmata, or breathing holes, being placed there; and which have no scaly legs, nor any regularly formed membranaceous ones; and which have, under their belly, certain fleshy protuberances, each seeming a portion of a ring, which is inflated at certain times.

These are the characters common to a vast class of these creatures, which are transformed into two winged flies; but seem never to be the marks of those which are produced from the eggs of the four winged class. *Reaumur's* Hist. Insect. Vol. 4. p. 164.

RESPONDEAS *ouster*, in law, is to answer over in an action to the merits of the cause.

RESSELA, a term used by Paracelsus to signify, as himself explains it, any thing that expels heat, in opposition to *assa*, which with him signifies any thing that promotes it.

REST (*Cycl.*)—Monsieur de Maupertuis asserts, that when bodies are in equilibrio, they must be so situated, that if any small motion be impressed on them, the quantity of action resulting will be the least possible. This he calls the law of *rest*, and from this law he deduces the fundamental proposition of statics. See Mem. de l'Acad. de Berlin, Tom. 2. p. 294.

Monsieur de Maupertuis deduces the laws of percussion from the same principle. See *Quantity of* ACTION.

REST-*harrow*, *anonis*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the papilionaceous kind. The pistil arises from the cup, and finally becomes a turgid seed vessel, in some species longer, and in others shorter, and usually containing kidney shaped seeds. The characters of the leaves are, that they usually grow three on each stalk, though sometimes they stand singly in other parts of the same plant.

The species of *anonis* enumerated by Mr. Tournefort are these. 1. The common prickly *anonis* with purple flowers. 2. The prickly *anonis* with white flowers. 3. The red flowered *anonis* without prickles. 4. The white flowered *anonis* without prickles. 5. The *anonis* with smooth procumbent stalks. 6. The least red flowered *anonis* without prickles. 7. The hairy and viscous purple flowered small *anonis*. 8. The perennial red flowered *anonis* with broad, roundish, and deeply serrated leaves. 9. The early flowering purple mountain shrubby *anonis*. 10. The Spanish shrubby *anonis* with fleshy tridentated leaves. 11. The low alpine *anonis* with a sweet fleshy root. 12. The smooth sea *anonis* with flowers standing in the alæ of the leaves. 13. The dwarf annual purple *anonis*. 14. The dwarf smooth purple flowered alpine *anonis* without prickles. 15. The Sicilian *anonis* with the appearance of the alopecuros. 16. The round leaved Spanish purple spiked *anonis* without prickles. 17. The hoary procumbent sea *anonis*. 18. The purple flowered American shrubby *anonis*, called by many *crotolaria*. 19. The great yellow viscous *anonis* without prickles. 20. The smooth *anonis* with yellow variegated flowers. 21. The broad leaved yellow annual viscous *anonis* without prickles. 22. The annual broad leaved erect Portugal viscous *anonis*. 23. The narrow leaved sea *anonis* without prickles, with yellow variegated flowers. 24. The yellow flowered dwarf *anonis* with smooth narrow leaves. 25. The little yellow French *anonis* without prickles. 26. The *anonis* with small yellow flowers. 27. The shrubby Asiatic *anonis* with large yellow flowers. 28. The shrubby Spanish *anonis* with rounder leaves. 29. The rose leaved shrubby Spanish *anonis*. 30. The broad and roundish leaved American *anonis*. 31. The creeping bituminose kidneybean-like *anonis*. *Tourn.* Inst. p. 408.

RESTY, (*Cycl.*) in the manege. A malicious unruly horse, that shrugs himself short, and will only go where he pleases, is said to be *resty*. A *resty* horse is much the same with what the French call *ramingue*. See RAMINGUE.

RESUSCITATION (*Cycl.*)—RESUSCITATION *of plants*, in chemistry, the art of reproducing a plant from its ashes. See PALINGENESIA.

Many have pretended to this art, and have shewn *resuscitated* plants in vials [c]; but all these seem only particular instances of artificial chemical vegetations, of which many others may be given. The external appearances of these resemble plants, and the ignorant may easily take them for such; but when closely considered, there is a great difference to be found.—[[c] *Boyle's* Works Abr. Vol. 1. p. 69.] See *artificial* VEGETATION.

RETCH, or RETCHES, a name given by our farmers to an iron, or a pair of irons, which in the common plow serve to fasten the sheat to the beam. The *retches* are fastened to the sheat with nails, and to the beam with pins.

RETENEGI, in the materia medica, a name used by Avisenna, and others, to express the common resin of the pine, or fir tree, and sometimes common black pitch. The lexicographers have given us storax as the explanation of *retenegi*, but this is not warranted by any passage in the authors who use the word. It is certain, indeed, that the generality of authors have confounded the several sorts of resin and pitch making trees together, and among them the pine, fir, cedar, and turpentine trees, are called by the same name, but the storax tree is never included among the number. These were only confounded together, because of the similitude of the things they produced; but the storax was too different from all these, and too precious a gem not be distinguished. See ERZ.

RETENTA, a word used by the medical writers to express things retained in the body, or which are not to be retained in a state of good health.

RETENTION *of the first stools*, in infants. See INFANT.

RETIARIUS, among the Romans, a kind of gladiator, who entered the lists armed only with a trident in his left hand, and a net in his right. He was to use his utmost address to throw the net over, and thereby entangle his antagonist; and if he missed of his aim, he was to betake himself to flight, till he had the good luck to recover his net. *Pitisc.* Lex. Antiq. in voc.

RETINACULUM, the name of a chirurgical inftrument ufed in caftration, and in the operation for a hernia, to prevent the inteftines from falling into the fcrotum.

RETORT (*Cycl.*)—The quantity of air rifing from fome fubftances is apt to burft glaffes in diftilling; Dr. Browne Langrifh has therefore given us a new contrivance of applying receivers to *retorts*, by which fuch accidents may be prevented. To his firft receiver he adapts a fecond, inferted into an opening at the top of the firft, in order to give more room to the rarefied and new generated air. To an opening, at the bottom of each of thefe receivers, he fixes a bottle, tied on clofe by means of a bladder, fo that they may be removed at any time, and another inftantly placed in their room; by which means very little of the fteam will efcape. He alfo ties on a bladder to an opening, or upper neck of the fecond recipient; and this bladder being much thinner and weaker than any of the glaffes, will always give way firft, and prevent their burfting. And even when there is the greateft danger of this accident, the fmalleft pin hole made through the top of the bladder, as foon as the fumes begin to rife, will be fufficient to let out the air as faft as it is generated. See Philof. Tranf. Nº 475. Sect. 3. where we have a figure of the whole apparatus. See alfo Tab. of Chemiftry, Nº 22, and 34.

RETREAT, (*Cycl.*) or TATTOU, in the art of war, is a beat of the drum in the evening, at the firing of a piece called the *warning piece*, at which the drum-major, with all the drums of the battalion, except fuch as are upon duty, beats round the regiment; the drums of the quarter guards, of the generals guards, and all other fmall guards, do likewife beat; the trumpets at the fame time founding at the head of their refpective troops. This is to warn the foldiers to forbear firing, and the centries to challenge, till break of day, that the reveille is beat. The *retreat* is likewife called *fetting the watch.*

RETTO *moto*, in the Italian mufic. See MOTO.

RETURNS (*Cycl.*)—RETURNS *of a mine*, in the military art, are the turnings and windings of the gallery.

RETURNUM *averiorum*, a judicial writ, the fame with *retorno habendo*. Reg. Judic. 4.

RETUSE *leaf*, *retufum folium*, among botanifts. See the article LEAF.

REVE-*land.* The land which in Domefday is faid to have been *thaneland*, and afterwards converted into *reveland*, feems to be fuch lands as being reverted to the king after the death of his Thane, who had it for life, was not fince granted out to any by the king, but refted in charge upon the account of the *reve*, or bailiff of the manor. *Spelm.* Feuds, c. 24. *Blount.*

REVERSE, in the military art, fignifies on the back, or behind. Thus we fay, a *reverfe view*, a *reverfe commanding ground*, a *reverfe battery*, &c.

REVOLUTUM *folium*, among botanifts. See LEAF.

REUTELE, in zoology, a name ufed by fome for the *umbla minor*, or red charre, a fifh common in the lakes of Germany, and of the northern parts of England and Wales. The name is originally German. *Willughby*'s Hift. Pifc. p. 196. See CHARRE.

REWARDS. Military *rewards*, among the Athenians, confifted fometimes in crowns prefented to thofe that had merited them; on which their names and noble actions were infcribed. Some had leave granted them to erect pillars or ftatues, in honour of fome god, with infcriptions fetting forth their victories. This was a favour that was feldom granted; Cimon indeed was honoured with it, but Themiftocles could never obtain the like. Another honour conferred at Athens on the valiant, was to have their arms placed in the citadel, and to be called *Cecropidæ*, or citizens of the true old blood. Others were prefented with a πανοπλια, or compleat fuit of armour. Songs of triumph were honorary compliments paid to fome. The children of thofe who were killed in battle were maintained at the public expence, till they came to maturity; at which time they were prefented before the affembly of the Athenian people with a compleat fuit of armour, one of the public minifters proclaiming before them, "that hitherto, in remembrance of "their fathers merits, the commonwealth had educated "thefe young men, but now difmiffed them fo armed, to "go forth and thank their country by imitating their fathers "examples."

Solon made a farther provifion for the parents of thofe that died in the wars, it being extremely reafonable that they fhould be maintained at the public expence, who had loft their children, the comfort and fupport of their declining age, in the fervice of the public.

As for thofe who were any wife difabled, they had an allowance from the public towards their maintenance. *Potter*, Tom. 2. p. 118, feq.

REWEY, a term among clothiers, fignifying cloth unevenly wrought, or full of *rewes*, 43 Eliz. c. 10. *Blount*, *Cowel.*

REX *mullorum*, in zoology, a name given by fome authors to a fpecies of *mullet* diftinguifhed from all the others by its having a prominent belly, and having no beards under the mouth. *Willughby*'s Hift. Pifc. p. 286. See the article MULLUS *imberbis.*

REY *grafs.* This is a hardy fort of *grafs*, much efteemed among the farmers for that quality. It will grow on any land, and therefore produces crops where nothing elfe will. It thrives beft of all on fower, clayey, and weeping grounds, and equally endures the fevereft droughts of fummer, and frofts of winter, fuffering no damage from either. It is the beft of all winter foods for cattle, the fhorter it is eaten the better, and it fprings the earlieft of any. There is no danger of overftocking it, for if it be left to grow too much, the ftalk becomes hard and fticky. It is beft for horfes and for fheep, and very much prevents the rotting of the latter. The beft way of fowing it is with clover. The common quantity of feed is two bufhels to an acre, but three bufhels is much better; though in fome lands, where the clover is likely to fucceed very well, they fow eight pounds of clover feed, and one bufhel of *rey* feed to an acre, and this makes a crop that will laft feven or eight years.

Some mow it as hay, and thrafh it for the feed, which about London fells from half a crown a bufhel to three fhillings. Four or five quarters of this feed will be fometimes produced from an acre of the *grafs*. If at any time a field of this *grafs* is found to grow thin, it is only neceffary to ftrew on a bufhel of the feed, and roll it with a wooden roller, and the plants rifing from this addition will make the whole crop fufficiently thick. *Rey grafs* has this great advantage, that it kills weeds without any other fown plant; even thiftles cannot grow among it. When the *rey grafs* is cut for hay before perfectly ripe, the hay is the better, but the feed will not grow fo well. When the feed is newly thrafhed, it muft not be laid too thick, for it is very apt to heat and ferment, and the whole will be fpoiled. *Mortimer*'s Hufbandry, p. 40.

RHABARBARUM, in botany, the name given to the plant of which *rhubarb* is the root, and which Mr. Tournefort makes to conftitute of itfelf a peculiar genus, of which there is no other fpecies. The characters he delivers of the genus are thefe. The flower confifts of one leaf, formed into the fhape of a bell, and divided into feveral fegments; from the bottom of this rifes a piftil, which ripens into a thick fruit, containing one large triangular feed, which is fo affixed to its triangular capfule as it ripens, that there is no feparating it from it. *Tourn.* Inft. p. 89.

RHABDOMANTIA, Ραβδομαντεια, among the antients, a fpecies of divination performed with rods. *Potter*, Archæol. Græc. l. 2. c. 16. Tom. I. p. 334.

RHABDONALEPSIS, Ραβδον Αναληψις, among the Greeks, the reception or elevation of the rod, a feftival kept every year in the ifland of Cos, at which the priefts carried a cyprefs tree. *Potter*, Archæol. Græc. l. 2. c. 20. Tom. I. p. 429.

RHABDOPHORI, Ραβδοφοροι, among the Greeks, officers appointed to preferve peace and good order, and to correct the unruly at their public games. *Potter*, Archæol. Græc. Tom. I. p. 448.

RHABDUS, Ραβδος, among the antients, the iron rod with which the boy rolled the *trochus*. See TROCHUS.

RHAGADIOLUS, in botany, the name of a genus of plants, the characters of which are thefe. The flower is compofed of a number of femiflofcules ftanding on the embryo fruit, and each perforated in its bottom part by the capillament which arifes from that embryo. Thefe are all contained in one common cup, the feveral leaves of which afterwards become fo many pods, difpofed in the form of a ftar, and containing long fhaped and pointed feeds.

There is only one known fpecies of this plant, which is the ftarry headed *hawkweed* of authors, or the *hawkweed* with falcated feeds. *Tourn.* Inft. p. 479.

RHAGE, a word ufed by medical writers for a fiffure or chap in any part. The ftones of grapes are alfo by fome called *rhages*; and by others the fame word is made to exprefs the extremities of the fingers or toes.

RHAMNOIDES, a name given by Tournefort, and others, to a genus of plants, called by Linnæus *hippophae.* See the article HIPPOPHAE.

RHAMNUS, *buckthorn*, in botany, the name of a genus of plants, the characters of which are thefe. The flower is compofed of only one leaf, and is of the fhape of a funnel, and divided into four fegments at the edge. From the bottom of this there arife a number of ftamina furrounding a piftil, which finally becomes a foft and juicy berry, ufually containing four callous feeds, gibbofe on one fide, and flat on the other.

The fpecies of *rhamnus*, enumerated by Mr. Tournefort, are thefe. 1. The common *buckthorn*. 2. The leffer *buckthorn*. 3. The fmaller *buckthorn* with oblong and narrow leaves. 4. The green flowered *buckthorn* with black berries. 5. The fmall Spanifh *buckthorn* with leaves like box. Thefe are called by fome authors *lyciums*. 6. The Spanifh *buckthorn* with larger box-like leaves. 7. The olive leaved Spanifh *buckthorn*. 8. The Spanifh *buckthorn* with hypericum leaves. 9. The Spanifh *buckthorn* with the leaves and whole appearance of the *ceratia*, or *filiqua*. 10. The capillaceous leaved Spanifh rock *buckthorn*. *Tourn.* Inft. p. 593.

RHAPSODOMANTIA, Ῥαψωδομαντεία, among the antients, a ſpecies of divination performed with the works or rhapſodies of the poets, particularly Homer and Virgil, who were looked upon as divine and inſpired perſons; whence this kind of divination was called *ſortes Homericæ* and *Virgilianæ*. *Potter*, Archæol. Græc. l. 2. c. 16. Tom. I. p. 333. See SORTES, *Cycl.*

RHEEDIA, in botany, the name of a genus of plants, ſo called from Mr. Van Rheed. The characters of the genus are theſe: the flower has no cup. It conſiſts of four petals, which are of an oval figure, and are hollowed, and expanded wide open. The ſtamina are five filaments. The germen of the piſtil is globoſe. The fruit is ſmall, and of an oval figure. It is ſucculent, and conſiſts only of one cell, and contains three very large ſeeds, which are of an oval oblong figure, and marked with ſtrangely irregular lines, reſembling ſeveral characters. *Linnæi* Gener. Plant. p. 523. *Plumier*. 18.

RHEGMA, a word uſed by the antients to expreſs any breaking, or burſting of a ſoft part without a wound, but moſt frequently for abſceſſes breaking inwardly.

RHENONES, among the antient Germans, a kind of garment covering the ſhoulders and breaſt down to the middle. It was either entirely made of ſkins, or covered over with them; the long hair of which being outward, proved a good defence againſt rain. *Pitiſc.* in voc.

RHEO-STATICS, is uſed by ſome for the ſtatics, or the ſcience of the equilibrium of fluids. *Caſtel*. Math. Univ. p. 73.

RHEUMATISM (*Cycl.*)—In obſtinate *rheumatiſms* ſmall doſes of emetic wine are much recommended by Dr. Huxham.

RHEXIA, in natural hiſtory, the name of a genus of plants, the characters of which are theſe. The perianthium conſiſts of one leaf; it is of an oblong figure, tubular, inflated at the bottom, and divided into four ſegments at the mouth. It remains after the flower is fallen. The flower conſiſts of four petals; they are of a roundiſh figure; they ſtand expanded, and are affixed to the cup. The ſtamina are eight capillary filaments longer than the cup. Theſe are affixed to the cup, and are terminated by long drooping antheræ. The germen of the piſtil is roundiſh, the ſtyle is ſimple, and of the length of the ſtamina. The ſtigma is ſomewhat thick and obtuſe. The capſule is contained within the belly, or inflated part of the cup; it is roundiſh, compoſed of four valves, and containing four cells. This contains a number of roundiſh ſeeds. It is to be obſerved, that in ſome ſpecies of this genus the calyx is ſmooth, in others it has ſeveral hairs diſpoſed in a ſtellated manner. *Linnæi* Gen. Pl. p. 161. *Pluknet*, f. 173. f. 4. *Gronovius*.

RHINANTHUS, in botany, the name of a genus of plants, the characters of which are theſe. The perianthium is roundiſh, but compreſſed, ſomewhat inflated and compoſed of one leaf, divided into four ſegments at the end. This is permanent, and does not fall with the flower. The flower is of the labiated kind, and conſiſts of one petal. Its tube is of the length of the cup, its limb open but compreſſed at the baſe. The upper lip is hooded, compreſſed, marginated and narrow; the under lip is broad, flat, and obtuſe, and lightly divided into three ſegments; the middle one ſomewhat larger than the reſt. The ſtamina are four filaments, of the length of the upper lip of the flower, under which they are hid, two of them are ſomewhat ſhorter than the others. The antheræ are incumbent, and are bifid and hairy. The germen of the piſtil is oval and compreſſed. The ſtyle is capillary, and of the length of the ſtamina, or ſomewhat more than that. The ſtigma is obtuſe and bent. The fruit is an erect orbicular but compreſſed capſule, it is compoſed of two valves, and divided into two cells. The ſeeds are numerous, and of a flatted figure, and fall out by the opening of the capſule at its ſides. *Linnæi* Gen. Pl. p. 282.

RHINE (*Cycl.*)—RHINE, in ichthyology, a name given by Ariſtotle, Appian, and moſt of the Greek writers to that ſpecies of the *ſqualus*, which we uſually call the *ſquatina*; the *ſquatus* of Iſidore and Pliny. Artedi has diſtinguiſhed this from all the other ſpecies of the *ſqualus*, by the having no pinna ani, and the mouth in the extremity of the ſnout.

RHINECHITIS, a name of a chirurgical inſtrument, uſed for ſyringing the noſtrils.

RHINGAU, a name given by ſome authors to the *lavaretus*, a ſmall fiſh, caught in the German lakes, and ſent in pickle into many parts of the world. *Willughby*'s Hiſt. Piſc. p. 183. See the article LAVARETUS.

RHINOBATUS, in zoology, the name of a flat cartilaginous fiſh, of the *ſquatina*, or *monk fiſh* kind, but differing from it in this, that the body is proportionably longer, and the head is more pointed; and the mouth is a great way below the end of the ſnout, and placed under the head. It is from three to four feet long, and is common in the Mediterranean, and brought to market in ſome parts of Naples. *Fab. Column.* p. 119.

RHINOCEROS, in zoology, the name of a genus of quadrupeds, ſo called from an horn growing on their noſe.

Of this genus there are only two known ſpecies. 1. The *rhinoceros* with only one horn on its noſe; and, 2. The *rhinoceros* with two horns.

In the year 1739 we had a young *rhinoceros* ſhewn in England, of which Dr. Parſons has given a very accurate account in the Philoſophical Tranſactions.

The creature fed on rice, ſugar, and hay; his keeper uſed to mix the rice and ſugar in the following manner: ſeven pounds of rice and three pounds of ſugar made the proviſion for one day; he eat this at three meals; and beſides this he eat about a truſs of hay every week, and a large quantity of greens that were brought to him, at different times, and of which he ſeemed more fond than of dried food. He drank often, and always ſwallowed a large quantity of water at a time. See Tab. of Quadrupeds, N° 13 and 14.

He appeared very peaceable in his temper, and bore to be handled on any part of his body, with great patience, except when he was hungry; but he was then always outrageous, as alſo when he was ſtruck. His moſt violent paſſions, even on the laſt occaſion, were however always immediately appeaſed by giving him victuals.

Notwithſtanding the lumpiſh aſpect, and heavy make of this creature, he would jump about very nimbly in his fits of paſſion, and often leap to a great height; and one common mark of his fury was the ſtriking his head againſt the walls, or any thing elſe that was in the way, and this he would do with terrible violence. He was very apt to fall into theſe paſſions in a morning before his rice and ſugar were given him, and from the whole he appeared quite untractable, and ſeemed able, in his paſſions, to have run ſo faſt, as that a man on foot could not have eſcaped him.

This creature was two years old, and did not exceed a young heifer in height, but was remarkably broad and thick. His head was very large; and the hinder part of it, near the ears, remarkably elevated above the reſt of the face, which was flat, and ſunk down, in a remarkable manner in the middle, riſing again toward the origin of the horn, but in a much ſmaller degree. The horn ſtands upon the noſe of the animal as upon a ſort of hill; and when the ſceleton of the head is ſeen, that part of the ſkull on which the horn is fixed, is found to riſe into a blunt cone, to anſwer to a cavity in the baſis of the horn, which is very hard and ſolid; in other reſpects, having no manner of hollow, or core, like thoſe of other quadrupeds. The horn in this young animal did not riſe above an inch high from its tough baſis, and was black and ſmooth at the top, but ragged downwards; and the determination of its growth is backward, not ſtrait up; this is very evidently ſeen in the horns of old *rhinoceroſes*, which are always curved in a conſiderable degree that way. If we conſider the proportion of this animal's ſize, to the length of its horn, and thence carry the proportion to that between the large horns we ſee in the muſeums of the curious, we muſt ſuppoſe the animal of a very ſtupendous ſize, when at its full growth. Phil. Tranſ. N° 470. p. 530.

The ſides of the under jaw, in this creature, ſtand very wide aſunder, ſlanting outward to the lower edge, and backward to the neck; the edges turn outwards from this ſtructure of the bones, and the head neceſſarily looks very large. That part of the head which reaches from the forepart of the horn to the upper lip may be called the noſe; this is very thick, and bulky, and has a kind of circular ſweep down towards the noſtrils; on all this part there are a great number of rugæ or wrinkles.

The noſtrils are ſituated very low, in the ſame direction with the opening of the mouth, and not more than an inch from it; and when viewed in a foreview, the whole noſe, from the top of the horn to the verge of the lower lip, is ſhaped like a bell. The under lip is like that of an ox, but the upper more like that of a horſe, and he uſes it as that creature does, to gather up hay from the rack, or graſs from the ground; but, with this ſuperior advantage, that this creature has a power of extending this lip to ſix or ſeven inches in length from the noſe, and there drawing it to a point; with this lip, thus extended, the creature is able to graſp a ſtick, or any ſmall ſubſtance, and hold it extremely faſt; and this power of prolonging the lips ſerves, in many purpoſes, to the ſame end as the trunk of that other unweildy animal the elephant.

The tongue of the *rhinoceros* is ſaid to be ſo rough as to be able to rub a man's fleſh off from the bones; but, in this young ſubject it was ſo ſoft, that it reſembled that of a calf. It may poſſibly grow harder with age; but the ſtory of its effects ſeems of a piece with the many other falſe marvels reported of this animal. The eyes are dull and ſleepy, much like thoſe of a hog in ſhape; he ſeldom opens them entirely; and it is to be obſerved, that they are ſituated nearer the noſe than thoſe of any other known quadruped. The ears are broad and thin toward the top, much like thoſe of a hog; but they ariſe each from a narrow round baſe, with ſome wrinkles on it, which iſſues out of a ſinus, as it were ſurrounded with a fleſhy fold. The neck is very ſhort, and has two folds, or wrinkles, wholly ſurrounding it, only that the anterior one is broken underneath; and has a flap hanging

hanging from it so deep, that it would contain a man's hand; from the middle of the posterior plica of the neck, there arises another, which passing backward, is lost before it reaches the body. The shoulders are thick and heavy, and have each a fold passing downward. The body is very large and thick, and stands out at the sides like that of a cow with calf. The legs are very thick and strong, they are round, and somewhat smaller downwards than in the upper part; and when the creature stands upright they bend inward at the knee, so that they are nothing like strait. In some quadrupeds the fetlock bends to the weight of the animal, but in this creature there is no appearance of any such bending, so that he seems to stand upon four stumps, especially when viewed behind. He has three hoofs upon each foot forward, but the back part is a great mass of flesh, rough like the rest of the skin; and the sole of the foot is very plump and callous in the surface, but easily yielding to the pressure from the softness of the subjacent flesh. Its shape is like that of a heart, with a blunt apex before, and a broad base behind. The tail is very small in proportion to the size of the animal, not exceeding seventeen or eighteen inches in length, and but thin or slender; it is very rough, and has a kind of twist or stricture towards the extremities, ending in a flat mass; this gave occasion to some authors to compare the whole tail to a spatula; on the sides of this flat part there grew a few short, but very thick and strong black hairs, but these grow much longer in the more advanced state of the creature; and are not round, like other hairs, but flat, like small pieces of whalebone. The creature has no other hair about it, except a very small quantity at the edge of the ears. See Tab. of Quadrupeds, N° 13 and 14.

The penis of the male *rhinoceros* is of a very remarkable structure, being inclosed in two cases. The female differs in nothing from the male except in the pudenda, which are shaped like those of a cow.

The skin of the *rhinoceros* is thick, and seems almost impenetrable; it feels like a piece of board of half an inch thick. It is covered in all parts, more or less, with a sort of incrustations, resembling scales. These are small on the neck, and largest of all in the shoulders and hips; between the folds of this thick skin, the cuticle, which is left bare, is soft, and easily penetrable. The scabby incrustations of the skin have been called scales, by some writers; but this is a very wrong term, for they have nothing of the nature of scales, nor any thing of regularity in them.

The creature is of the retromingent, and therefore probably of the retrogenerative kind; the penis, when erect, is not more than nine, or at the utmost ten inches long, and is curved backward at the end. This was the description of the *rhinoceros* shewn in England at this time, and of all the others that have been seen in this part of the world as to the general characters; but though these creatures, which we have seen, have but one horn, it is very certain, that there is a species of *rhinoceros* which has two. Martial has mentioned a *rhinoceros*, as shewn in the amphitheatre at Rome, which had two horns; but his commentators supposing the copies erroneous, have been at great pains to alter it, so as to make it express what they had seen or heard of, that is a *rhinoceros* only with one horn: but it appears, from almost indisputable testimony, that there not only is in nature such a *rhinoceros* with two horns, but that such were shewn in the public sports at Rome, and therefore the text seems to have been very right, and the commentators in the wrong. The creatures we have seen have indeed only had one horn; and the accounts of travellers, and the great number of horns preserved in the cabinets of the curious, which are all single, seem to prove this; but though the *rhinoceroses* of Asia are all one horned, yet it is certain, that there is a kind found in Africa which has two horns, and not less certain, that the Romans had beasts from this last part of the world as well as the other. Peter Kolbe, in his voyage to the Cape of Good Hope, describes *rhinoceroses*, which he saw, and which had a horn on the nose, and another close behind it. Sir Hans Sloan's museum affords two horns of a *rhinoceros*, standing just as this author has described them, which are still fixed to the same integument; and we are convinced of the Romans being acquainted with this species, from a brass medal of Domitian, which has on it a *rhinoceros*, with two horns on the nose placed in this manner.

Redi, who has been very sagacious in discovering the falsity of many of the pretended medicines taken from animals, yet gives us, on the testimony of his own experience, an account of some very remarkable virtues in the parts of the *rhinoceros*. The blood he assures us is excellent in colics and in dysenteries. The decoction of the skin, he assures us, is a grand stomachic antidote, and the horns are very valuable and alexipharmic. *Redi*'s Esperience.

RHINOCEROS *avis*, the *rhinoceros bird*, a name given by authors to a species of Indian raven, called by others *corvus indicus cornutus*. The beak of which is frequently brought over into Europe.

It is a very ugly bird, and of a very rank smell. It much exceeds the European raven in bigness, and its head and neck are very thick. Its eyes are very large, and its beak of a very remarkable figure, having a large and thick horn like protuberance on its upper part. The whole beak is bent like a bow, not hooked at the end like the beaks of the hawk, &c. It is of a yellowish white below, and on the upper part toward the head is of a fine gay red, and the rest of a yellowish white: the upper chap is serrated. The horn grows out from the head with this and runs along it, and bends up at its extremity; its upper and under part are red, its middle yellow. The bird feeds on carrion, and the guts of dead animals. *Aldrovand* de Avibus.

RHINOPTES, a word used by the antients to express a person, who from an ulcer in the great canthus of the eye, laying open the passages to the nose, can see through his nostril.

RHIPTASMOS, a word used by the antients, to express a restlessness and frequent tossing about, a very common symptom in fevers.

RHIZAGRA, the name of a chirurgical instrument used to extract the stumps of teeth.

RHIZOPHORA, in botany, the name given by Linnæus to a genus of plants, described under the name of *mangles* by Plumier, the characters of which are these: the perianthium is erect, and is composed of one leaf, divided into four oblong segments. The flower is erect, and is composed of one petal, divided into four segments, and is shorter than the cup. The stamina are twelve erect filaments, alternately shorter one than the other, and the antheræ are small. The germen of the pistil is subulated; there is scarce any style; the stigma is acute, and the receptacle is of an oval figure; this becomes fleshy, and contains the base of the seed. The seed is single, and extremely long; it is of a clavated figure, and pointed at the end. There is some variation in the number of the stamina in this plant; they are always, however, of some number between eight and twelve, these being the highest and lowest extremes. *Linnæi* Gen. Pl. p. 207. *Plumier* Gen. 15. Hort. Mal. Vol. 6. p. 31, 32.

RHODIOLA, in botany, the name given by Linnæus to a genus of plants, commonly called *rhodia*. The characters of which are these: it produces two kinds of flowers, the one hermaphrodite, acting as male flowers; the other simply female. In the male flower, the cup is a concave erect perianthium, divided into four obtuse segments, and not falling with the petals. The flower consists of four petals, which are oblong, obtuse, erecto-patent, and twice as long as the segments of the cup: these fall soon after they are open: they have four erect nectaria, surrounded with a thin rim, and somewhat shorter than the cup. The stamina are eight pointed filaments, longer than the petals of the flower. The antheræ are simple. The pistil has four oblong and pointed germina. The styles and stigmata are very imperfect. The fruit that should succeed these is very abortive.

In the female flower the cup is of the same kind with that of the male. The flower is composed of four rude, erect, and obtuse petals, of the same size with the segments of the cup, and remaining with it. The nectaria in this flower are the same with those of the male. The pistil has four oblong pointed germens, which go off into so many strait simple styles, crowned with obtuse stigmata. The fruit consists of four corniculated capsules, which are univalve, compressed inwards, and opening in that part. In these capsules are contained a number of seeds of a roundish shape. *Linnæi* Gen. Pl. p. 498.

RHODITES *lapis*, the *rose stone*, in natural history, the name given by authors to a kind of *astroites*, or *star-stone*, in which the figures more represent roses than stars: they are in both owing to coralloide bodies immersed in the stone; which, according to their various species, afford a different figure, when cut transversely, in the cutting the stone into plates for use. See Astroites and Star-*stone*.

RHODIUM *marmor*, a name given by the antients to a marble brought from Rhodes; it was of a good white, but inferior to the Parian, and was used by the Romans in their public buildings, and sometimes in statuary.

RHODOMELON, a name given by the antients to a confection made of roses, quinces, and honey, used as a grateful astringent and detergent in many cases.

RHODOPUS *gallinula*, in zoology, a name given by some authors to the bird more usually known by the name *tringa*. *Gesner* de Avid. See the article Tringa.

RHOITES, the name of a medicine among the antients, which is a sort of rob of the juice of pomegranates. Dioscorides describes it as the simple juice of the fruit, evaporated over the fire to the consistence of an extract; but Paulus Ægineta gives the receipt to be three parts juice of pomegranate, and one part honey, boiled to the evaporation of a third part. So that the *rhoites* of Dioscorides was a true rob of pomegranates; the other, rather honey of pomegranates, like our honey of roses.

RHOMB. See the article Rhombus, *Cycl.* and *Suppl.*

RHOMBO, the name of a peculiar fish of the *rhombus*, or turbot kind, called *rhombus aculeatus* by Aldrovand, Gesner, and other authors. It is a large fish, of an ash coloured green on the back, and white on the belly. It has no scales;

but the ſkin of its back is divided by lines, ſomething in the manner of the ſkins of ſnakes. The mouth is very large, and is well furniſhed with teeth; and the palate has a number of tubercles, armed alſo with a ſort of teeth. It feeds on fiſh, and its fleſh is very delicate. It is very common in the markets at Venice, and is caught in the neighbouring ſeas, and in many other places. *Willughby*'s Hiſt. Piſc. p. 92. *Geſner*, p. 778. *Aldrov.* de Piſc. l. 2. c. 48.

RHOMBOIDÆUS *major* and *minor*, names given by Albinus to what he makes two muſcles; though Winſlow and others account it only one. What Winſlow calls the inferior portion of the rhomboidalis, Albinus calls *rhomboidæus major*, and what he calls the upper portion of that muſcle, Albinus calls *rhomboidæus minor*. See the article SCAPULA.

RHOMBOIDALIS. See the articles RHOMBOIDÆUS and SCAPULA.

RHOMBOIDES, in anatomy, a muſcle, which is a thin, broad, and oblique ſquare fleſhy plane, ſituated between the baſis of the ſcapula and the ſpina dorſi. It may be divided into two portions, one ſuperior, the other inferior, which ſometimes appear ſeparate. The ſuperior portion, which ſeems in ſome ſubjects to be made up of two, is fixed by an inſertion wholly fleſhy in the two or three loweſt ſpinal apophyſes of the neck, and partly in the poſterior cervical ligament. The inferior portion is fixed by a tendinous plane in the three or four uppermoſt ſpinal apophyſes of the back.

Theſe two portions, of which the inferior is much the broadeſt, being united, are inſerted in the edge of the baſis ſcapulæ, from the ſmall triangular ſpace to the inferior angle, the ſuperior portion covering a ſmall portion of the angularis at its inſertion. This whole muſcle is covered by the trapezius, and covers the ſerratus poſticus ſuperior, being joined to each of theſe muſcles by a filamentary or cellular ſubſtance. *Winſlow*'s Anatomy, p. 174.

RHOMBOIDIA, in natural hiſtory, the name of a genus of ſpars, given them from their being of a rhomboidal form. They owe this figure to an admixture of particles of iron, and conſiſts of ſix planes.

Of this genus there are only two known ſpecies. 1. A white thin one with very thin cruſts; and 2. A whitiſh brown thick one with thicker cruſts. Theſe are both found in the foreſt of Dean in Glouceſterſhire, and in other places where there are iron ores.

RHOMBUS (*Cycl.*)—*Solid* RHOMBUS, in geometry, two equal and right cones joined together at their baſes.

RHOMBUS, in zoology, a genus of fiſhes, which are oviparous, and have a flat, ſhort, and ſomewhat ſquared body, and ſwim on one ſide. The turbot and other fiſh of that make, are of this genus. The ſides of theſe fiſh are equal, but their angles unequal. *Willughby*'s Hiſt. Piſc. p. 93.

RHOMBUS, in conchyliology, the name given by the generality of authors to a genus of the ſhell fiſh, much more properly called by ſome *cylindrus*. See CYLINDRUS.

RHOPALOSIS, a diſtemper of the hair deſcribed by the antients, and ſeeming to be the ſame with what we call the *plica polonica*, being a ſort of matting together of the hair into long and thick treſſes.

RHOPE, a word uſed by the Greek writers, to expreſs a violent tendency of the humors to any particular part of the body.

RHOX, a word uſed by ſome authors to expreſs the tunica uvea of the eye.

RHUBARB (*Cycl.*)—The Indian *rhubarb* ſown in our gardens has this peculiar property, that it yields a fine and clear gum. This is perfectly white and pellucid, and in the months of June and July is ſo plentiful, that an ounce may ſometimes be gathered at a time from one plant of it. It exſudates of itſelf from all parts of the ſtalks and ribs of the leaves, and ſometimes from the under part of the leaves themſelves. It ſtands in ſome places in large drops, and in others the ſtalks, &c. ſeem only to be covered with a thin layer of it; and the under part of the leaves in ſome have it in form of twiſted wires or long icicles. The plant may always be ſeen wounded by a ſort of cauſtic in the places where the germen makes its way out, and theſe may be followed with any pointed inſtrument through the ſkin; in ſome parts of the plant this juice is found to be turned gummy within it, and looks like clear ice. As this is the only known herbaceous plant, that yields a true gum like that of trees, it would be worthy obſervation, whether or not ſome of our own plants have ſome tendency of nature, to form a juice of the ſame kind. It would be moſt proper to look for this in the plants of the ſame genus, and as nearly related to the *rhubarb* as we can. The docks ſo common about our fields are of the ſame genus; and the ſorrel ſhews, by its taſte, that it is particularly allied to the plant; for both are alike of the dock kind, and both alike ſour. It would be proper to look carefully about the leaves of ſorrel a little before it flowers, to ſee whether any thing like the ſame gum appears on it.

There is yet this farther analogy between this *rhubarb* and our common ſorrel; that the huſks of our ſorrel, boiled in water, with a little alum, turn it to a fine red colour; and the huſks of *rhubarb* do the ſame, and both the one and the other often turn red in decaying.

The juice of the roots of this *rhubarb*, extracted by bruiſing and ſteeping it in common water, when the liquor is ſtrained and evaporated, becomes only a clear uninflammable gum, and melts in the flame of a candle. This gum, as well as that of the ſtalks and leaves, is of an inſipid taſte; and it is obſervable, that though the plant naturally yields it in ſo large a quantity, yet it will not flow from wounds made by art in any part of the plant. Upon the conſideration of the inſipid taſte of this gum, and its ſolubility in water, we may find ſome probable conjecture, in regard to the different virtues of this plant in purging and binding. The woody fibres have a ſtrong taſte; and, in all probability, are alone endued with the aſtringent quality. An infuſion of *rhubarb* is known to purge, and a powder of it to bind: the reaſon is eaſily ſeen on this conſideration. The water in the infuſion takes up all this gummy juice, and its other juices, but leaves the fibroſe part behind, in conſequence of which it ought to purge without binding; but in caſe of giving the powder, the juices are in great part evaporated in the drying, and the woody part left almoſt alone; it therefore purges but little, and proves powerfully aſtringent. Phil. Tranſ. N° 224.

RHUS, *ſumach*, in botany, the name of a genus of trees, the characters of which are theſe. The flower is of the roſaceous kind, and is compoſed of ſeveral petals, diſpoſed in a circular form. The piſtil ariſes from the cup, and finally becomes a roundiſh fruit, with a depreſſion on one ſide, which gives it ſomewhat of a kidney like ſhape, and containing a ſeed of the ſame figure.

The ſpecies of *ſumach* enumerated by Mr. Tournefort are theſe. 1. The common or elm leaved *ſumach*. 2. The Virginian *ſumach*, and 3. The Canada *ſumach* with long leaves ſmooth on both ſides. *Tourn.* Inſt. p. 611.

RHUSELINUM, in botany, a name given by ſome authors to the *ranunculus*. *Ger.* Emac. Ind. 2.

RHYNE, in botany, a name uſed by ſome authors for the camphor tree. *Breyn.* Prod. VI. p. 4.

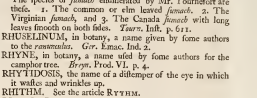
RHYTIDOSIS, the name of a diſtemper of the eye in which it waſtes and wrinkles up.

RHITHM. See the article RYTHM.

RIB. See RIBS, infra.

RIBATTUTA, in the Italian muſic, a ſtriking or ſounding the ſame note over again. Hence,

RIBATTUTA *di gola*, one of the graces in ſinging, is performed by repeated beating or ſtriking a note, from that which is immediately above it. See example A. It differs from a ſhake.



RIBATTUTA *di gola doppia*. See example B. This is pretty near what the French call *tour de goſier*, or *double cadence*. *Broſſard.* Dict. Muſ.

RIBESIA *nigra*, *black currants*, have been long famous in England for quinſies and ſore throats, ſo as to obtain the name of ſquinancy or quinſy berries. See GROSSULARIA.

RIBS (*Cycl.*)—The number of theſe varies in different ſubjects, ſometimes in one ſide only, and ſometimes in both.

Anatomiſts have divided each *rib* into the middle part or body, two extremities, the one anterior, the other poſterior; two ſides one external and convex, the other internal and concave; two edges, one ſuperior and the other inferior; and two labia in each edge, one external, the other internal. The poſterior extremity, which may be called the head of the *rib*, is articulated with the vertebræ of the back. At the anterior extremity freſh *ribs* are lengthened out by cartilaginous epiphyſes, ſtuck into their bony ends. Each of the true *ribs*, at the poſterior extremity, has two ſmall cartilaginous impreſſions, diſtinguiſhed by a kind of angle, by which they are articulated with the lateral cartilaginous impreſſions in the bodies of two vertebræ of the back; but the firſt *rib* has no more than one ſuch impreſſion, being articulated with one vertebra only. At a ſmall diſtance from the head of this extremity poſteriorly is another cartilaginous impreſſion on each ſide, a little convex, and cloſely joined to a ſmall tuberoſity. By theſe the *ribs* are articulated with the lateral cartilaginous impreſſions in the tranſverſe apophyſes of the dorſal vertebræ; and the tuberoſities ſerve for the inſertion of the ligaments; the portion which lies between the head and theſe impreſſions is contracted, and repreſents a neck. When the poſterior extremity of a *rib* is articulated with two vertebræ, the ſecond articulation is always with the tranſverſe proceſs of the loweſt two. Between the tuberoſity and middle part of the *ribs*, there is on their outſide a kind of oblique rough angle of different breadths. In the firſt *rib*, this angle is not diſtinct from the tube-

tuberoſity; in the ſecond, it reaches but to a ſmall diſtance from it; in the third *rib*, this diſtance is ſtill greater, and from thence it continues to increaſe gradually all the way to the third falſe *rib*; ſo that if we look directly at the back of a ſceleton, theſe angles repreſent the legs of a pair of compaſſes opened pretty wide. On the inſide of the *ribs*, toward the lower edge, we obſerve a groove reaching all the way from the angle to the extremity, and that chiefly in the five lower true *ribs*, and the three firſt falſe ones. The upper edge of the three firſt *ribs* is ſharp, the lower a little rounded. The upper edge of the third is more obtuſe, and the lower a little more flat. In the reſt, the upper edge is rounded, the lower, more or leſs ſharp.

In all the *ribs* the anterior extremity is lower than the poſterior; the *ribs* are much more crooked in the back than in the forepart; the appendices, epiphyſes, or cartilaginous portions of the true *ribs*, increaſe in length, as they deſcend in the ſame manner as the *ribs* themſelves; the cartilages of the firſt three or four *ribs* lie nearly in the ſame direction with the *ribs* themſelves. In the *ribs* below theſe, the cartilages make angles, at which they turn upward towards the ſternum, and this curvature increaſes in proportion as the *ribs* deſcend; and the loweſt cartilages, in changing their direction upwards, lie very cloſe to each other, and thoſe of the laſt two *ribs* have often, at their inferior edge, a ſort of apophyſis or production, by which they are connected with the cartilages immediately below them. The laſt two *ribs* extend conſiderably in breadth toward their lower ſharp edges, from the angle for a good diſtance anteriorly. Afterwards they contract in breadth and increaſe in thickneſs, forming a ſort of neck, a little longer than that at their poſterior extremity; then their breadth begins to increaſe again, by degrees, to the anterior extremity. In all the *ribs*, this extremity terminates in a cavity, in which the cartilages are grafted. The three uppermoſt falſe *ribs* increaſe in breadth from the angle forward, and the grooves are moſt conſiderable in theſe. They have alſo heads, necks, tuberoſities, and angles, almoſt the ſame as in the laſt true *ribs*. All the falſe *ribs* have cartilaginous appendages; the firſt of which is longeſt, and fixed to the cartilage of the laſt true *rib*; the two following are united together at their extremities, and the two laſt are connected only to muſcles and ligaments. They are both very ſhort, eſpecially the laſt, which is not above a quarter of an inch in length, and all theſe cartilages of the falſe *ribs* are pointed at their extremities.

The *ribs* are articulated anteriorly with the ſternum, and behind with the vertebræ of the back; the firſt *rib* is entirely united with the ſternum, by means of its cartilage, and in the ſix following the extremities of the cartilages join that bone. The three upper falſe *ribs* are joined to each other by the extremities of their cartilages; the connection of the *ribs*, with the vertebræ of the back, is for the moſt part by ginglymus. The ten upper *ribs* are confined to two motions only, upward and downward; whereas the two laſt are left more at liberty, and are therefore termed floating *ribs*. *Winſlow*'s Anatomy, p. 65.

Cartilages of the Ribs. All the *ribs* have cartilaginous portions, which differ from each other in length, breadth, incurvations, adheſions, and in their extremities. It is to be obſerved, that theſe cartilages are white, more poliſhed, broader and thicker in their natural ſtate, than in the dried ſceleton. The cartilages of the falſe *ribs* are naturally ſofter, and more pliable than thoſe of the true; the middle or inner ſubſtance of theſe acquires the conſiſtence of bones in old age, and their extremities ſome times oſſify, and are inmoveably fixed to the ſternum. Ibid. p. 149.

Ligaments of the Ribs. All the *ribs* are connected to the bodies of the vertebræ by ſtrong, ſhort, ligamentary faſciculi, fixed by one end round the foſſula in the vertebræ, and by the other round the head of each *rib*. They are alſo tied together by thin ligaments, which go from the cartilage of each *rib* obliquely to that of the next. The ten uppermoſt *ribs* on each ſide are connected to the tranſverſe apophyſes of the vertebræ of the back by ſtrong, ſhort, articular ligaments fixed to the tuberoſities of the *ribs*, and round the foſſula of the apophyſes; and this much in the ſame manner with thoſe which go between the heads of the *ribs* and bodies of the vertebræ: both theſe articulations are provided with capſular ligaments. The eleventh *rib* on each ſide having no articulation with the tranſverſe apophyſes, is connected to them by auxiliary ſtrong ſhort ligaments fixed in its neck. The laſt *rib* is only joined by its head to the body of the twelfth vertebra of the back; but it is connected, in a particular manner, to the tranſverſe apophyſis of the firſt vertebra of the loins by a broad ligament, fixed in the whole upper edge of the apophyſis, and in the lower edge of the *rib*, though about two thirds of its length. The firſt true *rib* has no ligamentary connection with the ſternum, the cartilaginous ſymphyſis being ſufficient; the reſt are cloſely joined to that bone by ſmall ligamentary portions, fixed by one end round the extremity of the cartilage, and by the other round the notches in the ſternum. The cartilage of the firſt falſe *rib* is joined to that of the laſt true *rib*, by ſeveral ſhort filaments, which go from the lower edge of the one to the upper edge of the other near its ſmall extremity. The other falſe *ribs* are connected together much in the ſame manner; except that the filaments, by which the fourth is connected to the third, are longer than thoſe above them, and thoſe between the fifth and fourth are much longer than any of the reſt; and for this reaſon theſe *ribs* are leſs ſteady than the others. The ligamentary expanſions of the vertebræ are in place of a perioſteum, but the *ribs* and ſternum have a perioſteum like other bones, only that the cartilaginous portions of the *ribs* generally give their covering the name of a pericardium.

Diſlocated Ribs. The *ribs* are ſometimes, though but ſeldom, diſlocated; for they are ſometimes diſplaced by ſome external violence, and thruſt either upwards or downwards, outwards or inwards. They cannot eaſily indeed be luxated outwards, becauſe prevented by the vertebral proceſſes, and reſiſted by very thick and ſtrong muſcles; but when they are driven into the cavity of the thorax, which oftener happens, they not only lacerate the pleura, or membrane, which lines the cavity of the thorax, but generally do great injury alſo to the contained parts: in conſequence of which ariſe moſt ſharp pains, inflammation, difficulty of breathing, coughs, ulcers, immobility, and many other dangerous ſymptoms.

When the *rib* is luxated either upwards or downwards, in order to replace it conveniently, the patient is to be laid on his belly upon a table, and the ſurgeon muſt endeavour to reduce the luxated bone to its right place with his hands; or the arm of the diſordered ſide may be ſuſpended over a gate or ladder; and while the *ribs* are thus ſtretched up from each other, the heads of ſuch as are luxated may be puſhed into their former ſeat.

Thoſe luxations, where the heads of the *ribs* are found to be thruſt inwards into the cavity of the thorax, are much the moſt difficult to be reduced, becauſe neither the hand, nor any other inſtrument can be applied internally, to aſſiſt and direct the bone in the operation. In this caſe it ſeems proper to lay the patient on his belly, over ſome gibbous or cylindric body, and move the forepart of the *rib* inwards toward the back, ſhaking it ſometimes; for thus it ſometimes happens, that the head of the luxated *rib* ſlips into its former place. But if this method of cure will not avail, we have no remedy left but inciſion, and endeavouring to replace the luxated head of the *rib* by the fingers, plyers, or little hooks. In the mean time, where the ſymptoms are not very urgent, and the heads of the *ribs* but little diſplaced, it is much more adviſeable to have recourſe to none of theſe means, becauſe there are ſeveral inſtances where the luxated *ribs* have ſafely retained their diſlocated ſtations; but above all, care muſt be taken to lay on a compreſs, dipped in warm ſpirit of wine upon the part, and retain it on by the napkin and ſcapulary bandage. *Heiſter*, Surg. p. 157.

Fractured Ribs. Sometimes the *ribs* are only fiſſured in ſuch a manner, that the external or internal part of them are only hurt, without their being removed out of their place. This is uſually attended by no bad accident, and the bone frequently grows together again of itſelf, without the accident's being diſcovered. But if the whole *rib* be fractured, and ſome part of it removed out of its place, it is a more dangerous caſe: for the coſtal muſcles, and the pleura, that lines the internal cavity of the thorax, will be much diſturbed by the fragments of the bone.

When a *rib* is fractured, it projects either externally or internally in the form of a broken arch; when it projects externally the ſymptoms are uſually much milder; but when it is drove inward the caſe is uſually much worſe, eſpecially if any vein or artery be divided by it, ſo as to let blood run into the cavity of the thorax: in conſequence of which there follow prickings, inflammation, difficult reſpiration, coughs, fevers, ſpitting of blood, ſuppuration, extravaſation of blood, and other bad ſymptoms, particularly if any of the viſcera are hurt at the ſame time.

In order to replace fractured *ribs*, it is neceſſary firſt to enquire whether they project internally or externally; when externally, the patient is to be placed upon a high table, and the ſeparated bones muſt be gently forced by the fingers into their places; the proper compreſſes, dipped in ſpirit of wine, muſt be laid on, and then covered with ſlips of paſtboard, or ſplints, and the circular bandage, or napkin and ſcapulary. But when the ſplinters are thruſt inward, while the patient retains a deep breath; both ſides of the bone muſt be compreſſed with the hands, and agitated till they are properly fixed. When they are replaced, the paſtboard muſt not be applied in this caſe, but only the bandage drawn a little leſs tight; by theſe means, fractures of this kind are uſually cured in three or four weeks. Ibid. p. 123.

Ribs *of fiſhes*. There is a very great variety in the ſhape, and other peculiarities of the *ribs of fiſhes*. They are in ſome ſmooth and flatted ſideways, as in the cyprini. In others they are rounded, as in the cotti and gadi. In the cyprini

cyprini the feveral fpecies have from thirteen to nineteen *ribs* on a fide, and the vertebræ are from thirty-feven to forty nine in number, differing greatly in number in the feveral fpecies of the fame genus. The *ribs*, in many fifh, adhere to the vertebræ, by means of cartilages, and feem only continued parts of them; but in others they are free, and loofe, and do not fo much as touch the vertebræ. We find inftances of the firft fort of ftructure in the cyprini, falmons, &c. and of the other in the pearch, the gadi, and the pleuronectæ. In the fpinofe fifhes, the laft vertebra always is terminated by a pair of broad apophyfes placed perpendicularly, and touching one another, and by means of cartilages thefe are fixed to the bones of the tail. *Artedi*, ichthyolog.

RIBS, among jewellers, the lines, or ridges, which diftinguifh the feveral parts of the work, both of brilliants and rofes. *Jeffries* on Diamonds.

RICA, among the Romans, a veil with which the ladies covered their heads. *Danet*, in voc.

RICCIA, in botany, the name of a genus of plants of the lichen clafs, or, according to Linnæus, of the algæ: the characters of this genus are thefe. The male flower ftands on the furface of the leaf, without a pedicle, and has neither cup nor petals, nor even ftamina, but is a fimple anthera or apex, of a tapering form, but truncated, and opening at the top when ripe. The female flower grows fometimes on the fame, fometimes on different plants. It has fcarce any cup, and no petals, but is loaded with a globofe fruit, having only one cell, which contains a vaft number of feeds. *Linnæi* Gen. Pl. p. 507. *Michel.* Nov. Gen. p. 57.

RICE (*Cycl.*)—The Chinefe water their *rice* fields by means of moveable mills, placed as occafion requires, upon any part of the banks of a river. The water is raifed in buckets to a proper height, and afterwards conveyed in channels to the deftined places. *Boyle*'s Works abr. Vol. 1. p. 108.

RICERCATA, in the Italian mufic. See RESEARCH, *Cycl.*

RICHARDIA, in botany, the name of a genus of plants, the characters of which are thefe. The cup confifts of one leaf, divided into fix parts, and is erect and pointed, and of about half the length of the flower. The flower is monopetalous, and of a cylindric funnel like fhape, the edge is divided into fix fegments. The ftamina are fix filaments, fo fhort as to be fcarce obfervable. The antheræ are roundifh and fmall, and ftand in the notches of the flower. The germen of the piftil ftands beneath the cup. The ftyle is capillary, of the length of the ftamina, and divided into three parts at the top. The ftigmata are obtufe. The feeds ftand naked, and are three in number; they are roundifh, but angular, and are broad at the upper part and gibbous. *Linnæi* Gen. Pl. p. 150.

RICINOCARPODENDRON, in botany, the name of a genus of plants, eftablifhed by Dr. Ammam, the characters of which are thefe. The flower is of the rofaceous kind, confifting of three petals, difpofed in a circular order, in the center of which there arifes a large and open tube, through which fhoots up the piftil, which grows at the bottom of the cup. This piftil finally becomes a trigonal fruit, divided into three cells within, and containing each one feed in a rough coat.

The leaves of this tree fomewhat refemble thofe of the afh, being compofed of three or four pairs of fmaller leaves joined to a middle rib; thefe are not ferrated, and terminate in a fharp point. The flowers grow at the alæ of the leaves, they are white, and are difpofed in lax fpikes. The fruit is green at firft, afterwards it becomes of a yellowifh red, and finally fcarlet. It is of the bignefs of a walnut, and in fhape much refembles the fruit of the ricinus. The covering of the feeds is black on the outfide and red within, and each feed is divided into two lobes. When ripe, the fruit burfts, and the feeds fall out. It is a native of the Eaft Indies. Act. Petropol. Vol. 8. p. 214.

The word is compounded of *ricinus*, *καρπὸς*, *fructus*, and *δένδρον*, *arbor*. See RICINUS.

RICINOIDES, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the rofaceous kind, being compofed of feveral petals arranged in a circular form, and placed in a many leaved cup; thefe, however, are male, or barren flowers; for the embryo fruits appear on other parts of the plant; thefe are contained in a cup, and finally become each a fruit, which is fiffile into three capfules, containing oblong feeds.

The fpecies of *ricinoides* enumerated by Mr. Tournefort are thefe. 1. The common French *ricinoides*, from which the French turnfole is prepared, and which is called by many authors heliotropium, or turnfole. 2. The American arborefcent *ricinoides* with divided leaves. 3. The cotton leaved American *ricinoides*. 4. The American *ricinoides* with ftave's acre leaves. 5. The hairy poplar leaved American *ricinoides*. 6. The chefnut leaved American *ricinoides*. 7. The fhrubby marfh mallow leaved and American *ricinoides*. 8. The mullein leaved American *ricinoides*. 9. The æleagnus leaved American *ricinoides*, 10. The citron leaved American tree *ricinoides* with filvery duft. *Tourn.* Inft. p. 656. See HELIOTROPIUM.

RICINUS, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the apetalous kind, confifting only of a number of ftamina which arife from a cup. Thefe flowers are barren, and the embryo-fruits grow on other parts of the plants; thefe become at length each a trigonal fruit, compofed of three capfules, containing feeds covered with a hard rind.

The fpecies of *ricinus* enumerated by Mr. Tournefort are thefe. 1. The common *ricinus* or palma chrifti. 2. The great American *ricinus* with green ftalks. 3. The great American *ricinus* with red jointed ftalks. 4. The fmall American *ricinus*. 5. The *ricinus* of Ceylon with deeply divided leaves. See Tab. 1. of Botany, Clafs 15.

The feeds of almoft all the fpecies of this plant are very violent emetics and cathartics. Some have ventured to give them in fmall dofes, in dropfies, but the practice is hardly juftifiable.

RICKETS (*Cycl.*)—*Rickety* children have larger livers, and lefs hearts, and lefs blood, than children in health, from too full and too grofs a diet, and too little exercife; and they have larger livers than children in health, from the livers always increafing in weight, when the weight of the heart and quantity of blood leffen. See HEART and LIVER.

Dr. Hahn, in a letter on the cyrtonofus, or *rickets*, which is commonly thought to be a modern difeafe; quotes Hippocrates, and feveral other antient writers, as treating of it. Med. Eff. Edin.

RIDE (*Cycl.*)—To RIDE *land-locked*, at fea. See the article LAND-*locked*.

To RIDE *by the ftoppers*, at fea. See the article STOPPERS.

RIDGES (*Cycl.*)—The method of plowing land up into *ridges*, is a particular fort of tillage. The chief ufe of it confifts in the alteration it makes in the degrees of heat and moifture; thefe being two of the grand requifites of vegetation, and very different degrees of them being requifite to the different forts of plants. Thofe plants commonly fown in our fields require a moderate degree of both, not being able to live upon the fides of perpendicular walls in hot countries, nor under the water in cold ones, neither are they amphibious; but they muft have a furface of earth, not covered, nor much foaked with water, which deprives them of a proper degree of heat, and caufes them to languifh. In this cafe they look weak, and their leaves yellowifh. They ceafe growing; and, in fine, die in a weak and very bad ftate.

The only way to cure the land of giving this difeafe to plants, is to lay it up in *ridges*, that the water may fall off, and run into the furrows below, from whence it may be conveyed by drains and ditches into fome river, or otherways carried wholly off from the land.

The more any foil is filled with water the lefs heat it will have. The two forts of land moft liable to be overglutted with water are hills, the upper ftratum of mould in which lies on clay; and generally, all deep and ftrong lands. Hills are made wet and fpewy, by the wet that falls in rains, dews, and mifts; and this wet not being able to fink through the clay, in thefe foils, runs down between it and the mould; but extending itfelf through the mould all the way, and making it continually wafhy. The plowing this fort of land in *ridges*, made from the higher to the lower part of the field, is of no benefit; for the water will prefs from below upwards in thefe *ridges*, being forced by the addition of frefh fupplies above.

There are two methods of draining a hill ground like this. The one is to dig feveral deep trenches crofs-wife, or horizontally on the fides of the hill: let thefe be nearly filled up with fhores, and the furface covered in the common method: the wet will be received into thefe in all parts, and difcharged at the ends; and the plow will go over the ftones, without ftriking through the depth of earth that covers them. Thus the land will be dried for a time; but, as thefe channels fill up with earth, between the ftones, they become of no ufe, and the expence of making new ones is very great.

The other way is to plow the land in *ridges* almoft horizontally, and then the furrows between them are fo many drains, carrying off the water at their lower ends; if the plow is made to ftrike a few inches deep into the clay, and the ends of the furrows are no higher than the other parts: every furrow will be a drain to every *ridge*, and the land of the *ridges* will be kept dry. If there were no other manner of plowing the *ridges*, on the fides of hills, than there is in the plain lands, this method of having open furrows, or drains, on declivities, would be impracticable; becaufe the plow could not turn up the furrows againft the hill and againft the *ridge* alfo, from the lower fide of it. But the eafy remedy againft this inconvenience, is to plow fuch *ridges* in pairs, without throwing any earth into the trenches, and then the *ridges* will be plain at top, and the rain water will run fpeedily downward to the next trench, and thence to the head land, and fo out of the field. Thefe trenches will be made, as well as kept always open by plowing in pairs; and this is abundantly more eafy than the way of plowing *ridges* fingly.

Every time of plowing the *ridges* muft be changed as to the pairs;

pairs; so that the furrow, which had two *ridges*, or lands, turned towards it one time, must have two turned from it the next time; and this method keeps the surfaces of all the *ridges* or lands pretty nearly even. This, however, cannot be done on a hill, whose declivity is so great, that the plow is not able to turn a furrow against it; but, in this case, perhaps, it may be sufficient to plow the *ridges* obliquely enough for the furrows to be turned both ways.

This plowing in an horizontal manner, on hills, is the best of all others; but our farmers are not to be easily brought into it, though they see thin lands of this kind ruined for want of it; their reasons for not doing it, are, that it would prevent the supposed benefit of cross plowing; and that they lose more ground by having more furrows between the *ridges*, than when they lay their lands flat; where the lands are made much larger than the round *ridges* can conveniently be. But these are in reality very erroneous, as well as mischievous opinions; for more mischief than good is done by cross-plowing in general; and instead of any real loss of land by *ridges*, the true state of the case is, that much ground is gained by it; that is, the surface of the earth is increased in quantity; for if a flat piece be plowed into *ridges*, and if in earth sixteen feet breadth, there be an empty furrow of two feet; and yet, by the height and roundness of the *ridges*, they have eighteen feet of surface, capable of producing corn equally with eighteen feet, while the piece was flat; there is then, instead of any loss, one eighth part of profitable ground, gained by the altering the piece from a level into a *ridge*.

RIDGES, in the manege, are the wrinkles, or risings of flesh in the roof of a horse's mouth, which run across from one side of the jaw to the other, like fleshy *ridges*, with interjacent furrows, or sinking cavities. It is upon the third or fourth *ridge* that we give the stroke with the horn, in order to bleed a horse whose mouth is overheated. See HORN.

RIDING (*Cycl.*)—RIDING *cast*, in husbandry, a term used by the farmers for a particular method of sowing their grounds, by making two *casts* upon a ground at the same time. This is not much used, but it is a quicker way than the double *cast*, which is the method now most used. *Plot's* Oxfordshire, p. 251.

RIDING *clerk*, one of the six clerks in chancery; who, in his turn, for one year, keeps the controlment books of all grants that pass the great seal. *Blount*.

RIEMLING, in zoology, a name given by several to the small fresh water fish, called by the Latins *phoxinus*, and vulgarly the *pink*. *Willughby's* Hist. Pisc. p. 267.

RINÆUS *musculus*, the name of a muscle mentioned by Douglass, which he also calls *nasalis*: it arises fleshy from the extremity of the os nasi, and adjacent parts of the os maxillare, and is inserted into all the cartilages of the alæ. Its use is to open and dilate the nostril, by pulling that part outwards.

RINAR, a word used by the chemists to express filings of any thing.

RINEUS *marinus*, a name given by some botanical writers to the *crithmum*, or *samphire*, a sea plant used as a pickle. *Ger.* Emac. Ind. 2.

RING, (*Cycl.*) in angling, an instrument intended to free the hook, when accidentally entangled among weeds. It is a circular piece of lead, of about six inches round, and is fastened to a long packthread when it is to be used. It is slipped over the end of the angling rod, and let down into the water where the line conducts it to the hook; the rod and line have then no farther business; but the hook is endeavoured to be disengaged by the pulling this ring backwards and forwards by the string which is fastened to it; the hook is generally freed from the weed by this means; but if not, and nothing but the breaking of the tackle will do, the breach is made in this manner near the hook; whereas if done without this ring, it might have happened in some other part of the line, or the rod itself might have been destroyed by it.

RINGS *of flies*, in natural history, the several rounds, or circular portions, of which the bodies of these and other insects are composed.

In the *fly* kind these are crustaceous or cartilaginous, and consequently of a matter little capable of extension; many actions of these insects require, however, that their bodies, or a part at least of their bodies, should be able to inflate or distend, and contract their size occasionally. Were every *ring* of the body one entire scale, or shelly substance, these changes could not be easily effected; nature has therefore so provided, that the tender bodies of these little creatures are sufficiently defended, and yet all the necessary motions may be performed.

In many flies each *ring* is indeed one entire scale; but, in this case, it makes a circle round the body of the creature, whose ends do not join, but have a furrow between them, and running the whole length of the body; this furrow is placed under the belly, and is of different sizes in the different species. It is very narrow in the great blue fly, and much broader in many smaller species. This furrow is filled with a matter merely membranaceous, or in other species, with a series of small moveable scales, ranged endwise one to another, and in number exactly equal to the *rings* of the body; and on each side, between these scales and the extremities of the several *rings*, there is a small membranaceous substance, which is capable of extending and giving way, as the inflation or contraction of the body on different occasions may require. *Reaumur's* Hist. Inf. Vol. 4. p. 256.

Other species of flies have to every *ring* two scaly arches, which differ a little in bigness; the one covering the back, and the other the belly of the creature; these arches are joined on each side by a muscular membrane. When the body is in its state of smallest extension, and is flatted, or contracted, this membrane is seen to make several foldings laid closely over one another, and making the whole take up but a very small space; and, in this case, the superior scaly arch seems immediately to touch, and be joined to the inferior: but when the creature inflates, and extends its body, the membrane opens from its several foldings, and gives room for a vast increase in diameter; and the extremities of the two ranges of scales separate to a very considerable distance from one another. The flies produced from the rat tailed water worms, give us an instance of this mechanism. In other flies there are none of these membranes, nor furrows, but the body is composed of *rings* made up each of two single scales, one covering the back and the other the belly; but these, in the common state of the body of the creature, are laid a great way over one another, and are not fixed to that position, but can slide asunder as the creature distends itself; and in many species of insects these scales continue to cover each other in part, even when the body is distended to a very great degree. Bees, wasps, &c. are thus formed; and it is extremely necessary that they should be so, since they have frequent combats with one another: if they were not thus armed, the strokes of their stings would easily find entrance through such membranaceous commissures as are found in other flies, and would prove fatal. Ibid. p. 257.

RING *of saturn*, in astronomy, an opake, solid, circular arch or plane, like the horizon of a globe, which entirely encompasses, but no where touches the planet. See the article SATURN, *Cycl.*

RING *dove*, in zoology, the name of a bird of the pigeon kind, called by Aldrovand and other authors the *palumbus torquatus*, and by the Greeks *phassa*. Its beak is yellow, its feet naked and red, its legs feathered almost down to the feet. The upper part of its neck has a very regular and beautiful white circle, from which the bird has its name; and its whole neck, above and below this, is beautifully variegated with changes of colours, according as it is opposed to the light. Its head and back are of a dusky blue grey, and its throat and breast of a grey mixed with purple, its belly of a plain grey. The colours are all deeper, and more lively in the male than female. It seldom flies single, but in large flocks, and builds on trees; its food is ivy berries and other vegetable matter. See Tab. of Birds, N° 27. *Ray's* Orn. p. 185.

RING *head*, an engine used in stretching of cloth. 43 Eliz. c. 10. *Blount*, *Cowel*.

RING-*scalpel*. We have a description and figure of a *ring-scalpel*, for assisting the delivery of women in child-birth, by Dr. Thomas Simson, in the Medical Essays of Edinburgh, Vol. 5. Art. 39.

RING-*tail*, in zoology, the English name for the female of the *subbuteo*; the male and female in this species, differing so much in colour, as to be called by two names; the male being called the *henharrier*. See the article HENHARRIER.

The *ring-tail*, or female *subbuteo*, is a moderately large bird. It has a sort of *ring*, or chain of feathers, round the back part of its head, reaching to its chin on each side, which stand erect, and are brown in the middle, and of a reddish white at the edges, and make a sort of crown which surrounds the head; and from this there hang down a naked skin, which covers the ears. It has a white spot on each side under the eyes; its breast and belly are of a tawny white, with long brownish streaks; and the middle of its throat is brownish; its back and wings are of a dusky ferruginous colour; its tail variegated with transverse streaks of black and tawny. The upper part of the beak is covered with a yellow skin. Its legs are yellow, and the inside of its mouth is black. It feeds on small birds, and its eggs are of a reddish hue, with very little clear white appearing in them *Ray's* Ornitholog. p. 40.

RIONDO, in zoology, a name used by some for the fish more commonly called *aper*, a small fish, of the shape of the faber or doree, caught in the Mediterranean. *Ray's* Ichthyogr. p. 296. See the article APER.

RIPIENO, in the Italian music, is used in pieces of music in parts, to distinguish those that play to fill up, from those that play throughout the piece. There are, says Mr. Brossard, two kinds of the *ripieno*: one plays the part of the little chorus exactly, and does not, therefore, increase the harmony or number of parts. What is to be played by all the musicians is marked with the words *tutti* or *omnes*. This sort of *ripieno* is found in almost all compositions. The other sort is much better, a different part being played, whereby

whereby the number of parts is increased, and the harmony made fuller. Thus in pieces where in strictness two trebles, and bass, and thorough bass are sufficient, because these parts are disposed in such a manner, as that their harmony is complete when played all together; yet, in order to render the piece more perfect, and to give it more grandeur, a counter tenor, tenor, and often two violins are added, whose parts are entirely different from the other; and the harmony then has seven parts instead of three, and is consequently more complete and full. The parts thus added are properly called *ripieni*. *Brossard.*

RIPIERS, *ripiarii*, in our old writers, those that bring fish from the sea coast to the inner parts of the lands. Camb. Brit. 234. *Blount, Cowel.*

They were thus called a *fiscella, qua in devehendis piscibus utuntur, anglice* a rip.

RIPOSTE, in the manege, is the vindictive motion of a horse that answers the spur with a kick of his foot.

RIPPERS, in the wire works, are the people who attend in the mills, take the prepared small rods of iron, and work at the barrels where they are drawn into wire. *Ray's* English words, p. 133.

RISCUS, among the Romans, sometimes signifies a chest or trunk covered with skins; sometimes it is used for a hamper, made of twigs or rushes to hold lint; and sometimes for a hollow place in the wall of a house, used likewise for holding lint, or the like. *Pitisc.* in voc.

RISENTITO, in the Italian music, is a brisk, lively, or expressive manner of playing.

RISIGALLUM, in the materia medica, a substance of a red colour, generally placed among the kinds of arsenic or orpiment of the antients. Some of the later writers understand by it the sandarach, and others the factitious red arsenic; that it was looked upon to be poisonous is plain from Avisenna, who recommends it for killing rats, mice, and other vermin; and this seems to refer it to the factitious kind, or something of that sort, known in those times; for the native sandarach, does not stand in the rank of poisons with them, nor indeed is such.

Dioscorides seems to distinguish the red orpiment from sandarach, in that he says, it approaches to the sandarach in colour; he would never say that a thing was of the like colour with itself; and therefore it appears, that he knew two kinds of red substances, under the names of red orpiment and sandarach. Avisenna mentions a red, a yellow, and a green zarnicle. We find these writers called the lapis armenus by the same name zarnicle with the orpiment; and it is probable, that this author confounding the two different substances together, means real orpiment by the red and yellow, and a poor greenish blue lapis armenus by the green.

RISING (*Cycl.*)—RISING *timbers*, in a ship, are the hooks placed on her keel; and are so called, because as they rise in proportion, so her rake and her run rise on her flat floor by degrees.

RISORIUS *novus*, in anatomy, a name given by Santorini to a muscle, formed of that part of the *quadratus genæ*, which arises from the cheek.

RISVIGLIATO, in the Italian music, is used to signify, that after having played or sung a doleful and lamenting strain, a gay and lively air is to follow.

RITHER, or RIDER, in mining, is a stone or thin clift that lies in the vein; the ore sometimes runs on both sides it. Sometimes the *rither* is so thick, it parts the vein, and makes one vein two. *Houghton's* compl. Miner in the Explan. of the Terms.

RITUALES *libri*, among the antients. See ARUSPICI *libri*.

RIVERS (*Cycl.*)—It has been held by many, that all springs and *rivers* owe their origin to rains and dews; but there are some springs which cannot be accounted for on this principle, though others very well may. The intermitting springs, which flow violently in rainy seasons, and are dry in summer, are probably owing to rains; but there are some springs, which discharge more water annually, than all that falls in rain and dews in the neighbouring country. The great perennial springs at Willowbrig in Staffordshire is of this kind, and that of the Sorgne in France is much more eminently so; the *river* of that name, being, according to Gassendus, navigable up to the very springs which are its source.

But if such springs, as these, discharge too great a quantity of water for the supply of rains and dews; how is it possible, that such small supplies of water as these, can afford the constant currents of the larger *rivers?* The Volga alone, according to Ricciolus, pours forth as much water in a year's time into the Caspian Sea, as would suffice to drown the surface of the whole earth. The *river* of St. Lawrence, in the West Indies, pours forth nearly as much as this. If either of these *rivers* alone do, as has been affirmed, from calculations, discharge annually as much water, as falls in the same time in rains and mists upon the surface of the whole earth; from whence are all the rest to be supplied, according to the system of their all being made by brains; and particularly where is left the supply for the Rio de la Plata; which Ricciolus affirms to be larger than the Nile, the Ganges, and the Euphrates put together? its mouth being ninety miles wide, and running with that violence into the sea, that it makes it fresh for two hundred miles together. These, and the other *rivers* of the several parts of the globe, upon a very moderate calculation, discharge at least five hundred times as much water into the sea, as falls upon the whole surface of the earth, in rains, mists, dews, snows, &c. in a like space of time.

As it is evident, therefore, that these cannot be supplied by rains, so neither is it possible that the several hot springs, and the salt springs can be supplied that way: the origin of springs also in places where there falls little or no rain, and where the conservatories must needs be too small to contain a supply, are great proofs that rain and mists are not the origin of springs, at least not in all places. The isles of Mago, Rotunda, and the Strophades, and the rock whereon the maiden tower stands in the Thracian Bosphorus, cannot be supplied with, or retain a sufficiency of rain water to supply constant springs, yet such are always found running there.

It cannot be otherwise but that there are subterranean communications between the sea and the sources of fountains, *rivers*, and the larger springs, by which these are supplied; and there are certainly charybdes which swallow the sea for these purposes; and when these happen to be stopped, the largest *rivers* have been dried up, and wholly ceased to run for a considerable time: this we have accounts in history has happened to the Thames, the Trent, and Medway in England; the Elve, the Motala, and Gulspang in Sweden, and other *rivers* in other countries. If, on the other hand, these charybdes happen to be too open, fresh water springs depending upon them will become salt. This we have instances of in history also; and even so old a writer as Pliny has said, that this once happened in Caria near Neptune's Temple. *Plot.* de Origine Fontium. See PENUARIA.

It is pretended, by some writers of voyages, that there are two *rivers* in China, the Chiemo and Jo, both in the province of Hensi, the water of both which is so light that the smallest straw cannot swim in them, but sinks to the bottom; but we have no authentic testimony of this wonderful thing. *Redi's* Esperience.

RIVER *horse*, in zoology. See HIPPOPOTAMUS.

RIVET, in the manege, is the extremity of the nail that rests or leans upon the horn when you shoe a horse. See the articles NAIL and SHOE.

RIVINIA, in the Linnæan system of botany, a genus of plants, the characters of which are these. The cup is a perianthium, divided into four segments, of a different colour from the rest of the plant, and remaining till the seed ripens. Its segments are oblong, oval, and obtuse. It has no petals. The stamina are four filaments shorter than the calyx standing in pairs, and remaining with the cup; the antheræ are very small. The germen of the pistillum is large and roundish, the style is very short, and the stigma simple and obtuse. The fruit is a round berry, standing on the cup, the leaves of which are bent back; this berry contains only one cell, in which is contained one roundish, but flatted, rough seed. *Linnæus's* Gen. Plant. p. 52.

RIVOLGIMENTO, in the Italian music, is the placing a treble or upper part in the place of the bass, or any low part, or *vice versa*. This often happens in double counterpoint, where the treble serves for the bass, or the bass for the treble; and that in such a manner, that the harmony, though different, remains as correct after this change, as it was in the natural order of the parts.

RIZIUM, in botany, a name given by the antients to a peculiar kind of red root brought from Syria, and used by the Grecian women to paint their cheeks red.

The Latin writers, who have mentioned this, have called it *radicula*; and Pliny, who has more than once mentioned it, calls it *herba lanaria*, or *radix lanaria*. This, however, is a very great error, confounding it with the *struthium* of the Greeks. It is probable, that the *rizium* was no other than the *ancusa*, or *alkanet root*, which grows very plentifully in the countries from whence the Greeks had their *rizium*, and which will answer all the purposes for which they used it. See ANCUSA.

ROACH, (*Cycl.*) in ichthyology, the English name of a fish, called by the generality of authors the *rutilus* and *rubiculus*, by some the *rubellio*. It is a species of the *cyprinus*, according to the new system of Artedi. See the articles RUTILUS and CYPRINUS.

ROACHING *of alum*, one of the last processes used in the *alum* making, and is what renders it fit for the market.

After the *alum* liquor has been left four days in the cooler, and is sufficiently shot, they drain it out; and taking out the *alum*, they wash it in a cistern of *alum* water so strong, that it can scarce take up any more of that salt, but only cleanses it of its accidental foulnesses. After this washing the *alum* is put into large pans, and a quantity of water added to it. It is set over the fire to melt in this water and boil a little; then it is scooped into a great cask, where it is suffered to stand about ten days; and it is then fit for the market under the name of *roach alum*, or *roached alum*; the

liquor let out of the cooler is boiled up again, and shoots more *alum*.

ROAD *goose*, in zoology, the name of a small species of wild *goose*. See the article GOOSE.

ROAN, in the manege. A *roan* horse is one of a bay, sorrel, or black colour, with grey or white spots interspersed very thick: when this party-coloured coat is accompanied with a black head and black extremities, he is called a *roan* with a black-a-moor's head. And if the same mixture is predominant upon a deep sorrel, it is called claret *roan*.

ROASTING, in metallurgy, is the separation of volatile bodies, from those which are more fixed by the combined action of air, and fire; and is generally the first process in the separation of metals from their ores: it differs from sublimation only in this, that in this operation the volatile parts are dissipated, when resolved into vapours; whereas in that they are preserved.

Sulphur and arsenic are in this manner collected and preserved in the *roasting* of many ores; and sublimation made, as it were, occasionally in the process.

The separation of the volatile parts of bodies, from the more fixed is, however, in many cases very difficult, and much nicety is required in the conducting this operation; this is the case, for instance, when the whole compound body melts in almost the same degree of fire that is necessary to raise, and dissipate the volatile parts in the air; in such cases, care must be taken, first previously to pound a little the body to be *roasted*, that its surface contiguous to the air may be increased in extent. A gentle fire is also necessary on such occasions, and a very free access of the air, which is the vehicle of these vapours. When the body in the *roasting* grows on these occasions into large lumps or clots, the surface of it must be restored to the necessary extent, by repeated poundings, for it is necessary above all things, that the matter be kept extended and recent, and never collected into a heap.

Bodies the most refractory in the fire, are always the most easily *roasted*; for a great fire may be consequently kept up to such, nor need the operation be repeated so often. Care must always be taken, however, that while the volatile bodies are dissipating in the fire, they do not carry up with them something from the fixed ones also; for this is a disadvantageous accident, and too often happens, especially when a fire too violent is used in the beginning of the operation; to prevent this, it is sometimes necessary to add some fixing body to the mass. *Cramer's* Art of Foss. p. 189.

The business of *roasting* of ores of metals, as now usually practised, is subject to many inconveniences, which may be most of them easily remedied, and the whole business reduced to a few easy rules. 1. The *roasting* of ores should be always performed, without addition, when the ores are rich, or of itself merely of a metallic nature. But the additions of quicklime, potashes, iron filings, and the like, are necessary, when arsenical, antimonial and sulphureous matters are found to be mixed with the ores. 2. The fire is to be so regulated from the first, that only the lighter or more volatile sulphureous or arsenic fumes may fly off, otherwise the more metallic part would likewise go, and without some contrivance to catch it would be lost. The ore must, however, always feel the force of an open flame, otherwise the sulphur, arsenic, &c. will never be thoroughly dislodged. 3. The more these immature substances abound in ore, the gentler the fire should be at first; and when the greater part of the sulphureous matter is thus exhaled, the fire is then to be quickened. 4. Where such additions are used, as are not metalline, as lime, mud, pot-ash, &c. they ought always to be separated afterwards from the matter before the fusion, by washing. *Shaw's* Lectures, p. 251.

ROB, (*Cycl.*) in pharmacy, the inspissated juice of any substance, usually boiled up to the consistence of honey.

It is possible, that great improvements might be made, by introducing the use of this form among the malt distillers. The great inconvenience attending that art being, that the malt being of a large bulk, in proportion to its saccharine part, and requiring a large proportion of water to extract that saccharine part, many large vessels, such as mash tubs, coolers, fermenting backs, &c. are necessary; and the necessary labour on the subject is increased, and the commodity rendered dearer. The remedy of this should seem the introducing a new art subservient to that of the malt distiller, and confining itself to the boiling down of malt wort to a *rob*, so as to supply the malt stiller with his subject, in the same manner as the fine stillers are supplied with treacle by the sugar baker. By this means the business of the malt stiller would be reduced to a great degree of simplicity, and the spirit produced would be also much finer than at present, because the subject would come tolerably refined to his hands, and purged of its gross, mealy and husky matter, which yields a disagreeable oil in distillation, and is also apt to burn to the still, and spoil the spirit. It is possible that a spirit purer and finer than that from treacle might this way be procured from malt prudently managed. Ib. p. 219.

ROBALO, in zoology, a name by which some have called the *camuri* an American sea fish of the *lupus marinus*, or basse kind. *Willughby's* Hist. Pisc. p. 272. See BASSE.

ROBBINS, in a ship, small lines which make the sail fast to the yards, being reeved into eylet holes in the sail under the head-rope for that purpose. The word is *make fast the Robbins*: for at sea they don't say *tie*, but make fast.

ROBERSMEN, or ROBERDSMEN, in our old writers, a sort of great thieves, mentioned in the statutes, 5 Ed. 3. c. 14. And in Rich. 2. c. 5. Sir Edward Coke says, that *Robin Hood* lived in the reign of Rich. 1. on the borders of England and Scotland by robbery, burning of houses, rapine and spoil, &c. And that these *roberdsmen* took their names from him. 3. Inst. 197. *Blount*, *Cowel*.

ROBIA HERBA, in Botany, a name given by Paulus Ægineta, and many others to a plant used in dying.

The near resemblance of the name to the word *rubia*, has made many conclude that it was the *rubia*, or madder which they meant by it, but they have taken care in their writings to distinguish it from that plant, and it is plainly the *genistella tinctoria*, or dyers weed, that they meant by the *robia herba*. They say it was used to dye yellow, and that it was also a custom to stain the hair with it.

These are the properties recorded of the *cymene* and *œcomenium* of the Greeks, and *lutum* or *lutea herba* of the Latins, which were names of the *genistella tinctoria*. Pliny says, that the *lutum* had leaves like flax and flowers like broom, which is exactly the case with the *genistella tinctoria*, but by no means agrees with the glastum or woad.

ROBINIA, in botany, the name of a genus of plants, called *pseudo-acacia* by Tournefort, and the generality of authors. The characters are these; the perianthium is small and one leaved, it is divided into four segments at the end, the three under segments are very narrow, but the upper one four times as broad, tho' of the same length with the rest, and is slightly emarginated; the flower is of the papilionaceous kind. The vexillum is large, round and obtuse. The alæ are of an oblong oval figure, and stand free, having a very short obtuse appendage: the carina is nearly of a semiorbicular figure, it it compressed, obtuse and of the same length with the alæ. The stamina are diadelphous filaments pointing upwards. The antheræ are roundish. The germen of the pistill is oblong and of a cylindric figure; the style is capillary and turns upwards, and the stigma is hairy and placed forward at the apex of the style. The fruit is a large and long pod of a compressed figure and somewhat gibbous; it contains a few kidney shaped seeds. *Linnæi* Gen. Pl. p. 349. *Tourn.* Inst. p. 417. *Rivin.* 4. 74.

ROCELLA, a kind of fucus or sea wrack found in the Mediterranean and other seas, and in some places used by the dyers for a purple colour, and called by the botanical writers, in general, *alga tinctoria*. *Casp. Bauhin.* Pin. p. 365.

ROCHET, the name given to a fish, otherwise called *cuculus* and *red gurnard*. See CUCULUS and GURNARD.

ROCHETTA, in the glass trade, another name for polverine. See the article POLVERINE.

ROCKS (*Cycl.*)—These are generally supposed great enemies to vegetation, and the people of Scotland have been deterred from cultivating many of their best lands, from an observation that they had a *rocky* bottom. This is however but a vulgar error among them, for *rocks* of a proper kind and properly disposed, as very many of theirs are, fertilize and are beneficial to the land, not hurtful.

In many parts of England we see gardens the most beautiful that can be imagined, both in regard to flowers and excellent plants, on a soil where the bottom is a hard *rock*, and the earthy covering not more than a foot or thereabout in depth. In some of these, all the disadvantages the Scotch complain of take place, and yet the gardens are fruitful, many of them having lofty hills on the south side; the declivity due north, and the *rock* perfectly bare next the walls on the north side.

The north sides of these hills in this very aspect, only with the *rock* covered with two or three foot of earth make very good hop gardens, producing a vast quantity of a very valuable commodity at a small expence; and it is remarkable that those gardens, which stand in this exposure, instead of being subject to particular evils, often escape those blasts and other mischiefs which affect the plantations of the same kind on the south side of the hills. It might be a very valuable article of trade, if the bleak hills of Scotland, or those of some of our northern plantations in America, could be made thus fruitful in so useful a commodity, and there seems only the want of a proper trial.

Another extremely valuable plant that might be raised on these barren *rocky* places, as they are generally supposed to be, is flax, in places where the descent is too steep for ploughing in the common way. It has been proved that a hand plough with a stem of ash of about seven feet long, and a plate on each side near the end to turn the turf, a coulter to be let out shorter or longer to four or five inches deep to cut the earth up as deep as it lies upon the *rock*, and an iron wheel, may be managed with ease and conveniency by two people, and will prepare ground for producing large crops of the finest flax. The best sort of flax seed of Flanders sown on this sort of ground succeeds so well, that if brought into

into general ufe it might give the only advantage that is at prefent wanting to the Scotch holland manufactory, and make it excell that of all the world befide. The northern American colonies might alfo furnifh us with the fame fort of flax raifed at a fmaller expence than almoft any other vegetable commodity, and coming to a fure market and at a very confiderable price.

Agriculture in Scotland is too much neglected to the great impoverifhing of the country, and the diftrefs of a numerous poor, for whom it would find conftant employment. It is not yet known whether many of the moft valuable plants for medicinal and mechanic ufes will not profper as well there, as where there are immenfe fums made by the raifing them; and the owners of lands would do well in this fcheme to try the effect of liquorice, madder, woad and the like plants on their grounds. Wherever the ground is deep enough, it is pretty certain that madder and liquorice would flourifh, and the laft of thefe needs fo little culture, that if once planted it may almoft be left to it felf. The *rocky* bottoms of lands, not too bleak, may alfo fucceed very well with faffron, which is one of the moft profitable plants that can be cultivated. Phil. Tranf. N° 109.

ROCK-*cryftal*, otherwife called *fprig cryftal*, in natural hiftory, a name given to the third order of *cryftals* from their being affixed to a *rock*, or other folid body.

This kind of *cryftal* is the moft common of all others, and is what the generality of authors defcribe under the name of *cryftal of the fhops*, being that kept for medicinal purpofes. See the article CRYSTAL.

The cleareft, pureft, and moft tranfparent that can be had, ought to be chofen; and to prove its genuinenefs, it may be tried with aqua fortis, true *cryftal* making no effervefcence with that menftruum. *Hill*, Hift. Mat. Med. p. 280.

ROCK-*fifh*, a common englifh name for the *gobius marinus* or fea gudgeon. *Willughby*'s Hift. Pifc. p. 207. See GOGET.

ROCK-*oil*, See the article PETROLEUM.

ROCK-*falt*, See the article *rock* SALT.

ROD (*Cycl.*)—ROD, in the manege, called in french *gaule*, is a fwitch held by the horfeman in his right hand, partly to reprefent a fword, and partly to conduct the horfe, and fecond the effects of the hand and heels.

Golden-ROD, in botany. See GOLDEN *rod*.

ROGATORES, among the Romans, thofe who in the *comitia centuriata* brought the cheft into which the people threw the ballots containing their votes. *Pitifc* in voc.

ROHEL, a word ufed by fome authors as the name for dragons blood.

ROLLER (*Cycl.*)—ROLLER, in zoology, the common name of a bird of the mag-pie kind, called *garrulus argentoratenfis* by authors, and fufpected to be the fame with the bird defcribed by Gefner under the name of the *blue crow*, *cornix cærulea*, and by Aldrovand under the name of *pica marina*. Its beak is black and long, fomewhat crooked at the end, otherwife like that of the common mag-pie; its eyes are of a greyifh hazel colour, and near them are two tubercles bare of feathers. Its rump and part of its wing feathers are of a fine blue, like the ultramarine colours ufed in painting; the middle of its back is of a reddifh brown, and the head is of a bluifh green, and its breaft and belly are of a whitifh blue or dove colour. It is brought to market in Italy and fome other places. See Tab. of Birds, N° 10. *Ray*'s Orn. p. 89.

ROLLER, in gunnery, a round piece of wood of about nine inches diameter, and four foot long, which ferves in moving mortars from one place to another when near. This is done by raifing the fore part of the bed fo high that a *roller* may be laid under it; then pufhing the bed forwards, and laying another in its way, and another before that and fo on, the mortar is eafily moved.

ROLLUS *aquaticus*, in zoology, the name given by authors to the *water rail*, a bird of the gallinula kind, called by fome *ortygometra*, and by others *gallinula chloropus altera*, or a different fpecies of the common green legged moorhen. It is very like the common moorhen but fmaller; its head is fmall; its body flatted, and its feet neither webbed nor enlarged by membranes, tho' it fwims on the water; its beak is like that of the ruff or avis pugnax, about two fingers breadth long and flatted fideways. It has a fmall bald fpot on its forehead, which is roundifh and black; its whole upper part is of a mixed colour of black and a brownifh yellow; the middle of all the feathers being black, and the fides of a dufky yellow. Its throat is of a greyifh red, its breaft is of a dead blue with a longitudinal white line in the middle; its belly is reddifh, and the lower part of its tail white; its legs are very robuft and ftrong, and it runs very nimbly; it is common about the fides of waters, and is a very well tafted bird. *Ray*'s Ornitholog. p. 234.

ROMAIN, in hufbandry, the name of a plant cultivated in the fields in many parts of the world, particulary in France, and called by our farmers *french vetches* or *french tares*; it is an annual plant but a very quick grower, and is extremely good food for cattle, particularly for horfes: they let thefe creatures feed on it all the fore part of the fummer, and then cut it for hay in Auguft or September. Its fhort continuance in the ground makes it lefs valuable than faint foin and clover, but it has this advantage over them, that it will grow on poor ground.

ROMAN (*Cycl.*)—ROMAN *Citizen*. See CITIZEN.

ROMPION, this kind of bell flower was formerly much efteemed in England for the fweet tafte of the roots, and univerfally cultivated in kitchen gardens; but we at prefent difregard it, tho' the French continue to be very fond of it. The feeds are to be fown in a bed of light dry earth in March, and in May the young plants will be of a fize to remove, or they may be left when fowed, only houghing them up to four inches diftance; being kept clean from weeds for the remaining part of the fummer, they will be fit for eating in the fucceeding winter.

RONDINE, in zoology, a name by which fome authors have called the *milvus*, or flying fifh. *Willughby*'s Hift. Pifc. p. 283. See the article MILVUS.

RONDINE-*pefce*, in zoology, a name by which fome have called the *hirundo pifcis* or *fwallow fifh*, called by others *mugil alatus*. *Willughby*'s Hift. Pifc. p. 233. See the article HIRUNDO *pifcis*.

ROOD (*Cycl.*)—In Scotland, the *rood* contains forty fquare falls. Tr. Pract. Geom. p. 82. See FALL.

ROOK, in zoology, a well known bird of the crow kind. See the article CORNIX.

Rooks are very deftructive of corn, efpecially of wheat, they fearch out the lands when it is fown, and watching them more carefully than the owners, they perceive when the feed firft begins to fhoot up its little blade; this is the time of their feeding on it, they will not be at the pains of fearching for it at random in the fown land, for that is more trouble than fo fmall a grain will requite them for; but as foon as thefe blades appear they are directed without lofs of time or pains by them to the places where the grains lie, and in three or four days time they will root up fuch vaft quantities of them that a good crop is often thus deftroyed in embryo. After a few days the wheat continuing to grow, its blades appear green above ground, and then the time of danger from thefe birds is over, for then the feeds are fo far robbed of their mealy matter that they are of no value to that bird, and it will no longer give itfelf the trouble to deftroy them.

Wheat that is fown fo early as to fhoot up its green blades before the harveft is all carried in, is in no danger from thefe birds, becaufe while it is in a ftate worth their fearching for, the fcattered corn in the harveft fields is eafier come at, and they feed wholly on this, neglecting the fown grain; but as this cannot always be done, the farmers to drive away thefe ravenous and mifchievous birds dig holes in the ground and ftick up the feathers of *rooks* in them, and hang up dead *rooks* on fticks in feveral parts of the fields; but all this is of very little ufe, for the living *rooks* will tear up the ground about the feathers, and under the dead ones, to fteal the feeds. A much better way than either is to tear feveral *rooks* to pieces and fcatter the pieces over the fields, but this lafts but a little while, for the kites and other birds of prey foon carry off the pieces and feed upon them. A gun is a good remedy while the perfon who has it is prefent; but as foon as he is gone they will return with redoubled vigour to the field and tear up every thing before them.

The beft remedy the farmer has is to watch well the time of the corn's being in the condition in which they feed upon it, and as this lafts only a few days, he fhould keep a boy in conftant pay to watch the field from day break till the dufk of the evening. Every time they fettle upon the ground or fly over it the boy is to hollow, and throw up a dead *rook* into the air; this will always make them rife, and by degrees they will be fo tired of this conftant difturbance, that they will feek out other places of preying, and will leave the ground even before the time of the corn's being unfit for them. The reafon of their rifing at the toffing up of their dead fellow creature is, that they are a bird extremely apprehenfive of danger, and they are always alarmed when one of their comerades rifes. They take this for the rifing of an out-bird, and all fly off at the fignal. *Tull*'s Horfehoing Hufhandry.

ROOM (*Cycl.*)—*Rooms* in houfes might be warmed by the fteam of boiling water conveyed in pipes along their walls. See Philof. Tranf. N°. 476. p. 370. feq.

The contrivance is a copper with a ftill head, and a lead or copper pipe fixed to this head, which conveys the hot fteam of the boiling water thro' the different *rooms* intended to be warmed.

ROOM, in a fhip, a place diftinguifhed by partitions, or bulk-heads, as the gun-*room*, bread-*room*, cook-*room*, powder-*room*, &c.

ROOT (*Cycl.*—The *roots* of plants, of all kinds, have great numbers of fibres, iffuing horizontally from them on all fides, and running a great way; but thefe feldom go deeper than about ten or twelve inches, the depth to which the earth is commonly ftirred in agriculture by the plough fpade. Some plants have all their *roots*, even the large ones, directed horizontally and fpreading in this manner; but of the others, even thofe which have top roots, or fuch as run perpendicularly

pendicularly down into the earth, the greater part have visible fibres running horizontally from them in great numbers, and even thofe which feem to have none, are not truly without them, they being only more fine and therefore lefs diftinguifhable by the eye.

The horizontal *roots* iffuing from the main body of the *root* feem to the eye to be fhort, and reach only a little way, but they in reality extend many times farther than they feem to do, often fpreading to the diftance of many yards, after their extream finenefs and earthy colour makes them imperceptible to the eye.

Mr. Tull has made experiments of this kind, and found that a turnep, which is a plant whofe root feems to have as few, and thofe as fhort fibres growing from its main ftem as any, yet has fuch as when the ground about it is properly moved by digging, extend to the diftance of fix feet every way. The diftance to which thefe fibres of the roots of plants extend may be difcovered by trials with falt; the common garden plants will not live, if their *roots* reach to a place where there is falt; therefore if feveral plants of the fame kind be planted in different parts of the fame bed of earth, and a trench dug round each at different diftances, and falt buried in this trench, it will be feen by the decaying of fome of thefe plants, and the thriving of others, according to the diftance at which the falt lies, which of them has reached it with their roots, and which have not; that is, which falt is placed at a diftance, to which the plants cannot extend their *roots*, and which is the fartheft place to which they do. If a furrow be cut in the ground of the depth of nine inches, and at the diftance of a yard from a turnep *root*, that *root* will extend its horizontal fibres to this diftance, at the depth of fix inches or thereabout from the furface; but when they are come thus far they will defcend perpendicularly below the level of the bottom of the furrow, and when they have paffed it, they will rife to the level of the others on the oppofite fide, and extend to the diftance of a yard beyond it. This could fcarce be conceived of a plant which feems to have fo few horizontal fibres as the turnep, but experiment has fhewn it to be a certain fact.

This is not peculiar to the turnep; for all other plants do it on occafion. The open mould being the natural foil for them to draw nourifhment from, if they defcend perpendicularly out of this to avoid expofing themfelves to the open air where there is a cut or ditch, as foon as they have paffed this, they always mount upwards again to enjoy the vegetable mould again at their proper depth: this is the reafon of what feems fo ftrange a thing in the turnep fibres as their rifing after they had paffed the furrow.

The *roots* of a common thorn hedge may be obferved to run horizontally in their natural direction, and if they come to a ditch they will defcend perpendicularly till lower than its bottom, and then running acrofs it, they will immediately mount again toward the furface, and extend themfelves horizontally at the depth of eight or ten inches to a great diftance: on opening the earth at five feet diftance from the ditch, the *roots* will be found tolerably large, and none of them reaching deeper than the common mould, which feldom is above a fpade deep.

Mr. Tull mentions a very extraordinary inftance of the fpreading of the *roots* of trees in that of a witch elm; a chalk pit contiguous to a barn, the area of which was about forty perch of ground, was made clean and fwept, fo that it could plainly be feen that there was no vegetable matter about it, any more than in the floor of the barn: ftraw was thrown from thence into the pit for cattle to lie on, and about three years after the pit was cleanfed, the dung made in it being taken up; the bottom of the pit, and the top of the chalk were at this time covered with *roots*, and thefe were found to come from a witch elm, of not more than five or fix yards in height, which was about five yards above the area of the pit, and eleven yards from it; fo that in three years the *roots* of this tree had extended themfelves to eight times the length of the body of the tree, beyond the extremity of the old *roots*, at eleven yards diftance from the bottom of the trench, whence the original *roots* proceed. The annual encreafe of the length of the *roots* in this cafe was about three times as much as the whole length of the tree.

The vegetable mould which lies ufually from the furface, to about a foot deep, being a proper place for the *roots* of trees, they will rife into it, tho' the unfkilful hand of man plant them deeper. Thus in an orchard where the trees are fet too deep, their *roots* all afcend till they come to a proper fcene of nourifhment; but if the ground be moift there is a difadvantage in this, for the *roots* paffing thro' a watery place are chilled, and the circulation retarded.

The generality of the world fuppofe, that the horizontal *roots* of plants are much fhorter than they really are, becaufe they fee that they are pretty taper near the *root*, and feem to come to a point very foon: by this obfervation they conclude that they diminifh on in the fame proportion that they do there, and confequently that they very foon come to an end. But by this means they calculate their length at lefs than one twentieth part of what it really is; for the truth is, that after the length of a few inches from the main *root*, they are not difcernibly taper, but pafs on in the fame bignefs to their very ends. This may be feen at any time in the *roots* of plants growing in water, and with care in the tracing them it may alfo be feen in thofe which grow in the earth; but the reafon why it is not commonly feen in thefe, is that they generally break off in the taking up about the part where they grow taper. Many plants which feem to have only large naked *roots* have thefe horizontal ones, which tho' fmall are branched out into many leffer fibres, and convey a great deal of nourifhment to the plant, and that from a great diftance. If a common carrot be taken up and examined, there will be found many fine fibres, like hairs growing from its fides: each of thefe examined with a microfcope, will be found to be a *root* not going taper, but all the way of the fame bignefs broken off at the end, and fending numerous fibres from its fides; all thefe are extended to fome length, and then appear broken off as the other; and it is very probable from what is known to be the cafe in the turneps, that this horizontal *root* is in its natural ftate extended four, five, or fix feet from the carrot, all the way of the fame length, and all the way fending out its lateral fhoots or fibres which run upwards and downwards the whole fpace of the ten or twelve inches of vegetable mould. If fo, from what a diftance every way, and by what an immenfe number of channels does this plant receive nourifhment?

The ufe of digging the earth to a great diftance every way from the *roots* of fuch plants as are defired to thrive well, is evident from this: for thefe tender *roots* which in an open mould will run to fo many feet diftance, are pinched up, and deftroyed when they come into a hard and undug earth. The advantage of having clear fpaces between plants cultivated for ufe, is alfo plain from this, fince they all have *roots*, tho' imperceptible to us, which occupy thofe fpaces, and draw nourifhment from them.

Many plants are of a fort of amphibious nature, and grow as well in water as on land; the perficaria falicis folio, or willow leaved arfmart, called when in the water, the long leaved pond-weed, is an inftance of this kind. This in the water and on the land makes fo different an appearance, that the old botanifts have taken it for two different plants. The *roots* of this, and of all other fuch plants, are much longer when they grow on land, than when in water.

The fecrets of vegetation as carried on by *roots*, and the ufes one part of the *root* is of to the other parts, are yet far from being underftood to perfection. We know indeed that all *roots* imbibe moifture from the earth, but it alfo appears, that they part with that moifture again in the form of water, as they received it without carrying it all up into the body of the plant on certain occafions. If a piece of flourifhing mint in a water glafs be fo contrived, that while the *roots* from one joint are all immerfed in water, thofe of an upper joint be received into a box, and laid all at one corner of it, and the box filled with fand dryed at the fire; after a nights ftanding, the water in the glafs will be found fenfibly decreafed, and the fand at that corner of the box where the *roots* of the mint are, will be found very wet, while all the reft remains dry. This water which has thus wetted the fand, muft have been received into the lower *roots*, and from thence conveyed to the upper ones, and they muft have again delivered it out into the fand, inftead of carrying it up into the body of the plant. Let a trough of earth be prepared of two feet in length, and let a ftrong fhoot of mint be fet in a glafs of water at each end of the trough, and while half the *roots* of each are placed in the water, let the other half be laid in the trough and covered with dry earth in powder; this dry earth will foon become moift, and the *roots* will fhoot out beyond its furface. Thefe are to be covered with foft earth as they appear, till the trough will hold no more; the whole trough will thus be foon filled with the *roots* of thefe two fhoots of mint, and thofe *roots* which rife to the furface, and are not covered, will be feen to bend down their points and enter the earth again.

Thefe mints grow greatly fafter than thofe which are planted either in water alone, or in water with earth in it; and the earth in the trough will always be found thoroughly moiftened, tho' no water is put to it, except what arifes from the lower *roots*, and is carried to thefe upper ones, which are placed in the earth. The quantity of water thus fent up by the lower *roots*, and thrown into the earth above by the upper ones, is more than a thoufand times the whole weight of the plants, and feems to have never mixed itfelf with the juices of the plant at all, but to have been evacuated pure water as it was received without ever going any higher than the upper *roots*.

The glaffes in thefe experiments need very frequent fupplies, a day or two being fufficient to drain them; but what is remarkable is, that if they are fuffered to be without water in the glaffes, they will not dry up or wither, but the *roots* below, as well as the plant above, will be kept

kept in a flourishing state for some time by the wet earth in the box. These experiments shew us a use in the several parts of the *roots* of plants, which providence has wisely allotted for the service of the whole, and which we can otherwise have no idea of. Every part of the *roots* of the same plant is thus found to be capable of supplying all the rest; and it is evident, that the several portions of the *roots* in the mint communicate one with another by means of vessels which serve only to carry water from the one to the other, without mixing it with the juices of the plant. Such vessels of communication there must have been between the two sets of *roots* of this mint, which must have passed thro' that part of the stalk of the plant, which was between the two joints, tho' several inches in length, and by these while one root was kept moist, the other was moistened by it, whether the upper one, or the lower one was in the moist place, and then the nourishment was carried up by both to the plant.

From this we see the great use of tap *roots* to plants, and understand the reason why the lucerne, saint-foin, and other plants which have long tap *roots* produce such numerous branches and succeed so well in dry seasons, when the shorter *rooted* plants are nearly destroyed. The earth at a great depth is always moist, and these tap *roots* penetrating to that depth imbibe that moisture, and send it up to the upper *roots*, which discharge it into the earth near the surface, as the upper *roots* of the mint do into the earth in the trough; and thence all the fibrillæ of the whole set of horizontal *roots* are supplied with a proper degree of moisture in the earth, where they run and grow almost as well as in moist weather. If this was not the case, the *roots* which are spread thro' the upper surface of the earth could be of no service to the plant in dry weather.

The stirring of the earth about the *roots* of plants has been a practice long used by our gardiners, who were well acquainted with the effects of it, tho' ignorant of its cause. The *roots* of plants send out horizontal fibres every way, and these send out fibrillæ on every side from them, which run thro' the whole upper stratum of vegetable mould: every time this mould is stirred, a great number of these fibres and fibrillæ are broken off, and the consequence of this is, that they encrease in number, several new *roots* always shooting out in the place of one that was broken off; and as the number of *roots* is the great means of the supply of a plant, every time the earth is stirred, that number, and consequently that supply is encreased.

There seems no danger of the plant's being surfeited by an over supply of nourishment this way; for we see nature has provided for a discharge of the abundant moisture by the other *roots*, as we find by the water discharged into the earth in the trough. It remains yet to try whether the fluid thus evacuated be pure water as received, or be altered into the nature of the plant. This cannot be easily determined by mint; but if a stronger flavoured plant, such as garlick, be set in water, and part of its *roots* placed in a bed of flower instead of earth, it will be soon seen whether the flower in this case be moistened as the earth in the other, and the tasting it will shew whether it be moistened with pure water, or with water altered to the taste and nature of the plant. *Tull's* Horsehoeing Husbandry.

Preparation of Roots, there are several ways of preparing *roots* for medicinal use in the eastern nations, which strongly alter them from their original form and appearance. An instance we have of this in the drug called *salep*, which is no other than the *root* of an orchis thus prepared. See the article Salep.

Other *roots* they also prepare in the same manner, or something like it; an instance of which we have in some of the oriental ginseng, which is clear and pellucid as a resin, and friable like one, retaining very little of the structure or appearance of the *root*. Kempfer gives the method by which the people in the east do this, and it may be well worth trying on some of our own *roots*.

The Chinese, this author informs us, give their ginseng its colour and transparence in this manner. They macerate the fresh *root* for three days in cold rice water, then expose it in close vessels, to the vapour of the same water; after which they carefully and leisurely dry it, and it becomes hard and brittle, of a brownish red colour, and as transparent as a resin.

All the ginseng of China is not of this sort, and it has been supposed by some, that such as was so, had assumed that appearance by age, as many of the more succulent *roots*, which have very small fibres, will become much less opake when perfectly dry, than they were at first; but experience shews that this is not the case, for many persons have kept the oriental ginseng a great many years, but it has never been known to assume that appearance. There is no doubt however, but that if the West Indian ginseng were treated in this manner, it would equal the prepared ginseng of the east: for the *roots* of some of our umbelliferous plants, particularly the skirret, may be made clear and transparent in this manner, by only boiling it in common water, and afterwards drying it in the open air. Mem. Acad. Scien. Par. 1740.

Flower-Roots. See the article Flower.

Root *of osteocolla*, a word used to express a sort of soft and rotten matter, on which the *osteocolla* of Germany is found in sandy grounds.

The workmen seek after the *osteocolla* by the direction of certain lumps, of a white marley matter, which they find lying on the sands; under this they always find a parcel of rotten vegetable matter, branching out from a main stem or trunk, at ten or twelve feet deep up to the surface; this rotten substance they call the *root of the osteocolla*; and they observe, that where the matter they seek after is not found round it at the time of their digging, they need only mark the place, and dig again a year afterwards, and they will find it formed in a perfect manner. The *osteocolla* found near Frankfort is all of this kind; and we find the holes in the center of all the pieces, through which this *root* had passed. It is so tender that it usually moulders away on the *osteocolla*, being exposed to the air; but sometimes they wash it out. Phil. Transf. N° 39. See Osteocolla.

It is not easy to conceive what this is, unless the remains of fossile branches of trees; but even then it is as difficult to account for the formation of the *osteocolla* about them, as there is none of it found concreted where they are not. We have a sort of *osteocolla* found with us in what we call petrifying springs; but as this is done in the water, it is easier to conceive how it becomes so pure, than how a soft and pappy substance found in the midst of a bed of sand, comes not to have some sand embodied in it.

Root, in mathematics (*Cycl.*)—The extraction of the *roots* of algebraic quantities, may be performed in a manner analogous to that used in arithmetic, for extracting the *roots* of numbers; and if the *root* cannot be accurately found, the process may be continued indefinitely, which will give a series. Thus the quantity $aa + xx$ being proposed, its square *root* thus extracted will be found to be,

$$a + \frac{x^2}{2a} - \frac{x^4}{8a^3} + \frac{x^6}{16a^5} - \frac{5x^8}{128a^7} + \frac{7x^{10}}{256a^9} -, \&c.$$

See Newton's *Meth. of Fluxions & inf. series*, p. 4. of Mr. Colson's Edit.

But the extraction of *roots* may be abbreviated by that great author's *binomial theorem*, which he thus expresses in his letter to Oldenburgh.

$$\overline{P+PQ}^{\frac{m}{n}} = P^{\frac{m}{n}} + \frac{m}{n}AQ + \frac{m-n}{2n}BQ + \frac{m-2n}{3n}CQ + \frac{m-3n}{4n}DQ +, \&c.$$

Where $P + PQ$ signifies the quantity whose *roots* or dimension, or *root* of any dimension, is to be investigated. P, is the first term of the quantity; Q, the rest of the terms divided by the first. And $\frac{m}{n}$ is the index of the dimension or power of $P + PQ$, whether that denomination be a whole number, a fraction, affirmative or negative. Lastly, A, B, C, D, &c. represent the terms of the *root* as they are found; that is, A stands for the first term $P^{\frac{m}{n}}$, B for the second $\frac{m}{n}AQ$, &c. The use of the rule will appear by a few examples.

1. To find the square root of $cc + xx$; that is, $\sqrt{cc + xx}$, or $\overline{cc + xx}^{\frac{1}{2}}$. Substituting cc for P, $\frac{xx}{cc}$ for Q, 1 for m, 2 for n, $\overline{cc}^{\frac{1}{2}} = c = P^{\frac{m}{n}} = A$, &c. we shall have $\overline{cc + xx}^{\frac{1}{2}} = c + \frac{xx}{2c} - \frac{x^4}{8c^3} + \frac{x^6}{16c^5} -$, &c.

2. In like manner $\frac{N}{\sqrt[3]{y^2 - a^2 y}}$ or $N \times \overline{y^3 - a^2 y}^{-\frac{1}{3}}$ will be found equal to $N \times \frac{1}{y} + \frac{a^2}{3y^3} + \frac{2a^4}{9y^5} + \frac{14a^6}{81y^7} +$ &c. For $P = y^3$, $Q = \frac{-aa}{yy}$, $m = -1$, $n = 3$, $A = P^{\frac{m}{n}} = y^{3 \times -\frac{1}{3}} = y^{-1} = \frac{1}{y}$, $B = \frac{m}{n}AQ = -\frac{1}{3} \times \frac{1}{y} \times -\frac{aa}{yy} = \frac{aa}{3y^3}$, &c.

3. Simple powers may be found in the same way. Thus, if $\overline{d+e}^5$, or $\overline{d+e}^{\frac{5}{1}}$ were required. Then by the rule $P = d$, $Q = \frac{e}{d}$, $m = 5$, and $n = 1$. Hence, $A = P^{\frac{m}{n}} = d^5$, $B = \frac{m}{n}AQ = 5d^4e$, &c. $C = 10d^3e^2$, $D = 10d^2e^3$, $E = 5de^4$, $F = e^5$; and lastly, $G = \frac{m-5n}{6n}FQ = 0$.

Here the series terminates, and therefore $\overline{d+e}^5 = d^5 + 5d^4e + 10d^3e^2 + 10d^2e^3 + 5de^4 + e^5$.

4. Di-

4. Division may be performed by the same rule. Thus, if it were required to divide 1 by $d+e$. Then $\frac{1}{d+e} = \overline{d+e}^{\,-1} = \overline{d+e}^{\,-\frac{1}{1}}$. Hence by the rule, $P = d$, $Q = \frac{e}{d}$, $m = -1$, $n = 1$, $A = P^{\frac{m}{n}} = d^{-\frac{1}{1}} = d^{-1} = \frac{1}{d}$, $B = \frac{m}{n} AQ = -1 \times \frac{1}{d} \times \frac{e}{d} = -\frac{e}{d^2}$, and $C = \frac{ee}{d^3}$, $D = -\frac{e^3}{d^4}$, &c. That is, $\frac{1}{d+e} = \frac{1}{d} - \frac{e}{d^2} + \frac{e^2}{d^3} - \frac{e^3}{d^4} +$ &c.

See *Newt. Epist. ad Oldenburgh.* Tom. 3. Oper. Wallis. *Analys. per quant. Series*, &c. Lond. 1711. p. 23. seq.

The method of extracting the *roots* of numbers, mentioned in the Cyclopædia under the head EXTRACTION, is the same as that given long ago by Vieta, and is to be met with in almost all books of arithmetic and algebra. Monf. de Lagni and Dr. Halley have given us much more expeditious methods. Dr. Halley's rules for the square and cube are inserted in the Cyclopædia, under APPROXIMATION; only one of the formulæ for the cube is erroneously printed. We shall here insert the doctor's rules which extend to the seventh power, and may easily be continued at pleasure, the law of the continuation being obvious.

$$\sqrt{aa \pm b} = \sqrt{aa \pm b}, \text{ or } a \pm \frac{ab}{2aa \pm \frac{1}{2}b}.$$

$$\sqrt[3]{a^3 \pm b} = \frac{1}{2}a + \sqrt{\frac{1}{4}aa \pm \frac{b}{3a}}, \text{ or, } a \pm \frac{ab}{3a^3 \pm b}$$

$$\sqrt[4]{a^4 \pm b} = \frac{2}{3}a + \sqrt{\frac{1}{9}aa \pm \frac{b}{6aa}}, \text{ or, } a \pm \frac{ab}{4a^4 \pm \frac{3}{2}b}$$

$$\sqrt[5]{a^5 \pm b} = \frac{3}{4}a + \sqrt{\frac{1}{16}aa \pm \frac{b}{10a^3}}, \text{ or, } \pm \frac{ab}{5a^5 \pm 2b}$$

$$\sqrt[6]{a^6 \pm b} = \frac{4}{5}a + \sqrt{\frac{1}{25}aa \pm \frac{b}{15a^4}}, \text{ or, } a \pm \frac{ab}{6a^6 \pm \frac{5}{2}b}$$

$$\sqrt[7]{a^7 \pm b} = \frac{5}{6}a + \sqrt{\frac{1}{36}aa \pm \frac{b}{21a^5}}, \text{ or } a \pm \frac{ab}{7a^7 \pm 3b}$$

For the application of these formulæ or rules, observe, that a denotes the nearest *root* to that of the proposed number, whether greater or less than the true; and that b is the difference between this *root*, involved to the proper power, and the proposed number. Thus, if it were proposed, to extract the cube *root* of 231, the nearest cube to it is 216, the *root* of which is $6 = a$, and the difference between 231 and 16 is $15 = b$. The *root* required will therefore be $= \frac{1}{2}a + \sqrt{\frac{1}{4}aa + \frac{b}{3a}} = 3 + \sqrt{9 + \frac{5}{6}} = 3 + \sqrt{9.8333} = 6.1358$. But this is only a first approximation. For a second suppose $6.1358 = a$; then its cube will be $= 231.000853894712$, which is greater than the truth, and the difference $0.000853894712 = b$. Therefore the *root* $= \frac{1}{2}a + \sqrt{\frac{1}{4}aa - \frac{b}{3a}} = 3.0679 + \sqrt{9.41201041 - \frac{0.000853894712}{18.4074}} = 6.13579243966195897$ true to the eighteenth figure, which Dr. Halley assures us he computed within an hour.

By this example the method of working may be sufficiently clear, and the use of the double sign $\pm$ is obvious. When a is less than the truth, then $a^3 + b$ represents the given number; but when a is greater than the truth, the proposed number will be represented by $a^3 - b$. In the first case, the *root* is $\frac{1}{2}a + \sqrt{\frac{1}{4}aa \pm \frac{b}{3a}}$, or $a + \frac{ab}{3a^3 \pm b}$, and in the second case it is $\frac{1}{2}a + \sqrt{\frac{1}{4}a^2 \quad \frac{b}{3a}}$, or $a - \frac{ab}{3a^3 - b}$.

Dr. Halley justly observes, that the irrational formulæ, $\frac{1}{2}a + \sqrt{\frac{1}{4}aa \pm \frac{b}{3a}}$, is preferable to the rational, $a \pm \frac{b}{3a^3 \pm b}$; because the extraction of the square *root* is much easier than a division by so great a divisor, as $3a^3 \pm b$.

These rules are at least triple the figures of the *root* at every new operation. Thus, in the foregoing example, by the first operation, we had five figures, *viz.* 6.1358 for the *root*; and at the second, we had the *root* true to eighteen places.

Monf. de Lagni published a rule for the sursolid *root*, or fifth power, which quintuplicates the figures of the *roots*, at least. The rule is this,

$$\sqrt[5]{a^5 \pm b} \quad \sqrt{\frac{1}{2}a + \sqrt{\sqrt{\frac{1}{4}a^4 \pm \frac{b}{5a}} - \frac{1}{4}aa}}$$

See Phil. Trans. N° 210, or Lowthorp's Abridgment, Vol. 1. c. 1. Sect. xx. p. 81. Mac Laurin's Algebra, p. 242. Simson's Algebra, p. 155. Where various general theorems for approximation to the *roots* of pure powers are given. See also EQUATION.

For common use, these extractions may be most commodiously performed by logarithms: dividing the logarithm of the power by the index of the required *root*, that is two for the square, three for the cube, &c. the quotient is the logarithm of the *root*; which may therefore be found by the tables.

In some books we have tables of square and cube numbers, by which the nearest square or cube to any proposed number within the limits of the table, may be found by inspexion. *Prestet* has given a table of this kind in his *Elemens des Mathematiques*.

For the *roots* of adfected equations. See EQUATION.

Seminal ROOT. See the article SEMINAL.

Cube ROOT, in geometry. Observe, that the *cube root* of any quantity A^3 may be A, or $\frac{-1+\sqrt{-3}}{2} \times A$, or $\frac{-1-\sqrt{-3}}{2} \times A$.

This follows from what was shewn under the head UNITY, that the *cube roots* of unity or 1 are 1, $\frac{-1+\sqrt{-3}}{2}$, $\frac{-1-\sqrt{-3}}{2}$. Hence the *cube roots* of A^3 or of $1 \times A^3$ will be as above mentioned. *Mac Laurin*'s Algebr. p. 226. where he shews the use of such expressions.

In general, every power has as many *roots*, real and imaginary, as there are units in the exponent of the power. *Mac Laurin* Ibid. p. 128.

Impossible ROOT is not only the square *root* of a negative quantity, but any other *root* denominated by any even number. Thus $\sqrt[4]{-1}$, $\sqrt[6]{-1}$, $\sqrt[8]{-1}$, or in general $\sqrt[2m]{-1}$ or $\sqrt[2m]{-x}$ are all impossible roots, or quantities.

Some call them *imaginary roots* or quantities.

ROPALON, in botany, a name given by some authors to the *nymphæa*, or *water lilly*, and also to the *faba ægyptia* of the river Nile.

ROPE (*Cycl.*)—*Standing* ROPES, in a ship, the shrowds and stays are so called, because they are not removed, unless to be eased or set taught.

ROQUET, in zoology, the name of a species of American lizard, of small size, and of a reddish brown colour, variegated with black and yellow spots. Its fore legs are remarkably long for a creature of this kind; its eyes are particularly vivid and sparkling, and its head is carried continually erect; and the creature is almost eternally in motion, hopping about like a bird, and it usually carries its tail bent into a semi-circle over the back. It is far from being shy or timorous, and is delighted at the sight of men; when tired with play or with running, it will open its mouth and pant, and loll out its tongue as the dogs do. *Rochefort*, Hist. Antill.

ROS (*Cycl.*—ROS *mayalis*, *maydew*, the *dews* that fall in the beginning of summer, particularly in this month, have great virtues attributed to them by many authors, when newly gathered and clean filtered. It is not of a watery appearance, or colourless, but is yellowish, and much resembles the urine of a healthful person. The common methods of putrifying water also have no effect on *dew*. Several quantities of it have been placed in digestion with different degrees of heat, from that of dung to that of a sand surface, but no putrefaction brought on it, though continued two months together; the heat, in whatever degree, serving to purify it, not to hurt it. The summer sun, for all the hot months together, has no more effect on it. It only sends out a green vegetable matter of the conferva kind which floats on the surface, and adheres to the sides of the vessel, and the whole quantity of the liquor remains as pure as before. Phil. Trans. N° 3.

Though these common methods of putrefaction do not take place in this fluid, a much more simple process will. If a quantity of it be put into an open wooden vessel, and set in a cool shady place, with a canvas stretched over it to keep out dust and insects, it will in three or four weeks putrefy and stink, and deposite a large quantity of a black and thick mud. The manner of the formation of this sediment is this: a small quantity of a foul matter first separates itself from the liquor, and floats at the top in form of a skin or film; this soon after precipitates itself to the bottom, and another succeeds in its place at the top, which is soon after precipitated in the same manner. Thus the mud is a congeries of these films one on another. If a quantity of *dew* be put into a long and narrow glass vessel, these films, instead of sinking, as soon as formed, will combine one with another at the top, and form a thick scum, which may be taken off with a spoon, and is very different from the black mud, separated to the bottom in the former experiment, being

being a white and thick flime: if a quantity of this be put into a drinking glafs, or other fuch veffel, and the water drained from it, it will fomewhat fhrink in twelve hours ftanding, and will become fo folid as to take the form of the glafs, and may be fhook out; it then refembles a lump of boiled white ftarch, but is fomewhat more tranfparent.

We have, in the Philofophical Tranfactions, a very remarkable account of a vegetable production from this jelly. A perfon having put a quantity of it into a double veffel, in order to putrify it, obferved, that after fome days, the moifture was in great part evaporated, through a fault in the luting of the junctures, and that a large mufhroom was growing up out of the almoft dry refiduum. It was, he fays, of a fpungy and watery nature, and of the fame nature with fome which he had feen growing out of rotten wood. The warmth employed in this digeftion was that of a *balneum mariæ*. The probable account of this is, that the feeds of this mufhroom, which are very light, and eafily wafted about every where by the winds, had fallen into the jelly, in the time of its being expofed; and finding it a proper nidus, had, by means of the additional warmth, which is alfo greatly beneficial to all the mufhroom clafs, been fet a growing, and arrived at their perfection in the form of the parent plant they fell from. There are in the fame paper other odd accounts of productions of the animal kingdom, in the fame *dew*, which might puzzle any one not verfed in experiments of this kind with other fluids. In one of the veffels of this *dew* he found millepides, differing from the common kind in fome particulars. Thefe were the common water millepides; and in another he found a quantity of green matter, probably a conferva, with numerous eulæ of infects inhabiting it; for in a few days there were produced from this a vaft number of flies. Another parcel of the *dew*, fet in an open glafs, was found after fome days filled with the eulæ of the common gnat, and the flies were hatched from thefe. Phil. Tranf. N° 3.

It is eafy for a bad philofopher to infer from thefe accounts the equivocal generation of thefe creatures in the water; but the infight we have had into the wonders of nature in the infect world are fuch, that at prefent we know their generation to be in many fpecies, particularly in the gnat and fly kinds, from the eggs of their parents depofited in water, or any watery fluids, and that common ditch water will at any time do what the *dew* does in this experiment.

ROS *folis*, *fundew*, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the rofaceous kind, compofed of feveral leaves, arranged in a circular form. The cup is tubular, and the piftil which arifes from it is at length converted into an oval pointed fruit, which opening at the extremity, difcovers a number of oblong, or roundifh feeds. To thefe marks, it is to be added, that the leaves are covered with long hairs, from which there feem to be feparated large drops of water.

The fpecies of *fundew* enumerated by Mr. Tournefort are thefe. 1. The common round leaved *fundew*. 2. The common long leaved *fundew*. 3. The perennial round leaved *fundew*. 4. The perennial long leaved *fundew*. 5. The largeft, long leaved *fundew*; and 6. The Portugal *fundew*, with leaves like thofe of the fmaller afphodel. *Tourn.* Inft. p. 244.

ROSA, the rofe. See the article ROSE.

ROSA *crucis*, in church hiftory. See ROSYCRUCIANS, *Cycl.*

ROSA *fatuina*, in botany, a name given by fome authors to the piony.

ROSA *junonis*, in botany, a name given by fome authors to the lilly.

ROSACEOUS *flower*, *rofaceus flos*, in botany, a term ufed to exprefs fuch flowers, as are compofed of feveral petals or leaves, difpofed in a fort of circular form, like thofe of the rofe: fuch are the flowers of the piony, crowfoot, cinquefoil, *&c.* In this fort of flowers the difpofition only of the leaves is regarded, their number being of no confequence. It is very feldom that the number is two or four, except in the circæa and onagra. The moft frequent number of leaves in thefe flowers is five, and fuch as have four differ from the cruciform flowers, not only in their difpofition, but in this, that the number is in the fame fpecies indeterminately four, five, or fix, as is the cafe in the clematitis, the capers, and the fpecies of rue, whereas in the cruciform ones it is ever conftant. See Tab. 1. of Botany, Clafs 1. *Tourn.* Inft. p. 234.

ROSACLORUM, or according to fome authors *rofi-chiero*, a fine red ufed to enamel on gold with. It is prepared in this manner: take ten pound of cryftal glafs, put it into a pot, and when it is well melted, add to it, at twice, a pound of the beft red lead, ftir the mafs well together, and afterwards caft it into water. Repeat this procefs three times, then when the matter is again in fufion, mix with it five ounces of calcined brafs, and the fame quantity of the deepeft cinnabar; ftir the whole well together, and let it fettle three hours; then add of glafs of tin three ounces, mix the whole, and it will be of a fine rofe colour. *Merret's* Notes on Neri, p. 350.

ROSALIA, a name ufed by authors for the meafles, or a difeafe very like the meafles, confifting in a number of afperities and protuberances of the fkin, which foon die away.

ROSARBA, in botany, the name of an imaginary plant, which has given great trouble to the commentators on the works of the antients.

The Arabian writers, Avifenna, Serapion, and others, have mentioned two kinds of carob or ceration; the one efculent, and endued with the virtue of a gentle purgative, the other an aftringent.

This laft they have diftinguifhed from the other by the name of the nabathæan pod or aljembut. They fay, in their defcriptions, that the aljembut is like the *rofarba*, fo run the old tranflations, but the true meaning of the original is *rofa vineæ*. This was a name given to the common wild acacia tree, and the tree which produced the nabathæan pod, might be very well likened to this; it being, in reality, only a fpecies of the acacia, and the fuccus acaciæ, or infpiffated acacia juice of the fhops; being, according to Ifidore, made oftentimes from the unripe fruit of this very fpecies.

ROSARIA, among the Romans, a kind of perfumes, fo called, either from their being chiefly made of rofes, or becaufe they had a moft exquifite odour.

ROSARY (*Cycl.*) is a word frequently met with in the antient hiftories of Ireland, and ufed to exprefs a peculiar fort of bafe money coined abroad, in the form of the penny, current in that kingdom; but of fo much bafer an alloy, that it was not worth quite half the real value of the penny. This and many other fuch coins were decried, and it was made death to import any of them by Edward the firft in 1300.

ROSBOTH, a word ufed by fome authors to exprefs a foft excrefcence from any part.

ROSCOLÆ, a name given by fome medical writers to the meafles.

ROSE, ROSA, in botany, the name of a genus of trees, the characters of which are thefe. The flower is compofed of feveral petals arranged in a circular form. The cup is compofed of feveral leaves, and finally becomes a roundifh or oblong flefhy fruit, which is unicapfular, and contains a number of angular hairy feeds.

The fpecies of *rofe* enumerated by Mr. Tournefort are thefe. 1. The fingle red *rofe*. 2. The double red *rofe*. 3. The double reddifh black *rofe*. 4. The red *rofe* which does not open. 5. The fingle pale red *rofe*. 6. The double pale red *rofe*. 7. The deep or blackifh red *rofe*. 8. The purple *rofe*. 9. The fingle purple *rofe*. 10. The changeable coloured *rofe*. 11. The Englifh changeable *rofe*. 12. The red and white variegated *rofe*. 13. The Ciphian *rofe*, or fmall pimpernel leaved Scotch *rofe*, with elegantly variegated flowers. 14. The greateft double *rofe*. 15. The middle fized double *rofe*. 16. The great fingle white *rofe*. 17. The great double white *rofe*. 18. The fmall white *rofe*. 19. The large mufk *rofe*. 20. The fingle flowered mufk *rofe*. 21. The double flowered mufk *rofe*. 22. The evergreen mufk *rofe*. 23. The large flowered *rofe* without prickles. 24. The fmall flowered *rofe* without prickles. 25. The curled leaved *rofe* with bright red flowers. 26. The common wild *rofe* with a pale fweet fcented flower. 27. The wild *rofe* with a large deep red flower. 28. The double flowered dog *rofe* or wild briar. 29. The *eglantine*, or *fweet briar*, with double flowers. 30. The common fingle flowered *fweet briar*. 31. The wild *rofe* with red very fweet fcented flowers. 32. The wild *rofe*, with a white very fweet flower. 33. The fingle cinnamon *rofe*. 34. The double flowered cinnamon *rofe*. 35. The fmall red *rofe*, commonly called the May *rofe*. 36. The fingle yellow *rofe*. 37. The double yellow *rofe*. 38. The very thorny field *rofe* with a white fweet fcented flower. 39. The dwarf very thorny *rofe* with red flowers. 40. The dwarf alpine *rofe*, with fmall roundifh pimpernel leaves, and very little flowers, of a livid red. 41. The wild dwarf red *rofe*. 42. The great wild apple *rofe*. 43. The white field *rofe*. 44. The creeping white field *rofe*. 45. The fmalleft *rofe*. 46. The two flowered field *rofe* without prickles. 47. The pale red mouth *rofe*. 48. The white mouth *rofe*. 49. The double pale red mouth *rofe*. 50. The fingle purple mouth *rofe*. 51. The crimfon *rofe*. 52. The Frankfort *rofe* with a thick cup, which does not open its flowers; and 53. The wild *rofe* or briar with large hairy fruit. *Tourn.* Inft. p. 637.

We have a vaft variety of thefe beautiful flowers preferved in our gardens; fome few of which are natives of our own country, but the far greater number are of foreign origin. They are all propagated either by fuckers, by layers, or by binding them on the other forts of *rofes*; the laft method is but feldom practifed, but is neceffary for the finer forts, which do not naturally fhoot vigoroufly, and which produce few or no fuckers. The beft fort of *rofe* for ftocks is the Frankfort kind; the feafon for doing it is in June, and there muft be great care afterwards, that the ftock produce no fuckers at the bottom, for thefe would foon ftarve the bud. *Miller's* Gardner's Dict.

When *rofes* are to be propagated from fuckers, they are to be taken off annually, and planted into nurfery beds, or into the places where they are to remain. They always take

take root well the firſt year, but if ſuffered to remain on the ſtock longer, they grow woody, and often fail.

But the beſt method of obtaining vigorous plants, is, by laying down the ſhoots; this is to be done in autumn, and by the autumn following they will have taken root ſo well, that they may be taken off from the old plant, and removed to the places where they are to remain. Theſe may be tranſplanted any time from October to April, but the earlier the better.

Roſes, in general, delight in a rich moiſt ſoil, and an open ſituation, in which they will produce great quantity of flowers, and thoſe much more beautiful than when they are on a dry ſoil and ſhady ſituation.

All the pruning they require is to have their dead wood cut, and their ſuckers taken away every autumn; and if there are any very luxuriant branches they may be ſhortened, and the doing this will ſupply the other parts of the tree with freſh wood. *Miller*'s Gardners Dict.

Eſſence of ROSES. There is ſcarce a more valuable perfume in the world than the eſſence of damaſk *roſes*, and ſcarce any thing is obtained from its ſubject with more difficulty and in leſs quantity. All eſſences or eſſential oils are, while in the plant, contained in certain veſicles, lodged in different parts, and of different ſtructure; theſe veſicles are in the *roſe* particularly ſmall and tender, and are placed very ſuperficially; the conſequence of this is, that there is originally but a very little of this eſſence in the flower, and this is the very ſubject that will be diſſipated and loſt when the flowers are gathered and thrown in a heap together, as they are ſucculent, and very quickly heat in lying together. To avoid all diſſipation and waſte of this choice eſſence, the *roſes* ſhould be thrown into the ſtill as ſoon as gathered, and diſtilled with very little water, and that in a balneum mariæ; then the fire is to be continued ſo long as the flowers float ſeparate about in the water; but as ſoon as ever they form themſelves into a cake, and ſtick to the bottom, the diſtillation ſhould be finiſhed, as they then yield no more eſſence. With all theſe precautions, however, it is with great difficultly we can procure any eſſence of *roſes*. What we obtain by this diſtillation being chiefly a very odoriferous and fragrant water. In the warmer countries the ſame caution affords a larger quantity of oil, which may be ſeparated and preſerved under the name of the eſſence. In Italy they make ſome quantity of it, but there it is very dear; a vaſt quantity of the flowers yielding only a very little eſſence, and that being thick and troubleſome in the procuring, as it every where ſticks to the veſſels.

It is to be obſerved, that the ſeaſon of the year, as to wet or dry, makes a very great difference in the eſſential oils of all plants; they are always much finer in dry and hot ſeaſons than in cold and moiſt: we find our *roſe* water in England much finer, and more fragrant, though diſtilled in the ſame proportion in hot and dry ſummers than in colder and rainy ones; and Mr. Geoffroy gives an account that he ſucceeded, one very hot and dry year, in the making eſſence of *roſes* in France, in the following manner.

As the *roſes* were brought to him freſh gathered, he turned them immediately into the ſtill; and drawing over the water into a glaſs matraſs, when it had ſtood by ſome time, and was perfectly cold, he diſcovered ſome of the eſſence fixed to the ſides of the matraſs, and the ſurface of the water covered with a thin reticular pellicle. All the contents of the matraſs were put to filter through a paper, ſupported by a fine linnen cloth; and the filtrated water was added to new *roſes* for many ſucceeding diſtillations, the produce of which was all filtered through the ſame paper. After a long courſe of diſtillations, with freſh flowers every time, but ſtill with the ſame veſſels and the ſame water, there was found in the paper of the filtre a quantity of thick eſſence; this being carefully waſhed out of the paper with a ſmall quantity of the moſt fragrant of the water, and afterwards ſeparated pure from its ſurface was very white, and extremely fragrant, and as thick as fine butter. This is not the only eſſential oil which naturally concretes into this firm ſtate; oil of anniſeed, though fluid, when diſtilled, always concretes in the ſame manner on the firſt approach of cold; and another oil of this kind is that of the laurel, which is uſed in ſome places, though very improperly, to give the ſcent and taſte of bitter almonds, or apricot kernels, to foods of different kinds.

Monſieur Homberg has taught us how to gain a larger quantity of the eſſential *oil of roſes* than is uſual in diſtillation, by the previous addition of mineral acids, as the ſpirit of ſalt, vitriol, &c. thereto; which increaſe the fermentation, and joining with the *oil* render it more liquid, and eaſier to be raiſed by heat. He adviſed a perfumer, who before ſcarce obtained an ounce of *oil* from an hundred weight of *roſes*, to ſteep his flowers for fifteen days in water made ſharp with ſpirit of vitriol, by which means the perfumer, upon diſtillation, found his quantity of *oil* increaſed almoſt a third.

The perfumers keep the ſtructure of the veſſel they employ in this diſtillation in great ſecret. Mr. Homberg tells us, it is a large convenient ſtill, that opens in a tube at the top to receive the water which muſt often be poured upon the *roſes* to bring over the *oil* with it; this it does but very ſlowly, and ſo requires that its quantity be large; the ſtill alſo opens below, that the flowers, when they will yield no more *oil*, may be eaſily taken out; but the principal contrivance is the figure of the veſſel which receives the *oil*; this is made like an ordinary matraſs, from the lower part of the belly whereof comes a tube, as from an old faſhioned cruet, and riſing to the bottom of the neck of the receiver, it bends outwards; ſo that though the veſſel uſually contains but two or three French pints, it conveniently receives and lets paſs many hundred pints of the *roſe* water, without any neceſſity of being changed; for a change would loſe the ſmall quantity of the *oil* obtained. The water diſtilled runs through a pipe into a ſecond receiver: the *oil* being lighter than the water, floats upon its ſurface, and adheres to the neck of the veſſel as high as the aperture of the little pipe, while the water runs from the bottom of the firſt receiver into the ſecond. See Mem. de l'Acad. des Sciences, 1700.

Mr. Homberg obſerves that this ſtill may be uſeful to draw off any kind of precious eſſential *oils*.

ROSE *fly*, in natural hiſtory, the name given by authors to a peculiar ſpecies of *fly* found very frequently on *roſe* buſhes, and produced out of a baſtard caterpillar, which feeds on the leaves of that tree.

The male of this *fly* has a long body, the female a ſhort and thick one; ſhe depoſits her eggs in ſmall holes, which ſhe makes in the bark of the young branches, and for this purpoſe is furniſhed with a very remarkable inſtrument placed at the hinder part of the body, which is a kind of ſaw. This is a four winged *fly*, and is ſo common on *roſe* buſhes, that it is ſcarce poſſible to miſs it in any of the ſummer months; and the parts of the branches where it has depoſited its eggs, are ſo vitiated by it, that they alſo are eaſily known. They are uſually ſwelled to a greater bigneſs, than either the part above or below them, and are uſually ſomewhat bent; they are often black on the underſide, and among this blackneſs the holes made for the eggs, and often the eggs in them may be ſeen. The head and breaſt of this *fly* are black. Its wings alſo are edged with black, its body is yellow, and its legs yellow, with a few black ſpots.

If theſe *flies* be obſerved in a ſummer morning, as they are crawling upon the branches of the *roſe* tree, they will ſoon be found at work for the depoſiting of their eggs. Theſe creatures give us a very good opportunity of obſerving the manner in which they perform this, as they are of a very ſluggiſh diſpoſition, and will ſtand ſtill even to be taken between the fingers; ſo that when one of them is in a proper ſituation, it may be examined, by bringing the eye near it, and by uſing the common magnifying glaſſes, without quitting its place or its work; and if there be leaves of the tree, or ſmall branches of it in the way, they may be removed without diſturbing the creature. *Reaumur*'s Hiſt. Inſ. Vol. 9. p. 145.

As ſoon as the *fly* has found a proper place for her eggs, ſhe directs the hinder part of her body downwards, and opening a pair of ſcaly ſubſtances placed near her tail, ſhe thruſts out from between them an inſtrument exactly repreſenting two common ſaws, with ſharp teeth and ſmooth backs; when ſhe has ſo placed theſe, that their points touch the bark, ſhe preſſes down her body in order to force the points to enter, and afterwards continues this preſſure till the whole length of both ſaws is immerſed in the wood. If the whole be nearly examined, however, it will be found that a ſimple preſſure is not all the means employed to force them in; but that as ſoon as ever the points are entered the bark, the two ſaws begin to work by means of tendons and muſcles made for that purpoſe, and are moved about exactly as the common ſaw in the hand of a carpenter; only that as there are two of them, they always move the contrary way, one being forced in while the other is drawn out; by this means they become a ſupport to one another.

As theſe inſtruments are extremely ſmall, they would not naturally cut an opening large enough for the receiving and covering the egg which is to be depoſited there. The creature therefore uſes great art and addreſs in the working with them. She opens the branch, not by making a bare puncture, but in the ſame manner in which a ſurgeon opens a vein, by plunging the point of his lancet perpendicularly in, and then raiſing it out obliquely; and, in order to enlarge the width of the wound, ſhe makes the teeth of each of the ſaws work forcibly againſt the ſides of it at every return. When the aperture is thus made of a proper ſize, the creature immediately draws out the ſaw, and preſſing her body down upon the bark, depoſits an egg in the hole; immediately after which, ſhe covers the orifice with a viſcous fluid, which bubbles up in the manner of ſoap ſuds, and ſerves at once to preſerve the egg, and to prevent the wounded fibres of the tree from decaying too ſoon. Ib. p. 150.

When the laying of one egg is thus finiſhed, the creature moves a little way forward or backward on the branch, and then begins the like operation for another egg, and goes on in this manner till ſhe has laid her whole ſtore. If the branch be all the way proper to receive them, ſhe lays them

them in a train, twenty or more, at ſmall diſtances, in a ſtrait line before one another; but if ſhe finds the branch become leſs proper for her purpoſe after ſhe has laid three or four, ſhe leaves it and ſeeks out another, where ſhe finiſhes what ſhe had there begun. There is not any apparent difference in the ſeveral young branches of the ſame *roſe* tree, that can ſhew us why one is, and another is not proper for this purpoſe; but the creature herſelf is very curious in her choice, and uſually examines a great number before ſhe fixes upon a proper one. The operation might ſeem very difficult to ſo ſmall an animal; but though the creature be of a very ſluggiſh diſpoſition, in all reſpects, it ſeems to find no trouble in this, and will uſually finiſh the laying ſix eggs in this manner in half an hour. The apertures are ſo ſmall, that there are uſually about fifteen of them in the ſpace of an inch, and yet there is always a ſmall ſpace between each, and thoſe above and below it. On ſtripping the bark from one of theſe branches, the wounds are ſeen to enter into the wood, and reſemble ſo many openings of a vein, by a ſurgeon in blood letting. In each of theſe there is depoſited one egg, which is conſiderably large, of a yellow colour, and pointed at one end. If the branch of a *roſe* tree, in which the eggs of this inſect are thus depoſited, be examined from time to time afterwards, the part where they are placed will be found to change colour, the bark will turn brown and then black, and the wounded parts will elevate themſelves above the reſt of the ſurface, and reſemble a ſtring of beads, or a long chain of olives. This elevation of the wounded parts is not to be attributed to the growth of them; but they are, on the contrary, ſo far deſtroyed, as to be rendered incapable of increaſe that way. This ſwelling is owing to another very ſingular cauſe, which perhaps nature does not give us another inſtance of in the whole animal world. The egg daily increaſes in ſize after it is laid, and this is very evidently ſeen on opening the ſeveral lodgments, formed at different times; thoſe which have been made two or three days, always containing eggs more than twice as large as thoſe made within a few hours. It is to be obſerved, in favour of this ſtrange occurrence, that the egg of this creature is not covered with a hard ſhell in the manner of a bird's egg; but only with a thin, and eaſily diſtenſible membrane; but then all other eggs of inſects are in the ſame manner covered with a diſtenſible membrane, not a hard ſhell, and yet none of them are ever known to increaſe in ſize after their being laid. The egg, in thus increaſing in ſize, raiſes up the wood and the bark which cover it; and in conſequence of this, the train of eggs make a ſtring of regular elevations of the part, as the egg increaſes, and the tumor grows larger; the aperture at the ſurface grows alſo wider in proportion, ſo that the worm, when hatched out of it, finds no difficulty in getting out, but immediately crawls to the leaves and begins eating.

There is, beſide this ſpecies, another *fly* of the ſame genus, produced from a baſtard caterpillar of the *roſe* tree, and of the ſame ſhape and ſtructure of parts with this, but differing in colour: the head and breaſt of this *fly* are of a deep violet colour, the body is yellow, and the legs and wings are of a ſomewhat paler violet tinge. This creature alſo depoſites its eggs in holes, made in the branches of the *roſe* tree, by means of a double ſaw placed at the hinder part of the body; but, as the former ſpecies lays them in a ſingle ſtrait line, this diſpoſes them in a very beautiful and very regular manner in two rows. Two eggs are firſt laid by the creature, at ſome ſmall diſtance, ſideways, one from another, but at the ſame height of the branch. The bottoms of theſe meet almoſt one with the other; but their tops are expanded a little, ſo that they make an acute angle, or expreſs the ſhape of the letter V; behind theſe there are placed two others, making a ſomewhat wider angle, and ſo behind theſe two others. Thus the creature frequently depoſits ten, twelve, or fourteen pair of eggs, which are all placed at ſome ſmall diſtance from one another, and are ſeparated into two diſtinct rows by an intermediate line. Theſe are not ſo well defended from injuries as the eggs of the former ſpecies, and are entirely buried in the wood; and lodged in ſuch large holes, that they appear naked even when firſt laid. Mr. Valliſnieri, who has elegantly deſcribed this inſect, obſerves, that as the ſaws of the former ſpecies are toothed only on one ſide, having a flat back in the manner of our common ſaws, thoſe of this ſpecies are toothed both ways: he obſerves alſo, that the two pieces which make a caſe for theſe ſaws, and which are opened to give them paſſage when they are to be uſed, are each of them hollow, and are of the greateſt uſe to the creature; the one ſerving as the paſſage for the eggs, the other for that of the glutinous liquor with which the creature covers the wound in the wood, after depoſiting her egg in it. But Mr. Reaumur, in comparing the ſize of the egg, when new laid, with the aperture, which this author ſuppoſes it to be depoſited through, is of opinion that it is much too large to have gone through ſuch a paſſage; he alſo obſerves, that the eggs may always be forced out of the body by preſſing it between the fingers; but that, in this caſe, they are always ſeen iſſuing out at the anus.

The *roſe* tree ſeems the peculiar favourite of theſe ſorts o flies, for beſide the two ſpecies already deſcribed, there is another very ſmall one which is found on this tree in great abundance in the months of April and May. This is every way ſhaped like the large kinds, but it is all over black except ſome white ſpots on the legs; the ſaw of this ſmall inſect is not of a ſufficient ſtrength to penetrate the branches of this ſhrub, it therefore always is ſeen upon the leaves, and depoſits its little eggs in a row of holes made in the middle rib of a leaf. It is to be obſerved that all the falſe or baſtard caterpillars produce theſe ſerrated flies; yet it is very ſingular that they do not all make the ſame apparent uſe of their ſaws that theſe do. The fly produced by the falſe caterpillar of the gooſeberry, always depoſits its eggs in ſingle rows along the middle ribs of the leaves; but the eggs are not let into them by holes made for that purpoſe, but are merely laid along upon the ſurface. It may be however, that the creature makes a wound where every egg is to be depoſited, which though not large enough to receive it, may yet ſuffice to afford a neceſſary moiſture to it. Mr. Reaumur was at the pains to keep ſome of the falſe caterpillars produced from the eggs of this fly the whole ſeaſon, and obſerve them through all their changes. When they had eaten ſufficiently in the caterpillar ſtate, they crept into the earth which he had put into the bottom of his boxes, and then changed into chryſaliſes in a double covering of a ſilky matter of their own ſpinning; they remained all the winter in this ſtate, and in the ſucceeding ſpring came forth out of the earth in form of flies. This author obſerves, that on putting a male and female together into another box, in which there were ſome branches of gooſeberry buſhes, the female immediately ſearched out the proper places for depoſiting her eggs, and laid ſeveral before his face in ſingle rows on the moſt prominent part of the ribs of the leaves: the creature ſeemed to give herſelf all the motions that the other ſpecies do in piercing the branches of the *roſe* tree, before the depoſiting of every egg; but that on examining the places afterwards, he never could find any mark of a wound in them, the eggs all lay upon the ſurface, but they were ſo firmly fixed on the place, that there was no removing them without breaking them, and a piece of the ſkin was always left behind, which ſtuck faſt on the place and covered the hole if there was any. There are alſo ſome other ſpecies of theſe *flies*, which make no apparent uſe of the curious ſaws they have behind: yet they all are poſſeſſed of them. *Reaumur's* Hiſt. Inſ. Vol. 9. p. 160. See the article SERRATE *Flies*.

ROSE *galls*, in natural hiſtory, a name given by authors to certain unnatural productions of the *roſa ſylveſtris*, or dog *roſe*, occaſioned by the bites of inſects: there are two kinds of theſe, the one very common, the other more rare.

The ſcarcer kind is uſually found on the young ſhoots, and on the heps or fruit, and is of a woody ſubſtance; the other is hairy and ſpungy and is found on the old branches. The woody kind uſually appears in the months of June and July, and is always found in cluſters. Theſe are compoſed of ten, twelve, or more *galls* of different ſizes and figures, ſome round, others oblong, ſome of the ſize of an olive, and others not larger than a pea. They are of the common ſubſtance of the white wood or blea of trees, and when ſituated on the fruit they prevent its ripening and make a very ſingular figure. They are of a reddiſh colour and are uſually ſmooth and gloſſy, but ſometimes they are beſet with ſhort and fine prickles.

The hairy *roſe gall* is too common, and too ſingular a figure to have eſcaped the obſervation of perſons in all ages; it has been introduced into medicine in many parts of the world, and is at this time preſcribed in Germany, when reduced to powder, in diarrhœas, dyſenteries and other diſorders of the bowels, and to promote urine and break the ſtone. Theſe *roſe galls*, though they appear at firſt ſight compoſed of tufts of hair, are however in reality made up of ſeveral ſmall *galls* growing from a bud on the branch and forming a cluſter on the part. They are of an oblong figure and reſemble the ſhape of a plum-ſtone. Each of them is the habitation of a ſingle worm, each having one cell in the center. This is perfectly ſmooth and even on the inſide, but from the outer ſurface of each of theſe ſeparate *galls* there go off a vaſt number of filaments which uniting and intermingling with one another form one complex maſs, and give the whole cluſter the figure of one *gall* of the bigneſs of an Indian or horſe cheſnut. Theſe filaments are of a reddiſh or greeniſh colour, and are often nearly an inch in length. They are called by ſome hairs, but very improperly, having no true character of a hair, but being of a rough ſurface, flatted, and branched with ſeveral ſhorter filaments growing from their ſides. The tubercles within, from which theſe grow, are of a hardneſs greater than that of moſt ſpecies of wood. Though theſe *galls* are uſually found on the branches of the ſhrub, and ariſing from the buds or eyes of young ſhoots, and are therefore ſuppoſed by authors to be the vitiated matter of a whole

branch

branch with its leaves divided into these filaments, yet they are sometimes found growing to the middle rib of a single leaf, where yet they do not want all their filaments, though there have been no vitiated leaves to form them. *Reaumur's* Hist. Inf. Vol. 6. p. 251.

Though these *galls* and the smooth ones before described are extreamly different in external appearance, yet on a close examination they appear to be more nearly allied than might be suspected. They are doubtless both the work of the same insect, and their principal difference is, that the one is smooth, and the other covered with these filaments. It is to be observed however, that the smooth ones have sometimes a sort of short and soft spines upon them, and these seem the rudiments of these hairs; and there seem to be *galls* found sometimes more, sometimes less hairy, and indeed of all the middle degrees between the two sorts.

The naked *galls* are usually larger and of a more spungy texture than the hairy ones; which is owing to all the matter, which should have formed the filaments, being united and wrought up into the body of the *galls*. There is also another variety of the smooth kind, which might appear an absolutely distinct species. This is a single and large *gall* of a smooth surface and spungy but woody texture. When cut open, it is found to contain several cells, each inhabited by one worm; and when nearly examined is found to be a congeries of as many smaller *galls* as there are cells, which have grown firmly together.

All these *galls* of the *rose* tree afford the same species of worms, and the same species of flies. The proper inhabitants, however, are hardly to be distinguished by the most curious observer from the great variety of species which are found in them, all produced of the eggs of other flies, whose worms are of the carnivorous kind, and are lodged in the *gall*, not to feed on the juices of the tree, but on the flesh of the proper inhabitant. When the parent fly who gives origin to the *galls* has deposited her eggs, and the tumor in consequence begins to be formed, an enemy of this kind pierces the covering, and sends in her offspring to feed on the inhabitant. These are flies of the ichneumon kind, and several species of them are of great beauty. All the flies described by authors as issuing out of this *gall* seem to have been of this kind: the proper inhabitant being a small black fly of no great beauty is disregarded, while the others have been particularly described. Mentzelius has given an elegant account of a species whose back is of a fine blue and its belly purple, and others have figured and described greenish and gold coloured ones, but these are all ichneumons, all bred of devouring enemies which have fed on the proper inhabitants of the *galls*, and lived and transformed themselves in their cells. *Reaumur's* Hist. Inf. Vol. 6. p. 254.

Oil of Roses. See *essence of* Roses, *supra*.

ROSEA, a name given by some authors to the erisipelas or St. Anthony's fire.

ROSLAND, in our old writers, heathy land, or ground full of ling; also watry and moorish land. 1. Inst. 5. *Blount*.

ROSMADIAN, a name used by the alchemists for what they call mercury of the philosophers.

ROSEMARY, *rosmarinus*, in the linnæan system of botany, a distinct genus of plants, the characters of which are, that the cup is a perianthium composed of one leaf, tubulated, and flatted in its upper part; its rim is erect and labiated, the upper lip whole, and the lower indented in three places. The flower is a single petal in form of a tube, and longer than the cup. It is labiated at the extremity; the upper lip is short, erect, divided into two segments, acute, and has bent edges; the lower lip is bent back, and is trifid, the middle segment large and hollow with a narrow base, the lateral ones are narrow, the stamina are two pointed filaments bent toward the upper lip and longer than it, the antheræ are single. The pistil has a quadrifid germen, the style is of the length, figure, and situation of the stamina, and the stigma single and acute. The cup holds in its bottom four oval seeds. *Linnæi* Gen. Pl. p. 6.

The characters of *rosemary*, according to Tournefort, are these. The flower consists of one leaf, and is of the labiated kind; the upper lip is bifid, and turned backwards and upwards, and adorned with crooked stamina; the under one is divided into three segments, the middle one being larger than the rest, and hollowed in the manner of a spoon. The cup is divided into two or three segments, and is furnished with a pistil, which is fixed in manner of a nail to the hinder part of the flower; this is surrounded with four embryos which afterwards become four roundish seeds ripening in the cup of the flower.

The species of *rosemary* enumerated by Mr. Tournefort are these. 1. The common narrow leaved garden *rosemary*. 2. The silver leaved garden *rosemary*. 3. The broad leaved wild *rosemary*. 4. The variegated leaved *rosemary*. 5. The large spiked purple flowered *rosemary*. The several species of *rosemary* when neither in flower or feed may be known by their having hard woody stalks, narrow leaves, and a smell much approaching to that of camphor. *Tourn.* Inst. p. 198.

We have five or six different species or varieties of this shrub in our gardens; they grow wild in the south of France, and in Spain and Italy, on rocks near the sea where they multiply prodigiously. With us they grow the most vigorously on a moist rich soil, but they are much sweeter scented when on a poor soil, and on such they bear the severity of our seasons much better, than where they grow more freely.

They are all propagated by planting slips or cuttings of them, in the spring of the year, on a bed of light fresh earth, and when they are rooted, they are to be removed into the places where they are to remain. The best season for doing this is in August, if they are planted later than this, they seldom live through the winter; therefore such as are not transplanted at this time should be left till the following spring, when March is a very good time for removing them; and if this be done in showery weather they take root almost immediately. The plants are sometimes killed in cold winters in our gardens, but when by accident they have rooted themselves in an old wall, as is often the case, they stand all weathers unhurt, which is owing to their being stunted and their roots dry.

The flowers of *rosemary* are used on many occasions in medicine; they are cephalic, good in all nervous and hysteric cases, and are ingredients in many compositions of the shops; they are esteemed of great service in apoplexies, palsies, vertigoes and epilepsies. They strengthen the sight, are good against a stinking breath; they are also prescribed in obstructions of the liver and spleen: the conserve of the flowers is an excellent thing to bring other medicines in these intentions into form, when they are intended to be given in boluses and electuaries.

The hungary water so long famous in England and elsewhere, is made of the flowers of *rosemary* distilled with rectified spirit of wine.

ROSMARUS, in zoology, the name of an animal called also by some the sea horse, and more usually known by the name *morse*. See Morse.

ROSOMACHA, in zoology, a name given to a species of hiæna. They are, says Olaus, taken by hunters chiefly on account of their skins, which are much esteemed by people of fortune for robes, as being variegated with very bright colours resembling flowers. *Hoffm.* lex univ. in voc. See the article Hiæna.

ROSPUS, a name used by some authors for the strange fish called the *rana piscatrix*, or frog fish. *Willughby's* Hist. Pisc. p. 86. See Rana.

ROSSE, in ichthyology, the name given by Bellonius to that kind of the cyprinus of Artedi which we call the roach. See the article Cyprinus.

ROST, in metallurgy, a term used by the miners at Chemnitz to express the ore of gold after it has been washed and powdered, and melted first with lime stone, and afterwards burnt with charcoal alone. See Lech.

ROSTEN, in the materia medica of earlier ages, a name given to crab eyes.

ROSTRUM (*Cycl.*)—The *rostrum* or snout in fishes varies very much in figure, and serves as a considerable article of distinction. It is 1. in some plagioplateous or depressed, as in the pike, *&c.* 2. In some it is conic in shape as in the oxyrynchus, *&c.* 3. In some it is extended into a long and sharp point, as in the common ones; and 4. In others it is triangular, or nearly so, as in the rays.

Rostrum is also used to signify an instrument wherewith paper is ruled for musical compositions.

ROT, in sheep (*Cycl.*)—This is the greatest of all the inconveniencies that attend the keeping these useful animals.

It is a very hard thing to prevent the *rot* if the year prove very wet, especially in May or June. Salt marshes and lands, where broom grows, are the best places of preservation for them. Sheep are sometimes all cleared of the *rot* when not too far gone with it, only by removing them into broom fields. Scurvy-grass, mustard, parsley, and thyme, are also good for the prevention of it.

Some propose the giving sheep half a handful of bay salt every month or oftener; and there is great probability that this may be of service; but the rational way of attacking all disorders in cattle, is by considering what are the causes of them. It will appear, upon enquiry, that wet seasons are the general occasions of the *rot* in sheep, and therefore it would be adviseable for the owners, when such seasons come on, to remove the animals into the driest pastures they can, and then to feed them principally with dry sweet hay, oats, bran, and the like, this would prevent the occasion; and if they were already a little infected, some salt given with their dry food, would be a happy means of curing them. *Mortimer's* Husbandry, p. 244.

ROTATED, *rotatus*, in botany, the name of a sort of flowers, so called from their shape, somewhat resembling a wheel. These are of the monopetalous kind, and are only a sub-distinction of the infundibuliform flowers. *Tourn.* Inst. p 116. Tab. 1. of Botany, Class 1. See the article Infundibuliformis.

ROTA-

ROTATION (*Cycl.*)—Mr. Winflow has given an account of this, as well as of pronation, and other circulatory animal motions. See Mem. de l'Acad. des Sciences, 1729.

ROTCHET, an Englifh name for the fifh, called by authors *cuculus*, and more frequently by us the *red gurnard*. *Willughby*'s Hift. Pifc. p. 282. See the article CUCULUS.

ROTELE, in zoology, a name by which fome call the *rutilus latior*, or *rubellio fluviatilis*, more frequently known by the name of the *rud* or *finfcale*, a river fifh with red bellyfins and tail. *Ray*'s Ichthyogr. p. 252. See RUBELLIO.

ROTHALS, in zoology, a name given by Gefner, and fome others to the *pochard*, or *red headed wigeon*; a bird diftinguifhed from all others of the duck kind, by having no variegation in its wings. See POCHARD.

ROTKNUSSEL, in zoology, a name by which the Germans call the *gallinula melampus* of Gefner. It is a bird fomewhat approaching to the fnipe kind; its back is brown, with a flight admixture of reddifh, and fome fpots of a dufky colour; its wings are variegated with black and white, and its beak and legs are black. It is common in many parts of Germany.

ROTOLO, an Egyptian weight of twelve ounces, each ounce confifting of twelve drachms, and each drachm of fixteen carrats. *Pocock*'s Egypt. p. 175.

ROTSCHWENTZEL, in zoology, the name of a bird, defcribed by Gefner and fome other authors, and feeming to be the fame with our *ruticilla*, or *red-ftart*. See the article RUTICILLA.

ROTSIMPA, in ichthyology, a name given by the Swedes to a fpecies of *cottus*, called by Jonfton and Schonveldt *fcorpius marinus*. It is different from the *fcorpæna* of the generality of writers, and is of the *cottus* kind. It is diftinguifhed by Artedi by the name of the fmooth *cottus*, with many thorns upon the head, and with the upper jaw fomewhat longer than the under one. See the article COTTUS.

ROTULA (*Cycl.*)—ROTULA, in natural hiftory, the name of a genus of the *echini marini*, of the general clafs of the placentæ. The characters of the *rotulæ* are, that they are flat fhells in form of a cake, compofed of various flat pieces, and formed into a round, fomething like that of a wheel; but wanting one or more parts of its outer ring, and radiated or dentated. Their mouth is fituated in the middle of the bafe, and the aperture of the anus in the third region of the axis, and marked with a cinquefoil flower at the fummit. The great and obvious character is however the dentated edge. Of this genus there are two known fpecies. 1. A kind with three very deep finufes, and four pervious foramina at the top, or fometimes only with two, and with a finely crenated pentagonal vertex; and 2. The folar echinus, which has ufually nine rays free from the outer ring. The vertex, in this fpecies, is round and denticulated, and variegated with very elegant lines. See Tab. of Teftaceous Animals, Nº 10. *Klein*'s Echin. p. 32.

ROTULA, in ichthyology, is alfo a name given by fome to the *faber* or *doree*. See the article FABER.

ROTUNDUS *major*, (*Cycl.*) in anatomy, a name given by Riolan, and fome others, to a mufcle, called by Vefalius and others the *tertius humeri*, and *tertius brachium moventium*. Albinus, Cowper, and others, call it *teres major*.

ROUGET, in ichthyology, a name given by the French to the fifh called the *lyra* and *capo* by authors. It is a fpecies of the *trigla*, and is diftinguifhed by Artedi by the name of the *trigla* with the long bifid fnout and tubulous noftrils.

ROUGH (*Cycl.*)—ROUGH-*fea*, in the fea language. See the article OVER-GROWN-*fea*.

ROUND (*Cycl.*)—ROUND *in*, or ROUND-*aft*, at fea, a term belonging to the main and fore fail. When the wind largeth, they fay, *Let rife the main tacks*, or *the fore-tacks! Hale aft the fore-fheet to the cat head*; *and the main fheet to the cubbridge-head!* And when thefe fheets are thus haled down they keep them from flying up with the *paffarado rope*. This work is called *rounding in* or *rounding aft* the fail.

ROUND-*feam*, in the fea language. See SEAM.

ROUND-*fplice*, in the fea language. See SPLICE.

ROUND-*top*, in the fea language. See TOP.

ROUSSIN, in the manege, is a ftrong well knit, well ftowed horfe, fuch as are commonly brought into France from Germany and Holland.

ROWELS *of a fpur*, in the manege. See SPUR, *Cycl.*

ROWLE, in a fhip, is a round piece of wood or iron, wherein the whip goes, being made to turn about, that it may carry over the whip the eafier from fide to fide.

ROYENA, in botany, the name of a genus of plants, the characters of which are thefe. The perianthium confifts of one leaf, which is inflated and permanent, and is lightly divided into five obtufe fegments at the edge. The flower is monopetalous, and confifts of a tube of the length of the cup, and an expanded mouth, which is divided into five oval and reflex fegments. The ftamina are ten very fhort filaments growing to the flower. The antheræ are oblong, acute, and double, and they ftand erect, and are of the length of the tube of the flower. The germen of the piftil is of an oval figure and hairy, and is divided into two ftyles, which are a little longer than the ftamina. The ftigmata are fimple; the fruit is an oval capfule, compofed of four valves, and furrowed with four deep lines, and contains only one cell, in which are four oblong and triangular nuts covered with a calyptra. This has been defcribed in Paradifus Batavus, and fome other books, under the name of a fpecies of the bladder nut, *ftaphylodendri fpecies*. *Linnæi* Gen. Pl. p. 193. *Hort. Amftel.* Vol. 1. p. 187. *Herm.* P. B. p. 232.

RUBECULA, in zoology, the name of a bird, commonly known in England, under the name of the *red breaft*, and called by fome *erithacus*. This is a folitary bird, and naturally fhy, but in winter will even come into peoples houfes in fearch of food. It is very careful in building its neft. It builds in the thickeft bufhes and hedges, where there are multitudes of fallen oak leaves, or the like large light matter. It covers its neft very artfully with large quantities of thefe leaves, and makes only one way to get into it, which is by a narrow paffage, and which it always covers with leaves when it goes abroad for food. *Ray*'s Ornitholog. p. 160.

RUBELLIO, in ichthyology, a name given by fome authors to a fmall fea fifh of a red colour caught in the Mediterranean, and more ufually called by writers on thefe fubjects the *erythrynus*. *Aldrovand.* de Pifc. p. 154. See the article ERYTHRYNUS.

RUBELLIO *fluviatilis*, the name of a frefh water fifh of the leather mouthed kind, called in Englifh a *rudd* or *roud*, and in fome places a *finfcale*. It is a common fifh in many of the rivers of England and Germany, and efteemed a well tafted fifh. They are in feafon all the year, except in the month of April, which is their fpawning time, and the males at that time are fubject to a great number of white fpots upon their heads, and are more rough than at any other feafon. It is a fifh broader than the carp, but thicker than the bream. It is of a brownifh yellow colour, and has very large fcales; the tail and belly fins are red, and the gills are commonly marked with a red fpot. *Willughby*'s Hift. Pifc. p. 252.

RUBELLUS, in zoology, a name given by fome authors to the common roach, and by others to the rudd or finfcale. *Gefner*, de Aquat. p. 965. See the articles RUTILUS and RUBELLIO.

RUBEOLA, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, fafhioned like a funnel, and either lightly dentated, or divided into four fegments at the edge. Thefe have fometimes a fingle, fometimes a double cup, and that of the two which was the lower, or the fingle one, if there were no other, is finally converted into a fruit compofed of two feeds.

The fpecies of *rubeola* enumerated by Mr. Tournefort are thefe. 1. The broad leaved *rubeola*. 2. The narrow leaved *rubeola*. 3. The procumbent *rubeola* with a very long fpike. 4. The common fmooth purple flowered fmall *rubeola*, called by many *rubia fquinanchica* and fquinancy wort. 5. The white flowered fmooth four leaved *rubeola* or fquinancy wort. 6. The rough Portugal *rubeola* with purple flowers. 7. The fea *rubeola*. *Tourn.* Inft. p. 130.

Thefe plants are called by Mr. Tournefort *rubeola* as a diminutive of *rubia*, or madder; moft other authors have called them *rubia fpicata*, or fpiked madder. They differ principally from the galliums in the funnel fhape of the flower.

RUBETA, the *toad*, in zoology, a creature fufficiently known. It is larger than the frog, its body is thick, its back broad, and its belly fwelled, and looking as if inflated, whence it is too heavy and unweildy to hop about as the frog does; its fkin is confiderably thick, and full of tubercles, of a dufky and blackifh colour on the back, and fpotted on the belly; and is naturally a loathfome and difagreeable object.

It feeds on the fame things that the frog does, worms, fnails, flies, and other infects; it feems alfo, that they are able to live on much lighter food, fince there have been many inftances of toads being found in the folid bodies of trees in holes, juft big enough for them to turn about in; and where there could be no nourifhment conveyed to them, except what they found in the juices of the tree. There are not wanting alfo inftances of their having been found in the fame manner in blocks of folid ftone, if we can credit the generality of authors. *Ray*'s Syn. Quad. p. 252.

RUBETRA, in zoology, a name by which Gefner and fome others have called that fpecies of the *œnanthe*, commonly known by the name of the *ftone-chatter*, *ftone-fmick*, or *moortitling*. *Gefner* de Avib. See the article STONE-CHATTER.

RUBIA (*Cycl.*)—RUBIA, *madder*, in the Linnæan fyftem of botany, a diftinct genus of plants, the characters of which are, that the calyx is an extremely fmall perianthium, fituated on the germen, and divided by four notches at its extremity. The flower is compofed of one fingle petal which is flat, divided into four fegments, hollow at the bafe, but forming no tube. The ftamina are four pointed filaments fhorter than the flower. The antheræ are fimple. The germen of the piftil is double, and fituated below the receptacle. The ftyle is flender, and bifid at top, the ftig-

mata are headed. The fruit is compofed of two round bodies, fmooth, and firmly joined together. The feeds are fingle, roundifh, and umbilicated. *Linnæi* Gen. Plant. p. 24.

The characters of this genus, according to Mr. Tournefort, are thefe. The flower confifts of one leaf, fhaped like a bell, and very open at the mouth, and divided into feveral fegments, and ufually perforated. The cup changes into a fruit compofed of two fucculent berries, which contain ufually an umbilicated feed. The leaves are all fet in rundles about the ftalk, feveral being placed at a joint in form of a radiated ftar.

The fpecies of *rubia* enumerated by Mr. Tournefort are thefe. 1. The common cultivated *madder*. 2. The great wild *madder* of Montpelier; and 3. The exotic four leaved fhining *madder*. The difpofition of the leaves, about the ftalks of thefe plants, ferve to diftinguifh them from other claffes, when they are not in flower; and this genus is abundantly diftinguifhed from all the others which have their leaves difpofed in this manner, by its having a berry, or juicy fruit, inftead of the dry fruits of the others. *Tourn.* Inft. p. 15. See MADDER, *Cycl.* and *Suppl.*

The root of the common *madder* cultivated for the ufe of the dyers, is an excellent aperient and diuretic. It is prefcribed with great fuccefs in obftructions of the liver and fpleen, in fuppreffions of the menfes and urine, and in dropfies, jaundices, and cachexies. It is alfo recommended as a vulnerary, and faid to be peculiarly excellent in the diffolving coagulated blood. The dyers prepare a red colour with it, and ufe it alfo as a firft tint for feveral others.

RUBIA *icterita*, a term ufed by Paracelfus and his followers for the erifipelas.

RUBICAN, in the manege. A horfe is faid to be of a *rubican* colour, that is a bay, forrel, or black, with a light grey or white upon the flanks; but fo that this grey or white is not predominant there.

RUBICILLA *americana*, in zoology, a name given by Mr. Ray to the *guiratirica*, a Brafilian bird, of the bullfinch kind, very beautifully variegated with red, black and grey. See the article GUIRATIRICA.

RUBICULUS, in ichthyology, a name given by Figulus and fome others to that fpecies of fifh which we call the *roach*. It is of the cyprinus kind, and is diftinguifhed by Artedi under the name of the red-eyed cyprinus, with the tail and belly fins red. See the article CYPRINUS.

RUBIGO, (*Cycl.*) in hufbandry, is the name by which the antients expreffed what we call the *blight* in corn, &c. they gave it this name from the refemblance of the colour of the blighted ftalks to rufty iron.

They generally thought that it came from heaven, being ignorant of its true caufe, which is want of nourifhment in the earth. Virgil gives this up as an incurable diftemper, and tells the farmer, that if his corn is blighted he muft live upon acorns, not fuppofing that any remedy could be devifed for fuch a diftemper.

Palladius gives many receipts to cure the *blight*, and other diftemperatures of corn that come from above, as they imagined at that time. The chief efficacy of thefe feems to confift in certain fecret fympathies and antipathies, to fright the clouds away with. The world will eafily judge how likely fuch means as thefe were to have fuccefs.

The antient farmers generally ufed prayers, fupplications, and facrifices to their gods on this occafion; and if thefe did not fucceed, they proceeded to blafphemy and threatenings, and brandifhed bloody axes againft the fky, as a token to their gods to defift from plaguing them, or elfe to expect no quarter. They ufed to hang up in their fields and gardens, on thefe occafions, pieces of red cloth, and the feathers and heart of an owl, as a way to fright the clouds from coming over thofe places. Thefe people in general having no true knowledge of the theory of hufbandry, had recourfe to magic, and ufed what they thought fpells and enchantments on all occafions. Cato, Varro, and even Columella, are full of thefe ridiculous devices. A better knowledge in the real nature of hufbandry, has taught us to underftand this matter in a very different manner, and to apply more efficacious remedies to it. *Tull's* Horfehoing Hufbandry, p. 68. See BLIGHT.

RUBINUS, the *ruby*, in natural hiftory. See RUBY.

RUBRICA, in natural hiftory, a red earth ufed for marking, and in painting. There are two kinds of it, a harder and a fofter.

The firft, or harder kind, is but little in ufe, except among the turners in wood, as it does not mark fo eafily, requiring to be firft wetted, and then preffed hard upon the fubftance to be marked. This is dug in Lincolnfhire, Hampfhire, and Suffex; and is a hard and dry earth, of a fomewhat pale red, like the common pale red bricks, and is of a very regular and clofe texture, and always compofed of a number of thin lamina, lying clofely and evenly on one another. It is of a rough uneven furface, adheres firmly to the tongue, is not eafily broken between the fingers, and ftains the hands a little; it is of a very aftringent tafte, and melts pretty readily in the mouth. It is very readily diffufible in water, mouldering to powder, foon after being thrown into it, and makes no effervefcence with acids.

The fecond or fofter kind is very common, and put to a number of different ufes. It makes fimply a very good pale red for the painters, and is very ferviceable to them in their mixed colours. It is in conftant ufe in many parts of the kingdom for the marking of fheep; and when wafhed and feparated from its fandy particles, is, by fome of our modern druggifts, fold under the name of bole armenic.

It is found in many parts of the world; the beft in England is that from feveral parts of Derbyfhire, from whence the colour-fhops and druggifts of London are fupplied; many of the latter thinking this a fhorter method than the common one of our bole armenic makers, of preparing it from a mixture of tobacco pipe clay, and the red ochre called Spanifh brown. See BOLE and BOLUS.

This foft, or common *ruddle*, is a loofe ponderous earth, of a lax texture, and very friable; and of a pale, but tolerably bright red, of a fomewhat fmooth and gloffy furface, foft to the touch, adhering firmly to the tongue, eafily broken between the fingers, and ftaining the hands. It is of a rough auftere tafte, very readily breaks, and falls to powder in water, and makes no effervefcence with aqua fortis. *Hill's* Hift. of Foff. p. 48.

RUBUS, the *blackberry bufh*, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the rofaceous kind, being compofed of feveral petals, arranged in a circular form on a cup, from the middle of which there arifes a piftil, furrounded with a great number of ftamina; this finally becomes a fruit of a globular form; compofed, as it were, of a number of fmall berries full of juice; thefe are affixed to a placenta, and contain oblong feeds. See Tab. 1. of Botany, Clafs 21.

The fpecies of *rubus* enumerated by Mr. Tournefort are thefe. 1. The common *blackberry bufh* with black fruit. 2. The French white flowered *blackberry bufh*. 3. The *rubus* with double white flowers. 4. The Polifh *rubus* without prickles, and with a large black fruit. 5. The common *rubus* without prickles. 6. The prickly *rubus* with the leaves and flower both elegantly divided. 7. The prickly *rafpberry bufh*. 8. The fmooth *rafpberry bufh*. 9. The fweet fcented *rubus*. 10. The white *rafpberry*. 11. The creeping *rubus* with bluifh fruit. 12. The dwarf alpine *rubus*. 13. The dwarf marfh *rubus*. 14. The creeping trifoliate *rubus*, with foft hoary leaves and large blue fruit. 15. The fmall, erect, hoary, white flowered alpine *rubus*. 16. The trifoliate dwarf upright elegant *rubus*, with prickles like the rofe-bufh, and a fruit of the colour and tafte of the ftrawberry. *Tourn.* Inft. p. 614.

RUBUS, in ichthyology, a name given by Joannes Cuba, Albertus, and fome other writers, to the fpecies of *ray*, ufually called the *fkaite* or *flaire*. See RAJA.

RUBY, *rubinus*, (*Cycl.*) in natural hiftory, a gem, the diftinguifhing character of which is, that it is of a red colour with an admixture of purple.

The *ruby*, in its moft perfect ftate, is a gem of very great beauty, and of equal value. It is often found perfectly pure, and free from all fpots or blemifhes; but it is much more frequently debafed by them, and greatly brought down in its value, efpecially in the larger fpecimens. It is of very great hardnefs equal to that of the fapphire, and fecond only to the diamond. It is various in fize, but is lefs fubject to variations in its fhape than moft of the other gems. It is moft frequently found very fmall; its common fize being that of the heads of the larger forts of pins; and when of this fize it is very cheap; but it is alfo found of four, fix, and ten carrats; and fometimes, though but very rarely, up to twenty, thirty, or forty; nay, we have accounts of fome of more than an hundred. It is never found of an angular or cryftalliform fhape, but always of a pebble like figure, often roundifh, fometimes oblong, and much larger at one end than the other, and in fome fort refembling a pear, and is ufually more or lefs flatted on one fide.

It is commonly fo naturally bright and pure on the furface as to need no polifhing; and is worn in rings, and in the crowns of princes, in its rough or native ftate. Its colour is red in very different degrees, from the deepeft garnet colour to that of the paleft red diamond, but it ever has with the red more or lefs of a purplifh tinge: this is very plainly diftinguifhed in the deeper coloured fpecimens, but in the pale ones is gradually lefs and lefs to be diftinguifhed in proportion to their degree of colour. Thefe are the diftinguifhing characters of the *ruby*, and by thefe it is eafily known from the garnet, carbuncle, and other red gems.

Our jewellers are very nice, though not perfectly determinate in their diftinctions; knowing this gem, in its different degrees of colour, under three names; the firft is fimply the *ruby*: this is the name they give it in its moft perfect and ftrongeft coloured ftate.

The fecond is the *fpinal ruby*. Under this name they know thofe *rubies*, which are of a fomewhat lefs deep and greatly lefs vivid colour, than what they call the true *ruby*, or fimply the *ruby*.

The third is the *balafs ruby*, a name derived from Balakeia, the

the name of a country where the paler *rubies* are principally found. Under this name they exprefs a pale, yet very bright *ruby*, with a fmaller admixture of the purple tinge than in the deeper coloured one, and fomething refembling the colour of the damafk rofe. This is of confiderable value, but lefs than the deeper, or as they call it the true *ruby*.

Befide thefe, they know alfo two other ftones, under the general name *rubies*, calling them the *rock ruby* and the *rubacelle*. But thefe are not truly of the *ruby* kind; the firft being a very beautiful fpecies of garnet, and having a tinge of blue with its red; and the other a hyacinth, having a manifeft caft of yellow.

We have the true *rubies* only from the Eaft Indies. In Europe there are not unfrequently found cryftals tinged to the true colour of the *ruby*, but thefe ever want its luftre and hardnefs. In the Eaft Indies, the true *rubies* are often found almoft colourlefs, and not unfrequently variegated with fpots or ftains of a pure blue, evidently the fame with that of the fapphire. Doubtlefs alfo the *ruby* is fometimes found like the other gems, wholly deftitute of colour; but in this cafe, as the hardnefs of the ftone is the only thing that proves it to be of the gem clafs; both this, and all the other colourlefs fpecimens of the gems, are confounded under the name of the colourlefs fapphire; or, as our jewellers chufe to fpeak it, the white fapphire. *Hill*'s Hift. of Foff. p. 590. feq.

Arfenical RUBY, *rubinus arfenicalis*, in chemiftry, a name given to a fublimation of a mixture of arfenic and common fulphur. Thefe two bodies mixed together in different proportions afford very different appearances. If arfenic, mixed with one tenth part of its weight of fulphur, be thrown into a crucible red hot upon the fire, and covered immediately with a tile, and finally poured out after two minutes fufion, it becomes a folid brittle mafs of a very pale yellow. If arfenic be melted in the fame manner, with a fifth part of fulphur, the mafs when cold will be of a red colour: and finally, if arfenic and fulphur be melted or fublimed together, in equal quantities, the product is a beautiful red tranfparent mafs, called *rubinus arfenicalis*.

Counterfeit RUBY. The way to give the true fine red of the *ruby*, with a fair tranfparence, to glaffes, is as follows. Calcine, in earthen veffels, gold diffolved in aqua regis till it become a red powder. The operation will require many days in a hot furnace; when the powder is of a proper colour, take it out; and when it is to be ufed, melt the fineft cryftal glafs, and purify it by often cafting it into water; finally add, by fmall quantities, enough of this red powder, to give it the true colour of a *ruby*, with an elegant and perfect tranfparence. *Neri*'s Art of Glafs, p. 192.

RUDD, in ichthyology, a name given by the Englifh to a fifh of the cyprinus kind; it is called *orfus* and *rutilus latus*, or the *broad roach* by authors, and in fome parts of England the *finfcale*. See ORFUS, RUTILUS and CYPRINUS.

RUDDER (*Cycl.*)—RUDDER-*irons*, in a fhip, are the cheeks of that iron, whereof the pintle is part, which is faftened and nailed down about the rake of the *rudder*.

RUDDER-*rope*, in a fhip. See ROPE, *Cycl.*

RUDDLE, *rubrica*, in natural hiftory. See RUBRICA.

RUDDOCK, in zoology, an Englifh name for the *rubecula*, more commonly known by the name of the *red breaft*, or *robin red breaft*. *Ray*'s Ornitholog. p. 160. See the article RUBECULA.

RUDMAS *day*, in our old writers, the feaft of the *holy crofs*. There are two of thofe feafts, one on the third of May, being the invention of the *crofs*; and the other the fourteenth of September, called *holy rood-day*, and is the exaltation of the crofs. *Blount*.

The word is compounded of the Saxon *rode*, i. e. *crux*, and *mafs-day*, i. e. feaft-day.

RUE, *ruta*, in botany, &c. See the article RUTA.

We have feveral forts of *rue* in the gardens of the curious, but the common kind only is propagated for medicinal ufe. All the kinds may be propagated, either by cuttings in the manner of rofemary, or elfe by feeds. Thefe fhould be fown in the fpring on a bed of light earth; and when the young plants come up, they fhould be removed at about two inches high to the places where they are to remain. *Miller*'s Gardners Dict.

Goats RUE, in medicine. See GALEGA.

Wild RUE. See the article HARMALA.

RUELLIA, in botany, the name of a genus of plants, defcribed by Linnæus, Plumier, and others, the characters of which are thefe. The cup is compofed of one leaf, and is divided into five erect narrow fegments. The flower confifts of one petal, the tube is of the length of the cup; the neck broad and inclined, and the verge divided into five open fegments. Thefe are all obtufe at the points, and the two upper ones are longer than the reft, and are turned a little backwards. The ftamina are four filaments placed in the wide part of the tube in pairs. The germen of the piftil is roundifh, the ftyle is flender, and of the length of the ftamina; and the ftigma is bifid and acute, and the lower fegment of it is rolled back. The fruit is a cylindric capfule rounded at each end; it is of the length of the cup, compofed of two valves and femibilocular: this contains fome roundifh but compreffed feeds. *Linnæi* Gen. Pl. p. 298. *Plumier* Gen. 2. *Dillen*. Hort. Elth. 248, 249.

RUFFE, in zoology, the Englifh name of the *cernua* or fmall gilded pearch, a fifh common in our rivers, and much refembling the pearch in figure. *Ray*'s Ichthyol. p. 334. See the article CERNUA.

The *ruffe* is called by the generality of authors *cernua fluviatilis*; and by fome *charus acerina* and *afpredo*. It is called by Johnfon and Charleton alfo *fcrollus*. Willughby, as well as thefe authors, has mentioned the *fcrollus* as another fpecies of fifh; but it is proved, by obfervation, that they are evidently the fame fpecies. Artedi makes this fifh a pearch, or *perca*; and accurately diftinguifhes it from the other fifh of that genus by the name of the pearch, with only one fin on the back, and with a cavernous head. See the articles CERNUA and PERCA.

This fifh may be preferved alive in glafs jars with frefh water, and be made very tame. It muft be fed, for it cannot fubfift on the animalcula of river water as fmall dace can. See DACE and Phil. Tranf. N° 478. p. 25.

No fifh fhews the circulation of the blood in a finer manner than *ruffs*, whofe fins are exceeding tranfparent. Befides, it is a creature vaftly tenacious of life, and will live twenty or thirty minutes out of water, without receiving much damage. Phil. Tranf. l. c. p. 26.

RUFFE, in ornithology, the name of a male fpecies of bird, the female of which is called *reeve*, and the Latin name for which is *aves pugnax*, or the fighting bird.

It is about five ounces in weight; its head is of a greyifh brown with blackifh fpots, its neck is grey, and its back and fhoulders variegated with black, white, and brown. Its breaft and belly are white, and its throat of a greyifh white, and fomething mottled. Its wings are black and white. The females are fomewhat fmaller than the males, and they feldom fight. The males have a very remarkable circle of long feathers, furrounding their necks in the form of a *ruff*, worn antiently by ladies, and from this the bird has its name; the feathers of this are fometimes white, but more ufually black, yellow, grey, or of a very fhining blackifh blue; nor is the diverfity of colour peculiar to the feathers of the *ruff* alone; but the whole body of the bird is fo variable, in this refpect, that at fome feafons it is fcarce poffible to find any two of the males which are exactly of the fame colour; but about Midfummer, when they have newly moulted, they are all of the fame colours, and continue fo till toward the fucceeding fpring. The beak is ridged and triangular, and is blackifh, and the feet of a yellowifh red. They come over to us in vaft numbers in fpring, and remain the fummer, building in fome parts of Lincolnfhire, particularly in the fenny country about Crowland. When they firft come over there are many more males than females among them; but thefe are fo continually fighting, that their number foon decreafes below an equality. They are fed up after they are taken with bread and milk, and become very fat, and a very delicate bird; but they are obliged to be kept in the dark, for as foon as the leaft light is admitted they begin to fight. They are ufually taken with nets, while vaft numbers of them are fighting together. *Ray*'s Ornitholog. p. 224, 225.

RUFFE is alfo the name of a particular fpecies of pigeon, called by Moore the *columba cucullata rudis*.

It is in fhape very like that fpecies of pigeon called the *jacobine*, but is larger, and has a longer beak. The iris of the eye is fometimes red, fometimes pearl coloured. The feathers of the hood and chain are much longer than the *jacobine*, though they do not come down fo low to the fhoulders of the wings, nor are they fo compact and clofe, but are apt to blow about with every little blaft of wind, and fall more backward off the head, and lie in a rough confufed manner.

It is a common thing to match the *jacobine* pigeon with this fpecies, with intent to improve its chain by the length of the *ruff*'s feathers; but the event is, that the pigeon is always worfe inftead of better, being longer beaked, and loofer in its head and chain without any real advantage. *Moore*'s Columb. p. 48.

RUGGIOLA, a fort of Spanifh flate, ferving in many places in the room of tiles and bricks. It is a flaky ftone, of the nature of fome of our grey flates, and is cut out of a mountain near Cordova; a plate of this being well heated on both fides, will retain its warmth for twenty-four hours.

The people of Cornwal and fome parts of Yorkfhire ufe a ftone, which is of a talcky nature, to warm themfelves when in bed, applying it at the feet of the bed. This they call the warming ftone from its ufe, and it will retain a fenfible heat fix or eight hours, after once moderately warming. *Plot*'s Oxfordfhire, p. 258.

RUGOSE *leaf*, among botanifts. See LEAF.

RUININE *oil*, a name given by fome authors to the oil of the *palma chrifti*, which is very common in the Weft-Indies, and is ufed by the common people in lamps. It is a delicate fweet and tranfparent oil, and has no peculiar operation in phyfic. They often give it in glyfters from one fpoonful to three at a time, and it has only the effect of common oil: but

but the leaves of the plant are one of the grand medicines of the negroes, bruiſed and applied to the head; they are thought to be an almoſt infallible remedy for the head-ach, of whatever kind, or from whatever cauſe.

RUKKAIA, in zoology, a name given by ſome to a peculiar kind of ſquirrel, found in the iſland of Ceylon. See the article SCIURUS.

RUM (*Cycl.*)—*Rum* differs from what we ſimply call ſugar ſpirit, in that it contains more of the natural flavour or eſſential oil of the ſugar cane; a great deal of raw juice and parts of the cane itſelf being often fermented in the liquor, or ſolution of which the *rum* is prepared.

The unctuous or oily flavour of *rum* is often ſuppoſed to proceed from the large quantity of fat uſed in boiling the ſugar; which fat, indeed, if coarſe, will uſually give a ſtinking flavour to the ſpirit, in our diſtillations of the ſugar liquor, or waſh, from our refining ſugar houſes; but this is nothing of kin to the flavour of the *rum*, which is really the effect of the natural flavour of the cane. The method of making *rum* is this:

When a ſufficient ſtock of the materials is got together, they add water to them, and ferment them in the common method, though the fermentation is always carried on very ſlowly at firſt; becauſe, at the beginning of the ſeaſon for making *rum* in the iſlands, they want yeaſt, or ſome other ferment to make it work; but by degrees, after this, they procure a ſufficient quantity of the ferment, which riſes up as a head to the liquor in the operation, and thus they are able afterwards to ferment and make their *rum* with a great deal of expedition, and in large quantities.

When the waſh is fully fermented, or to a due degree of acidity, the diſtillation is carried on in the common way, and the ſpirit is made up proof: though ſometimes it is reduced to a much greater ſtrength, nearly approaching to that of alcohol or ſpirit of wine, and it is then called double diſtilled *rum*. It might be eaſy to rectify the ſpirit, and bring it to much greater purity than we uſually find it to be of; for it brings over in the diſtillation a very large quantity of the oil; and this is often ſo diſagreeable, that the *rum* muſt be ſuffered to lie by a long time to mellow before it can be uſed; whereas, if well rectified, it would grow mellow much ſooner, and would have a much leſs potent flavour.

The beſt ſtate to keep *rum* in both for exportation, and other uſes, is doubtleſs that of alcohol, or rectified ſpirit. In this manner it would be tranſported in one half the bulk it uſually is, and might be let down to the common proof ſtrength with water when neceſſary: for the common uſe of making punch, it would likewiſe ſerve much better in the ſtate of alcohol; as the taſte would be cleaner, and the ſtrength might always be regulated to a much greater exactneſs than in the ordinary way.

The only uſe to which it would not ſo well ſerve in this ſtate, would be the common practice of adulteration among our diſtillers; for when they want to mix a large portion of cheaper ſpirit with the *rum*, their buſineſs is to have it of the proof ſtrength, and as full of the flavouring oil as they can, that it may drown the flavour of the ſpirits they mix with it and extend its own. If the buſineſs of rectifying *rum* was more nicely managed, it ſeems a very practicable ſcheme to throw out ſo much of the oil, as to have it in the fine light ſtate of a clear ſpirit, but lightly impregnated with it; in this caſe it would very nearly reſemble arrac, as is proved by the mixing a very ſmall quantity of it with a taſteleſs ſpirit, in which caſe the whole bears a very near reſemblance to arrac in flavour.

Rum is uſually very much adulterated in England, ſome are ſo barefaced as to do it with malt ſpirit; but when it is done with molaſſes ſpirit, the taſtes of both are ſo nearly allied that it is not eaſily diſcovered. The beſt method of judging of it is, by ſetting fire to a little of it; and when it has burnt away all the inflammable part, examining the phlegm both by the taſte and ſmell. *Shaw*'s Eſſay on Diſtillery.

RUMI, in the materia medica, a name given by Aviſenna and Serapio to maſtic of the finer kind. They diſtinguiſhed this drug into two ſorts; the one called by this name *rumi*, which was white and pure; the other called *cupti*, which was foul and blackiſh; the former came from the iſland of Chios, the latter from ſome part of Ægypt.

RUMOUR, in law. Spreading falſe *rumours* is criminal and puniſhable at common law. 1 *Hawk.* P. C. 234.

RUMPHIA, in the Linnæan ſyſtem of botany, the name of a plant which makes a diſtinct genus. The characters of which are, that the cup is a one leaved perianthium, divided by three notches at the extremity, and is placed erect, and is plain. The flower is compoſed of three petals, which are all oblong, obtuſe, and equal in ſize. The ſtamina are three pointed filaments of the length of the flower. The antheræ are very ſmall. The piſtil has a roundiſh germen. The ſtyle is pointed, and of the ſame length with the ſtamina, and the ſtigma is three cornered. The fruit is a ſkinny drupe of a turbinated form, and furrowed in three places. The ſeed is a whole nut of an oval figure, containing three cells, the nuts in each of theſe are three cornered in ſhape. *Linnæi* Gen. Pl. p. 9.

RUN (*Cycl.*)—RUN, in the manege. To *run* a horſe is to put him to his utmoſt ſpeed. Some uſe the word *running* for any kind of gallop.

RUNCARIA, in our old writers, ſignifies land full of brambles and briars. 1 Inſt. 5. The word comes from the Latin *runca*, a weed. *Blount.*

RUNCATION, a term uſed in the antient huſbandry, to expreſs the clearing away the weeds from among the corn and other ſown plants.

They uſed when the corn or other plants were an inch or two high, to draw a ſort of rake or harrow over the ground indiſcriminately over the corn and weeds, and when this was done a perſon followed over all the field, and picked up all the weeds with the hand; the treading down the young corn, however, by this perſon's feet, and the injury done to it by the rake, were ſo great, that the crop always ſuffered greatly by it; and many of the Romans choſe to omit the uſe of the rake or harrow, as a thing that did as much injury to the corn as to the weeds, and contented themſelves with the ſending a perſon to pick up the weeds without it.

This was a ſort of firſt hint to the horſehoing huſbandry of the moderns, though ſo injudiciouſly managed, that it was of very little, if any, uſe in this its infancy. But had theſe farmers been inſtructed to ſow their corn in rows, and then to uſe the rake or harrow as we do the hoe, only between thoſe rows, they would then have had all the advantage of deſtroying weeds by it, and of ſtirring the earth, and no injury would be done to the crop. *Tull*'s Huſbandry. See the article HUSBANDRY.

RUNGS, in a ſhip, the ſame with the floor or ground timbers, being the timbers which conſtitute her floor, and are bolted to the keel, whoſe ends are *rung-heads*.

RUNG-*heads*, in a ſhip, are made a little bending to direct the ſwip or mold of the *futtocks* and naval timbers: for here the lines, which make the compaſs and bearing of a ſhip, do begin.

RUNIC (*Cycl.*)—In ſeveral parts of Sweden, ſtones may be met with which were formerly ſet up as obeliſks in memory of the dead; and theſe monuments are marked with the antient northern letters called *runor*, or the *runic* characters. In ſome places, the characters vary from the *runic*, particularly in free ſtones found in Helſignland, of which Mr. Celſius has given us a deſcription, with an explanation. See Phil. Tranſ. N° 445. Sect. 3.

From theſe Helſingland inſcriptions an alphabet of ſixteen letters may be derived, which is very ſingular. In other alphabets different ſounds are generally denoted by different figures; but here the ſame character, according to the diverſity of its place and altitude between two parallels, denotes different ſounds.

But theſe characters, however different they may appear at the firſt ſight from the *runic*, may eaſily be derived from them; or *vice verſa*, the *runic* may be derived from the *helſingic*, if theſe be ſuppoſed the moſt antient. The ſubtraction of a perpendicular line in the firſt caſe, or its addition in the latter, brings the two characters to a near reſemblance.

The inſcription, which Mr. Celſius conſiders, was publiſhed in Monſ. de la Motraye's travels, but erroneouſly. See Phil. Tranſ. loc. cit.

RUNNING, in antiquity, made one of the exerciſes performed in the pentathlon or quinquertium. See the article PENTATHLON, *Cycl.*

This exerciſe was in ſo great eſteem among the antient Greeks; that ſuch as prepared themſelves for it, thought it worth their while to burn, or parch their ſpleen, becauſe it was believed to be an hindrance to them.

Indeed, all thoſe exerciſes, that conduced to fit men for war, were more eſpecially valued; and that ſwiftneſs was eſteemed ſuch in an eminent degree, appears from Homer's giving his hero the epithet of πόδας ὠκὺς Ἀχιλλεύς. *Pott.* Arch. Græc. l. 2. c. 21.

RUNNING *of the eyes*, in infants. See INFANT.

RUNNING-*fights*, at ſea. See FIGHTS.

RUNNING-*ropes*, in a ſhip, are thoſe which run on blocks and ſhivers.

RUNOR. See the article RUNIC.

RUNT, the name uſed with the diſtinction of places for ſeveral ſpecies of pigeons. Theſe are the Leghorn, the Spaniſh, and the Frieſland *runt*, &c. The *columba domeſtica Piſarum*, *Hiſpaniæ* & *Friſiæ* of Moore.

The Leghorn *runt* is a ſtately large pigeon, ſeven inches or better in the legs, cloſe feathered and faſt fleſhed, extremely broad breaſted, and very ſhort in the back. He carries his tail, when he walks, ſomewhat turned up like a duck's; his neck is longer than any other pigeons, and he carries it bending like a gooſe or ſwan. He is gooſe headed, and his eye lies hollow in his head, with a thin ſkin round it, like that of the Dutch tumbler. His beak is very ſhort for ſo large a bird, and has a ſmall wattle on it, and the upper chap falls a little over. It is a very valuable pigeon, but is tender, and requires care.

The

The Spanish *runt* is the longest bodied of all the pigeons; it is short legged, and loose feathered, and does not walk so upright as the Leghorn *runt*. These are of a great variety of colours, but are apt to have accidents in sitting, from their sitting too heavy, and often breaking their eggs.

The Friesland *runt* is a large pigeon, and has all its feathers reverted, or looking as if placed the wrong way.

The Roman *runt* is a pigeon of the same general make with the common kind, but so large and heavy that it can hardly fly.

The Smyrna *runt* is middle sized, and is feather footed, and that to such a degree sometimes, as to look as if there were wings upon the feet; the feathers of these are sometimes four or five inches long, and often pull the eggs and young out of the nests. The common *runt* is the common blue pigeon kept for the table, and known to every body. *Moore's* Columb. p. 42.

RUNT is also a name given to Canary birds when three years old. See CANARY and PASSERES *Canarienses*.

RUPELLENSIS *sal*, in chemistry, a name given to a peculiar kind of salt, invented by Mr. Seignette at Paris, and extolled as a very valuable medicine.

The preparation of it was kept a great secret, till discovered by some members of the Paris academy. It was found to be a species of *sal polycrestum*, and was properly a soluble tartar composed of cream of tartar, and the fixed salt of common pot-ashes well depurated. This salt is of a very singular nature; for though it be a true alcaline salt, it yet is capable of crystalization, and it does not easily dissolve in the open air as other fixed salts do; but, on the contrary, it calcines therein like vitriol and the Glauber's salts. Phil. Transf. N° 436.

Another peculiar property of it is, that if it be satiated with vitriolic acids, and the liquor be evaporated, there is obtained a salt which has the figure of Glauber's salt, and all the properties requisite to make Mr. Seignette's salt. In order to which, take salt of kali or pot-ashes of Alicant well purified one pound; dissolve it in water, and add to it cream of tartar half a pound: this is about the quantity usually necessary; but the true proportion, in this case, can no more be determined than in the making the common soluble tartar, otherwise than by trial every time; either from the salt of kali's having retained more or less humidity, or from the tartar's having more or less foulness. Boil the whole together in order to dissolve the tartar; and if the quantity of tartar have been too great after the fermentation is over, filtre the liquor, and as it cools the superfluous tartar will fall to the bottom: after the separation of the tartar, evaporate the lixivium over a gentle fire to a proper standard, and then set it in a cool place, and there will shoot fine crystals. If the liquor be a little too far evaporated, there will be no crystals formed, but the whole liquor will congeal into a hard substance transparent like ice; but upon dissolving this in more water, it will shoot as fair as it would have done if properly evaporated at first.

The virtues of this salt consist in its being an excellent purge, its dose is from one to two ounces; and it is to be dissolved in a large quantity of water.

RUPERT's drops, a sort of glass drops with long and slender tails, which burst to pieces, on the breaking off those tails in any parts, said to have been invented by Prince Rupert, and therefore called after his name.

This surprising phænomenon is supposed to arise from hence; that while the glass is in fusion, or in a melted state, the particles of it are in a state of repulsion; but being dropped into cold water, it so condenses the particles in the external parts of their superficies, that they are thereby reduced within the power of each other's attraction, and by that means they form a sort of hard case, which keeps confined the before-mentioned particles in their repulsive state; but when this outer case is broke by the breaking off the tail of the drop, the said confined particles have then liberty to exert their force, which they do by bursting the body of the drop, and reducing it to a very peculiar form of powder.

This theory seems to be corroborated by making the drops red hot, and letting them cool again by gentle degrees in the open air, for then there is no such effect. Yet it must be allowed, that there is another experiment which seems to impugn this hypothesis; and that is by grinding away any part of the drop upon a grindstone, when the remaining part continues entire; though there appears no reason why it should not break, and burst into dust, if the internal parts be the cause of it; since by this means they must needs be set at liberty, in the most ample manner possible, unless it be that in grinding, the vacuities between the internal particles are filled up with the matter worn off from the stone; and by this means fixing the parts of the glass next the stone, they destroy their repulsive force; constituting as it were another sort of hard external case, which confines the internal particles no less than the other did.

The history of these drops is this; they were first brought into England by prince Rupert out of Germany, and shewn to king Charles II. who communicated them to the Royal Society at Gresham College; and a committe appointed on this occasion by the Society, gave the following account of them. They must be made of green glass well refined, for till the metal, as the glass men call it, is perfectly refined they never succeed if made of it; but always crack and break soon after they are dropped into the water. The best way of making them is to take up some of the metal out of the pot upon the end of an iron rod, and immediately let it drop into cold water, and there lie till it is cold. If the metal be too hot when it is dropped into the water, the business does not succeed, but the drop frosts and cracks all over, and falls to pieces in the water, and every one that does not crack in the water, but lies in it whole till it is quite cool, is sure to be good: there is great nicety in the hitting a due degree of heat in the metal, and the workmen who best know their business cannot promise beforehand which shall succeed, but often two fail for one that hits right. Some of them frost over the surface without falling to pieces, and others break into pieces before the red heat is quite over, and that with a small noise; others break soon after the red heat is over and make a great noise, and some neither break nor crack till they seem to be quite cold; and others hold together while they are in the water, but fly to pieces with a smart noise when they are taken out of it; some do this on the instant, others an hour or two after, and others will keep several days, nay weeks, and at last fall to pieces without being touched. *Neri's* art of glass by Merrett. p. 356.

If one of them be taken out of the water while it is hot, the small part of the neck and so much of the thread or string it hangs by, as has been in the water, will upon breaking fall into small parts, but not the body, though it have as large cavities in it, as those which burst in pieces.

If one of these drops be cooled in the open air hanging on a thread, or on the ground, it becomes like common glass in hardness, solidity, and all other its qualities, and has nothing of the nature of the drops cooled in water.

When a glass drop falls into the water, it makes a hissing noise, the body of it continues red a pretty while, and there proceed from it many eruptions like sparkles that crack, and make it leap up and move, and several bubbles arise from it till it cools; but if the water be ten or twelve inches deep these bubbles diminish so in the ascending, that they vanish before they attain the superficies of the water, where nothing is to be observed but a little thin steam.

The outside of the glass drop is close and smooth like other glass, but within it is full of spungy cavities and blebs. The figure is a sort of oval or pear like shape, such as pearls are painted in, the bottom of which is rounded, and the top terminates in a long neck which is usually variously bent and crooked. Almost all those that are made in water have a little protuberance or knob, a little above the largest part of the body, and most commonly placed on the side toward which the neck ends, but sometimes it is upon that side that lies uppermost in the vessel where it is made.

If the water be hot into which the glass drop is thrown, it always cracks and breaks in the water, either before the red heat is over or very soon after. If dropped into oil they do not miscarry so often as when dropped into water: they produce also a greater number of large bubbles, and continue longer bubbling than when dropped into water: those made in oil have also fewer blebs, and smaller than those which are made in water; and frequently they are smooth all over, not having those knobs which the others have. Some part of the neck of these also, and part of the small thread that is quenched in it, cooled, breaks like common glass; but if the neck be broken off near the body, and the body held all the while close in ones hand, it will crack and break all over; but even then it flies not into so small parts, nor with so smart a force and noise as those do which are made in water, and the pieces will hold together till they are parted, and there then appear long streaks or rays upon them, pointing toward the center of the body, and thwarting the little blebs in it.

If the drops are dropped into vinegar, they frost and crack, so that they are sure to fall to pieces before they are cold, and the noise of their falling in is more loud and hissing than in water, but the bubbles are not so remarkable.

In milk they make no noise nor any bubbles that can be perceived, and never miss to frost and crack all over, and fall to pieces before they are cold. In spirit of wine they bubble more than in any other of the liquors, and while they remain entire, they tumble to and fro, and are more agitated than in other liquors, and they never fail to crack and fall to pieces; and by that time five or six of them have been dropped into this spirit it will be set on a flame, but it receives no particular taste from them.

In water wherein nitre or sal armoniac have been dissolved they succeed no better than in vinegar. In oil of turpentine, the first broke as in the spirit of wine, and the second set it on fire, so that it could not be used again. In quicksilver, being forced to sink by a stick, it grew flat and rough on the upperside; but the experiment could not be perfected, because it could not be kept under till it cooled. In an experiment made in a cylindric glass like a beaker, filled with cold

cold water, out of feven that were tried one only fucceeded, the reft all cracking and breaking to pieces; and it was obferved, in this experiment, that at the firft falling of the drop into the water, and for fome time after, while the red heat lafted, red fparks were fhot forth from the drops into the water; and that at the inftant of the eruption of thofe particles, and of the bubbles which manifeftly break out of it into the water, it not only cracks, and that fometimes with a confiderable noife, but the body moves and leaps about, and that as well in thofe which fucceed as thofe that break in the water.

A blow with a fmall hammer, or other hard body, will not break one of thefe glafs drops if ftruck upon the body; but if the tip only of the neck be broke off, it flies to fmall particles, which eafily crumble into duft; and if it be broken, when the particles have liberty to difperfe themfelves, they will fly every way in an orb, in the manner of a granado.

If they are ground down ever fo low into the body with water and emery they do not fly; but rubbed on a dry tile, they ufually fly to pieces as foon as the bottom is a little flatted, though fometimes they bear rubbing away deeper; and fome, when rubbed half down, have been laid by without burfting, and have flown to pieces a little while after without being touched.

If one of them be broken in the hand under water, it ftrikes it more fmartly than if in the open air; and if it be broken near the furface of the water, the particles it flies into do not difperfe themfelves into an orb as in the air, but all fall regularly and evenly to the bottom; and they burft in the fame manner in the exhaufted receiver of the air pump as in the open air. One of thefe drops being faftened into a cement, all but a part of the neck, and then the tip of it broken off, it made a pretty fmart noife, but not fo great as if broken in the hand; and though, on examining, it appeared to be all fhivered to pieces within, and its colour turned greyifh; yet the outfide remained fmooth, though cracked, and being taken in pieces, the parts of it rofe like thofe of the flaky bodies, talc, or the like; the flakes were many of them conical in fhape, and were alfo cracked, that they eafily fell into duft.

Another drop faftened into a ball of cement of half an inch in thicknefs upon the breaking off the tip of it, burft the ball in pieces like a granado. And when attempted to be bored by a lapidary as they bore pearls, they fly to pieces as foon as the tool enters them, in the fame manner as they do when the tip is broken off.

Thefe were the feveral experiments tried on them by the gentlemen of the royal fociety, and thefe all tend to prove the before-mentioned account of their burfting to be true; and indeed none more than the dry and wet grinding of them; the wet emery, in the latter cafe, making a coat in the place of that it wore away; and the dry powder of tile in the former, fcarce anfwering the fame purpofe, and at beft but very imperfectly, and preferving the body together only for a fmall time. *Neri's* Art of Glafs, p. 362.

RUPICAPRA, in natural hiftory, the name of a creature of the goat kind, from whofe fkin the chamois leather is made, the creature itfelf being called alfo the *chamois* by the French, and by the Germans the *gemp*. See Tab. of Quadrupeds, N° 8. It is very common in the mountains of Helvetia, and in many other places. In the figure of its body it feems to approach very much to the ftag kind; its belly, forehead, inner part of its ears and throat are white; it has a yellow ftreak on each fide near the eyes, and the reft of the body is perfectly black; its tail alfo is black, and that equally on all fides, not white on that part next the body as is the cafe in the deer. *Ray's* Syn. Quad. p. 78.

The male and female both have horns, which are a hand's breadth and an half long, rough toward the bottom, and fomewhat knotty; a new knot growing every year; they are nearly ftrait, but at the top bent into the fhape of a hook, black, and not fmooth, but longitudinally ftriated with flender ftreaks, and their inner cavity is filled up with a folid bone proceeding from the fkull.

This creature has two remarkable holes always open behind its ears: thefe fome have imagined ferved for refpiration; and Appian, who had the *poetica licentia* for whatever he chofe to fay, feems to have led them into this; but there is no fort of probability of truth in it, fince the fkull is feen immediately under thefe holes, and there is no perforation through it, nor any duct difcoverable from them. The vulgar have alfo fome remarkable opinions founded on the ftructure of the horns of this creature; the one, that in depreffing them to rub his back, he often gets them fo far within the fkin that he cannot get them out again; and the other, that he hangs by his horns to the rocks.

RUPITANI, a name given to the Donatifts. See CAMPITÆ.

RUPPIA, in botany, the name given by Linnæus to a genus of plants, called by Micheli *bucca ferrea*. The characters are thefe. The cup is compofed of a fubulated fpadix, ftrait, and of a very fimple ftructure, which becomes a little bent when the fruit is ripe, and is doubly befet with fructifications. There are no petals, nor any ftamina, but a number of kidney fhaped antheræ placed on each fide. The piftils are feveral flender capillary ftyles, each bearing an an oval germen with a fimple ftigma. The fruit is an oval, pointed, thin capfule or cortex placed on the ftyle, which becomes elongated. There are as many of thefe as there were piftils on the plant, and each contains one roundifh feed. *Linnæi* Gen. Pl. 442. *Micheli* 35.

RUSCUS, in botany, the name of a genus of plants, called in Englifh *butchers broom*. The characters of the genus are thefe. The flower confifts of only one leaf, and is of the globofe campaniform kind or hollow, with the belly or body larger than the rim. This is inclofed in a cup, divided into many fegments, and from the bafe of it rifes a piftil, which ripens into roundifh foft fruit, containing one or two feeds which are ufually very hard.

There are four fpecies of this plant. 1. The common myrtle leaved kind. 2. The broad leaved one with the flowers and fruit growing to the leaves called the Alexandrian bay. 3. The narrow leaved one with the fruit growing to the leaves, called *hippogloffum* by authors; and 4. The narrow leaved kind with the fruit growing on the tops of the branches.

Authors have not been accurate in referring the plants of this genus to their proper name *rufcus*, but the three latter have been called by different writers *hippogloffum*, *bonifacia*, *laurus alexandrina*, *chamædaphne*, *laurotaxa*, and *radix idæa*; and many of them have, in their defcriptions, miftaken the calyx of fome fpecies for the flower. *Tourn.* Inft. p. 79.

The root of *butchers broom* is one of the five aperient ones, and is celebrated by authors as a very powerful attenuant and refolvent. It is good in all chronic cafes, and is frequently prefcribed in diet drinks, intended to open obftructions of the vifcera, or to promote urine.

RUSH, in botany. See the article JUNCUS.

Petrified RUSHES. What is ufually called by this name is a kind of foffile coral. But we have in England alfo another not uncommon fubftance, frequently called by the fame name; this is an incruftation of fparry matter, in form of a ftony cruft on the outfides of real *rufhes*; though, in this cafe, it is no real petrifaction, but only a covering of this ftone-like matter. Incruftations and petrifactions are ufually confounded together, and the generality of people do not attend to the diftinction, which is, that in a real petrifaction, the ftony matter penetrates the very fubftance of the body, as is the cafe in the petrified wood of Ireland and other places; whereas in thefe incruftations the fubftance itfelf remains unaltered within, and its outer part alone is covered with the ftony fubftance: this is the cafe with what is called petrified mofs at Scarborough and in other parts of England, and this is the cafe in regard to what we call fometimes petrified *rufhes*. Thefe being water plants, and growing by the fides of fprings, loaded with fpar, often fall in, and become covered over with it. We have near Kettering in Northamptonfhire a fpring which does this very quickly: a gentleman who tried the experiment, by putting in fome *rufhes*, at about thirty yards from the fource, found them in one day covered with a thin fkin of fpar; but after lying fome months there, it formed itfelf into a cruft of half an inch thick round them; and was fo hard, that it would not break by being thrown violently on the ground; but all this while the *rufhes* were not petrified, but only incrufted. *Woodw.* Cat. Foff. Vol. 2. p. 78.

RUSH *grafs*. See the article JUNCAGO.

RUSMA, in natural hiftory, the name given by the eaftern nations to the fubftance, called by the antient Greeks *fory*. It is properly an ore of vitriol, and is ufed as a depilatory, being mixed with lime. *Hill's* Hift. of Foff. p. 6. See the article SORY.

Mr. Boyle tells us, he made a fine powder of equal parts of *rufma* and quick-lime, and letting them foak a little time in water they became a foft pafte, which he fpread on the part he would free from hair; and after letting this pafte lie on about three minutes he wiped it off with a wet cloth, and found the hair taken away by the roots, without any inconvenience to the part. *Boyle's* Works Abr. Vol. 1. p. 137.

Orpiment and quick-lime is ufed in Europe for a depilatory. See the article HAIR, *Cycl.*

RUSSGANGENUM, in natural hiftory, a name given by the people of the Eaft-Indies to a yellow and brafs like foffile fubftance, found in many places there; it refembles the marcafites, only that on trial it is found to contain very little fulphur: it is probably an ore of zink.

RUST *of corn*, or BLIGHT, in hufbandry, the name given by our farmers to a difeafe in corn and other vegetables, in which their ftalks and leaves feem burnt up, and appear of a fort of *ruft* colour.

Wheat is blighted at two feafons, firft in the bloffom, and then its generation is prevented, many of the hufks being empty in the ear, and the rudiments of the grains not impregnated: fecondly, wheat is blighted when the grains are brought to maturity; and in this cafe they become light, and are of little value for making of bread, having fcarce any flour in them.

The firft of thefe cannot happen in England from frofts, becaufe our wheat is not in flower till the month of June; but

but it is long and continual rains that chill the bloffoms, and in this manner prevent their fertility: this, however, does not often happen to us; thefe rains are not common at this feafon of the year; and if they were, this country lying much of it open, the winds diflodge thefe drops of water from the ears, and prevent the mifchief they would do there.

Lammas wheat does not retain thefe drops fo long as the bearded or cone wheat; and, in confequence of this, in the terrible blight in England in the year 1725, the bearded wheat received infinitely greater mifchief than the lammas wheat.

The fecond kind of *blight* from light ears, is, that which is more frequent, and more general with us; this brings the greateft fcarcity of wheat, and the caufe of this is plainly want of nourifhment of the grain, by whatever means that want is occafioned. Several accidents kill the plants, or injure their health, and in that cafe the grains are not filled: lightning does great mifchief to the farmer in this kind, as is plain by the feveral black fpots and patches in fields of corn, in years, when there has been more lightning than ufual. This is a difafter that muft be quietly fuffered, fince it can be neither prevented nor remedied; but the other caufes of *blights*, which are moft general, and do the moft damage, may be prevented in fome meafure at leaft.

One great and common caufe of the *blight* is, the lodging or falling of corn; in this cafe the ftalks are broken near the ear, and the veffels are hurt which fhould carry up the nourifhment to the ear. In this cafe, there can juft juices enough pafs for the keeping the plant alive, and bringing it to its full height, but it is languid all the time, and the grains can never be filled with flour. The earlier in the feafon this lodging of the ftalks happens, the thinner and poorer the ears will be: hence it happens, that when dung and tillage have brought a wheat land into fo good a ftate, that in April and May it feems to promife the farmer five or fix quarters of wheat, it fhall be all deftroyed by falling in June, and fcarce yield him five bufhels, and this fo thin and lank, that the expences of reaping and thrafhing are more than its value. The wind is generally accufed of the throwing down thefe ftalks, but this does not feem to be truly the cafe; the wind may prefs upon the plants; but the caufe of their giving way to it is a weaknefs in their ftalks, and this feems owing either to the want of nourifhment, or the want of air, or of the fun's rays, and perhaps to the want of all three together.

A rich acre will maintain a crop of five quarters ftanding, while a poor acre will not be able to fupport fuch a crop, as would have yielded only about three quarters had it ftood. This is a proof of want of due nourifhment being one great caufe of the falling. Air is neceffary to the nourifhment of all plants, wheat in patticular requires a very free air. It fucceeds beft in open hilly places where the wind comes freely to it, and fhakes off the drops of water from the leaves, as well as their own recrements; and it is plain, that a great quantity of the fun's rays is neceffary to keep wheat ftrong; becaufe in the hotter countries it is not fubject to fall as it is with us, and in other northern countries.

There is another caufe of the *blight*, which is the wheat's coming too late into bloffom. It fhould bloffom in the beginning of June, becaufe there is not otherwife time during the hot weather for it to pafs through the different ftages to the perfection of the grain.

The caufes of the *blight* being thus known, the cure or prevention may be attempted by the farmer, on much more rational grounds than it was among the antients. It is advantageous to haften as much as poffible the time of bloffoming of the corn, and to protract as long as we can the ripening of the grain, that it may have fufficient time to fill and fwell. The earlieft fown wheat is generally obferved to efcape the *blight* beft, and this is owing to its coming fooneft into bloffom. The antients ufed to let their fheep feed upon the corn while young in the blade, by way of preventing it from lodging or falling afterwards: fome of our own farmers ufe this method alfo; and, it is true, that the corn is prevented from falling by this; but the remedy is as bad as the difeafe, for the ftalks are not made very ftrong by this practice, but the ears lighter. They therefore do not weigh down and lodge the ftalks indeed, but they are in fome fort blighted by this means, and the difeafe is caufed by the means ufed to prevent it. This feeding the wheat with fheep retards the time of its bloffoming, and the only advantage of early fowing is thus taken away by it: what grows after the eating of the fheep is a fort of latter crop, and is always weaker and later than the firft. The longer the corn remains on the ground the more nourifhment it requires from it; and in this unnatural remaining on the land, there is no proper fupply provided.

The general remedy for all the cafes of the *blight* is the modern method of horfehoing hufbandry. In this the hoe ftirs up the ground as often as the farmer pleafes, and every fuch ftirring gives new life and nourifhment to the plant: this way a fupply of food for the ear may be given, whenever it is neceffary, and the wide intervals left for the hoe in the drilling the wheat; for this fort of hufbandry gives a free paffage for the fun and air to all the plants.

The moft general *blight* of all that happen in thefe cold countries is caufed by infects, which fome think are brought in the air by an eaft wind, accompanied by moifture, a little before the grain is filling with that milky juice which hardens into flour. Thefe infects depofite their eggs within the outer fkin or rind of the ftalks; and when the young ones are hatched they feed on the parenchyma, and eat off many of the veffels which fhould convey this juice; then the ear is deprived of it, and muft in confequence be thin and poor, in proportion to the number of the veffels eaten, and as the infects happen to come earlier or later; for fometimes they come fo late, that the grains are fufficiently filled with this milky juice before they have any power to hurt the veffels.

In this cafe, though the ftraw, when examined by the microfcope, appears to have its veffels eaten and torn, and to be full of black fpecks, which are caufed by the fame infects, yet the grain is plump and full. This is one of the many cafes in which the early fown wheat efcapes the *blight*. It has been feen, that of the crop of wheat, in the fame field, fome of which has been fown earlier and fome later, though there has been no other difference in the whole, yet the early fown wheat has been full eared, and the late fown has been light eared; and both have had their ftalks equally eaten and fpotted by the infects.

A proof that thefe mifchievous infects are brought by the eaft wind, is, that the corn on the eaft fide of hedges is often found *blighted*, and deftroyed by them, while that on the weft fide of the fame hedge is unhurt. Some fuppofe they are bred in the earth, and crawl up the ftalks, becaufe fome whole fields are fubject to them, and others efcape them wholly; but this is more probably owing to the difference of the fituation of thefe fields, as they are more or lefs expofed to the eaft. Some wheat is more liable to be hurt by this infect-*blight* than another, and the beft remedy in this evil is to plant fields which are moft expofed to thefe *blights*, with fuch wheat as is leaft fubject to be injured by them. The white cone, or bearded wheat, which has its ftalk or ftraw like a rufh, not hollow, but full of pith, except near the lower part, where it is very thick and ftrong, is very proper on this occafion; it is probable, that this plant has fap veffels, that lie deeper, and fo are not to be deftroyed like thofe of common wheat; the ftalks of this are often found fpotted with black, which fhews that the infects have been there, and yet the ears are found full, and the grains plump in them.

There is another kind of *blight*, called by the farmers *moor loor*, this is occafioned by the earth's falling away from the roots of the wheat, and is cured by throwing up fmall furrows againft the rows in the drilling method. The horfehoing hufbandry is beft of all others calculated to prevent *blights*, and to cure them when they happen; but as there are fome years when all wheat is *blighted*, even at thefe times, the horfehoing hufbandry has an advantage; for when the ftalks fall they never lie abfolutely on the ground in this cafe, but the air has room to play between them; but the common fown wheat has not this advantage. The ears in the *blighted* wheat of the drilled kind are not fo light nor poor as in others, but make the farmer fome amends in the corn, though greatly lefs than in the common produce. *Tull*'s Horfehoing Hufbandry.

Corn is always more fubject to *blights* after a wet fummer than at any other feafon; the reafon feems, that the roots being continually drenched with water, the plant runs up to ftalk, and has very little ear, and the corn in the ear is never large or full.

It is obferved, that when the mildews rife or *blights* fall, they generally infeft only one kind of grain, fometimes wheat, fometimes oats, and fometimes barley only; and the fame fort of obfervation holds good in regard to fruit, fometimes only apples are *blighted*, fometimes only pears, fometimes cherries, and fo on. *Mortimer*'s Hufbandry. T. 1. p. 305. See the article BLIGHT.

RUSTICULA, in zoology, a name by which Aldrovand and fome other authors have called the *godwit*, more commonly known by the name *ægocephalus*. *Aldrovand.* de Avib. See the article ÆGOCEPHALUS.

RUSTICULA *brafilienfis*, in zoology, the name given by Mr. Ray, and fome others, to the *guarauna*, a water bird of the Brafils, of the fize of our fnipe. See GUARAUNA.

RUT (*Cycl.*)—RUT *of the fea*, is where it dafhes againft any thing.

RUTA, *rue*, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the rofaceous kind, ufually confifting of four hollowed petals, difpofed in a circular form. From the cup of the flower there arifes a piftil, which afterwards becomes a roundifh fruit, approaching to a fquare form, and compofed of four capfules affixed to an axis, and ufually containing angular or kidney fhaped feeds.

The fpecies of *rue* enumerated by Mr. Tournefort are thefe. 1. The common broad leaved garden *rue*. 2. The more fhrubby broad leaved garden *rue*. 3. The narrower or fmaller leaved garden *rue*. 4. The larger wild *rue*. 5. The fmaller

fmaller wild *rue*. 6. The broad leaved *rue* with hairy flowers. 7. The narrower leaved *rue* with hairy flowers. 8. The white-flowered coriander-leaved prickly mountain *rue*. 9. The Spanifh flax-leaved wild *rue*.

The *rues* would feem to belong properly to the plants, with cruciform not rofaceous flowers; but that the number of the petals in each flower is in the cruciform flowers, always determinately four; but in this genus, as in the other rofaceous ones, it is fometimes four, fometimes five. *Tourn.* Inft. p. 257.

Rue has always been held in great efteem as a cephalic and alexipharmic. It is good in all nervous difeafes, fevers, fmall-pox, meafles; and greatly fo in hyfteric cafes. It is given by many to ftrengthen the ftomach, and to prevent the return of habitual colics. It has alfo been given in pleurifies and peripneumonies, and againft the bites of venomous animals. There ufed to be a conferve and a fimple water of *rue*, but both are now rejected.

RUTA *muraria*, *wall-rue*, in botany, the name of a genus of plants, the characters of which are thefe. The leaves are of a fhape nearly refembling thofe of garden *rue*. The flower is not difcovered, but the fruit are a number of roundifh membranaceous capfules furrounded by an elaftic ring, on the contraction of which they burft and throw out a great number of minute feeds.

The fpecies of *wall-rue* enumerated by Mr. Tournefort are thefe. 1. The common *wall-rue*. 2. The broad leaved alpine *wall-rue*. 3. The taller German *wall-rue*; and 4. The tall climbing *wall-rue* with various leaves. See Tab. 1. of Botany, Clafs 16. *Tourn.* Inft. p. 541.

RUTICILLA, in zoology, the name of a fmall bird, called by the Greeks *phœnicurus*, and in Englifh the *red-ftart*. Its breaft and rump are of a reddifh brown, the lower part of its belly is white; its head, neck and back of a gloffy lead colour; the head is marked before with a very fine white fpot, which is feparated from the eyes and beak by a black line. Its throat is black, with an admixture of grey at the tops of the feathers. Its long wing feathers are all brown; its tail is compofed of twelve feathers, the five outer ones of each fide red, the two middle ones blackifh. Its legs and beak are black, and its mouth yellow within. It feeds on flies, beetles, fpiders, *&c.* *Ray's* Ornithol. p. 159.

RUTILUS, in zoology, a very well known river fifh, called in Englifh the *roach*, remarkable for its livelinefs and vivacity.

In fome parts of the world this fifh will only live in ftanding waters; with us it equally thrives in ponds and rivers, and is remarkable for its numerous progeny; a pond being much fooner ftocked with this than with any other fifh. *Ray's* Ichthyog. p. 262.

RUTILUS *latior*, in zoology, a name given by many authors to the fifh called in Englifh *rudd* or *finfcale*, and more ufually in Latin *rubellio fluviatilis*. Id. Ibid. p. 252.

RUTTEE, a weight ufed in the Eaft Indies, one hundred of which make eighty-eight caracts. See CARACT.

RUTULUS, in Roman antiquity, the barrier of the cavea, or place where the wild beafts ufed in amphitheatrical fports were fhut up. It was made of iron bars, which turned upon hinges, and all at once flew open with great fwiftnefs. See *Pitifc.* Lex. Ant. in voc. *rutulus* and *cavea*.

RUTY-PUNDOC, in natural hiftory, a name given by the people of the Eaft Indies to a peculiar fpecies of yellow orpiment, which they find on the tops of the mountains there; and after feveral calcinations give internally in coughs and colds. The antient Greeks ufed this orpiment in the fame manner; we have of late run into an opinion of its being a fatal poifon. But Dr. Boerhaave, in his chemiftry, affirms, on his own trials, that it is innocent and harmlefs. Thefe people, who have not the ufe of chemiftry, give us a hint of the virtues of great numbers of our own foffils, which are common alfo to their country. The felenitæ, fibrofe talcs, fpars, and many other foffils, which we wholly neglect, are in common ufe with them, and great cures are often performed by them. *Woodw.* Cat. Foff. Vol. 2. p. 13.

RYE, *fecale*, in botany. See the article SECALE.

This fort of grain fucceeds very well on any fort of dry land, even on the moft barren gravel or fand. The farmers fow it about the beginning of September, after a fummer's fallow, in the drieft time they can. Two bufhels of feed is the quantity generally allowed to an acre of land; but if it be ground newly broken up, or if it be fubject to worms, they then allow a peck more to the acre. A little fprinkling of dung, or mud, upon *rye* land, will greatly advance the crop, though it is laid but half the thicknefs that it is for other corn; its produce is commonly about twenty bufhels upon an acre.

The farmer knows it is ripe when the ftraw is yellow, the ear bends, and the grain feels hard. It is not apt to fhed the feeds; and therefore, if there are many weeds among the crop, it may be left lying upon the ground, or gravel, as they call it, eight or nine days after it is cut, before it is bound up, if the weeds are not dry fooner: for otherwife, they will grow moift in the barn, and caufe the whole to give, and not to thrafh well, and fometimes they will make it mufty.

As it is a grain that will grow in the ear fooner than any other if it be wet, care muft be taken if rain falls after it is cut, to turn it as it lies on the ground every other day; and at the fame time to keep the ears as far from the earth, and as much above the ftubble as may be; this will prevent the mifchief. If it be pretty clear of weeds it may be houfed as foon as it is cut. If either this grain or wheat lodge upon the ground, it is beft to cut them, even though they are not ripe; for the ftalk being broken will yield no more nourifhment to the ear.

There is another very effential ufe to the farmer made of *rye*. April is the feafon of the year when food is of all others the fcarceft for cattle, efpecially for fheep and lambs: on this occafion fome fplit the ridges of the wheat ftubble and fow them with *rye*; they harrow this in, allowing about a bufhel to an acre: they feed the fheep with this in April, and in May they plow it up for fallow. *Mortimer's* Hufbandry, p. 136.

In many parts of France there have been certain years, in which this grain, from no apparent caufe, has proved noxious, and fometimes even poifonous. Mr. Perrault travelling through Sologne, was informed that the *rye* of that province was fometimes fo corrupted, that thofe who eat of the bread that had much of the corrupted grain in it, were feized with gangrenes in different parts of the body, which was not preceded by any fever, inflammation, or any confiderable pain; and that the gangrened parts ufually fell off after a time of themfelves, without the affiftance of chirurgical inftruments.

The grains of *rye* thus degenerated are black on the outfide, and tolerably white within; and when they are dry, they are harder and clofer than the natural good grain: they have no ill tafte, but fometimes they have a vifcous metallic like honey hanging to one end of them. They grow longer than the other grains in the fame ear, and are found from one or two, to feven or eight in the fame ear. Some have fuppofed that thefe were not the proper feeds of the plant, but fome other extraneous bodies that got in among them; but it is evident, from a clofe infpection, that they are really the genuine feeds only altered by fome accident; the coats, and the furrow, and even the germen for the young plant, being entirely the fame as in the natural feeds.

The places where the *rye* is found to degenerate in this manner, are all a dry and fandy foil. In thefe places there is fcarce any foil in which more or lefs of thefe large feeds are not found among the others, but where there are but few of them the ill effects are not perceived. The feafons when the degeneracy is greateft, and the effects the worft of all, is, when there have been exceffive rains in the fpring, and there come on exceffive heats in the fucceeding fummer.

The bread which is made of the *rye* that holds ever fo much of this bad corn, is not diftinguifhable from other *rye* bread by the tafte, and feldom produces its ill effect, till fome confiderable time after it is taken. Befide the gangrenes already mentioned, it not unfrequently brings on other bad confequences, fuch as drying up the milk of women who give fuck, and occafioning fometimes malignant fevers, accompanied with drowfinefs, ravings, and other dangerous fymptoms. The part ufually feized by the gangrene is the legs, and this often in a very frightful manner. The arms are the part moft fubject next, but all the other parts of the body are fubject to it.

The firft fymptom of this approaching gangrene is a ftupefaction and deadnefs in the part; after this there comes on fome pain, though not violent, and the fkin becomes livid; fometimes the fkin fhews no mark of it, but the pain and fwelling increafe; and it is neceffary to make an incifion into the flefh to find the gangrened part. In the more defperate cafes, the only remedy is the taking off the part; and if this is neglected, the flefh is all wafted, and the fkin becomes black, and clings round the bones, and the gangrene appears again in the fhoulders.

The poorer people are only fubject to this difeafe; and, as they principally eat the *rye* bread; and as thofe years when there is moft of this bad grain among the ears of *rye* produce moft of thefe diforders, it has been judged certain that the *rye* is the occafion of it. It may deferve enquiry, however, whether that grain may not be innocent of the mifchief, and its degeneracy and the diftemperature attributed to it may not both be the effect of the fame bad conftitution of the air. If it proves, on enquiry, that only thofe who eat of the *rye* are fubject to the difeafe, it will feem a proof of its being really owing to it; and in this cafe the mifchief may be prevented by the fifting the grain before it is ground, the degenerated grains being fo long that they will all remain in the fieve that lets the others through. The experiment has been made on the fpot, by giving the flower of the corrupted grains alone to animals, and it is faid they have been killed by it. Phil. Tranf. N° 130.

RYSAGON, in the materia medica, a name by which fome authors have called the *caffumunar root*.

S.

S, in the Italian music, stands for *solo*; it is used in pieces of music of several parts, to intimate, that in such places a voice, or instrument, is to perform alone. See the article SOLO.

SABAZIA, Σαβαζια, among the Greeks, nocturnal mysteries in honour of Jupiter *Sabazius*, into which all that were initiated had a golden serpent put in at their breasts, and taken out at the lower part of their garments, in memory of Jupiter's ravishing Proserpina in form of a serpent. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 429.

SABINA, *savin*, in medicine. See SAVIN.

SABINITES *lapis*, in natural history, a name given to a stone in which are preserved the leaves of the common savin. See the article *fossile* PLANTS.

SABLE (*Cycl.*)—SABLE, in zoology, the name of the animal whose fur is so much valued, and sold under the same name. It is a creature of the weasel kind, and called by authors *mustella zibellina*. See the article ZIBELLINA.

SABLE *mouse*, in natural history, the name of an animal found in Lapland, and in other cold countries; many extraordinary things are related of the manner of living of these creatures.

They are of the bigness of a squirrel, and their skin is streaked with brown and black; there are also some spots beside the streaks; the black is a very fine deep colour, the brown is pale; they have two very sharp teeth above, and two below of the same kind; their feet are like a squirrel's, and they have no tail; they are usually very fat and fleshy, and are so quarrelsome and fierce an animal, that if a stick be held out to them they will bite at it, and will hold it so fast, that they may be tossed and swung about in the air by it without letting it go. In their march they usually keep a direct line from north east to south west, and always travel in thousands in the same troop. The whole number forms a square body, and they march only from the time of the twilight to the morning, lying still all the day.

They march in lines, which are some ells distant, but always exactly parallel to each other, so that the places they have gone over look like the furrows of a ploughed field. If they meet with any thing in their way that might deter another animal, it never stops them; but, though it be fire, a deep well, a pond, a torrent, or a bog, they without hesitation venture through, and by that many thousands of them are destroyed, and are found dead in the morning, in the waters, or otherwise.

If they be met swimming over lakes, and attacked by men in boats with the oars, boat hooks, or other instruments; they neither retreat nor offer to run up the oars, but hold on their course; and if they be put out of it they presently return into it again. When they are met in the woods or fields, they set themselves up on their hinder feet, and make a sort of squeaking noise, somewhat like the barking of a dog; they will leap up at a man, and rise as high as his head, and in this manner they will defend their line a long time; but if they find themselves overpowered, they will disperse and run into holes, or any other places of secrecy, making a noise, which sounds something like the word *biob, biob*.

They never come into a house, nor meddle with any thing that we eat; if they chance to come to a house in their way, there they stop till they die; but if they come to a stack of hay, or corn, they eat their way through.

When they march over a meadow they do it great damage, by eating the roots of the grass; but if they encamp there, they wholly destroy the produce; the land looks like a place where there had been a fire, and the whole surface looks as if strewed with ashes.

They are said to be very fruitful, bringing forth eight or nine at a time; but it is certain, at least, that they bring forth more than one, for in their marches it is not unusual to see a female with a young one in her mouth and another on her back. They seem no great delicacy to creatures of prey. If dogs or cats kill them they eat only the head, and when a bird of prey seizes them it only feeds on the entrails; it is said only on the heart: the poor Laplanders, however, in want of other food eat the whole body, and say it is as well tasted as a squirrel. In the severity of winter these creatures lie under the snow, and have their breathing holes as the hares, and other inhabitants of these places use to have. The Laplanders are always glad to see these creatures on their march, for it always foretels plenty of more valuable creatures among them: the same cold that sends these out, sending also a number of fowl, squirrels, foxes, and other animals the same way. Wormius has written a complete treatise on this animal, calling it *mus norwegius*, this is reprinted at large in his Museum. Phil. Transf. N° 251. p. 112.

SABURRÆ, in natural history, the name of a genus of fossils found in form of powder, and usually confounded among the sands, and called by the same name. These are not composed like the genuine sands of pure natural concretions, but are irregular particles, seeming to have been the fragments of other large bodies. They are not to be dissolved or disunited by water, but retain their figure in it, and do not cohere by means of it into a mass. They are often very opake, and in many of the species will ferment with acids, and are often fouled with heterogene particles, taking in the coarser, stony, mineral, and metalline particles, and are according to their colour divided into several kinds.

White SABURRÆ. Of these consisting of pure spar we have three kinds. 1. A fine snow white one; and 2. A dull coarse white one found in different places on Mendip Hills; and 3. A fine cream coloured one found only in the islands of the Archipelago. Of these containing heterogene particles we have nine species. 1. A bright coarse white one composed of crystal and spar found in Leicestershire. 2. A white coarse one with micæ common in Wales. 3. A dull white fine one found in Northamptonshire. 4. A dull greyish white coarse one common in Yorkshire. 5. A fine dull brownish white one common in Leicestershire. 6. A fine glittering greyish white one found in Yorkshire. 7. A fine greenish white spangled one found in Dorsetshire. 8. A dull coarse greenish grey one common in Yorkshire; and 9. The *pulvis puteolanus*, a fine dull looking grey one found in Italy. See PUTEOLANUS.

Red SABURRÆ. Of those which are pure we have five species. 1. A fine pale red one found in Bristol. 2. A coarse shining pale red one found on the coast of Fife. 3. A coarse shining greyish red one found on the shores of the island of Minorca. 4. A coarse greenish red dull one found on the shores of some parts of the Mediterranean. 5. A fine shining ferrugineous one found about Lisbon. Of those variegated with talcy spangles we have nine species. 1. A fine red one with micæ found about Minorca. 2. A coarse red variegated one with micæ. 3. A large bright flesh coloured one with micæ. 4. A fine brownish red variegated one with micæ. 5. A fine flesh coloured micaceous one, all from the coasts of Scotland. 6. A fine whitish red one with micæ, and variegations, found on the shores of the northern islands. 7. A brownish red coarse one found on the shores of the Red Sea. 8. A large coarse blackish red one found on the shores of Sicily; and 9. A coarse shining greenish red one found on the shores of the Mediterranean.

Green SABURRÆ. Of these we have only two known species. 1. A coarse beautifully green dull one, which was the chrysocolla of the antients, see CHRYSOCOLLA. And 2. A fine shining green one found on the shores of the Red Sea.

Yellow SABURRÆ. We yet know only one species of this kind, which is the shining gold coloured micaceous one, which has deceived the world very often into an opinion of its containing gold. It is very common in Virginia and elsewhere.

Black SABURRÆ. Of this we have one pure species, a fine black one variegated with white, common in France. Of those containing talcy particles we have two known species. 1. A fine variegated black and white one, with micæ found on the shores of the Mediterranean; and 2. A coarse variegated black and grey one, frequent on the shores of Wales; and besides these there are three of this colour which are full of metalline particles. 1. A ferrugineous black glittering one found on the shores of Italy. This is the shining black sand, as it is called, used to throw over writing. 2. A coarse glittering brownish black one, common on the shores of Wales, and used there on the same occasion; and 3. A fine bluish black glittering one, common also on the shores of Wales. All these are principally made up of lead ore. *Hill's* Hist of Foss. p. 569.

SACABURGH, SACABERE, or SAKEBERE, in our old writers, one that is robbed, or by theft deprived, of his money or goods, and puts in surety to prosecute the thief with fresh suit; according to Selden, in his titles of honour, and Briton. c. 15 & 29. with whom agrees Bracton (lib. 3. tract. 2. c. 32. n. 2.) *Furtum vero manifestum est, ubi latro deprehensus sit seisitus de aliquo latrocinio*, scil. Honhabend and

& Backberond & *inſecutus fuerit per aliquem cujus res illa fuerit, qui dicitur* ſacaburh, &c.

The word may come from the Saxon *ſac* or *ſaca*, i. e. *lis, cauſa, proſecutio*, and *burh*, *pignus*, *hoc eſt furti ſymbolum. Spelm.* Gloſſ. in voc.

But Sir Edward Coke ſays, *ſacabere*, or *ſakebere*, is derived from *ſac* and *bere*, that is, he that did bear the bag. 8 Inſt. fol. 69. *Blount.* Law Dict. in voc.

SACARII, among the Romans, were a company or fraternity of porters, who had the ſole privilege to carry all goods from the harbour to the warehouſes, none being allowed to employ their own ſlaves, and much leſs thoſe of others, for that purpoſe. *Pitiſc.* in voc.

SACCER. See the article SAKER, *Cycl.*

SACCHARUM (*Cycl.*)—SACCHARUM, in the Linnæan ſyſtem of botany, is the name of the plant which produces ſugar, and which makes a diſtinct genus by itſelf. The characters of this are, that there is no calyx or flower cup, but a downy ſubſtance longer than the flower, and including only one ſingle flower, which is compoſed of two oblong and pointed valves, both equal in ſize, placed erect, hollowed and naked, or not bearded. The ſtamina are three capillary filaments of the length of the flower; the antheræ are ſomewhat oblong, the germen of the piſtil is pointed. The ſtyles are two and are hairy, the ſtigmata are ſimple. The flower encloſes the ſeed which is ſingle, oblong, narrow, and pointed. *Linnæi* Gen. Pl. p. 18.

SACCHARUM *ſaturni*, in medicine, is recommended by ſome internally for dyſenteries, and hæmorrhages of all kinds; but the generality of the world condemn it, as containing all the poiſonous qualities of the metal it is made from in their higheſt degree.

Externally it has been long famous for its virtues in the eryſipelas, in inflammations of all kinds, and in embrocations. It is uſed alſo in ſmall quantities in collyriums for the eyes; it deterges, dries, and cicatriſes ulcers; and in gonorrhœas is mixed in injections with great ſucceſs.

It is well known that this ſalt made with the common vegetable or mineral acids, when diſtilled, will not give back the acid again, but only yields a water without any ſharp taſte and an inflammable oil; but if it be made into the animal acid of piſmires, whether procured by diſtilling thoſe inſects freſh, or by throwing large quantities of them into water till it is ſufficiently impregnated, it will on diſtillation yield back the ſame proportion of acid of the ſame ſtrength. Phil. Tranſ. N° 68. See TINCTURA *antiphthyſica*.

SACCHARUM *lactis*. See the article MILK.

SACCINI, in our old writers, Monks ſo called, becauſe they wore a garment of goat's hair next to their ſkins. *Saccus* is applied to coarſe cloth made of ſuch hair. *Blount.*

SACCO *beneditto*. See the article SANBENITO, *Cycl.*

SACCUS *cum brochia*, in our old writers, a ſervice or tenure of finding a *ſack* and a *broach* to the king, for the uſe of his army. Bract. lib. 2. c. 16. *Blount*, *Cowel.*

SACCUS *lacteus*, a name given by ſome anatomiſts to the *receptaculum chyli*.

SACER (*Cycl.*)—SACER, in ichthyology, a name given by Gaza and ſome others to that ſpecies of the *labrus*, diſtinguiſhed by Artedi by the name of the red forked tailed *labrus*, and called by the generality of other authors the *anthias piſcis*. See the article ANTHIAS.

SACHETTUS, in zoology, the name of a ſea fiſh, much reſembling the common river pearch in ſhape and colour, and having the ſame black obliquely tranſverſe lines on its ſides, and ſeeming the ſame with the *channadella* of Bellonius, Rondeletius, and other authors. It has only one long back fin, the foremoſt rays of which are prickly, the others ſmooth behind theſe prickly rays; it has a large black ſpot, which alone diſtinguiſhes this from all the other fiſh of its kind. Its mouth is large, and its lower jaw ſomething longer than its upper. The belly fins are black, and the tail is forked; the ſcales are large; and as in the other fiſh of this kind, cover not only the body but the gills, and part of the head of the fiſh. It is common in the Mediterranean, and is brought to market at Rome, Venice, and elſewhere, and accounted a very delicate and well taſted fiſh. *Ray*'s Ichthyolog. p. 326.

SACRA (*Cycl.*)—SACRA *fiſtula*, a name given by ſome to the cavity, in which the ſpinal marrow is lodged, and by others to the ſpinal marrow itſelf.

SACRA *gentilitia*, among the Romans. Beſide the public feſtivals obſerved by the whole Roman people, and beſide the holy-days kept on birth days, marriages, or any other perſonal account, there were likewiſe family feaſts celebrated annually by the deſcendants only of particular families.

They thought themſelves obliged to keep theſe with the utmoſt exactneſs and regularity, on pain of divine vengeance. Livy tells us that a young man of the Fabian family, when the capitol was beſieged by the Gauls, made his way through the enemy's army, in order to celebrate the yearly feſtival of his family, to the no ſmall aſtoniſhment both of the beſiegers and beſieged. Mem. Acad. Inſcript. Vol. 8. p. 310.

SACRANUS *color*, a name given by ſome authors to purple, or very deep red.

SACRARIUM, among the Romans, a chapel in a private family. It differed from *lararium*, as being dedicated to ſome particular deity, and the *lararium* to the houſhold gods in general. *Pitiſc.* in voc.

SACRE, in zoology, the name of a ſpecies of falcon, called by authors *falco ſacer*, and differently deſcribed by different authors, but by all agreed to be an extremely bold and active bird. The deſcription Mr. Ray has ſelected of it is this. It is a larger bird than the common falcon. Its head is flat and of a greyiſh colour; its eyes large, and its beak bluiſh. Its back and wings are brown; its breaſt white, and variegated with brown ſpots. Its thighs are white within, and its tail is variegated with ſpots of the ſhape of a kidney. Its wings are very long, and its legs and feet of a bluiſh colour. The yearling birds of this ſpecies are called *ſori*, and differ conſiderably in their plumage from thoſe of a more advanced age, having their legs paler, and their breaſts leſs ſpotted. It will ſeize upon the largeſt birds, and on young goats, &c. for food. *Ray*'s Ornithol. p. 43.

SACRIFICE (*Cycl.*)—SACRIFICES, among the Greeks, were of four kinds, *viz.* 1. Free-will offerings, or ſuch as were paid in conſequence of a vow, χαριστηρια and Ευκταια, for a victory obtained, the firſt fruits offered by huſbandmen for a plentiful harveſt, and the like. 2. Propitiatory offerings, ιλαστικα, to avert the anger of ſome offended deity, and ſuch were all *ſacrifices* uſed in expiation. 3. Petitionary ſacrifices, Αιτητικα, for ſucceſs in any enterprize. 4. *Sacrifices* expreſsly commanded by ſome oracle or prophet, τα απο μαντειας.

For the materials and rites of *ſacrifices* ſee *Potter*, Archæol. Græc. T. 1. p. 209. ſeqq. and SACRIFICE, *Cycl.*

SACRIMA, among the Romans, the new wine which was offered to Bacchus as an acknowledgment of his protecting and preſerving every thing that belonged to wine. *Pitiſc.*

SACRO-COCCYGÆUS, in anatomy, a name given by Winſlow to a muſcle now generally called ſimply the *coccygæus*, he calls it alſo *coccygæus poſterior*.

SACRO-LUMBARIS, a long complex muſcle, narrow and thin at the upper part, and broad and thick at the lower, repreſenting a kind of flat pyramid. It lies between the ſpine and poſterior part of all the ribs, and along the back part of the regio lumbaris, all the way to the os ſacrum. Through all this ſpace it is cloſely accompanied by the longiſſimus dorſi, which lies between it and the ſpinal apophyſes of the vertebræ, a narrow fatty or cellular line running between them; it is fixed below by a broad thin tendinous aponeuroſis to the os ſacrum, and part of the criſta of the os ilium. From thence it runs upward, and a little laterally over all the regio lumbaris; afterwards it runs up obliquely over all the ribs, ſometimes as high as the two or three loweſt vertebræ of the neck. The ſide next the longiſſimus dorſi is all this way very even; but that next the ribs is divided into ſeveral digitations, reſembling the branch of a palm tree. Theſe are fixed in the tranſverſe apophyſes of the neck, in the tuberoſity of the firſt rib, in the lower part of the angular impreſſions, in the following ribs, and near the extremity of the laſt. *Winſlow*'s Anatomy, p. 245.

SACRO-LUMBARIS *pars ſuperior*, in anatomy, a name given by Cowper and ſome others, to a muſcle, called by Winſlow *tranſverſalis collateralis colli*, and by Albinus the *cervicalis deſcendens*. See the article TRANSVERSALIS.

SACRO-SCIATIC *ligaments*. Theſe are two in number, the one broad and external, the other ſmall, narrow, and internal. The broad, or external *ſciatic* ligament, is ſlightly faſtened to the inſide of the tuberoſity of the criſta of the os ilium. It covers exteriorly the two poſterior ſpines of that bone, and continues to be inſerted along the anterior and exterior edges of the falſe tranſverſe apophyſes of the ſacrum. From thence this ligament diminiſhing in breadth, deſcends obliquely toward the tuberoſity of the os iſchium, and is inſerted immediately below the ſinus, which lies between that tuberoſity and the *ſciatic* ſpine. This inſertion is afterwards continued over the whole internal labium of the inferior portion of the os iſchium, and of the ramus of that bone, and the inferior portion of the ramus of the neighbouring os pubis. Through all this latter courſe of its inſertion, that is after its arrival at the tuberoſity of the iſchium, it produces a kind of ligamentary falx, one edge of which is fixed to the bones, the other lies looſe; and by this ſituation of the falx, it ſeems, together with the bones, a kind of deep channel or groove. The ſmall *ſacro-ſciatic*, or internal *ſciatic* ligament, adheres cloſely to the inſide of the poſterior portion of the former. It is fixed interiorly alſo to the edge of the inferior part of the fourth falſe tranſverſe apophyſis of the os ſacrum, and from thence all the way to the upper part of the os coccygis. From this inſertion it runs up a little obliquely to the ſpine of the iſchium, in the ſharp point and upper part of which it is fixed. During this courſe it croſſes the broad ligament, being cloſely united to the inſide thereof, and loſes but very little of its breadth. By theſe two ligaments two diſtinct openings are formed; a large one which is the ſuperior *ſciatic* ſinus, and a ſmall one with the inferior *ſciatic* notch. *Winſlow*'s Anatomy, p. 123.

SACRUM *os*. See the article Os *ſacrum*.

SACTIM, a word used by some of the chemical writers to express vitriol.

SADAF, in the materia medica, a name given by the Arabian writers, sometimes to the purpura or purple fish, and sometimes to the purple fucus, with which the antient Greek women used to stain their cheeks. This was the original of all painting, and the plant was the common purple sea wracks. After this every thing was called fucus that was used by the women to paint their faces; and they had a fucus metallica made of white lead or cerufs, and the purple root of alcanet, &c. were called fuci.

SADAR, or ALSADOR, the Arabian name of the medicinal *lotos*, described by Dioscorides, and many others of the antients. This shrub was called by some of the antients *acanthus*, from its being full of thorns, and hence many have confounded it with the common *acanthus*, or *bear's breech*, and many with the *acanthus* of Theophrastus, which is the acacia or gum arabic tree. The fruit of this tree, called by Virgil the berries of the *acanthus*, is the *nabac* of the Arabian writers, though some would have it to be a kind of fig. Serapion evidently declares the *sadar* and *acanthus* of Virgil, that is the *lotus cyreniaca* of Herodotus, and the *lotus* of Dioscorides to be one and the same plant. Bellonius has also described it under the name of *napeca*, a name probably derived from *nabac*, the appellation usually given its fruit: he says it is an ever-green shrub, and was called by some of the Greek writers *oenoplia*. Prosper Alpinus, in his account of the Ægyptian plants, also describes the *nabeca* as a thorny shrub; though authors have observed that there are two species of it, the one thorny and the other not. Leo Africanus, in his third book, mentions also the same tree; but he mistakes the name, writing it *rabech* instead of *nabech*; he says it is a prickly tree, producing a fruit resembling a cherry, but smaller, and of the taste of the zizyphus. These are the berries of the *acanthus* mentioned by Virgil. *Prosper Alpin.* de Plant. Ægypt.

SADDLE (*Cycl.*)—A hunting *saddle* is composed of two bows, two bands, fore-bolsters, pannels, and *saddle*-straps: and the great *saddle* has beside these parts, corks, hind-bolsters, and a troussequin. The pommel is common to both. See BOW, BAND, BOLSTER, &c.

A horseman that would sit a horse well, ought always to sit on his twist, and never on his buttocks, which ought never to touch the *saddle*; and whatever disorder the horse commits, he ought never to move above the *saddle*. *Guill.* Gent. Dict. P. I. in voc.

SADDLE-*backed*, among horsemen, a name given to a horse, that is hard to fit with a *saddle*, his reins being low, and his head and neck raised, so as to require a *saddle* to be made on purpose for him. *Guill.* loc. cit.

SADDLE *case*. See the article HOUSING, *Cycl.*

SADDLE *roll*. See the article TROUSSEQUIN, *Cycl.*

Cart-SADDLE. See the article CART.

SADDLE *straps*, are small leathern straps, nailed to the bows of the *saddle*, which are used to hold the girths fast to the *saddle*. See the article BOWS.

SADIR, a word used by some chemists to express the scoria of any metal in fusion.

SADRE, a title given by the Persians to the chief of the Mahometan religion. See the article CALIPH.

SÆPÆ, a name given by some medical writers to sharp corroding pustules.

SAFFRON, *crocus*, (*Cycl.*) in botany. See CROCUS.

There is no accident attending the culture of this valuable and useful plant, which the farmers so much dread, as what they call the *rot* with us, and in French *la mort*. This is more common in the *saffron* fields of the Gatinois than in ours. Mr. du Hamel, who undertook to give the Paris academy some account of this malady of the plant, observes, that no author has given any account of it; and that the people employed in the culture of the *saffron*, know the terrible effects of it, without at all guessing at what may be its cause. It seems a sort of contagion among the plants, spreading far and wide, and extending from one root as from a center all over a whole field, if not stopped; the season of its most fatal spreading is the spring, and the mischief is found to be stopped from farther progress, by digging deep trenches at that time of the year between the sound and the tainted parts of the field.

Mr. du Hamel, in enquiring into the state of the roots or bulbs of the *saffron* in many fields where this disorder reigned, found that the roots in the center where the distemperature most raged, and those at a middle distance from this part and the border of the field, and those at the border, were all in three different states, according to the degree of spreading of the infection. Those in the middle where the infection began, were utterly destroyed, their several coats all shrivelled up and withered, their inner part resembling only a dirty and rotten earth, and their superficies being covered with several brownish red glandulous bodies of the bigness of beans. Those of the middle distance were found in a condition nearly allied to these; their integuments were flaccid, but not wholly withered; and there were some remains of the fleshy bulb within; but this matter was a sort of pulp, looking as if it had been boiled. It was easy to see from this, that these roots were speedily approaching to the perfect state of decay of the others; they were covered in the same manner on their outsides with glandulous substances, like those of the middle roots, only that they seemed on these more plump, and well fed. At some distance from these he also observed a number of violet coloured threads, forming a sort of network in the ground.

The roots at the edges of the field were found in a yet much sounder state than any of the others; their bulbs seemed unhurt, and the membranes sound and fresh, but they were in many places covered with reticular violet coloured filaments, and from some parts of these there issued small glandules, which seemed ready to grow into the same shape and size with those on the decayed roots; though they, at this time, appeared only as so many purple spots lodged on the surface of the root or between its membranes. The earth all about these roots was also found to be full of these reticular violet coloured threads.

These violet threads and their glandules being always found in the places where the rot was among the *saffron* roots, and never in any other place, it became very natural to suppose they had some considerable share in the contagion; to examine, therefore, what they truly were, Mr. du Hamel picked several of them out of the earth, and having washed them clean, he found that they were very like the truffle in appearance; and in all their qualities they were seldom larger than a hazel nut, and were covered with a sort of soft down or velvety coat, and they had a mushroom like taste, but with an earthy flavour. There were found some of them adhering to the bulbs of the *saffron*, and others two or three inches distant from them; the violet threads are of the thickness of a coarse thread, and are covered with a velvety coat, in the same manner with the glandulous bodies; some of these extend themselves from one to another between these glandules, while others spread themselves over the surface of the bulb of the *saffron*, and pierced it in many directions quite to the center: they make numerous anastomoses and inosculations in the body of the root, and have fastened to them in several places little knots or ganglions, which seem only small tufts of the cottony or velvety matter which covers them.

From the whole it seems very clear, that this is a parasitical plant, which grows very quick in its glandules; and by means of these threads, or filaments, sucks its nutritious juices from the roots of the *saffron*, which it by that means destroys. It seems to grow in the same manner with the truffle, that is, it never appears above the surface of the earth, but is produced under ground, and there grows and propagates its species. It spreads very fast, and soon occupies a large compass of ground, continually furnishing new glandules at the end of the filamentous roots, in the manner of the potatoe and some other roots. Thus the disease of the *saffron*, wherever it begins, spreads itself every way in a circular direction; and there is nothing to be seen on the surface of the earth, which can give any opportunity of guessing at its cause.

It remained now to enquire whether this plant was peculiar to fields of *saffron*; and whether it was brought thither with the *saffron*, or was there before: and another material question was, whether it could draw its nourishment from any other plants, or must have it from *saffron* only. To try this, Mr. du Hamel put some of the bulbs of the new plant into a pot of fresh earth, where he also planted some roots of *saffron*, of narcissus, and of the common lilly. Six months afterwards, examining the whole, he found the glandules had greatly increased in number, and had fed upon the lilly roots as well as on the *saffron*; hence it appeared, that this was a real plant capable of increasing itself, and not destined singly to that food; after this digging up the earth in several places where *saffron* had never been planted, he found in some places the same parasitical plant, fastening itself to the roots of the anonis, and some other plants, and letting alone several others, such as the senecio, &c. The roots of muscari were also sometimes found affected by it; and a certain distemperature, which the florists complain of in their tulip roots, seems to be owing to the same cause.

This mischievous plant, however fatal it prove to the *saffron* fields; may, on the contrary, prove a real benefit in corn fields, by destroying many of the pernicious herbs which hurt the corn, as it preys only on those which send their roots deep into the earth, never hurting those which are superficially fixed, as corn, and the like are. The florist, however, is probably often as much injured by it, as the *saffron* cultivator; and doubtless, whole beds of plants are often destroyed without the proprietor's knowing what to attribute the mischief to. One misfortune attending this destroying plant, is, that the common culture of land which destroys other weeds, serves rather to promote its increase, since it delights in light dry earth, not in wet, or undug lands: it is possible, however, to stop its progress, by digging pretty deep between the sound and the infected roots; of the last, those which are eaten to the heart can never recover again, but of those which are only wounded superficially there is some hope; since it is common for them to be

be cured by taking them up, peeling off their outer husks, and drying them in the sun. This separates the worst part of the destructive plant, and the rest becomes soon dried and withered, and incapable of farther vegetation, while the root itself is uninjured, and when put into the ground will shoot again. Mem. Acad. Par. 1728.

The yellow tinge, which this medicine is able to give to the fluids, is carried so far, that no juice escapes it. Amatus Lusitanus gives an account of a fœtus in a mother's womb, tinged yellow, by her taking very frequently medicines with *saffron* in them. This had been disputed and disbelieved by many. But an experiment made at Leipsick on a bitch big with puppies, restored the credit of Amatus. For on giving this creature *saffron* frequently among her food, the puppies had their flesh and the whites of their eyes, when opened, dyed yellow with it; though the chyle, in the lacteals, was not yellow but whitish. However, it does not seem improper to verify the experiment farther.

Tree SAFFRON, in natural history, the name of an East-Indian shrub, which grows to about two feet high, having square branches, which are beset with leaves in pairs. The pedicles of the flowers come from the alæ of the leaves, and are branched, each pedicle supporting about five flowers; these are of the shape of the jasmine flowers, and are white above, and of the fine reddish yellow colour of *saffron* below. The flowers never open but in the night, and then do not perfectly expand themselves, but all the petals remain in such a position, that they can close instantaneously on occasion of the least heat; they are placed each in a green cup, to which they are so slightly fastened, that the least motion makes them fall. They seldom stand more than four days, often not so long; the flowers have no smell, but are of a cordial virtue, approaching to that of *saffron*. Mem. Acad. Paris, 1699.

Meadow SAFFRON, *colchicum*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the liliaceous kind, but consists only of one leaf which arises immediately from the root, in form of a fine slender tube, and by degrees expands and enlarges, and becomes divided into six segments. The pistil arises from the bottom of the flower, and terminates in several very slender filaments; this finally becomes a fruit of an oblong trigonal form, which is divided into three cells, and contains roundish seeds. To this it is to be added, that the root is doubly tuberose, one part being fleshy, and the other tuberose, and both are covered with a common membrane.

The species of *colchicum* enumerated by Mr. Tournefort are these. 1. The common *colchicum*. 2. The white *colchicum* with purple lines. 3. The common *colchicum* with a leaf veined with white. 4. The common *colchicum* with a leaf painted with yellow. 5. The common French *colchicum* with single blackish purple flowers. 6. The *colchicum* which flowers both in spring and autumn. 7. The English narrow leaved white flowered *colchicum*. 8. The *colchicum* with flowers mottled with white and red. 9. The many flowering *colchicum*. 10. The white *colchicum* with red streaks. 11. The many flowered variegated *colchicum*. 12. The broad leaved variegated *colchicum*. 13. The *colchicum* variegated with a deep purple and snow white. 14. The *colchicum* variegated with a paler purple and a greyish white. 15. The *colchicum* with flowers, tessclated like the fritillaries. 16. The Coan purple *colchicum*, with large, broad, and curled deep green leaves. 17. The double Portugal *colchicum* with flesh coloured and purple flowers. 18. The *colchicum* with narrow variegated segments of the flower. 19. The double flowered variegated *colchicum*. 20. The many flowered, broad leaved, variegated *colchicum*. 21. The white many flowered *colchicum*. 22. The broad leaved many flowered *colchicum* with white hellebore leaves. 23. The double autumnal many flowered *colchicum*. 24. The vernal many flowered *colchicum* with broad convoluted leaves. 25. The double flowered common *colchicum*. 26. The many flowered double white *colchicum*. 27. The double many flowered *colchicum* with tessclated flowers. 28. The vernal Spanish *colchicum*; and 29. The narrow leaved mountain *colchicum*. *Tourn.* Inst. p. 349.

Syrup of SAFFRON. This medicine is thus made: take fine *saffron* an ounce, cut it small, and put it to infuse in a pint of mountain wine; let it stand three days without heat, then strain off the wine; to which, after filtration, add twenty-five ounces of double refined sugar: melt the sugar over a gentle heat, and then set it by for use.

Tincture of SAFFRON, a preparation made as follows: take *saffron* an ounce, cut it small, and pour on it in a matrass a pint of proof spirit; let them stand together three days without heat, often shaking the vessel, then filter off the tincture for use. Its dose is from thirty drops to a drachm or more. It is good in all cases where the *saffron* in substance is.

If the same quantity of wine be used instead of spirit, it is called *vinum crocatum*, *saffron* wine.

SAGADENON, a name given by the antients to what they say was the very finest kind of opobalsamum, produced in Palestine and the country thereabout.

SAGDA, or PSAGDA, in natural history, the name of a stone described by Aldrovand, which he says is of a green colour, and has the property of attracting wood.

Pliny and the antients give this name to a gem of a greenish colour, very much esteemed at that time; and about the origin of which the antients had many fabulous reports. Solinus tells us, that it is produced at the bottom of the sea, and thence rises up of itself as ships pass over the place where it is, and fixes itself to their bottoms, and that it cannot be got off again without cutting away a part of the wood. This author has generally taken his accounts of things from Pliny; though he has been at the pains to disguise them, in such a manner, that they are often unintelligible. All that Pliny says on this occasion, is, that the *sagda* was of a green colour, and was found by the Chaldæans at the bottoms of their ships; even this, however, is not very intelligible, unless they meant that the ships which traded to the Red Sea, and lay long in the harbours, and were sometimes aground, picked up at their bottoms the stones which make up the shores, and some of these are of the jasper kind, and usually green; at this rate it could not be a stone of any great value, nor do we indeed find any where that it was, except in Solinus.

It is to be observed, that the antients called a certain ointment by the name *sagda* as well as this stone; this ointment was green, and probably the stone had its name from the resembling it in colour. This was a custom common among the writers of early times; and they have the names of *libanotis*, *myrrhites*, *stactachates*, and *aromatites*, from the resemblance which certain agates and jaspers had to the drugs, &c. in common use among them.

SAGE, *salvia*, in botany. See SALVIA.

The several sorts of *sage* propagated either for the kitchen, or for medicine in our gardens, are to be produced by cuttings planted in any of the summer months, watering and shading them till they have taken root, and after that they should be removed to a dry soil, where they may have the benefit of the sun. *Miller's* Gardners Dict.

Sage has always been esteemed a cephalic and sudorific. An infusion of it made in the manner of tea, has been long famous as the common drink of people in fevers. It is attenuant and diuretic, promotes the menses, and is good in vertigoes, tremors, palsies, and catarrhs. There used to be a syrup, conserve, and simple water of *sage* kept in the shops; which are all disused, and the dried herb only retained.

SAGE *apples*, a name given by naturalists to a sort of soft gall, or protuberance, found frequently on the leaves and stalks of *sage* in the eastern parts of the world, and much resembling the soft gall of the oak leaf, called the *oak apple*.

These are both owing to the same cause, the puncture of an insect of the fly kind, which deposits its eggs in the wound, and the worms or maggots hatched from those eggs feed on the inside of the gall, and occasion a preternatural derivation of juices to the part, whence it swells and assumes this form. The leaves of many other plants are also liable to the same accident, particularly those of ground-ivy, on which there grow eatable galls of this kind. The *sage apples* are so frequent in the east, that they are brought to market at Constantinople, and eaten as delicacies. See GALLS.

SAGENE, a Russian measure equivalent to seven English feet. Five hundred *sagenes* make a werst. Phil. Transf. N° 445. Sect. 7. See WERST.

SAGIMEN *vitri*, a name given by some of the chemists to any alkaline salt.

SAGINA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these. The cup is a four leaved perianthium remaining after the flower is fallen; the leaves being of an oval figure, hollow, and spread very open. The flower is composed of four oval obtuse petals, shorter than the leaves of the cup, and spread wide open. The stamina are four capillary filaments, the antheræ are roundish. The germen of the pistil is of a globose figure; the styles are four in number, tapering in shape, and bent back; these are downy, and the stigmata are simple. The fruit is a capsule, of an oval figure, containing four cells, with four valves. The seeds are numerous and very small, and are fixed to the receptacle. *Linnæi* Gen. Pl. p. 55.

SAGITTARIUM *alexipharmacum*, in the materia medica, the name of a root cultivated with great care in Jamaica, and supposed a remedy for the wounds of poisonous arrows. The plant of which it is the root is the *canna indica radice alba*. *Sloan's* Hist. 1. p. 253. but its virtues have not yet brought it into use on this side the water. *Dale*, Pharm. p. 250.

SAGITTATED *leaf*, among botanists. See LEAF.

SAGOCHLAMYS, among the Romans, a sort of garment that partly resembled the *sagum* and partly the *chlamys*. See SAGUM and CHLAMYS, *Cycl. Pitisc.* in voc.

SAGOUIN, in zoology, the name of a very beautiful small species of monkey, described by Clusius, and seeming the same with *cogui minor* of Marggrave. See COGUI.

Clusius says it is of the size of a squirrel, and has the look

of a lion about the head, and that it is a very tender and delicate little animal, and impatient of the flighteft injury. *Ray's* Syn. Quad. p. 154.

SAGULUM, among the Romans, a little, or fhort *fagum*. See the article SAGUM, *Cycl.*

SAHIRA, in the materia medica, a name given by Avifenna to the *mify* of Diofcorides and the Greeks. Avifenna has placed it among the zagi or atramenta, but defcribes it in the very phrafe of Diofcorides, faying that it is of a gold yellow colour, hard and fparkling when broken. The Greek chemical writers call this *chalcanthum chloron*, or yellowifh vitriol. There feems, however, fome reafon to fufpect that Avifenna has, in this place, confounded two fubftances, and given to the melanteria the name of *fchira*, and the defcription of mify; for the mify has nothing in it to entitle it to the name of atramentum or ink; but the melanteria of the Greeks very well deferves that name, as it immediately turns black on being wetted, though it be in itfelf naturally of a yellow colour refembling fulphur. The properties of thefe two fubftances are ftrangely confounded by Avifenna; his interpreters are generally cenfured, as being faulty; but the blame, in reality, lies upon the author himfelf, who did not clearly underftand the things he was to defcribe to others. See the articles MELANTERIA and MISY.

SAIC, one of the many names given by the antients to quickfilver. See MERCURY, *Cycl.* and *Suppl.*

SAIL (*Cycl.*)—*After*-SAILS, in a fhip, are thofe that belong to the main maft and miffen. They keep the fhip to windward. On which account fhips failing on a quarter wind require a *head-fail* and an *after-fail*; one to countermand the other.

Netting-SAIL, in a fhip, is only a *fail* laid over the *Nettings*.

SAINT CUTHBERT's BEADS, an Englifh name for the *trochitæ* and *entrochi*, found in great abundance in the clay of Yorkfhire and fome other counties with us. They are truly the remains of parts of the arms of the *ftella arborefcens*, or branching *ftar-fifh*; but have been fo far miftaken, by authors, as to be fuppofed a fort of rock plants, or the parts of fome unknown vegetable petrified.

Agricola judged very well of the nature of the matter they confift of, faying they were of the fame fubftance with the *lapis judaicus*, which is a fpar, as they are, but thefe are ufually of a dufkier colour, fometimes bluifh, fometimes whitifh or reddifh, though thefe latter colours are more rare. The fame author obferves alfo, that they make an effervefcence with vinegar, and fome of them move out of their places with it, becoming a fort of creeping ftones. This is no great mark of diftinction, however, for all fpars, or all foffils, which vinegar will corode, will be acted upon, in the fame manner by it, provided that they are broke into fmall pieces, and that the bottom of the veffel in which the vinegar is put, be not too rough or too flanting to a point. The fingle joints are ufually thin, and regularly round; they have always a hole through the middle; though it is fometimes filled up with earthy or ftony matter; this has given them the name of *beads*, as by means of this they may be eafily ftrung together. The hole is ufually fmall, and fometimes oval, though commonly round.

The outermoft round or circle is generally fmooth, but the flat fides are all thick drawn with rays or lines from the circumference to the central hole. Aldrovandus from thefe ftriæ refembling antimony, and the whole mafs in the compound pieces, or *entrochi*, refembling the trunks of fmall trees, with the hollow for the pith, and the feeming rudiments of branches growing from them, calls them *ftelechitæ ftibii facie*. Though in other parts of his book he difcourfes of them after Gefner and Agricola, under the names of *trochitæ* and *entrochi*. In the compofition of the compound ftones or *entrochi*, the fingle joints are applied clofely to one another fide by fide, and they are fitted fo nicely together by the rays of one meeting the cavities between the rays of another, that the whole mafs, when ftruck violently, will not feparate into them, but breaks tranfverfely in an oblique direction, as all the other fpars do; particularly the *lapides judaici* or fpines of *echini* petrified. Phil. Tranf. N° 100.

SAINT FOIN, *fanum*, or *fanctum fœnum*, the name given by the French, and continued by us to a fpecies of plant, frequently ufed for the food of cattle, either frefh or dried; it is called *holy hay* or *wholefome hay*, from its excellent nutritive quality. The ftalks of the plant are commonly about two feet long, but they grow fometimes to five or fix feet, and it has tufts of red flowers of three, four, or five inches in length.

This plant will make a forty times greater increafe in poor ground than the common turf; and this is owing to its having a long perpendicular root, of that kind, called tap roots, which finks to a great depth to attract its nourifhment. The length of this root is fcarce to be credited by any but thofe who have feen it; it is frequently drawn out of the ground to the length of twelve or fourteen feet, but it is faid to be often thirty feet or more in length.

The farmers have a general opinion, that this plant never fucceeds well in any land, where there is not an under ftratum of ftone, chalk, or fome other hard matter, to ftop its running; but that otherwife it fpends itfelf in root, and comes to nothing above ground. This is an error too grofs to need much refutation. It is certain, that the roots being to plants, what the ftomach and guts are to animals, the more and larger roots any plant has, the more nourifhment it receives, and the better it thrives.

Saint foin always fucceeds where its roots run deep, and the beft crops of all are produced upon lands where there is no hard under foil to obftruct their paffage. An under foil of clay may kill the plants, by retaining the water, and chilling and rotting their roots.

The long root of *faint foin* has, near the furface, many horizontal roots iffuing from it, which extend themfelves every way; there are of the fame kind all the way down, as the roots go, but they grow fhorter and fhorter all the way. Any dry land may be made to produce this valuable and ufeful plant, though it be ever fo poor; but the richeft and beft land will produce the fineft crops of it. The beft way of fowing it is by drilling, but the earth muft be very well prepared, and the feed well ordered, or elfe very little of it will grow. The heads of thefe feeds are fo large, and their necks fo weak, that if they be much more than half an inch deep, they are not able to rife through the incumbent mould; and if they are not covered they will be malted, as the farmers exprefs it; that is, it will fend out its root while it lies above ground, and be killed by the air; and whether the farmer plants bad feed that will not grow, or good feed that is buried or malted, the event will be the fame. The ground will be underftocked with plants. A bufhel of feed to an acre of land is full twenty feeds to each fquare foot of land; but as there is fome difference in the largenefs of the feeds, there is no abfolute certainty as to this calculation. The worft feafons for planting it are the beginning of winter, and the drought of fummer; the beft is the beginning of the fpring; and it is always ftrongeft when planted alone, and is not fown together with corn, as is the practice of fome farmers. If barley, oats, or any other corn, fown with the *faint foin*, happen to be lodged afterwards, it kills the young *faint foin*. If it be planted with any other corn, it is beft done by drilling in the horfehoing way; in this cafe it is not much liable to be killed by the lodging of the corn, as the drilled corn feldom falls at all, and when it does, never falls fo low as the fown corn.

The quantity of feed to be drilled upon an acre of land will depend wholly upon the goodnefs of it; for there is fome feed of which not one in ten will ftrike, whereas in good feed not one in twenty will fail. The method of knowing the goodnefs, is, by fowing a certain number of the feeds, and feeing how many plants are produced by them. The external figns of the feed being good, are, that the hufk is of a bright colour, and the kernel plump, of a light grey or blue colour, and fometimes of a fhining black. The feed may be good though the hufk be black, as that is fometimes owing to the letting it receive the wet in the field, not to its being half rotted in the heap.

If the kernel be cut acrofs, and appear greenifh and frefh, it is a certain fign that it is good. If it be of a yellowifh colour, and friable, and look thin and pitted, they are bad figns. The quantity of feeds allowed to the acre in the drill way, is much lefs than that by fowing, and is to be computed according to the number of plants that are to be allowed in that fpace, allowing for the common cafualties. It is not neceffary to be exact in this calculation, or to fay whether two, three, or four hundred plants are to be allowed to a fquare perch; neither is it poffible to know before-hand the precife number of plants that may live out of thofe that come up; for fometimes the grub takes them when they have only the two firft leaves, and the crop is greatly diminifhed by this means. Four gallons of good feed to an acre of land will cover the land with plants when judicioufly managed.

Single plants of *faint foin* make the greateft crops; but the farmers, in general, plant them fo clofe, that they ftarve one another. The fingle plants always run the deepeft, and thofe which do fo will always draw moft nourifhment. The plants which ftand crowded ftarve one another, and often die after a few years; but the fingle ones grow to a vaft bignefs, and are every year better and better.

The beft way to calculate how many plants are to be allowed to a perch, is to compute how much hay each fingle large plant will produce; for if kept fingle, and well cultivated, they will all be large ones. Without culture thefe plants never arrive at a fourth part of the fize that they do with it. The hay of a large fingle cultivated plant will weigh more than half a pound, and a hundred and twelve plants upon a fquare perch, weighing but a quarter of a pound a piece, one with another, amount to two tun to an acre. If *faint foin* be planted on fome forts of land early in the fpring and hoed, it will fometimes produce a crop the following fummer; in a garden the feeds fown in February will yield plants of two feet high that will flower in the month

month of June following; and though March be frosty the young plants seldom suffer by it. This shews, that this plant is naturally a quick grower; but the farmers usually plant it on poor or cold land, and give it too little culture, which makes it backward, and slow of growth with them. The poor land usually allotted to this plant also makes it generally yield but one crop a year, but on a rich land it will yield two very good crops annually, with a moderate share of culture and management.

The farmer who expects to make a profit of this plant must not expect a good crop the first year. Nothing is so injurious to *saint foin* as its standing too thick; if it be sown so thick as to cover the ground the first summer, the plants will starve one another for ever after; but if the owner will be content to place them so thinly as to have but a small crop the first year, they will increase prodigiously, and every succeeding crop will be better and better. When *saint foin* is well hoed, it will grow as much in a fortnight as it would otherwise do in six weeks; and this quick growing is of advantage to it every way, not only making the plants larger, but of better nourishment to the cattle, whether they are eaten green or made into hay.

The proper distance to drill this plant for the horsehoing husbandry is at double rows, with eight inch partitions between them, and thirty inch intervals between every two and two. These intervals need only be hoed alternately, leaving every other interval for making the hay on. This method of hoing is of vast advantage, and poor land by means of it will always produce two crops in a year. The land is always to be perfectly cleared of grass before the sowing the *saint foin*, and the lumps of earth carefully broken. But no harrowing is to be allowed after it is drilled, for that would bury it; and it is not proper to roll it at all, unless for the sake of barley, when they are sown together; and when that is done, it should be with a light roller and in dry weather. This should be done lengthwise of the rows, and as soon as it is drilled; if it be not done at this time, it is best to stay three weeks before it is done, that the necks of the young *saint foin* may not be broken.

No cattle are to be suffered to come in the first winter upon the *saint foin*, after the corn is cut, among which it was sown. Their feet would injure it by treading the ground hard, as much as their mouths, by cropping it, and it would never come to good. Sheep should not be suffered to come at it even the following summer and winter. One acre of drilled *saint foin*, considering the difference of the quantity and goodness of the crop, is worth two acres of sown *saint foin* on the same land, though the expence of drilling be twenty times less than that of sowing. The first winter is the time to lay on manure after the corn is reaped off. Pot-ashes, or the like, are very proper, and a small quantity of them will do, as there are at this time no other plants to partake of the benefit, but the young crop has it all; and the young plants being thus made strong at first, will continue so, and be long the better for it.

It is observed, however, that in the drilling and horsehoing way there is no necessity for any manure at all. Some farmers sow eight or ten bushels of the seed of *saint foin* to an acre along with their corn, with intent that it should kill all the other weeds; but the consequence is, that the plants stand close, and starve one another, and are no bigger than where the plant grows wild on the hills in Calabria, where it is so small and seemingly despicable a plant, that it seems a wonder that any body could be tempted to think of cultivating it: yet, when rightly managed, it seems capable of being as useful a plant as any in the world. Where these plants stand so thick they draw out all the nourishment from the ground, in a few first years, and soon die, though manured ever so carefully. Six or seven years seems their greatest duration; whereas, when the seed is drilled in, and the plants are horsehoed, they will be as strong and vigorous as ever, at thirty years standing.

Some people who have turned their thoughts to husbandry, have been of opinion, that the cytisus would succeed better with us than the *saint foin*; it is probable enough that it would grow well; but the labour of sheering it, would with us, where the pay of servants is so dear, run away with the greatest part of the profits of the crop.

Lucerne is another thing which many have thought of introducing among us in the place of *saint foin*, but it requires so much care to suit it with a proper soil, that whatever are the profits of it, it never can be so general as *saint foin*. *Tull's* Horsehoing Husbandry, p. 76. seq.

Saint foin succeeds best also in high grounds, which is a great advantage in the article of making it into hay, as it has greatly more advantage of the sun, and less to fear of mischief from wet than grass which grows in low grounds. On the high grounds the wind will dry more in an hour than it will in meadows that lie low in a whole day; and often the crops of *saint foin* make very good hay in the same seasons in which all the grass hay is utterly spoiled. The sun, on the high grounds, has also a more benign influence, and sends off the dew there two hours earlier in the morning, and holds it up as much longer in the evening; by these advantages the *saint foin* has more time to dry, and is made with half the expence of common hay.

All kinds of hay differ greatly in their goodness, according to the manner in which they are made, but the hay of *saint foin* differs more than all.

There are properly four kinds of the *saint foin* hay, differing according to the times of cutting them. These are first, the virgin hay; secondly, the blossomed hay; thirdly, the full grown hay; and fourthly, the thrashed hay. The first of these, or virgin hay of *saint foin*, is the best of all, and excepting lucerne has not its equal in the world. The *saint foin* for this hay must be cut before it begins to blossom; for when it stands till full blown, the most volatile spirituous and nutritive parts of its juices are spent on the generation; and this being done at once, the sap is greatly depauperated, and the plant can never afterwards recover the strength, vigour, and nutritive qualities it had at that time. The exact time of cutting this is, when a few of the blossoms, which are forwarder than the rest, are beginning to look red. *Saint foin* cut in this state, even though the weather prove bad, may be made up in small ricks, and a chaff basket drawn in the middle of each; this easy care will prevent it from firing; and though the colour be a little altered, it will be as good and nourishing, as if made at the most favourable season. Working stone-horses have been kept fat the whole winter on this hay alone without corn, and they are so fond of it that they will refuse beans and oats mixed with chaff in the common way for it.

Sheep will also be fatted in pens in winter with only this hay and water better than with pease, oats, and the like; and if the hay be weighed to them, and the whole expence and profit computed, the clear profit will be found to amount to four pounds a tun. These creatures make no waste in this way of feeding, but eat up every morsel of the stalks, though ever so thick, for they are always brittle, and are as well tasted as the rest.

The blossom hay is very beautiful to the eye, and of a very sweet smell, but it does not fatten the sheep as the virgin hay does, nor can working horses be kept fat upon this without an admixture of some corn.

The land ought to be well tilled for the virgin hay; for if it stand on a poor land, without much culture, it will not be above four or five inches long before it flowers, and will therefore yield but a poor quantity, and will spring up again, but very slowly, for another crop; but when on good land and well tilled, it will yield at this time two or three tun to an acre, and will spring up immediately very strong for a second crop.

This virgin hay is seldom sold, it being worth a much greater price than the common, and being usually kept by the farmer for his own use. Id. Ibid.

Beside the advantage the farmer makes of this plant, as well for hay as for the feeding his cattle, there is a considerable profit to be made by selling the seed of it when properly managed.

The owner of a land of *saint foin* has three chances for the making his hay; since this may be done either when it is in the leaf, or in the bloom, or when full grown. If the weather should prove unfavourable all this time, he may still reserve the crop for seed, and for thrashed hay, to his no small advantage. The ordinary crop of seed from one acre is sufficient to plant a hundred acres in the way of horsehoing husbandry; but as this is not yet universally practised, there is a sufficient demand for what seed a few who practise it can spare.

But beside the use of *saint foin* seed in sowing for new crops, it is also an excellent provender for horses; and those, in general, who have tried it, affirm, that one bushel of it will go as far as a bushel and a quarter of oats. When this seed is well cured, it is extremely sweet, and all sorts of cattle are fond of it: hogs will eat it and be fattened very well by it. But the goodness of the seed, and of the remaining hay, from out of which it is thrashed, depends very much upon the manner of the managing of them. When the thrashed hay has been kept dry, it is found to be better food for horses than common grass hay; and when cut small with an engine it is found as good as chaff for any cattle. It requires some skill to know the time at which the *saint foin* should be cut for seed. The seeds never ripen all at once. The flowers grow in spikes, and begin opening at the bottom, from thence gradually opening to the top. It is several days before the whole succession of flowers are blown, and the seed ripens in the same manner, so that the lower part of the ear has ripe seed many days before the top; and, in consequence, if the farmer stays till the top seeds are quite ripe, the lower ones will be all shed and lost.

The properest time to cut it is when the greatest part of the seed is ripe, the top part beginning to be full and the bottom full ripe. The kernel or seed is bluish, and the husk brownish when ripe. The seeds and husks are green for some time after the flowers are fallen, and it is better to cut the plant while it is thus, than to let it stand too long; for the

the seeds will ripen and become bluish after cutting, which will be much better than the letting them be lost by waiting till they ripen upon the stalks in bad weather.

The *saint foin* for seed must never be cut in the heat of the day, for then it will dry too fast as it falls, and much of the seed will be lost. It is best for the mowers to begin at day-break, and to leave off as soon as the sun has any power, going to work again in the cool of the evening. If the plant be dry at the time of cutting, it may be immediately made up into little cocks; but if not, it must be made hay of, only observing never to turn it while the sun is hot upon it: unless there happen rain it is scarce necessary to turn the swarths at all; and when this is done, it must be done very carefully, that the ears be not shaken.

There are two ways of thrashing this plant; the one on the field, the other in the barn. The first can only be done in very fine weather, and while the sun shines warmly upon the field. The middle of the day is the only time for this, and the method is to spread a large sheet, and peg it down at the corners, and in this thrash the plants from the cocks by small parcels at a time. The straw is to be separated from the seed, and made up into ricks; and this is good food for horses and other cattle, and the seed, *&c.* is to be collected, and afterwards winnowed, to separate the chaff.

If the seed have been wetted in the time of thrashing or lying in the ear, it may be put up immediately; but if it have been thrashed and winnowed dry, it will ferment and spoil if laid together too soon. The common way of managing it is by spreading it in a malt-house, or on a barn floor, but in spite of this it will often heat and spoil; the best way of all is to spread a layer of straw, and on this sprinkle a layer of the seeds, then cover these with another layer of straw, and this with more seeds, and so on, till the heap is raised six or seven feet high. The seed will thus be kept cool, and in spring it may be easily separated from the straw, and will be as fresh as if just thrashed; if this be sown, not one seed in twenty will fail of coming up. When the weather is not fine enough to give opportunity to the thrashing the *saint foin* in the field, it must be very carefully carried into the barn with sheets at the bottom of the carts, otherwise a great quantity of the seed will be lost in the way. *Tull*'s Husbandry, p. 90.

SAKER, in the manege, the same with *dock*. See DOCK.

SAL, *salt* (*Cycl.*)—See the article SALT.

SAL, in the history of the gems, a term used by Pliny and the antients, to signify a defect or flaw, which took off very much from the value of the gem. Martial having occasion to mention this sort of blemish, in crystal, calls it *nitrum* instead of *sal*. *Et turbata levi questus crystallina nitro.*

The critics have sometimes changed this word *nitro*, to *vitro*, and others have made the confusion yet greater, by supposing that the poet did not mean rock crystal but crystalline glass: but these are all errors. It is plain, by what Pliny and others have said on the same subject, that the author means here the same that others do by the word *sal*. This was a dusky and dusty foulness, seemingly composed of a quantity of saline particles, shooting into their forms within the body of the crystal. The gems in general were subject to this blemish; and we find, in particular, that the emerald was frequently debased by it.

It is found at this time, indeed, that crystal is much more subject to it than any of the gems; but, as the Romans called all the green crystals found in the copper mines of Cyprus by the name of emeralds, it is easy to conceive, that the emerald, as they understood the word, must be frequently subject to it. The poets using the word *nitrum* instead of *sal* is not wonderful, for the Greeks called common salt *halonitrum*, so that the words seem almost synonymous.

SAL *Ægypti*, in natural history, a name given by Hippocrates, and many other of the old writers, to the *natrum* of the antients, called also *nitrum* by some, though very different from our nitre. It had the name *natrum* from *natrium*, or *nitrium*, the name of a city of Ægypt; and therefore this, as well as the name used by Hippocrates, stood for Egyptian salt.

SAL *ammoniac*, or *armoniac*. See ARMONIAC, *Cycl.*

The substance known by the antients, under this denomination, was very different from the *salt* we now call by this name. It was indeed no other than a particular appearance of the *muria*, or common alimentary *salt*, in a striated form. We have common *salt* of this very form now in some parts of the world, but though with us it is scarce, with them it was very frequent, and was in common use, and esteemed the very best kind of *salt* for the use of the table. Dioscorides is extremely accurate and express in his account of it, and when he has reckoned up the various properties and uses of common *salt*, he describes the several sorts of it, and particularly this striated one among them, which, he says, was the very best of all the kinds; yet it seems owing to the description of this author, that the common errors about this *salt* have arisen; for he says that it was fossile, and composed of strait regular fibres. And after writers finding no *salt* of the common alimentary kind, answering to these characters, and perceiving that the compound mass, we call *sal armoniac*, was of this structure and appearance, made no hesitation to determine this to be the *salt* called *sal ammoniacum* by the antients, not considering the incongruity of the characters of that *salt* to their accounts, or the impossibility of its ever being used at table as common *salt*. *Hill*'s Hist. of Foss. p. 384.

The *sal ammoniac* of the moderns may be easily prepared in the following manner: take four ounces of common volatile *salt* of ox bone, saturate it with strong spirit of sea *salt*, and evaporate the superfluous moisture, upon which there will be found a cake of true *sal armoniac* left behind.

This is an experiment which regards both philosophical and technical chemistry, as it shews that odours may depend upon the mechanical structure and texture of bodies; and leads to a cheap way of making *sal armoniac* in other countries, as well as in the Levant. The volatile *salt* here employed has a very quick and pungent odour; so likewise, though in a less degree, has the spirit of *salt*; but these two, upon mixing, destroy each other's odour, so as to leave the cake of *sal armoniac* scentless; but if a little of this *sal armoniac* be rubbed in a mortar with salt of tartar, or any other fixed alkali, this lays hold of the acid of the sea *salt*, and leaves the volatile salt to strike the nose as pungently as before. *Shaw*'s Lectures, p. 422.

Our own volcanos, or subterraneous fires, which we have in the coal countries, afford us *sal ammoniac*. It is found sticking to the sides of the openings of these volcanos, in considerable thick crusts, under other crusts of sublimed sulphur. There is no fossile *salt* in these places, nor any thing else, that can form *sal armoniac* in the common way we suppose it to be found in; but it appears truly, that it proceeds only from the coal that feeds these fires. It is certain, that *sal armoniac* is sometimes found on brick kilns, where nothing but coals and common brick clay are burnt; and as no one would suspect it of being contained in the brick clay, there is here only the coal to afford it. The common coal slate of those counties also contains alum, sulphur, and *sal armoniac*; for alum may be drawn from it by the common operations; and when it is burnt, as it frequently is there for hardening the coal ways, both brimstone and *sal armoniac* are found in the heaps in several places.

The *sal armoniac* found in the openings of the burning mountains, particularly mount Ætna, is evidently the same in all respects with ours; and even this also may, for ought we know, be formed of coals, of which the inaccessible bowels of that mountain may contain great stores; though none have been found rising near enough to the surface to be dug for use. Other bitumens also may possibly afford this *salt* on burning as well as coal, and it is not to be doubted but many such are to be found in the earth thereabouts. The *salt* on the sides of the mouths of mount Ætna is found in large and thick cakes, and in dry weather may be collected in vast quantities, and possibly a great part of what the Venetians sell into other parts of Europe may be from these places. Either this *salt*, or that of our own volcanos, may be used in all the processes of chemistry, with the same success as other *sal armoniac*. It is of itself grey and coarse, but on mixing it with lime, and wetting them, a volatile spirit is raised; and on subliming a mixture of it with pot-ash, a dry and white volatile *salt* is obtained. If some spirit of wine be added to the mixture of *sal armoniac* and pot-ash, more of the volatile *salt* will be produced than any other way. Phil. Transf. Nº 130.

We are well assured that this *salt* is a concrete, the acid of which is that of sea *salt*, and its alkali, a volatile urinous one; both of which are found in dung burnt and raised into soot.

If there is occasion to separate the acid of sea *salt* from *sal ammoniac*, there need only be used the common vitriolic acid, which being well known to be stronger than that of sea *salt*, it divests that acid of its alkali by its superior power, and it becomes the basis of a new concrete *salt* with this acid, while the acid of sea *salt* now freed and separated may be drawn off pure by distillation.

If on the other hand it were required to draw from *sal ammoniac* its volatile alkali, the substances to be employed to this purpose are such alkalies as act upon the acid of the sea *salt*, absorbing and retaining it; the volatile alkali becomes freed, and rises with a very small heat. This alkali thus raised appears in two different forms, the one a liquid, which is called spirit of *sal ammoniac*, the other a dry one, which is called the sublimed *salt* of *sal ammoniac*; and though these are sometimes obtained separate, yet in some operations they are in part of the one and in part of the other kind. This is well explained by Mr. du Hamel in his course of experiments on this substance. Mem. Acad. Scien. Par. 1735.

As the adding an alkali is the way to separate this natural volatile alkali from *sal ammoniac*, the more powerful that added alkali is, the better may it be expected to perform its effect. Chalk, lime, *salt* of tartar, and pot-ashes, have all been in common use to this purpose, and all except the lime give the volatile alkali in a dry form, which is no wonder, since these are all naturally dry bodies before the operation; but there is one circumstance in these operations very worthy regard,

regard, which is, that the mixtures ſometimes afford more volatile alkali than the weight of the whole quantity of *ſal ammoniac* from which this volatile alkali is drawn; beſide that, there muſt be ſuppoſed to remain all the acid matter at the bottom of the veſſel; but the whole account of this muſt be, that this volatile urinous *ſalt* is ſo extremely powerful, that it raiſes and carries up with it a part of its other matter.

It remains, however, yet to enquire why lime alone being joined with *ſal ammoniac* in diſtillation, yields this volatile alkali in a liquid form, or in the ſtate of ſpirit of *ſal ammoniac*. There ſeldom riſes any thing in a dry form in this proceſs; when there does it is but very little; and when there ariſes no liquid, as is ſometimes the caſe, there ariſes often nothing at all; whereas, with the other alkalies, there ariſes, as has been ſeen, more than the weight of the whole quantity of *ſal ammoniac*. We very well know that this liquid ſubſtance, which we call ſpirit, is no other than the ſame volatile *ſalt* diſſolved in water, or in ſome other humidity, furniſhed by the matter, added to the ſalt in the diſtillation, and that this *ſalt* in riſing has brought up its diſſolvent with it. The lime, though deprived in a great degree of its humidity, by the operation which made it lime, yet retains enough for the purpoſe of melting the *ſalt* into what we call this ſpirit; and when the operation with lime does not ſucceed it is owing to this, that the calcination of the lime has been ſo perfect, as to deprive it of all its humidity; and the truth of this is evident, ſince the adding a little water will always enſure the riſing of a ſufficient quantity of ſpirit, and that with leſs fire than it can be obtained with when no water is added. We are yet at a loſs, however, to account for lime's acting differently from all the other additions to this *ſalt*, and making nothing ariſe in a dry form.

Mr. du Hamel obſerves, that by its formation, lime is diveſted of all acids, and of all humidity; but that by means of its fatty particles, whether they are from ſhells embodied in the ſtones from which it was made, or from the natural bitumen of ſtones, it is always endeavouring to recover what it has been diveſted of by fire; that it abounds with a vaſt number of fiery particles; and that by means of theſe, it is enabled to act upon the urinous, and therefore fatty matter of the *ſal ammoniac*; whether it be, that it unites itſelf intimately with it, ſo as never to be ſeparated from it, or whether it decompounds, and as it were burns it. And what confirms this conjecture, is, that Mr. du Hamel having diſtilled four drachms of ſpirit of *ſal ammoniac* with one drachm of freſh lime, he obtained a ſmall quantity of volatile *ſalt* in a dry form; the lime in ſo ſmall a proportion not being able to prevent the *ſalt* from this ſpirit from appearing in a dry form. And it is eaſy to conclude hence, that a volatile *ſalt* might be obtained from *ſal ammoniac* with lime, in a dry form, provided that the *ſal ammoniac* be mixed in an over proportion up to a certain quantity. Mem. Acad. Scien. Par. 1735.

The ſpirit and *ſalt* of *ſal ammoniac* being the ſame matter in a dry and a liquid form; it is evident, that the liquid muſt of the two be moſt ſtriking to the noſe, becauſe the particles of the *ſalt* are more eaſily diſunited from this latter union: and the *ſalt*, in a dry form, is ſo very volatile, that it entirely evaporates when laid on a hot iron, however fixed the matter may have been, which it originally carried up with it. It appears very plain from this, that the union between this volatile body and the particles of more fixed ones, which it carries up with it in ſublimation, and which are proper to give it the form of a dry concrete, is ſo intimate, that it will bear very ſevere trials and remain unaltered, and indeed, that it is ſcarce poſſible at all to decompoſe it.

It is no indifferent matter what the additions are with which *ſal ammoniac* is diſtilled; they muſt, by no means, be either ſuch as contain a nitrous, or a vitriolic acid; the former of theſe meeting with the fatty and ſulphurous part of the *ſal ammoniac*, may cauſe a detonation and burſt the veſſels; and the other, which is yet much more dangerous, might diſengage a portion of the ſea *ſalt*, which would again mix with the volatile part with which it has now no buſineſs to be allied, and with the fatty matter it might form a very diſagreeably ſcented ſulphur. Bole contains a vitriolic acid, and is therefore to be rejected. Gypſum mixed with it gives a ſmoaking liquor, whoſe odour is inſupportable, and chalk and common pot-aſhes are the beſt of all additions.

The firſt who gave *ſal ammoniac* internally was Platerus; but its uſe in fevers was not then known; he only uſing it in aſthmas. In ſucceeding times it became known as a febrifuge. It is frequently uſed in this intention, in Germany and Holland, and with great ſucceſs. The common doſe to a grown perſon is one drachm. The largeſt doſe, in caſes of the moſt robuſt conſtitutions, is two drachms. A perſon of eleven or twelve years old may take two ſcruples, and an infant of a year old may take fourteen grains. Its chief virtue is in intermittent fevers, in which it may be thus given. Let the doſe of *ſal ammoniac*, proportioned to the age and ſtrength of the patient, be diſſolved in an ounce of common water, or of any diſtilled water; and let the patient take it half an hour before the time that the fit is to come on. This is to be repeated in the ſame manner, before every fit, till the diſtemper is removed.

Though the great uſe of this medicine be in intermitting fevers; it is not, however, adapted only to thoſe, but may be of uſe in fevers of other kinds. The ſame doſe may be taken every five or ſix hours, drinking a baſon of ſage tea after it. It very frequently ſucceeds ſo well, that one doſe of it carries off the diſeaſe, ſo that it never returns again; but if the firſt doſe does not ſucceed in this manner a few others will. Two, three, or four doſes almoſt always prove ſufficient. This medicine has no viſible effect upon the body, more than the ſudden removal of the ſickneſs; for it neither operates by vomit, nor by ſtool, nor by ſweat: its effect ſeems to be owing to the correcting and altering of the matter of the diſeaſe, not the evacuating it out of the body.

The bark is ſuperior to this *ſalt* in the cures of quartan agues, and indeed in other caſes it is more certain in the ſtopping a ſecond fit; but there is another advantage in this, which the bark greatly wants, this is the preventing relapſes. Theſe are very frequent after cures in the common way, but are ſcarce ever found to follow in caſes when this *ſalt* has been uſed.

Another advantage of this medicine is the ſmall quantity of the doſe, and the few doſes that are neceſſary to be taken for a cure; whereas every one knows how many large doſes of the bark are neceſſary, and that often at ſuch ſmall diſtances of time, in caſes, that it is often difficult to perſuade the patient to be cured at the expence of ſo nauſeous a load of medicines. Act. Erudit. 1717.

SAL *aquarum*, in natural hiſtory, a name given by many of the antient writers to the nitre of the antients or *natrum*.

They had this *ſalt* principally from Ægypt, and called it in their works the produce of the evaporated waters of the Nile; for this reaſon Hippocrates ſometimes calls it *ſal ægypti*, and ſometimes *ſal in aquis creſcens*, a *ſalt* growing in the waters.

SAL *circulatum*, in chemiſtry, a term uſed by Paracelſus for a preparation of ſea *ſalt*, of which he diſtinguiſhes two kinds, under the name of the *circulatum minus* and *circulatum majus*. Theſe ſeem to have a great affinity with the famous alkaheſt or univerſal ſolvent, ſo much talked of in the works of this author, and his ſucceſſor Van Helmont.

The *circulatum minus* was a liquor procured by a tedious proceſs from ſea *ſalt*; this *ſalt*, he ſays, is that body in which nature has placed the greateſt perfection; and from this he, by incredible induſtry, procured a liquor which he calls a perpetual oil, and to which he alſo gives the name of the ens primum of *ſalts*. He calls it the higheſt and moſt ſucceſsful of all *ſalts*, and declares that all poiſons are ſubdued by it; and that being brought to the utmoſt degree of purity and ſubtilty, it pervades all bodies, and readily diſſolves them, itſelf remaining unaltered in the action. Theſe are all properties expreſsly attributed by Helmont to the famous alkaheſt. See ALKAHEST.

The *circulatum majus*, however, we are told, by the ſame author, was much more powerful and much more difficult to be obtained than the former. This he calls the matter of mercurial *ſalt*, and the living fire: he acknowledges that the higheſt fire and celeſtial life lie hid in common mercury, and ſays the quinteſſence of mercury is celeſtial fire: by this and a great many other enigmatic expreſſions in this writer, there is room to believe, that the alkaheſt, deſcribed by Helmont, is a preparation of mercury and ſea *ſalts*. *Boerh.* Chem. p. 573.

SAL *diureticus*, a form of medicine, of the nature of the *terra foliata tartari*, introduced into practice by the late college diſpenſatory. The method of preparing it is this: take of any alkaline fixed *ſalt* a pound, boil it in four or five pints of diſtilled vinegar in a gentle heat. When the fermentation is over, pour on more diſtilled vinegar; and when the fermentation ariſing from this addition is over, pour on ſtill more, and proceed thus till the moiſture being nearly all evaporated, freſh vinegar being added will excite no more fermentation: this generally happens when about ten quarts have been uſed; then evaporate to a dryneſs; the *ſalt* will be impure, and muſt be melted for a ſmall time, with a gentle heat, afterwards diſſolved in water, and filtered; if the melting has been rightly performed, the ſtrained liquor will be pellucid as water; then evaporate this in a gentle heat to a dryneſs, and you will have a very white *ſalt*, ſoluble either in water or ſpirit of wine. *Pemberton*'s Lond. Diſp. p. 187.

Jamblici SAL. See the article JAMBLICI *ſal*.

SAL *lucidum*, in natural hiſtory, a name given by ſome to nitre. Others uſe the phraſe to expreſs the nitre of the antients, that is the natrum.

SAL *marinus*, in ichthyography, the name of a truttaceous fiſh of the umbla kind, and very much approaching to that ſpecies called the *reutele*. See REUTELE. And by ſome ſuſpected not to be eſſentially different from that ſpecies. It is a very ſcarce fiſh, and is extremely valued for the table, but is never caught in any plenty, never keeping in ſhoals as many other fiſhes, but living ſingly. It loves clear ſtony rivers of a ſharp current, and feeds on ſmall fiſh. Its moſt frequent ſize is of about a pound weight, and it very rarely exceeds

exceeds twice that. Its tail and fins are very red; its fides and belly reddifh, and its back of a fort of orange colour or reddifh yellow, having fome yellow fpots. Its fcales are moderately large, and do not eafily fall off on rubbing.

The *fal marinus* is diftinguifhed by Artedi by the name of the forked tailed falmon, with a yellowifh back, and with yellow fpots. See SALMO.

SAL *marinum regeneratum*, in chemiftry, the name given to a fea *falt*, produced by adding an alkali to its acid fpirit of *falt* drawn by diftillation. The procefs is thus, dilute four ounces of oil of tartar, with three times its weight of fair water; put this mixture into a tall glafs body, and heat it, and drop into it any of the kinds of fpirit of fea *falt*, whether Glauber's, or that prepared with bole; fhake the veffel now and then, and continue to drop in the acid till the alkaline liquor is fated, and there rifes no more effervefcence; filter the liquor, and evaporate to a pellicle, and fet it by to cryftallize, and there will be procured cryftals of perfect fea *falt*, in all things agreeing with common *falt*. *Boerh.* Chem. Part II. p. 253.

SAL *martis*, *falt of iron*, a chemical preparation, which is made as follows: mix together a quart of water and eight ounces of oil of vitriol; pour the oil of vitriol in by a little at a time; and having put this mixture into a glafs veffel, add to it filings of iron, four ounces. When the ebullition is over, evaporate the liquor to a pellicle, and fet it to fhoot; there will be found a green vitriol or *falt* in fair cryftals, which dry for ufe.

This *falt* is one of the moft powerful preparations of iron; it opens obftructions of all kinds, and ftrengthens the vifcera; it is an excellent medicine in cachexies, obftructions of the fpleen and liver, and in fuppreffions of the menfes; it is alfo found good againft worms.

The beft manner of giving it is in folution, half an ounce in a quart of water, four ounces of which is a dofe; and if drank in the manner of the natural chalybeate waters, it will be found to exceed moft of them in its good effects.

SAL *mirabile*. *Glauber's falts*. Though this be a well known preparation, and the refult of a mixture of a vitriolic acid with marine *falt*, and the world has fuppofed it could be no other way found than by fuch an union made by art; yet Mr. Heliot has communicated to the academy of fciences of Paris, an account of its being found in vitriol alone, without the addition of any foreign matter.

The common green vitriol or copperas is well known to be made in England, by an union of the fulphureous acid of the common pyrites, and iron. Old iron is thrown into large quantities of a folution of the pyrites, that it may be diffolved, and the union produces a concrete in the form of a regular *falt*. This *falt* we well know contains a fulphureous matter; whether that be obtained from the pyrites, or from the iron that enters its compofition; fince, in the diftillation of its oil, there ever efcapes a very ftrong and penetrating fcent of fulphur through the junctures of the veffels.

There are alfo fome vitriols, particularly the common Swedifh kind, which may very probably be aluminous; fince the yellow fhining gold like marcafite from which it is made, yields in its native ftate true fulphur in diftillation, and afterwards affords vitriol in the lixivium, after the remainder has been long expofed to the air, and finally it yields alfo alum by the addition of urine and pot-afhes, to what they call the mother water of vitriol.

Mr. Lemery has fhewn, that after a moderate diftillation of green vitriol, a *falt* of the nature of alum may be drawn by a lixivium from the colcothar; and befide this, Mr. Heliot has found in that colcothar a vitrifiable earth, and a genuine *Glauber's falt*. Thofe who are at all acquainted with chemiftry, know that *Glauber's falt* is a concrete compofed of the vitriolic acid and fea *falt*, and it is generally received as a certainty that any other acid joined to fea *falt* cannot afford this concrete; therefore if *Glauber's falt* is to be produced from fea falt alone, and yet is proved to be found in pure vitriol; it muft follow, that pure vitriol does contain fea falt, or at leaft that fubftance which is the bafis of fea falt: and this will prove a lefs fingular obfervation, if it can be evinced, according to Becher, that all the known *falts* owe their origin to marine *falt*.

Mr. Lemery, in order to procure his aluminous *falt* from vitriol, does not pufh his diftillation too far, that the acid may remain engaged and entangled in that earth, by the union with which it is to form this *falt*, which is afterwards to be feparated by lixiviation; but Mr. Heliot pufhes the diftillation to the utmoft degree with a violent fire of three or four days and nights, fuch as Kunkel prefcribes, for the diverting vitriol of all its acid, that the remainder in the retort may contain little or no *falt* at all. He took eighteen pounds of Englifh vitriol, which he calcined to a rednefs, and by that means reduced it to fix pounds. This quantity, though put in a covered earthen veffel, acquired nine ounces in weight from the humidity of the air in two days; and in this ftate it was put into a german retort, and urged to that degree by the violence of fire, for fo long a continuance, that the remaining black mafs, though treated with all the care imaginable, and wafhed by repeated lixiviation, yielded only two ounces and a half of *falt*, and that of a very earthy kind. About nine ounces of phlegm had been feparated at the beginning of the diftillation, but when the white vapours began to appear, the veffels were all clofed, and fo kept to the end of the operation; the produce of which was an icy oil of vitriol, which was found in a black cryftalline form.

The fuccefs of the operation, as to the procuring this icy oil of vitriol, depends on the nice luting the junctures of the veffels, fo as to prevent all communication with the external air; for otherwife the vapours attract a moifture from the air, which renders them fluid in the receiver. The receiver muft alfo be placed at a confiderable diftance from the retort, that it may be cool enough to condenfe the vapours, and large enough to prevent their exploding, for want of room; for though the preceding calcination has carried off the more volatile parts, yet there remains matter enough for great explofion, and for the formation of a fubftance not lefs inflammable, than crude fulphur, were the acid in a lefs proportion.

The beft method is to fit to the neck of the retort a receiver with two necks; the one of which receives that of the retort, and the other is received into a capacious fingle receiver of the common kind.

The icy oil is not eafily got out of the receiver, for it exhales fo ftrong a fulphureous vapour, that if it be placed lower than the operator's head, it would fuffocate him in a moment.

This icy oil is black, becaufe it carries over with it a quantity of that oily matter, which no vitriol is ever entirely free from, and which is always found in the mother water, as it is called, of vitriol, after the repeated cryftallifations of the *falt* from it; and it is well known, that any inflammable fubftance, in ever fo fmall a quantity, will turn the pureft oil of vitriol black; nor is this all, for the acid fpirits alfo, when urged by a violent fire, carry over with them iron, or at leaft fuch particles, as are capable of becoming iron. This is eafily demonftrated in either the common or the blackifh cryftals of the icy oil of vitriol; for if thefe be diffolved in a large quantity of pure diftilled water, and allowed to ftand feven or eight days, there always precipitates to the bottom of the veffel a fediment, which, after it has been calcined, has many particles, which readily anfwer to the magnet.

Befides this oily matter, and thefe particles of iron, the oil of vitriol carries with it alfo a white, heavy, and cryftalline fubftance, of the nature of earth, which may be feparated, by means of fpirit of wine, from oil of vitriol, ever fo well rectified. The fame fort of earth is alfo found in the *falt*, which is extracted from the *caput mortuum*, left after the diftillation of the icy oil. The lixivium made by this author from the remaining mafs, left after the diftillation of the icy oil of vitriol, was expofed to the air, in a glafs cucurbit, for the fpace of fix months; and the faline liquor, concentrated by evaporation in a fand-heat, became green, and would by no means cryftallize. The firft faline pellicles had a faline, but earthy tafte: thefe precipitated by degrees of themfelves, and were finally fucceeded by others, which tafted acid, but not greatly fo. This liquor being evaporated to a drynefs, an ounce of the remainder was put into a retort, and four ounces of oil of vitriol was put on it, with one ounce of water, to forward the diffolution; this was kept in digeftion twenty days, at the end of which time the liquor acquired a green colour, which fhewed that there were yet in the mafs metallic parts for it to diffolve: this was finally diftilled with a gentle heat, to feparate the phlegm, and afterwards the fire was encreafed, to drive over the acid; the oil of vitriol came over as ftrong, as it was when put on, but much more fulphureous. The diftilled oil being returned upon the *falt*, with the frefh addition of a fmall quantity of water, became fo hot, that the veffel could not be held in the hand; which had not been the cafe in the firft mixture, at leaft not in any fenfible degree. Several more cohobations made it yet more and more acid, and at length it became fo cauftic, as to leave an efcbar on being juft touched upon the tongue.

The green colour, which the acid firft received, became at length changed into a blue one, which gave fufpicion that there was copper, as well as iron in the vitriol. This might appear ftrange, as it was Englifh vitriol that was ufed; but Kunkel has proved by experiments, that there is fome copper in all vitriol, even in the Englifh; nay he advances, that in the vitriol of iron, made with oil of vitriol and filings of that metal, there may always be difcovered fome fmall portion of copper; and, in fine, that there is no iron but contains fome portion of copper, and no copper but contains fome portion of iron.

After the fixth cohobation of this blue liquor, there remained a granulated and filamentous faline fediment, on the furface of which there was a fmall quantity of a yellow fublimation, refembling flower of fulphur; warm water being poured upon this matter, became of a greenifh colour; and this being digefted in a fand-heat, became afterwards reddifh,

reddifh, and precipitated to the bottom a white and very heavy powder; which, on a feries of examinations, proved to be of the nature of that opake white ftone, ufually found among the ores of metals, and called by the Germans *quartz.* The faline liquor, from which this was feparated, became yet redder by long digeftion, but when cold, it turned to a fine green.

This liquor being concentrated, by evaporation, to the quantity of two or three ounces, was put into a glafs veffel, with its pellicle, which foon precipitated itfelf to the bottom, in form of a thin cruft, covering the furface of the glafs in the manner of a wet paper. In five or fix weeks time, there became formed in this veffel, both at the bottom and fides, a number of large cryftals, of a beautiful green colour, and as the liquor dried away, thefe mouldered into a brownifh red powder.

In fine, there appeared, in the remainder of this liquor, another fort of cryftals; thefe were white and tranfparent, and were formed in fquare columns, with their extremities cut in the manner of thofe of the pyramids of the columns of *Glauber's falt*; they had alfo a bitter tafte, and left a remarkable fenfe of coldnefs on the tongue. Thefe appeared indifputably, by thefe and all other trials, to be true *Glauber's falt*. Mem. de l'Acad. Scien. Par. 1738.

Glauber's *fal mirabile* was long thought to be the produce of art only; but of late years, a natural *falt*, perfectly fimilar to Glauber's, has been found in many places. We have a full account, by Mr. Boulduc, of a fubftance of this kind, which had been found near Grenoble in Dauphine. The fame gentleman alfo found a *fal mirabile* in the waters of Paffy. The true Epfom *falt*, defcribed by Dr. Grew in 1696, is alfo either the fame as Glauber's, or at leaft Glauber's is the principal part of it. Stahl afterwards found a true *Glauber's falt* in the acidulæ, or ferrugineous waters, and did not fcruple placing this among the natural mineral *falts*. Hoffman alfo found a fpring of very bitter and purgative mineral water, a pound of which contained two drachms of this *falt*. The cathartic *falt*, found near Madrid, is alfo of the fame nature. See Hift. de l'Acad. Par. 1727. p. 29, 30. and the Memoires of the fame year, p. 375, feq. 4to.

It is to be obferved, that though Glauber made his *falt* known about the middle of the preceding century, yet Kunckel, in his Laborat. Chymic. affures us, it was known in the electoral houfe of Saxony an hundred years before. However this be, we owe the knowledge of it to Glauber, who called it *admirable*; and it foon acquired, and has ever fince maintained, the reputation of an excellent internal medicine in many cafes.

Glauber's falt may be obtained from borax, by mixing oil of vitriol with it. Mix four ounces of borax with one ounce and one drachm of oil of vitriol; upon fublimation, this gives the *fal fedativum* of Homberg, and the refiduum, expofed to a ftrong fire, affords *Glauber's falt*. This operation may be fhortened very much, for inftead of fublimation, the *falt* may be obtained by cryftallization, in light foliated laminæ. This *falt*, whether prepared by fublimation, or by cryftallization, has the property of diffolving in fpirit of wine; and if this fpirit of wine be fet on fire, the flame is green. Spirit of wine has no effect on borax, and the oil of vitriol digefted with it, does not make its flame green. Therefore it is neceffary, in order to give this greennefs to the flame, that borax fhould be united to an acid. Philof. Tranf. N° 436. p. 39.

SAL *nitrium*. See NITRIUM *fal.*

SAL *polychreft of Seignette*, a foluble tartar made with *fal kali*, inftead of *falt* of tartar. Mr. Boulduc defcribes this *falt* in the Mem. Acad. Scienc. 1731. See POLYCHREST, *Cycl.*

SAL *fedativum of Homberg*, This ufed to be made by diffolving borax in water, into which oil of vitriol was poured, and then diftilling this mixture, quieting *falt* was obtained. Mr. Geoffroy has lately taught us an eafier way of preparing it: he evaporates the liquor to the proper confiftence, and then allows it to cryftallize. Mem. de l'Acad. Par. 1732. See SEDATIVUM *fal.*

SALACSAE, in natural hiftory, a name given by the inhabitants of the Philippine iflands to a kind of bird, by whofe flight they pretend to divine the event of things. All the account we have of the bird is, that it is of a fmall fize, and is varioufly coloured, and has a long and large beak.

SALAMANDRA, the *falamander*, in zoology, a name given by authors to feveral fpecies of the lizard kind, but the principal are two, the *falamandra aquatica*, and *falamandra terreftris*.

The *falamandra aquatica*, or water *falamander*, is our common water newt, or eft, which is very common in fifhponds, and other ftanding waters, and is diftinguifhed from the reft by the flatnefs of its tail.

The manner of propagation in thefe animals is very fingular, and ferves to illuftrate the analogy between animal and vegetable nature.

The *falamandra terreftris*, or land *falamander*, is a fpecies of lizard very like the green kind, except that its head, and its belly, are thicker. Its tail is fhort, and its colour a fine black, marked with red fpots, and of a bright, fhining, and gloffy appearance. It is very common in many mountainous places.

The difference between this and the water kind is not only in colour, but in the fhape alfo of the tail; which in this is round, not flat as in that; yet there are fome who affirm, there is no fpecific difference between the two, but that the water kind, when it deferts that element, and comes to live on fhoar, alters in colour, and becomes round at the tail.

The opinion of this creature's being able to remain unhurt in the fire for a long fpace of time, is wholly falfe and fabulous.

The *falamander* is evidently a viviparous animal, yet it is fuppofed that the young are hatched from perfect eggs, while in the body of the parent animal. *Ray's* Synop. Quad. p. 274.

SALAMANDRINO, in ichthyology, a name given by the Italians to that fpecies of falmon, which Salvian calls *falmarinus*. It is diftinguifhed from all the other fpecies of this fifh, by its having a yellowifh back, with yellow fpots, and a forked tail. The flefh of this fpecies is very delicate. It loves cold and clear rivers. *Willughby's* Hift. Pifc. p. 199.

SALAMGA, in natural hiftory, the name given by the people of the Philippine iflands to a fpecies of fea fwallow. This is the bird, whofe nefts are fo famous as an ingredient in foops.

SALANDRA. See the article CHELANDIUM.

SALANDRIA. See the article CHELANDIUM.

SALAR, in ichthyology, a name given by fome authors to the trout. See TRUTTA.

Others apply the name to a young falmon while very fmall. See SALMO.

SALAYASIR, in natural hiftory, the name by which the people of the Philippine iflands call that fmall fpecies of duck, which is fo common thereabouts. This is an inhabitant of their lakes and marfhes, and is a perfect duck, and very beautifully coloured, but does not exceed the bignefs of a man's fift.

SALEFUR, a name given by fome of the chemifts to garden faffron. See SAFFRON.

SALEP, in the materia medica, the root of a fpecies of *orchis*. See the article ORCHIS.

Salep fhould be chofen clean, firm, and hard; it is very little liable either to decay, or fophiftication.

The people of the Eaft are extremely fond of *falep*; they look upon it as one of the greateft reftoratives, and provocatives to venery in the whole vegetable world.

That *falep* is the root of an *orchis*, no way differing from our common *orchis's* in virtue, but owing its appearance to the manner of preparing it, and confequently, that *falep* may be prepared from the roots of *orchis* of our own growth, Mr. Geoffroy has proved in the following manner. He confidered, that the method of curing one root in the eaftern parts of the world was probably the fame with that ufed in all; and obferving that Kæmpfer had defcribed the manner in which the Chinefe prepare their ginfeng, to make it pellucid, which was by firft fteeping, or macerating it in water, and afterwards carefully drying it; he determined to attempt the curing the roots of the common *orchis*, in a method not unlike that ufed to the ginfeng, in order to make *falep* of it. The *falep*, which we receive from Turkey, is a root of a white or reddifh colour, according to its different age; and as we receive it, is always tranfparent. As to our own *orchis*, if we attempt to dry the roots in the common way, they never will appear at all like the *falep*, but will become fhrivelled up and brown, and will always retain, or be ready to imbibe from a humid air, a great quantity of moifture. To prepare thefe, in imitation of the *falep*, Mr. Geoffroy chofe the largeft, plumpeft, and faireft roots he could find; thefe he nicely fkinned, taking off the whole outer rind, then throwing them into cold water, he fuffered them to macerate there fome time; after this he lightly boiled them; and after this taking them out of the water, and draining them, he had them ftrung upon threads, to be dried in a warm and dry air. When the roots were thoroughly dried, they were very tranfparent, and refembled pieces of gum tragacanth, and continued dry and hard. The roots thus prepared, may be kept ever fo long in a dry place, and will never attract humidity, or become mouldy and rotten; as they will always do in wet weather, if dried in the common way with their fkins on.

The *orchis* roots thus prepared may be reduced to powder, this powder will diffolve away in boiling water, and a fcruple of it will make a bafon full of jelly, in the manner of the Turkifh *falep*. This jelly is an admirable medicine in all the cafes, in which *falep* is prefcribed, and may be rendered agreeable by the addition of wine, fugar, fpice, &c. and the powder may be given with great fuccefs in affes milk, for difeafes of the breaft.

If the water, in which the roots have been boiled, be evaporated over a gentle fire in an earthen veffel, there will remain an extract of a vifcous texture, and a very agreeable fmell, refembling that of a meadow of flowers when the wind blows over it. Mem. de l'Acad. Scienc. Par. 1740.

SALIÆ, in antiquity, Roman virgins, dreſſed after the manner of the ſalii, who aſſiſted the pontif in ſacrificing. *Pitiſc.* in voc. See the article SALII, *Cycl.*

SALIAN *dance*, in antiquity. See DANCE and SALII, *Cycl.*

SALICARIA, *willow herb*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals, diſpoſed in a circular form, and growing out of the ſegments of a tubular cup; from the bottom of this cup there ariſes alſo a petal, which finally becomes an oval bicapſular fruit, containing a number of ſmall ſeeds, affixed to a placenta, and uſually ſurrounded and covered by the cup.

The ſpecies of *ſalicaria*, enumerated by Mr. Tournefort, are theſe. 1. The common long leaved *ſalicaria* with purple flowers. 2. The trifoliate purple flowered *ſalicaria* with hexangular ſtalks. 3. The roundiſh leaved purple flowered *ſalicaria*. 4. The narrow leaved Portugal *ſalicaria*. 5. The broad hyſſop leaved *ſalicaria*. 6. The narrower hyſſop leaved *ſalicaria*. 7. The white flowered hyſſop leaved *ſalicaria*. 8. The Spaniſh hyſſop leaved *ſalicaria* with long deep blue flowers. 9. The ſmalleſt narrow leaved *ſalicaria*. 10. The ſmalleſt Portugal *ſalicaria* with leaves like moneywort. *Tourn.* Inſt. p. 253.

SALICARIA, in zoology, a name by which Geſner, and ſome others, have called a ſmall bird, very much reſembling the muſcicapa, or fly-catcher, if not the ſame ſpecies.

It lives among the willows in wet places, and feeds on ſpiders, flies, and other inſects. *Geſner.* de Avib. See the article MUSCICAPA.

SALICASTRUM, a name by which Pliny, and ſome other botanical authors, have called the *ſolanum lignoſum*, the woody nightſhade, or bitter ſweet. *Ger.* Emac. Ind. 2.

SALICHA, in the materia medica, a name given by ſome of the old writers to cinnamon. Aviſenna and Serapion uſe it for the bark we call *caſſia lignea*, and the Greeks *hylocaſia*, when ſtripped clean from the wood.

The antients had two ways of collecting the barks of trees and plants for medicinal uſes; the one was the ſtripping them from the branches of trees, as we do at this time; the other was the cutting off the branches, bark and all, and drying them together. The *ſalicha* ſignifies, however, the *caſſia*, or cinnamon, thus ſtripped from the wood, not cut with it. The word *ſelach*, in the Arabic, from which it is derived, ſignifying *exuviæ*, or the caſting off the outer part of any thing. The *ſelach alhaie* is the *exuviæ ſerpentis*, or caſt ſkin of a ſerpent, and ſo of the reſt. The determinate ſenſe of the word *ſalicha* is, therefore, the bark of *caſſia* ſtripped from its wood, and is what the antients called *caſſia fiſtula*, from its being rolled up in the form of a pipe. But we have perverted their meaning in this term, and applied it to the fruit of the pudding pipe tree, that being our *caſſia fiſtula*. Damocrates, in his iambics, and alſo in his antidote, mentions this bark under the name of *caſſia fiſtula*; and Scribonius Largus, among the reſt, expreſsly informs us, that it was the bark, not the fruit of a tree, that was at his time known by this name. Aviſenna, and the more correct writers, keep this word for the name of *caſſia*, never expreſſing cinnamon by it, though others do. They call cinnamon *darſini*.

SALICINEA, in the materia medica, a name uſed by Geſner, and ſome other authors, for the *nardus Celtica*, or Celtic ſpikenard. *Ger.* Emac. Ind. 2.

SALINE, a name given to a preparation of ſea *ſalt*, procured from the froth of the ſea, hardened by the ſun in hot countries. It is called by ſome authors *pilatro de Levante*, and is uſed in glaſs-making; and in the making the fine purple colour from cochineal, by boiling it in a ſmall quantity, with the bran and fœnugreek, of which the magiſtery is made for that purpoſe. *Neri*'s Art of Glaſs, p. 173.

SALINE is alſo the name given by authors to ſprings of *ſalt* water, called by us *ſalt wells*, *ſalt ſprings*, and *brine pits*. Moſt parts of the world are found to have theſe, but thoſe of Franche Compté, in France, ſeem to be the moſt remarkable. The ſprings are ſituated in deep caves, and theſe in the greater work are about four hundred feet in length, and fifty feet in breadth: into this work they deſcend by a ſtone ſtaircaſe of forty ſteps, and thence by a wooden one of twenty; at the bottom of theſe ſtairs is a cave with an arched roof. This firſt cave, or vault, is forty feet long, and thirty two feet and a half broad, and in it are ſix ſprings of *ſalt* water, and two ſprings of freſh water; all which iſſue out of the ſame rock, in the ſpace of fourteen feet in length. From this cave they go into others, which are ſupported in the middle, each by a row of thick pillars, from which are carried double rows of arches. They then paſs through two gates into a ſpacious vault, thirty five feet high, and ſupported, nigh the entrance, by four ſtrong pillars, placed in form of a ſquare. In the middle ſpace, between theſe pillars, is a baſon of a very conſiderable ſize, into which the *ſalt* water from ſeveral ſprings is collected: and in the ſame vault, beyond theſe pillars, are four others placed in a row, ſupporting different arches, of ſixty feet in length, and forty eight feet in breadth; beyond which there is an irregular ſpace, ſixty three feet long, in which are ſix or ſeven ſprings of *ſalt* water, and ten or twelve of freſh. The *ſalt* waters of theſe ſprings, and of the ſix ſprings before-mentioned, are kept ſeparate from the freſh water, and are all conveyed through gutters to the baſon before-mentioned. From this baſon, they are drawn out by a wheel and buckets into four large ſtone baſons or reſervoirs, one of which holds fifteen thouſand hogſheads, and the other three together twenty-five thouſand hogſheads. From theſe reſervoirs they are to be drawn off, as occaſion requires, into ſmall ciſterns placed near the boiling houſes; and the waters contained in the ſeveral baſons, as they are drawn from the ſprings, at different times, and are of different ſtrength, are mixed together before the boiling, in ſuch proportion, that each pound of the water yields about three ounces of *ſalt*.

The water of the freſh ſprings is alſo collected in the caves into a freſh water baſon prepared to receive it, and is raiſed by means of a crane to the level of a little brook, through which it runs away by a ſubterranean conduit. *Brownrig* of Salt, p. 94.

SALINE *principle*, a term uſed by the chemical writers, to expreſs a conſtituent part of ſeveral mixt bodies, on which their exiſtence in that form depends; and which, though always exiſtent in them, and always ſeparable by art, is yet not perceivable in many of them in the complex.

The *ſaline principle* of vitriol is of the number of thoſe made by ſome a neceſſary principle of the exiſtence of that body, and by others ſuppoſed not to exiſt at all, otherwiſe than in the general form of that compound *ſalt*. But the exiſtence of it, in a ſeparate ſtate, is proved by this experiment: take four or five gallons of the ſtrong vitriolate water at the water works, as it runs from the beds of pyrites to the great ciſtern; this is to be choſen, becauſe having yet undergone no operation but that of the air and water, it muſt needs be in the moſt ſimple and natural ſtate; diſtil from this about two thirds of the inſipid water, let the glaſſes cool, and the water will then let fall a vitriol of a lovely pale green colour, together with a large quantity of ochre or yellow earth. Evaporate away a third part of the remaining liquor, and more vitriol ſtill will be produced of a paler colour than the former, and ſome yellow earth will alſo be thrown down, though leſs in quantity than before; after this has been repeated five times, inſtead of vitriol, a yellow *ſalt* will be obtained; and after that, on more evaporations, a white *ſalt* will be every time obtained, which will be extremely different from vitriol both in colour and taſte, being fiery and pungent, and partaking ſcarce at all of that acrid and nauſeous aſtringent taſte, which is ſo peculiar to vitriol. It is unctuous like *ſalt* of tartar, and cleanſing like ſoap, rendering the hands waſhed with it ſoft and ſupple; whereas the common vitriol makes them very harſh and rough; finally, this laſt *ſalt* diſſolved in water appears fatty and mucilaginous.

From five pounds and a half of the laſt lixivium four pounds of this ſalt will be obtained, and half a pound of the liquamen will never congeal. It is remarkable, that this *ſaline* matter is the moſt ſoluble of all the ſorts, as the greateſt quantity of it may be kept fluid in the ſmalleſt quantity of water we know of in any experiment of this nature.

The liquamen remains thin, and is of an acrid and fiery taſte, ſcarce ſupportable on the tongue. See the article LIQUAMEN *pyriticum*.

The white ſalt, which is called the *ſaline principle* of vitriol, being put into a retort, and diſtilled in a ſand furnace; the far greater part of it comes over in form of a highly acid ſpirit, eſpecially that coming laſt in ſmall drops. This liquor being rectified in a tall glaſs body, a volatile ſulphureous liquor ariſes immediately on the application of the heat. The ſmell of this is ſo ſubtile, and penetrating, that it is almoſt inſupportable, and yet it is clear as water and inſipid to the taſte. This may be preſerved in its full perfection many years, only by keeping it cloſe ſtopped, not letting fall any ſediment. The remaining liquor is the common acid liquor of vitriol, and by diſtillation may be ſeparated into ſpirit of vitriol, and that heavy and corroſive liquor, commonly called oil of vitriol.

In alum, vitriol, and mineral ſulphur, the *ſaline principle*, which in each of them is by far the chief part, both in quantity and energy, has much the ſame nature and properties. In the laſt indeed it is clogged with ſulphur; for the true nature of common ſulphur is, that it is a vitriolic ſalt, the very ſame with that of common vitriol; and the ſulphureous parts, which give it that form and exiſtence which we expreſs by the word ſulphur, are leſs copious than could be imagined, compared with the *ſaline*, which are genuine vitriol, differing in nothing from the common vitriol, but that it contains a ſmaller admixture of terreſtrial and metalline parts. Phil. Tranſ. N° 103.

SALINE *earths*. The chemiſts under this, as a general head, reckon all thoſe *ſaline* and *earthy* ſubſtances, which are calcined or burnt in the fire; as all the kinds of lime, potaſhes, ſoot, and the like; theſe being ſo many mixtures of ſalt and *earth*; and all ſalts appearing to them, indeed, on a rigorous examination, to be only *earths* of different natures, which when reduced to a certain degree of ſubtility or fineneſs of parts, ſo as permanently to diſſolve in water, are then emphatically denominated ſalts. *Shaw*'s Lectures, p. 67.

SALIVAL (*Cycl.*)—SALIVAL *ducts*. Dr. Trew endeavours to shew, that the vessels called *salival ducts*, by Coschwitzius, are not truly *salival ducts*, but veins. Phil. Transf. N° 457. Sect. 7. p. 441.

SALIVARIS, in botany, a name given by some authors to the pellitory of Spain, or pyrethrum of the shops, from its quality of draining a large quantity of the saliva into the mouth by its great heat and acrimony. *Ger.* Emac. Ind. 2.

SALIX, the *willow*, in botany, the name of a genus of trees, the characters of which are these. The flower is of the amentaceous kind, being composed of a great number of stamina arranged in form of a spike: These are the male flowers, and are barren; the embryo fruits appear on other trees of the same species, which produce no male flowers. These are disposed like the stamina into the form of a spike, and finally become conic capsules, which when ripe open into two parts, and discharge a seed winged with down.

The species of *willow* enumerated by Mr. Tournefort are these. 1. The common white tree *willow*. 2. The common black *willow* with leaves not serrated. 3. The common red *willow*. 4. The yellow *willow* with crenated leaves. 5. The almond *willow* with auriculated leaves, green on both sides. 6. The *willow* with almond like leaves auriculated on each side, which casts its bark. 7. The *willow* with long and very narrow leaves white on both sides. 8. The long narrow leaved *willow*. 9. The long hoary and pointed leaved *willow*. 10. The brittle or crack *willow*. 11. The dwarf *willow* with scaly heads. 12. The great bay leaved mountain *willow*. 13. The round silvery leaved *willow*. 14. The dwarf broad leaved erect *willow*. 15. The broad leaved creeping *willow*. 16. The round leaved creeping dwarf alpine *willow* with leaves greyish underneath. 17. The round leaved dwarf *willow*. 18. The creeping round or alder leaved alpine *willow*. 19. The mountain creeping *willow* with leaves woolly on each side. 20. The dwarf *willow* with leaves smooth on both sides. 21. The dwarf hoary flax leaved *willow*. 22. The dwarf *willow* with short narrow and woolly leaves. 23. The Pyrenean mountain *willow*. 24. The smooth narrow leaved creeping *willow*. 25. The Alpine *willow* with shining leaves like serpyllum. 26. The sallow or *willow* with broad roundish leaves. 27. The sallow with pointed roundish leaves. 28. The broad leaved white *willow*. 29. The Portugal *willow* with auriculated sage like leaves. *Tourn.* Inst. p. 591. See Tab. 1. of Botany, Class 19.

SALIX *amerina*, in botany, is used for *agnus castus*. *Lemeri* Tr. des drog. p. 18. See AGNUS *castus*.

SALLIUS *lapis*, a name by which Ludovicus Dulcis, and some other writers of his time, have miscalled the *lapis samius* of the antients. That author describes it as being heavy, white, and brittle, and gives it the same virtues with the *lapis samius* of Pliny.

SALLY (*Cycl.*)—SALLY-*port*, in a fire ship, is a great opening in her side, made on purpose for the men to escape by, when they have grappled an enemy, and fired their train.

SALMO, the *salmon*, a well known fish. It is distinguished from other fish of the truttaceous kind by these characters. It is of an oblong body covered with very small scales, a small head, a sharp nose, and a forked tail. Its back is bluish; the rest of its body whitish, or reddish, and usually spotted. Its under jaw is bent upwards, and that sometimes so much as to make itself a sinus in the upper, by constant motion, and sometimes to perforate it. The *salmon* is first produced from its parent's spawn in fresh rivers, thence it goes into the sea to acquire its growth and feed. And at the time of its full growth, and in the season for spawning it removes into the fresh waters again.

The *salmon* in the different stages of its life and growth has different names. The Latins called it when young *salar*, when of a middle growth *sario* or *fario*, and only when full grown *salmo*. In England the fishermen have names for it in every year of its growth. In the first it is called a *smelt*, in the second a *sprod*, in the third a *mort*, in the fourth a *fork-tail*, and in the fifth a *half fish*; finally, in the sixth it is called a *salmon*. This is the common agreement of our fishermen, though there are some who say the *salmon* comes much sooner to its full growth. *Willughby*'s Hist. Pisc. p. 139.

In the Artedian system of ichthyology, the characters of this genus of fishes are these: the branchiostege membrane on each side contains eleven, twelve, or nineteen bones. The body of the fish is generally variegated with spots. The back fins are placed nearer the head than those of the belly, and the teeth are large, and are placed in the jaws, and palate, and on the tongue.

The species of this genus enumerated by Artedi are these. 1. The *salmon* with the snout often reaching beyond the lower jaw. This is the common *salmon*. The spots are black, and the back convex, the belly flat and plain. 2. The *salmon* with grey spots, and with the end of the tail equal. This is that sort of *salmon* which we call the grey; its body is broader and thicker than the common *salmon* in proportion to its length. 3. The broad *salmon* with black and red spots, and with an even tail. This is the kind we call the *scurff*, or the *bull trout*. 4. The forked tailed *salmon* with only black spots, and with a longitudinal furrow on the belly. This is the *trutta lacustris* of authors. Its flesh is red. Its weight about twenty pound, when full grown; it will sometimes weigh much more. The upper jaw in the spawning time is crooked, the head and back are of a bluish green colour. 5. The *salmon* with the lower jaws somewhat longer than the upper, and with red spots. This is the common river trout. The tail of this fish is scarce at all divided; the pinna ani has ten rays; the spots below the lineæ laterales are red, those on the head and back are blackish. 6. The oblong *salmon* with two rows of teeth in the palate, and with only black spots. This is that sort of trout, called by the Germans *huch*; the sides and the fins are red, and the body is slenderer than in the common river trout. There are some spots on the lower jaw, but none on any other part of the head. 7. The twelve inch *salmon* with five rows of teeth in the palate. This is the fish called by authors the *carpio lacus benaci*, and by us the *gilt charre*. The body is much broader than that of the common trout. The flesh when boiled becomes red. It has eight spots on each side in the lower jaw, and black spots in the back. The sides and belly are silver coloured, and the snout is bluish. 8. The twelve inch *salmon* with red belly fins, and the lower jaw somewhat the longer. This is the *salmo lapponicus* of Linnæus. The *torgoch* of the Welch, and probably the *red charre* of some parts of England. The body is more slender than that of the river trout. The belly is generally reddish. The flesh of this species scarce becomes at all red in boiling; the spots are broad, but of a faint and obscure colour. 9. The forked tail *salmon* with the lineæ laterales turning upwards, this is the umbla of authors; it has three or four foramina under the eyes, and has no middle line of teeth in the palate. The belly and the sides below the lineæ laterales are yellow. The head is bluish, and there are some whitish spots above the lateral lines. 10. The twelve inch *salmon* with the upper jaw longer than the under. This is the fish called the *pavelin* by the Germans, and the *umbla altera* of authors: it has yellow spots on the sides, and the belly and its fins are also yellowish. The lateral line is strait. The middle row of teeth in the palate is scarce perceivable; but there is a double row of them in the upper jaw, with a skin resembling a lip between them. The flesh boils red. *Artedi*'s Gen. Pisc. p. 9.

The *salmon* is a very peculiar kind of fish. It is bred in rivers, but goes every year from thence into the sea; and at a certain season of the same year it always returns up into the fresh water again; and what is remarkable, is, that so far as observation has been able to trace them at any time, the same shoals of *salmon* always return into the same river out of which they swam, not into any other; so that the people who live on the *salmon* fishery are not afraid for their rivers being cleared, by all the fish in them going down into the sea, for they know that they will all return up to them again at a proper time. When the *salmon* has once entered a fresh river, he always swims up against the stream, and often will go an hundred leagues up a river in the large and long rivers; and the people at this vast distance from the mouth have the pleasure of taking a fish, that is properly in part of the sea kind. It is also remarkable, that the rivers which most abound with *salmon* do not make the seas about their mouths any more abound with them than others, particularly the harbour of Brest affords no *salmon*; though the river Chateaulin, which discharges itself into it, is the richest *salmon* river in France.

Another singularity, in regard to the *salmon*, is their swimming up the rivers together in such vast numbers. It is to be allowed, indeed, that herrings, mackrel, and many other fish, do in the same manner appear on the coasts at certain seasons in prodigious numbers; but the reasons for their coming together in these quantities, are much more easily explained than that of the *salmons* doing so. The herrings, when they come in such prodigious shoals to the coasts of Normandy, have been found to be allured thither in these numbers by a prodigious quantity of a particular sort of sea worms which are their favourite food, and which are found to cover the whole surface of the sea at that time. Rondeletius has described these insects under the names of sea caterpillars; they always appear in the months of June, July, and August, which are the herring seasons at that part of the world; and probably the same cause will be found to bring them to other places, if sufficiently enquired into, as these and some other fish come to certain places in shoals to get food. The *salmons* do it in order to propagate their species. The spawn of the *salmon* is never deposited but in rivers, and at the time that these fish are found up the rivers, it is only with this intent; the females go first, and the males follow as far as the others please to lead them, which is usually to some convenient place in shallow water, where the spawn when deposited is not buried under too great a quantity of water, but has the advantage of a continual warmth from the sun's heat.

Salmon do not equally frequent all rivers, though they may seem to us equally proper for their reception. There are

two rivers which open themselves into the harbour of Brest very near one another; the one of these is famous for the quantity of *salmon* in it, and the great advantage of the fishery, the other never has any of these fish in it. It most probably is owing to their finding plenty of food, and proper places for the depositing their spawn in the one of these rivers, and not in the other, that makes this regular choice. *Des Landes* Trait. Phys.

SALMON *pipe*, in our old writers, an engine to catch *salmon*, or such like fish. 25 H. 8. c. 7. *Blount*, *Cowel*.

SALMON *trout*, in zoology, the English name of the fish called *trutta lacustris*, by Gesner and other authors. It is caught in lakes, in mountainous countries, and grows to a very considerable size, sometimes to thirty, forty, or fifty pounds weight. It resembles the *trout* in figure, but its belly is very flat, and has, as it were, a long furrow or cavity running the length of the belly. Its back and head are of a very beautiful bluish green colour; and the whole fish, especially its back and the upper parts of its sides, are marked with numerous black spots. Its back fin is also spotted with black, and its scales are small and silver coloured. *Gesner* de Pisc. p. 1210.

SALMULUS, in zoology, the name of a small fish of the truttaceous kind, called in English a *samlet*.

It seldom grows to more than seven inches in length. It is very like the common trout, but differs in these particulars. 1. It is broader in proportion to its length. 2. It has fewer spots, and those of a deader colour. 3. It is white in its general colour. 4. The tail is more forked. 5. The lines on the sides are smaller and paler. 6. The sides under the lines are yellowish; and 7thly, It has several bluish streaks near the side lines. It is caught about Hereford, and in some other places. *Willughby*'s Hist. Pisc. p. 189.

SALPA, in zoology, the name of a fish caught in great plenty in the Mediterranean, and common in the markets of Italy and elsewhere. Its usual size is about a foot in length, and it has a somewhat flatted, yet considerably thick body, and a strait back. Its sides are variegated with a number of fine gold coloured lines running longitudinally; the intermediate spaces between these toward the back are of a bluish green, toward the belly they are white; there are usually eleven of these lines on each side. The mouth is extremely small, and each jaw has only one row of teeth, which are thick and broad below, and terminate in a double point. It has only one back fin, the anterior rays of which are prickly, the hinder ones soft. It generally keeps about the shores, and swims in large shoals. Though it be a very beautiful fish it is no very delicate tasted one, nor much regarded, the poorer sort of people usually buying it up. *Rondelet* de Pisc. l. 5. c. 23. p. 154. *Aldrovand* de Pisc. l. 2. c. 21. See Tab. of Fishes, N° 55.

SALPUGA, in natural history, a name given by some of the Latin writers to the *solipuga*, a small kind of spider, that buries itself in the sands in hot countries, and bites men who come in its way in a very venomous manner. It is common in Africa, and in some parts of Europe; Sardinia in particular, according to Solinus, abounds with it. See the article SOLIPUGA.

SALSIRORA, in botany, a name used by some authors for the *ros solis*, or sundew. *Ger.* Emac. Ind. 2.

SALT (*Cycl.*)—*Salts* are defined to be solid fossile bodies, friable, pellucid, not inflammable, but fusible by fire, and congealing again in the cold; soluble in water, so as to disappear in it, naturally concreting into regularly figured crystals, and impressing a sensation of acrimony on the tongue.

These are the characters and qualities common to all *salts*, and to no other bodies: and these they always manifest when pure and freed from heterogeneous substances; but in the state in which they are naturally found in the earth, though they have that in their taste alone which may sufficiently distinguish them, yet they do not exhibit all their genuine characters: some of them being found solid and pure, either within the earth or on its surface, but commonly without their proper form; others embodied in earths and stones, as the particles of metals in their ores; and others in a fluid state suspended in waters.

Of the fossils of this class, nature therefore affords us three distinct orders, and under those they are distinguishable into five genera. The *salts* of the first order are those found native and pure, either in the earth or without its surface, and exhibiting all other natural characters, though often without their proper form. Of the second, are those found not native, but in form of ores, never pure, but distinguishable by their taste, and immersed in and blended with the constituent matter of earths and stones in extremely small particles. And of the third are those naturally found suspended in waters, and in a fluid form, but ready to assume their proper figures on the evaporation of a part of that water.

Of the first of these orders are the common *alimentary salt* or *muria*, and the *natrum* or *nitre* of the antients. Of the second are *alum* and *nitrum*, and of the third are *borax*, and *halcryptium*, an alkaline *salt* hid in the chalybeate waters. *Hill*'s Hist. of Foss. p. 380. See the articles NATRUM, ALUM, NITRUM, BORAX, and HALCRYPTIUM.

The *muria* or *alimentary salt* is a body which appears to us under an almost infinite variety of forms, but is always immediately distinguished by applying it to the tongue, and always assumes the same figures after a regular crystallization. Sea water, and that of *salt* springs, sustain it in a liquid form; and beside this state, it is found in vast masses in the earth, either of a fine pellucid structure, called *sal gem*, or else variously debased and coloured, or in form of a striated body, resembling the fibrariæ, or fibrose talcs, as they are called. This is the true *sal ammoniac* of the antients. See SAL *ammoniac*. But in which ever of these forms this *salt* is found, it affords the same crystals on evaporation: these, according to the degree of heat used in the evaporation, are either pyramidal, cubic, or parallellopiped. All these *salts* are soluble in water, but they require different quantities of it to dissolve them, and this makes one of their criterions. This *salt* requires three times and one seventh its own quantity of water, to make a perfect solution. The sea water, in different parts of the world, is very differently sated with it, some parts containing twice as much as others. *Hill*'s Hist. of Foss. p. 380.

Alimentary salt, according to the various ways of preparing it, may be distinguished into several kinds. 1. *Bay salt*, prepared by evaporation by the heat of the sun. 2. *Marine salt* boiled, which is extracted from sea water by coction. 3. *Brine salt*, or fountain *salt*, prepared by boiling from natural brine, whether of ponds and fountains, or of lakes and rivers. 4. *White salt*, prepared from sea water, or any other kind of *salt* water, first heightened into a strong brine by the heat of the sun, and operation of the air. 5. *White salt*, prepared from a strong brine, or lixivium, drawn from earths, stones, or sands, strongly impregnated with common *salt*. 6. Refined *rock salt*, which is boiled from a solution of fossile *salt* in *salt* water, or in fresh. And 7. *Salt upon salt*, which is made from bay *salt* dissolved in sea water, or other water, and boiled to a white *salt*. *Brownrig*, on Salt, p. 50.

Bay SALT. This *salt* is of two kinds: the first drawn from sea water, as is practised in France, Spain, and Portugal, and many other hot countries; the other from the water of *salt* springs, or lakes, as in the Cape Verd islands, in the island of Tortuga, Turks island, and many other parts of America.

The first kind is, in times of peace, imported into Great-Britain in very large quantities, and our colonies and fisheries in America commonly supply themselves with the latter.

There are several methods practised, in the different parts of the world, of making this useful *salt*; of which some are more simple and easy, others more complex. It is sometimes prepared by a total exhalation of the water in which it was dissolved; but the most simple and easy method of making it, is, when the water of ponds and lakes, impregnated with *salt*, is totally exhaled by the force of the sun and air, and the *salt* is left concreted into a hard crust at the bottom of the lake. We have many instances of *salt* thus prepared, in the different parts of the world. In the Podolian deserts, near the Borysthenes, is a *salt* lake, whose water, by the heat of the sun, is exhaled, and all its *salt* left in form of ice, in so hard cakes, that it is to be cut away in large pieces with tools; and in Russia, on the borders of Crim Tartary, there are vast desert plains, which in summer produce neither tree nor plant, but are covered with *salt*. In the West-Indies we are told of a *salina* of this kind, called *garci mendoza*, forty leagues long, and sixteen broad. And in the kingdom of Algiers there are many *salines*, which in winter are so many *salt* water lakes, and dry plains in summer, covered with a crust of *salt*, which is dug out, and sold in very large quantities; and there are more of them in several parts of the world.

Large quantities of *salt* of this kind, however, are prepared by the art and labour of man. The English in the Cape Verd islands have long been used to prepare great quantities of it. The islands, which principally afford this *salt*, are chiefly Mayo, Bonavista, and Sall. The subjects of Great-Britain have long enjoyed a liberty of preparing *salt* in the two first of these, free of all taxes, except a late one imposed on the captains for every ass which they hire of the inhabitants, to carry the *salt* to their boats. *Brownrig* of Salt, p. 1 to 19.

The time of making this *salt* is in the dry season, which in those islands is usually from November to July: those ships, therefore, which are to load with *salt*, are to be there in the months of December or January. On the west side of Mayo, or May island, they find themselves, as soon as on shoar, upon a bank of dry loose sand, fifty or sixty yards broad; and when they have passed this, they enter upon the *salina*, or *salt* marsh. This is a plain of half a mile broad, and a mile long, the greater part of which is hollowed out into pits, which, at a proper season of the year, are filled to the depth of eight inches with strong brine, or pickle. See SALT-*marsh*, infra.

Some authors, who have given accounts of these works, say, that this brine is only sea water, let in through holes in the bank at spring tides. But this is an error, the brine of these pits being much more strongly impregnated with *salt*,

salt, than the sea water, and being the real produce of *salt* springs, with which the whole island abounds at a certain depth. In moderate seasons, the sailors find these pits ready filled with brines, but in times of great drought, they are obliged to dig little wells to come at the water, and with this they fill the pits to the proper depth. The bottom of these pits is a kind of close earth, which retains the water, and the sailors, who first arrive at the place, clean out as many of these as they have occasion for, and others, who follow them, do the like. After the pits are properly filled, the heat of the sun exhales the water very fresh, and leaves all the *salt*, which forming itself into crystals, sinks to the bottom from time to time. As this is done very quick in this season, they twice a week draw out all the *salt* that is ready formed with rakes, and lay it in little heaps to drain; after this they add it to their general cargo in one large heap, where it soon dries entirely, and becomes fit to be put on board their ships.

If the weather be favourable, a large ship may be, in this manner, loaded with *salt* in a fortnight, and it is often done much sooner, the sailors finding the pits, at their arrival, ready filled with concreted *salt*.

Though a ship be thus very easily loaded with *salt* in good seasons, yet bad weather, and delays upon the voyage, often are the occasion of ships returning without their loading; for the wet destroys all the *salt* they had prepared, and the tornados toss up the sand, and mix it with the *salt*, and at the same time make it impossible to load it. This trade might therefore be carried on with much greater advantage, if there was a British factory established at the place, whose business it should be to make *salt* in the dry season, and sell it afterwards to the sailors, and this might be done at a cheaper rate, than what the seamen can make it for, it usually standing them in about sixpence a bushel.

The *salt* is made at Bonavista in the same manner as in the island of May; but the brine is weaker, and the *salt* does not kern, as the sailors call it; that is, it does not granulate, or crystallize, so soon as in the other place; but the ships are often forced to be contented with this, when either the isle of May is too crouded, or when the rainy season sets in there, while they are at work; for though these islands are but eighteen leagues distant from one another, the rains are sometimes several weeks later in one than in the other. The weather is not excessively hot in either of these islands, the sailors finding it tempered continually by breezes from the sea. *Brownrig* of Salt, p. 26.

The British colonies in America have also, for near a century past, been used to supply themselves with *salt* of this kind from Tortuga, one of the Leeward islands, uninhabited, and situated near the coast of Caraccas, on the Spanish main, and the Turk's island, which lies not far from Hispaniola; and many vessels, freighted from North-America to Barbadoes, and others of the Caribbee islands, were accustomed to go from thence to these *salt* islands, and carry back a loading of *salt*, for which they always found a market in Newfoundland, New-England, and other places in North-America. The Spaniards, who had been used to suffer this without molestation, at length seized such ships as they found loaded with this *salt*, and the traders in this way were compelled to go in a sort of fleet from Barbadoes, and the neighbouring places, and they kept together till out of danger. The method of making the *bay salt* in these places, is much the same with that already described; only in the American isles they do not collect it out of small pits, but out of large ponds and lakes; and the sailors often find vast quantities of clean and good *salt* ready prepared, lying at the bottom of these lakes.

It has been reported, as a very extraordinary thing, that in these American islands the *salt* never kerns, or forms into grains, except during the hot season of the year; but this is a story much improved in the telling, and the whole truth seems to be this. During the constant rains, the ponds overflow, and great quantities of *salt* are washed away; and when these are over, the ponds and lakes remain full of a very weak brine, so that no *salt* can crystallize in them till most of the water is exhaled, and this does not happen, till toward the time of the rainy season's setting in again; but as this season begins only in showers once in two or three days, and those not great, the *salt* is easily prepared from the brine of the pits, which is then very rich, notwithstanding this slight interruption. These first showers of the rainy season are always a sort of tornados, and wash off a great quantity of *salt* from the surface of the earth into the ponds; and, in general, while they are so moderate, that there falls no more water in them, than is daily evaporated by the sun, they are an advantage in keeping the ponds supplied, which otherwise, after the continuance of heat that has been at that time, would be dry, and in no condition for working.

Bay salts, prepared in France and other parts of Europe, are of the same kind, in the general meaning of the processes, with those of the African and American islands. As the *salt* is there prepared from the water of *salt* springs, it is in Europe made from sea water. *Bay salt* is not extracted from sea water, in the colder parts of Europe, as on the coasts of Germany, Denmark, and Sweden, but in places situated in a more southern climate, as on the coasts of France, Spain, and Italy. Some marine *bay salt* has also, of late years, been made in England at Limington, and in some other parts of Hampshire, and in the Isle of Wight: but in these places it is only made in drier summers, and then rather by accident than design, it being collected from ponds, which were originally made for heightening of sea water, or reducing it into a strong brine by the heat of the sun, in order to lessen the expence of fuel, in boiling it into white *salts*. *Brownrig* of Salt, p. 35.

The ponds, in which this *salt* is made, nearly resemble a rude kind of *salt* marsh, described by Agricola, in which the sea water is received into a pool, and thence, by a trench, is conveyed into several pits dug in the earth; and when it has stood some time in these pits, it is suffered to run out into others, and so on, till the brine is strong enough to crystallize.

This is the case in our English *salt* works; but the French marshes, in which a vast quantity of *bay salt* is annually prepared, are made in a much more artful manner. A full account of which is given in the Philosophical Transactions, N° 51. See SALT-*marsh*, infra.

When rainy weather happens, in the time that the French are making this *salt*, they keep it out of the pits as much as possible; but unless it rain much, the damage is not very great, the heat of the sun sufficiently exhaling it. If it rain very violently for a whole day, all the care in the world cannot so well keep it out, as to render it practicable to make *salt* for the three or four next days. But when it has rained successively for five or six days, they are forced to empty all the water out of the beds, and take in fresh, before any *salt* can be made. This is an accident, however, that rarely happens to them. The hottest years always afford the most *salt*. In the very hot weather, there is *salt* made even in the night; and it is always observed, that there is more *salt* made in stormy weather than in calm. The west, and north-west winds, are always found to be most useful to the *salt* makers; and in good seasons, the French *salt* workers draw out the *salt* from their pits every other day, and draw more than an hundred weight from every pit. This they do with instruments that will retain the *salt*, and are pierced full of small holes, which let the water run off.

Those pits which are made in a reddish earth, are always found to make the *salt* more grey; and those in a bluish earth, more white; and it is always observed, that if more than the proper quantity of water be let in, the *salt* is the whiter, but there is the less of it in proportion. All the marshes should have a clayey viscid earth, neither spungy nor sandy. There is a great deal of caution to be used in drawing out the *salt*, that the earth, or other impurities of the pit, do not mix with it; for two workmen, who are differently skilled in their business, will procure from the same pit a very brown and foul, and a very clean and white *salt*; and they always separate a pure and white *salt*, which rises to the top of the water, before the other granulates, and falls to the bottom. This pure *salt* is not only of a better colour than the other, but is in smaller grains, and this is what the politer people use at their tables. These marshes are overflowed once a year, at the end of the season, about a foot high, and this preserves them from year to year. *Brownrig* of Salt, p. 44.

The French have so many works of this kind, that in favorable seasons as much *bay salt* is made in a fortnight, as serves for the whole year, not only for the home consumption, but for that of other nations, who purchase it of them, and who use much more of it than the French themselves. But, on the contrary, when a rainy season comes, there is often a scarcity for a whole year afterwards. It is wonderful, that though the method in which the French work has been long known among us, we have never attempted it ourselves, either here, or in our American colonies, which would seem a very easy matter, the principal care being in the first erecting the works, or *salt* marshes. See SALT *marsh*, infra.

The several kinds of *bay salt*, made in the different parts of the world, are found to differ greatly from one another in several particulars; as 1. in the size of the crystals, which is owing to the heat of the sun, and the time it lies in the pits. The French cream of *salt*, and the blown *salt* of the isle of May, are fine and small grained. The Portugal *salt* is larger grained than that of France; and that of Tortuga is larger than either. 2. In purity. As all *bay salt* has some mud, slime, or the like, in the making, and some kinds are mixed with the bittern *salt*, or what is called Epsom *salt*, they are all more white while dry, and more pellucid when moist, and they differ in colour, according to the earth which makes the bottoms of the pits. Thus some of the French *bay salt* is grey, some reddish, and some white, according as a blue clay has lined the pits, or a red, or white one. 4. Some kinds of *bay salt* are more apt to contract a moisture from the air than others: this is sometimes owing to

to the smallness of the grain, and sometimes to a mixture of a calcarious, or alkaline *salt* with it. And 5. some kinds have an agreeable smell in large heaps; such are the Portugal, and the Hampshire *bay salts*; and this seems owing to the sea water, they were made from, having a bituminous matter in it. 6. It differs greatly in taste, according to the various foreign mixtures it contains; and it will often alter in taste, and other qualities, by long keeping. Thus the *salt* of Peccais is so bitter, when new made, as not to be eatable, but after keeping a while, it becomes very pleasant. This is owing to its containing at first a large portion of the bittern *salt*, or Epsom *salt*, which liquifies in keeping, and running off in form of a fluid, leaves the rest of a good taste. In general, *bay salt* is much fitter for use, after it has been kept some time in a dry place, than when it is first made.

From the accounts already given of the *bay salt* of other countries, and the manner of preparing it, it seems evident, that our being obliged to purchase it of other nations is the effect of our want of application to the making it ourselves; since it is evident that it may be very well made, both in England, and in many of our American colonies. *Brownrig* of Salt, p. 202.

In England, a very advantageous sort of works might be set on foot in the following manner. A number of *salt* pits should be made in a row in the marsh, and their bottoms lined with plaister, or some strong cement that will not easily break up; and by this caution, the *salt* may be drawn white and pure like the Portugal kind, not grey like the French. Over each pit covers should be made of thin boards, or rather of canvas painted white, and stretched on frames of wood, and these should be fixed to strong posts, erected on the north side of the pits, and contrived to be easily drawn back to them, in the manner of draw-bridges. These covers, thus fixed, may be let down over the pits, in manner of a shed or penthouse, in rainy weather, to keep the brine from being diluted with fresh water; and in dry weather they may be raised almost to a perpendicular, but inclining a little toward the south, so as to form a wall with a south aspect; and thus they would serve for a double use, being a covering to the pits in rainy weather, and reflectors of the sun's heat in fair. The reflexion of so large a body of the sun's rays, in the course of a bright day, would greatly promote the evaporation of the brine; and the hinges, on which the reflectors turn, being placed at ten inches from the ground, when the reflectors stand upright, there will be a space under them, through which the air will continually flow in a brisk current, and this will greatly promote the evaporation of the water.

The passages of communication between the pits must be narrow and winding, and must be wholly stopped up in wet weather, that no fresh water run into the brine. This channel should be covered also with boards, and at the entrance of the pits there must not be a pond, as is the custom in France, but only a narrow covered trench, running parallel with the side of the pits which is opposite to the reflectors; and the pond, which forms the entrance of the pits in the French *salt* marshes, must in these be detached from them, and instead of it, there must be formed a fourth brine pond, communicating with the third by a long and narrow channel.

If these contrivances should be reduced to practice in England, the *salt* will probably crystallize much faster there than in the French marshes, and the brine may be kept as deep, and even deeper than in the French pits; and a shower of rain will only retard the work for the small time in which it is falling: whereas, in the French works, it throws them back three or four days, as no *salt* can be formed till all the water it brought be evaporated.

Four cisterns may be dug adjoining to the brine pits, to admit the brine in the *salt* ponds, when the weather is very rainy; and as to the *salt* water in the reservoir, if it should be found necessary to preserve it from rain in cisterns, when so much rain falls, as to make it fresher than sea water, it may be let out, and sea water admitted in its place. And in order to promote the evaporation, and to make the *salt* water in the reservoir fitter to supply the first brine pond with brine of a due strength, it may be proper, by means of a small fire engine, continually to force up the *salt* water in the reservoir, as often as occasion requires, and by means of a diverger, fitted to the engine, to make it descend again into the reservoir like a shower of rain; by which means, the evaporation of the watery vapours will be greatly promoted, after much the same manner as is practised at several of the *salt* works in Germany, where the brine is very weak. *Brownrig* of Salt, p. 209.

Thus by augmenting the force of the sun's heat, and of the air, by promoting the evaporation of the watery vapours, and preventing the brine from being diluted with rain, it is very probable that, during the summer season, double the quantity of *salt* might be prepared at an English work with these contrivances, that is now usually prepared at a French *salt* marsh of equal magnitude.

Beside these methods of managing sea water, it is certain that very large quantities of *bay salt* might be prepared in England with great ease, from the natural brine of *salt* springs, and from the common fossile, or rock *salt* of Cheshire, dissolved in weak brine, or in sea water. Upon the whole, *bay salt* might thus be made here at a moderate price, and in sufficient quantities to supply both the nation itself, and all our colonies.

Brine SALT, a name given to that sort of common *salt* which is not made from sea water, but from the water of *salt* wells and springs. Great quantities of this *salt* are made in most of the inland countries, as in Germany, Switzerland, Hungary, and in some parts of France and England.

In Somersetshire, Cumberland, Westmoreland, Durham, and Yorkshire, there are many *salt* springs, but they are either too weakly impregnated, or situated where fuel is scarce, and for those, and other reasons, are not worked; but in other parts of England there are many rich and valuable *salt* springs, which are worked to great advantage: of these some are situated in Staffordshire, a great many in Lancashire, but the chief are those at Droitwich in Worcestershire, and Nortwich in Cheshire; about which last place there are many rich mines of fossile *salt*, above and beneath the beds of which the *salt* springs are usually found. At Nantwich, in the last county, there are also some *salt* wells, which have been of very long standing, being supposed by many to have been worked in the time of the Romans. The *brine* of these springs is found to differ very greatly in its strength and qualities; some yielding greatly more *salt* than others, and the *salt* extracted from some of them being found improper for many uses, for which that of others serves very well.

The *brine* of Barton and Nortwich is almost fully saturated with *salt*, a pound of it yielding six ounces of *salt*; that of Droitwich, Upwich, and Middlewich, contains about one fourth *salt*; some of the springs at Nantwich yield a sixth part *salt*, and those of Weston, in Staffordshire, afford only one ninth part. In England, we seldom boil weaker brine than the last; but in Germany, and some other places, where *salt* is scarce, they work springs, whose water is not higher impregnated than the common sea water, containing about $\frac{1}{36}$ *salt*. *Brownrig* on Salt, p. 98.

Beside common *salt*, the brine of most springs is impregnated with several other ingredients, the nature and properties of which ought to be known to every person who works the springs, in order to his managing his affairs with judgement. The brine of almost all *salt* wells has somewhat of a sulphureous principle mixed in it, as may be observed from its fetid smell, but this soon goes off in the boiling. Dr. Lister observes, that the brine of the pits at Droitwich stinks like rotten eggs, and will make any thing stink in twelve hours that is *salted* with it, whether it be flesh of young, or of grown animals; and yet the *salt*, prepared from this brine, is accounted the best of any inland *salt* in England, and seems indeed as good as any in the world. Nay, this very brine, after it has been boiled a little and clarified, proves an excellent pickle for beef, or any other meat, and for other domestic uses. Philos. Trans. Abr. Vol. 2. p. 362.

In the *salt* mines at Bevieux, in the Pais de Vaux, there are always found large veins of virgin sulphur, and the people who dig in them are often killed with damps and explosions. *Scheuchzer* of the Salt Works at Bevieux.

The brine of many of the English springs turns black as ink on being mixed with galls, and has in it a ferrugineous ochre, which subsides from it when it is exposed to the air in an open vessel, and falls to the bottom of the *salt* pan, as soon as the liquor begins to boil.

Brine of our *salt* springs has also usually mixed with it a very large proportion of what is called *scratch*. This is a sparry substance, analogous to that which forms the crusts in our teakettles, and the incrustations of moss, &c. in our petrifying springs. The Droitwich brine is very free from this, but the other brines of England, as well as those of Germany, and other places, all abound with it. At the bottom of some of our *salt* wells there is also found a black mud, which, when stirred up, blackens and infects the whole spring, like ink; and beside these ingredients, the brine of most springs is impregnated with several other *salts*, as well as the marine one. In all the German *salt* springs the liquor leaves a bitter ponderous fluid, resembling our bittern, produced in the working of sea *salt*, but seeming to partake more of the muriatic, or calcarious *salt*, than the bitter purging one of sea water, as may be concluded from the numerous experiments made on it by Hoffman. This is also observed by Leigh, in his Natural History of Lancashire and Cheshire, who observes, that beside the marine *salt*, the waters of the *salt* wells in those counties always contain a quantity of a calcarious nitre; and both the observations of Hoffman on the German brine pits, and the experiments made on the waters of several of our own springs, seem to confirm, that the waters of this kind in general contain among them other *salts*, or mineral alkalies. *Hoffman*, Obs. Med. Chym. Lib. 2. Obs. 18. *Leigh's* Nat. Hist. Lancashire, p. 44.

The

The antient methods of boiling brine into *falt*, in Chefhire and Worcefterfhire, are accurately defcribed in the tranfactions of the Royal Society; and the method, formerly ufed in Staffordfhire, is delivered in Dr. Plot's hiftory of that county; but the method, now generally ufed in England, is this.

The brine being received from the well into a large ciftern, is thence received, as occafion requires, into the *falt* pan. Thefe pans are of the fame form with thofe ufed in the boiling of fea *falt*, and ufually hold about eight hundred gallons: in fome places thefe are made of iron, and in others of lead. When the brine is put into the pan, a little blood is mixed with it, in order to clarify it, and leaden pans are placed at the corners, to receive the fcratch, or calcarious earth, that feparates from them in the boiling. An ounce of blood is fufficient for eight hundred gallons of brine. As foon as it is boiled, it is carefully fkimmed, and afterwards it is fuffered to boil very brifkly for fome time, till the *falt* is granulated; after this the fcratch is feparated, and the fire flackened, till the whole *falt* is formed.

When they have feparated the fcratch, and the *falt* is ready to cryftallize, they put into the pan feveral forts of feafonings, as they call them, fuch as ale, butter, and the like, which they fuppofe correct the bad qualities of the brine, and make the *falt* of a fmaller grain. After this they boil it very gently, and when as much *falt* is formed, as will fill two or three of their wicker bafkets, they rake it up to the fides of the pan, and fill it into the bafkets, placing them over the leach trough, that the brine may drain into it from the *falt*. The *falt* taken out, they call a draught of *falt*, and the operation, a clearing of the pan. *Brownrig* of Salt, p. 104.

In this manner they draw the *falt*, and clear the pan five or fix times during each procefs, leaving at laft only a few quarts of brine at the bottom of the pan. The bafkets, into which they put the *falt* out of the pan, are called alfo *barrows*: they ufually contain about a bufhel of *falt*, and are of a conic figure, open at the bafe. The whole procefs of working a pan of brine ufually lafts about twenty four hours. After the *falt* has drained an hour or two in the bafkets, it is removed into the hot-houfe over the furnace, where it remains four or five hours to be thoroughly dried, and is then taken out of the bafkets, and laid up for fale.

In all the Englifh *falt* works, the leach brine, which is what remains in the pan after the *falt* is cryftallized, and what drains from the *falt* in the bafkets, is not thrown away, as it is in Germany, but is added to the pan next to be boiled. And befide the *falt* made in this manner, they have, at moft of the Englifh *falt* works, a different kind, which they call *fhivery falt*. See the article SHIVERY *falt*.

They have alfo another kind of *falt*, made up in form of fugar loaves in fmall wicker bafkets, which is thence called *loaf falt*, or *bafket falt*. This is the whiteft, drieft, and fineft grained of any *falt*, and is therefore greatly efteemed at table. In preparing this *falt* they ufe fome refin, and other additions, to break the grain, and render it very fmall; others alfo, to this purpofe, boil it the more brifkly, and ftir it brifkly all the while. But in Chefhire, where the beft bafket *falt* is made, they ufe no particular procefs about it, but only take the third draughts of every pan, which always are the pureft *falt*; and they do not fuffer thefe to lie fo long in the pan, as when they make *falt* of a larger grain, but take it out before it can form large cryftals: by this means they have it of a fine fmall grain, and they then prefs it hard down into the wicker bafkets, and when dried in the ftove, they let it remain in the bafkets for fale. *Brownrig* of Salt, p. 107.

Not long fince Mr. Lowndes publifhed a method of greatly improving the Englifh *brine falt*, fo as to make it at leaft equal to the French *bay falt*.

The method is this. Let a brine pan, containing about eight hundred gallons of liquor, be filled with brine to within an inch of the top; then make and light the fire, and when the brine is juft lukewarm, put in either an ounce of blood from the butchers, or the whites of two eggs. Let the pan boil with all poffible violence, and as the fcum rifes take it off. When the frefh, or watery part is pretty well decreafed, throw into the pan the third part of a pint of new ale, or the fame quantity of the grounds of any malt liquor. When the brine begins to grain, add to it the quantity of a fmall nut of frefh butter, and when the liquor has ftood half an hour longer, draw out the *falt*. By this time the fire will be greatly abated, and fo will the heat of the liquor; let no more fuel be thrown on the fire, but let the brine gently cool, till a perfon can juft bear to put his hand into it; keep it in that degree of heat as nearly as poffible, and when it has worked for fome time, and is beginning to grain, throw in the quantity of a fmall nutmeg of frefh butter, and about two minutes after that fcatter throughout the pan, as equal as may be, an ounce and three quarters of common alum, pulverifed very fine; then inftantly, with the common iron fcrape-pan, ftir the brine very brifkly in every part of the pan for about a minute; then let the pan fettle, and conftantly feed the fire, fo that the brine may never be quite fcalding hot, yet always a great deal more than lukewarm; let the pan ftand working thus for about three days and nights, and then draw it, or take out the *falt*. The brine remaining, will, by this time, be fo cold, that it will not work at all, therefore frefh coals muft be thrown upon the fire, and the brine muft boil for about half an hour, but not near fo violently as before the firft drawing; then with the ufual inftrument take out fuch *falt* as is beginning to fail, and put it apart; then let the pan fettle and cool. When the brine becomes no hotter than one can juft put one's hand into it proceed as before, and let the quantity of alum not exceed an ounce and a quarter, and about eight and forty hours after draw the pan, and take out all the *falt*. *Lowndes*'s Brine Salt improved.

This is Mr. Lowndes's procefs only; he afterwards directs cinders to be chiefly ufed in preparing the fires, the better to preferve an equal heat, and by that means alfo he propofes faving a confiderable expence, afferting, that at prefent cinders are fo little valued in Chefhire, as to be thrown out into the highways. Mr. Lowndes adds, that in a pan of the fize before-mentioned, there may be prepared, at each procefs, fixteen hundred pounds weight of *falt* from the beft brine in Chefhire, and one thoufand and fixty-fix pounds from the ordinary brine of that county. This, as the procefs continues five days, is a little more than five bufhels and a half of *falt* a day, from the beft brine, and a little more than four bufhels a day from the ordinary kind. *Brownrig* of Salt, p. 106.

Marine SALT, the name given by writers on this fubject, exprefsly to that kind of common, or white *falt*, which is boiled from fea water, without any previous preparation.

This *falt* is only made in counties where great quantity of fuel can be had at a very low price, or where the fun has not force enough; and is therefore made in few counties of England, except on thofe parts of the Britifh coaft which moft abound in pit-coal. This has thence got the name of *Newcaftle falt*, and is exported to Denmark and Norway, and fome other countries, as well as fent to London and other parts of England.

The moft convenient works for the making this *falt* are conftructed in the following manner. The faltern is erected at fome convenient place near the fhore; it is a long and low building, confifting of two parts, one called the fore-houfe, and the other the pan houfe or boiling-houfe. The fore-houfe ferves to receive the fuel, and cover the workmen; and in the boiling houfe are placed the furnace, and the pan in which the *falt* is made. And in fome places they have two pans, one at each end of the building, and the fuel and place for the workmen is in the middle. The furnace opens into the fore-houfe by two mouths, and from thefe is carried up a wall to prevent the afhes from flying to the *falt* pans, and in this is a door of communication between the two houfes. The body of the furnace confifts of two chambers, divided from one another by a brickwork called the mid feather, which from a broad bafe terminates in a high edge nigh the top of the furnace, and by means of fhort pillars of caft iron fixed upon it, fupports the *falt* pan. The pans are oblong and fhallow, the common meafure being fifteen feet in length, twelve feet in breadth, and fixteen inches in depth; they are commonly made of plates of iron joined together with nails, and the joints filled with a ftrong cement; and the bottom of the pan is prevented from bending down, or changing its figure, by hooks faftened to ftrong iron bars which are placed acrofs it.

Between the fides of the pan and the walls of the boiling-houfe there runs a walk five or fix feet broad, where the workmen ftand to draw out the *falt*. The roofs are wood, and are faftened with pegs of wood, nails mouldering away into ruft in a few months.

Not far diftant from the faltern on the fea fhore, between full fea and low water mark, they make a little pond in the rocks, or with ftones in the fand; this they call a *lump*, and from this pond they lay a pipe; through which, when the fea is in, the water runs into a well adjoining to the faltern, and by this well they pump it into troughs, by which it is conveyed into their fhip or ciftern, in which it is ftored up till they have occafion to ufe it.

The ciftern is built clofe to the faltern, and may be placed moft conveniently between the boiling-houfes on the backfide of the fore-houfe. It is made either of wood, brick, or clay, and fhould be covered with a fhed, that the *falt* water in it may not be weakened by rains, and fhould be placed fo high that the water may conveniently run out of it into the pans. When the fea water has ftood in the ciftern till the mud and fand are fettled from it, it is drawn off into the *falt* pan; and at the four corners of the *falt* pan, where it is fupported by the brick work, and confequently the flame does not touch its bottom, there are placed four fmaller leaden pans and fcratch pans, which for a *falt* pan of fifteen feet, are ufually about a foot and half long and a foot broad, and three inches deep. Thefe have a bow or circular handle of iron, by which they may be drawn out with a hook when the liquor in the pan is boiling.

The *falt* pan being filled with fea water, a ftrong fire of pit-

pit-coal is lighted in the furnace, and then, for a pan which contains about fourteen hundred gallons, the *ſalt* boiler takes the whites of three eggs, and incorporates them all with two or three gallons of ſea water, which he pours into the *ſalt* pan, while the water contained therein is only lukewarm, and mixes this with the reſt by ſtirring it about with a rake. In many places they uſe inſtead of eggs the blood of ſheep or oxen to clarify the ſea water; and in Scotland they do not give themſelves the trouble of clarifying it at all. As the water heats, there ariſes a black frothy ſcum upon it, which is to be taken off with wooden ſkimmers. After this the water appears perfectly clear, and by boiling it briſkly about four hours, a pan loaded in the common way, that is about fifteen inches deep, will begin to form cryſtals upon its ſurface. The pan is then filled up a ſecond time with freſh ſea water; and about the time when it is half filled, the ſcratch pans are taken out and emptied of a white powder, ſeeming a kind of calcarious earth, which ſeparates itſelf from the ſea water, during its boiling before the *ſalt* begins to ſhoot. When theſe have been emptied, they are again put into their places, where they are afterwards filled again. This powder being violently agitated by the boiling liquor, does not ſubſide till it comes to the corners of the pan where the motion of the maſs is ſmaller, and it there falls into theſe pans placed on purpoſe to receive it.

The ſecond filling of the pan is boiled down after clarifying in the ſame manner as the firſt, and ſo a third and a fourth; but in the evaporation of the fourth, when the cryſtals begin to form themſelves, they ſlacken the fire, and only keep the liquor ſimmering. In this heat they keep it all the while that the *ſalt* is granulating, which is nine or ten hours. The granules or cryſtals all fall to the bottom of the pan; and when the water is almoſt all evaporated, and the *ſalt* lies nearly dry at the bottom, they rake it all together into a long heap on one ſide of the pan, where it lies a while to drain from the brine, and then is put into barrows and carried to the ſtore-houſe, and delivered into the cuſtody of his majeſty's officers. In this manner the whole proceſs is uſually performed in twenty-four hours, the *ſalt* being commonly drawn out every morning. This is the method in moſt of our *ſalt* works, but in ſome they fill the pan ſeven times before they boil up the *ſalt*, and ſo take it out but once in two days, or five times in a fortnight. In the common way of four boilings, a pan of the uſual ſize, containing one thouſand three hundred gallons, they draw from fifteen to twenty buſhels of *ſalt* every day, each buſhel weighing fifty-ſix pounds.

When the *ſalt* is carried into the ſtore-houſe it is put into *drabs*, which are partitions, like ſtalls for horſes, lined at three ſides, and the bottom with boards, and having a ſliding board on the foreſide to draw up on occaſion. The bottoms are made ſhelving, being higheſt at the back, and gradually inclining forward; by this means the brine remaining among the *ſalt*, eaſily ſeparates and runs from it, and the *ſalt* in three or four days becomes ſufficiently dry; in ſome places they uſe cribs and barrows, which are long and conic wicker baſkets for this purpoſe, and in ſome places wooden troughs with holes in the bottom. The ſaline liquor which remains from the making of *ſalt* is what is called bittern. See the article Bittern.

The ſides of the pans in which the *ſalt* is made, are ſoon cruſted over with the ſame ſort of matter formed into cakes or cruſts, that falls in powder into the ſcratch pans; this the workmen call ſtone ſcratch; they are obliged to cleanſe the pans of it once in a week or ten days, otherwiſe they will be burnt: in England they do this with iron picks, but at Hall in Saxony they have a much better method; for they then take out the pans, and turning them bottom upwards, burn ſtraw under them, by which means the matter of the cruſt looſens itſelf, and after this it falls off on being ſtruck with a mallet or hammer. *Brownrig* of Salt, p. 62.

In Lancaſhire, and ſome other parts of England, ſea *ſalt* is made in this manner: they pare off, in dry weather, in ſummer, the ſurface of the flats, which are covered at full ſea, and bare when the tide is out. When they have procured heaps of this they put it into troughs, and pour freſh water on it; this waſhes off the *ſalt* that hung about the ſand, and is received ſo impregnated into veſſels ſet underneath the troughs. So long as this liquor is ſtrong enough to bear an egg they put on more water; when an egg ſinks in it they throw the ſand out of the troughs, and put in freſh from the heaps. The water thus impregnated with *ſalt* they boil in leaden pans, and evaporate to a dryneſs, the *ſalt* remaining behind. *Ray*'s Engliſh word, p. 179.

Rock Salt, a name given by the common people of England to the foſſile *ſalt*, or *ſal* gem, found in ſeveral parts of the world.

It was in the year 1670 that we firſt diſcovered the mines of *rock ſalt* in Cheſhire, where it was accidentally found on the lands of Mr. Marbury, of Marbury, in that county, in boring for coal. It lay there thirty-three or thirty-four yards from the ſurface, and there iſſued from it a vigorous ſharp brine ſtronger than any of the Cheſhire *ſalt* ſprings before known afforded. Since that many other mines of it have been found in the ſame county, and a great many are now worked by a company of proprietors, and yield vaſt quantities of *ſalt*; but this is eſteemed unfit for domeſtic uſes in its natural ſtate, and for that reaſon the proprietors uſe the method practiſed in Poland, Hungary, and many other places on the coarſer *rock ſalt*, that is, the refining it, by diſſolving it in weak brine, and then boiling it into *ſalt* again; this is done with great quantities on the ſpot; and beſide this great quantities are carried in the rough ſtate to Liverpool, and there refined with the water of the river Merſey at full ſea, or elſe ſhipped at Liverpool, and thence tranſported to other parts of England and Ireland, where it is wrought into *ſalt* with ſea water.

The *rock ſalt* refined upon the ſpot is alſo exported to Ireland; and in times of war, to our American colonies, when they cannot have bay *ſalt*. The works where they refine the *rock ſalt* are called refineries, and the *rock ſalt* is broken ſmall and put into leaden ciſterns, where it is diſſolved cold in ſea water. When the ſolution has ſtood a day and night to ſettle, it is drawn off from the ſediment into the *ſalt* pan, and refined into *ſalt* in the ſame manner that common brine is boiled up. The ſame additions are uſed in the clarifying it, and the ſcratch or calcarious matter falling from it, forms a cruſt as in the other works. The brine left in the pans after the *ſalt* is taken out is not thrown away, but is added to the next quantity put into the pan, and ſo on to the end of the works. *Brownrig* on Salt, p. 139.

In Hungary, near the city of Eperes, they have a very remarkable mine of this *ſalt* which ſupplies the whole country thereabout. The mine is near two hundred fathoms deep, and in the greateſt part is ſunk through earth, not through rock. The veins of *ſalt* are ſo large, that there are many blocks of it weighing two thouſand pounds, ſome of ten or more. The *ſalt* is uſually hewn out into long ſquare pieces of about two feet, and is afterwards ground between two grindſtones, to reduce it to a powder fit for uſe. Though the mines of *ſalt* are uſually cold and damp, yet the *ſalt* itſelf being very ſolid, and in the rock or maſs, is ſeldom much affected by the dampneſs. The *ſalt* in many of the mines is not of a fine white, but ſuch as is of a duſky grey in the maſs, often becomes very white when powdered, and made fit for uſe.

Salt upon Salt, a name given to a kind of common *ſalt* prepared by the Dutch, of great uſe in preſerving herrings and other fiſh, and to which they principally owe their advantages in the herring trade. The Dutch prepare two kinds of refined *ſalt*, one of a ſmall grain, intended for the uſe of the table, and called butter *ſalt*. They export large quantities of this to the countries upon the Rhine, and into other parts of Germany. The other kind is a very ſtrong and pure *ſalt*, and is of the largeſt grain of any boiled *ſalt*, now made: this laſt they call the St. Ubes or Liſbon *ſalt*, from its reſemblance to the pure bay *ſalt* made in thoſe places.

The *ſalt*, which they refine, is altogether marine bay *ſalt*, and they chiefly have it from France and Spain; but they find, by experience, that any one kind of bay *ſalt* does not anſwer their purpoſes, ſo well as two or more kinds; they therefore frequently mix three parts of Cadiz *ſalt* with one part of that of Souſton, which is of great ſtrength, but very dirty, and of a green colour, and does not coſt above half the price of the Spaniſh *ſalt*; for diſſolving the bay *ſalt*, they uſe ſea water, which they bring in lighters to Dort and Rotterdam from below the Brill or Helvoet; out of theſe lighters it is craned into cellars, and is thus impregnated with bay *ſalt* to a certain degree of ſtrength, which they determine by hydrometers made for that purpoſe. After the heavy droſs of the *ſalt* is ſubſided to the bottom of the cellar, the clear brine is pumpted up into the *ſalt* pan through a mat, which retains the light ſcum, ſtraws, or other impurities, which floated on the ſurface of it. Theſe *ſalt* pans are of iron, of a round figure, and commonly forty feet in diameter, and eighteen inches deep. Theſe pans are placed over a hearth furnace, and the only fuel they uſe in the boiling the *ſalt* is dry turf. The fire is kept up ſo high, that the liquor boils briſkly all the time, and if any ſcum ariſes, they carefully take it off, but they uſe no clarifying mixtures. A little before the *ſalt* begins to granulate, they add to the pan a lump of butter, of the bigneſs of a walnut, and half a pint of ſour whey, which has ſtood at leaſt half a year. When theſe things are perfectly mixed in by a good ſtirring, they ſhut the doors and windows of the houſe, that no air can blow in cold, and the houſe is kept thus hot all the time that the *ſalt* is forming. This method is not new, or peculiar to the Dutch works, for Agricola deſcribes an apparatus of boards, to keep the cold air out of the *ſalt* pan all the time that the *ſalt* is forming; and the Germans uſe it in many places at this time.

It is out of this ſame brine, and by the ſame proceſs, that they make the table *ſalt* and the ſtrong *ſalt*; only toward the end of the proceſs they make this difference, if the pan is to be wrought into table *ſalt*, the brine is kept gently ſimmering during the whole operation, and all is finiſhed in twenty

twenty four hours; but if it be to be made into the ftrong *falt*, they flacken the fire to fuch a degree, that the operation takes up three days. In both cafes they let the *falt* remain in the pan till the whole is finifhed; they then rake it out with wooden rakes, and after it has drained a while in wooden drabs, it is fit for ufe. The mother brine, of which there always remains a large quantity in the pan after the ftrong *falt* is made, as alfo the drainings of the drabs where the *falt* is put, is referved to be boiled up into table *falt*; but the mother brine of the table *falt* becomes more fharp and bitter after every procefs, and is finally thrown away. *Brownrig* of Salt, p. 142.

Sea SALT. The common *fea falt* is deftructive to almoft all plants, except thofe which naturally grow in the fea water, or on the fhores. Mr. Tull has invented a method of determining how far the horizontal roots of plants run, by burying *falt* at a diftance from them. See the article ROOT. It has been thought by fome that this was an uncertain trial, becaufe, though the roots reaching the *falt* were deftroyed by it, yet the plant would continue to be fupplied by others, and would not perifh; but this is erroneous, for the roots of plants coming where *falt* is, are not killed by it, but they draw juices from the earth where it is buried, and carry it with thofe juices to the plant, and by this means they fail not to kill it. One root, thus coming in the way of *falt*, is able to kill the whole plant, though it have ten thoufand roots, takiog good nourifhment from other places.

This is finally exemplified in the growing of mint in water. If a ftrong and vigorous fhoot of mint, growing in fimple water, be placed near a glafs of *falt* water, and one fibre of its roots be raifed out of the glafs in which it ftands, and plunged into the *falt* water, the whole plant will be killed in a few days by this *falt*, taken in by this fingle fibre, though all the reft are takiog in proper nourifhment from the frefh water all the time. The fame thing happens, if one of thefe roots be taken up and tied in a bag, containing a fpoonful of dry *falt*; the *falt* will foon grow moift, and the plant will be killed. On tafting of the leaves of the plants thus killed, they are found to have imbibed a larger quantity of *falt* than could be conceived from fuch a fmall and fingle root, the whole ftalk, leaves, and every other part of the plant, tafting ftrong of *fea falt*. *Tull*'s Horfe-hoeing Hufbandry. See *Marine* SALT, fupr.

Egra SALT. See the article EGRANUM *fal*.

Effential SALTS. See *Salts of* PLANTS.

Fixt SALTS. Mr. Homberg has given, in the Memoirs of the Paris Academy, a very curious paper of the fubject of volatilizing the *fixt falts* of plants. He obferves, that the *fixt falt* of any plant is a *faline* matter, which has already loft in the fire all, or the greater part at leaft, of the volatile matter contained in the plant it is obtained from, as its phlegm, acid fpirit, urinous fpirit, its effential oil and urinous *falt*; and that its figure is in fome degree that of a fpunge, the pores of which being always open, are ever ready to receive again fuch forts of volatile fubftances, as the fire has before driven off from them; and that art may in fuch a manner add thefe its deprived parts to it again, that the concrete fhall lofe its fixity, and become volatile, as the whole was in a great meafure before. The whole of this operation confifts in the adding to the lixivial *falt* one or more of thofe volatile fubftances, the lofs of which gave it its prefent form. Thefe are to be introduced into the *falt* by repeated cohobations, which are to be continued till fo much volatile matter is added to the fixt, that the whole becomes volatile together; the naturally volatile particles being mixed in fuch proportion, as to be able to carry up the fixed in vapour with them. The feveral volatile fubftances of plants are of different kinds, and confequently require different operations, to make them mix with the *falt*. Tartar may very well ferve as a general inftance in this cafe, and the manner of introducing into its *fixt falt* thofe principles, of which the fire before divefted it, and by this means rendring it volatile, may ferve as a fpecimen of the manner of doing it in all the reft: but as *falt* of tartar, and all other fixt vegetable alkaline *falts*, however well purified, always contain a great deal of earth, the feveral volatiles employed act differently on this, according to their feveral natures; fome carrying it all up in vapour, others carrying only a part of it, and leaving at the bottom of the veffel more or lefs of an earthy matter, infipid to the tafte, and wholly divefted of its alkaline *falt*; every particle of which, even in this cafe, has been volatilized, and raifed by the fire.

The alkaline *falt*, thus volatilized, appears alfo, according to the different fubftances employed, in very different forms; fometimes in that of a *faline* liquor, fometimes in an acid, and fometimes in ao urinous fpirit: fometimes alfo it becomes changed into a volatile *fal falfus*, fometimes into an acrid and fœtid *falt*, and finally, fometimes into a volatile aromatic one. The firft matter which fire drives out of tartar, or any other vegetable fubftance, is its phlegm: this being mere water, one would think at firft fhould be little able to change fo fixed a fubftance as *falt* of tartar into a volatile one; but when we farther confider the great power of water, when put in action by the fire, and that this agent is the caufe of fome of the greateft changes that happen in animal and vegetable bodies, and perhaps of every thing of this kind that paffes in our earth, we fhall not wonder that it may be made, by the help of fire, one of the agents capable of raifing, or volatilizing a part at leaft of *falt* of tartar; but as phlegm is the leaft active of all the principles which chemiftry feparates from bodies, or at leaft acts upon the others the moft flowly, and with the leaft violence, the method of volatilizing part of *falt* of tartar by means of this, muft naturally be more tedious than by any of the other principles; yet it is to be done with time by this, as well as by the other.

The thing that put Mr. Homberg upon this courfe of experiments was, as he candidly acknowledges, an accident. He was difpleafed with the Venice foap, with which he fhaved himfelf; and endeavouring to mend it, he cut it into thin flices, and after drying it three months in the fhade, he powdered it in a mortar, and wetted it into a pafte again with oil of lavender and fpirit of wine; and in continuing his trials to this purpofe, he at length found part of the *falt* of the foap become volatile.

It is very well known that foap is made of the *falt* of kali, or pot afhes and oil. On the event of this experiment, Mr. Homberg proceeded to judge, according to the known rules of chemiftry, that oil, of which the volatile *falts* are generally fuppofed to borrow their volatility, being intimately mixed with the fixed alkaline *falts*, as here with that of the kali, might render them all volatile, as in this inftance; for that in this ftate they were no longer alkalis, their pores being now not open, but filled to the utmoft wi.h tbe particles of oil. All oils contain alfo an acid, and that acid being mixed with the alkali *falt*, the whole on this muft ceafe to be an alkali, and become a middle, or neutral *falt*, fuch as common fea *falt*; but then as the acid is not, in this cafe, joined to the alkali, but by the means of oil, and accompanied with oil, this new found neutral *falt* muft neceffarily be of an oily, or a fulphureous nature.

In carrying on this idea, and trying by chemical experiments all the objects it offered, Mr. Homberg, in fine, found, that in order to volatilize the *fixt falts* of vegetables, it was neceffary to begin, by converting them into foap; then to wait for the fhooting of certain cryftals, or bright points, which would appear upon the furface, and that thefe cryftals were a neutral *falt*, volatilized of itfelf by the mere operation of nature: after this the matter is to be moiftened with a new liquor, and then fet upon the fire, and that thus there would be a new appearance of volatilized *fixed falt*; and the repeating this procefs feveral times, affords always, at length, a very large proportion of the *fixed falt*, no longer fuch, but truly volatilized. The choice of a proper liquor, for the wetting the matter, is a thing of no fmall confequence. Water is, of all others, the leaft proper, and oil appears the moft fo; and of the different oils, thofe drawn by diftillation are much more effectual than the common expreffed ones. The great reafon of this is, that the liquor ought not only to be the moft volatile that may be, but it muft be alfo fuch, as will moft intimately unite with *falt*. Spirit of wine is very excellent for the purpofe, but would be much more fo, did it not want this laft quality.

Mr. Homberg, by various trials, carried at length this attempt to fo great a height, that he was able to volatilize nearly one half of *falt* of tartar, or of any other volatile *falt*. The new *falt* often appears in a dry form, the oil, which is employed in the making it, preferving it from the effect of humid vapours, which would otherwife have refolved it into a liquor. Mem. de l'Acad. Par. 1714.

Foffile SALT. The ifland of Tfongming, in the Eaft-Indies, affords the moft remarkable kind of foffile, or native dry *falt* in the world. The country is there, in general, very fruitful, but in certain parts of the ifland there are fpots of ground, of feveral acres, which appear wholly barren, yielding not the leaft appearance of any thing vegetable upon them.

Thefe fpots of ground tafte very *falt*, and abound in *falt* in fuch a manner, that they fupply not only the whole ifland, but a great part of the neighbouring continent. When the people fee the earth become dry, and covered with white fpangles, which are pieces of *falt*, they dig it up about a foot deep, and carry it away to the work places, where they put it into large wooden veffels of four or five inches deep, and many feet broad, fet a little flanting. They pour water upon it in thefe. When it has ftood a proper time they let it out, and add more, till all the *falt* is diffolved; then they boil this water in the common way, and extract the *falt* from it. It is very remarkable, that the fame pieces of land, which produce vegetables one year, will produce this *falt* another; and, on the contrary, the *falt* parts will fome feafons produce vegetables. The *falt* work there is a thing of great advantage to the inhabitants, and all the poor are, in the feafon, employed in it; the men in collecting and wetting the earth, and the women in boiling up the water, which they attend as carefully as the men. Obferv. fur les Cout. de l'Afie.

Glauber's Salt. See Sal *mirabile*, supr.

Salts *of Count Lagarais*, a name by which the French and some other nations call a preparation of vegetable bodies, invented by the gentleman whose name it bears, but very improperly called by him a *salt*.

The history of these preparations is this: in the year 1731, the Count de Lagarais shewed the French king some powders, which he proved to be very useful in medicine, and which he called the *essential salts of certain plants*. The method of making these was long kept a secret, but at length the discoverer publishing it to the world, it appeared that they were made by means of water only, agitated in a violent and continued manner in a close vessel with an instrument resembling a chocolate mill. Mr. Langelot had before attempted a resolution of this kind of vegetable, and other substances, by means of water and motion, but his was done by grinding them with a very small quantity of water at a time; whereas this of the Count's is by powdering the ingredients, mixing them with a large quantity of water, and breaking them to pieces by a continued motion of this sort of mill made with four vanes, or flaps of thin wood, which was kept for six or eight hours in a continual motion by means of a larger wheel, such as the lapidaries polish stones with.

There is no doubt but that the instrument, used by the Count, is of very great use, and that the result of the operation is a very valuable form of medicine; but it is not a *salt*, but an extremely fine extract, containing the gummy, resinous, and *saline* parts of the body, and is a form capable of being reduced to powder, and easily administered, as it contains the virtues of the plant it is made from in an extremely small compass, and is capable of ready solution in aqueous fluids. It is certainly a form of medicine worthy to be brought into practice, and must be a very proper way of administring the more bulky medicines to children, and persons of tender constitutions.

To give a proper view of the nature of these preparations, and their difference from the extracts made in the common manner, it may be proper to enter, in some degree, into the manner of preparing the two forms. The common extracts of the shops are made either from the juices of succulent plants, as houseleek, purslain, or the like; or from a strong decoction of the other drier plants in common water, which when separated from the coarser parts by subsidence, filtration, or the like means, are evaporated over a balneum mariæ to the consistence of a thick honey.

There will, in process of time, an essential *salt* separate itself from these extracts, and many plants have, in the decoctions, a large quantity of a fine substance, which will never be made to pass the filter: and the extracts, made by this means, contain the oil, the gummy and resinous parts of the plants, and their essential *salts*, though this is but in a very inconsiderable quantity. These are the common extracts of plants.

The method of making those extracts, called *Count Lagarais's salts*, is this. They choose a glass vessel, capable of holding six or seven pints, and having a wide mouth; into this they put an ounce of bark, sena, guaiacum, or whatever other vegetable they are to make the extract of, first reduced to a coarse powder. They pour on this two pints and an half of rain water, or distilled water, and then taking the vessel to the place where the mill is fixed, they raise it so high, that the body of the mill is in the middle of the liquor; they then cover the top of the vessel with a wet bladder, that the froth may not be thrown over, and then turning the large wheel, they make the mill move round very swiftly in the liquor for six or seven hours together; after this they let the liquor settle for an hour or two, till only the finer parts of the body remain suspended in it, and then pour it off into a number of flat China, or stone ware dishes, putting only a small quantity into each dish, and these they set in the sun, or over a balneum mariæ prepared on purpose; for should they attempt the evaporation in a sand-heat, the small quantity of extract in each dish would be burned. When the whole is evaporated to a dryness, there remains on the whole inner surface of the dishes a thin crust of an extract, which is to be separated by scraping it off with a piece of stiff paper, and reserved for use. This always breaks up in small scales, which have a very shining surface on that part where they adhered to the dishes, and it seems that this has given occasion to some to believe, that they were particles of real *salt*.

There is no doubt, but this method of procuring a powerful extract might be of great use, in regard to all those substances which water can have power to penetrate; but it is not easy to give credit to its being able to make the like valuable medicines from the metals, though that has been pretended. Gold and silver are pretended to be operated on in a powerful manner by it, but there seems a fallacy in this, since even iron itself, which is much more penetrable by water than those metals, yields but little virtue to it, two ounces of the filings of this metal yielding, with the utmost care and accuracy, only about four grains of a white earthy matter, which is also much more likely to be a part of the water than of the metal.

The *salts of the metals*, as the Count called them, which were prepared by this means, were always suspected to hold some *saline* quality, which they owed to the menstruum, which, whatever was pretended, was not simple water, and a strict examination of them always discovered a marine *salt* among them. It is true indeed, that according to Langelot's method of grinding, some leaves of gold were reduced, by the addition of a very small quantity of water, into a liquor, from which, on distillation, a few red drops were separated; but it is to be observed, that as Langelot's method is the grinding the substance with great vehemence, and for a long time, in an iron mortar, with a pestil of the same metal, there is reason to suspect, that what was found to come forth in red drops was a solution of iron, not of gold, as was pretended by those who first prepared them. It is not to be doubted, but the method of evaporation of Count Lagarais's medicines is of great use, since no other can so well retain the finer parts of the medicines. Mr. Geoffroy tried it on roses, violets, and some other flowers, and found great reason to wish that all the medicinal extracts could be prepared in the same manner; but the method is impracticable, when medicines are to be prepared for general use; for though the mills might be made to be moved in great numbers at once, by a current of water, and so this part of the work performed with tolerable ease, yet the evaporations, in such quantities, could by no means be made in any tolerable room, or time, and they must be evaporated as soon as made, since they very quickly turn four, and lose all their virtues. Mem. de l'Acad. Scienc. Par. 1739. See Extract.

Lixivial Salts. It may appear very natural, from considering the common method of making the *lixivial salts*, that they should be all of them one and the same substance; and as the greater part of them agree perfectly, not only in taste, smell, and colour, but even in their effects, in the nicest chemical operations, in which it appears wholly the same thing, whether one or another of them be employed; many, even of the most celebrated chemists, have positively declared that they are all the same, and Kunkell has positively asserted this on many repeated experiments, allowing them no other difference, than that some contain more, some less earth; and this he affirms not to be owing to the different species of the plant, but from certain accidents in the burning.

This account, however specious, is not true; for though there are many of the *lixivial salts* procured from different plants, which, on many trials, appear alike, yet there are some that greatly differ from the common kinds; as that of tamarisk, which wants the greatest of all their characters, in that it is no alkali, but a true *sal salsus*; and beside this, there are probably many other as remarkable differences in others, which happen not yet to have been observed. Mr. Bourdelin, of the Paris Academy, having observed, that among the *lixivial salts* some were greatly more, some greatly less alkaline, and this last mentioned kind not at all, determined to search minutely into their differences in this respect. In this attempt he tried the produce of a great number of different fruits and flowers of plants, many of which gave *lixivial salts*, considerably different from one another; but nothing more strengthened his opinion of the essential differences of some of them, than the *salt* of guaiacum, which proved to be little more an alkali than the *salt* of tamarisk, and which he is of opinion may be prepared in such a manner, as not to proye at all alkaline. Mem. de l'Acad. Par. 1728. See Lixivious, *Cycl.*

The opinion of the fixed *salts*, drawn by elixiviation from all plants, being the same, having greatly prevailed, Mr. Gmelin, of the Petersburg Academy, went through a multitude of experiments with the *salts*, made carefully from a great number of different plants, on a number of different liquors; some mineral acids, others solutions and impregnations of different substances; and by these he found that they had very different qualities, beside their differing greatly in the degree of their alkaline power, which had been looked upon as their essential character.

He observes, that these *salts* are not to be obtained pure by any means, except a violent and repeated calcination; and that this is not the method used with the several *salts* made for medicinal use, and consequently that they are all impure. The additional matter, which makes these *salts* impure, is either an earthy, an oily, an acid, or a volatile alkaline substance, according as the plant, while recent, abounded with one or the other of those principles, or as their mutual connexions with one another were more or less strong in each. As therefore the several species of plants are well known to abound with different principles, it must necessarily follow that the *lixivial salts*, obtained from them in the common way, must differ in their nature and properties, as the acid abounds in one, the volatile alkali in another, and the earth or oil in a third.

This difference unquestionably owes its origin to the nature of

of the different plants; but besides this it must be allowed, that there are several accidents by which the *salt* may also be rendered of a different nature, or at least its natural diversity from others may be encreased, and set in a stronger light. The different manner of burning the plant will occasion a great change in the *salt* it yields; and two different *salts* will be obtained, if one half of the same quantity of ashes be lixiviated with hot water, and the other half with cold. This has been fully proved by Stahl in his *Fundamenta Chemica*.

These are only accidental differences in the same *salt*; what Mr. Gmelin takes upon him to prove by experiment, is, that there are more real differences between the *salts* of various plants, and those wholly dependent on the nature of those plants, than had been before suspected.

That the *salts* of plants may be fairly compared together, it is necessary that they should all be made in the same manner; the fire should, in all the processes, be raised to the same degree, and the time of the plants remaining in it should be also ascertained, and the lixivium from each be prepared in the same uniform manner: thus the volatile parts of one plant will be no farther evaporated than of another, and the lixivia will contain an equal share of the principles of the several plants, proportioned to their several natures; for it is a certain fact, that if the lixivium of the same ashes be made in part with hot water, and in part with cold, the *salt*, obtained from that made with the hot water, will contain more of the earthy and oily parts of the plant, than that made with the cold.

The method of making a fixt *lixivial salt* of a plant, so as to retain as much as may be of the virtues of the plant, is this. Let the plant continue on fire without breaking out into flame, and let the fire be continued till it fall into ashes, but no longer, lest some of the volatile parts be driven off, which might have been preserved. Cold water, and not hot, should be used to make the lixivium, that the *salt* may appear in its proper form; and as the water of wells, rivers, and other places, differ greatly from one another, the water used for this purpose should be such, as has been previously distilled two or three times over, and so rendered perfectly pure, and kept in glass vessels, not in earthen, leaden, or wooden ones, lest it contract some adventitious particles. Now if the lixiviums of plants, made with all these cautions, are found to differ from one another, there is no room to doubt, but that the *salts* of those plants are really different one from another.

This evidently appeared from the labours of a Swedish chemist, whose papers fell into Mr. Gmelin's hands, and who had with all this care and caution prepared the *salts* of a number of plants; a copious table of the different effects of which, in different mixtures, is added to Mr. Gmelin's account: but not only the *salts*, but the very ashes of different plants, prepared in the same exact manner, are found to differ obviously to the senses. The ashes of mugwort, small centaury, chervill, and dill, are of a brownish grey; goats beard and lingwort afford white ashes; those of sanicle are whitish; those of Roman wormwood of a greenish grey; those of rue, agrimony, and saxifrage, brown; those of tansy of a dusky green; those of dodder of a fine green; eyebright, southernwood, common wormwood, and scabious, afford them grey; scurvygrass of a whitish grey; hyssop, yarrow, and sowbane, of a dusky grey; melilot and oak leaves, as also plantain, colts foot, pine tops, and fumitory, of a dusky brown; pennyroyal of a pale brown, with some spots of white; elder flowers, sage, and mother of thyme, afford yellow ashes; those of strawberry leaves are of a pale brimstone colour; those of catmint of a dusky red; of prunella brick coloured; of honeysuckle blue; of fern blackish; and those of St. John's wort, feverfew, origanum, and pimpernel, are all of a deep black.

The quantity of ashes, produced from an equal weight of different plants, is very different, some yielding a seventh part of their weight, others but a twelfth or thirteenth, and some particular plants much less than this; St. John's wort in particular yields but a twenty eighth part, and fern but a twenty fourth.

The lixiviums made from these different ashes were some colourless from the beginning, others at first were bluish, greenish, or of other colours, but these tinges all went off after a few days, and the liquor became limpid.

The lixiviums of the several plants are very differently acrid to the taste, though made exactly in the same manner and proportion, and those of some plants are not acrid at all; that of strawberry leaves has scarce any taste; that of the barba capræ, instead of an acrid taste, has a sweet one; and the lixivium of mother of thyme has no taste, by which it can be distinguished from fair water: the lixiviums of pimpernel, dill, and strawberry leaves, have a sulphureous smell; those of most other plants are wholly scentless. Act. Petropol. Vol. 4. p. 289.

SALTS *of metals*. See the article METAL.

SALT *of milk*. See MILK.

Mineral SALT. It has been for many ages a constant opinion among the chemists, that minerals contain no volatile *salt*. Mr. Homberg, however, found the means of preparing an acid mineral *salt*, in a dry form and volatile. This would dissolve in spirit of wine, and that solution being thrown on marble, fermented, and dissolved it in the manner of aqua fortis.

All the world knows that many mineral substances contain an acid, and that this is easily raised in distillation, and therefore is very volatile; but as this could never before be separated, otherwise than in a liquid form, they esteemed it something of a peculiar nature, and called it an acid mineral spirit, banishing the word *salt* from its name. But Mr. Homberg found, that if the acid spirit of any mineral was so embarrassed in the particles of some metal, as that it ceased to be fluid, that metal was always considerably increased in weight by it; and that if afterwards all the acid which had been added to it were again separated from it, there would remain a volatile *salt* in a dry form, and that this *salt* if dissolved in spirit of wine, or in common water, made an acid liquor, which would dissolve all alkalies with an ebullition: from this, he says, it is plain, that the minerals have a volatile *salt*, as well as the animals or plants; which last were also long supposed to want it, and the volatile *salt* supposed peculiar to the animal kingdom: from this also it very plainly appears, that the acid spirits of minerals, as they are called, are in reality no other than these volatile *salts* dissolved in their own phlegm.

The method of procuring this *salt* may be seen in the following instance. Take two ounces of fine silver, dissolve it in five ounces of spirit of nitre; pour this solution, while hot, into a pint of river-water, in which there has been before dissolved as much sea *salt* as it can contain, the silver will precipitate itself in form of white scales. Wash this precipitate till it is insipid to the taste, and then dry it; it will, when perfectly dried, weigh two ounces and an half.

After this calcine in an iron vessel over a strong fire two or three pounds of fine tin, in which there is no mixture of any other metal. Take of this calx of tin well dried an ounce and half, mix this carefully with the two ounces and half of the calx of silver, perfectly dry also: put the mixture into a matrass, of which two thirds shall remain empty; expose this matrass to the naked fire, with its neck turned downwards, there will run into the neck of the matrass a black matter, which will immediately fix itself into a hard stone of a brown colour, this will weigh about an ounce and half; this stone is the calx of tin dissolved by the acids, which remain in the calx of silver; and the caput mortuum, at the bottom of the matrass, will be found to be the silver now divested of those *salts*, which it had carried with it from its dissolvent in the precipitation. This may be run into a mass by the copel, and no part of it will be lost.

Beat this brown stone to powder, let the powder be perfectly dry; then put it into a double vessel, sublime it according to art, and the result of the operation will be half an ounce of a volatile *salt*; this is to be rectified by re-subliming it two or three times over a very gentle fire, and it will then be a volatile and mineral *salt*, perfectly dry, of a fine white colour and transparent. The caput mortuum of this sublimation is the calx of tin. Mem. Acad. Par. 1692.

SALT *of mineral waters*. See the article HALCRYPTIUM.

Pine SALT. See the article PINE.

SALTS *of plants*. See the article PLANT.

Sedative SALT, a name given by the modern chemists to a *salt*, of the virtues of which they boast much. Those who first described it gave the process for making it in a very enigmatical manner; and their successors invented many different ways of preparing it. The truth is, that all mixtures of borax with the vitriolic acids furnish us with a *sedative salt*, as do also the mixtures of borax with spirit of nitre, or of sea *salt*.

Becher first gave the enigmatic account of it, which Homberg traced to its origin, and found the way of making it with the vitriolic, as Lemery did with the other acids. This *salt* is formed by sublimation, and is a congeries of saline flowers, not a little approaching to flowers of benjamin. These flowers are so light and fine, that they swim upon water, and will not dissolve in it unless it be made warm.

The *sedative salt* is a perfect *sal salsus*; it makes no alteration in the colour of the juice of violets, and has no sensible effect on the solution of corrosive sublimate, or on a solution of mercury in spirit of nitre for a long time; but it finally precipitates a yellow powder from it as the borax does; there is this difference, however, between this precipitate, and that formed by crude borax, that the powder precipitated by the *sedative salt*, does not as the other become white on washing with large quantities of water. These experiments shew this *salt* to be wholly analogous to tartarum vitriolatum, or to the Glauber's *salts* in its effects.

When the composition of which this *salt* is to be made is placed on the fire, there arise different liquors before the *salt* appears; the first is a phlegm of a fattish complexion, and with the smell of soap; this is succeeded by a turbid white liquor, along with which there arise some of the first flowers.

ers. This makes a solution of mercury in spirit of nitre muddy after some time, and finally precipitates from it a small quantity of a white powder. After this all the *salt* or flowers ascend; these flowers, dissolved in warm water, recrystallize themselves in it when cold, assuming the same form with that they had in the flowers, except that the combinations of particles are more dense and heavy.

The usual method of making this *salt* has been this. Take a glass retort, with a large neck, put into it four ounces of borax in fine powder, and pour on this half an ounce of common water to wet it into a sort of soft paste; then add to this an ounce and two drachms of concentrated oil of vitriol; place the retort in a reverberatory furnace, and give at first a small fire, which raise by degrees till the retort is red hot: there will pass over into the receiver about an ounce of aqueous matter; and after this the flowers, or *sedative salt*, will rise with a little more humidity; hence some part of the flowers will be dissolved in the liquor, and run over into the recipient, but the greater quantity will remain in form of a dry sublimation in the neck of the retort; they will finally stop up the whole orifice of the neck, and what arises after this usually forms a circle of a sort of glossy *salt*, about their bases, out of which the flowers seem to shoot.

They are composed of multitudes of fine thin blades, or flakes, and are easily brushed out of the neck of the retort with a feather; the glossy circle at the bottom of them may be dissolved in water, and recrystallized, and by this means all the *salt* will be procured.

Mr. Geoffroy the younger has given, in the memoirs of the Paris academy in 1732, an account of a way of making this *salt* by solution and crystallization alone, without the trouble of distilling; he has also summed up the several other ways of making it with blue and white vitriol, but the method here mentioned is that by which the chemists now make it. Mem. Acad. Par. 1732.

Shivery SALT. See the article SHIVERY.

Vitreous SALT, in chemistry, a term used by some modern chemists for a kind of *salt*, which till of late has wanted a name, and which is found in and separable from the fixed alkaline *salts* of vegetables.

It is bitter, hard, fixed, and not alkaline, and of a crystalline or glossy appearance.

The method prescribed by Boerhaave for the procuring it with most ease, is this: put six pounds of the best pot-ashes into a clean glass, add thereto twenty pints of cold rain water; stir them together with a stick, and suffer the whole to rest. When the ashes are thoroughly dissolved, gently decant the clear lixivium; and there will be found at the bottom, mixed with the fæces, a number of small greyish granules, of a bitter taste, and of an almost glassy brittleness and hardness; these are the *salt* required, and contain no alkaline quality; but to obtain it in greater purity, dissolve six pounds of pot-ashes in fourteen times their weight of water; filter the lixivium while hot, and make it perfectly clear; then put it into a glass vessel ready heated, and moistened, and suffer it to stand; a dusky crust will soon begin to shoot to the bottom and sides of the glass, and will gradually become thicker and thicker; at length when no more appears to shoot, pour off the liquor, and there will remain behind a *salt* like the former, but purer, and in larger quantity: if the remaining lixivium be boiled a little, and set to crystallize again, it will afford a small quantity more of this *salt*; but after this it will yield no more; whence there seems to be only a certain and determinate quantity of this *salt* contained in the alkali. If this *salt* be put into a vessel of rain water and shook about, it does not dissolve, only the alkali washes off, and the *salt* remains purer than before; after this it is to be gently dried and kept. *Boerh.* Chem. P. 2. p. 42.

It is well known among the chemists, that genuine fixed alkaline *salts* can hardly be crystallized; and though some have produced this *salt* as a crystallized alkali, the fallacy of the pretext is evident, since this appears on trial to be no alkali at all; and it remains not less difficult than before to crystallize pure alkali, though a *salt* different in its nature from it, may be crystallized in a certain quantity from among it.

This *vitreous salt* never runs spontaneously in the air, nor does it easily dissolve in cold water; when boiled it requires a large proportion of water to dissolve it, and as soon as cold it easily separates itself from it again: it is lastingly bitter to the taste, and crackles very much when thrown into the fire: it is neither acid nor alkaline, nor approaches in its nature to any other *salt* hitherto known; but seems nearest of all others to resemble sandiver. This may suggest a query, whether the fire in producing the fixed alkali, does not at the same time produce this *salt* from vegetables; and whether by combining the sand and alkali together in glass-making, the fire does not again separate and throw up this *salt* in sandiver. Something of this kind seems to be the case, and a close inquiry on these principles may shew us why tartar, in the state of an alkali, does not afford this *salt*; for tartar proceeds from a subtile liquor, intimately fermented in all its parts. There yet remains the trying this *salt* on various bodies, by means of fire, to give a true knowledge of its nature, which is at present too little known. This is to be observed, however, that it differs so much from the alkali, in which it is contained, that the careful chemist, before he makes use of that alkali in any nice process, or experiment, ought carefully to separate this neutral *salt* from it. *Boerhaave's* Chem. P. 2. p. 100.

Fusible SALT *of urine*. This *salt*, otherwise called by some *sal microcosmi*, and *native salt of urine*, is extracted from *urine* in a particular manner.

It is best prepared from putrified human *urine*; but it may be prepared from fresh. A quantity of the *urine* of sound beer drinking men being putrified in a moderate heat, and then slowly boiled in glazed earthen vessels to the consistence of a syrup; if this liquor be placed in a cellar or cool place, in about four weeks time, or sooner in winter, crystals of a peculiar figure will be formed. But these being impure, must again be dissolved in a sufficient quantity of water, and filtered as hot as possible through grey paper, and the solution again put in a cool place, where in a few days crystals will again be formed much cleaner than the former. These being separated from the liquor and dried, the operations of solution, filtration, and crystallization, must be reiterated twice or thrice, till the *salt* becomes perfectly white and without smell.

Mr. Marggraff says, that 100, or 120 measures of *urine* give about three or four ounces of this *salt*, which always crystallizes first, and is easily distinguished from that which appears afterwards in crystals of a long and cubical form.

This *salt* is ammoniacal, but of a peculiar nature. It is a saline acid body. By distillation an urinous volatile spirit first rises. The residuum may be reduced by a violent fire into a pellucid white transparent mass like glass, of a very fixed nature, and from which neither acid nor any thing else can be separated, without the addition of some other matter.

This vitreous substance may be entirely dissolved in two or three parts of distilled water, and is thereby changed into a transparent liquor, somewhat thick, not unlike the concentrated oil of vitriol, and having the properties of all acids, such as fermenting with volatile and fixed alcalies, forming neutral *salts* with them, precipitating bodies dissolved in alcaline menstruums, and dissolving alcaline earths. It does not dissolve gold nor silver; and copper, tin, and lead little; but iron very strongly. It extracts a red colour from *cobaltum pro cæruleo*, in German, *blau farben-kobalde*, the mineral by which glass is tinged blue.

But this *salt*, in its dry state attracts metals with much more vigour, and with them produces several remarkable and singular phænomena; for all which, as also for the relation their *salt* bears to acid, alcaline and neutral *salts*, we refer to the learned author, who has also examined its effects on several solutions of terrestrial bodies. One most eminent property is, that mixed with the inflammable part of soot, and dissolved in a close vessel, it produces a phosphorus. An ounce of this *salt* of urine thus separated from its urinous part, and exactly mixed with half an ounce of soot, affords in this way a drachm of the best phosphorus. The residuum did not produce any when tried.

The learned author does not pretend to determine exactly the true origin of this *salt*, he thinks its acid may come into the human body from vegetable aliments. He has observed elsewhere that cresses, mustard, rocket, and even corn exposed to a very violent fire, produce a phosphorus. Hence he thinks this acid must be mixed with those substances; and the like may happen in other vegetables. He thinks this conjecture strengthened, because urine in summer, when people eat most vegetables, always produces this *salt* in the greatest quantity. *Marggraff*, in Mem. de l'Acad. de Berlin 1746. See also Miscel. Berol. Tom. VII. p. 341.

Spirit of SALT. This menstruum dissolves iron into a yellowish green liquor, and copper into one of a very deep yellow colour: tin dissolves in it with great violence and noise, and in great quantity; the solution becomes a thick but pellucid fluid: lead also dissolves in it; but after this solution has stood for some time, there always subsides to the bottom a white powder. Silver, if it is perfectly pure, does not dissolve in *spirit of salt*, but if it contain ever so little copper, as it is very seldom met with perfectly pure from that metal, its surface is then always corroded, and its colour sullied. *Spirit of salt* dissolves mercury into a limpid liquor; if diluted with water it does not dissolve the regulus of antimony; and if this regulus is dissolved by the most concentrated *spirit of salt*, if a little water be added, or it be only exposed to a moist air, it is reduced to a fine powder. Zink dissolves easily and perfectly in this menstruum. *Cramer's* Art of Assaying, p. 38.

SALT-*marsh*, *salina*, a place where *salt* is made, of which there are many natural ones in the hotter countries, where the sea exhaling the water of *salt* lakes, leaves the *salt* dry and ready for use at the bottom, without any art or labour of man to make it: thus in Muscovy and some other places there are whole fields of *salt*. See *bay* SALT, supr.

The countries, however, where this is not naturally performed, may effect it by art, and make *salines* or *salt marshes*, where they may use the sun's heat to great advantage. This is annually done to great advantage in France, and there is no reason why we may not do the same, either at home or in our American colonies, though it has not yet been attempted.

In order to make a *saline* or *salt marsh*, a low plat of ground must be chosen, adjoining to the sea, and distant from the mouths of large rivers, and this must be near some convenient harbour for vessels. The ground must be free from fresh water springs, and out of the reach of land floods, and if possible should have a clayey bottom; and finally, it must be well defended from the sea, either by natural or artificial banks of earth of a proper strength and thickness.

The ground thus chosen must be hollowed out to three ponds or receptacles. The first into which the sea water is usually admitted may be called the reservoir. The second receptacle, which is to be divided into three distinct ponds, communicating with each other by narrow passages, and containing brine of different degrees of strength, may be called the brine ponds; and the third receptacle is to be furnished with an entrance, between which and the brine ponds there is to run a long narrow and winding channel; the rest of it is to be divided into small and shallow pits, containing a very strongly saturated brine, which in them is to be converted into *salt*, and they may therefore very properly be called the *salt* pits.

The first receptacle or reservoir must have a communication with the sea by a ditch, defended on each side by walls of brick or stone, and made of such a depth, that by it all the water of the reservoir and other parts of the *salt marshes* may be able to run out at low water, and by it also the sea may be admitted into it at high tide. So that at neap tides the marsh may be filled with sea water to the depth of ten inches in the reservoir; and consequently, at higher tides, to the depth of two feet, when there is occasion to overflow the marsh, as is always to be done in the winter season, when there is no *salt* to be made; for, by this means, the wood work is kept from decay, and the clay bottom from injuries by frost. The ditch between the reservoir and the sea must have a flood-gate, by which the sea water may be admitted, retained or let out as occasion may require. *Brownrig* of Salts, p. 37. Phil. Transf. N° 51.

The several ponds or receptacles must not have all their bottoms upon the same level, but must be made of unequal depths, so that the first receptacle or reservoir may be eight inches and a half deeper than the *salt* pits in the third receptacle. The three brine ponds also situated between the reservoir and the *salt* pits must be of unequal depths. The next adjoining to the reservoir must be the deepest, and that which is nighest the *salt* pits the shallowest, but all of them must be shallower than the reservoir; and the three receptacles being thus constructed, the water standing at the same height in them all, and forming with its surface one continued plain, will be ten inches deep in the reservoir, when only an inch and half in the *salt* pits.

The length and breadth of the brine ponds and reservoirs are to be at discretion; but it is best to err in making them too large, and in general they ought to be so large as to furnish the *salt* pits with a constant supply of brine, fully saturated with *salt*; and, for this purpose, it is necessary to have them of different dimensions, in different countries, according to the degree of heat.

The bottoms of the reservoir and brine ponds are to be lined with any kind of lean and tough clay, or earth, that will hold water; and the French use a red, or blue clay, to be had in the neighbouring grounds. With them the blue always succeeds better than the red, which colours the *salt* much more; but in order to have a perfectly pure *salt* from this kind of manufacture, the bottom should be lined with some clean cement, which will hold water perfectly, and will not be easily broken up. Id. Ibid.

The *saline* or marsh being thus constructed; the saltmen, at the proper season of the year, open the flood-gate when the tide is out, and drain off all the stagnating water; when this is done, they repair the bottom of the marsh in several places, where it is found necessary, and cleanse the several receptacles from mud and dirt: after this they admit the sea water, at the next high tide, till it floats the whole marsh, and stands at about ten inches high in the reservoir. In a day or two most of the water in the *salt* pits is exhaled, and what remains is a very strong brine, they then let in more sea water at the two or three following tides; and so take care to admit as much water fresh into the marsh as has been wasted in vapour by the heat, constantly raising it to the height of ten inches in the reservoir, and consequently to an inch and half in the *salt* pits; and when the weather is extremely hot, or there are sharp drying winds, they fill them something higher than this.

All the parts of the marsh are thus supplied with water out of the reservoir, but the sea water which is let into the reservoir, is not confusedly let into the other water or brine of the ponds and *salt* pits; for, as the several parts of the work communicate only by narrow channels: it is provided, that the *salt* water flowing out of the reservoir never returns to it again, but gently flows along till it arrives at the second brine pond, and from that to the third, being forced forward by the sea water received from time to time into the reservoir: during this flow course, the watery fluid alway flies off in great quantity by exhalations, and the brine is continually preparing for crystallization as it flows along gently, growing all the way stronger and stronger, as it approaches the *salt* pits; so that when it at length enters these pits, it is fully saturated with *salt*; and particular care is taken to guard the entrance of the *salt* pits by a long and narrow channel, by which means the strong brine contained in these pits is prevented from returning back, and mixing with the weaker brine in the brine ponds; care is also taken, that the strong brine in the *salt* pits is spread out very thin, and exposed to the sun and air with a large surface, by which means the water more quickly exhales from it, and the *salt* is left concreted into crystals. These crystals, or *salt*, the workmen in France draw out every day, and dispose them at length together in a pyramidal heap, which they cover over at the top with thatch or straw, and so preserve them from the injuries of weather. Thus at a small expence and trouble a *salt* is prepared, which is found very fit for all domestic uses; and France is furnished with a very profitable article for exportation into other countries. *Brownrig* of Salt, p. 43. See *Bay* SALT, supra.

SALT-*petre*. There are some lands in Jamaica and our other American plantations, which are said to contain *salt-petre*; though there have been no works set up for the refining and preparing it. The earth containing it has been found to have very different effects on vegetables from those of common earth.

The sugar canes that grow on these spots shoot up much faster, and grow larger than in other grounds; but they rot very soon if not ground, and they do not boil so well into sugar as the others. Potatoes planted in these grounds are always found to be two months forwarder than others, but they must be used soon, otherwise they decay, the *salt-petre* eating away the skin, which is thinner on those roots which grow in this sort of ground than elsewhere; and the fleshy part of this beginning to rot and moulder away. The tobacco planted, on the same grounds, is greatly altered in its nature also. It grows up very quickly, and becomes robust and strong, but it will not be cured to so good a colour as that which grows on common earth, nor will it keep so well; many cargoes of this tobacco have wholly perished at sea, by the leaves mouldering away to dust. And it is reported, as a certainty, that this tobacco, when smoaked, flashes in the pipe with large flames. Phil. Transf. N° 33.

SALT *springs*. There is a copious *salt spring* in the neighbourhood of Durham, lost to the country, by its rising in the bed of the river Weare. It does not issue out of any one particular spot, but bubbles up from the mud and rocks for the space of forty yards in length, and about ten yards in breadth. It is best examined in dry seasons, in the middle of summer; for at this time the water of the river is all carried into another part of the channel, and this place left dry. The greatest quantity at this time is found to issue out of a hard rock. It is as *salt* as any of the Cheshire brines; and though but very small in quantity, in proportion to the size of the river, yet it gives a manifest saltness to the water a hundred yards below. The brine has been collected in summer by some curious people, and evaporated, and is found to yield a very useful *salt*, not like that of the common inland *salt springs*, which is our white basket *salt*, but rather like the bay *salt*, of a dusky colour, and not very pleasant taste, but as fit for all the uses of life as any other *salt*. The water of this spring, as it runs among the stones in summer tinges them all of a reddish colour, which is a property not common to other brine. Phil. Transf. N° 163.

In Cheshire, and many other counties, they make a great use of the water of these springs, as a manure for their lands. They let out the water of these springs for a certain time upon the lands, after there has been rain, and by this means the quantity of *salt* they contain is so blended with the rain water, that it is too weak to hurt the corn or grass, and yet is strong enough to kill worms, and other vermin.

The vegetables of all kinds are improved also by this, for there are no lands that fatten cattle sooner, than the pasture grounds which are thus, at times, overflowed by the *salt* water.

We have instances of a like effect of sea *salt* in small quantity, and but occasionally laid on, doing great good to pasture in those high pastures about Erith, which are only overflowed sometimes in spring tides. These fatten cattle of all kinds in a very surprising manner. It is a wonder that no body has yet attempted a regular manuring of land with *salt* upon this plan, for bay *salt* might be had at a very small price in time of peace, and a bushel or two allowed to an acre, would probably have all the advantages that these over-

overflowings of the high tides, and natural *ſalt* ſprings, are found to have. Some farmers have tried the ſcattering *ſalt* over their corn fields, as ſoon as ſown, in the quantity of two buſhels to an acre, and it is ſaid with good ſucceſs. *Mortimer's* Huſbandry.

SALTS *microſcopically examined*. Mr. Lewenhoek has opened a very extenſive field for microſcopic obſervations, in the evaporation of certain fluids, in which *ſalts* of various plants, and other ſubſtances of a like kind, had been diſſolved.

The fixed *ſalts*, in general, are ſaid by chemiſts to admit of no cryſtallizations at all; but this curious obſerver found, that on being evaporated in ſmall quantities before the microſcope, they each would ſhoot into extremely minute, but regular cryſtals, and thoſe often of various forms in the ſame *ſalt*; but that theſe varieties were only of a certain number, and that no other *ſalt*, but that to which they belonged, had them all in the ſame regular manner.

The ſophiſtications of *ſalts*, too common among our chemiſts, may be diſcovered by this means, and many other advantages may he obtained from it, as well as great amuſement, in the obſervation of the variety and beauty of the figures.

The moſt agreeable way of examining theſe *ſalts* is by the ſolar microſcope; but the moſt accurate, and fitteſt for making deductions from, is that by the common double microſcope. The way is to diſſolve a ſmall quantity of *ſalt*, of any kind, in water, and add to this about one fourth part of ſpirit of wine; this renders the whole a much leſs fit menſtruum for keeping the *ſalt* in ſolution, and conſequently it much more readily concretes from among it. A large drop of this liquor is to be laid on the ſurface of a thin and clear piece of glaſs, ſuch as may conveniently be laid upon the ſtand for receiving objects in this microſcope; then this glaſs is to be held till gently heated over a clear fire, and when it begins to evaporate, the glaſs is to be placed under the microſcope, and about a third magnifier uſed to examine it. The *ſalts* will ſoon be ſeen beginning to ſhoot, and will form themſelves under the eye into very beautiful figures; ſome reſembling branches of trees, others ruins and fortifications, and the like; but what are moſt to be depended upon, as eſſential to the *ſalt*, are certain little ſingle ſhoots, reſembling cryſtals; theſe are determinate in their figure, the others more vague and uncertain. Theſe will always be produced the ſame from the ſame *ſalt*, the others ſcarce twice from even the different drops of the ſame ſolution, alike in all reſpects. Philoſ. Tranſ. Nº 172. p. 1075.

Carduus Benedictus affords three different kinds of *ſalts*, or cryſtals, ſingle and perfect in their kinds; the one is a thin ſquare, another an oblong, and thicker body, terminated by a point at each end, and reſembling in miniature the perfect double pointed ſhoots of rock cryſtal; and the third a quadrilateral pyramid, of the ſhape of the cryſtals of common *ſalt*. The oblong double pointed ſhoots are the moſt numerous in this *ſalt*, and ſeem to be the perfect figure of the genuine and purer *ſalt* of the plant. They are ſo numerous and minute, that Lewenhoek ſays he ſaw as many of them in the quantity of a ſingle grain of water, as the eye can count ſtars in a clear night.

Theſe, as alſo the cryſtals of many other *ſalts*, continue regular while the water is about them, but as that evaporates they join together, and become confuſed.

Wormwood affords a great variety of figures in its *ſalt*. When this begins to ſhoot by the evaporation of the water, there are diſcovered a number of very ſmall double pointed ſhoots, reſembling the ſhape of a weaver's ſhuttle; after theſe there are found ſome ſquare ones, then ſome which have ſix angles, yet are flat and thin; ſome others reſemble triangles with the corners cut off, and ſome are large and oblong; others large and ſquare, and bordered round with the reſemblance of the cut edges of a looking glaſs.

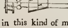
Blue vitriol, beſide its own rhomboidal cryſtals which ſhoot firſt, affords afterwards many oblong ones. The firſt rhomboidal ones have no ſenſible thickneſs, but they grow larger and thicker every inſtant, while the eye looks at them. They are pellucid and colourleſs at firſt, but afterwards they by degrees become blue, as they encreaſe in thickneſs.

Oil of tartar, made by diſſolving the *ſalt* into a liquor by the humidity of the air, firſt ſhoots into oblong and cylindric, but very thin bodies, reſembling ſmall cuttings of hairs; after theſe there appear certain flat bodies, having either two oblique ends, or one end ſtrait, and the other oblique.

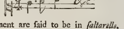
Ruſſia pot-aſh firſt concretes into figures like a weaver's ſhuttle, but theſe ſoon after enlarge, and loſe their form: after this there appear hexangular figures with broad baſes, reſembling ſome of the native diamonds and cryſtals; among theſe there are others oblong and flat, but truncated at each end, and ſome roundiſh; others approaching to that figure, but with ſeveral angles, irregular both in number and ſize.

Camphor forms regular cryſtallizations, approaching to a rhomboidal figure, having ſix perfect ſides, though generally irregular in bigneſs, and their thickneſs is generally equal to their breadth. Among theſe are many irregular ones; ſome ſhaped like the flint of a gun, and ſome broad at the baſe, and running to a taper and fine point. Philoſ. Tranſact. Nº 173. p. 1089. See Tab. of microſcopical Objects, Claſs 3.

SALTARELLA, or SALTARELLO, in the Italian muſic, is applied to triple time, the firſt note of which is pointed thus:



or



Airs in this kind of movement are ſaid to be in *ſaltarello*. Such are the Venetian forlanos, ſicilianas, ſome jigs and other gay dances.

SALTATIO *mimicorum*, in antiquity. See DANCE, *Cycl.*

SALTO, in the Italian muſic. See LEAP.

SALVIA, *ſage*, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, comprehending the *horminum*, and *ſclarea* of Tournefort and other authors, as plants of the ſame characters, and properly of the ſame genus: the characters of which are, that the calyx is a one leaved perianthium hollow, ſtriated, larger and compreſſed above, with an erect bilabiated edge; the upper lip being divided into three ſegments, the lower into two. The flower is a ſingle petal in form of a tube, large, and compreſſed above, and labiated at the mouth; the upper lip is concave, compreſſed, bent, and rimmed round its edge; the lower is broad and trifid; the middle ſegment being large, roundiſh, and rimmed round the edge. The ſtamina are two filaments bifid from their middle; the two branches remote, and having an obtuſe ſinus, one branch being the longer, and hid under the upper lip of the flower, and on this the anthera is placed; the other is terminated by an obtuſe body, probably a nectarium. The piſtil has a quadrifid germen, a thread-like, and very long ſtyle, placed in the ſame direction with the ſtamina, and a bifid ſtigma. There is properly no fruit, the calyx or cup of the flower cloſing ſlightly, and containing in its bottom four roundiſh ſeeds. *Linnæi* Gen. Plant. p. 6. See Tab. 1. of Botany, Claſs 4.

The characters of this genus, according to Tournefort, are theſe. The flower conſiſts of one leaf, and is of the labiated kind; the upper lip is ſometimes only arched, ſometimes very much hooked, the lower is divided into three ſegments; the middle one being protuberant, not hollowed like a ſpoon, as in the claries. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and is ſurrounded with four embryos, which afterwards become as many ſeeds of a roundiſh figure, which ripen in a tubular caſe, that was originally the cup of the flower. To theſe marks it may be added, that the ſtamina reſemble the os hyoides in animals. *Tourn.* Inſt. p. 180.

The ſpecies of *ſage* enumerated by Mr. Tournefort are theſe. 1. The greateſt yellow flowered mountain *ſage* with clary leaves. 2. The large broad leaved *ſage*. 3. The greater *ſage* with purple flower cups. 4. The greater *ſage* with changeable coloured leaves. 5. The great *ſage* with leaves variegated with green and yellow. 6. The three coloured ſilvery *ſage*. 7. The leſſer *ſage* with ſinuated leaves edged with yellow. 8. The roundiſh leaved *ſage*. 9. The broad leaved ſerrated *ſage*. 10. The wormwood *ſage*. 11. The berry-bearing *ſage*, or apple *ſage* of Candy. 12. The Candy *ſage* without apples. 13. The white flowered Candy *ſage* without apples. 14. The narrow leaved ſerrated *ſage*. 15. The leſſer auriculated, and not auriculated *ſage*. 16. The ſmall white flowered not auriculated *ſage*. 17. The leſſer *ſage* with variegated leaves. 18. The thin leaved Spaniſh *ſage*. 19. The lavender leaved Spaniſh *ſage*.

The common broad leaved *ſage*; or, as we uſually call it, from the colour of ſome of the leaves, red *ſage*, is a ſudorific and diuretic; it promotes the menſes, and is good in palſies, vertigoes, tremors and catarrhs; and mixed with honey, it is ſaid to be one of the beſt known cures for the aphthæ and eroſions of the mouths of children.

The ſmaller leaved *ſage* generally ſold among us under the name of *ſage* of virtue, has the ſame qualities in a greater degree.

SALUSANDRIA, in botany, a name given by ſome authors to the nigella, called in Engliſh *gith*, or fennel flower. *Ger.* Emac. Ind. 2.

SALUTATION, *ſalutatio*, among the Romans, was a daily homage paid by clients and inferiors to their ſuperiors.

Among the great the atrium was the place appointed for this purpoſe, but among people of middling condition the veſtibulum only. See the articles ATRIUM and VESTIBULUM.

This practice of *ſalutation* was not confined to the city, but took place in the army likewiſe, it being uſual for the private ſoldiers to go very early in the morning to *ſalute* their centurion, who at their head proceeded to *ſalute* the tribune, and then the tribune, with the reſt, went and *ſaluted* the imperator, or commander in chief.

The women too had their crowds of *ſaluters* attending them every morning. *Pitiſc.* in voc. *ſalutatio.*

The manner of receiving thoſe who came to pay their reſpects,

ſpects, was to receive thoſe of the better ſort with a kiſs, and the poorer ſort had a ſmall entertainment given them, and were even feaſted by ſuch as wanted to be thought more liberal than ordinary.

SALUTATORIUM, in nunneries, a place where the nuns receive the ſalutation of thoſe that come to ſee them. *Hofm.* Lex. univ. in voc.

Salutatorium is alſo uſed for the veſtry, or place where the biſhop was dreſſed, and received the ſalutation of viſitants before divine ſervice. Id. ibid.

SALUTIGERULI, among the Romans, were ſervants chiefly employed by the women in carrying ſalutations to one another. *Pitiſc.* in voc.

SAMALUM, in botany, a name by which Pliny and ſome other authors have called the *pulſatilla*, or paſque flower. *Ger.* Emac. Ind. 2.

SAMARRA, a garment worn by thoſe condemned by the Romiſh inquiſition to be burnt; ſuch are impenitents, and thoſe who confeſs themſelves guilty of hereſy, but repent, and renounce their errors before the execution.

It is a black kind of frock, made of ſackcloth, and painted with flames pointing downwards; ſometimes the unhappy ſufferer's picture is drawn to the life on it, and ſometimes devils are painted on it dragging, as it were, the perſon along with them to hell. It is otherwiſe called *ſambenito*, and *ſamaretta*. *Hofm.* Lex. univ. in voc.

SAMBAK, or ZAMBAK, in botany, a name uſed by ſome authors for the jaſmine, or common white jeſſamy. *Chabræus*, p. 112.

SAMBENITO, a kind of frock worn by thoſe who are condemned by the Romiſh inquiſition to be burnt. See the article SAMARRA.

SAMBUCA, among the antients, a triangular muſical inſtrument. *Pitiſc.* in voc.

SAMBUCUS, the *elder*, in botany, the name of a genus of trees, the characters of which are theſe. The flower conſiſts only of one leaf, and is of the rotated kind, and divided into many ſegments at the edges. The middle of the flower is perforated by the pointal of the cup, in the manner of a nail, and the cup finally becomes a berry, containing ſeveral oblong ſeeds.

The ſpecies of *elder*, enumerated by Mr. Tournefort, are theſe, 1. The common *elder* with black berries. 2. The common *elder* with white berries. 3. The racemoſe mountain *elder* with red berries. 4. The jagged leaved *elder*. 5. The dwarf *elder*, called *ebulus*, or danewort. 6. The dwarf ſhrubby *elder* with beautifully variegated leaves. 7. The jagged leaved *ebulus*, or danewort. *Tourn.* Inſt. p. 606.

SAMEL-*bricks*. See the article BRICK.

SAMIA *terra*, in the materia medica, an earth of the marl kind, found in the iſland of Samos, and much uſed both in medicine and in the pottery of the antients.

It is of two kinds, a white dull looking one, called the *collyrium ſamium*, and a browniſh and glittering one, called the *aſter ſamius*. *Hill's* Hiſt. of Foſſ. p. 38.

The *collyrium ſamium* is ſtill to be found in the place from whence they had it, and from whence it has its name; and is a very fine and pure earth, of a cloſe, equal, and regular texture, and yet remarkably light. It is of a fine bright white colour, and of a ſmooth, even, and gloſſy ſurface. It is ſoft to the touch, adheres firmly to the tongue, is eaſily broken between the fingers, and does not at all ſtain the hands, but drawn along a rough ſurface, leaves a fine clean white line. It melts ſlowly in the mouth, and does not ferment with acids. Theſe are the characters by which it is to be diſtinguiſhed from the white earths: to which may be added its manner of lying in the earth; which is not, as that of moſt of the other earths, in a continued ſtratum, or bed, but in the perpendicular fiſſures, and horizontal cavities in the ſtrata of ſtone, in the manner of the European earths, called the *medullæ ſaxorum*, but in ſubſtance very different from them all.

The antients prepared them by burning, waſhing, and then uſed them with ſucceſs internally in hæmorrhages, and fluxes of all kinds, and externally in inflammations. They alſo uſed them, probably, both mixed together, and blended with ſome other viſcous earth, or clay, for the fineſt of their earthen ware. *Hill's* Hiſt. of Foſſ. p. 38.

The other kind of *Samian* earth, called *aſter ſamius*, is ſtill found in the place from whence they had it, and lies in the ſame manner in which they have deſcribed it, in an horizontal cavity between two rocks.

It is a looſe, lax, and crumbly earth, of a mixed colour, between a duſky white and a pale brown, and all over ſpangled with ſmall glittering particles. It is of a looſe and incoherent ſtructure, but uſually breaks away into flat pieces, and ſeems ſomewhat of an obſcurely laminated make. It is of a dry duſty ſurface, falls to pieces very readily between the fingers, and though it duſts the hands, does not at all ſtain them. It melts very readily in the mouth, and when thrown into water parts immediately, with a hiſſing noiſe, into a number of flaky pieces, and from thence moulders into a looſe powder. It makes no effervefcence with acid menſtrua, and when its glittering particles are ſeparated, and ſtrictly examined, they are found to be ſo many thin flakes of that ſpecies of foſſils, called *ſelenites*.

This, as well as the other ſpecies, or *collyrium*, was prepared by calcination and waſhing, and uſed by the antient phyſicians internally in fluxes and hæmorrhages, and externally in inflammations. It was alſo one of the moſt valued earths in the Roman pottery. *Hill's* Hiſt. of Foſſ. p. 39.

SAMIARII, among the Romans, were a kind of furbiſhers, who with Samian earth poliſhed the arms of the prætorian ſoldiers and emperor's life guards. *Pitiſc.* in voc.

SAMIR, a kind of worm, which, according to the fabulous ſtories of the Jews, was made uſe of by Moſes in fitting and poliſhing the precious ſtones in the ephod, and the two tables of the law. *Hofm.* Lex. univ. in voc.

SAMLET, an Engliſh name for a fiſh of the truttaceous kind, caught in Herefordſhire, and ſome other parts of England, and called by Willughby *ſalmulus*. *Willughby's* Hiſt. Piſc. p. 193. See SALMULUS.

SAMOLUS, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf, is rotated, aad divided into ſegments at the edge. The piſtil ariſes from the cup, and is fixed in the manner of a nail to the lower part of the flower, and finally joining with the cup, it forms a ſhell, or capſule, which opens at the ſummit, and contains a great number of ſmall ſeeds.

The ſingle ſpecies of *ſamolus*, according to Mr. Tournefort, is the *ſamolus valerandi*, called *anagallis aquatica rotundifolia*, or the round leaved water brook lime, by authors. *Tourn.* Inſt. p. 143.

SAMP, in our American colonies, a name given to a ſort of bread made of the maiz, or Indian corn.

They firſt water the corn for about half an hour, and then beat it in a mortar, or grind it in a hand mill; they then ſift out the flour, and winnow the huſks from it; they then mix this into a thin paſte with water, and bake it in flat loaves, which they call *ſamp* loaves, or *ſamp* bread.

Beſide this they have another diſh prepared of this corn, which they eſteem a great delicacy, and call by the name of *ſamp*, without the addition of loaf or bread. To make this, they only bruiſe or grind the corn to the ſize of rice, and then winnowing away the huſks, they boil it gently till it is thoroughly tender, and then add to it milk and butter, and ſugar: this is not only a very wholſome, but a very pleaſant diſh. It was the firſt diet of our planters when newly ſettled there, and is ſtill in uſe, as an innocent food in ſickneſs as well as health.

The Indians, who feed on this ſort of food, are found never to be ſubject to the ſtone, and to eſcape ſeveral other painful diſeaſes.

The Engliſh have found a way of making a very good ſort of beer of the grain of this Indian corn: they do this either by uſing the bread made of it, or elſe by malting it as we do our own corn. When they make the beer of the maiz bread, they break or cut it into lumps as big as a man's fiſt; they maſh theſe in the ſame manner that we do malt, and boil up the wort in the ſame manner, either with or without hops. Phil. Tranſ. Nº 142.

SAMPHORÆ, among the antients, were horſes marked with the letter Σ on their legs. *Pitiſc.* in voc.

SAMPSUCHUS, a word generally uſed as a name of the common ſweet marjoram. This is as old a cuſtom as Dioſcorides; for that author expreſsly ſays, that the plant *ſampſuchus* was called *amaracus* by the Cyzenians, and ſome others whom he names, and ſeems to make them proper ſynonyms of the ſame plant; yet afterwards mentioning the oils, called *oleum ſampſuchinum* and *oleum amaracinum*, he declares them to be different medicines.

This might ſeem to imply a falſe text, either by the error of the tranſcribers or printers, in one of the places, but thoſe who are verſed in the writings of Dioſcorides, will not infer ſo much; for there are too many inſtances of this ſort of contradiction in his works. It appears, however, from the moſt antient writers of all, that the *amaracus* and *ſampſuchus* were originally the names of different plants.

Meleager in his poem, where he compares the ſeveral poets of his own and former times to the flowers of various garden plants, compares one to the *amaracus*, and another to the *ſampſuchus*. Galen and Paulus Ægineta alſo make them different plants, and allot different chapters to the treating of them. This would never have been the caſe, had the general opinion of the world at that time made them one plant; and the teſtimony of Dioſcorides, that they were ſo, will weigh very little with thoſe who know how often that author, though excellent in his way, is guilty of inaccuracies of this kind.

Diocles, in Athenæus, indeed mentions *amaracus*, which ſome call *ſampſuchus*: but even allowing that ſome people did call the *amaracus* by this name, it does not follow but that this might be improperly done, and that the *ſampſuchus* might ſtill be the name of a different plant.

SAMYDA, in botany, the name of a genus of plants firſt deſcribed by Plumier, and called by him *guldonia*; the characters are theſe. The cup is a very large one-leaved perianthium

anthium, divided into five segments, which stand wide expanded, and remain when the flower is fallen, and are of an oval figure. The flower is of the shape of a truncated cone; it is of the length of the cup, and is dentated at the edge, and sulcated. There are no stamina, but the apices stand each at the summit of one of the jags of the flower, and are of a roundish figure. The germen of the pistil is of an oval figure; the style is of the length of the flower, and is of a pointed form; and the stigma is headed. The fruit is an oval berry with four deep furrows, divided into four cells, and containing a number of kidney-shaped seeds in an oval receptacle. Linnæus thinks this nearly related to the *melia*. *Plumier*, 24. *Linnæi* Gen. Plant. p. 520.

SANALIA, a name given by some authors to those tumors, commonly called *meliceres*.

SANAMUNDA, in botany, a name used by some authors for the sea heath spurge, or empetrum of the shops; a plant of the thymelæa kind.

In the materia medica, however, according to most catalogues, the *sanamunda* is appropriated to be the name of the heath spurge, another plant of the thymelæa kind, different from the sea sort. *Park.* Theatr. p. 203. *Dale's* Pharmac. p. 314.

SANATES, among the Romans, an appellation given to those people in the neighbourhood of Rome, who having revolted, soon submitted themselves again; on which account they had equal privileges with the other citizens, there being a law in the twelve tables ordaining *ut idem juris* sanatibus *quod fortibus sit*. *Pitisc.* in voc.

SANATODOS, in natural history, a name given by the people of Sicily to the spungy excrescence found on the stalk of the dog rose, and more usually called the *bedeguar*.

This they greatly esteem in all venomous bites, and use it in fine powder, both internally and externally, in many parts of that country. They use no other remedy for the bite of a viper: the wound is scarified, and some of the powder is sprinkled on, and large doses of it are also given internally in strong wine.

In the bite of a mad dog they apply it to the wound, softened into a sort of pultice with oil, or with strong wine; and they give it in repeated doses internally in broths, and other weak fluids. They give it also in continual fevers, and in many other cases, particularly in the colic. It is said, that a single dose of a dram of it, in red wine, takes off all the pain of the colic in an hour.

There seems a very old opinion on the side of this medicine, in the cure of a bite from a mad dog; for Pliny tells us, that the root of the wild rose, from the stalks of which this substance grows, was revealed in a dream for the curing this terrible disease. People, who have found out some one virtue in a plant, are generally ready to attribute a great many more to it; but though too much may be said in praise of the virtues of this substance, by the people of that part of the world, it is well worth trying whether it does not contain some of them, as it is a thing very common among us, and easily had in any quantities. *Boccone's* Museo de Piante.

SANCTORIAN *tables*, is used to signify such registers as exhibit the quantities of perspiration, its proportion to stool or urine, &c. We have such tables from the observations of Dr. Lining at Charles-Town, South-Carolina. See Philos. Trans. Nº 470, and 475.

SANCTUARIUM, in ecclesiastical writers, the same with *brandeum*. See BRANDEUM.

SANDS, *arenæ*, in natural history, a genus of fossils, the characters of which are; that they are found in minute concretions forming together a kind of powder, the genuine particles of which are all of a tendency to one determinate shape, and appear regular, though more or less compleat concretions; not to be dissolved or disunited by water, or formed into a coherent mass by means of it, but retaining their figure in it; transparent, vitrifiable by extreme heat, and not dissoluble in, nor effervescing with acids. *Hill's* Hist. of Foss. p. 544.

These are subject to be variously blended and intermixed either with homogene, or heterogene particles, particularly with flakes of talc; and according to these, and their different colours, are to be subdivided into several kinds.

White SANDS. Of such of these as are pure and free from heterogene particles, we have only six known species. 1. A fine shining kind, commonly used for strewing over writing, and common in many parts of the kingdom. 2. A large shining white *sand*, found in great plenty about Maidstone, and sent up to London for the making our common white flint glass. 3. A very fine white glittering *sand*, found on the shores of some rivers in Italy, and used there for the finest glass. 4. A brownish white fine, but dull looking *sand*, very common in France, and used there in glass-making for the green glass; but though common enough with us also, is so much inferior to the other kinds we have, that it is never used or regarded. 5. A yellowish white fine dull *sand*, common in the deserts of Africa, and not less so in Italy, America, and England, but made no use of. And 6. a reddish white one, common in Sussex, and in many other places.

Of the white *sands*, mixed with *sandy* particles of other colours, we have three species. 1. A large brownish white shining *sand*, found, so far as is yet known, only in one place, which is in the loam pits in Hedgerley near Windsor; and this is the very *sand*, of which with clay that loam is composed, and to which probably it owes its value. 2. A large yellowish white shining *sand*, which nearly resembles the former kind, and which might be of use to make an artificial loam, in the place of the natural one beforementioned, as also in the glass trade: this is found about Deptford, Highgate, Hampstead, &c. 3. A large coarse variegated *sand*, made up of white, black, reddish, and brown: this is very common in our gravel pits, and on the shores of the sea and rivers.

Of the white *sands*, containing heterogene particles, there are also three kinds. 1. A fine dull brownish white *sand*, with micæ, or small spangles of talc: this is common near the surface in most parts of England. 2. A fine dull greenish white *sand*, with micæ, common about Deptford, Woolwich, &c. And 3. a fine glittering greyish white *sand*, with micæ, found in great plenty on the shores of the islands of Scilly.

Red, or *reddish* SANDS. Of those which are pure there are five species. 1. A large shining red *sand*, found on the shores of the island of Santorini. 2. A large shining flesh coloured *sand*, common about Naples. 3. A coarse shining brownish red *sand*, common on the heaths of Sussex. 4. A fine brownish red shining *sand*, found near the surface on Hampstead heath. 5. A fine pale brownish red shining *sand*, frequent near the surface on the heaths of Sussex. *Hill's* Hist. of Fossils.

Of the impure reddish *sand* we know only one species, a pale red very fine one, with micæ: this is common in the deserts of Arabia, and not in any other place, so far as is yet known.

Yellow SANDS. These are a very numerous sort. Of those which are wholly pure we have thirteen known species. 1. A fine pale brownish yellow one, common on Hampstead heath. 2. A fine shining pale reddish yellow one, common about Highgate. 3. A very fine shining pale yellow one, common in the deserts of Arabia, and also found with us in Kent and Sussex. 4. A fine shining gold coloured *sand*, common on Hampstead heath. 5. A very coarse shining pale yellow one, frequent every where to the north of London. 6. A coarse dull whitish yellow one, common in Hyde-Park. 7. A large shining yellow one, found also in Hyde-Park. 8. A coarse very bright yellow one, found in Northamptonshire, and in some other counties. 9. A large dull yellow one, common on the shores of our rivers. 10. A fine dull deep yellow one, common in America, and in England. 11. A dusky yellow shining coarse one, found on Hampstead heath. 12. A coarse shining brownish yellow one, common among gravel about London.

Of those mixt with arenaceous particles of other colours, we have six known species. 1. A fine greenish yellow pale and dull one, found on Hampstead heath. 2. A fine greenish and reddish yellow pale dull one, found in Sussex. 3. A coarse blackish yellow shining one, common about Tyburn and elsewhere. 4. A fine blackish yellow shining one, common about London. 5. A large shining blackish and pale yellow one, found about Hampstead. 6. A fine deep yellowish brown shining one, found in Gloucestershire, and some other counties.

Of the yellow *sands* which contain heterogene particles, not arenaceous, we have nine species. 1. A brownish yellow fine one, with micæ, found about Hampstead. 2. A fine pale reddish yellow one, with small spangles, common in America, and found with us in Sussex and elsewhere. 3. A coarse straw coloured *sand*, with micæ, found in Sussex, and about London. 4. A coarse sulphur coloured *sand*, with micæ. This is a more scarce species. 5. A large shining yellow *sand*, with micæ, found on Hampstead heath. 6. A fine dull deep yellow one, with micæ, common in most parts of the kingdom. 7. A large deep yellow *sand*, with micæ, found in Northamptonshire, and some other counties. 8. A coarse saffron coloured *sand*, with micæ, common in Germany, and found also in Sussex. 9. A deep brownish yellow fine *sand*, with micæ, found about Highgate.

Brown SANDS. Of those of this colour which are pure, we have only three known species. 1. A fine brown *sand*, frequent about Woolwich. 2. A coarse shining pale brown one, found on the shores of the Thames. And 3. a coarse purplish brown shining one, common about Bristol.

Of those containing heterogene particles, we have only two species. 1. A dull brown coarse *sand*; this has among it some fragments of spar. It is found on the shores of rivers. 2. A coarse shining pale brown one, common among gravel on the beds of rivers.

Black SANDS. Of these we have only two species. 1. A fine shining greyish black one, found in Italy, but not with us. 2. A fine shining reddish black one, which seems peculiar to America.

Green SANDS. Of these we yet know only one species, which is a coarse variegated dusky green one, common in Virginia,

nia, but not known elsewhere. *Hill's* Hist. of Foss. p. 568. It is remarkable that *sand*, though it appear a very hard, dense, and indissoluble body, yet is contained invisibly in the brine, or salt water of our salt springs; and even on the shooting of the salt, after evaporation, there still remain the particles of it in the clear pellucid salt; and this, though wholly soluble in water, yet when a brine, made by such a solution, is boiled, deposits as much of the *sand* as the common brine of the pits, or sea water.

Dr. Plot, who was very curious to know the true history of this singular effect, procured experiments to be made in the following manner. Eight folds of fine Holland, and as many of much finer cambrick, were put together, and a quantity of the brine of the Staffordshire salt pits being strained through this, there was nothing separated from it but a small quantity of black dust, which seemed to have fallen in by accident, and which was not at all like *sand*; yet on evaporating this brine, it was found to contain no less than one fourth part as much *sand* as salt. The quantity of brine yielding a bushel of salt, yielding also a peck of *sand*.

Some have supposed from these, and the like observations, that the *sand* was generated during the time of the boiling of the liquor, but the more careful examiners think otherwise; it appearing to them, that the particles of this *sand* may be seen in the brine, by the help of a microscope, before the boiling, in form of rectangular oblong plates, some nearly square; these were so small, as readily to pass the strainer with the water; and appearing as numerous in it after, as before the straining, shew that they are no more to be kept, but by such means, than the salt.

The pores of the finest strainers, examined by the microscope, appear twenty times bigger than these plates, or particles of the *sand*, and therefore it is not to be wondered at, that they let them through. There requires, therefore, no more to the formation of the *sand*, than the coalescing of several of these particles into one larger granule, and so on; and this is very likely to be done by means of the evaporation of a part of the fluid which kept them separate, and of the motion given to them in boiling, which naturally and necessarily brought them into the spheres of their own mutual attractions, at a time when their attraction with the fluid they swam in, was also much diminished with its quantity. This attraction seems even evidently to increase between the particles, as the water becomes evaporated, and when finally the salt is drawn from it, and it is examined as it drops from the baskets, in which the salt is put to drain; it is seen to contain more numerous particles of this sandy matter than before; and these are found to coalesce into yet larger concretions, by degrees, as the remainder of the fluid evaporates from them on the glass.

The particles of this stony matter, when once thus united, are no more to be separated by water, nor is the matter any longer soluble in that fluid. The common spar found in form of stalactites and incrustations on the roofs, walls, and floors of old caverns, shews that it was once dissolved in water, and by that means brought to those places, and made into those forms; and it should seem, that this *sand*, as it is called, was only this sort of spar, which is contained more or less in all water; and which, on the evaporating of that water and separation of the salt, which might help in making the water a menstruum proper for the retaining it, shoots out into its own natural concretions; for the figure of these thin plates is the true and natural thin parallellopiped or rhomboidal figure of the smaller concretions of that matter, and even of those pieces into which it falls on breaking. Phil. Transf. N° 145.

Sand seems to have been the first substance added to proper salts for the making of glass. Josephus, Tacitus, Strabo, Pliny, Agricola, &c. all mention this, and tell us of the stores, from which the *sand* for this use was brought, being inexhaustible.

Later ages have found that stones which have crystal for their basis make a finer glass than *sand*, of this kind are flints, &c. but these all are so expensive in their preparation, that *sand* is still used in much greater abundance than any other ingredient. All the preparation it requires, is, that it be well washed before it is used; which much of what is used is found ready to their hands, being brought from the shores and beds of rivers.

Our glass-houses, in London, use for their white glass the common white *sand* used in writing, and have it from Maidstone in Kent in vast quantities. For their green glass they use a common coarse and greenish looking *sand*, of which there are vast strata at Woolwich. *Merret's* Notes on Neri, p. 260.

Common *sand* is a very good addition by way of manure to all sorts of clay lands, it warms them, and makes them more open and loose. The best *sand* for the farmers use is that which is washed by rains from roads, or hills, or that which is taken from the beds of rivers; the common *sand* that is dug in pits never answers nearly so well. *Sand* mixed with dung is much better than laid on alone: and a very fine manure is made by covering the bottom of sheep folds with several loads of *sand* every week, which are to be taken away, and laid on cold stiff lands, impregnated as they are with the dung and the urine of the sheep.

Beside clay land there is another sort of ground very improveable by *sand*; this is that sort of black foggy land on which bushes and sedge grow naturally, and which they cut into turff, in some places. Six hundred load of *sand* being laid upon an acre of this land, according to the Cheshire measure, which is near double the statute acre, meliorate it so much, that without plowing, it will yield good crops of oats or tares, though before it would have produced scarce any thing. If after this crop is taken off, the land be well dunged, and laid down for grass, it will yield a large crop of sweet hay.

Once sanding this land will improve it for a vast number of years, and it will yield two crops of hay in the year, if there be weather to make it in. Some land in Cheshire has been, by this means, rendered of twelve times its former value to the owner. The bogs of Ireland, when drained, have been rendered very fruitful land, by mixing *sand* in this manner among the earth, of which they consist. Add to this, that in all these boggy lands, the burning them, or firing their own turff upon them, is also a great advantage. The common peat, or turff ashes, mixed with the *sand* for these purposes, add greatly to its virtue.

Sea *sand*, which is thrown up in creeks and other places, is by much the richest of all *sand* for manuring the earth, partly its saltness, and partly the fat and unctuous filth that is mixed among it give it this great virtue. In the western parts of England, that lie upon the sea coasts, they make very great advantages of it. The fragments of sea shells also, which are always in great abundance in this *sand*, add to its virtues; and it is always the more esteemed by the farmers, the more of these fragments there are among it.

The sea *sand* used as manure in different parts of the kingdom is of three kinds: that about Plymouth, and on other of the southern coasts, is of a blue grey colour like ashes, which is probably owing to the shells of muscles, and other fish of that or the like colour, being broken and mixed among it in great quantity. Westward, near the land's end, the sea *sand* is very white, and about the isles of Scilly it is very glistering, with small particles of talc; on the coasts of the north sea the *sand* is yellowish, brown, or reddish, and contains so great a quantity of fragments of cockle shells, that it seems to be chiefly composed of them. That sea *sand* is accounted best, which is of a reddish colour: the next in value to this is the bluish, and the white is the worst of all.

Sea *sand* is best when taken up from under the water, or from *sand* banks, which are covered by every tide.

The small grained *sand* is most sudden in its operation, and is therefore best for the tenant who is only to take three or four crops; but the coarse or large grained *sand* is much better for the landlord, as the good it does lasts many years.

Where the *sand* is dredged out of the sea, it is usually twice as dear as where it is taken from the *sand* banks.

When the land has been well manured with the large *sand*, they take four crops of corn from it, and then lay it down for pasture for six or seven years before they plow it again. The grass is so good, that they commonly mow it for hay the first year; it always abounds very much with the white flowered clover. If the grass grows but short, it is the farmer's interest to feed his cattle upon it, and it will turn to as good account this way, being very sweet and rich, and making the cattle fat, and the cows yield a very large quantity of milk. *Mortimer's* Husbandry.

Indian Sand. The substance, commonly called *Indian sand*, is famous for answering to the magnet. It is brought into several parts of Europe, and is said to be gathered on the sea shore in Persia. After it is gathered, it is boiled in water to wash away the sea salt and other impurities it may contain. After this operation, it is dried and sent abroad in form of a black powder, consisting of grains of different sizes. Some of these grains are very rough in every part of their surface, and others have one side only rough, the others perfectly smooth and glossy. Their figure is very irregular, and resembles that of the grains of common *sand* only; the grains of this *Indian sand* are usually smaller than those of our common *sands*.

These little lumps have neither taste nor smell, and are so friable, that they are easily reduced to an impalpable powder by rubbing. Some of the particles are strongly attracted by the loadstone, and others are so inactive as to be scarce at all affected by it. Those particles, which are of the deepest dusky black, are most of all affected by the loadstone; those which are not affected by it, seem rather of the colour of lead, of a bluish black and shining; these are in the greatest quantity, and the others are selected from among these by the loadstone. Phil. Transf. N° 432. p. 298.

Muschenbroek considering that some of the particles of this *sand* had so strong a magnetic virtue, and others scarce any at all, was tempted to try whether it might not be possible to increase the like virtue in these last, and after some trials he found a way to succeed in this attempt; suspecting, that there

there might be too great a quantity of fulphur adhering to the *fand*, to fuffer it to be turned into any metalline regulus by a long continuance in an open fire; he mixed it with half its quantity of pot-afh, and toafted it in an open crucible about two hours: after this the falt being wafhed away with common water the *fand* was found to be much blacker than before, and about one fourth of it was now endued with a very powerful magnetic force.

The falt has a great fhare in making this *fand* magnetic after burning; for a burning of it, without that admixture, is found to give it, indeed, fome power of this kind, but it is very little.

There is another matter, however, which being mixed with this fand, contributes yet greatly more to its virtue, this is black foap. This *fand* being mixed with an equal quantity of black foap is to be put into a crucible, and placed in a gentle fire, where the foap will fwell and bubble up; as foon as this is over, and the moifture all evaporated, the fire is to be increafed, and the matter kept red hot, about half an hour, or a little longer than that; then the crucible being taken out, and cooled, the remainder is to be wafhed, and this will be then a black powder; every grain of which is magnetical, and that very beautifully. If the operation be ever fo many times repeated on the fame *fand*, the power remains the fame in it, neither being increafed nor leffened by all the work.

A mixture of one third of this *fand*, one third of black foap, and one third of falt of tartar, treated in the fame manner as the former, feems to increafe the virtue of magnetifm yet farther in the *fand*, than when treated with the foap alone; beef fuet mixed with the *fand* gives it much of the magnetic virtue, after melting and burning it away on the fire; and common pitch treated in the fame manner with it, yet greatly increafes it. If it be too long kept over the fire, with any of thefe mixtures, the virtue decreafes, and if not long enough, it does not arife to its utmoft height; fo that experiments only can fettle the true degree of heat, neceffary to its greateft perfection.

The greateft power that can be given to this *fand*, in this quality of magnetifm, is, however, to be given in the following manner. Mix together equal parts of the *fand*, and of rofin, pitch, frankincenfe, and rape oil, put this into a crucible, and lute it well in all parts, then place it for an hour in a reverberatory furnace: when this is cooled, there will be found black grains of the *fand*, between black coals of the oily matter, which, when feparated, will leap up to the magnet, when held at fome diftance over them; and fhew, in all refpects, the ftrongeft magnetic virtue, that we know communicable to this fubftance.

It might appear, from this experiment, that the *fand* grew more fenfible of the magnet, as its particles more approached to the nature of fteel; but on making the trial by calcining the *fand* with the ingredients ufed to turn iron into fteel, fuch as chimney foot, fea falt, powdered charcoal and afhes, it acquired fome magnetic virtue indeed, but not nearly fo great as that given it by the laft procefs, or by the fimply mixing it with bluifh foap before the calcination.

After thefe experiments, the queftion naturally occurs, of what can this *fand* be. It has been fuppofed by fome, to be the granulæ or fragments of load-ftones, or the feparated particles, which when concreted into a mafs, afford the common magnet; but this can by no means be the cafe, fince common load-ftones lofe of their force, by being calcined with the very ingredients which render this magnetic; and indeed the phænomena it affords on experiments are fo very fingular, that it is not eafy to determine any thing about it.

There are feveral parts of the world which afford this *fand*, but with fome difference in the figure of its grains, and their magnetic virtue. Befide Perfia it is found on the fhores of Virginia; another fort of it is found about Italy, and very common at Leghorn; this is very magnetic. There are two forts of it found in the river Eber in Haffia, of which one is like the Italian, but the other confifts of large grains, almoft as big as hempfeed, but having very little virtue. A very ftrong fort is found in Dalmatia, near old Ragufa; and probably future enquiries will fhew, that there are yet many more kinds of it differing in ftrength and fize. Phil. Tranf. Nº 432. p. 301.

Sand *bags*, in the military art, are bags of earth or *fand*, containing about a cubical foot; they are ufed for raifing parapets in hafte, or to repair what is beaten down.

They are alfo of ufe when the ground is rocky, and affords no earth to carry on their approaches, becaufe they can eafily be brought from far off, and removed at will.

The fmaller *fand-bags* hold about half a cubical foot of earth, and ferve to be placed upon the fuperior talus of the parapet, to cover thofe that are behind, who fire through the embraffures, or intervals, which are left betwixt them.

Sand *flood*, a term ufed by the people of Suffolk, and fome other parts of England, to exprefs a mifchief to which they are fubject, by having their lands covered with vaft quantities of *fand*, rolling in upon them like a deluge of water.

Mr. Wright, a fufferer by one of thefe deluges, gives a very good account of them in the Philofophical Tranfactions. In the neighbourhood of the plains, fubject to this mifchief, there are always hills which are made up of *fand*, and only covered with a thin turf. The plains themfelves, which are inevitably ruined by the deluge of this dry fort, are alfo fandy; having only the fame fort of thin turf on them, though capable of producing very good crops, and ftanding all common accidents.

Violent winds break through the turf that covers thefe hills, and then the *fand* lying loofe and naked, is foon carried down upon the plains, where it covers and buries the grafs, and in a very little time eats through the light turf, and mixing itfelf with the *fand* underneath, becomes one bed of this dry matter never to be covered with a turf again. A large body of *fand* being thus got together, nothing ftops its progrefs; but it at every ftorm rolls over more and more ground, fo that in a few years it extends itfelf a vaft way; efpecially where the ground, over which it paffes, is of the fame fandy nature, and only covered with a thin turf.

In fome parts of Suffolk the ground encourages this change fo greatly, that a bed of *fand* broke loofe from a neighbouring hill, and covering only a few acres, perhaps eight or ten, will, before it has travelled four miles forward, which it does in a fmall courfe of years, deluge a thoufand acres. It travels down hill fafter than any way elfe, but will not be ftopped by afcent, but will move up the fteepeft hill, only that it requires more time. The making of fences, in the common way, to keep it out is vain. It runs through the hedges, and flies over the tops of the banks; and when it reaches a village, in its courfe, will bury the cottages, unlefs preferved at more charge than they are worth. It will in a very little time beat up to the eaves of a houfe, of the low kind, that are ufually built in country villages, and has often weight enough to break down walls in its paffage.

The beft way of ftopping its progrefs is by hedges of furze, planted one over another as they become levelled; thefe, if well kept up, will, by degrees, ftop or divert the progrefs; and fome who have tried this, with refolution, after they have had the *fand* raifed twenty feet high, have found it ftop its increafe; and then having manured this adventitious foil with dung, found it as good ground as that which made the furface before.

About Thetford the villages were wholly deftroyed by this about ninety years ago; and the branch of the river Oufe, called then Thetford river, fo blocked up by it, that very fmall veffels only could go up it, where very large ones ufed before. The river has been of great fervice in ftopping its progrefs into Norfolk, where otherwife its courfe would have carried it, and its vaft fpreading fideways in proportion of its going forward, would have made it bury vaft quantities of land in a very few years.

The moft probable conjecture, as to the caufe of this ftrange fort of deluge in thefe parts of England, is, that this portion of the county of Suffolk lies eaft north eaft of a part of the great level of the fens, and is by this expofed to very impetuous winds, which acquire more than ordinary force, by their paffing through fo large a tract of country uninterrupted; the ftorms feem to be one great caufe of the mifchief, and the fandy nature of the foil the other. There are old ftories in the country, of fuits at law commenced among the farmers, for grounds blown out of the owner's poffeffion; but the people who gain this fort of wandering land are the greateft fufferers. A little *fand* fprinkled by the winds over a tract of land, where there is a bed of *fand* under the turf, foon eats through that obftacle; and what was at firft only a thin coat of *fand*, becomes then a deep plain of it, capable of being blown away to the depth of eight, ten, twenty, or more feet, and is carried over every thing in its progrefs before the winds, when once taken up by them. Phil. Tranf. Nº 37.

Sand-*gavel*, a payment due to the lord of the manor of Rodley, in the county of Gloucefter, for liberty granted to the tenant to dig *fand*, for their common ufe. *Blount*.

Sand-*lands*, a term ufed by our farmers to exprefs fuch grounds, as confift wholly of a pure fheer *fand*.

This is of different colours, as white, blackifh, reddifh, or yellowifh, and is very different in its nature, and in the fize of its particles, fome being harfher and fome milder, and fome very light, feeming only to be mere duft. The grey, black, and afh-coloured *fand*-lands are the worft of all, and generally are found on heaths and commons. Gravelly lands approach much to the nature of thefe, and thofe which confift of largeft ftones, and are mixed with the harfheft *fands*, are of all the moft barren.

The propereft plants for arable land, of this kind, are white oats, rye, black wheat, and turneps. The natural produce, in weeds, is quick grafs, forrel, broom, furze, fern, and heath.

The beft manure for them is either marl, or fuch clay as will break with the frofts. Cow dung is alfo a good manure for thefe lands, and many ufe with fuccefs chalk, mud, and the half rotten ftraw from dunghils.

When

When the farmer has a mind to raiſe corn on theſe lands, he muſt order them, as the clays; (ſee CLAY-*lands*) but where they are over-run with broom, furzes, and ſuch ſort of weeds, marl is to be laid on in great quantities. This is the practice in Staffordſhire, and by it they rid themſelves of theſe troubleſome weeds, and procure good crops of corn, though at ſome expence.

The firſt ſowing of this land is with black wheat, and for this they make three fallowings in winter, and ſtir them in the May following; at this time they ſow them, allowing one buſhel of ſeed to an acre, which generally yields them ſixty again. Then once plowing theſe lands, after this crop is off, they are fit to ſow rye on.

In Oxfordſhire they ſeldom give theſe lands more than two fallowings for wheat, except they are very much over-run with weeds; and they eſteem the white and lammas wheat the moſt agreeable for this ſort of land, and then after a fallow rathripe barley. They afterwards generally fallow them every other year, and reckon them unfit for beans and peas, though they ſometimes ſow them with winter vetches. If they ſow peas on them, they eſteem the rathripe kinds the beſt.

In Herefordſhire they are much ſubject to moſs growing upon their *ſandy lands*, and they make a great improvement by burning it on the ground, and mixing the aſhes with lime, which they then plow in.

They generally ſow them with rye after this manure, and that yields a very great increaſe upon them, and brings on a very good kind of graſs, if they are laid down after a crop or two. *Mortimer*'s Huſbandry, p. 70.

SANDAL-*bricks*. See the article BRICK.

SANDALIGERULI, among the antients, ſervants whoſe buſineſs it was to carry their maſter's or miſtreſs's *ſandals*. *Pitiſc.* in voc. See SANDAL, *Cycl.*

SANDAPELONES, among the Romans, a kind of porters who were employed in carrying the bier called *ſandapila*. *Pitiſc.* in voc. See SANDAPILA.

SANDAPILA, among the Romans, a ſort of bier uſed for carrying out the bodies of people of low circumſtances.

It was not a bed, but a kind of wooden cheſt, made of a few boards nailed together, and was uſually burnt along with the body. *Pitiſc.* in voc.

SANDARACH, (*Cycl.*) in the works of ſome of the antients, a name by which the yellow matter collected on the legs of bees is called; others of them called it *erithace* and ſome *ambroſia*.

We uſually eſteem this to be wax; but the experiments of Reaumur, and others, evidently prove, that it is not real wax; though it contains the matter of which wax is to be made: it is only the farina of flowers, collected into lumps, and probably ſerves the bees as food; and after it has afforded them nouriſhment, ſuffers ſome change in their bowels, by which it is converted into the ſubſtance we call wax. *Reaumur*'s Hiſt. Inſ. V. 10. p. 510. See PAIN *d'abeile.*

Gum SANDARACH is eſteemed good in diarrhœas and hæmorrhages, its doſe being from ten grains to half a drachm. It is alſo ſometimes preſcribed in gonorrhœas and the fluor albus. See SANDARUS, infra.

SANDARESUS, in natural hiſtory, a gem, the chief property of which, according to Pliny, is its being pellucid, and containing in its ſubſtance a kind of gold coloured globules; which are likewiſe tranſparent, when ſeen betwixt one and the fire. *Hofm.* Lex. univ. in voc.

SANDARUS, in the materia medica, the original name of the gum, which later ages have, by corruption of the name, called *ſandarax* or *ſandaracha*. The latter name is peculiarly improper, as it confounds this innocent gum with a poiſonous mineral of the arſenic or orpiment kind.

The Arabians are not eaſily to be underſtood in what they ſay of this gum. Some deſcribe it as a diſtinct gum from all others, and ſay that it reſembled amber in its colour and properties; this ſeems to expreſs properly what we at this time call *ſandaracha*, which has much of the appearance of yellow reſin, and therefore cannot be wholly unlike amber; but, as this gum was uſed in varniſh, and ſeveral other gums were alſo uſed for the ſame purpoſe, theſe writers, according to their uſual cuſtom of attributing the ſame name to different things, which had the ſame properties, have ſometimes called the *cancamum* by this name, and ſometimes amber. Gum lacca has often been called alſo by this name by theſe authors; and the context only can clear up what is meant, when either the word *ſandarus* or *cancamum*, or vernix is uſed.

SANDASTER, in natural hiſtory, a kind of gem mentioned by Pliny, with gold coloured globules in it that ſhone like ſtars, and were in number and diſpoſition not unlike the ſeven ſtars. *Hofm.* Lex. in voc.

SANDIVER (*Cycl.*)—It is reported, by many authors of great credit, that this ſalt, in its genuine form, and no way differing from ſuch as is ſeparated from glaſs, is thrown out in great abundance in the eruptions of the burning mountains, and lies about in lumps of a ſpungy texture and great ſize, or in ſmaller ſolid ones among the ſciarri and aſhes thrown out at thoſe times. The more firm and ſolid pieces are the moſt pure, and are generally of a fine white; the others not unfrequently are tinged bluiſh or yellow, and have ſometimes ſome of the melted matter of the ſciarri blended among the maſs, and filling up ſome of the cavities. In the catalogue of the ſpecimens of ſubſtances thrown out of Mount Ætna in one of its eruptions, and ſent as a preſent to the Royal Society, we find mention of ſeveral pieces of *ſandiver*, but without any particular deſcription. Phil. Tranſ. N° 53.

SANDYX (*Cycl.*)—Though the generality of authors have taken this to be only a name for the fine red colour, ſome have plainly uſed it for a bluiſh green.

Strabo tells us, that the colours uſed by painters, in his time, and called *armenium pictorium*, was of a bluiſh green colour, and that it was called *ſandycis metallum* by ſome. Thus the word *zarnich* was made to expreſs the ſame two things with the addition of the yellow orpiment; and Aviſenna deſcribes them all together, telling us, that *zarnich* is yellow, red, or green. The two firſt of theſe colours are natural to zarnich, as the name of orpiment; and there is, indeed, a greeniſh zarnich now alſo known in the world, but that was unknown in his times; and, we find, that he meant the *lapis armenus* by the *green zarnich*.

SANE *memory*, i. e. Perfect and ſound memory to do any lawful act.

SANGUINALIS *lapis*, in natural hiſtory, the name of a ſtone, deſcribed by Monardes, and other authors, and celebrated for its great virtues againſt hæmorrhages.

It is of the Jaſper kind, and is properly to be called an accidental heliotrope, being of a duſky green, ſpotted and veined with red; and differing in nothing from our common heliotropes, which are brought from the Eaſt-Indies, but in that it is leſs tranſparent and coarſer. See the article HELIOTROPE.

SANGUINARIA, *bloodwort*, a name given by many botanical authors to the *lapathum ſanguineum*, or bloody dock, from the red veins in its leaves; and by ſome to the *cornu cervinum*, or buckſhorn plantain, from its ſuppoſed virtues. *Ger.* Emac. Ind. 2.

SANGUINARIA, in botany, the name of a genus of plants, the characters of which are theſe. The ſpatha is compoſed of two leaves, and is oval and concave, and ſhorter than the flower. The flower conſiſts of eight oblong and obtuſe petals; they ſtand very wide expanded, and the inner ones are narrower than the outer. The ſtamina are numerous ſimple filaments, ſhorter than the flower. The antheræ are ſimple. The germen of the piſtil is oblong and compreſſed. There is no ſtyle. The ſtigma is thick furrowed, with ſtriæ all along, and equals the ſtamina in height. The fruit is an oblong capſule, compoſed of two valves, and containing many round ſeeds. *Linnæi* Gen. Plant. p. 227. *Dillen*, Hort. Eltham, p. 252.

SANGUINEA, a name given by ſome of the chemiſts to nitre. See NITRE.

SANGUINEOUS *fevers*, a term uſed by the medical writers to expreſs a kind of fever, in which there is always a plethora, or fullneſs of blood, which nature is attempting to leſſen by means of this accelerated motion of it, either by forming ſome hæmorrhage, or by throwing a part of it off in form of ſweat. It is very obvious to reaſon, therefore, that bleeding is the firſt thing neceſſary in theſe fevers. The continent fevers, ſuch as the ephemera and ſynocha, are of this kind. *Junker*'s Conſp. Med. p. 252.

SANGUINEROLA, in ichthyology, a name given by the Italians to the *phoxinus*, or minow. Artedi makes this a ſpecies of cyprinus.

It has the Italian name from the blood red colour which diſplays itſelf under its belly. *Willughby*, Hiſt. Piſc. p. 268. See PHOXINUS.

SANGUINUS, in botany, a name given by ſome of the antients to the birch tree, from the deep reddiſh black colour of its twigs. Pliny calls it *ſanguineus frutex*, and not underſtanding that it was the ſame with the birch, mentions the name of that tree immediately after it, as if different from it. The Italians ſtill call the birch *ſanguino*; and ſome authors, from the redneſs of the twigs of ſome ſpecies of the alaternus, have called that ſhrub the *ſanguinus albus*. Some have ſuppoſed that this name was uſed to expreſs the birch tree alſo, but erroneouſly; for though the bark of the body of that tree is ſometimes white, there was no reaſon for adding that epithet to the word *ſanguinus*, which not being uſed for any other tree, could need no diſtinction. The Romans, and many other nations, uſed this tree as we do, for the puniſhment of children's faults; and it is poſſible that the name *ſanguinus* might be given it on this occaſion. *Pliny*, lib. 16. cap. 36.

SANGUIPURGIUM, a name given by ſome authors to a ſlight ſpecies of fever which was judged ſalutary, and only ſerving to purge and cleanſe the blood.

SANGUIS *draconis herba*, in botany, a name by which ſome authors call the *lapathum ſanguineum*, or bloody dock. *J. Bauhin*, Vol. 2. p. 988.

SANGUISORBA, in the Linnæan ſyſtem of botany, the name of

of a diftinct genus of plants, the characters of which are thefe. The cup is a perianthium, compofed of two very fhort leaves, placed oppofite one to another, and falling with the flower. The flower is a fingle petal, divided into four oval obtufely pointed fegments, which cohere only at their lower extremities. The ftamina are four filaments, broad in the upper part, and of the fame length with the flower. The antheræ are fmall and roundifh. The germen of the piftil is fquare, and fituated between the cup and the flower. The ftyle is flender, and extremely fhort; and the ftigma obtufe. The fruit is a capfule containing two cells, filled with very fmall feeds. *Linnæi* Gen. Plant. p. 46.

SANGUISUGA, in zoology, a name by which fome authors exprefs the *hirudo*, or leech. *Charlt.* Inf. p. 62. See the article HIRUDO.

SANGUISUGUM, a name given by fome barbarous authors to a diforder of the heart, fuppofed to arife from its retaining an abundant quantity of blood.

SANICULA, *fanicle*, in botany, the name of a genus of the umbelliferous plants, the characters of which are thefe. The flower is compofed of feveral petals, which are difpofed in a circular form, and have their points bending inwards. Thefe ftand upon a cup, which finally becomes a fruit compofed of two echinated feeds, which are gibbofe on one fide, and flat on the other. Many of the flowers of the plants of this genus are barren.

The fpecies of *fanicle*, enumerated by Mr. Tournefort, are thefe. 1. The common wood *fanicle*; and 2. the Canada *fanicle*, with very large and jagged leaves. *Tourn.* Inft. p. 326.

The medical writers all agree in celebrating this plant, as one of the greateft vulneraries we have of our own growth. They recommend it for the healing frefh wounds and erofions; and many go fo far, as to talk of fiftulas having been cured, by injecting a decoction of it: but the modern practice of furgery has fallen upon very different methods of practice, in thefe cafes, from their predeceffors, and in confequence of that, the whole tribe of vulnerary herbs are difregarded.

SANIDIUM, in natural hiftory, the name of a genus of foffils, of the clafs of the felenitæ, but neither of the rhomboidal nor columnar kinds, nor any other way diftinguifhable by its external figure, being made up of feveral plain flat plates.

The word is derived from the Greek, Σανίδιον, tabella, a flat thin plate or table, and expreffes a body made up only of fuch plates. And the felenitæ of this genus are of no determinate form, nor confift of any regular number of planes or angles, but are merely flat, broad, and thin plates or tables, compofed of other yet thinner plates, like the talcs, but diftinguifhed from thofe bodies by this, that thefe plates are made up of arrangements of flender fibres, difpofed obliquely, but in uninterrupted lines acrofs the body.

The felenitæ having been always efteemed (when meant of this clafs of bodies, for fome have applied the word to certain fpars and other fubftances) regularly figured foffils, this genus has been overlooked by authors, and the fpecimens of it which occurred, looked on as bodies of a different clafs, as fpars or talcs. Their not fermenting with acids, however, determines them not to be fpars; and their obliquely ftriated ftructure, their want of elafticity, and their readily calcining in the fire, diftinguifh them from the talcs, and fhew them to be true and genuine felenitæ. *Hill's* Hift. of Foff. p. 122.

Of this genus there are only two known fpecies, the one colourlefs and pellucid, the other whitifh and opake. The firft is found pretty frequently about Oxford, as alfo in Northamptonfhire, Yorkfhire, and other counties; the other is very common in all parts of Germany, and is found alfo in Leicefterfhire, and fome other parts of England, but with us it is not common. *Hill's* Hift. of Foff. p. 144, 145.

SANIS, Σανίς, among the Greeks, a kind of punifhment, inflicted by binding the malefactor faft to a piece of wood. *Potter*, Archæol. Græc. Tom. I. p. 131.

SANKIRA, in botany, a name given by fome authors to the plant, of which the China root, ufed in medicine, is the root. *Kæmp.* Amœn. Exot. p. 781.

SANS *pareille*, in conchyliology, the name of a peculiar fpecies of buccinum, which has its mouth opening a contrary way to that of all other buccina. This is a fingle fpecies among the recent buccina, but we find more than one kind with this peculiarity among the foffile fhells, and that in great abundance in many places in England.

SANTALUM, (*Cycl.*) in botany, the name of a genus of plants, the characters of which are thefe. The perianthium is a narrow rim, ftanding on the germen of the piftil, and rightly indented into four fegments. The flower is monopetalous, and of the campanulated kind; its edge is divided into five acute fegments. The ftamina are eight filaments; they ftand on the upper part of the tube of the flower, and are alternately one fhorter than another. The antheræ are fimple. The germen of the piftil is turbinated. The ftyle is of the length of the ftamina; and the ftigma is fimple. The fruit is a berry. *Linnæi* Gen. Pl. p. 164.

SANTEO, in botany, a name given by the people of Guinea to an herb, which they efteem remarkably good in all difeafes of the eyes, the herb being boiled in water, and the eyes washed with it. The leaves of this grow in pairs, oppofite one to another, and have no footftalks. The joints, or fettings on of the leaves, are blackifh, and they are of the fize and fhape of thofe of the laurel. Philofoph. Tranfact. N° 202.

SANTOLINA, *female fouthernwood*, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the flofculous kind, and is of a globofe fhape. The feveral fmall flofcules, it is compofed of, are divided each into feveral fegments at the end, and are placed upon the embryos, with imbricated leaves between them, and the whole contained in a fcaly cup of a femiorbicular figure. The embryos ripen into feeds, which have no down, and the flowers are larger than thofe of the wormwood, or abrotanum.

The fpecies of *fantolina*, enumerated by Mr. Tournefort, are thefe. 1. The common *fantolina* with cylindric vermiculated leaves. 2. The *fantolina* with hairy woolly leaves, and with large flowers. 3. The *fantolina* with heath, or favinlike leaves. 4. The cyprefs leaved *fantolina*. 5. The creeping hoary *fantolina*. 6. The *fantolina* with lefs hoary leaves. 7. The *fantolina* with dufky green leaves, and fulphur coloured flowers. 8. The *fantolina* with dufky green leaves, and gold yellow flowers. 9. The great rofemary leaved *fantolina*. 10. The leffer rofemary leaved *fantolina*. 11. The corymbiferous African *fantolina* with a large coronopus leaf. 12. The corymbiferous African *fantolina* with a fmaller coronopus leaf. 13. The Spanifh camomile leaved *fantolina*. And 14. the Cretic *fantolina* with vermiculated leaves. *Tourn.* Inft. p. 460.

Santolina has the fame virtues afcribed to it with the *male fouthernwood*. See SOUTHERNWOOD.

It is alfo particularly recommended in uterine complaints. It is ufed to deftroy worms; and the powder of the dried leaves, half a drachm for the dofe, and to be continued for a confiderable time, is efteemed good in the fluor albus; alfo in pleurifies and peripneumonies.

SANTONICUM *femen*, in the materia medica. See the article CHOUAN.

SANTSI, in botany, a name given by the Chinefe to a plant, famous among them for its medicinal virtues.

It is defcribed by the writers, who have been on the fpot, in fo remarkable a manner, that it cannot eafily be miftaken, provided their defcriptions are juft. They tell us that it grows wild on the mountains in fome of the provinces of China, and that each root of it ufually fends up eight ftalks, the middle one greatly higher than the reft.

They have no branches, and have each only three leaves at the top, and the middle ftalk bears clufters of flowers. The root they fay is four inches thick, and pufhes out feveral fide branches, of the thicknefs of a finger. The bark of thefe roots is rough and brown, and their internal part foft and yellow.

The fmall roots only are ufed in medicine, the great ones being feldom found. The plant flowers in the month of July, and the fpring feafon is accounted the beft for taking up the roots.

The way of multiplying the plant is to cut the great root into flices tranfverfely, and plant thefe an inch deep in a good foil; they will foon fhoot up the natural number of branches, and in three years the plant will grow to its utmoft perfection.

The great ufe of the plant is in hæmorrhages, in which cafe it is faid to be almoft infallible. Obferv. fur les Cout. de l'Afie.

SAP *Cycl.*—*Courfe of the* SAP, a term ufed by gardners and nurfery men to exprefs the current of the *fap* in trees.

This has been generally fuppofed to run in an equable and even manner; but Mr. Fairchild has fhewn, that it has an irregular, and even contrary motion to its firft courfe.

This is a difcovery of more real ufe in gardening, than might at firft thought be imagined; fince this accurate experimenter obferves, that by means of it he could render barren trees fruitful, and decaying trees healthful, and render the fyftem of gardening much better in itfelf, and more ufeful to the public.

The laureola grafted on the mezereon, and the evergreen oak of Virginia upon the common Englifh oak; both thefe hold their leaves all the winter, and are in good ftate and flourifhing, though grafted on trees which drop their leaves in winter. This plainly fhews that the juices rife upwards in winter, even in thofe trees which drop their leaves, otherwife thefe grafted ever-greens muft have ftarved at that feafon.

If all the variety of foreign oaks were to be grafted on the Englifh oak, it would make the timber more firm and lafting than it is, when raifed from foreign acorns; for as the crab ftock makes the wood of the apple more firm and lafting, than that of the apple ftock, and the peaches and almonds, budded on plums, are more lafting than thofe on peach ftalks: fo, by the contrary rule, all firm timber, grafted

ed on ſpungy ſtocks, would be made worſe than it would be on its own bottom; as if the Engliſh elm were grafted upon the Dutch elm, it would partake ſo much of the nature of the ſtock, as to be a ſpungy wood, and not fit for the uſes it is uſually put to.

In grafting the New-England cedar, or juniper, upon the Virginia cedar, this experimenter found that the branch which was grafted, being left ſeveral inches below the grafting, that part continued growing, as well as the upper part above the grafting. The viburnum was another ſubject of his experiments. On bending down the top of this tree, and burying its upper branches in the earth, theſe became roots, and the proper roots were by degrees removed out of the ground as theſe took place. All the roots became branches, and finally the tree became inverted, and grew as well as in its natural ſtate.

A pear tree being inarched upon two pear ſtocks, continued in a flouriſhing ſtate, even when the root was raiſed out of the ground, and it received no nouriſhment, but from the two inarched branches. This tree, after it had ſtood ſome years in this condition, puſhed out new ſuckers from the root; which proves, that the branches are as uſeful to ſupply the root with nouriſhment, as that is to ſupply the branches; and hence it is no wonder that ſo many trees miſcarry in planting, when there are no branches left on the head. Philoſ. Tranſ. N° 384. p. 127.

SAPA, among the Romans, new wine boiled to the third part of its firſt quantity. *Pitiſc.* in voc.

SAPINDUS, the *ſoapberry tree*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals, arranged in a circular form; theſe are uſually four in number, and the cup is alſo compoſed of four leaves. The piſtil ariſes from the cup, and finally becomes a round fruit, which encloſes a ſtone of the ſame ſhape, with a roundiſh kernel in it.

There is only one known ſpecies of this genus, which is the *ſoapberry tree* with leaves growing to an alated rib. *Tourn.* Inſt. p. 659.

The berries of this tree are uſed as ſoap; they are of the ſize of a muſket-bullet, and are uſed in waſhing without any admixture of ſalt or oil. They perform the office of ſoap very well, as to the cleanſing the linnen, but they rot it in time.

The negroes in general uſe them for their coarſe apparel, which bears them much better than the finer linnen worn by the Europeans. Philoſ. Tranſ. N° 96.

SAPINUS, in botany, a name given by ſome of the modern botanical writers to the fir tree. This does not ſeem, however, to have been the tree ſo called by the antients. Some of thoſe writers have plainly deſcribed the pine tree under this name, and Pliny makes it the denomination of the pitch tree, ſuch as was manured in his time.

Matthiolus contends that no peculiar tree was ever called by this name, but that what the antients meant by this word, was, that part of the fir, or any other tree of that kind, which was above the ground, and below the branches. This is uſually a ſmooth part of the tree, free from knots; and the other part, where the branches grow, was called *fruſterna*. Matthiolus grounds this on the authority of Pliny, but that author errs in this; for that part of the tree was not called *ſapinus*, but expreſſed by the adjective *ſappinea*.

This is abundantly proved by Vitruvius; and on comparing the text of theſe two authors, it appears that Pliny took from Vitruvius what he ſays on this ſubject, though he did this erroneouſly; for Vitruvius ſays, that this part of the fir was called *ſappinea*, becauſe very ſmooth, and free from knots, like the *ſappinus*, or pine.

Pliny, in another place, diſtinguiſhes between the *ſapinus* and *ſappinus*. The *ſappinus* he ſeems to make the ſame with the common pitch tree, and the *ſapinus* with the pine, or with ſome other tree of the coniferous kind: he places this great diſtinction between them, that the *ſappinus*, when cut down, would never grow up again, but that the *ſapinus* would.

Some of the old gloſſaries diſtinguiſh alſo between the *ſapinus* and *ſappinus* in this manner, the one being always tranſlated the pine, πίτυς; and the *ſappinus* the fir, πεύκη. The obſervation of Pliny, of the one of theſe trees growing again from the root when cut down, and the other not, is contrary, however, to the ſentiments of the reſt of the antients.

Theophraſtus ſays of both the pine and fir, that when once cut down they never ſhoot up again; and Herodotus mentions the ſame thing, as a ſingularity among trees.

The word *ſapinus* ſeems to be only a contraction of *ſapapinus*, a name given by the Latins to the domeſtic or cultivated pine, from the vaſt quantity of juice or ſap it contained. They had a way of expreſſing this juice by the word *ſapa*; and Theophraſtus has, for the ſame reaſon, called the domeſtic pine by the name *orrus*, ὀῤῥός, a word ſignifying juice or ſap. This was the pine tree which bore the pine nuts uſed in medicine and in foods; and Pliny, who calls it the *manured pitch tree*, plainly errs, becauſe that tree cannot bear eſculent nuts, or anſwer to the reſt of the deſcription.

SAPO *amygdalinus*, *almond ſoap*, a new form of medicine got much into uſe of late in nephritic caſes, and made to ſupply the place of the common hard *ſoap* for internal uſes, in a more determinate manner for the phyſician, and a more cleanly one for the patient.

It is thus made. Take any quantity of freſh oil of almonds, and thrice its quantity of *ſoap* lees; digeſt them together in ſuch a heat as will make them but juſt boil, within a few hours the oil and lees will be united, and the liquor will ſoon after become ropy, and ſomething tranſparent, and will cool into the conſiſtence of a jelly; then throw in ſea ſalt till the boiling liquor has loſt its ropineſs; continue the boiling till drops of the liquor being received upon a tile, the water is ſeen to ſeparate freely from the coagulated *ſoap*; then take away the fire, and the *ſoap* will riſe to the top of the water, and is to be taken off for uſe. *Pemberton*'s College Diſpenſ. p. 184.

SAPONACEA *terra*, in natural hiſtory, a term uſed by ſome to expreſs a kind of native alkali *ſalt*, of the nature of the nitre, or natron of the antients, which is found on the ſurface of the earth, mixed with dirt, &c. in the neighbourhood of Smyrna, and thence called by ſome *Smyrna earth*.

It is found principally in two places near Duraclea, a large open village, about ſix leagues to the eaſtward of Smyrna; and in a very flat plain, about a league weſtward from the river Hermus. It is at firſt gathering, a fine whitiſh *ſalt*, which of itſelf boils up, as it were, out of the ground. It is always gathered before ſun-riſe, and only in mornings in which there falls no dew; ſo that a ſtock ſufficient for the whole year muſt be laid in during the ſummer months. It comes up in ſome places an inch or two above the ſurface of the ground, but when the ſun riſes upon it, it dries and falls down again. The earth producing it lies low in both places, and in winter is waſhy. It is thinly covered with graſs.

It may be ſuſpected, at firſt ſight, that the neighbouring ſea impregnates this earth about Hermus, but the ground which produces it, and lies about Duraclea, is ſo far from the ſea, that it overthrows this ſpeculation; though every morning in ſummer the earth be ſwept clean of this *ſalt*, the next morning always produces a new crop.

Dr. Smyth, who made experiments upon this *ſalt*, informs us, that three hundred drachms of it being put into a retort, and this ſet in a ſand-heat with a very ſtrong fire for twelve hours, yielded between five and ſix ounces of an inſipid phlegm, of no other ſmell but ſuch as, in all ſuch operations, ariſes from the fire. It appeared from this, that the matter contained no volatile *ſalt*. After this the quantity of two hundred drachms, calcined in a German crucible, were diſſolved in water. This compoſition of earth and water, boiled into a lixivium, made five hundred drachms, after it had boiled three hours, and the foul ſcum had been continually taken off during that time, and been filtrated; the cloſe liquor being then evaporated to a dryneſs, there remained a pure white fixed alkaline *ſalt*, of the nature of pot-aſh.

The people of the place make ſoap with this earth in the following manner. They mix three fourths of this earth with one fourth of lime, and then pour boiling water upon the mixture: they ſtir this with a ſtick, and there ariſes to the top a thick browniſh ſubſtance, which they ſcum off; they ſave this in veſſels by itſelf. They uſe both this and the clear liquor in making ſoap, but this is much ſtronger than the liquor. They put fifty kintals of oil into a large copper boiling veſſel, and kindling a large fire under it, they let the oil boil a little, and then throw in by little and little firſt the ſcum of the lye, and afterwards the liquor itſelf; though ſometimes they uſe only the one, or only the other. They continue adding more and more of theſe, till the oil acquires the conſiſtence of ſoap, which is often ſeveral days. The fire muſt be all this time kept up very ſtrong. The ſcum of the lye, and the ſtronger part of the lye itſelf, mix with the oil in the boiling, and the weaker part unmixing itſelf, ſinks to the bottom, and is let out by a cock prepared for that purpoſe. This is not thrown away, but is let run upon freſh lime and earth, to make a lye for future uſe; and when the ſoap is perfectly made, it is ladled out, and put upon a brick or lime floor to harden.

The common proportion in the making the ſoap is two loads of earth, of five kintals each, to fifty kintals of oil, and the produce is between ſeventy and eighty kintals of ſoap. The earth is bought at a dollar a load, and the ſoap at $6\frac{1}{2}$ a kintal. There is employed annually, in making ſoap at Smyrna, at leaſt ten thouſand kintals of oil. The bringing the ſoap earth to Smyrna employs a thouſand camels, or fifteen hundred, for eight months of the year, the four ſummer months being too hot for camels to travel in. A common ſoap houſe produces, at a medium, a thouſand dollars a year clear profit. Philoſ. Tranſ. N° 220. p. 230.

SAPONARIA, in the materia medica, a name given at different times to ſeveral plants, which had in ſome ſort the properties of ſoap.

The *ſtruthium* of the Greek, and *herba lanaria* of the Romans, having ſomewhat of this property, and being uſed in the cleaning of wool, ſeveral authors have explained it by the word *ſaponaria*; but this is leaving us as much in the dark, as to the plant, as we were before, not at all aſcertaining which, if any of the plants at one time or other ſo called, was to be underſtood as being the ſame with the *ſtruthium.*

The Greeks have many times called hyſſop by the name *ſaponaria*; others have given the ſame name to the anagallis, or pimpernel; and others to ſeveral different plants, which they ſuppoſed to have the effects of ſoap, or of nitre, in cleanſing of things.

None of the plants, however, that we have under the name *ſaponaria*, will at all agree with the *ſtruthium*, or *herba lanaria*, which was a thiſtle; and the very Arabians ſeem not to have known it, but have erroneouſly ſuppoſed their candiſi to be it.

SAPONARIA *terra*, in mineralogy, a name given by ſome authors to the common fullers earth. *Dale*'s Pharm. p. 19. See FULLERS *earth*, *Cycl.* and *Suppl.*

SAPONARIA *terra alba*, in natural hiſtory, a name given by ſome authors to the common tobaccopipe clay.

They call the common fullers earth alſo *ſaponaria terra*, and diſtinguiſh it from this by the epithet *purpuraſcens*; though it has no ſuch colour as purple about it. *Kentman*'s Nomenclator, foſſ. p. 1. See the article CIMOLIA.

SAPONARIUM *lixivium*. See LIXIVIUM *ſaponarium.*

SAPONEA, a name given by authors to a pectoral medicine made of oil of ſweet almonds and ſugar, mixed with the diſtilled water of violets.

SAPOTA, in botany, the name by which Plumier calls a genus of plants, ſince deſcribed by Linnæus under the name of *achras*. See the article ACHRAS.

SAPPAN, in the materia medica, a name uſed by ſome authors for the wood of the *arbor Campechiana*, or logwood uſed in dying. *Breyn.* Prodr. Vol. 2. p. 37.

SAPPHIRE, (*Cycl.*) the name given by the moderns to a beautiful pellucid gem of a blue colour: this is however extremely different from the ſtone the antients knew under the name of the *ſapphire*; for that was no pellucid gem, but an opake ſtone of a very deep blue, veined with white, and ſpotted with ſmall gold coloured ſpangles, in form of ſtars, and was only a more beautiful kind of their *cyanus*, which was the ſtone we call *lapis lazuli.*

The deſcriptions of all the authors of antiquity of the ſtone they called the *ſapphire*, plainly evince this; and hence authors of a later date have too haſtily concluded, that our *ſapphire* was wholly unknown to them: but this ſeems a very improbable conjecture, and a ſtrict enquiry into their writings will ſhew that they have very well deſcribed our *ſapphire*, under the name of *the ſky blue beryl*, or *beryllus aëroides*; and as it had among them no peculiar generical name, it could not have been better named than thus; as the beryl is plainly that of all the gems to which the *ſapphire* moſt approaches, and its colour is in the fineſt ſpecimens a pure ſky blue.

It is in its moſt perfect ſtate a very elegant and valuable gem, and is ſecond only to the diamond in luſtre, hardneſs, and price. It is met with of various ſizes, but ſeldom ſo very ſmall as many of the other gems, and has been ſometimes found up to three quarters of an inch in diameter. Its more uſual ſtandard is between a ſeventh and a ſixth of an inch. It is various in figure, being ſometimes found in the pebble, and ſometimes in the cryſtal form. Its moſt uſual appearance is in ſmall irregularly rounded, or oblong flattiſh ſtones, covered with no cruſt, and looking of a bright blue, but without the luſtre and fine poliſh of the native ruby. It is ſometimes alſo found in beautiful hexangular cryſtals, terminated by hexangular pyramids of a fine blue throughout, and naturally of a high poliſh. Sometimes alſo theſe ſprigs are only coloured at their points, and ſometimes they are wholly colourleſs.

The proper and only colour of the gem is blue; in ſome ſpecimens this is a fine deep colour, like that of the cleareſt ſky; and in others it varies into paleneſs in ſhades of all degrees, between that and the pure brightneſs and water of cryſtal, without the leaſt tinge of colour, but with a ſuperior brightneſs, that eaſily diſtinguiſhes it at ſight from cryſtal, it more than any ſtone approaching to the nature of the diamond; and in ſome it has a duſky whiteneſs, like that of milk: this laſt colour might be ſuppoſed owing to a mixture of a fine white earthy matter, but that it has been found that different mixtures of pellucid liquors, ſolutions of copper, and of different ſalts, are capable of producing the ſame colour.

It ſeems very clear, from a multitude of experiments, that this gem, in its pureſt and fineſt ſtate, owes its beautiful blue to copper; and the ſame metal being found capable of giving this milky look with a caſt of blue, the general opinion of this laſt mentioned milky looking ſtone being a true *ſapphire*, ſeems perfectly right.

The pebble *ſapphires* are always finer than the cryſtalliform ones, and moſt of the fine colourleſs *ſapphires*, which our jewellers commonly, but very improperly, call white *ſapphires*, as they have not the leaſt tinge of whiteneſs in them, but are abſolutely colourleſs, as the pureſt waters are of the pebble, not of the ſprig kind.

The *ſapphire* is of very different degrees of hardneſs and brightneſs in different parts of the world, and conſequently of very different value.

The antients uſed to diſtinguiſh the *ſapphire*, as they did all the other precious ſtones, into the male and female kind, according to the deeper or paler colour; and our jewellers, according to their cuſtom of dividing the gems into ſeveral kinds, according to their different accidents of purity, beauty, &c. make four kinds of *ſapphire.*

1. The firſt is the fine blue oriental *ſapphire.* This is the name they give the *ſapphire* when in its greateſt degree of purity and perfection, as hard as the ruby, and of a fine ſky blue.

2. The white *ſapphire.* This is the name they give the *ſapphire* when wholly colourleſs, and reſembling the diamond; and that whether it have been naturally found ſo, or reduced to that ſtate by art: for as all *ſapphires* loſe their colour on being put into the fire, it is a common practice with ſome jewellers, when they have *ſapphires* of a bad colour, to diveſt them wholly of it by fire, and bring them to what they call white *ſapphires*; but this, as before obſerved, is a very improper name, as the gem in this ſtate has not the leaſt tinge of white, but is wholly colourleſs, and as there is another white *ſapphire*, which is truly ſo, and which they call the milk *ſapphire.*

3. The third kind of *ſapphire* is what they call the water *ſapphire.* This alſo is a very improper name, not at all expreſſing what they mean by it; for they call by this name all the ſoft pale blue *ſapphires* which are found in Europe.

4. The laſt is the milk *ſapphire.* This is the name they give the *ſapphire* when of a white milky caſt, with a faint tinge of blue.

The fineſt *ſapphires* in the world are thoſe brought from the kingdom of Pegu in the Eaſt-Indies, where ſome are found perfectly colourleſs as cryſtal, and others of all ſhades of blue, up to the violet colour, but never with the leaſt tinge of purple, or any other colour but true blue: theſe are all found in the pebble form. We have other very fine *ſapphires*, both of the pebble and cryſtalliform kind, from Biſnagar, Conanor, Calicut, and the iſland of Ceylon: theſe are of all the ſhades of colour, and in Ceylon there are ſometimes found a ſort of baſtard gems, part red and part blue, ſeeming of a mixt nature between the *ſapphire* and the ruby.

The occidental *ſapphires* are from Sileſia, Bohemia, and many other parts of Europe, and are often very beautiful ſtones; but are greatly inferior, both in luſtre and hardneſs, to the oriental. *Hill*'s Hiſt. of Foſſ. p. 594.

SAPPHIRE-*colour.* To give this elegant and beautiful blue to glaſs, the workers in the glaſs-houſes uſe the following method. Take an hundred weight of rochetta fritt, and add to it a pound of prepared zaffer, and to this one ounce of manganeſe; mix all well together, and put them into the furnace to melt and purify, and when it is become perfectly pure and fine, work it into veſſels, &c. This ſmall quantity of manganeſe, with the zaffer, gives a moſt beautiful violet blue. *Neri*'s Art of Glaſs, p. 93.

SAPPHIRE-*paſte.* The method of making the counterfeit *ſapphires* in paſte is this. Take of cryſtal prepared two ounces, minium, or common red lead, ſix ounces, zaffer prepared five grains, manganeſe prepared ſeven grains; mix all the powders perfectly together, and put them into a crucible, cover it with a ſtrong lute, and put the whole into a potter's kiln, to ſtand in the hotteſt place for twenty four hours; it will be of a moſt beautiful deep *ſapphire*-colour. Blue paſtes of two other degrees of blue are alſo made in the following manner. For a ſky blue take cryſtal prepared two ounces, red lead ſix ounces, prepared zaffer twenty one grains; mix all well together, and bake them as before. For a deep violet blue take cryſtal two ounces, red lead four ounces, and four grains of painters blue ſmalt; mix all, and bake together in the kiln.

Theſe both make good blues, but much inferior to the firſt proceſs. *Neri*'s Art of Glaſs, p. 132.

SAPPHIRINA *aqua*, the *blue eye water*, is thus made. Pour a pint of ſtrong and freſh lime water into a copper veſſel; add to it a drachm of crude ſal armoniac, and throw in ſome filings, or ſmall pieces of copper, it ſoon acquires a beautiful blue colour, and is not only uſed as an eye water, but alſo to deterge old ulcers; and ſometimes is mixed with other things in injections for gonorrhœas.

SAPPHIRO-RUBINUS, in natural hiſtory, a name given by ſome modern writers on gems to a ſtone, partly a ſapphire, and partly a ruby, or, more properly ſpeaking, a ſapphire tinged in ſome part with the ruby colour, while the reſt remains

remains blue. The Indians call this *nilacundi*. *Boet*. de Boot. See NILACUNDI.

SARABARA, among the antients, a Medish or Babylonish garment, which reached only to the knees. *Pitisc*. in voc.

SARACHINUS, in ichthyology, a name given by Charleton and others to the fish, called by the generality of authors the *thrissa*, by us the *shad*, or mother of the herrings.

Authors have given names to the herring kinds, according to their different growth and size, and multiplied the species much beyond what they ought to be. Artedi observes that the *agonus* and *sarachinus* are only herrings of different growth, and that the *alausa minor* of authors is the same with the *agonus*. See the article CLUPEA.

SARACUS, in zoology, a name given by some authors to a species of sea fish of the herring kind, more usually called *agonus*, and by many suspected to have no essential difference from the *alausa* or shad, but to be the same fish in another state. *Ray's* Ichthogr. p. 226.

SARAX, in botany, a name given by some authors to the whole class of the ferns. *Ger*. Emac. Ind. 2.

SARCITES, the *flesh stone*, a name given by some authors to the cornelian, from its being of the colour of flesh; as it is very exactly in some pieces.

SARCITES, or SAURITES, is also a stone supposed to be found in the belly of a lizard; it seems to have been a species of pale cornelian. Pliny mentions it, but gives no description of it.

SARCITES, the *flesh stone*, in natural history, is also a name given by some authors to a species of stone, whose fibres were supposed to represent those of beef. It was of a black colour and firm texture.

SARCLIN-*time*, is the time or season when husbandmen weed their corn.

SARCOCOLLA (*Cycl*.)—It has been the opinion of many writers of the middle ages, that this was the gum of the beach tree. That fruit tree being very common in most parts of the world, and nothing at all like the *sarcocolla* being found to come from it, people have been led to wonder how this absurd opinion first got footing in the world; but this is easily explained by tracing up the authors who set it on foot to their origin.

Dioscorides is the great fountain, from whom all these little streams of knowledge have been supplied; and this author treating of *sarcocolla*, says, that it is the gum of a Persian tree. The words *persian tree* and *peach tree* are the same both in Greek and Latin; and hence, what he said of a tree growing in Persia, has been attributed to the peach tree; and this gum, so very different from the gum of that tree, has been supposed to flow from it.

But this is not the only confusion made in regard to this word. The later Greeks have given the name *sarcocolla* to a plant, in nothing resembling the *sarcocolla* tree. The old Greeks called both the gum and the tree, which produced it by the same name of *sarcocolla*, as they did in regard to the styrax and galbanum, and many other of the medicinal gums, and the trees and plants which produced them. But among the later Greek writers, the little plant *argemone*, an herb of the poppy kind, was called *sarcocolla*. Apuleius tells us, in his account of this plant, that the Greeks of later Ages called it *arsella* and *sarcocolla*; and Strabo confirms this, giving the same name to the same plant, only that he mistakes the Latin name, and writes *agrimonia* for *argemone*.

Marcellus Empiricus has the same observation; he says, in express words, the plants which the Greeks called *sarcocolla*, the Latins call *argemone*; and Neophytus, who describes the plant, and speaks largely of its virtues in bruises, and the like, says, that some of the Greeks call it *argemone*, some *artemone*, and others *arsella* and *sarcocolla*.

The near alliance of the sounds *argemone* and *agrimonia* seems to have deceived this author, and some others, and they sometimes give us the plant agrimony, sometimes argemone, as the *sarcocolla* of the Greeks: Neophytus is of this number, for he calls it *argemone altera*, as a plant very different from the common argemone, and his description suits with the agrimony. *Apuleii* Herb. c. 31. *Strabo* Hortul.

SARCO-EPIPLOCELE, a term used by the old medical writers, to express a compound rupture, consisting of a descent of the *epiploon* and a *sarcocele*; or a rupture of the indurated *epiploon*, whether umbilical or scrotal.

SARCOMA (*Cycl*.)—The *sarcoma narium*, by some called also *hypersarcoma narium*, is the same with what is commonly called the *polypus narium*, a caruncle of various size and consistence in the nostril. These caruncles are usually soft, extensive, and capable of elongation, but sometimes they are hard and rigid. They are sometimes pale, sometimes red, and are generally small in their beginnings, and advance but gradually; though some of them grow so fast, as to hang down out of the nose in three or four days time. They are usually not attended with pain; but some of them are hard, livid, very painful, and have a tendency to become cancerous. Some are wholly concealed in the nose, others hang down to the lips, and others, though contained in the nose, yet distend it greatly. Some are of an even surface, and others like a cluster, some descend backward through the apertures by which we draw breath through the nose into the fauces; and grow so big there as to be visible behind the uvula, and occasion difficulty of speaking and swallowing, and sometimes almost strangle the patient.

They have usually but one root, though sometimes several, and are usually formed in and from the pituitary membrane, and the disorder seems to be really no other than a morbid disposition of the spungy production and glands of this membrane. The *sarcoma* and *polypus*, though disorders of the same kind, may however be properly enough made two species; the *polypus* being soft, and hanging by a slender root, like the stalk of a fig; and the *sarcoma* of a more fleshy consistence, and adhering by a large, firm, and immoveable basis.

These disorders come sometimes from internal causes, sometimes from external injuries, and too often prove cancerous, or are attended with a spina ventosa, or caries of the bones of the nose. They may be sometimes removed by caustics, but the extirpating them with the knife is the shortest, safest, and most eligible method. *Heister's* Surgery, p. 437.

SACROMA *of the eyes*, a fleshy excrescence or tubercle formed on the inner surface of the eye-lids. These tubercles, in their beginnings, are usually small; but they, by degrees, advance often to a very considerable bulk. Some of these are of smooth surfaces, others rough and unequal, like a rasberry or mulberry.

They are always to be cured by extirpation, getting them out by a hook, a pair of plyers, or a needle and thread, and then cutting them out to the roots with scissars; the wound should be suffered to bleed a while, and afterwards washed with a collyrium made of aloes, tutty, and sugar of lead mixed in rose water, till it is perfectly healed. Some use the caustic to these tumors, but the scissars are more safe and less painful. *Heister's* Surgery, p. 374.

SARCOTHLASMA, a term used by the old physicians to express a bruise on the flesh.

SARCULATION, a term used in the antient husbandry, to express a sort of hoing, which they used among their pease and beans, and sometimes among their corn.

The *sarculum* was a sort of narrow and long hoe, with which they rooted up the weeds among plants growing irregularly. We have the same kind of instrument in use at this time in some places for hoing between the plants of flax; but one way of sowing, in rows, at present, has prevented the necessity of having recourse to so inconvenient and troublesome an instrument in other cases.

SARCULATURA, in our old writers, weeding of corn; whence *una sarculatura* was the tenant's service of one day's weeding for the lord.—*Tenet in bondagio & debet unam* sarculaturam, *&c*. *Kenn*. Paroch. Antiq. p. 403.

SARDA, the *cornelian*, in natural history, the name of a genus of the semi-pellucid gems: the characters of which are, that they are semi-pellucid stones, composed of crystal with a small admixture of earth, of a plain uniform structure, not tubulated nor crustated, and usually of one simple colour.

Of this genus there are three species. 1. The *red cornelian*, which is a very common stone among our jewellers, and is of all the degrees of red from a deep blood colour, to that of the water in which raw flesh has been soaked; and this last, if any can be called so, is its proper colour. It is usually found in a roundish, or pebble like form, and its most frequent size is between half an inch and two inches in diameter, and is found in the East and West Indies, and in many parts of Europe: our jewellers value none but the oriental, but there are very fine ones found in Silesia and Bohemia, and on the shores of the Rhine. The antients, according to the degree of colour, divided these stones into male and female, the deeper coloured ones being called the male; and our jewellers call one sort of it the beryll: this is the male *cornelian* of the antients, and is an oriental stone of a clear deep red; they have had this from the Italian lapidaries, who call every stone which is softer than the gems, and of a good colour, and capable of a fine polish, beryll, with the addition of its proper name, calling this therefore the beryll *cornelian*; and the brown crystal, the beryll crystal; but our dealers reject the proper name of the stone, and keep only the word, signifying its excellence; and both the one and the other of these substances are by them called simply the beryll. *Hill's* Hist. of Foss. p. 460.

The second species is the *yellow cornelian*. This is a stone, in the opinion of many, of greater value than the former, when in its most pure and perfect state. It is found sometimes in broad flat pieces, but more usually in the shape of our common pebbles, and is of all degrees of yellow from the deepest that can be imagined to that of a lemon peel. It is of a greater degree of transparence than the red, and in its most common state appears, when cut, like a piece of fine yellow amber. We have it principally from the East Indies; there are some specimens of it found in Germany, but they are neither very good nor very frequent, and in England we sometimes meet with large masses of it, but they are never thoroughly coloured.

The third species is the *white cornelian*. This, though less beau-

beautiful than either of the others, is however a very beautiful ſtone; it is often found in the rugged ſhape of our common flints, though not unfrequently flattiſh or roundiſh like the reſt. It is the largeſt of all the *cornelians*, being found from two to ſix inches, and often more in diameter, and is of a very beautiful colour, not a clear white, but with an admixture of blue, bringing it to a ſort of pearl colour, and is leſs tranſparent than either the yellow or the red kind. It is found in the Eaſt Indies and in many parts of Europe; France has afforded very fine pieces of it, and Germany produces it in great abundance; but the beſt next the Oriental is that of New Spain. Ibid. p. 461.

Mr. du Fay, of the academy of ſciences of Paris, accidentally hit upon a very fine way of turning any part of a red *cornelian* white, ſo as to form veins or clouds of that colour at pleaſure in it. He had obſerved, that there was a way of making figures in white upon garnets, which was done by engraving the intended figure in the ſtone, and then filling up the engraving with the common white enamel, which, when poliſhed down to the level of the ſtone, ſeemed to make one body with it, and the figure to be naturally formed in white in it. Deſirous of trying this experiment on the *cornelian*, he had one engraved, and filled up the lines with white enamel in powder, then putting it over the fire to melt the enamel, he drew it back ſeveral times, to ſee how the proceſs ſucceeded, and at length found that this ſtone would not bear the neceſſary degree of fire for the operation, but would itſelf be calcined and ſpoiled before the enamel would run: on this he ſhook out the powder, but was ſurprized to find the bottom of the engraving had all been tinged white by it, though it had not melted. To continue this trial, he laid ſome of the powder enamel on a *cornelian* that was not engraved, but only the powder was laid on in a certain figure. A ſmall degree of heat having been given to this under a muffle in a wind furnace, the parts of the ſtone which had been covered with the powder were found to be white, and the others as red as before the ſtone was put into the fire.

It appeared hence, that this coating over a part of the ſtone was ſufficient to give it a whiteneſs by the help of fire; but the curious author of this invention did not ſtop here, he ſoon found that the matter of the enamel was not neceſſary to this change, but that any other denſe ſubſtance would produce the ſame effect. The common Spaniſh white, and ſeveral other colours, were found to ſucceed very well; but the beſt of all other ſubſtances, he obſerves, is a colcothar of vitriol carefully prepared; the finer part of which being ſeparated by waſhing, and afterwards mixed up with gum water, may be uſed to draw traces ever ſo beautiful, and theſe will be all ſhewn in white upon the ſtone after it has paſſed the fire. The different parts of a figure thus delineated will be more or leſs white, as the coat of colour has been laid more or leſs thick upon the ſtone, ſo that there only requires a nice hand to draw figures ever ſo beautifully diverſified, with the ſhades of a thicker or a clearer white. The counterpart of this experiment gives alſo very beautiful figures, that is, the covering the whole ſurface of the ſtone with a coat of the colour, and then drawing the intended figure or lines cut through this coat; this being done, and the whole ſet by to dry, when it has afterwards been in the fire, all the ſurface will be found white, except where the lines were cut in, and theſe will all be beautifully red, the colour of the ſtone having ſuffered no hurt in them. Thus the figure will be expreſſed in red upon a white ground, and even the minuteſt traces drawn by the point of a fine needle will not be loſt. Mem. Acad. Par. 1732.

All *cornelians* are not equally proper for this purpoſe. Thoſe of a fine deep red, which are all of one ſimple colour, and are commonly called by our jewellers *cornelians* of the old rock, always ſucceed perfectly well, and their natural deep red ſhews the white with much beauty. The common pale *cornelians* always loſe a part of their own colour in the fire; and the *cornelians*, which have veins of different colours, or ſhades of colour, never ſucceed well, becauſe every different vein receives the tinge in a different manner. The meaner ſort of *cornelians* are ſubject alſo to crack and fly, with the degree of heat neceſſary to this operation; whereas the finer ſtones of the old rock always bear it without hurt.

It would ſeem a natural conſequence from theſe experiments, that the black agate, the coloured jaſpers, and many other of that ſort of ſtones might ſucceed as well in the delineating figures on them; but Mr. du Fay, after repeated experience, found that the *cornelian* alone would do.

SARDA, in zoology, a name by which ſome call the fiſh, more uſually known by the name of *pelamys* or *pelamys ſarda*; a fiſh reſembling a young tunny, but having larger and longer teeth and no ſcales. *Geſner* de Piſc. p. 1151. See the article PELAMYS.

SARDACHATES, in the natural hiſtory of the antients, the name of a ſpecies of agate, found frequently at this time on the ſhores of rivers in the Eaſt-Indies; and ſeeming to contain an admixture of the matter of the common red cornelian, is very excellently characterized by the name the antients gave it.

It is a very elegant and beautiful ſpecies, and is often found of a conſiderable ſize. It is of a pale whitiſh ground, and has no veins or other variegations, except a multitude of minute ſpots, of a pale red, and of the matter of the red cornelian; theſe are ſcattered very ſparingly in ſome parts of the maſs, but in others they are ſo cluſtered together, as to make ſmall clouds of an elegant red. It is very hard, and is capable of an elegant poliſh. Our lapidaries do not much eſteem it, but in ſome other places it is wrought into toys which are much eſteemed. *Hill's* Hiſt. of Foſſ. p. 483.

SARDANUS, in zoology, the name of a fiſh of the harengiform kind, caught in the Mediterranean, and common in the markets of Rome and Venice. Its body is broader than that of the pilchard, and its back green; and the line which runs along the belly is much leſs rough than in that fiſh. It is indeed eaſy to diſtinguiſh it from the pilchard, but not ſo eaſy to ſhew in what it differs from the common herring more than in ſize. It ſeems very probable, that it is no diſtinct ſpecies of fiſh; but, that the herring, like the pilchard, is always ſmaller in the Mediterranean than in the Ocean. *Willughby's* Hiſt. Piſc. p. 225.

SARDAR, in the Turkiſh military orders, the title of an officer choſen from among the caias of the Janizaries on ſome particular occaſion, ſuch as to head a detachment ſent to war, or on any other occaſion.

The word is of Perſian origin, and is derived from *ſar*, which in the language ſignifies a head or chief.

This officer is a colonel of a detached body; he is attended in his expedition by his deputy, and two ſecretaries, and his office expires at his return from the buſineſs he was diſpatched on. *Pocock's* Ægypt. p. 169.

SARDELLA, in zoology, a name by which ſome have called the pilchard of the Mediterranean ſea, ſuppoſing it different in ſpecies from that of the ocean, but it ſeems in reality to be no other than the common pilchard, only not growing ſo large there as in the Ocean. *Willughby's* Hiſt. Piſc. p. 224. See the article PILCHARDUS.

SARDINA, in zoology, a name by which many have diſtinguiſhed a fiſh of the harengiform kind, which is in reality, however, no other than a ſmall pilchard, the pilchard growing to a larger ſize in the Ocean than in the Mediterranean. *Willughby's* Hiſt. Piſc. p. 224. See PILCHARDUS.

SARDOA, or SARDOUM, in botany, a name given by the antients to the water crowfoot, with jagged leaves, called alſo *apiaſtrum* and *ranunculus apii folio*, from its leaves reſembling in ſome degree thoſe of the ſmallage. This has been in all ages charactered as a poiſon; but Pliny has found means to confound this with baum, under the name of apiaſtrum, which he ſays is fed on by the bees in Italy, but is very well known to be a dangerous poiſon in Sardinia.

SARDONIA *herba*, in botany, a name given by many of the antients to the poiſonous water *ranunculus*, which others call *apiaſtrum*, from its having leaves ſomewhat reſembling ſmallage; and our modern botaniſts call it the *ranunculus paluſtris apii folio*, or water crowfoot with ſmallage leaves.

It had the name *ſardonia* from its growing very plentifully in Sardinia. The old Greeks have generally written the name of that iſland *Sardonia*, not Sardinia; and hence they have called the plant alſo by the ſame name.

It is branded by all authors, both antient and modern, with the name of a poiſon, and we ſee that even the cattle will not touch it, though a very ſucculent and well looking herb.

SARDONYX, (*Cycl.*) in natural hiſtory, the name of a genus of the ſemi-pellucid gems, which are conſiderably tranſparent, of the true onyx ſtructure, either zoned or tabulated, and are compoſed of the true matter of the onyx, variegated with zones of that of the red or yellow cornelian.

Of this genus there are four known ſpecies. 1. The thin zoned red *ſardonyx*, or whitiſh onyx, with thin, ſnow white, and red zones; this is one of the moſt beautiful of the ſemi-pellucid gems. The ground of this is a cryſtalline matter, ſomewhat whitiſh, otherwiſe very little differing from pure cryſtal, either in colour or tranſparence; and the zones are always extremely fine and ſlender, and laid with a beautiful regularity over one another; they are of the true matter of the cornelian, and ſome are of the plain red cornelian, others of the white, and others often of a pale fleſh colour, made by an admixture of the former two. It is only found in the Eaſt Indies, and is greatly valued among our lapidaries. *Hill's* Hiſt. of Foſſ. p. 493.

The ſecond ſpecies is the broad veined red *ſardonyx*, or horny onyx, with red punctated zones. This is a beautiful ſtone, though greatly inferior to the former kind. Its ground is of a true horn colour, and much reſembles that of many of the agates of the Eaſt Indies, and its zones are of the true matter of the red cornelian, but they are broad and coarſe to the naked eye; and when viewed with a microſcope, or even only attentively examined by the naked eye againſt a good light, they are found to be each compoſed of a number of thin ones, ſeparated from each other by narrow zones of the common matter of the ſtone, and each compoſed of ſeveral cloſe arrangements of ſmall red ſpots. This is found in New Spain and in ſome parts of Europe, and is ſometimes wrought into ſnuff-boxes, counters for cards, or other toys; but is very little eſteemed.

The third species is the yellow leaved *sardonyx*, which, as its veins are as truly of the matter of the yellow cornelian, as those of the former species are of the red, is certainly entitled as much as they to the name of *sardonyx*. This is a very beautiful stone, and was well known among the antients by the name of the *onyx in qua chrysolithi color*, or the chrysolite onyx. The chrysolite of the antients was the gem we now call the topaz, and the zones of this stone are truly of that colour, though of less transparence and brightness. It is found in pretty large masses, but always flat, and full of numerous cracks and flaws, so that few pieces of it can be obtained of any size. Its zones are so many flat and regular plates or tables, laid evenly on one another, but divided by other zones of the matter of the stone: this is of a clear and beautiful pale brown, and the zones being of an extremely bright yellow, the whole is very beautiful. It is found in many parts of the world, but is no where common, it being rare to meet with two specimens of it together. Arabia, Armenia, Persia, China, and New-Spain, have all been known, at times, to produce it. In Italy it is very much valued, but with us it is hardly known.

The fourth species is the orange coloured *sardonyx*, or the bluish white onyx with orange coloured and whitish zones. This is a very singular species, and is not without its beauty, though greatly inferior to the former. Its ground, or basis, is a bluish white, and its zones are made of the matter of the deeper yellow and the white cornelian laid alternately, and often intermixed with other zones, made of the common matter of the stone. It is found in Ægypt, Arabia, and the East-Indies, and not unfrequently in Germany, but the European is greatly inferior to the Oriental.

These are all the genuine *sardonyxes*; but the stone called *sardonyx*, in Pliny's time, being properly a camæa, not a *sardonyx*, is to be seen under that head. *Hill's* Hist. of Foss. p. 497.

SARFAR, a name given by some of the chemists to iron.

SARGAZO, or SARGASO, in botany, a name for the plant commonly called *sea lentils*; a small sea plant found among the rocks, and sometimes at open sea, and supposed to be a good diuretic. *Mont.* Exot. p. 7. *Piso*, p. 18.

SARGO, the name used by Agustino Scilla, in his book of petrifactions, for the name of one of those kinds of sea fish, in the hinder part of whose jaws are found those round *dentes molares*, or grinder teeth, which, when found in a petrified state, are called *bufonitæ*, or toadstones.

It is very certain, that by *sargo* Scilla means no other fish than the *sargus*; yet Mr. Willughby says that the *sargus* has none of these round grinders, or *tubercula ossea*, as he calls them, and makes this one of the characters by which the *sargus* is to be distinguished from the sparus and scarus, and other fishes of that tribe.

It is probable that Scilla, who wrote more expresly on these subjects, dissected his *sargus* with too much accuracy, to be mistaken in this material part of it; and it is possible that Mr. Willughby, though a very accurate writer, might overlook these teeth in the hinder part of the jaw of a fish which he was only describing in the common way, and had no peculiar reason for examining in so nice a manner just in this part. Philos. Trans. N° 219. p. 195.

SARGUS, in zoology, the name of a fish well known, and much esteemed among the antients, and not uncommon at this time in the markets of Rome, Venice, *&c.* being caught in the Mediterranean and Adriatic in considerable quantities. See Tab. of Fishes, N° 54.

It something resembles the sparus in figure, but its nose is longer and more pointed, and turns up a little, and its foreteeth are shaped like two human teeth, which stand in the same part of the mouth. It has no tubercles in the hinder part of the jaws, as the sparus has; and its whole body is variegated with brown transverse rings, resembling the variegations of the perch, and has only one fin on the back, the anterior rays of which are prickly, the hinder ones not at all so. *Willughby*, Hist. Pisc. p. 309. *Gesner*, de Pisc. p. 993.

SARGUS, in zoology, is also the name of a river fish, called by others *gardon*, *sardus*, and *cephalus*, and by many supposed to be no way essentially different from our common roach.

It is a river fish, very much resembling the chub in its general figure, and the size of its scales, but it has a smaller head, and a somewhat broader body than that fish. Its back is bluish, its neck greenish, and its belly white. It has no teeth. Its eyes are yellow, and it is usually less fat than the chub.

It is a very brisk and lively fish, and is a sort of emblem of health among the French, and used proverbially as such in the same manner as the roach among us. We say of a healthy man, he is as sound as a roach, they, he is as sound as a *gardon*. It is common in the rivers of France, Italy, and Germany, and is esteemed but a moderately fine fish for the table. *Willughby's* Hist. Pisc. p. 260.

SARIGOY, in zoology, a name by which some call the creature we know by the name of the *opossum*. See the article OPOSSUM.

SARIO, in zoology, a term used by some authors for the salmon when in the middle stage of its growth, when it is past its younger state, in which it is called a *salar*, and is not yet arrived at what is properly called a *salmon*. *Willughby's* Hist. Pisc. p. 189. See the article SALMO.

SARISSA, in antiquity, a very long spear used by the Macedonians. Ælian says, that by the antient usage they ought to be sixteen cubits in length; but that in fact they were but fourteen, two cubits being allowed for the handle, and the other twelve to cover their bodies. *Pitisc.* in voc.

SARMATICA *lues*, a name given by some authors to the *plica polonica*.

SARMENIUS *lapis*, a name given by the writers of the middle ages to a stone said to be used in the polishing of gold, and to have virtues in medicine also; such as preventing abortion, and the like.

It seems to have been only a corrupt way of spelling *samius lapis*, a stone to which Pliny has attributed the same virtues.

SARMENTOUS *stalk*. See the article STALK.

SARONIA, Σαρωνια, among the Greeks, a festival kept in honour of Diana, surnamed *Saronia*, from Saro the third king of Trœzene, by whom a temple was erected, and this festival instituted to her. *Potter*, Archæol. Græc. Tom. I. p. 439.

SAROS, Σαρος, in chronology, a period of 223 lunar months. *Suidas* in voc. Σαρος Mem. Acad. Inscr. Tom. 8. p. 283.

The etymology of the word is said to be Chaldean, signifying restitution, or return of eclipses; that is, conjunctions of the sun and moon in nearly the same place of the ecliptic.

The *saros* was a cycle like to that of *meto*. See the article METONIC, *Cycl.*

SAROSEL, in the glass trade, the name of the room into which the mouth of the Leer opens, and in which the glass vessels are placed, when taken out of the Leer.

The men who attend to do this are called the *sarole* men. *Neri's* Art of Glass, p. 244.

SARPA, in zoology, the name by which the *salpa*, a very beautiful fish of the Mediterranean, is known in the Italian markets. *Gesner* de Pisc. p. 979. See SALPA.

SARPICULA, among the Romans, a term used by the old Roman writers to signify a pruning hook. *Pitisc.* in voc.

SARPLAR *of wool*, a quantity of wool otherwise called a pocket, or half sack; a sack containing eighty tod, a tod two stone, and a stone fourteen pounds. See the article SACK, *Cycl.*

In Scotland it is termed *sarpliath*, and contains eighty stone. Vid. Dict. Rust. in voc.

SARPOE, a name given to the fish called by authors *salpa*. See SALPA.

SARRACENA, in botany, the name of a genus of plants, the characters of which are these. The flower is of the rosaceous kind, and is composed of several leaves, arranged in a circular form, and placed on a one leaved cup, divided into many segments at the edges, or sometimes of a number of distinct leaves; from the center of the cup there arises a pistil, which carries on its top a sort of membranaceous shield, which finally becomes a roundish fruit, usually divided into five cells, and containing oblong seeds.

There is only one known species of *sarracena*, which is the *sarracena* with hollow and auriculated leaves, commonly called *the hollow leaved sea lavender*, the *limonio congener* of Clusius. *Tourn.* Inst. p. 657.

SARRITION, *sarritio*, in Roman authors, the term used to express what we call hoeing in husbandry, or something analogous to it, that is a way of stirring up the earth about young plants, and destroying the weeds that would grow among them. When the plants had been some time come up, they stirred the land with wooden rakes or harrows, and then went over the fields, and pulled up the weeds by hand.

Columella says, that they sowed the medica by scattering the seeds on the surface of the ground, and then raking them in with iron rakes, and that at different times. After this they went over the ground again with the same instruments, to root up the weeds which would have choaked the young plant. They both harrowed and hoed *rastris* with rakes; so that their *occatio* and *sarritio* were performed with much the same sort of instrument, and differed only in the time or season at which they were performed: the first was at seed time, to cover the grain and level the ground, and the other was to move the ground after the plants were up.

They used two kinds of *sarrition*; the one was intended only to move the ground, the other was to cover up the young plants, that they might grow the more strong and vigorously. The antients all sowed their corn under furrow; that is, they first levelled the ground by harrowing, then scattered the seed upon it, and afterwards plowed it in. This method left the ground very uneven, and the corn came up mostly in the lowest places betwixt the furrows, which always lay higher. This we see is always the case at present, where the same method is followed; and the understanding this explains a passage in Virgil, which many have been perplexed about, *cum sulcos equant sata*, when the corn is as high as the furrows, which it is plain it could not be

be in this method of hufbandry, till it was of fome growth. When they only hoed to ftir the furface of the ground, or ufed what they called plain *farrition*, they harrowed or hoed lengthways of the furrows, which being fomewhat hardened, there could be little earth thrown down thence upon the corn.

The other kind of *farrition* was performed by ftirring the earth crofsways of the furrows, by which a great deal of it muft needs be thrown down among the young corn. The hufbandmen of thefe times fuppofed, that the falling down of this earth upon the ftalk, burying it to fome depth, was the occafion of its growing ftrongly and vigoroufly: but though this could not be the cafe, it is certain that the corn did grow better for the operation, becaufe the ground was thoroughly ftirred by it, and had an advantage for the plants, like that obtained by the modern practice of horfe-hoeing.

The antients in many other cafes, as well as this, feem to have miftaken the intent and meaning of their general practices in hufbandry. Columella fays that beans, peafe, and other the like herbs, fhould all be well hoed when they are about four fingers high, excepting only the lupine, but that hoeing was injurious to this plant, which having only one root, when that was cut the whole plant perifhed.

He adds, that hoeing was not neceffary to this plant, becaufe it was of itfelf fo ftrong a grower, that it kills all weeds, ftarving them out by drawing all the nourifhment to itfelf.

If the hufbandmen of thefe times had fowed their lupines in rows, and harrowed only between thofe rows, they would have been in no danger of cutting the roots of the plant; and had they been better acquainted with hoeing, they would have known that the killing the weeds is the leaft part of the advantage arifing from it, the principal being the opening and dividing the earth, and giving it a kind of new tillage.

The *farrition* ufed by the antients fcratched only fo flight a part of the furface of the ground, that it is to be doubted whether it was of much advantage; and this was done fo indiftinctly among the corn and weeds, without favouring one any more than another, that it is a difpute whether the good it did, in facilitating the runcation, or hand-weeding afterwards, was greater than the damage it did by tearing the corn; fo that many of the hufbandmen of thofe times chofe to omit it, and only to employ the hand-weeders: but with us hoeing, when carefully practifed, is of infinite advantage, no way injurious to the corn, though wholly deftructive of the weeds.

It is an error therefore in the tranflators of the antients, to render the word *farritio* by *hoeing*, without giving any farther explication of it; for the antients truly hoed their vineyards in an exact fenfe of the word, but not their corn; neither did they plant their corn in rows, without which they could not give it their vineyard hoeing. This farculation was ufed only among fmall quantities of fown corn, and is yet in ufe for flax; for the farculum, which is a fort of very narrow hoe, is ftill ufed among the plants of flax growing irregularly, but this is too tedious and expenfive ever to have place in whole fields of corn.

If the antients hoed their crops of corn ftanding irregularly, as fown at random, they muft have made very mad work of it, fince they were at no pains to fow in rows, and hoe between them with their bidens, which was an inftrument with which they tilled many of their vineyards, and which entered the ground as deep as the plow, and was a much better inftrument than the Englifh hoe, which is very ill calculated for the office its principal bufinefs lies in, which is ftirring the ground. *Tull*'s Horfe-hoeing Hufbandry.

SARTORIUS (*Cycl.*)—This is the longeft mufcle of the human body; it is flat, and about two fingers in breadth, fituated obliquely along the infide of the thigh. It is fixed above by a very fhort tendon, in the lower part of the anterior fuperior fpine of the os ilium, before the mufculus fafciæ latæ. The beginning of its body lies in the notch, between the two anterior fpines of that bone. From thence it runs down obliquely over the vaftus internus, and other mufcles that lie near it, all the way to the infide of the knee, where it terminates in a fmall tendon, which grows broader near its extremity, and is inferted obliquely, and a little tranfverfely, in the forepart of the infide of the head of the tibia, near the fpine or tuberofity of that bone, immediately above the infertion of the gracilis interior.

The flefhy body of this mufcle is enclofed in a vagina made by the fafcia lata; its fibres in general are longitudinal, and when its lower tendon turns obliquely over toward the head of the tibia, it feems to be braced down, and fecured in its place by a tendinous frænum or vagina. *Winflow*'s Anatomy, p. 214.

SASSAFRAS (*Cycl.*) The culture of this tree is a hard tafk, it being a very difficult tree to keep long alive, though it will do very well for fome time. It will not live in greenhoufes, and hard winters kill it in the open air.

The beft way to manage it is to remove it in April into a warm and well defended place, where it will be fafe from the cold winds, and from too much open fun. It muft not, however, be under the droppings of other trees. In winter fome mulch muft be laid on the ground round the ftem, and in the fummer feafon all the weeds muft be cleared away about it.

It is brought from Virginia and Carolina, in both which places it is common.

Ximenes, an author of confiderable credit in the world, has ventured to tell us, that the chips of the *faffafras* tree put into fea water will, in a few days, render it frefh and potable. He was probably impofed on by fome perfon, in whom he placed too much confidence in this article, for experiments fhew it to be falfe; ever fo large a quantity of this wood, kept for ever fo long a time in fea water, having no fuch effect. *Redi*'s Efperienze.

The oil of *faffafras* forms into chryftals like the oil of thyme, obferved by Mr. Neuman, and which he fuppofed like to camphor. Philof. Tranf. N° 389, 390, and 450. See CAMPHOR and OIL *of faffafras*.

SASSAROLLO, in zoology, the name of a peculiar fpecies of pigeon, called by fome *columba rupicola*, or the rock pigeon.

It is of the fhape of the common pigeon, but fmaller, and has red legs, and a grey variegated back. It feems the fame with the *livia* of other authors. *Aldrovand* de Avib. See the article LIVIA.

SATISFACTION, in law, is ufed for the giving of recompence for an injury done; or the payment of money due on bond, judgment, &c. In which laft it muft be entered on record. 2 *Lill.* Abr. 495. Terms of Law.

SATURATION, in chemiftry, is the impregnation of an acid with an alkali, or of an alkali with an acid, till either will receive no more, and the mixture becomes neutral.

SATUREIA, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of the labiated kind. It differs from thyme, in that the flowers grow fcatteredly in the alæ of the leaves; from calamint, in that they do not ftand on ramofe pedicles; and from the thymbræ, in that they are not verticillate.

The only fpecies, properly of this genus, is the common garden *favory*.

SATURN (*Cycl.*)—The ring of *faturn* fometimes difappears, concerning which we have a paper in the Philofophical Tranfactions, N° 471. fect. 9. by Mr. Heinfius of Peterfburg.

This phænomenon is rare. It ought to happen every fifteen years; but from the fituation of the earth, with refpect to the fun and to *faturn*, it happens not above once in 30 or 45 years. See Philof. Tranf. loc. cit.

SATURNIAN, *faturnius*, in antient poetry, a kind of iambic verfe ufed in fatirical writings: it confifted of fix feet, and a fyllable over, and thence called *trimeter hypercatalectus*. *Pitifc.* in voc. See IAMBIC, *Cycl.*

SATURNINE, (*Cycl.*)—SATURNINE *tincture*, *tinctura faturnina*. See the article TINCTURE.

SAUEL, in ichthyology, a name given by the Portuguefe to a kind of fifh, very frequent on the coafts of China, which by the natives is called *xiyu*. In the months of April and May vaft numbers of them are taken in the river Kiang, near Nanking: during which time one of the moft honourable of the emperor's eunuchs takes care to have feveral fhips filled with thefe fifh; which being put into the fhips alive, are buried, as it were, in ice provided for that purpofe, and in this manner preferved for the fummer's provifion of the emperor. The fhips made ufe of to carry thefe fifh to the emperor's court at Pekin, are of the neateft kind, and richly adorned; and all other veffels are obliged to make way for them. *Hofm.* Lex. univ. in voc.

SAVELIN, in zoology, the name of a truttaceous fifh of the umbla, or umbra kind, caught in the Danube, and in fome other large rivers. Its back is black; its fides fpotted with yellow fpots; and its belly and the belly fins are yellow. The fcales are very fmall, and on the head there is a very remarkable feries of fpotted lines running into a fingular figure, and furrounding the eyes, and running afterwards to the angle of the gills. The upper jaw is much longer than the lower. Its moft frequent fize is about a foot in length, but it fometimes comes up to fix or eight pound weight. It is a very fine tafted fifh. *Willughby*, Hift. Pifc. p. 195.

SAVIN, *fabina*, in medicine, is a famous hyfteric and attenuant; it promotes the difcharges by urine; but its great effect is the promoting the menfes, which it will do more forcibly than fafely, if not under very careful management.

It is kept in the fhops as an ingredient in many compofitions, but is very rarely ufed in extemporaneous prefcription. *Savin* is a fpecies of *juniper*. See the article JUNIPER.

SAVORY, in botany. See SATUREIA.

SAURITES, a ftone mentioned by Pliny, and fuppofed by the antients to be found in the belly of a lizard. It feems to have been a kind of cornelian of a pale flefh colour.

SAURURUS, in botany, the name of a genus of plants, the characters of which are thefe. The perianthium is oblong, coloured,

coloured, and permanent; it is compofed of one leaf, and ftands fideways on the amentum. There are no petals, but the cup being coloured, has been by fome taken for a flower. The ftamina are fix long capillary filaments, three ftanding on each fide. The antheræ are oblong and erect. The germen of the piftil is oval, and divided into three lobes. There is no ftyle. The ftigmata are three, and are obtufe and permanent. The fruit is an oval berry, having only one cell, and containing only one oval feed. *Linnæi* Gen. Pl. p. 155.

SAURUS, in ichthyography, a name given by fome authors to the *lacertus*, or longer gar fifh, called *agulia imperiale* by the Italians, and the *girrock* by the Englifh fifhermen. *Willughby*, Hift. Pifc. p. 232.

SAURUS, the *lizard fifh*, is alfo a name given by Salvian, and fome other writers, to a fifh of the cuculus kind, refembling the mackrel in figure and tafte, and more ufually called *trachurus*. *Salvian*, de Aquat. p. 15. See the article TRACHURUS.

SAUSTRA *beady*, in natural hiftory, a name given by the people of the Eaft-Indies to a kind of foffil, to which they attribute great virtues in medicine.

Before it is given internally, it undergoes an hundred calcinations, and feveral preparations with the juices of herbs. When the operation is over, they fay it will cure a thoufand difeafes. It has its name from thence, the word *fauftra* fignifying with them a thoufand.

It is a talcy ftone, and in its native ftate is of a reddifh colour. *Woodw.* Cat. Foff. Vol. 2.

SAUVAGEA, in botany, the name of a genus of plants, the characters of which are thefe. The perianthium is compofed of five acute and lanceolated leaves, and remains after the flower is fallen. The flower confifts of five plane, erect, obtufe, emarginated petals, which are longer than the leaves of the cup. The ftamina are numerous capillary filaments, about half the length of the flower. The antheræ are fimple. The germen of the piftil is buried in the cup. The ftyle is fimple and fhort. The ftigmata are fix; they are of an oblong figure, and of the length of the ftyle. The fruit is a covered oval capfule, confifting of one cell. The fpatha and capfule open horizontally along the middle. The feeds are fmall and numerous. *Linnæi* Gen. Pl. p. 240.

SAW *fifh*, in ichthyology, the Englifh name for the fifh called by authors the *priftes*, and *ferra pifcis*. It has thefe names from the form of its fnout, which refembles a large toothed *faw*.

According to the new fyftem of Artedi, this is a fpecies of fqualus, and is diftinguifhed from the other fpecies of the fame genus, by the name of the fqualus with a long pointed and flatted fnout, dentated on each fide. See Tab. of Fifhes, N° 5. and SERRA *pifcis* and SQUALUS.

SAWING *afunder*, a punifhment very common among the antient oriental nations. See *Pitifc.* in voc. *ferra*.

SAXIFRAGE, *faxifraga*, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the rofaceous kind, confifting of feveral petals difpofed in a circular form; from the cup of which there arifes a two horned piftil, which finally becomes, together with the cup, a roundifh, but two horned bicapfular feed veffel, which ufually contains a number of very fmall feeds.

The fpecies of *faxifrage*, enumerated by Mr. Tournefort, are thefe. 1. The common round leaved *faxifrage*. 2. The *faxifrage* with bulbs at the leaves. 3. The fmall annual fpring *faxifrage*, called rue-leaved whitlow grafs. 4. The moffy *faxifrage* with trifid leaves. 5. The trifid leaved alpine *faxifrage* with pale yellow flowers. 6. The fmall hairy trifid leaved alpine *faxifrage*. 7. The white flowered trifid leaved rock *faxifrage*. 8. The many flowered houfeleek leaved white *faxifrage*. 9. The Pyrenean houfeleek leaved *faxifrage* with crenated leaves. 10. The narrower houfeleek *faxifrage* with ferrated leaves. 11. The *faxifrage* with rounded ferrated leaves. 12. The alpine houfeleek *faxifrage* with rough leaves. 13. The purple flowered heath-like alpine *faxifrage*. 14. The blue flowered heath-like alpine *faxifrage*. 15. The long leaved pyramidal mountain *faxifrage*. 16. The fmalleft yellow flowered Pyrenean *faxifrage* with leaves like houfeleek, very clofely put together. 17. The fmalleft white flowered Pyrenean *faxifrage* with leaves very clofely fet together. 18. The fmalleft alpine *faxifrage* with bluifh green leaves bending downwards. 19. The yellow alpine houfeleek leaved *faxifrage*. 20. The broad leaved Pyrenean trifid *faxifrage*. 21. The broad leaved rigid *faxifrage* with trifid leaves. 22. The fmalleft trifid leaved Pyrenean *faxifrage* with pale yellow flowers. 23. The Pyrenean *faxifrage* with leaves partly whole, and partly trifid. And 24. the fmalleft yellow flowered moffs-like Pyrenean *faxifrage*. *Tourn.* Inft. p. 252.

In the materia medica we have two very different plants defcribed under the name of *faxifrage*; fo that the writers on thefe fubjects feem often ftrangely to contradict one another in their defcriptions, when they are really defcribing two perfectly different plants.

The one is the *faxifraga antiquorum*. This is a low plant, fomewhat refembling thyme, and its feed is of an agreeable fmell, and warm and acrid tafte. The other is the common white meadow *faxifrage*, a plant of fix or eight inches high, with roundifh leaves and large white flowers. The root of this fpecies is granulofe, or made up of a number of fmall knobs, and thefe are in moft places ufed in the fhops under the name of *faxifrage* feeds.

The feeds of *faxifrage* were once in great efteem, as a diuretic and remedy for the ftone, but they have of late loft their credit. It may be obferved, however, that we are not proper judges of what might have been the virtues of an acrid feed, while we ufe in its ftead an infipid root. *Lemery*'s Hift. of Drugs.

Golden SAXIFRAGE. See CHRYSOPLENIUM.

Red SAXIFRAGE, *faxifraga rubra*, a name given by fome botanic authors to the *filipendula* or dropwort. *Ger.* Emac. Ind. 2. See FILIPENDULA.

Yellow SAXIFRAGE, *faxifraga lutea*, a name given by Fuchfius, and fome other authors, to the common melilot. *Ger.* Emac. Ind. 2.

SAYACU, in zoology, the name of a Brafilian bird, of the fize of our chaffinch, and all over of a greyifh green colour, and very beautifully bright and fhining in the back and wings. Its beak is black, as are alfo its eyes. *Marggrave*'s Hift. of Brafil.

SAYAN, in natural hiftory, a name given by fome to a fpecies of fea fwallow. The bird whofe nefts are fo famous an ingredient in foups.

SCAB—*Crown* SCAB, in the manege, is a mealy fcurf upon the pafterns of a horfe, that make the hair briftle and ftare.

SCABBARD, in the manege, is the fkin that ferves for a fheath or cafe to a horfe's yard.

SCABBED-*heels or frufh*, in the manege, is an eating putrefaction upon a horfe's frufh, which is very hard to cure, and has a noifome fmell.

SCABIES, the *itch* (*Cycl.*)—Medical writers diftinguifh this hateful difeafe into two kinds, the benign and the malign.

The benign *itch* befide being divided into the dry and moift, is alfo diftinguifhed into the chronic, which remains on the patient for many years, and the periodic, which returns and difappears at certain periods. It is alfo divided by others into the fuperficial and profound, the firft affecting only the fkin, and arifing ufually from contagion, the other lying deeper in the blood and humors.

The malignant *itch* is of many kinds, diftinguifhed by the epithets ferine, fcorbutic, venereal, and leprous. In thefe cafes the malignant *itch* is fometimes called alfo the complicated *itch*, as it is complicated with other diforders, and is attended with various fymptoms, not properly belonging to it as the *itch*.

Signs of the itch. The moft obvious and general figns of the *itch* are the eruption of pimples, or puftules, over the whole furface of the body, excepting only the head; which contain, in the end, a fanious and ulcerous matter. Thefe puftules ufually appear firft in the hands, and fuch other parts as are moft expofed to the air, and from thefe they gradually fpread themfelves all over the body; the body is more turgid in thofe places where the puftules are fituated, than in a ftate of health; and thefe puftules are attended with a violent itching, efpecially in the night. After a few days they either break of themfelves, or are opened by fcratching, and then become fo many little ulcers; thefe, however, ufually heal of themfelves in a very little time, and leave no fcar behind them. This kind of benign *itch* occupies no part but the fkin, and indeed the matter always lies between the cutis and cuticula, whence the cutis not being deeply corroded, the cuticle eafily heals. *Junker*'s Confp. Med. p. 448.

In the *benign moift itch*, the puftules contain a large quantity of matter, and when broken difcharge a large flow of it; there is alfo round the bafis of the puftules of this kind an inflammatory red circle; and, in fine, the more plainly that appears, the greater is the fuppuration. The ulcerations, in this kind, are deeper than in the dry, and the puftules rather give a fenfation of pain and burning heat than of itching.

In the *benign dry itch*, the puftules are much fmaller than in this cafe, and are full of a limpid water; and they ulcerate the fkin more fuperficially, and caufe a violent itching, rather than any forenefs or heat in the parts.

The *malignant itch*, when of the ferine kind, called alfo by fome the fcorbutic *itch*, is dry and fcaly, and frequently fhews bloody fpots under the larger fcales. The fkin round about thefe is tinged by the ftagnating blood, fometimes to a red, fometimes to a livid, or bluifh black colour. The itching from this kind is much more violent than from the benign, and on any fudden change of the body, either to hotter, or colder, becomes almoft intolerable. When the fcabs and cuticle are fcratched off, as is very frequently the cafe, the cutis underneath is feen red and bloody, but neither blood nor lymph are difcharged from the fcabs in fome cafes, in others a yellowifh ferous liquor runs out, and almoft immediately hardens into a fcab or cruft like that which was pulled off.

The venereal or pocky itch. This is ufually rather dry than moift, and does not fpread itfelf fo quickly as the other kinds. It fometimes occupies the body in general, fometimes only particular places, as the thighs, the fcrotum, or the face.

At its firſt appearance there are uſually felt certain little tumors under the ſkin; and after this there appears a ſcab which remains on the part a conſiderable time, and will not eaſily be removed or torn off. The pain of this is ſharp and eroſive, eſpecially when it is exaſperated by ſcratching; and while this is fixed to ſome one part, there are pains felt deep within the fleſh in other places, which are moſt intolerable in the night; and in women the fluor albus, or whites, is uſually an attendant on it; and in men ſometimes a gonorrhœa, ſometimes bubos and other tumors; and in infants, who are thus affected, from the diſeaſes of their parents, there are frequent excoriations, and often criſtated and verrucoſe excreſcences of fleſh about the anus.

The leprous itch. In this the head is frequently affected, the pains are very violent, and the hair and ſkin very frequently fall off. There iſſues from the ſcabs white ſanious matter, and the whole texture of the ſkin is altered; the cuticle being beſet with ſmall ſcales, and feeling rough like the ſkin of an elephant, whence the diſeaſe has been called by ſome *elephantiaſis*.

In other reſpects, this complaint is attended with no ſenſation of pain, or uneaſineſs; but the face is inflated, the teeth become black, the breath becomes fœtid, and tumors of the bubo kind appear on ſeveral parts of the body, all which become finally malignant ulcers; and in the progreſs of the diſeaſe, large ſcabs, with portions of the ſkin, fall from different parts of the face.

Perſons ſubject to the itch. Theſe are principally men of a ſanguineous temperament of body and phlegmatic diſpoſition, who moſt eaſily fall into the moiſt *itch* of the ſimple benign kind, and are of all others moſt difficultly cured of it. Thoſe, on the other hand, who are moſt ſubject to the ſimple dry *itch* are men of a dry temperament and choleric habit. All perſons who eat coarſe foods, with much ſalt, and drink ſour or decayed liquors, eaſily fall into this kind; as alſo ſuch as live in a damp foggy air, and thoſe who are ſubject to obſtructions of the liver, and who have long been afflicted with quartans. Thoſe who have a ſuppreſſion or diminution of the uſual quantity of urine, and by that means have the ſalt ſeroſities of the blood not duly carried off, are alſo more ſubject than others; as alſo, from the ſame cauſe, are ſuch as have had old ulcers ſuddenly ſtopped, or iſſues dried up; people who have been uſed to cupping, at certain regular times, and afterwards neglect it; and finally, thoſe of an idle and ſedentary courſe of life. Ibid. p. 450.

Cauſes of it. The cauſes of the ſimple benign *itch* are a ſtaſis and corruption of the lymphatic humors, and this is often occaſioned by the humid temperament of the air, which in cold ſeaſons prevents the going off of thoſe humors by ſweat, which had been directed to the ſkin by nature for that purpoſe, hence they remain there and corrupt; and there are other things which more or leſs concur to cauſing it; theſe are a change of the food and drink continued for ſome time, and with this a plethoric habit of body. It is ſometimes the criſis of other diſeaſes, as of a quartan, &c. Theſe are the cauſes, and theſe the perſons ſubject to the *itch*, as a primary diſeaſe beginning with them; but its uſual method of propagating itſelf is by contagion; fifty people, at leaſt, having it by this means, for one, on whom it appears of itſelf. A free uſe of ſalted food greatly exaſperates the *itch* in all perſons, but this alone can have but little effect toward the original producing it. The malignant or complicated *itch* owes its origin to other cauſes. The ferine *itch* is always cauſed by the ſcurvy, and the venereal or pocky *itch* owes its origin to a corruption of the lymph in the venereal diſeaſe.

Prognoſtics in the itch. The ſimple benign *itch*, of the moiſt kind, is the mildeſt of all the kinds, and in general the moſt eaſily cured; but as it is more ſubject to ulcerations than the other kinds, this ſometimes makes the cure in bad habits of body more difficult. The dry *itch* is more troubleſome, and takes more time in the cure than the moiſt, and is more troubleſome to the patient; but in the moiſt ſanious and ſuppurating *itch*, when it is raſhly treated by mercurial and ſulphureous ointments, by quickſilver girdles, by aſtringents and refrigerants, and is driven in, which is a very common caſe, there always ariſe very unhappy ſymptoms, ſuch as anxieties of the præcordia, aſthmas, ſuffocative catarrhs, intermittent fevers, and ſometimes inflammatory acute ones, both which are of a different appearance from thoſe diſtempers in their uſual ſtate; not unfrequently alſo terrible chronic complaints are brought on by this, as cachexies, anaſarcas and œdemas. The *itch*, in general, when newly caught by infection, is always much more eaſily cured, than when it ariſes from a fault in the humors, and is conſequently much more deeply rooted: for the ſame reaſon, the chronic *itch* is of all others the moſt difficult to be cured; and where there concurs with it a defect or fault of ſome of the viſcera, as is too often the caſe, the cure is yet greatly the more difficult. The malignant *itch* is always much more deeply rooted in the patient, and of conſequence is much more difficult of cure than the ſimple; and in particular, the ferine or ſcorbutic *itch* is one of the moſt ſtubborn diſeaſes we know of. In this caſe the food, and other circumſtances, often make the cure much more difficult than it naturally would be: poor people are often infeſted with this; and their diet not being in their choice, are with difficulty cured of it. The venereal *itch*, though generally accounted the moſt terrible of all the kinds, is yet much more eaſily cured than the ſcorbutic, and ſometimes than the ſimple chronic kind, when treated in a proper manner. *Junker's* Conſp. Med. p. 452.

Method of cure. The corrupt ſtate of the humors is to be corrected according to the ſeveral kinds. In the benign *itch*, this is effected by alexipharmics and diuretics, ſuch are decoctions of the woods of guaiacum, ſaſſafras, and the like, with elecampane and pimpernel roots, and the common abſorbents ſated with acids, as the crabs eyes, or oiſter ſhells, ſaturated with lemon juice, or the like; and the acrimony of the humors is greatly taken off by ſulphur and nitre given in powders, or by the ſimple balſam of ſulphur in oil of almonds. After this external applications compleat the cure; of this kind are the mercurial ointments, and thoſe which contain ſulphur. In the dry *itch* fomentations and baths do much more than ointments; of this kind are decoctions of the oxylapathum root, and a lixivium of quick-lime and ſulphur, or the general bathing in mineral ſprings.

In the malignant itch, the ferine or ſcorbutic is to be treated as the ſcurvy, to which it owes its origin. The antiſcorbutic juices ſhould be taken for ſome time, and the decoction of tobacco made very ſtrong, is a good external application; mercurial ointments have alſo their uſe here, and the violent heat of the eruptions may be mitigated by camphor, and by the frogs ſpawn plaiſter.

In the venereal itch, the method to be uſed for a cure is the ſame with that for the venereal diſeaſe in any other appearance, but in this there muſt be always kept up a gentle perſpiration: mercurial ointments have peculiarly a place here: and when the diſeaſe is ſo rooted as to give way to no other means, recourſe is to be had to a ſalivation; and finally, the cure is to be completed by evacuating the corrected humors by ſtool, in which caſe calomel is a very uſeful ingredient in purges, and the decoctions of the diaphoretic and diuretic vegetables are of great ſervice in compleating it, and preventing a return. Ibid. p. 454.

SCABIOSA, *ſcabious*, in the Linnæan ſyſtem of botany, a diſtinct genus of plants; the characters of which are, that there is both a common and a proper perianthium, of which the latter is alſo double. The common perianthium is expanded, and compoſed of many leaves, and containing many flowers; its leaves are inſerted in the receptacle, and ſurround it in various ſeries, the inner ones becoming gradually leſs than the outer. The proper perianthium is double, but both are fixed on the germen of the piſtil. The outer perianthium is ſhort, membranaceous, and folded, and remains after the flower is fallen; the inner is divided into five ſegments, which are narrow, and pointed; the flowers are monopetalous, they are placed erect, and the petal forms a tube, which is widened at the extremity, and ſlightly divided either into five, or four ſegments, the exterior of which are the larger. The ſtamina are four ſmall and weak filaments. The antheræ are oblong, and laid cloſely upon them. The germen of the piſtil is placed below the proper receptacle of the flower; and is incloſed, as in a caſe, in its proper vagina. The ſtyle is ſlender, and of the length of the flower. The ſtigma is obtuſe, and is obliquely rimmed round the edge. The ſeeds are ſingle to each flower, of an oval oblong figure, and crowned with their proper cups, and contained in the common receptacle, which is convex, and divided by the perianthia of the ſeveral flowers. See Tab. 1. of Botany, Claſs 12. and *Linnæi* Gen. Plant. p. 23.

The characters of this genus, according to Tournefort, are theſe. The flower is of the floſculous kind, and is compoſed of ſeveral unequal floſcules, contained in one general or common cup. Thoſe floſcules, which are placed in the middle of the flower, are divided at the ends into four or five ſegments, and thoſe which make the outer circle or rim of the flower are bilabiated. Each of theſe ſtands on the coronated top of an embryo, and each is contained in its proper and peculiar capſule, which afterwards becomes either a ſimple or a funnel faſhioned capſule, containing a coronated ſeed. *Tourn.* Inſt. p. 464.

The ſpecies of *ſcabious* enumerated by Mr. Tournefort are theſe. 1. The common hairy field *ſcabious*, or *ſcabious* of the ſhops. 2. The greater *ſcabious* with purpliſh blue flowers. 3. The broad leaved white ſhrubby *ſcabious*. 4. The broad leaved ſhrubby *ſcabious* with bluiſh flowers. 5. The tall annual *ſcabious* with leaves like agrimony. 6. The narrow leaved white flowered ſhrubby *ſcabious*. 7. The larger white flowered, narrow leaved ſhrubby *ſcabious*. 8. The yellow flowered *ſcabious* with multifid leaves. 9. The double headed white *ſcabious*. 10. The broad leaved white proliferous *ſcabious*. 11. The proliferous *ſcabious* with gingidium leaves. 12. The ſmall fine leaved poliferous *ſcabious*. 13. The Alpine *ſcabious* with great centaury leaves. 14. The ſmooth mountain *ſcabious* with leaves like the common *ſcabious*. 15. The red flowered mountain *ſcabious* broad not

jagged leaves. 16. The red flowered mountain *ſcabious* with broader and longer undivided leaves. 17. The *ſcabious* with the virga paſtoris, or ſmall dipſacus leaf. 18. The narrow leaved ſilvery *ſcabious.* 19. The long headed red flowered exotic *ſcabious.* 20. The long headed *ſcabious* with fleſh coloured flowers. 21. The long headed *ſcabious* with variegated flowers. 22. The long headed *ſcabious* with blackiſh flowers, with the ſmell of civet. 23. The proliferous Indian *ſcabious.* 24. The Portugal *ſcabious* reſembling the Indian. 25. The greater round headed *ſcabious*, called the leſſer *ſcabious.* 26. The leſſer round headed *ſcabious.* 27. The leſſer *ſcabious* with deeply divided leaves. 28. The little *ſcabious* with ſweet ſcented heads. 29. The great leaved Spaniſh ſtarry *ſcabious.* 30. The ſtarry *ſcabious* with great jagged leaves. 31. The leſſer or ſea ſtarry *ſcabious* with jagged leaves. 32. The ſmalleſt ſtarry *ſcabious.* 33. The ſtarry *ſcabious* with undivided leaves. 34. The annual proliferous ſtarry *ſcabious.* 35. The Sicilian *ſcabious* with heart-wort leaves. 36. The ſhrubby procumbent mountain *ſcabious*, with leaves like the young leaves of the achillea. 37. The Sicilian ſhrub *ſcabious* with laureola leaves hoary underneath. 38. The ſhrub *ſcabious* with ſtock July flower leaves. 39. The narrow leaved umbelliferous and proliferous *ſcabious*, with leaves cut into the middle rib. 40. The fleſh coloured flowered *ſcabious*, with leaves like the hairy jagged devil's bit. 41. The great tree *ſcabious* of Africa, with undivided, wrinkled, and crenated leaves. 42. The ſmall ſea *ſcabious.* 43. The cut leaved *ſcabious* with large flowers in membranaceous cups, and with woolly ſeeds. 44. The leaſt annual erect *ſcabious* with angular ſeeds. 45. The daiſy leaved annual *ſcabious.* 46. The greyiſh hoary Pyrenean *ſcabious* with large flowers. 47. The ſmooth graſſy leaved *ſcabious.* 48. The hairy creeping Alpine *ſcabious* with divided leaves. 49. The *ſcabious* with hairy undivided leaves, called the devil's bit. 50. The *ſcabious* with ſmooth undivided leaves and blue flowers. 51. The *ſcabious* with undivided leaves and white flowers. 52. The fleſh coloured flowered *ſcabious* with undivided leaves. 53. The *ſcabious* with whole leaves, proliferous heads, and blue flowers. 54. The *ſcabious* with leaves like fraxinella. *Tourn.* Inſt. p. 465.

The muſk *ſcabious* and other garden kinds are propagated by ſowing their ſeeds in May or the beginning of June, and the next year they will be very ſtrong, flowering from June to September, and producing ripe ſeeds, which they will not do if ſown early in the ſpring, and ſo made to flower the ſame year. The ſeeds are to be ſown on ſhady borders, and at Michaelmas the young plants are to be removed to the places where they are to remain. They are very hardy, and ſeldom periſh, till after they have ripened their ſeeds. *Miller's* Gardner's Dict.

The common *ſcabious*, of our corn fields, is accounted a great alexipharmic and pectoral; it is made an ingredient in ptyſans, and infuſions given in coughs and all diſorders of the lungs, and is recommended greatly by authors in pleuriſies, quinzies, coughs, aſthmas, and conſumptions. Some even recommend it in malignant fevers, and even in the plague.

It is alſo uſed externally, either in a ſtrong decoction, or elſe boiled into an ointment with lard in the itch, and many other diſorders of the ſkin.

Scabious, though ſo much celebrated with us for its medicinal virtues, has been ſuppoſed by many to have been wholly unknown to the antient Greeks: others who could not give into the opinion of their not knowing ſo common a plant, have ſuppoſed the *ſtæbe* of Theophraſtus and Dioſcorides to be the plant we call *ſcabious*, but there is no more juſtneſs in this than in the former opinion.

The antient Greeks knew two very different plants by the name of *ſtæbe*, but neither of theſe at all anſwered to the characters or virtues of *ſcabious*; the one was a ſhrub, the other an aquatic plant with woolly leaves. The ſhrub called *ſtæbe* was the ſame with the *pheos* and *hippopheos*, a prickly ſhrub of a cubit in height, but very full of branches, which grew on the ſhores of the iſland of Crete, and other the like places; and the plant *ſtæbe* was a ſmall gnaphalium, or cudweed, growing in wet places, and uſed for the ſtuffing of beds, and the packing up of earthen ware, and other brittle things, to prevent their breaking. The other was uſed by the fullers about cloaths.

It is ſufficiently evident, from theſe accounts, that neither the one nor the other of theſe *ſtæbes* had any of the qualities of *ſcabious*; but though neither of theſe was *ſcabious*, yet it does not follow that *ſcabious* was unknown.

Dioſcorides and Theophraſtus have deſcribed a plant called *pſorice*, from its virtues in curing cutaneous eruptions; and this agrees, in all reſpects, in figure, as well as qualities with our *ſcabious*. The later Greek writers have called this *pſora*, and thus it ſtands in Aëtius, and many others.

In times long after theſe, however, the names were forgot, though the plant and its virtues remained well known; the modern Greeks willing to deſcribe ſo uſeful a plant, but ignorant of its name, in their own language, called it *ſcampiuſa*, a name formed out of the Latin word *ſcabioſa*, by the common change of *b* into *mp*, and *o* into *u*. This was long retained in uſe; and as it was common with the Greeks to leave out the initial letter, *ſ*, in many words, ſo they ſometimes wrote this *campiuſa*.

Fuchſius, who was very deſirous of underſtanding the writings of Myrepſus, confeſſes, that he knew not what to make of the words *ſcampiuſa* and *campiuſa*, which he ſo frequently met with in that author; but though he gives no deſcription of the plant, the virtues he attributes to it are thoſe of *ſcabious*; and the names are ſo eaſily diſcovered to be derived from the Latin *ſcabioſa*, that there is no room for doubt of its being the ſame plant.

SCABROUS *leaf*, among botaniſts. See LEAF.

SCABROUS *ſtalk*. See the article STALK.

SCAD, the Engliſh name of a fiſh of the cuculus kind, reſembling the mackrel in ſhape, called by writers the *trachurus*. *Willughby's* Hiſt. Piſc. p. 290. See TRACHURUS.

SCÆNANTH, or SCHÆNANTH, in the materia medica, the dried ſtalk of a plant brought to us from Arabia.

This plant is called, by the generality of botaniſts, *juncus odoratus* and *aromaticus*; but Linnæus gives it the name of *iſchæmum*, under which head its botanical characters are deſcribed. See ISCHÆMUM.

The ſtalk is uſually eight or ten inches in length, ſometimes conſiderably more; it is ſmooth and gloſſy on the ſurface, and about the thickneſs of a wheat-ſtraw, but much more rigid and firm. It is round, jointed, and not ſolid, but has a cavity in it filled with a central pith like that of our common ruſhes. Its colour is yellowiſh at the baſe, or toward the root, but toward the top it is purpliſh or greeniſh; it is very light, yet conſiderably hard, and is of a fragrant or aromatic ſmell, in which we may diſcover ſomething of a mixed ſcent, between that of the roſe and pennyroyal. Its taſte is acrid and bitteriſh, but not unpleaſant.

It ſhould be choſen freſh, ſound, and clean, not duſty or decayed, of a good ſmell and ſtrong acrid taſte. *Hill*, Hiſt. Mat Med. p. 413.

The word *ſchænanth* ſignifying the flower of the ruſh, might naturally lead us to ſuppoſe, that what we now receive under that name, is not the drug that was ſo called by the antient Greeks and Romans, and ſome have very vigorouſly ſupported this opinion. But on enquiry into the Grecian materia medica, we find that none of their *ſchænanth* had flowers on it any more than ours.

Among the moderns, Garcias tells us, that though he bought up vaſt quantities of this drug in the Indies to ſend into Portugal, he never ſaw ſo much as one flower upon any of it; and among the antients Galen makes the very ſame obſervation. He ſays he wonders how this drug obtained the name of *ſcænanth*, for that he never met with any one piece that had a flower upon it. The reaſon alledged for this is very frivolous and trifling; namely, that the camels of that part of the world where it grew, cropped off the tops, and with them the flowers; but among the vaſt quantities of this drug, at one time or other ſent, there would be found ſome that had eſcaped the mouths of theſe creatures, and have preſerved its fine flowers, had it any ſuch as are aſcribed to it; ſo that the opinion advanced, by ſome, of its having flowers like roſes, is wholly falſe and groundleſs.

Anthos was a word uſed by the Greeks, as its Engliſh flower is, to ſignify the moſt perfect, or beſt of any kind of thing. We call the fineſt ſpecies of any thing the flower of it, and thus they called the fineſt gold the anthos and anthimion of gold, in the ſame manner this ruſh was called *ſcænanth*, or the flower of ruſhes, not for its being full of flowers, but for being the moſt excellent and valuable of all kinds of ruſhes.

The very oldeſt among the Greek writers do not uſe the term *ſcænanth*, but they call this drug *juncus aromaticus*, or *juncus odoratus*, σχοῖνον ἀρωματικὸν, and σχοῖνον εὐώδη. are the names it goes by. Hippocrates calls it by the latter of theſe names; and Meleager, though he mentions it as an herb to be put into the poets crowns, yet ſays nothing of any flowers it has, but recommends it for its fragrant ſmell.

The antients uſed the whole plant in medicine, ſtalk, leaves, and flowers; its virtue reſiding pretty equally in every part of it, as is manifeſt from every part's poſſeſſing the ſame ſmell and taſte, and having the ſame pungency in the mouth. They preſcribed it as a deobſtruent and promoter of the menſes, but at preſent it is never heard of in extemporaneous preſcription, only kept as an ingredient in ſome compoſitions. Id. ibid.

SCALARE, in natural hiſtory, a name given by Rumphius to a peculiar ſpecies of *turbo*, or *ſcrew ſhell*; the ſeveral wreaths of which having an opening between them form an open ſpiral. See TURBO.

SCALE, (*Cycl.*)—Many have been the diſputes among antient and modern muſicians, about the conſtitution of muſical *ſcales*. Some of the antients, with Euclid, will have it compoſed of tones major, and limma's; ſo that the ſeven intervals of an octave would be thus expreſſed, $\frac{9}{8}$, $\frac{256}{243}$. $\frac{9}{8}$, $\frac{9}{8}$, $\frac{256}{243}$, $\frac{9}{8}$, $\frac{9}{8}$ Some modern authors have from hence inferred the imperfection of the Greek muſic. They alledge, we here find the ditonus, or an interval equal to two tones major

major expreffed by $\frac{81}{64}$, inftead of the true third major expreffed by $\frac{5}{4}$. As there can be no queftion of the beauty and elegance of the latter, the former therefore muft be out of tune by a whole comma, which is very fhocking to the ear. In like manner, the trihemitone of the antients falls fhort of the third minor by a comma; which is alfo the deficiency of their hemi-tone, or limma, from the true femi-tone major, fo effential to good melody. All which errors would make their *fcale* appear much out of tune to us. A late learned author [a] fays he readily grants the objection, but adds, that fuch a *fcale* alfo appeared out of tune to the antients themfelves; fince they exprefsly tell us, that the intervals lefs than the diateffaron, or fourth, as alfo the intervals between the fifth and octave, were diffonant, and difagreeable to the ear. Their *fcale* here mentioned, and called by fome *fcala maxima*, was not intended to form the voice to fing accurately, but was defigned to reprefent the fyftem of their *modes* and *tones*, and give the true fourths and fifths of every key a compofer might choofe. Now if inftead of tones major and limmas we take the tones major and minor, with the femi-tone major, as the moderns contend we fhould, we fhall have a good *fcale* indeed, but a *fcale* adapted only to the conciunous conftitution of one key; and whenever we proceed from that into another, we find fome fourth or fifth erroneous by a comma. This the antients did not admit of. If to diminifh fuch errors, we introduce a temperature, we fhall have nothing in tune but the octave: fo that this *fcale* of the antients was not deftitute of reafon, and no good argument againft the accuracy of their practice can from thence be formed [b].—[[a] Dr. *Pepufch*, ap. Philof. Tranf. N° 48. p. 268. Ibid. p. 269.]

The names of the notes of the Greek *fcale*, fee under the head DIAGRAM.

Hour SCALE. See the article HOUR.

SCALES, in natural hiftory. What the naturalifts underftand by *fcales*, are certain flat and femipellucid bodies, common to the fifh, the ferpent, and the lizard kind; confifting of a fubftance fomewhat analogous to that of the horns and hoofs of other animals, as is found by cutting and burning them, and by their fmell.

The *fcales* in fifhes are of fo many different kinds and fhapes, that they afford, in many cafes, very good characters for the diftinction of the fpecies. The differences of thefe parts of fifh arife from their number, fituation, figure and proportion, and to fome other qualities peculiar to a few of them. Their differences, in regard to number, are thefe. There are none on feveral kinds of fifh, as on the petromyza, the dolphin, and the whales. Upon fome other fifhes they are but very few in number, as on the conger, the eel, the clariæ, &c. And they are on others found in vaftly great numbers, and placed in clufters one over another, as in the pearch, falmon, &c.

In regard to their fituation they differ in thefe particulars. 1. On fome fifh they are placed extremely thick and clofe upon one another. 2. In others they ftand in imbricated rows. The efoces give us an example of the firft, and the cyprini, in general, of the fecond kind. And 3. in fome they are fcattered, and at fuch diftances, that they do not touch one another; as in the congers, the eels, the clariæ, &c. Their differences in figure are not lefs evident than thofe in pofition. 1. Some are roundifh, as thofe of the clupeæ and falmons. 2. Some are oval, or of an oblong round figure, as thofe of the gadi. 3. In fome fifh they are ftrait on one fide, and rounded on the others, as in the pearch and mullet. The proper defcription of thefe is, that they have a rectilinear bafe, and rounded fides.

Their differences in proportion are thefe; they are either in regard to one another, or to the *fcales* of other fifhes, or according to our fenfes, in regard to the fize of the fifh, either very large, great, fmall, middling, or extremely minute. Thefe are words, which give a fort of ufeful idea in the defcription, though they are far from being determinate or regular in their fignifications. As to the other peculiar qualities of the *fcales* of fifhes, they are in fome foft and fmooth, as in the falmon and cyprini; and in others hard and rough, and as it were a little prickly: of this fort are the *fcales* of the pearch, the caprifcus, and fome of the pleuronecti. *Artedi*, Ichthyol.

Scales of fifhes make a fet of very curious objects for the microfcope; they are formed with a furprifing beauty and regularity, and in the different kinds exhibit almoft an endlefs variety in their figure and contexture. Some are longifh, fome round, fome triangular, and fome fquare; and there are others of all the fhapes that can well be imagined. Again, fome are armed with fharp prickles, as thofe of the foal and pearch; others have fmooth edges, as thofe of the cod, tench, carp, &c. and there is a great variety even in the *fcales* of the fame fifh; for the *fcales* of the back, belly, fides, and head, are all different in fhape and arrangement: thefe bear a very great analogy to the feathers, as they are called, on the wings of butterflies.

Thefe *fcales* are not fuppofed to be fhed every year, nor during the whole life of the fifh, but to have an annual addition of a new *fcale* growing over, and extending every way beyond the edges of the former, in proportion to the fifhes growth; fomewhat in the manner as the wood of trees encreafes annually, by the addition of a new circle next the bark. And as the age of a tree may be known by the number of ringlets its trunk is made up of, fo in fifhes, the number of plates compofing their *fcales* denote to us their age. It is alfo probable, that as there is a time of the year when trees ceafe to grow, or have any farther addition to their bulk, the fame thing happens to the *fcales* of fifhes; and that afterwards, at another time of the year, a new addition, encreafe, or growth begins.

Mr. Lewenhoek took fome *fcales* from an extremely large carp, forty two inches and a half long, Rynland meafure, which were as broad as a dollar; thefe he macerated in water, to make them cut the eafier, and then cutting obliquely through one of them, beginning with the firft formed, or very little fhell in the center, he by his microfcope plainly diftinguifhed forty lamellæ, or *fcales*, glewed as it were to one another; whence he concluded the fifh to be forty years old.

It is generally imagined that an eel has no *fcales*; but if the flime be wiped clean away, and the fkin then examined by a microfcope, it is found covered with extremely fmall *fcales*, ranged in a very orderly and pretty manner; and probably very few fifhes, except fuch as have fhells, are truly free from *fcales*.

The way of preparing *fcales* for the microfcope is to take them off carefully with a pair of nippers, wafh them very clean, and then place them between the leaves of a book to make them dry flat; and when thoroughly dry, they are to be put between two flips of talc. The fnake, viper and eft afford alfo a very beautiful and very different feries of *fcales* from thofe of fifhes. *Baker*'s Microfcop. p. 237. *Lewenhoek*'s Arc. Nat. Tom. 3. p. 214.

SCALENI, (*Cycl.*) compound mufcles irregularly triangular. The antients call them only two in number; afterwards they were divided into fix, three lying on each fide, but ufually there are only two on each fide, one lying upon the other.

The firft, or *fcalenus primus*, is fixed to the upper parts of the outfide of the firft rib by two portions, commonly called its anterior and pofterior branches; the anterior is fixed to the middle portion of the rib, about an inch from the cartilage; and the pofterior more backward in the firft rib, an interftice of about an inch being left between it and the other branch; and they are both, at their other extremities, inferted in the tranfverfe apophyfes of the vertebræ of the neck.

The fecond, or *fcalenus fecundus*, is fixed a little more backward in the external labium of the upper edge of the fecond rib; fometimes by two feparate portions; and fometimes without any divifion. The anterior portion is fixed immediately under the pofterior portion of the firft *fcalenus* by a fhort flat tendon, and is afterwards fixed by infertions, partly tendinous, and partly flefhy, in the tranfverfe apophyfes of the four firft vertebræ of the neck. The pofterior portion is fixed in the fecond rib, more backward than the other, and from thence is divided into two portions, and runs up to the tranfverfe apophyfes of the vertebræ of the neck; where the firft is inferted in the three firft vertebræ, the other only in the two firft. The vertebral infertions of both the *fcaleni* vary, being fometimes confounded with each other, and fometimes with thofe of the neighbouring mufcles. *Winflow*'s Anatomy, p. 230.

SCALENUS *lateralis*, in anatomy, a name given by Albinus to a mufcle, called by Cowper and others *fcalenus fecundus*, and by Winflow, and the French anatomifts, *portion anterieur du feconde fcalene*. Morgagni calls it *fcaleni pars a cofta fecunda enata*; and Fallopius defcribes it under the name of *octavi thoracis mufculi pars quæ inferitur in fecundum*.

SCALENUS *medius*, in anatomy, a name given by Albinus to a mufcle called the fecond *fcalenus* by Douglafs, and the third *fcalenus* by Cowper. The French call it by the name given by Winflow, *la portion ou branche pofterieure du premier fcalene*; and Vefalius has defcribed it under the name of *pars tertii et quarti dorfum moventium*.

SCALENUS *minimus*, in anatomy, a name given by Albinus to a very fmall mufcle, which other writers on this fubject have omitted to defcribe, and which the author acknowledges to be fometimes wanting.

It is very fmall, and arifes from the upper edge of the firft rib, and has two caudæ; the one of which is inferted into the lower part of the fpine, and the other a little higher. It often wants one, and fometimes the other, or latter of thefe two caudæ, and is of the fame ufe with the other *fcalenus*.

SCALENUS *pofticus*, in anatomy, a determinate name given by Albinus to one of the *fcaleni*, too much confounded by other authors with the reft of the mufcles of that name, as they are in general with one another.

This is the mufcle defcribed by Fallopius under the name of the *nonus thoracis mufculus*, and by Morgagni under the name of the *fcaleni pars a fecunda cofta enata*. The French

call it *la portion posterieure du second scalene*; a name given it by Winslow.

SCALLION, or ESCALLION, a sort of onion which never forms any bulb at the root, but is used green in spring, before the other sorts sown in July are large enough.

This is however very scarce in London, the gardiners usually selling in its place the shoots of such decayed common onions, as have sprouted in the house. These they plant in a bed early in the spring, and they soon grow large enough for use, when they pull them out; and taking off all the old outer coat of the roots, they lay them in bunches, and sell them at market for *scallions*.

The true *scallion* is easily propagated by parting the roots in autumn, and planting them three or four together in a hole, at six inches distance. These will grow in any soil or situation, and will multiply very quickly, and in a very great abundance; and their being hardy enough to endure the severest winter, and fit for use so early in spring, makes them worthy a place in all kitchin gardens. *Miller's* Gardner's Dictionary.

SCALLOP. The anatomy of this fish lets us greatly into the knowledge of the structure of the parts of other bivalve shell fish.

The *scallop* is composed of two shells, which, as in many others, are one concave, and the other plane or flat. The cardo, or hinge, is lightly bent from the concave shell, and thence carried over a part of the plane shell, and all the way between it is firmly connected to a cartilage. In the middle of the length of the cardo there is placed another short, black, and very strong cardo.

It is easy to see, from hence, to what is owing that remarkably strong power, which this creature has of shutting and opening its shell; and it is very possible, that by means of so strong an apparatus of tendons or ligaments as it has in this part, it may be able to move the plane shell in so swift and regular, as well as forcible and easy a manner, that it may use it in moving from place to place; and possibly it may make a sort of wing of it, to beat against the water, as the pinion of a bird does against the air; and what the antients have so frequently said of its moving about in a very swift manner, from place to place, may be true, though we have been wanting in later observations to see it.

When the two shells are opened, the following particulars offer themselves to the view. First, the mouth: this is covered with a sort of membranous hood, as in the oister; it does not stand on the center of the head, but toward the right hand, and the covering is only an elongation of the branchiæ, or gills of the fish: these are of a membranous nature, and surround the whole body from the mouth to the anus, which stands toward the left hand from the mouth, where they are connected again.

That branchia of the exterior pair, to which the flat or plane shell adheres, is fixed in its center to an immensely strong muscle, which grows from the shell, and is fixed into the body of the fish at right angles: this branchia is fixed to the upper limb of that muscle, and the other branchia is, in like manner, connected to the lower limb of the same strong muscle. These two exterior, or spurious branchiæ, from this muscle to a considerable extent, are formed only of a thin and pellucid membrane, and being carried to the middle of the valves on each side, they are there fixed down in such a manner, that they cannot be removed by any means, without injuring or destroying them.

The use of these is to defend the body of the animal from the injuries of the water, and other substances let in with it, on the opening of the shell. From the place of this adhesion there is propagated a strong and thick muscle, of a truly wonderful structure; this is a sort of limb, or verge to the animal. It is contracted inward when the animal is dead, but while it is alive it is expanded, at the creature's pleasure, a great way out beyond the edges of the shell, and is jagged, and variegated with lines and streaks, in an amazing and elegant manner.

The use of this part seems easily guessed, it being, when expanded out at the mouth of the shell, a sort of net, for the catching whatever the creature chuses to feed upon. It is, at the pleasure of the animal, either laid flat on the surface of the mud or rock, or arched into a part of a circle: when in any of these positions, any thing comes in its way which is proper food for the creature, it immediately gathers up like a net round about it, and withdrawing itself into the shell, takes in the prey with it. In this case, the use of its being cut or fringed, is also plainly seen; for it can, by means of this structure, let out the water taken in with the prey through the jags, and yet retain the prey itself. Philos. Trans. N° 229. p. 567.

The use of this admirable muscle, is not only the serving as a net for the taking the food, and afterwards as a strainer for the separating the water from it, but its muscular force is so great, that it also serves as a weapon of death to the little animal it has seized, by compressing it to pieces if necessary, at least by squeezing it till no life remains. This is a very necessary article in the preying of an animal, which can neither follow or resist an animal in motion; but this is not all. When the prey is brought into the shell, it might there remain, where first laid down, without being of any use to the *scallop*, who cannot turn about her mouth to come to it: in this case the same wonderful muscle, by its undulatory motion, serves to convey the prey to a part of the shell nearer the mouth of the animal; and when there, taking it up between the jags of the fringe, it holds it to the opening of the mouth; in this last office serving in the place of a hand. These are the many and necessary uses of this part.

But to come to the branchiæ, or gills, properly so called. The true branchiæ are four in number; they are of a yellowish colour, and are fringed in a very elegant manner: these every way surround the great central muscle, and serve as a covering to the uterus of the animal, or its ovary; certainly, however, to the parts of generation, by whatever name they may be called.

The lower part of the body of the *scallop* is yellow, and its upper part white, and near its mouth there is very plainly to be discovered a process with a double aperture. It seems probable, from all observation, that the *scallop* is an hermaphrodite animal, and contains the parts of generation of both sexes in each individual; and it appears that the female part of generation is, on occasion, pushed out from one of these apertures, and the penis, or male part, from the other.

The mouth of the *scallop* is furnished with reddish lips, resembling the branchiæ, or gills, in their structure, but very short and small; and near the hinge there are two large circular cavities, resembling the eyes of the turbot. Near the head there is a large mass of blackish matter toward the left hand, and under that, or rather behind it, is situated the creature's heart. The pericardium is pellucid, and is of so fine a structure, that the heart is easily seen through it: it is of a reddish colour, and its aorta, or large artery, is divided into a great number of branches, which are sent every way round to the gills.

It is some doubt, however, whether this their membrane, before described, serves alone in the capacity of a pericardium; or whether all this black matter, that lies about it in a sort of rhombic form, does not also, in some degree, supply that office. The lower part of this gives place to the urinary bladder, and the strait gut arises from the base of this black substance, and is thence carried strait over the pericardium; whence it runs on to the branchiæ, and is at length affixed to the great central muscle.

This central muscle is of a rounded figure, very smooth, and white, and even in the greater part of its bulk, where it is connected to the shell; but on the left it is divided, and forms another white and lacerated muscle, which runs along a part of the shell, and strengthens the connection of the body of the fish with this part of the plane valve. Philos. Trans. N° 229. p. 569.

SCALMUS, among the Romans, a block or round piece of wood in a boat, to which the oars were tied with a thong of leather called *strappus*. See the article STRAPPUS.

Scalmus was also used to denote the boat, a part being taken for the whole. *Pitisc.* in voc.

SCALPRA *dentalia*, instruments used by the surgeons to take off those black, livid, or yellow crusts, which infest the teeth, and not only loosen and destroy them, but taint the breath.

According to the varieties of the occasion, the surgeon has these instruments of various shapes and sizes; some are pointed, and narrow at the end, others are broader pointed, and have edges, others are hooked, or falciform, but these are usually, for convenience of carriage, all adapted to one handle.

The manner of using them is to begin near the gums, supporting the blade with the left hand, and scraping all along the tooth, till the crust is taken off, taking care not to wound the gums, or displace the teeth. *Heister's* Surgery, p. 456.

SCAMMA, Σκαμμα, among the Greeks, the mark in leaping, or throwing quoits; so called, from its being made by digging up the earth. *Potter*, Tom. I. p. 442.

SCAMMATHA, in the Jewish customs, a kind of excommunication, and the most terrible of all in use among that people. See the article NIDDUI.

SCAMMONY (*Cycl.*)—SCAMMONIA *Monspeliaca*, *Montpelier scammony*, a name given by some botanical writers to a species of periploca, distinguished by Mr. Tournefort by the name of *periploca Monspeliaca foliis rotundioribus.*

SCAMPIUSA, in botany, a name used by Myrepsus and others for a plant, which they greatly recommend in the itch, and other cutaneous disorders.

Fuchsius confesses himself at a loss to guess what plant was meant by this name; but a little knowledge of the customs of the later Greeks, in adopting the Roman names for things, would have explained this to him. We find, by familiar instances without number, that in the words they adopted from the Latin, they usually changed the *o* into *u*, and the Roman *b* into *mp*. If we look upon the word *scampiusa* in this light, suppose it formed from a Roman word,

word, as most of the names of plants at that time were, and change the *u* into an *o*, and the *mp* into *b*, we immediately bring back the word to *scabiosa*; a very well known Latin word, and the name of a plant possessed of the same virtues they have given to the *scampiusa*.

They sometimes also wrote this *campiusa*, without the initial *s*; but this cannot appear wonderful, when we recollect that the *milax* was in the same manner *smilax*, and the *smaragdus* was written *maragdus*, even by the antient Greeks themselves.

SCANDIACA, in botany, a name given by some authors to the white flowered *lamium*, called archangel by others. *C. Bauhin*, Pin. 155. See LAMIUM.

SCANDULÆ, in antient house building, shingles, or flat pieces of wood, used by the Romans instead of tiles to cover houses. This, according to Cornelius Nepos, was the only covering used in Rome till the war with Pyrrhus, or 470th year of the city. *Pitisc.* in voc.

SCANDULARII, among the Romans, mechanics who prepared the *scandulæ* used in covering houses, who were exempted from all public services. See SCANDULÆ.

SCANDYX, *venus comb*, in botany, the name of a genus of plants of the umbelliferous kind, the characters of which are these. The flower is of the rosaceous kind, consisting of several petals, which are arranged in a circular order on a cup, which afterwards becomes a fruit composed of two oblong bodies, resembling needles, and containing the seeds. The species of *scandyx*, enumerated by Mr. Tournefort, are these. 1. The common *scandyx* with rostrated seeds. 2. The larger Cretic *scandyx*. And 3. the smaller Cretic *scandyx*. *Tourn.* Inst. p. 326.

SCANELLO, in the Italian music, is used for the bridge in violins and other instruments. It is the same with *ponticello* and *magas*. See the articles BRIDGE and MAGAS.

SCANSOR, in ichthyology, a name given by Gesner to the fish called by the generality of writers *lupus piscis*. See the article LUPUS.

SCANTON, a word used by some to express the fetid smell of wine.

SCAPE *goat*, in the Jewish antiquities, the goat which was set at liberty on the day of solemn expiation. For the ceremonies on this occasion, see Levit. xvi. 5, 6, &c.

Some say that a piece of scarlet cloth, in form of a tongue, was tied on the forehead of the *scape goat*. *Hofm.* Lex. univ. in voc. *Lingua*.

Many have been the disputes among the interpreters, concerning the meaning of the word *scape goat*, or rather of *azazel*, for which *scape goat* is put in our version of the Bible.

Spencer is of opinion that *azazel* is a proper name, signifying the devil, or evil dæmon. See his reasons in his Book de leg. Hebr. ritual. Dissert. viii. Among other things he observes, that the antient Jews used to substitute the name *samaël* for *azazel*, and many of them have ventured to affirm, that at the feast of expiation they were obliged to offer a gift to *samaël* to obtain his favour. Thus also the *goat*, sent into the wilderness to *azazel*, was understood to be a gift or oblation. Some Christians have been of the same opinion. But Spencer thinks that the genuine reasons of the ceremony were, 1. That the *goat* loaded with the sins of the people, and sent to *azazel*, might be a symbolical representation of the miserable condition of sinners. 2. God sent the *goat* thus loaded to the evil dæmons, to shew that they were impure, thereby to deter the people from any conversation or familiarity with them. 3. That the *goat* sent to *azazel* sufficiently expiating all evils, the Israëlites might the more willingly abstain from the expiatory sacrifices of the Gentiles.

SCAPHA, in anatomy, is used to express the external circumference of the ear.

It is in surgery used to express a bandage for the head. See the article BANDAGE.

SCAPHEPHORI, Σκαφηφοροι, among the Athenians, an appellation given to the strangers residing among them, because they were obliged, at the festival Panathenæ, to carry little ships, called *scaphæ*, σκαφαι, which were a sign of their foreign extraction. *Potter*, Archæol. Græc. Tom. I. p. 56.

SCAPHIUM, among the Romans, a cup of an oblong form, somewhat resembling that of a boat, whence also it had its name. *Pitisc.* in voc.

Scaphium likewise signifies a kind of dial, which, beside the hours, shewed also the solstices and æquinoxes. *Pitisc.* Lex. Antiq. in voc.

SCAPHOIDES *os*, (*Cycl.*) in anatomy, the first bone of the first row in the carpus. It has its name from the Greek σκαφη, a boat, is sometimes called *os naviculare* in Latin for the same reason, as supposed to resemble a little boat. It has a convex side next the radius, by which it is articulated with the basis of that bone, and with a tubercle, which is one of the four eminences on the concave side of the carpus. Toward the thumb it has two half sides, one large one for the os trapezium, and the other a small one for the os trapezoides. It has likewise a hollow side for the os magnum, and a small semilunar side for the os lunare. Its inner and outer surfaces are rough. *Winslow*'s Anatomy, p. 83.

SCAPHOIDES *tarsi*. This bone, which is called also *naviculare*, from its resemblance to a small flat boat, lies before the astragalus. It has two cartilaginous sides, an oval circumference, and a tuberosity. Its thickness is inconsiderable, when compared with its other dimensions, and it lies as it were on its side, before the astragalus. The concave side is posterior, and is articulated with the anterior convex side of the astragalus. The anterior convex side is divided by two small lines into three planes, for the articulation of the three ossa cuneiformia. The circumference forms an oval, which contracts by small degrees, and terminates in an obtuse point: one side of this circumference is more convex and rough than the other, and the inequalities in it serve for the insertion of ligaments. The points of the oval ends in a tuberosity, marked with a muscular impression. In the natural situation of this bone, the most convex side is uppermost, the other lowest, and the tuberosity turned inward and downward. By this situation, and the difference of the sides, it is easy to distinguish the os naviculare of the right foot from that of the left. The smaller, or inferior convexity of the circumference has, near the tuberosity, a superficial notch, and on the opposite side a small cartilaginous surface, and a small tubercle for its articulation with the os cuboides, &c. for the insertion of ligaments. *Winslow*'s Anatomy, p. 98.

SCAPULA (*Cycl.*)—This is a large bone, situated laterally at the upper and posterior part of the thorax, from about the first rib down to the seventh. The neck of the *scapula* is the largest of its three angles, and ought more justly to be called a head with a very short neck, and a superficial, or glenoide cavity in the top of it, which is lined with a cartilage, and of an oval figure, but pointed at the upper part, and rounded at the lower; and is much deeper in the natural state, than when viewed in the sceleton. In the natural situation of the *scapula* this cavity is turned obliquely forward, and not directly outward. Between the edge of this cavity and the contracted part, which is the true neck, some inequalities are observable, which are the remains of the symphysis of ossification. Above and below the glenoide cavity are two small rough marks, or impressions, the lowest of which extends itself a little over the neighbouring costa. These may be termed the muscular impressions of the neck of the *scapula*. In the neck, spine, basis, inferior costa, and coracoide process of the *scapula*, there is a diploe; the rest of the bone is transparent, thin, and almost without any middle cellular substance. The *scapula* is articulated with the clavicle by the acromion, and with the os humeri by the glenoide cavity: it is likewise joined to the trunk by a fleshy symphysis, or syssarcosis. It serves to facilitate the motions of the arm, to give insertion to a great many muscles, and as a shield to defend the back parts of the thorax. *Winslow*'s Anatomy, p. 73.

Fracture of the SCAPULA. The *scapula* is usually fractured either near its acromion, or head, where it joins the clavicle, or in some more distant part. If the fracture happens in the process of the acromion, the reduction will be easily made, by lifting up the arm to relax the deltoide muscle, and pushing the arm evenly upwards, making the fractured parts meet together with the fingers: but notwithstanding their reduction is so easy, they easily slip away again from any slight cause, and so are difficultly agglutinated. They are in particular very easily separated by the weight and motion of the arm, and by the contraction of the deltoide muscle; insomuch that there is scarce ever an instance of a fractured acromion being so perfectly cured, as to admit afterwards of a free motion of the arm upwards: all means must, however, be used to endeavour to keep the replaced bones in their proper situation. A compress, wet with spirit of wine, is to be applied to the fracture, a ball is to be put under the arm-pit to support it; the whole is to be bound up with the bandage commonly called *spica*, and the arm is to be suspended in a sash or sling hung about the neck. But if the neck of the *scapula*, which lies under the acromion, or its acetabulum, should be fractured, which is a case that indeed very seldom happens, and when it does is very difficult to discover, it is a hundred to one but from the vicinity of the articulation, the tendons, muscles, ligaments, nerves, and large veins and arteries, there will follow a stiffness and loss of motion in the joint; great inflammation is also to be expected, and abscesses with the worst symptoms, and sometimes death itself.

SCAPULAM *antrorsum agens*, in anatomy, a name given by Vesalius, and some of his followers, to the muscle generally known under the name of the *serratus anticus*. He has also, in another part of his work, called it *primus scapulam moventium*. Riolanus has called it the *serratus minor*, and several other authors the *secundus scapulæ*. See the article SERRATUS.

SCAPULAM *attollens*, in anatomy, a name given by Spigelius to a muscle, which he also calls *musculus patientiæ*. It is the *levator scapulæ* of Albinus and Cowper.

SCAPULAM *moventium secundus*, in anatomy, the name given by Vesalius to a muscle, called by Winslow and some others the

the *trapezia*, and by Albinus the *cucullaris*. Cowper calls it the *trapezius*, or *cucullaris*. See TRAPEZIUS.

SCAPUS, among botanists, a peculiar kind of stalk, which supports the parts of fructification of a plant. It does not grow from any part of the main stalk, but rises immediately from the root. See STALK.

SCAR *crow*, in zoology, the name of a bird of the *larus*, or sea gull kind, called by authors *larus niger*, or the black gull, and by the Germans *brandvogel* and *meyvogel*. It is a very long winged bird, and is all over black, and of the size of the common blackbird. Its legs are short and red. It is common about the sea coasts, and feeds on insects. It is a well tasted bird. *Ray's* Ornithol. p. 296.

SCARABÆUS, the *beetle*. This is an extremely numerous genus of insects; and in order to have a distinct idea of the differences of the species, they are arranged by Lister into a sort of method. The first general distinction is into those which live on land, and those which live in the water; of each of which there is a very great number. Those *beetles* which live on land have some of them antennæ laminated at the end, others have them sharp pointed. The outer wings, or cases of the wings, in some are perfect, in others they seem mutilated. Some have the antennæ inserted into a sort of promuscis. These were called by the antients *gurguliones*, and in some there is only one juncture in this, in the middle, in others several near the end. Some have a sharp pointed instrument at their head; these are called *cimices*. See the article CIMEX.

Of the water *beetles* there are two principal kinds, one sort living in salt water, the other in fresh.

Of those *beetles*, the extremity of whose antennæ are formed like a comb, there are ten species mentioned by Mr. Ray. 1. The great reddish *beetle* with the tail bending downwards, known among us under the name of the *chaffer*. This is too well known to need a description; it is common among trees and bushes at the end of May, and seems particularly fond of the maple. 2. The greyish yellow woolly *beetle*. This seems nearly allied to the former species, but is but about half as big. These are very common in the southern parts of England in the month of June; they fly about elms in vast swarms; they are very rare in the northern counties. 3. The greenish black *beetle* with reddish brown cases of the wings. This is of the size of a horse bean, and is found among rose trees in May. 4. The great purplish black *beetle* with serrated legs. This is one of our largest *beetles*, and is very common on heaths, and in other places, in the month of March; it flies about in the evening, and makes a great noise; it is usually infested with a great number of yellow lice, and is thence called the *lousy beetle*. 5. The large black *beetle* with two yellow undulated fasciæ on the cases of the wings. This is sometimes found without the fasciæ; it sometimes flies, but rarely. It is found about human dung, and probably feeds on it, for it has always a very strong scent of it. 6. The green *beetle* with red cases for the wings. This is about the size of a horse bean, and is found in woods in the month of June. 7. The small *beetle*, called the *lady bird*. 8. The *lady bird* with only two large black spots, one on each of the cases of the wings. This is common among bushes in the beginning of June. 9. The yellow *beetle* with black spots. This is much smaller than the lady bird; its colour is a pale yellow, or lemon colour, and it has four black spots, of an oblong square figure, on the cases of the wings. 10. The reddish *beetle* with two spots on the shoulders, and seven white marks on each of the cases of the wings. This is about the size of the common lady bird, and is found in June near rivers, among the rushes, and in cyperus grasses. *Ray's* Hist. Insect. p. 384.

Of those *beetles* which have antennæ terminating in slender points, there are a great number of species, which may be subdivided into some other general classes: some of them have whole and perfect cases to their wings, and have long horns; these are by some called *capricorn beetles*; of these there are several species. See the article CAPRICORN.

Some *beetles* are covered with a very hard crust, and have scarce any wings underneath it. These are generally very slow creepers, and of these we have in England three species. 1. The short purplish black *beetle* with gibbous shoulders. This seems to be the same with the *cat beetle*, or *scarabæus feliformis* of Mouffet, and others. This is not unfrequently found on heaths in March, and at that time is often found in coitu. The male is considerably smaller than the female. This creature feeds on the yellow gallium, and when fatigued will cast out at its mouth a yellowish liquor, which is of a pungent taste like pepper. 2. The slow stinking black *beetle*, called the *blatta fœtida* by Pliny and others. This is of a deep dusky black colour, not at all glossy or shining. This is common in cellars, and other damp places, in the month of April. 3. The great purplish *beetle* with a cast of green. This is common in gardens, and in April is always infested with a great number of lice.

Some *beetles* which have wings very rarely use them, but run very swiftly along the ground; of these we have two species common among us. 1. The black *beetle* with sulcated wings. This is a very common insect, and is frequent in pathways in April. 2. The black *beetle* with striated wings, and with yellow legs and horns. This also is common in pathways in summer.

All these *beetles* have the antennæ laminated at the ends. Of the other kind, which have them go off to a slender and taper point, there are also many kinds: of these some have only short cases for their wings, as if they had been cut off near the root. The general characters of this class of *beetles* are, that they have oblong and slender bodies, and have two appendages forming a kind of fork at the tail. Of this kind are the common earwig, or forficula, and the staphylinus, which is a large and long black *beetle*, with a sharp fork at its tail, and with a naked body. It is of a deep and dusky black, not at all glossy; it has very large yellow wings, folded under the small thecæ on the back; it turns up its tail in a threatning posture when attempted to be caught, and throws out a sort of white bladders at it; it runs very nimbly, and is a very voracious creature, feeding on other *beetles*, or on any insects it can catch.

Some *beetles* are all over soft, and have no membranaceous wings. The bodies of these *beetles* seem covered with a crustaceous substance, but it is soft, and yields to the pressure of the finger like a bladder; these all eat herbaceous or vegetable food; we have two species of them. 1. The oil *beetle*, a bluish black shining *beetle*, called *proscarabæus* by Mouffet. This is found in meadows in great abundance, and feeds on the leaves of some of the species of ranunculus. 2. The short legged black smooth *beetle*. This has scarce any antennæ, and when tired, rolls itself up into a round ball. This is found in May feeding on the aperine, or common cleavers; but Lister suspects whether this be not a worm state of some *beetle*, rather than a perfect *beetle*.

Some *beetles* have long heads, shaped like the trunks of other insects, and in these the horns are lodged: these were called by the antients *gurguliones*. *Ray's* Hist. Insect. p. 391. See the article GURGULIO.

Some *beetles* have a forceps at the head, indented on each side in the manner of a saw. Of this kind we have only one known species in England; this is the green *beetle* with ten white spots on the cases of the wings. This is found in June in the northern parts of England. It is a very voracious animal, destroying great numbers of other insects, particularly caterpillars.

Some *beetles* have a very remarkable property of leaping, and this of a very peculiar kind; for they do not leap, like other insects, by means of their hinder legs, but by means of their breast. There are some general marks by which this genus of *beetles* may be distinguished from others; these are, 1. they are always of an oblong and flatted figure. 2. Their head is always joined in a very nice manner to the shoulders. 3. Their legs are extremely short and slender.

Of this kind of *beetles* we have in England only two known species. 1. The chesnut coloured leaping *beetle*. This is found frequently in corn-fields, and elsewhere. 2. The greenish black *beetle* with horns pectinated on one side. This is a scarce species, but is found in dry places in March. *Ray's* Hist. Insect. p. 387.

SCARABÆUS, in ichthyology, a name given by Gaza to that species of *sparus*, which is called by others the *cantharus*. It is distinguished by Artedi, by the name of the silver eyed *sparus* with yellow longitudinal and parallel lines on the sides. See the article SPARUS.

SCARABÆUS *tardipes*, the *slow beetle*. We have a very singular account of the longevity of this animal, and that without food, given by Mr. Baker from his own observation. In the year 1737 he found several *beetles* of this kind plunging themselves in the mud at the bottom of an old cistern; these were about an inch in length, and of a rusty black colour, and had long jointed antennæ: they had no wings, but only a thick shell, covering the whole body, and divided along the middle with a fissure, resembling the meeting of the two case wings in other *beetles*; the tail turned up a little, and the legs were long, but moved slowly. Mr. Baker chusing one of the largest of these, threw it into a cup of spirit of wine, in a little time it appeared to be dead, and was shut up in a small box, and laid by, but some months after it was found alive and well: it was then plunged again into spirits of wine, and left a much longer time; and after being taken out as dead, and put in the same box again for some time, when it was found again come to life. It had now twice escaped from being plunged in spirits, and lived three months shut up without any sustenance. After this the *beetle* was kept a month or two without sustenance under a glass, and at the end of this time again put into spirit of wine, and left there a whole night; after this, however, it again recovered, and seemed the next day as well as before. He lived, in the whole, two years and an half, without any visible food or drink. Several things were at times offered him by way of food, as bread, fruits, &c. and water set in his way, but he never touched either. It seems very probable that this creature received a sufficient nourishment from the particles floating in the air; and it is very possible that lizards, snakes, &c. when they live so long without any visible food, are supplied in the same man-

manner, though at other times they are capable of digesting more solid matters; as doubtless was also the case with the *beetle*, when in its own natural state. This is an instance of a creature's subsisting without visible food, longer than we have any other account of any kind; but it is possible, that though the larger animals cannot long subsist without supplies of solid food, yet many insects may find nourishment enough for their tender bodies in the particles floating in the air, though we want observations for proof of it.

While kept under the glass it did not walk about much, but usually placed its nose close against one edge of it for the benefit of the air. It was of an agreeable aromatic smell, and when touched communicated its scent to the fingers, which did not go off in a long time. Its smell is stronger in winter than in summer. This creature not only bears the plunging in spirit of wine much longer than any other animal, but it bears the exhausted receiver of an air pump without any injury or uneasiness. It has been kept under it half an hour, and would walk about without any concern; only when the air was let in it appeared startled, and drew up its legs for about a minute.

We know that the Ægyptians had a very high veneration for the *beetle*; this appears not only by the account historians give of its being one of their deities, but by the many images of it we find among their antiquities. As these were a wise and learned people, we cannot suppose they would, without some reason, pay so much regard to so contemptible an animal as this appears to be; and it is very possible they might have discovered this property of its living in this manner without food, and thence esteem it a symbol of the deity. It is not known how long Mr. Baker's *beetle* would have lived in this manner with him, for it at length got away, while a careless servant took up the glass to wipe it. Philos. Trans. N° 457. p. 447.

SCARABÆUS *vorax*, the *cankerworm*. This last term is used in the translation of our Bibles to signify a very destructive insect, of the nature of the locust, and usually mentioned as its companion. The septuagint gives it the name Βρῦχος, *bruchus*, a name signifying an animal which makes a great noise, as this insect does both in eating and in flying. We generally understand by this word a reptile, but it certainly means no other than that sort of *beetle*, which we call the *cockchaffer*, or *dor*; a flying insect, very remarkable for the humming noise it makes with its wings when in motion, and which, when it is found in swarms sitting upon the hedges, makes a continual noise in eating, like the sawing of wood. This creature deserves very well to be placed with the locust, as a destroyer of the fruits of the earth. Our own experience in Norfolk has given a very late proof of this; and the histories of Ireland shew that this creature has, in that kingdom, devoured every green leaf from the trees, for whole tracks of land at a time. That we have a wrong translation of the word *bruchus* in *cankerworm*, is evident even from the scriptures themselves; for the prophet Nathan expresly says that it is a fly, and has wings, which cannot agree with any thing of the nature of what we understand by the word worm, which always signifies with us a reptile, or a creeping animal. This prophet has indeed described them so well, that it is wonderful that so obvious a thing should not have been observed by the commentators. He says they spoil, and then flee away; they camp in the hedges in the day, and when the sun ariseth they flee away, and their place is not known where they are. That is, they then retire again to the hedges, and hide themselves among the trees, where they lie quiet and concealed till the sun sets again. It is plain, by comparing these words with the common animal here mentioned, that the *bruchus* of the Old Testament is the same with our *cockchaffer*, and that the prophet has given us the natural history of the animal he describes in this short account.

In another part of the Old Testament, the same word *bruchus* is translated *locust*, or *beetle*; and this explains the rationale of that odd clause in the Jewish law, where Moses tells the Israelites, these may ye eat of: every flying creeping thing that goeth upon all four, which have legs above their feet to leap withal upon the earth; even these of them ye may eat: the locust after his kind, and the bald locust after his kind, and the *beetle* after his kind, and the grashopper after his kind.

It has appeared very strange to many, that here among the pure and clean foods, the *beetle*, and such other dry and nasty reptiles, should be recommended as wholesome food for man; but there appears reason on the side of this when thoroughly considered. It is very evident that neither the Jews, nor any other people, would eat such insects as these, while any thing better was to be had; but as they lived in a country often visited by locusts and these *cockchaffers*, which might at some time eat up all the fruits of the earth, then in the want of these the prophet tells them they might eat up the devourers themselves, and yet be clean. So also it appears that we are to understand what we are told of St. John the Baptist, that he fed on locusts and wild honey; for it was in the desert that he eat these, where no other food was to be had.

The poor people of Ireland have taught us, that the prophet advised his people to a wholesome food in this text; for some years ago, when the county of Gallway, and other neighbouring parts, were so infested with this vermin, that the whole face of the country was destroyed by them, and the trees stripped of their leaves and fruits, as much as in the depth of winter; the poor people wanting other food, eat the vermin themselves that had done the mischief; and the *cockchaffers*, which are doubtless what is meant by Moses under the name of the *beetle*, as they are truly of the *beetle* kind, were found to be a very good and wholesome food.

It is very probable also that this kind of *beetle*, so famous for devouring the fruits of the earth, is that kind to which the Ægyptians paid divine honours, and for which they had such high veneration, that they frequently engraved its figure on their obelisks; though the antiquaries give a very different account of it, supposing that the beetle was held sacred by them, as being an hieroglyphical representation of the sun. This seems a very forced conjecture; whereas nothing can be supposed more natural, than that a nation, addicted to polytheism, as the Ægyptians were, and in a country frequently suffering great mischief and scarcity from swarms of devouring insects, should, from a strong sense and fear of evil to come, give sacred worship to the visible authors of their sufferings, in hopes to render them more propitious for the future. The same Ægyptians, we very well know, worshipped the other great destroyer of their country, the crocodile; and the Romans, a much more civilized people, built a temple to the disease which raged most among them, the fever.

The ignorant people among the Irish, when the vast swarms of these *beetles* first appeared among them, were of the same turn, and rather reverenced than destroyed them, saying that they were the ghosts of their dead friends killed at the battle of Agrhim, who were come in this form to pester and annoy their heretical enemies, the English protestants. They even thought that the English families suffered more by them than the Irish; but this was only because the grounds of the former were better improved, and the creatures found plenty of better food there. Philos. Transact. N° 234.

SCARBOROUGH *water*. The water of this medicinal spring has been the subject of great contests and disputes among the physical people; all allowing it considerable virtues, but some attributing them to one ingredient, others to another. Dr. Witty alledges that its material principles are alum, nitre, and vitriol of iron; but though this author declares, that these principles are all to be separated out of it, Dr. Tonstall, on the other hand, affirms that it has no vitriol of iron in it, but a stone powder and a clay, leaving sand at the bottom of the vessel; and therefore that it is apt to breed the stone, and is bad in the gout, jaundice, and all other diseases where indurations of the parts, or stony concretions in the body, are the cause; and this author seems to speak very experimentally, when he alledges that he never had any symptoms of the stone till he drank the *Scarborough water*, but acquired that disease during the course of it.

Alum stone dissolved in water is always found to yield a purple tincture with galls, and therefore the colouring an infusion of this or other vegetable substances by the *Scarborough water*, which is by all allowed to contain this stone, is no proof of any vitriol of iron being contained in it; other than such a small portion of it, as is always found in this alum stone. All waters, which have dissolved iron, will yield vitriol as a salt from that metal on evaporation. The cliffs about *Scarborough* yield abundance of salt in shoots and effervescences, plainly owing to the *waters* of the spring; yet all these are nitro-aluminous, none of them at all vitriolic. If the *Scarborough water* is set by for some days, after it is taken fresh from the spring, it precipitates a sediment; which being examined, is found not to be of a ferrugineous nature, but a mere glebe of alum.

Upon the whole, the virtues of alum and vitriol are so far different, that it must be easy to see which of the two salts the *water* partakes most of, by its virtues; but as to the stony matter, which the one of these disputants calls an insipid clay, and the other a sandy stone, it is no other than spar, which is contained in all water; and which has been in general so far from being accused of breeding the stone in the bladder, that the general consent of mankind has seemed to esteem it a cure for that disorder. The spar, in the form of the lapis judaicus and ostracites, and the very waters which are so impregnated with it, as to encrust every thing with it that is put into them, are given for the cure of this disease. Philos. Trans. N° 85.

SCARFED, in the sea carpenters language, is the same as pierced, or fastened or joined in: thus they say the stem of a ship is *scarfed* into her keel. They also imply by it, that the two pieces are shaped away slanting, so as to join with one another close and even; which they call *wood and wood*.

SCARIFICATION *of the eye*. See the article EYE.

SCARLATINA *febris*, the *scarlet fever*, in medicine, the name of an eruptive *fever* usually attacking young persons, and not attended with any great danger. When it is moderate in degree, it may be left to nature alone, and will go off very well without the assistance of medicines, only observing a good regimen; but if it be more violent, it is to be treated with more care: the patient is to be kept warm in bed, and to be made to drink large quantities of warm diluting liquors, acidulated either with lemon juice, or spirit of sulphur or vitriol, and draughts of the attemperating and diluting medicines are to be given every four or six hours, and by the attemperating and gently diaphoretic powder; but during the course of the cure all hot things are to be carefully avoided, as well in food as medicine, for every thing of this kind renders the disease worse, when treated in the proper manner. The *scarlet* spots, after a few days, dry off, and the skin scales away, and after this the patient usually is soon well. At this time two or three doses of some gentle purge are to be given; and if the weather be bad, the patient is to be confined to his chamber for some days afterward, that the transpiration may be free and uninterrupted; by this means, the worst kinds of this *fever* go well off.

But when this caution is neglected, it is very common to find the patient fall into a swelling of the belly after about three weeks, and sometimes into an anasarca; sometimes attended with a fever, sometimes without one, and often with tumors of the glands, and many other dangerous disorders. The urine, in these cases, becomes brown and turbid, and many are lost in this manner. But as this new disease, as it is usually called, though it is in reality no other than another period of the *scarlet fever*, owes its whole origin to the morbific matter which caused the first appearance of that, being in part retained in the body, the best method of cure is by those remedies which are able to carry those humors out of the body. Gentle purges are to be given at short intervals, and the way nature indicates is to be carefully followed, by giving diuretics in the intermediate days; for the brown turbid urine, voided naturally in this case, is an attempt of nature to carry off the matter that way. The best of all diuretics in this case is a tincture of salt of tartar and spiritus nitri dulcis mixed together, and taken twenty drops, or more, three times a day. In young subjects, who will not take purges in the common way, a glyster made of an infusion of sena purges them very well, and answers the purpose.

The common hot sudorifics are not to be given in these cases, for sweat is scarce to be obtained by any means in this disease; and great care is to be taken to keep the tumid parts from the cold air, otherwise the patient is often carried off at once by the chilling them. If there be a fever with this second complaint, as is usually the case, the attemperating medicines are to be given in an afternoon and evening, and draughts of gently diuretic liquors to be drank after them.

In this, and in all other eruptive *fevers*, any thing that cools the patient is of the utmost consequence, and the bed is not to be new made, nor the shirt changed by any means, during the course of the distemper. Immoderate heat, on the other hand, is almost as bad, and the middle regimen is the only proper one to be observed. The patient lying quiet, and being kept in an equal and moderate heat, in all cases of eruptive *fevers*, as well as in this, the patient may be allowed, in the beginning, to walk about in his chamber, taking great care to keep out the cold, and need not be confined to his bed, so long as his strength will permit his keeping up. *Heister*'s Compend. Med. p. 83.

SCARUS, in zoology, the name of a sea fish, of which there have been several remarkable things asserted by the antients, some with and some without any foundation; as that it ruminates, or chews the cud like our oxen, *&c.* This Aristotle, Pliny, Oppian, and others affirm, but none of them of their own personal knowledge; they seem to have had it by hearsay, or else as authors often do, to have taken it from one another; for the thing is not true in fact.

It has been said also to be the only fish which feeds on herbs; and it is so far true that it does feed on them, and that few other fish, but not that no other feed in the same manner. It has been reported also that this is the only fish that sleeps. Gesner would persuade us, that not only this, but many other fish, also sleep. But this does not seem to be the fact; for this race of animals have no eye-brows, nor any membrane to close and cover their eyes with, as other creatures have, which nature has allotted sleep to. *Ray*'s Ichthyogr. p. 304.

The later naturalists have described three species of this fish, Rondeletius two, the *scarus onias*, and *scarus varius*; and Bellonius one, which is different from both these, and seems to have been the very fish the antients knew by this name.

The *scarus onias* is a sea fish, found among rocks and near the shores. Its scales are large and very thin, and its back of a blackish blue; its belly of a fine white, and is of an oblong and rounded shape; its teeth are broad, not pointed, and resemble those in the human jaws; its eyes also are large, and its head over the eyes of a fine strong and clear blue.

The *scarus varius* is of the shape and figure of the former, but its eyes and its belly are of a purple colour; its tail is of a fine clear and strong blue, and the rest of its body is of a greenish or bluish black; its scales are spotted and speckled with dusky dots; its mouth is moderately large, and its teeth broad in the upper jaw, and somewhat pointed in the under. From the head to the tail, all along the ridge of the back, there runs a row of short spines, which are connected at their bottoms by a membrane; and in the middle of the belly there are several purple spots. It is a very beautiful fish. *Rondelet.* de Pisc. lib. 5. cap. 3.

The *scarus Bellonii*, which differs from both these, and seems to be the same fish which the antients called by this name, is of a mixed bluish and red colour; its scales are broad and thin, and it has two transverse protuberances near the sides of the tail. Its body is rounded, but not very long; its teeth are strong and obtuse, and well fitted for their office, which is the tearing off the tough sea herbs from the rocks, and chewing them for food. Its mouth is but small, and it has only one fin on the back, which is prickly. Its usual size is about five or six inches in length. It is accounted a very delicate fish, but is insipid unless eaten with the guts, and all that they contain. The liver and stomach of this fish, with its contents, are cooked up by the Greeks into a very delicate dish; the epicures among them not regarding the rest of the fish. *Bellonius*, de Pisc. p. 126.

SCARY, in husbandry, a term used by the farmers for a barren land, which has a poor or thin sward, or coat of grass, upon it. *Plot*'s Oxford. p. 247.

SCATARELLO, in zoology, the name of a small bird of the ficedula kind, of a greyish brown on the back, and a pale yellow on the breast and belly. Its legs are black. It seems nearly allied to the beccifago. *Aldrovandus*, de Avibus. See the article BECCIFAGO.

SCATCH-*mouth*, in the manege, a bit-mouth, differing from a canon-mouth in this, that the canon is round, whereas a *scatch* is more upon the oval. That part of the *scatch-mouth* that joins the bit-mouth to the branch, is likewise different; a canon being stayed upon the branch by a fonceau, and a *scatch* by a chaperon, which surrounds the banquet. The effect of the *scatch-mouth* is somewhat greater than that of the canon-mouth, and keeps the mouth more in subjection. Commonly snaffles are *scatch-mouths*.

SCATEA, a word used by Paracelsus for a somewhat hard sabulous concretion in the urine.

SCAULEZ, in ichthyography, the name of a fish common on the Mediterranean shores, and called by authors ***hepsetus*** and ***anguella***. *Willughby*'s Hist. Pisc. p. 210. See the article HEPSETUS.

SCAZONE, in ichthyology, a name given by Salvian and others to the fish which we call the ***pricked dog***, or ***hound***, and the generality of authors the ***galeus spinax***. It is a species of squalus, distinguished by the roundness of the body, and the having no pinna ani. See the article SQUALUS.

SCELETON, in anatomy. See the article SKELETON, *Cycl.* and *Suppl.*

SCEMI, in botany, a name given by some authors to the *carob*, or sweet pipe tree. See the articles SILIQUA and CAROB.

SCENE (*Cycl.*)—The original *scene* for acting of plays was as simple as the representations themselves; it consisted only of a plain plat of ground, proper for the occasion, which was in some degree shaded by the neighbouring trees, whose branches were made to meet together, and their vacancies supplied with boards, sticks, and the like, to compleat the shelter; and these were sometimes covered with skins, sometimes only with the branches of other trees newly cut down, and full of leaves.

It does not appear that the antient poets were at all acquainted with the modern way of changing the *scenes*, in respect of the different parts of the play, but all was performed in the same place.

The first things represented in these new theatres were what they called *mimi*. These were a very coarse sort of poems, representing, in obscene and indecent language, the vices and indecent actions of the principal people of the time. Sophrones and Xenarchus seem to have been the first writers of this sort of comedy, and they used sometimes prose, sometimes verse, in these compositions. After the licentious things, thus represented, had given great offence to the magistracy, the poets hands were tyed up from writing at all, and the actors in these *scenes* were forbid to speak. Hence arose a new way of entertaining the spectators, which we still continue, under the name *pantomime*, the same by which they expressed it. In this all was represented in dumb shew, and the gestures and motions of the limbs were all they had to represent the actions of others by.

This sort of public diversion seems to have been in fashion in the days of Aristotle, and to have been continued long afterwards. Salmasius is of opinion that Pylades was the first who separated the pantomime and dancing from the plays,

plays, where the actors spoke. But this seems an error in that great critic, for they seem, by what histories we have left of them, to have been represented singly long before that time, Pylades living in the time of Augustus Cæsar. Poetry and dancing were early supposed to have some relation to one another; the first was called a *speaking dance*, and the latter a *dumb poem*; a name afterwards, and not till long afterwards, given to a picture. Thus they were introduced on the same *scenes*, as things naturally connected together.

SCENT. Some animal carcasses, buried with lime, though ten feet under ground, have been observed to give so strong a *scent*, as to attract dogs to the place. See LIME.

SCENT *bags*, in natural history, a name given by Tyson to those peculiar pouches, or bags, which certain animals, as the civet cat and musk animal, have for the receiving the matter of their perfume. These *bags* are common to more animals than is generally supposed, and in all have much the same qualities, the matter they contain being in most of them fœtid, and disagreeable, while contained in the *bag*, and only becoming sweet and pleasant when dried, or taken at least from the animal, and smelt in small quantities. The weasel and polecat with us have *bags* of this kind, and the famous bag, or pouch of the opossum, is of the nature of these; though it serves also to the other great purpose of receiving and sheltering the young in time of danger. It contains, like the rest, a tough and viscous matter, which ouzes out of the glands, and is of a very offensive smell while the creature lives; but as soon as it is taken out and dried, the smell changes into a fine perfume. The gland of the aper moschiferus, as Tyson calls it, is of this kind, containing a glutinous humor of a very offensive smell when fresh, but when dried, becoming sweet and perfumed as musk. Philos. Transact. N° 239. p. 125. See the article APER.

SCEPASTRA, the name of a kind of bandage for the head, described by Galen.

SCHADIDA *calli*, in botany, a name given by some authors to the plant which affords the euphorbium of the shops. *Herm.* Cat. p. 31.

SCHÆNANTH, *schænanthus*, in botany, the same with *ischæmum*. See SCÆNANTH and ISCHÆMUM.

Schænanth was much praised by the antients as a deobstruent, and promoter of the menses; but at present it is only kept as an ingredient in some officinal compositions.

SCHÆNICLOS, in zoology, the name of a bird, which, by the description of Bellonius, seems to be the same with that called by the French *alouëtte de mer*, the *sea lark*, and by us the *stint*. *Aldrovand.* lib. 20. cap. 56.

SCHAFFILT, in zoology, the name of a very small owl, not larger than a thrush, called *noctua minor* by authors.

Its eyes are very bright, and of a yellow colour; its ears very large; its feet are feathered to the toes, and the soles of its feet are yellow. It is caught in the woods in Germany. *Ray*'s Ornitholog. p. 69.

SCHAKARILLA, or SCHACARILLA, in the materia medica, a name given by some authors to the medicinal bark called *cortex thuris*, and *cortex elutherii* by others. *Montani* Exot. p. 8.

SCHAPHAN, in Jewish antiquity, the name of an animal declared unclean by the law of Moses [b]. Interpreters do not agree in their explanations of this word.—[b Levit. xi. 5.] See the article CHOEROGRILLUS.

SCHASIS, a word used by some of the writers in surgery to express scarification.

SCHEAT, or, as it is sometimes written, SCHEAD, or *sheart*, a name given by many to the jentling, a fish of the chub kind, caught in the Danube, and most of the larger rivers of Germany, and called by Gesner and Aldrovand *capito cæruleus*. *Willughby*'s Hist. Pisc. p. 256. See JENTLING.

This is the *glanus* of Pliny, and the other old Roman authors, and is distinguished by Artedi by the name of the *silurus* with four beards near the mouth. This is its character in which it differs from the *lake*, another fish of this kind; which, though a genuine species of *silurus*, has only one beard.

SCHELLENT, in zoology, the name of a species of duck, found about the sea coasts, of the size of the common duck, and differing from the *capo rosso* in this, that it is twice as large, and the eyes have yellow iris's; though agreeing with it in the colour of the bead, which is of a reddish brown. Its neck is grey, and its back is of a blackish grey; its throat, breast and belly white, but near the anus there is a transverse brown line. The long feathers of the wings are black and white, and the tail of a blackish grey. *Aldrovand*, de Avib. p. 223.

SCHELLEY, in zoology, a name given in some counties of England to the fish known among authors by the name of *ferra*. *Willughby*'s Hist. Pisc. p. 184. See FERRA.

SCHEME, (*Cycl.*) *schema*, σχημα, in the antient music, is used for the varieties arising from the different positions of the tones and semitones in a consonance.

SCHETES, was formerly a term for usury; and the commons prayed that order might be taken against this horrible vice, practised by the clergy as well as the laity. Rot. Parl. 14 Rich. II. *Blount.*

SCHETIC *diseases*, a term used by the old writers in medicine to express such diseases as were not deeply rooted in the constitution, but might be easily removed.

SCHEUKZERIA, in botany, the name of a genus of plants, the characters of which are these. The perianthium is divided into six oblong, acute, reflex and expanded leaves, remaining with the fruit. There is no flower of petals. The stamina are six very short and flaccid capillary filaments. The antheræ are erect and obtuse, very long, and of a compressed figure. The germina of the pistils are three in number; they are of the size of the cup, and of an oval compressed figure; though there be no style. The stigmata are oblong, and obtuse on the upper part; they grow on the outside to the germina. The fruit consists of as many capsules as the pistil had germina; they are of a roundish figure, inflated and compressed, and each composed of two valves. The seeds are single and oblong.

The number of the germina and capsules vary, from three up to six; the three seem, however, the most natural state of the flower, and are the most frequent. *Linnæi* Gen. Plant. p. 152.

SCHILUS, in ichthyology, a name given by many to the fish called by the generality of authors *lucioperca*, or the pike fish. See LUCIOPERCA.

Artedi refers it to the genus of the *perca*, or pearch, and distinguishes it from the common pearch, by calling it the pale spotted pearch with two large teeth on each side the mouth. See the article PERCA.

SCHINELÆON, a word used by the antients to express an oil of mastich, or oil in which mastich was dissolved.

SCHINUS, in botany, the name by which Linnæus calls the genus of plants, described by Tournefort and others under the name of *molle*. The characters are these: the cup is very small, and is lightly indented in five places. The flower consists of five expanded petals. The stamina are a considerable number of oblong slender filaments. The germen of the pistil is roundish, and the fruit is a globose berry, containing a large seed of the same globose figure. This plant, in its external appearance, resembles very much the *rhus* and the *lentisk*, in the fructification, but when closely examined, is found to differ from both; from the former, in having more than five stamina, and from the latter, in the petals. *Linnæi* Gen. Pl. p. 515.

SCHIRROSIS, a name given to a disorder of the eye, arising from the violence of a long continued inflammation, when the flesh increases in bulk, and assumes a livid colour.

SCHISMA, in music. Some, as Grassineau, make this interval equal to half a comma, and say that eighteen of them are required to make a compleat tone, reckoning nine commas to a tone. But all this is inaccurate. See the article INTERVAL.

It is also used by some for the difference between the tones major and minor [c], called by others a *comma*.—[c *Descartes*, Comp. Music.] See COMMA, *Cycl.* and *Suppl.*

SCHIT-ELU, in botany, a name given by some authors to the plant, which produces the seed called *sesamum* in the shops. Hort. Mal. Vol. 9. p. 105.

SCHLEMMEN, a term used by the smalt-makers to express the substance of the smalt after fusion, when it is separated from the *eschel*; that is, a sort of grey ashes which adhere to it, and is ready for powdering for use.

SCHNOT *fish*, a name by which some call the hasela or hasler, a fresh water fish, approaching to the mullet or chub kinds, and at some seasons esteemed a very delicate dish. *Willughby*'s Hist. Pisc. p. 261. See the article HASELA.

SCHOENAS, among the antients, a land measure containing two parasangs, or sixty stadia, according to Herodote; which makes seven and an half of our miles. But Pliny computes it at five miles, or fifty stadia. *Pitisc.* in voc. See PARASANG and STADIUM, *Cycl.*

SCHOLARES, an ecclesiastic order, instituted by Innocent the third in the council of Lateran. *Hofm.* Lex. univ. in voc.

SCHOOL, (*Cycl.*) or SCHOOLING, in the manege, is used to signify the lesson and labour both of the horse and horseman.

A *school pace* or *gate* denotes the same with *ecoute*. See the article ECOUTE.

SCHRAITSER, in zoology, the name of a fish very common in the Danube, and in many things resembling our ruff, or small gilded pearch.

Its common size is about three inches in length; its tail is forked, and its back fin is supported by thirty rays or nerves, eighteen of which are rigid and prickly, and those which stand behind them soft and flexile. The upper jaw has a membrane somewhat like a lip, which hangs from it, and the coverings of the gills terminate in a spine or prickle. The membrane of the back fin is variegated with black spots, and its general colour is somewhat paler than that of the pearch. It is a very well tasted fish. *Ray*'s Ichthyography, p. 335.

SCHWALBEA, in botany, the name of a genus of plants, the characters of which are theſe. The perianthium conſiſts of one leaf, and is of a very ſingular figure, being tubular, inflated, and ſtriated on the ſurface, and terminated by an oblique mouth, lightly divided into four ſegments. The upper ſegment is ſmalleſt of all, the two ſide ones are longer, and the bottom one is longer and broader than theſe, and is emarginated. The flower conſiſts of one leaf, and is of the labiated kind. The tube is of the length of the cup, and the limb erect. The upper lip is erect, hollow, and undivided; the lower lip is of the ſame ſize, but is divided into three obtuſe and equal ſegments. The ſtamina are four capillary filaments, of the length of the flower, but two of them are a little ſhorter than the others. The antheræ are incumbent. The germen of the piſtil is round. The ſtyle is of the length and figure of the ſtamina, and is placed in the ſame ſituation. The ſtigma is thick and crooked. The ſeed is ſingle, roundiſh, and ſmall. *Linnæi* Gen. Pl. p. 291. Flor. Virgin. p. 71.

SCIADEPHORI, Σκιαδηφοροι, among the Athenians, an appellation given to the ſtranger women reſiding in Athens, becauſe they were obliged, at the feſtival Panathenæa, to carry umbrellas to defend the free women from the weather. *Potter*, Archæol. Græc. lib. 1. cap. 10. Tom. I. p. 56.

The word comes from Σκιαδεια, an umbrella, and φερω, I carry.

SCIÆNA, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of fiſhes, the characters of which are; that the opercula of the gills are ſcaly, and the back fin is bifid. Of this genus are the *umbra*, &c. *Linnæi* Syſt. Nat. p. 54. The characters of this genus, according to the Artedian ſyſtem, are theſe. The whole head, and the coverings of the gills, are ſcaly, and one of the laminæ of theſe coverings is ſerrated at the edge. The body is compreſſed and broad; the back is acute; and the teeth are only in the jaws and fauces, the palate and tongue being bare. There is only one fin on the back, but it is bifid, being ſo deeply divided at the middle, that it ſeems to make two. The tail is not forked, but even at the end. The appendices of the pylorus are ſeven or eight in number.

There are only two known ſpecies of this genus. 1. The *ſciæna* with the upper jaw longeſt, and the lower jaw bearded. This is the *ſciæna* and *umbra* of authors, and is called by Bellonius *chromis*. 2. The *ſciæna* variegated with black, and with very black belly fins. This is the *umbrino* of the Italians, and is the fiſh called *corvulus* and *coracinus* by many authors. The lines are of various lengths and breadths, and are laid obliquely on the ſides. The mouth is large, and the eyes brown. *Artedi*, Gen. Piſc. p. 29. See UMBRA and CORACINUS.

The name *ſciæna* is of Grecian origin, derived from the word Σκια, a ſhadow. The fiſh had this name from its being of a duſky or ſhadowy colour.

SCIAMACHIA, the fighting with a perſon's own ſhadow, a ſort of exerciſe preſcribed by the antient phyſicians, in which the motion of the arms, and other parts of the body, were of very great ſervice in many chronic caſes.

SCIAPODES, Σκιαποδες, a fabulous race of men, mentioned by Pliny, who had only one leg.

They were called *ſciapodes* from σκια τε ποδος, becauſe in ſummer they held up their leg, and ſheltered themſelves from the heat with the ſhadow of their foot. *Hofm.* Lex. in voc. See the article MONOCOLI.

SCIARRI, in natural hiſtory, the matter which runs down in burning torrents from the craters of Mount Ætna.

This matter, when cold and hard, is hewed and employed at Catania, and other places. It is chiefly uſed for the baſements and coinage of buildings. It probably contains mineral and metallic particles, being a ponderous, hard, grey ſtone. Philoſ. Tranſ. N° 481. p. 327, 328. See the article STONE.

Some of the *ſciarri* are coarſe, and others fine and poliſhed on the ſurface; ſome of them are black, others reddiſh, and others of the colour of iron; and many of them have coverings of pure ſulphur over the whole ſurface, or a part of it. Some very fine and ſmooth ones, reſembling iron, but very light, are found in, or near the mouths of the eruption, and ſome are very hard and heavy, and of a mixed nature, ſeeming to be the reſult of many ſorts of minerals melted together. Theſe latter, when the mountains have poured out ſtreams of fire, always remain in the places, and are the ſubſtance that was on fire cooled again.

At the time of the moſt terrible eruptions of this kind, theſe heaps of *ſciarri*, which ſometimes appear to be ſolid rocks of metalline matter, are only a ſort of covered arches, under which the melted matter yet continues liquid and running, and burſts out, at times, in the ſeveral parts of their ſides or ſurfaces. The general appearance of a train of theſe *ſciarri*, left after the eruption of ſuch a rivulet of fire, is much like that of the Thames, or ſome other ſuch large river, in the time of a ſevere froſt, the rocks of *ſciarri* riſing above the general ſurface, like the clods of ice in that ſcene; the colour only differing, the great quantities of the *ſciarri* in theſe places being of a deep bluiſh hue.

It is remarkable, that the ſubſtance of theſe *ſciarri*, even while melted and running in ſtreams down the hill, is ſo firm and ſolid, that no weight will ſink into it, nor any inſtrument make its way through the ſurface, any more than a ſolid maſs of cold metal. It has been ſuppoſed by ſome, that the flowing matter concreted into the common pumice ſtone, but that is a vulgar error, the pumice being a wholly different ſubſtance. Philoſ. Tranſ. N° 49.

SCIATHERICA, a name given to *dialing*. See DIAL and DIALING, *Cycl.*

SCIATHERICUM *teleſcopium*, a horizontal dial with a teleſcope, adapted for obſerving the true time, both by day and night, to regulate and adjuſt pendulum-clocks, watches, and other time-keepers. It is the invention of the ingenious Mr. Molyneux, who has publiſhed a book with this title, containing an accurate deſcription of this inſtrument, its uſes, and application.

SCIERIA, Σκιερια, in antiquity, a feſtival in honour of Bacchus, kept in Arcadia.

It was ſo called, becauſe that God's image was expoſed ὑπο τῃ σκιαδι, *i. e.* under an umbrella. At this time the women were beaten with ſcourges, in the ſame manner with the Spartan boys at the altar of Diana orthia, which they underwent in obedience to a command of the Delphian oracle. *Potter*, Archæol. Græc. Tom. I. p. 430.

SCILLONEORTE, Σκιλλων Ἑορτη, in antiquity, the feſtival of ſea onions. It was obſerved in Sicily. The chief part of it was a combat, wherein youths beat one another with ſea onions. He that obtained the victory was rewarded, by the gymnaſiarch, with a bull. *Potter*, Archæol. Græc. Tom. I. p. 431.

SCIMPODIUM, Σκιμποδιον, among the antients, a ſmall couch or bed, on which one perſon only could reſt at a time. It was on the *ſcimpodium* that the Romans uſed to lay themſelves, when weary or indiſpoſed.

The *ſcimpodium* was ſometimes uſed inſtead of the *lectica*, to carry both men and women, not only through the city, but likewiſe in journeys into the country. *Pitiſc.* in voc. See LECTICA.

SCINCUS, the *ſkink*, in zoology, the name of a ſpecies of lizard, called alſo by ſome the land crocodile, *crocodilus terreſtris*, and well known in the druggiſts ſhops as an ingredient in ſeveral compoſitions.

It reſembles the ſmaller ſort of lizards, being uſually about ſix inches long, and its uſual thickneſs is that of a man's thumb. It is of a ſilvery greyiſh colour, ſcaly, and has a rounded tail; its head is of an oblong figure; its noſe ſharp; and its feet, as it were, alated, having five toes each, armed with very ſharp claws. It is very common in Egypt and Arabia. *Worm.* Muſ. p. 86.

The dried fleſh of the *ſcincus* is greatly commended, as poſſeſſing all the virtues of that of vipers, but in a more exalted degree. It is ſaid to do wonders as a reſtorative, and provocative to venery. For this laſt purpoſe the belly is preferred to any other part of it; but there appears no reaſon for this in the dried animal. The people of Egypt cut the fleſh to pieces, and boil it down to a ſtrong broth or jelly; in which form it may do ſome ſervice, though it fails with us. The only uſe made of it at preſent in the ſhops, is as an ingredient in ſome of the old compoſitions.

SCINDALMOS, a word uſed by the antients to expreſs a fiſſure of the cranium, or of any other part.

SCINTILLA *veneris*, a term uſed by Paracelſus to expreſs a reſolution of the limbs, or deprivation of motion from a venereal cauſe.

SCIOGRAPHY, the art of ſhadows, or dialing. Alſo in architecture, it is ſometimes uſed to denote the draught of a building, cut in its length or breadth, to ſhew the inſide of it; as alſo the thickneſs of the walls, vaults, floors, timber works, &c.

SCIOMANTIA, Σκιομαντεια, in antiquity, a kind of divination, by raiſing the dead, who were ſaid to appear in airy forms like ſhades. *Potter*, Archæol. Græc. Tom. I. p. 350.

SCIOPODÆ, in hiſtory, the name given by Pliny, and other of the old writers, to a nation of people which they place in Æthiopia, on the burning ſands; and who they ſay, when too hot, lie down upon their bellies, and ſhadow themſelves from the ſun by lifting up their feet, which are very large and broad, againſt it. Theſe are ſome of the *gentes mirabilis figuræ* of Pliny, and are worthy to ſtand among the monocoli, and other ſuch monſters.

SCIRA, Σκειρα, a feſtival among the Athenians, otherwiſe called *ſcirrophoria*. See the article SCIRROPHORIA.

SCIRONA, a word uſed by ſome of the antients to expreſs the autumnal dews.

SCIRPUS, the *ruſh*, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, the characters of which are; that the cup is an imbricated ſpike, made up of oval and bent ſcales, parting the ſeveral flowers. The flowers have no petals. The ſtamina are three long filaments; and the antheræ are oblong. The germen of the piſtil is extremely ſmall. The ſtyle is long and thread like. The ſtigmata are three in number, and extremely ſlender. The ſeed is ſingle, three cornered, pointed, and is covered with hairs, which

which are shorter than the cup. *Linnæi* Gen. Plant. p. 12. See Juncus.

SCIRRHUS (*Cycl.*)—The feat of a *fcirrhus* is very various and uncertain; for this diforder is not confined to the internal parts alone, to wit, to the liver, fpleen, lungs, mefentery, pancreas, and in females to the uterus; but it frequently happens alfo to the external parts, as to the lips, tongue, tonfils, fauces, palate, gums, neck, mammæ, axillæ, inguina, penis and tefticles, and that generally after inflammations of thofe parts; though it fometimes alfo appears without any inflammation, efpecially in perfons of a heavy phlegmatic habit; fometimes alfo it is occafioned by an external injury, as a fall, a blow, &c.

As foon as the *fcirrhus* is formed, the immediate confequence is, that the indurated part becomes unfit to perform the functions allotted by nature to it, and the neighbouring parts fuffer preffure, and become impeded in the performance of their feveral functions. It is therefore no wonder that they are found fubject, in thefe cafes, to inflammations, ulcerations, cancers, gangrenes, tabes, ftiffnefs, immobility, and the like, according to the nature of the injured part.

The more inveterate a *fcirrhus* is, the greater will be the difficulty in the cure. When this diforder happens to young people, and fuch as are of a good habit of body, it is much more fafe and tractable, than when it happens to older infirm perfons. When there is any thing venereal in the cafe, the difficulty is yet the greater. The *fcirrhus* is of the more or lefs confequence, according to the nature of the part it is feated in; and internal ones are always more dangerous, for this reafon, than the external.

While a *fcirrhus* continues free from pain, there is little danger from it; but when it becomes painful or ulcerated, it generally threatens a cancer. The cure of thefe diforders is always difficult and uncertain, but in young robuft habits fometimes the knife and corrofives will effect it.

When the *fcirrhus* is of long ftanding, and in old people, great care muft be taken how it is meddled with, left, while under treatment, it fhould become cancerous. On the other hand, when the *fcirrhus* is but newly formed, and you have no figns of vehement pain or hardnefs, where the patient is otherwife of a good habit of body, external and internal remedies are to be employed at once, to endeavour to fet the confined fluids at liberty. The internal remedies, found of moft fervice on thefe occafions, are the decoctions of the woods, digeftive tinctures, or mild mercurials, giving between whiles relaxing medicines, to refolve the infpiffated humors.

In regard to the external remedies, plafters made of the warm gums, as ammoniacum, galbanum, fagapenum, and the reft, either alone or mixed together, and affifted fometimes by the powder of bryony root, or of the birthwort, are ufed. Mercurials ferve greatly to this purpofe, and the following compofition is alfo excellent as a plafter on thefe occafions. Take galbanum and opoponax of each an ounce, ammoniacum and bdellium of each two ounces, oil of olives two pounds, yellow wax half a pound, powder of long and round birthwort, lapis calaminaris, myrrh and frankincenfe, of each one ounce, Venice turpentine four ounces; melt them all into a plafter.

Next to plafters, cataplafms are found highly ferviceable in thefe cafes, one of the beft of which is made in the following manner. Take white bryony root four ounces, round birthwort and angelica of each an ounce, leaves of favin, rue, fcordium, wormwood and camomile flowers, of each one handful; melilot, elder, marfhmallows and centaury, of each half a handful; let thefe be boiled together in a fufficient quantity of water to the proper confiftence for a cataplafm, adding, toward the end of the boiling, three ounces of galbanum, diffolved in the yolk of an egg, two ounces of linfeed meal, and as much as is neceffary of linfeed oil.

It is to be applied warm, and often renewed; and a fomentation made from the fame ingredients, boiled in vinegar, is often found alfo of great ufe.

Inftead of thefe remedies fome highly extol the ufe of acid vapours on this occafion; fometimes the fteam of boiling vinegar is ordered to be received on the part, and that either of plain vinegar, or of fuch as has been medicated by infufions of rue, lavender flowers, or other fuch ingredients, or of the Venice treacle. Some fprinkle vinegars of thefe kinds over a hot ftove, and receive the vapour through a funnel; others advife the burning of common brimftone, and holding the part over the fume; and others are fond of fumigations of cinnabar. Great care muft be taken in thefe cafes not to raife too large a fume, nor to keep the patient over it too long; and he muft be advifed not to admit it into his nofe or mouth, for all thefe fteams are injurious to the lungs; and in the laft cafe, the quantity of mercury raifed in vapour from the cinnabar may often be enough to raife a falivation.

Mercurial medicines are alfo found to perform wonders in thefe cafes, either adminiftered in the beginning, or after all other remedies have failed. Befide giving mercurials internally, an excellent mercurial ointment may be made, by mixing quickfilver firft with a fmall quantity of Venice turpentine, and afterwards with a much larger of hog's lard, by rubbing them together in a glafs or marble mortar. The *fcirrhus* fhould be anointed two or three times a day with this, covering it with a common mercurial plafter; and to prevent this method from raifing a falivation, fome purging medicine, as the extract of rudius, or jalap, is to be given in fmall dofes every fourth or fifth day.

But if all thefe methods prove unfuccefsful, and the *fcirrhus* is free and moveable, and its fituation threatens no danger from the neighbourhood of any confiderable veffels, and if the patient's ftrength fhall be judged fufficient to undergo the operation, the affiftance of the knife muft be called in, and the *fcirrhus* cut out, to prevent its growing cancerous. When the *fcirrhus* is thus taken out, the wound is to be dreffed and healed with the common vulnerary balfams: but when the *fcirrhus* is fixed, knotty, uneven, and deeply rooted; where the patient is of a bad habit of body, is fubject to form *fcirrhufes* from an hereditary taint, or has formed feveral already; and laftly, where the fituation of the diforder is fuch, that from the vicinity of confiderable veins and arteries, there is danger of bringing on an hæmorrhage, which may prove fatal, then all attempts to cure, whether by the knife, by digeftives, or by corrofive medicines, are to be neglected; for this kind of *fcirrhus* is almoft always attended with very violent pains, and all that can be done is to attempt to alleviate thofe pains, and prevent a cancer. *Heifter*'s Surgery, p. 221.

Scirrhus *hepatis*, in medicine, a difeafe confifting in an indurated tumor of the liver, occafioned by a ftagnation of the humors which grow thick there, from an exhalation of their more fluid and fubtle parts.

This differs from the *infarctus hepatis*, not only in degree, but in its fymptoms, for it almoft always is attended with a hectic, or with œdemato-hydropic fwellings. *Junker*'s Confp. Med. p. 208.

Signs of it. Thefe are a tumor and hardnefs in the right hypochondrium, or region of the liver, always evident to the patient, and often fenfibly perceived by any body elfe, on touching the part. To this are to be added dull tenfive pains, and a fenfe of a weight hanging there, and ufually afthmatic fymptoms, and a dry cough. It becomes painful to lie on the left, or oppofite fide; and with thefe a hectic comes on, with a wafting of the upper parts, and a fwelling of the inferior ones; firft of the feet, but afterwards upwards to the belly, which finally become very obftinate, and truly afcitic. The urine in this cafe is fmall in quantity, and of a deep orange colour, and thick confiftence. It has ufually a mucid fediment, and fometimes a thick one of a rofe colour.

Caufes of it. Thefe are ufually either an omiffion of artificial difcharges of the blood, by habitual bleedings at fpring and autumn, or a fuppreffion of the natural ones, by the menfes or hæmorrhoidal veffels: an improper treatment of intermittent fevers with aftringents, of quartans with large quantities of bark, and of acute fevers with too cooling a regimen, or a violent quantity of the volatile falts, or a condenfation of the humors in a fimple infarction, by means of cold external applications. The ftopping hæmorrhages, which nature had brought on for her relief in plethoras, have alfo been fometimes known to occafion a *fcirrhus* of the liver; as have alfo external injuries by blows, falls, and the like.

Prognofticks. A recent *fcirrhus* of the liver admits of a cure, but this not without great difficulty, and in a more confirmed one there is very little hope. This tumor has a continual tendency to corruption, either by fphacelation, or by an inflammatory fuppuration; neither of which can happen fuccefsfully, for the firft muft occafion inftantaneous death, and the latter exulceration, and a fucceeding fatal hectic. A *fcirrhus* of the liver often follows, and fometimes precedes a jaundice of the moft violent kind.

Method of treating it. The bowels are firft to be cleanfed and relaxed by a clyfter, made of a decoction of mallows, camomile flowers, mullein, and fennel feed; after this, bleeding in the foot is to be ordered, and then the nitrous and other refolvent medicines are to be given, fuch as tartar of vitriol, and the like. After this medicated wines fhould be drank as the common drink, prepared with bryony and arum roots, centaury, hyffop, and maidenhair leaves, faffafras, fenna, black hellebore, and rhubarb; and externally, plafters of the refolvent and ftrengthening kinds are to be applied. But after all directions for the treatment, it is to be acknowledged, that an obdurate and inveterate *fcirrhus* admits of no remedy. *Junker*'s Confp. Med. p. 210.

SCIRRONES, a name given to a fort of fmall lice breeding under the fkin.

SCIRROPHORIA, Σκιῤῥοφορία, in antiquity, an anniverfary folemnity at Athens, upon the twelfth day of the month *fcirrophorion*. For its origin and ceremonies fee *Potter*, Archæol. Græc. lib. 2. cap. 20. Tom. I. p. 430.

SCIRROPHORION, Σκιῤῥοφοριων, in antient chronology, the twelfth and laft month of the Athenian year. It contained

 twenty

twenty nine days, and anfwered to the latter part of our May and beginning of June. See MONTH.

It had its name from the feaft *fcirrophoria*, kept in it.

SCISSIMA, in botany, a name given by fome authors to the beech tree. *Ger.* Emac. Ind. 2.

SCISSORS. Mr. Monro has given us the figure and defcription of a pair of *fciffors*, the blades of which are crooked on their flat fides. Thefe *fciffors* are very ufeful for taking off excrefcences from hollow parts, or for cutting in curve lines, which the common *fciffors* cannot eafily be applied to. Med. Eff. Edinb. Vol. 5. art. 41.

SCIURUS, the *fquirrel*, in the Linnæan fyftem of zoology, makes a diftinct genus of animals, the characters of which are; that the creatures have four toes on the fore feet, and five on the hinder, with palms made for climbing and leaping, and all have woolly tails. *Linnæi* Syftem. Natur. p. 33.

We have five fpecies of this little animal defcribed to us. 1. The common Englifh kind. 2. The great grey Virginian one. 3. The black backed kind of Ceylon. 4. The American flying *fquirrel*. And 5. the Barbary kind.

The common Englifh *fquirrel* is well known, and is diftinguifhed from the others by its fize and colour. It is fomething larger than the weafel, but fhorter bodied; its back and fides are reddifh; its throat and belly white; and it generally carries its long hairy tail erect over its back, fo that it ferves it for a fhade. It is common in our woods, and feeds on all forts of fruit, but principally on hazel nuts; which it gathers in the feafon, and lays up for its winter ftore. The fame fpecies of *fquirrel* with ours is found in Poland and Ruffia, grey or afh coloured.

The fecond, or great grey American *fquirrel*, is very common in Virginia, and is of the fize of a rabbet. It is of a dark iron grey, fuch as fome rabbets are of; its fore feet have only four toes, its hinder ones five.

The third, or black backed *fquirrel*, is found in the ifland of Ceylon, and called by fome *rukkaia*, from the noife it makes. The hair on its back is fometimes grey.

The fourth, or flying *fquirrel*, is a very fmall kind; its back is of a dufky moufe-coloured grey; its throat and belly white; its eyes fmall, black, and prominent, refembling thofe of the moufe kind; its tail is very long, and very broad and flat. It has a thin and lax fkin on each fide, which is fixed to the fore and hinder legs, and confequently, on the extending its legs, this fkin expands on each fide like a fort of fail: this it always does in leaping, and is by that means carried a great way; and hence has arifen the opinion of its flying. It is very common in New Spain, and is fometimes met with in the colder American countries. It very much approaches to the moufe kind in many particulars, receding from the nature of the *fquirrel*. Its furr is fhort like that of the rat or moufe, not long like the other *fquirrels*. It never erects its tail on its back, nor turns or twifts it round, as the other *fquirrels* do. It has a very beautiful black line on each fide the face, near the eyes.

The fifth kind, or Barbary *fquirrel*, is of a mixed colour, between black and reddifh, and is very beautifully variegated all down the fides with brown and white longitudinal ftreaks, laid in a regular alternate order, and each reaching the whole length of the body. Thefe lines are, in fome of thefe creatures, not brown and white, but black and white; and the tail, when in a ftate of reft, is feen elegantly ftreaked with the fame colours, but when the creature erects it, the hairs ftanding all upright, the beauty of this variegation is hid. The belly of this creature is blue and white. It is fmaller than our *fquirrel*, and has fhorter ears, which are roundifh, and lie clofe on the head. The whole head has much of the figure of a frog's, in all other refpects it is perfectly like our *fquirrel*. *Ray*'s Synop. Quad. p. 214.

SCLAREA, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of the labiated kind; the upper lip is hooked like a reaper's fickle, and the under one divided into three fegments, the middle one being largeft, and hollowed like a fpoon. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower. It is furrounded by four embryos, which ripen into as many feeds, and are contained in a fort of tubular capfule, which was the cup of the flower.

The fpecies of *fclarea*, enumerated by Mr. Tournefort, are thefe. 1. The *fclarea*, called *gallitrichum fativum* and *orvala* by authors. 2. The woolly *fclarea* with very large flowers, called *Æthiopis* by many authors. 3. The jagged leaved *fclarea*, called the *Æthiopis* with divided leaves. 4. The large leaved glutinous Portugal *fclarea*. 5. The afphodel rooted *fclarea*. 6. The Indian *fclarea* with variegated flowers. 7. The glutinous Pyrenean *fclarea* with finuated leaves. 8. The ftinking hairy white flowered *fclarea*. 9. The early African annual *fclarea*. 10. The great annual Bœtic *fclarea* with pale blue flowers. 11. The blue flowered meadow *fclarea* with ferrated leaves. 12. The white flowered meadow *fclarea* with ferrated leaves. 13. The bright red flowered meadow *fclarea* with ferrated leaves. 14. The greater *fclarea* with deeply divided leaves. 15. The white flowered Syrian *fclarea*. 16. The blue flowered Syrian *fclarea*. 17. The great fpotted fage leaved *fclarea*. 18. The fmall fmooth fage leaved *fclarea*. 19. The purple flowered fage leaved *fclarea*. 20. The *fclarea* with triangular dentated leaves. 21. The triangular leaved woolly ftalked *fclarea*. 22. The blue flowered betony leaved *fclarea*. 23. The African fhrub *fclarea* with leaves like the helianthemum. 24. The large flowered dwarf *fclarea* with jagged leaves. And 25. the Syrian *fclarea* with rugged dentated leaves. *Tourn.* Inft. p. 179.

SCLERIA, a word ufed by medical writers to exprefs a hardnefs of the inner part of the eyelids.

SCNIPS, in natural hiftory, a name given by authors to the fmall fpecies of gnat, always found about the oak tree feeding on the juices of its leaves, which it fucks by means of its fharp trunk.

It is fuppofed by fome to be hatched of the fmall oblong white worm, that inhabits the oak apples.

SCOBS, a word ufed by fome authors to exprefs the rafpings of ivory, hartfhorn, or other hard fubftances. Some alfo have ufed it to exprefs the fcoriæ of metals; and fome as a name for the *cineres clavellati*, or pot-afhes, ufed in foap and glafs-making.

SCODEGHINO, a name given by chirurgical authors to a peculiar fpecies of incifion knife, defcribed by Scultetus, and ufed by Rouffet in performing the Cæfarean operation.

SCODINEMA, a word ufed by fome medical writers to exprefs a heavinefs of the head.

SCOLECIA, in the materia medica of the antients, a name given to a kind of verdigreafe.

Of this there were two fpecies, the one found native in the earth, the other fictitious.

The latter kind was prepared by rubbing a quantity of vinegar in a brafs mortar, with a brafs peftle, till it became thick and ropy; when it was in this condition, a fmall quantity of alum and fea falt, or nitre, were added to it, and it was fet in the fun in the heat of the dog days. It was to ftand thus till it became ropy, thick, and of a green colour; and then being drawn out into long threads, and dried, it had the refemblance of worms in fhape, and thence had its name.

SCOLION, among the antients, a kind of Bacchanal fong ufed at entertainments. See *Pitifc.* in voc.

SCOLIOSIS, a word ufed by Hippocrates to exprefs a diftortion of the fpine fideways.

SCOLIUM, in antiquity. See the article SCOLION.

SCOLOPAX, the *woodcock*, a very well known bird, diftinguifhed by its fize, which is fomewhat fmaller than that of the partridge, and by its colour, which is on the back a variegation of black, grey, and a reddifh brown; and on the belly a pale grey, variegated with tranfverfe ftreaks of brown. Its beak is three fingers breadth long, and the upper chap a little longer than the under.

In the Linnæan fyftem of zoology, the *fcolopax* is the general name of a large order of birds, the diftinguifhing character of which is, that they have a fomewhat cylindric beak, which is rounded, and obtufe at the point. *Linnæi* Syftem. Natur. p. 47.

SCOLOPAX, in ichthyography, the name of a fea fifh called in Englifh the *trumpet*, or *bellows fifh*.

It is a very fmall fifh, caught very frequently in the Mediterranean, and common in the markets of Rome, Venice, and elfewhere. Its common length is about three inches; its body is flat, and of about one finger's breadth, and covered with rough and harfh fcales. The fnout is extremely long, and is hard, ftrait, and made all of one bone, broad at the head, and narrow at the end, and opening there tranfverfely with a membrane affixed to the under jaw, and ferving to open and fhut it at pleafure. The eyes are large, and their iris's of a pale red. It has a thin fin at each of the gills. The anterior part of the belly is formed into a fharp edge, and has no fins, but two bony fubftances, feeming the rudiments of belly fins; and a little lower on the belly it has one, which is longer and notched. Behind the anus there is a long fin, reaching to the tail, and on the back there are two others very oddly placed; the hinder ftands very near the tail, the other higher up; and this laft is no other than one long and large bony fpine of two inches long, and fet in a joint, by which it is moveable at pleafure. Before this there ftands another very fine prickle, and behind it three others, which make the whole a fort of fin. *Gefner*, de Pifc. p. 1008.

SCOLOPENDRA, in zoology, an infect of a very flender and long body, very fmooth, and of a yellowifh or reddifh colour, furnifhed with a vaft number of legs, and having two long antennæ, and a bifid tail.

It is ufed by fome as a depilatory, being boiled in wine. *Dale*'s Pharmacop. p. 355.

There is a fpecies of this animal, which naturally fhines in the dark in the manner of a glow-worm, but with a fainter and more general light. Every part of the body of this animal will emit fparks, if preffed in the dark. It is covered with a foft down, or fhort and fine hair, much refembling in texture

ture the dewny matter which grows on the back of colts-foot leaves.

The two fides of the animal are covered alfo with two other lifts or ftripes; thefe go off from the main ftripe at the top, and thefe are about a quarter of an inch broad; they are covered with a fine and foft hairynefs, of more than a quarter of an inch long, of a fine changeable red and green colour, and of prodigious beauty and brightnefs. Among this long hair of the ftripes on the fides there are fet a vaft number of long and fharp prickles; they are about the fame length with the hair, but they are as ftiff as a hog's briftle, and are very fharp at the points, and of a black colour; there are feveral hundreds of thefe on the two fides. The tail, or fmaller end, terminates on the back in two fcales, which are very bright and fine; under this is the anus, at which the creature voids its excrements. The larger end has no part of the common characters of a head, except the mouth; but as it has this, and ftands oppofite to the tail, it is properly enough called fo in defcription. It has no horns, no eyes, nor any other of the common organs of infects heads.

The mouth is very wide, in proportion to the fize of the creature, and is not placed at the extremity, but fomewhat under the belly part; fo that when the back of the creature is viewed, the mouth is not feen. The belly is fmooth and flat, and is covered with a thin fkin, much paler coloured than that of the back, and irregularly variegated with a number of brown fpots, of different fizes and fhapes. Within an inch of the tail there are feen on this under part feveral marks, like thofe of the annular divifions of the bodies of infects, but they do not fhew themfelves on the back. The legs are placed in two rows, each of the whole length of the body of the fifh; they begin from the angle of the mouth on each fide, and are continued to the tip of the tail. Thofe ftanding near the mouth are longer than the others, which gradually decreafe till they are very fhort at the tail; the longeft are about a quarter of an inch in length, and the fhorteft not a fixth of that length.

The whole number of legs is feventy two, thirty fix ftanding on each fide. From within the body, through the middle of each leg, there paffes a clufter of three or four prickles; thefe are larger or fmaller, according to the fize of the leg, and vary alfo in number, the longeft legs having moft of them; they give ftrength and firmnefs to the legs, ferving them in the place of bones, and iffuing out beyond the end of the leg, in the way of claws; they ferve the creature for the laying faft hold of any thing it pleafes. On each fide of the upper, or back part of the fifh, there are alfo placed a number of foft, flat, and fmooth fins; thefe ftand near the legs, and are placed face to face in fuch a manner, that each foot has its correfponding fin. The fins are exactly of the fame number with the legs, and, like them, are largeft toward the head, and go off gradually tapering toward the tail.

Thefe ferve the creature in the office of a fifh, giving it power to fwim in the water, as the others ferve it as a reptile to crawl upon the ground at the bottom. The fins on each fide are fringed with the fame changeable coloured hair, that the ftripes on the back are.

On opening the body there appears a mufcular organization, elegantly contrived for the working fo great a number of legs and fins. This appears in form of one large and broad red mufcular congeries, and from this there are propagated on each fide thirty fix pair of rays, or oblong and flender mufcles, every pair ferving for the motion of one leg and one fin. Thefe are very diftinctly vifible, and reprefent the fpine and ribs in fome fifh. And in this the wonderful care of nature is feen, in regard to this little animal, which, by means of thefe diftinct mufcles, is able to move every fingle leg or fin feparately, and confequently can put as many, or as few as it pleafes, in motion at a time. It is plain alfo, from the ftructure of the body of this creature, that it can at pleafure roll up its body into a round form, and in that cafe will appear as a globe covered with long and fharp prickles: this is probably its practice, when in danger of being devoured, and may ferve it on many occafions. It has been thought by fome, that Rondeletius means this creature by his *phyfalus*; but this does not appear to be the cafe on a careful examination. Philof. Tranf. N° 225.

Scolopendra *marina*, a name given by Dr. Molyneux to a new fpecies of fea animal, of the centipede *fcolopendra* kind. See Tab. of Microfcopical Objects, Clafs. 1.

This remarkable infect, taken in the Irifh feas, is evidently the fame animal defcribed by Oligerus Jacobæus, in the *Acta medica Haffnenfia*, under the name of *vermis aureus*, or *erucæ marinæ fpecies rarior*. It was caft on fhore in Holland, at Katwik op Zee; and Aldrovand feems to have meant it alfo under the name of the broad bodied chefnut coloured fea *fcolopendra* with numerous yellow feet. The figures and defcriptions in both thefe places are however very imperfect, and the account given by Dr. Molyneux is the only one at all to be relied on, of this ftrange animal. Philof. Tranf. N° 224.

Scolopendra *fcutata*, in natural hiftory, the name of an animal of the infect kind, found in the year 1736 by Klein in Pruffia, and at the fame time by Mr. Brown in fome parts of Kent.

It was met with in Pruffia in vaft abundance, in the places where they take crayfifh, and having not been met with there before, furprifed the people employed in that fifhery fo much, that they brought home many of them. In Kent its appearance was attended with greater fingularity, Mr. Brown found it in a pond on Bexby common, where the country people had obferved vaft numbers of them for five or fix weeks before. This pond was quite dry on the 24th of June that year, but being filled by the thunder fhower on the 25th of the fame month, the pond was obferved to fwarm with them in two days, by a farmer watering his cows there; and what is very obfervable is, that there appears no channel into this pond, that could convey them from any other place.

The creature is about an inch and half in length, and fomewhat lefs than an inch in breadth, and though fo fmall, yet bears a great refemblance, in many of its parts, to the great Molucca crab, called by fome the *buckler crab*. When the back is viewed, it is feen to be covered with a cafe or fhield, fo that it in fome meafure refembles a tortoife, only it is remarkably gibbous, or prominent all along the middle of the back, and has a triangular opening in the fhell near the tail. This covering is of the confiftence of the upper wings of the beetles, and the eyes are prominent, and placed beyond it. When the creature is turned upon its back, fo that the belly comes in fight, there are obferved a vaft number of legs, and every one of thefe is furnifhed with a fort of bag at the end, which finally divides itfelf into feveral fingers or toes, and all thefe are compofed of a number of articulations, in the manner of the antennæ of the common infects. There iffue from the tail two long and flender bodies, articulated in the fame manner; thefe are about a third of an inch in length, and greatly refembling the common antennæ. On the head alfo it has two fhort horns, ftanding in the common place of the antennæ. When the cafe or fhell is taken off, the rings of the body are found to be about thirty in number. The legs are very extraordinary, they are forty two on each fide; the twenty that ftand next the head are nearly of the fame fize, but then they grow gradually fmaller towards the tail. The feet confift each of five membranaceous claws; thefe are flat, and have a ftiff rib in the middle, and are hefet at the edges with hairs, in the manner of the legs of a crab. On the lower fide of the leg hangs an oval bag; and beyond that grows a large thin membrane, which can be extended at the creature's pleafure by means of a ftrong rib, which runs all the way along its middle. This membrane, and alfo the whole foot, are convex toward the head, and concave on that fide that ftands toward the tail; the thigh, or firft joint of the leg, is webbed on each fide, and indeed the whole ftructure of the legs feems calculated for fwimming, rather than for walking. Philof. Tranf. N° 447. p. 151.

SCOLOPENDRITES *lapis*, in natural hiftory, a name given by fome authors to a fpecies of the *lapis fyringoides*, or pipe ftone, the tubules of which they fuppofed to refemble the figure of the body of the *fcolopendra*.

SCOLYMUS, in botany, the name of a genus of plants, the characters of which are thefe. The flower is compofed of a number of femiflofcules, each placed on an embryo feed, and perforated in its bottom part by the capillament which runs out from the embryo. The femiflofcules are feparated each from the next by a little leaf, and are all contained in a fquammofe cup. The embryos afterward become feeds affixed to the thalamus of the flower, and adhering to thofe little leaves which feparated the femi-flofcules. See Tab. 1. of Botany, Clafs 13.

The fpecies of *fcolymus*, enumerated by Mr. Tournefort, are thefe. 1. The *fcolymus* with gold yellow flowers, called by authors the *yellow flowered thiftle*, and the *yellow thorn*. 2. The annual yellow flowered *fcolymus*. And 3. the tall African yellow flowered *fcolymus*. *Tourn.* Inft. p. 489.

It is not certain that any of the antients ufed the word *fcolymus* as the name of the plant we call the artichoak. Theophraftus, Diofcorides, and indeed all the antients, have defcribed this plant; but Theophraftus fays that only its roots were eatable, and Diofcorides fays fo of its young fhoots. It feems, therefore, that they meant our chardon by this name, the ftalks of which our gardiners have a way of blanching for the table.

Thefe Greek writers had indeed another name for the artichoak, they called it *acanthe*. This cannot be doubted by any, who will obferve their accounts of the *acanthe*, which tell us that it was of the thiftle kind, but had a large and roundifh head, compofed of fcaly leaves, in the manner of the cone of the fir or pine, (the pine apple as we vulgarly call it) and that in this head was contained its only efculent part.

This name *acanthe* being very like the word *acanthus*, the name of the *branca urfina*, or bear's breech, there have been many errors in the editions of the antient Greeks,

 by

by confounding the two words. *Dioscorides*, lib. 18. *Theophrastus*, p. 72. See ACANTHE.

SCOMBER, the *mackrel*, a well known sea fish of the thynnus kind, and distinguished from the other fish of that genus by its extremely small and thin scales; by its bluish green colour on the back, variegated with undulated and crooked black lines; by the forkedness of its tail, and the very substance of the fin of it, being almost entirely wanting at the angle of it; and by the largeness of its eye, in comparison of the *amia*, and other fish of this kind, which most resemble it in other respects. *Willughby's* Hist. Pisc. p. 181.

In the Linnæan system of zoology, the *scomber* is a distinct genus of fishes, of the general order of the acanthopterygii. The characters of this are, that the membrane of the gills has seven bones, and that the tail has lateral eminences. Of this genus are the *scomber*, *thynnus*, *amia*, and *trachurus*. *Linnæi* Syst. Nat. p. 54.

In the Artedian system of ichthyology, the characters of this genus of fish are these: the branchiostege membrane on each side contains seven slender bones, the upper one of which is nearly covered by the covering of the gills. The tail is very forked, so as to resemble the form of a crescent. There are one or more eminences on each side toward the tail. The fins are either only two on the back, or else, beside these, there are several other small and short ones, running all the way to the tail, as well on the upper as the under part of the body. The appendices to the pylorus are very numerous.

The species of this genus are these. 1. The *scomber* with five pinnules at the end of the back, and a short spine at the anus. This is the common *mackrel*. 2. The *scomber* with eight or nine pinnules at the end of the back, and a furrow at the belly fins. This is the *tunny* fish. 3. The *scomber* with prickly lateral lines, and thirty bones in the pinna ani. This is the fish we call the *horse mackrel*, and in some places the *scad*. 4. The *scomber* with two back fins, and with the last ray of the second very long. This is the *amia* of Salvian, and the *glaucus* of Aldrovand. It grows to three feet long. 4. The *scomber* with the second ray of the second back fin very high. This is the *glaucus primus* of Willughby and Rondeletius. *Artedi*, Gen. Pisc. p. 25. See the articles GLAUCUS, &c.

SCOPELISMUS, Σκοπελισμος, an audacious crime practised by some villains among the Arabians.

It consisted in placing a certain number of stones upon the farm or field of persons these miscreants had a pique at; which stones served as a denunciation of utter destruction to those, who for the future should attempt to till the ground on which they were laid. And such terror attended this malevolent and clandestine threatening, that none ever ventured to till such fields. *Pitisc.* in voc.

SCOPS, in zoology, the name of a bird of the horn owl kind.

It is the smallest of all the owl kind, being scarce so large as a pigeon, and is grey on the head, and of a whitish brown, variegated with streaks and spots of brown in other places. Its beak is short, black, and crooked, and it has two series of feathers, like the rest of the horn owls, resembling horns, which stand over its ears. It is very common in Italy. *Aldrovand.* de Avib. lib. 8. cap. 4. *Ray's* Ornithol. p. 65.

SCORAX, a word used by some authors to express the gum of the olive tree.

SCORDIUM (*Cycl.*)—This plant is propagated in our gardens for medicinal use, by parting the roots, or planting slips or cuttings in March, in beds of moist earth, at four or five inches distance, in July they will be in flower, and fit to cut for use. But every other year the bed should be renewed, and that always on a fresh spot of ground, for they do not succeed well on the same. *Miller's* Gardner's Dictionary.

Scordium, or *water germander*, is esteemed a great sudorific and alexipharmic. It is prescribed in malignant and pestilential fevers, and even the plague itself. It is an attenuant and dissolvent, and is used to destroy worms. Externally it cleanses foul ulcers, and, applied by way of cataplasm, mitigates pain. It is never used alone, but merely kept in the shops as an ingredient in the *confectio Fracastorii*, which, though it contains several medicines of more virtue, yet takes its name *diascordium* from it.

SCORIA, (*Cycl.*) in metallurgy, the recrements of metals in fusion, or more determinately speaking, the mass, or part of the mass of a melted metal, converted by the action of the fire into a body, which when cold is brittle, fixed, not dissoluble in water, but melts again when exposed to the fire, and is properly a kind of glass.

Some authors call by this name that saline mass, which is produced by melting ores and metals together with saline, and reducing fluxes. But the word *scoria* is not properly to be understood of all this mass, but only of the vitrified particles which are lodged between, and adhere to the small masses of the salts, and which may be separated from them by water. *Cramer's* Art of Assaying, p. 185.

SCORIFICATION, in metallurgy, is the art of reducing a body either entirely, or in part, into *scoria*.

It is used by metallurgists, in order that any metal, imprisoned in a solid body, may, on account of its weight, descend and separate itself therefrom, and finally if that be required, be itself either wholly or in part converted into *scoria*. All fixed bodies are subject to this alteration, not totally excepting even gold and silver. There are also, among the volatile bodies, some that may be fixed, and which assume the form of *scoræ*, by adding fixed bodies to them.

It is often proper to make this *scorification* in a vessel that may absorb the *scoriæ*, and retain only the metallic part of the mass under trial. In this case the operation is called *cupelling*, and vessels made of ashes, called *tests* and *coppels*, serve for this purpose. It is evident in these processes, that a great attenuation of the *scoriæ* is necessary, that they may be able to pass through the vessel; nor is there any fitter body to promote this operation than lead, which, by its undergoing itself a like attenuation in the fire, disposes other bodies to be reduced into a subtle *scoria* for the same attenuation.

SCORITH, a word used by the chemical writers to express sulphur.

SCORPÆNA, in the Artedian system of ichthyology, the name of a genus of fishes, of the acanthopterygious kind, the characters of which are these. The branchiostege membrane on each side contains seven bones. The head is large, and very prickly. There is only one back fin, and that is lower in the middle than elsewhere. The body grows small toward the tail. The eyes are placed near one another, and are covered with the common skin. There are teeth in the jaws, palate, and fauces; and the appendices to the pylorus are eight or nine.

The species of this genus are these. 1. The *scorpæna* with pinnules at the eyes and nostrils. This is the *scorpius minor*, or *scorpæna* of authors. 2. The red *scorpæna* with many cirri about the mouth. This is the *scorpius major* of authors, and is three or four times larger than the other. *Artedi*, Gen. Pisc. 33.

According to Mr. Willughby, the *scorpæna* is a fish of the anguilliform kind, called by the people of Cornwall *father lasher*.

It is of about six inches in length, and in shape much resembles the fresh water bullhead. Its head, and the forepart of its body, are very large, the hinder part smaller, the belly is flat and broad, and the whole body is without scales. It has a rough line running along both sides. It is variegated with black and yellowish marks, and the belly is white. The mouth is large, and is furnished with several rows of small teeth. It has large fins at the gills, and two on its back, which are somewhat prickly, and one strait one on the belly. It keeps about the shores, and feeds on shrimps and small fish. It is common in the Dutch and English seas.

Scorpæna is also the name of a fish caught in many parts of the Mediterranean. It seldom grows to more than a pound weight. Its body is of a long, not flatted form, and is moderately thick. Its head is extremely large, and is armed with prickles, and it grows gradually less from thence to the tail. Its belly is not flat, but tumid, and its back rises in the middle. It something resembles the river pearch in shape, and is of a yellowish colour, variegated with spots of brown. Its scales are small and rigid. The coverings of the gills are armed with spines, and there are others about the eyes and about the mouth. The space between the eyes is hollowed, and over each eye there is a sort of small fin. The eyes are large and prominent, and are placed near one another. Its mouth is extremely large, but its teeth small. It has only one back fin, but that being very low in the middle, gives an appearance of two. The anterior spines of this are rigid and prickly, the hinder ones soft and flexile. The prickles about the head are accounted venomous, and the fishermen usually cut them off as soon as the fish is caught. Its tail is not forked, but rounded at the end. The belly and bellyfins are reddish. *Gesner*, de Pisc. p. 1018. *Aldrovand.* de Pisc. lib. 2. cap. 24.

SCORPIACA, the name of an antidote recommended by Galen against the stinging of scorpions.

SCORPIO, the *scorpion*, in zoology. See SCORPION.

SCORPIO, in botany, a name by which some of the old authors have called the *genista spinosa*, or common furze bush. *Ger.* Emac. Ind. 2.

SCORPIOIDES, in zoology, the name of a fish of the gotturugine kind, but differing in colour, being of a faint green, variegated with black spots; and in either wanting the eyefins, or else having them extremely minute. *Rondelet.* de Pisc. See GOTTORUGINE.

SCORPIOIDES, in botany, the name of a genus of plants, the characters of which are these. The flower is of the papilionaceous kind; the pistil arises from the cup, and finally becomes a jointed pod of an oddly convoluted shape, resembling a snail or caterpillar, and usually containing in each of its joints a single oval seed. See Tab. 1. of Botany, Clas. 10.

The

The species of *scorpioides*, enumerated by Mr. Tournefort, are these. 1. The *scorpioides* with beupleurum, or hare's ear leaves. 2. The beupleurum leaved *scorpioides* with rough, and more contorted horns. 3. The *scorpioides* with thick pods. 4. The *scorpioides* with beupleurum leaves, and with smooth pods. 5. The *scorpioides* with cochleated and striated pods. *Tourn.* Inst. p. 402.

SCORPION (*Cycl.*)—The opinions of authors are very different as to the sting of this creature; some asserting that there is an opening in it, through which a poisonous liquor is thrown into the wound made by it, as is the case in the tooth of the viper, &c. and others affirming that there is no such opening.

Galen affirms that there is none, but most of the writers of the middle ages assert that there is. But the whole is set in the clearest light by Segnior Redi, who took the pains of examining microscopically the stings of *scorpions* brought alive from Tunis, Egypt, and Italy. These he nicely examined by the best glasses in the Musæum of the Great Duke of Tuscany, and could find no aperture: but not satisfied with this, he pressed the stings, to try if he could make any liquor flow out of them; they were, however, so hard and horny, that squeezing could have no effect on them; and finally he caused a *scorpion* to strike upon a plate of iron, but no liquid was found thereon; so that he began to conclude Galen's opinion right, when he accidentally discovered an exceedingly small drop of white liquor upon the sting, and this he afterwards found in all the trials he made with several *scorpions*. And Mr. Lewenhoek discovered an opening on each side of the sting of this creature, for the emission of the poison, which he supposes is not discharged, till the sting is buried in the wound. *Baker's* Microscope, p. 213.

Mr. de Maupertuis, having caused *scorpions* to bite several animals, of which very few died, or suffered any more than the pain of the sting, is of opinion, that oil of *scorpions* and other vulgar antidotes to the poison of these animals, have rather got their reputation from the innocence of the sting of these creatures, than from any considerable virtue in the medicines. Mem. de l'Acad. Scienc. 1731.

Water SCORPION, *scorpio palustris*, a name given to a very remarkable species of water insect. It is a very thin and light little creature, yet is but a very slow mover. Its head is very small, and is hard to the touch, and of a paler brown than the rest of the body; and this is terminated by a very fine and sharp hollow proboscis, of the same colour and texture. The eyes are small, but prominent, and are very hard and black. The shoulders are broad and flat; they are of the same colour with the head, and are wrinkled on the surface. The triangular spot between the wings is black and shining, the body is of a bright red lead colour on the back, and of a faint dusky brown on the belly, and is composed of six joints, covered with a sort of scales. The outer wings are very hard and firm, and lie very far over one another; they are opake, and of a dark muddy brown, without any variations: the inner wings are of a dusky white, veined with a red lead colour. The two fore legs are broader and thicker than the rest, and end in short blunt claws; these the creature never walks with, but always uses them as arms: the hinder pair are the longest, and both they and the middle ones end in a sharp claw; they are all of a pale brown, and somewhat transparent. The tail is long and strait, it is composed of two slender bristles, of a pale brown; the creature scarce ever separates these. It lives among the weeds in clear standing waters, and is continually watching for its prey. It feeds on other insects, and is particularly fond of the *cicada aquatica*, or worm of the great libella. It seizes its prey with the fore legs, and holds it fast in them while the proboscis pierces into the body, and sucks the juices. See Tab. of Insects, N° 8.

SCORPION *fly*, in natural history, a name given by Mouffet and other writers to a kind of fly, remarkable for carrying the end of its tail turned up in form of the *scorpion's* sting.

There are two very beautiful species of these. The one has silvery wings, variegated with three transverse streaks of black toward the ends; the head is black, and the breast, shoulders and feet whitish; the rest of the body is black. The tail, which represents a sting, has five joints, three of which are red, and the others black; the end of the tail also is forked, and the forks black, and turned up like the sting of a *scorpion*.

The other resembles this in many respects, but the end of the tail is thicker, and the forks blunter; the head is dunish, the mouth long, and each wing variegated with six black spots, of a large size.

SCORPIUS, in ichthyology, the name of a fish caught in the Mediterranean, of a long and rounded body, not flatted, and with a very large head, from whence it gradually grows smaller to the tail. See Tab. of Fishes, N° 61.

It grows to three or four pounds weight, and is of a reddish colour, variegated with brown and blackish spots. It has several short filaments or beards about its mouth, and the coverings of the gills are armed with several prickles. Its head also has several prickles about it, and the wounds they make are said to be very venomous. The fish is however eaten, and accounted very well tasted. *Gesner*, de Pisc. p. 1017.

SCORTIUM, among the Romans, a measure of capacity of a round form, which used always to be heaped. *Pitisc.* Lex. Antiq. in voc.

SCORZONERA, in botany, the name of a genus of plants, the characters of which are these. The flower is of the semiflosculous kind, being composed of a number of semiflosculès standing on the embryo seeds, and contained in one general oblong cup. The embryos usually ripen into seeds, which are covered with a sort of coat or husk, and are winged with down.

The species of *scorzonera*, enumerated by Mr. Tournefort, are these. 1. The *scorzonera* with broad sinuated leaves. 2. The *scorzonera* with broad sinuated leaves, and bitter roots. 3. The double flowered *scorzonera* with broad sinuated leaves. 4. The Dutch broad leaved *scorzonera*. 5. The *scorzonera* with nervous leaves. 6. The low *scorzonera* with broad nervous leaves. 7. The common narrow leaved *scorzonera*. 8. The lower narrow leaved *scorzonera*. 9. The narrow leaved *scornozera* with little roots. 10. The narrow leaved *scorzonera* with bluish flowers. 11. The thick leaved Montpelier *scorzonera*. 12. The dusty flowered marsh *scorzonera*. 13. The *scorzonera* with jagged leaves. 14. The *scorzonera* with capillaceous leaves. 15. The plantain leaved Portugal *scorzonera*. 16. The grass leaved Portugal *scorzonera* with pale yellow flowers. *Tourn.* Inst. p. 476.

The root of this plant is used in medicine, and is esteemed an alexipharmic and sudorific. It is given in malignant fevers, and is by some recommended in epilepsies, vertigoes, and disorders of the womb; but it is not frequently prescribed in the present practice.

SCOTAL, or SCOTALE, is used where any officer of a forest keeps an alehouse within the forest, by colour of his office causing people to come to his house, and there spend their money, for fear of his displeasure. We find it mentioned in the Charter of the Forest, cap. 8. *Nulus forestarius faciat* scotallas, *vel garbas colligat, vel aliquam collectam faciat, &c. Manwood*, 216.

The word is compounded of *scot* and *ale*, and by transposition of the words, is otherwise called *aleshot*. Terms of Law. *Blount*, *Cowel.*

SCOTER, in zoology, the name of a species of duck, called also in some places the *black diver.*

It is nearly of the size of the common duck, but of a rounder body, and is all over of a deep shining and beautiful black; in some the shoulder feathers are of a yet deeper black than the rest; and in others there is a slight admixture of greyishness in the middle of the breast. The wings are black, without any variegation, and the beak is black, but has a little yellowness near the nostrils: the feet also are black. It is very common on the shores of Lancashire, and some other counties. It lives only about salt waters, and is a very great diver. *Ray's* Ornitholog. p. 80.

SCOTINUS, in botany, the name of a shrub called by the Latins *cotinus*, and *cotinus coriaria*, to distinguish it from the *cotinus*, κότινος, of the Greeks, which was the *oleaster*, or wild olive.

The Italians call the *cotinus coriaria* sometimes *scotinus*, and sometimes *scotanus*; the latter word seems an erroneous way of writing the former, which is only the Roman name of the same tree, with an *s* put before the first letter: and this is very common with the Italians, in their adopting Latin words; what the Romans called *phalangium*, they call *sphalangio*; what they called *conchylium*, these call *scongiglio*; and so of a number of other words.

SCOTODINOS, a term used by medical writers to express a vertigo, or dizziness of the head, attended with a dimness of sight.

SCOTOMA, a word used by some in the same sense as *scotodinos*, to express a vertigo with dimness of sight.

SCOUP *duck*, in zoology, the name of a species of duck, somewhat smaller than the common duck, and of a strange diversity of colours, even in the different birds of the same species, insomuch that it is not easy to find any two perfectly alike in a flock of forty or fifty. The beak is blue, and its most general colours are these: the head, and part of the neck, are of a greenish black; the lower part of the neck has some whiteness, and the breast is black; the belly is white, with an admixture of yellow in its lower part, and near the anus it becomes black; the upper part of the neck is of a sooty black; the middle of the back is white, variegated with dusky brownish lines, and the rump and tail are brown, as are also the wings, but these have some transverse streaks of white. The tail is not above two inches long; the legs are bluish. *Ray's* Ornithology, p. 279.

SCRATCH, in the language of the salt-workers of our country, the name of a calcarious earthy or stony substance, which separates from sea water in boiling it for salt.

This forms a thick crust in a few days on the sides and bottoms of the pans, which they are forced to be at the pains

of taking off once in a week or ten days, otherwife the pans burn away, and are deftroyed. See SALT.

This is no other than the fame fubftance which crufts over the infides of our tea-kettles, and is truly a fpar, fuftained more or lefs in all water, and feparable from it by boiling. The fhells of fea fifh have great affinity in their fubftance and nature with this, both being powerful alkalis, and both eafily calcining into lime.

The *magnefia alba*, fo celebrated in Germany for its mild purgative and alkaline virtues, feems very nearly allied to this earth; and it is probable, according to Hoffman, that the purging virtues of many fprings are owing to the quantities they contain of this fubftance.

SCRATCH *pans*, in the Englifh falt-works, a name given to certain leaden pans, which are ufually made about a foot and half long, a foot broad, and three inches deep, and have a bow, or circular handle of iron, by which they may be drawn out with a hook, when the liquor in the pan is boiling. See SALT.

The ufe of thefe *pans* is to receive a calcarious earth, of the nature of that which incrufts our tea-kettles, which feparates from the water in boiling; this fubftance they call *fcratch*; and thefe *pans* being placed at the corners of the falt pan, where the heat is leaft violent, catch it as it fubfides there.

SCREW (*Cycl.*)—SCREW, in the manege. See SPLENT and THOROUGH-*fplent*.

SCREW-*fhell*, the Englifh name of the *turbo*. See the article TURBO.

SCRIPTULUM, among the Romans, the twenty fourth part of an ounce, and equal to two *oboli*. See the article OBOLUS, *Cycl.*

SCRIPTULUS, a word ufed by fome inftead of *fcrupulus*, a fcruple, or weight of twenty grains.

SCROFANELLO, in zoology, a name by which fome have called a fmall fifh of the Mediterranean, more ufually known by the name of the *fcorpæna*. *Salvian*, de Aquat. p. 94. See SCORPÆNA.

SCROPHULARIA, *figwort*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of a fort of globofe form, open at the mouth, and divided as it were into two lips, the upper of which has two fmall leaves under it. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and afterwards becomes a fruit or capfule, of a roundifh but pointed figure, divided by an intermediate feptum into two cells, and containing fmall feeds affixed to a placenta.

The fpecies of *figwort*, enumerated by Mr. Tournefort, are thefe. 1. The common, or knobby rooted *figwort*. 2. The great hairy *figwort*. 3. The great *figwort* with green ftalks and leaves. 4. The great water-*figwort*, commonly called *water-betony*. 5. The leffer water *figwort*. 6. The yellow flowered *figwort*. 7. The nettle-leaved *figwort*. 8. The baum-leaved *figwort*. 9. The betony-leaved *figwort*. 10. The fhrubby *figwort* with thick leaves, like in fhape to thofe of teucrium. 11. The fmooth elder-leaved Spanifh *figwort*. 12. The great hairy elder-leaved Portugal *figwort*. 13. The roundifh thick and black leaved *figwort* with pale yellow flowers, and very turgid feed veffels. 14. The fern-leaved *fcrophularia*, or broad leaved dog's rue. 15. The fhining ftone *figwort* with laferwort leaves. 16. The narrow leaved *figwort*, commonly called *dog's rue*. 17. The leffer dog's rue *figwort*. 18. The vervain-leaved fhrubby Portugal *figwort*. *Tourn.* Inft. p. 167.

The root of *fcrophularia* is efteemed externally as a remedy for the piles and the king's evil. It is generally made into an ointment for thefe purpofes; but fome give it alfo internally in diet drinks.

This root is of a very fingular figure, by which it is eafily diftinguifhed at fight from all other medicinal roots. It is ufually of the thicknefs of a man's finger, or more, of an oblong figure, nearly as thick at the one end as the other, and full of protuberances on the furface, refembling a kind of little kernels; and between there are a great many fibres, which ftrike deep into the ground. The root itfelf has no great fmell, but its tafte is fomewhat acrid and difagreeable.

SCROTUM (*Cycl.*)—Many authors have given accounts of the diftemperatures of this part, of various kinds, impeding the intent of the propagation of the fpecies, but one of the moft remarkable of thefe, is the exceffive growth of that part, as well in length as in breadth and thicknefs. Securgius, in his *Spermatologia*, gives an account of a perfon, whofe *fcrotum* grew to fuch a fize, that it reached down to his knees, and the penis was fo wholly loft in it, that the paffage for the urine was fcarce vifible, and feveral orifices were made by a fharp humor ouzing out of it in different places. The perfon lived a long time with it in this condition, and ufed to fupport it by a bandage worn acrofs the fhoulders.

The author gives alfo an account of another *fcrotum* of this kind, which being at length taken off, partly by a mortification, and partly by the operation of a furgeon, was replaced again by nature in the fame unufual fize.

SCRUTATORES, among the Romans, certain officers, or fervants, whofe bufinefs it was to fearch every body that came to falute the emperor, in order to difcover if they had any kind of arms concealed about them. They were firft inftituted under the emperor Claudius. *Pitifc.* in voc.

SCULION, in ichthyology, the name given by Ariftotle, and many other of the antient writers, to the fifh called by later authors *catulus*, and *catulus major*, and in England the *bounce*. It is a fpecies of the fqualus, called by Artedi the reddifh variegated *fqualus* with the pinna ani placed in the middle, between the anus and the fin of the tail. See the article SQUALUS.

SCULPONEÆ, among the Romans, a kind of fhoes worn by flaves of both fexes. Thefe fhoes were only blocks of wood made hollow, like the French *fabots*.

SCUMA, a word ufed by fome of the chemifts for *fquamma*, the fcales of any metal, and particularly applied to the flakes flying off from hot iron under the hammer.

SCURFF, in zoology, an Englifh name for a fpecies of falmon, called alfo in fome places the *bull-trout*. It never grows to any great fize, and differs plainly from the falmon of the common kind in this, that its tail is even, and not forked. Its head is fhort and thick, and its flefh is lefs red than that of moft of the falmon kind. *Willughby*, Hift. Pifc. p. 193.

SCURRA, in zoology, a name by which the antients have called the *monedula*, or common jackdaw. *Ray's* Ornithol. p. 85.

SCURVOGEL, in zoology, the name of an American bird, called by fome the *nhender-apoa*, and by the Brafilians *jaburuguacu*.

It is of the crane kind, or nearly approaching to that genus. Its beak is large, feven or eight fingers breadth long, rounded, and fomewhat bent upwards at the end. In the fummit of the head he has a fort of boney crown, of a mixed greyifh and whitifh colour. Its neck is confiderably long, and both that and the head are deftitute of feathers, and are only covered by a fquammofe naked fkin. It is about the fize of the ftork, and has a fhort black tail; all the reft of the feathers are white, except that the long wing feathers are blackifh, with fomewhat of a purplifh glofs. When the fkin is taken off, it is dreffed feveral ways, and is a very delicately tafted bird. *Ray's* Ornitholog. p. 202.

SCURVY (*Cycl.*)—There are fome who derive all difeafes from the *fcurvy*, which indeed muft be allowed to create, or mimic moft other maladies. Boerhaave tells us it produces pleuretic, colic, nephritic, hepatic pains, various fevers, as hot, malignant, and intermitting, dyfenteries, faintings, anxieties, dropfies, confumptions, convulfions, palfies, fluxes of blood; in a word, it may be faid to contain the feeds and origin of almoft all diftempers. A cachexy, or ill habit, is much of the fame nature with the *fcurvy*. It is fuppofed by phyficians, that the immediate caufe of the *fcurvy* lies in the blood, the fibrous part of which is thick, and the ferum too thin and fharp; and that hence arifes the great difficulty in the cure, becaufe in the correcting of one part, regard muft be had to the other. It is well known how extremely difficult it is to cure an inveterate *fcurvy*; how many *fcorbutic* patients have grown worfe by an injudicious courfe of evacuations; how many are even rendered incurable by the treatment of inconfiderate phyficians; and how difficult, tedious, and uncertain the cure is, in the hands even of the beft, who are obliged to ufe fuch variety and change of medicines, in the different ftages of that malady; which neverthelefs may be cured, fays the Bifhop of Cloyne, by the fole, regular, conftant, copious ufe of tar-water. In the cure of the *fcurvy*, the principal aim is to fubdue the acrimony of the blood and juices; but as this acrimony proceeds from different caufes, or even oppofite, as acid and alkaline, what is good in one fort of *fcurvy* proves dangerous, or even mortal, in another. It is well known, that hot anti-fcorbutics, where the juices of the body are alkalefcent, increafe the difeafe; and four fruits and vegetables produce the like effect in the *fcurvy* caufed by acid-acrimony. Hence fatal blunders are committed by unwary practitioners, who, not diftinguifhing the nature of the difeafe, do frequently aggravate, inftead of curing it. The bifhop fays, if he may truft what trials he has been able to make, this water is good in the feveral kinds of *fcurvy*, whether acid, alkaline, or muriatic; and he believes it the only medicine that cures them all, without doing hurt in any. In a high degree of *fcurvy* a mercurial falivation is looked on by many as the only cure; which, by the vehement fhock it gives the whole frame, and the fenfible fecretion it produces, may be thought to be more adequate to fuch an effect: but the diforder, occafioned by that violent procefs, it is to be feared, may never be got over. The immediate danger, the frequent bad effects, the extreme trouble, and nice care attending fuch a courfe, do very defervedly make people afraid of it. And though the fenfible fecretion therein be fo great, yet in a longer tract of time the ufe of tar-water may produce as great a difcharge of *fcorbutic* falts by urine and perfpiration; the effect of which laft,

though not so sensible, may yet be greater than that of salivation; if it be true, that insensible perspiration is considerably more than all the rest of the sensible secretions together. See TAR-*water.*

For the cure of the *scurvy* some have proposed, that the patient should be put into a warm or hot bath, till a sweat is moderately raised, and then immediately taken out and immersed into cold water. *Morgan*, Mech. Pract. of Phys. p. 354. ap. Med. Eff. Edinb.

SCURVY-*grass*, *cochlearia*, in medicine, is a powerful attenuant and resolvent; and on that principle is an excellent medicine in all diseases arising from a viscid state of the fluids, and particularly in the *scurvy*. The best way of taking it, is to eat the whole herb by way of sallad.

The *scurvy*, however, is a disease so various, that the same medicine cannot be good for all the kinds. Accordingly *scurvy-grass* proves hurtful, where the *scurvy* is attended with a redness in the face, palpitations of the heart, frequent feverish heats, head-achs, purgings, and the like; in all which, acrid medicines of any kind do harm. See the article COCHLEARIA.

SCUTARIUS, among the Romans, beside its ordinary signification of a shield-maker, was used to denote one of the emperor's life-guards, because their whole body was covered with armour. *Pitisc.* in voc.

SCUTELLARIA, in botany, a name given to a species of *cassida*. See CASSIDA.

SCUTHINON, in botany, a name given by the antient Greeks to a yellow wood, called also *thapsum*, *chrysoxylon*, and *scythicum lignum*. It was of a beautiful yellow colour, and was used in dying and in colouring the hair yellow, which was the favourite colour of that time.

The same authors have sometimes also called it *cythinon*, or *cuthinon*: this is only the former word with the initial *s* taken away, as it was common with them to do in regard to many words; thus they called the smilax *milax*, the smaragdus *maragdus*, and so of many more.

SCUTTLE-*hatch*, in a ship, the little hatch that covers the *scuttle*. See HATCH.

SCUTUM, in natural history, the name of a genus of the *echini marini*, the characters of which are; that it is a shell of an irregular figure, which on the lower part represents, in some measure, a shield; on the superficies it has the shape of a five-leaved flower; its mouth is in the middle of the base, and the aperture for the anus at the edge. See Tab. of Testaceous Animals, N° 6 and 7.

Of this genus of the eschini there are two kinds, the angular and the oval. The angular kind has its circumference notched into corners; on its back it has the cinquefoil leaf with very turgid marks, the lines being all crenated also at the edges, so that it in some measure represents the flowers of the gourd kinds when open. The aperture of the anus is at the broader side of the circumference.

The oval kind is a shell of a tolerably regular oval figure, with the cinquefoil mark upon its back, made up of leaves like those of the olive, but split as it were at the extremities. The mouth in this species is in the middle, the anus in the edge, and the base is a little hollowed.

Of the first of these kinds, the angular *scuta*, there are only two known species: the first a lower flattish kind, and the second a more elevated one.

Of the second, or the oval *scuta*, there are three known species. 1. A kind made up of extremely small granulose circles. 2. A hollow based one shielded like the tortoise, and with a pentagonal aperture for the mouth. And 3. an echinated one with a very high top, and a slight sulcus, or furrow, on that part where the anus is. *Klein*'s Echnod. p. 28.

SCUTUM, in pharmacy, a name given to a solid stomachic topic, whether made in form of a bag, with medicinal ingredients sowed in it, or of a plaister. It is always fashioned into the shape of a shield. The plaisters, for this purpose, were used to be made of the warm stomachic gums, and the bags were filled with the warm aromatic powders; and they were worn to warm and strengthen the stomach, correct a cold intemperature, and promote digestions, and prevent vomiting. The patella, or knee pan, is also sometimes called by anatomists *scutum*.

SCYBALA, a term used by the antient physicians to express the excrements of the intestines, hardened into lumps while in the body.

SCYBELITES, a term used by the antients to express a sort of must, or juice of the grapes, which distilled from them spontaneously without pressing.

SCYLACION, a word by which the antients expressed the flesh of puppies, which they recommended as of great service in many chronic cases.

SCYLDWIT, in our old writers, a mulct or fine for any fault. Leg. Hen. I.

It comes from the Saxon *scilde*, i. e. *delictum*, and *wite*, i. e. *pœna*. *Blount.*

SCYMNUS, in ichthyology, a name used by Ælian, Appian, and many other of the old Greek writers, for the fish called *sculion* by Aristotle. This is a species of the squalus, called by Artedi and others the *squalus* with the pinna ani placed in the midst, between the anus and tail; the *catulus vulgaris*, and *catulus major* of authors. See the article SQUALUS.

SCYPHUS, among the Romans, a very large kind of drinking cup. The *scyphus* was called the cup of Hercules, as that of Bacchus, *liberi patris*, was named *cantharus*. *Pitisc.* in voc. See the article CANTHARUS.

SCYRA, in our old writers, a fine imposed upon such as neglected to attend the *scyregemot* court, which all tenants were bound to do. *Blount*, *Cowel.*

SCYRIUM *marmor*, a name given by the antients sometimes to a white, and sometimes to a yellowish marble, both used in the public buildings of the Romans, but seldom in statuary, not being capable of a high polish.

SCYTALE, in zoology, the name given by the antients to a species of serpent, which was very long and thin, and equally big all along the body, so that the tail was not easily distinguished from the head.

SCYTHÆ, Σκυθαι, among the Athenians, a designation sometimes given to the officers, more usually called *lexiarchi*.

They had the name *scythæ*, because they were often natives of Scythia who were chosen *lexiarchi*, as being brawny and sturdy fellows. See LEXIARCHI.

SCYTHARION, in botany, a name given by the antient Greek writers to a tree, whose wood was of a fine yellow colour, and was used in those early times to dye things yellow; it was called also *Scythicum lignum*, from its country, and *chrysoxylon*, or golden wood, from its fine yellow colour. It has been supposed that this was the same with the *cotinus coriaria* of the Romans; but this is an erroneous conjecture, since the wood of this tree dyed a yellow colour, and that a brownish red, or a clear and pure red, according as the infusion was made more or less strong. This *scytharion*, therefore, could not be the same with the *cotinus*, but it certainly is the same with the *thapsum* of the Greeks. See CHRYSOXYLON.

SCYTHIAN, a word used very often in the old Greek writers on the materia medica, to distinguish the peculiar sort of gum, or other drug, brought from that place. The *Scythian* and Indian drugs have been by many supposed different kinds of the same medicine; but this is an error, for it appears very obvious, on comparing the writings of Galen, Aëtius, Ægineta, and other of the later writers among the Greeks, with those of Dioscorides, Theophrastus, and the other old ones, that the words *Scythian* and Indian mean the same thing, and that what the old writers have called Indian, these have called *Scythian*.

The meaning of this is, that those things were called *Scythian*, which were brought from the country of Indoscythia, or that part of *Scythia* which lay at the ostia of the river Indus: but it is to be observed, that though the later Greek writers mean this by their term *Scythian*, yet the word is used in a very different sense by the Arabians, Avisenna, Serapio, and others; and that wherever they mention a drug under the name of *Scythian*, they mean that it comes from the northern parts of *Scythia*, on the confines of Europe. These authors having understood of this *Scythia*, what the Greek writers have said of the other, have made no small errors in regard to the history of drugs, having given bdellium, and many other gums, the produce of only the *Scythia* of the Greek medical writers, to the frozen *Scythia* before-mentioned.

SCYTHICUM *lignum*, in botany, a name given by the antients to a tree, called also *scytharium* by the later writers of the Greeks. This is by some supposed to be the same with the *cotinus* of the antients used in dying.

The Greeks called the *oleaster*, *cotinus* indeed, but that is not meant as the shrub supposed to be the same with the *Scythicum lignum*, but the *cotinus Romanorum*, or, as those people expressed it, *cotinus coriaria*.

This however seems to be an error; for the *cotinus coriaria* was used to dye yellow, whereas the *Scythicum lignum* was used for a fine pale yellow, or citron colour, and was thence called *chrysoxylon*, the golden wood, or wood dying a gold colour.

Pliny says that the *cotinus coriaria* dyed things to the colour of the fine conchs, that is, to a fine bright flesh colour; and Anguillara tells us, that the *scotano* of the Italians, which is the same with the *cotinus coriaria* of the Romans, dyes woollen things to a very agreeable red colour. The words of Pliny are, that it dyes things *conchylii colore*. These have been understood as expressing the colour of the purple fish, or murex, which is a kind of shell fish, and whose colour is a true purple; in this sense the colour would not be the same with that yielded by the modern *scotano*: but this is not the sense of Pliny, for he often mentions the *conchylius color* as a kind of red, and in many places carefully distinguishes it from the purple colour yielded by the murex; and it seems, according to him, to be the fine pale red, which we see so beautiful in the mouths of the great conchylia, which our collectors of shells call *conchs*. See the articles SCOTANO, and CONCHYLIUS.

SEA (*Cycl.*)—The *sea* differs in saltness in different parts; it is, in general, observed, that in hottest climates the water is saltest. When

When salt water freezes, it hath been thought to let fall all its salt; the ice of *sea* water, and the water melted from it, tasting fresh, and being good for boiling meat and pease in. Captain Middleton, being in Hudson's streights in July 1738, took ice from under the surface of the *sea*, which he melted till he got forty quarts of water; these he evaporated to dryness, and out of that quantity had only six ounces of salt, or about $\frac{1}{213}$. Philos. Trans. N° 461. sect. 13.

The ascent of the *sea* water, for the formation of springs by a subterranean circulation of its water to their sources, has been a great objection with many against the system of their being formed of the *sea*; but Dr. Plot has observed, that there are many ways by which the water may ascend above its own level. 1. By the means of subterranean heats. 2. By filtration. 3. By the unequal height of several *seas*. 4. By the distance of the center of magnitude from the center of gravity in the terraqueous globe. The superficies of the Pacific *sea* is said to be farther from the center of gravity, than the top of the highest hill on the adverse part of the globe. And 5. by the help of storms.

The *sea* water actually ascends above its own level in coming into wells, whose bottoms lie higher than the surface of the sea at highwater mark. *Plot*, de Origine Font.

General motion of the SEA. Mr. Dassie of Paris, in a work published about sixty years ago, has been at great pains to prove that the *sea* has a general motion, independent of winds and tides, and of more consequence in navigation than is usually supposed. He affirms that this motion is from east to west, inclining toward the north, when the sun has passed the equinoctial northward, and that during the time the sun is in the northern signs; but the contrary way, after the sun has passed the said equinoctial southward; adding, that when this general motion is changed, the diurnal flux is changed also: whence it happens, that in several places the tides come in during one part of the year, and go out during the other; as on the coasts of Norway, in the Indies, at Goa, Cochinchina, &c. where, while the sun is in the summer signs, the *sea* runs to the shore, when in the winter signs, from it. On the most southern coasts of Tonquin and China, for the six summer months, the diurnal course runs from the north with the ocean; but the sun having repassed the line toward the south, the course declines also southward. Philos. Trans. N° 135.

Bason of the SEA, *fundus maris*, a term used by geographers, and other writers, to express the bottom of the *sea* in general.

Our honourable Mr. Boyle is the first who has written any thing on this part of the globe, and he has given us a treatise expressly upon it; but this only gives an account of its irregularities, and unequal depths, and is founded on the observations communicated to him by mariners, and people of too little curiosity to be depended upon for great discoveries.

The ingenious Count Marsigli has, since his time, given us a much fuller account of this part of the globe, in a great part from his own experiments in many places, particularly along the coasts of Provence and Languedoc.

The entire bason of the *sea* is of such immense extent, and covered in many places with such an unfathomable depth of water, that it is not to be expected that it can be traced in every part; but as the whole may be guessed at, from some part of it, and as its general figure is of no consequence in a search of this kind, the observations of this curious author are of great value, in forming a judgment of the whole. *Marsigli*, Hist. de la Mer. p. 4.

The materials, which compose the bottom of the *sea*, may very rationally be supposed, in some degree, to influence the taste of its waters; and Marsigli has made many experiments to prove, that fossile coal, and other bituminous substances, which are found in plenty at the bottom of the *sea*, may communicate in great part its bitterness to it. We are not, however, to judge hastily, that there are not so many beds of these at the bottom of the *sea*, as would be necessary for such a purpose, or to judge too hastily against the existence of any other substances there, because we do not find proofs of them by the plummet, which in founding brings up other substances, and not these; for the true bottom of the *sea* is very often covered and obscured from us by another accidental bottom, formed of various substances mingled together, and often covering it to a considerable depth.

The entire gulf of Lyons, situated between Cape Quiez in Rousillon, and Cape Croisit in Provence, forms a bank above the surface of the water at the shore, of the exact and perfect figure of an arch; and within this there is formed another such arch, making the bottom of the *sea* in that place for a very great way from shore, which is of different depths in various places, but usually between sixty and seventy fathom. See SHORES.

It is a general rule among sailors, and is found to hold true in a great many instances, that the more the shores of any place are steep and high, forming perpendicular cliffs, the more deep the *sea* is below; and that on the contrary, level shores denote shallow *seas*. Thus the deepest part of the Mediterranean is generally allowed to be under the height of Malta. The observation of the strata of earth, and other fossils, on and near the shores, may serve to form a very good judgment, as to the materials which are found in its bottom. The veins of salt and of bitumen doubtless run on the same, and in the same order in which we see them at land; and the strata of rocks, that serve to support the earth of hills and elevated places on shore, serve also, in the same continued chain, to support the immense quantity of water in the bason of the *sea*. It is probable also that the veins of metals, and of other mineral substances, which are found in the neighbouring earth, are in the same manner continued into the depths of the *sea*. The particles of metals, in this case, are probably carried off into deep water, and sunk among the softer matter of the bottom, but some of the lighter minerals seem to have given colour to those beautiful crusts, which are found upon many *sea* plants, and which lose their lustre in the drying. The subterranean rivers, and currents of water, make great changes in what would be the natural surface of the bottom of the *sea*, where they arise, each having a peculiar bason of its own. We are informed by numerous instances of subterranean currents, and as we see them break out in rivers on the surface of the earth in some parts, so in others we may be well assured that they break up the bottom of the *sea*, and empty their fresh waters into the salt mass.

In this case, the rushing up continually of such a body of water makes a roundish cavity, and its running some one way lengthens and carries on that cavity, till by degrees it is lost, as the fresh water by degrees becomes blended with the salt. Thus every river, that arises in the bottom of the *sea*, alters the form of its surface, and makes a bason for itself, in which it runs a considerable way. Many *seas* near the shore, and when the water is tolerably clear, shew the traces of these currents to the naked eye from the surface, and the water taken up from them is found more or less fresh. *Marsigli*, Hist. de la Mer. p. 13.

The coral fisheries have given us occasion to observe, that there are many, and those very large, caverns or hollows in the bottom of the *sea*, especially when it is rocky; and that the like caverns are sometimes found in the perpendicular rocks, which form the steep sides of those fisheries. These caverns are often of great depths, as well as extent, and have sometimes wide mouths, equal to their largest diameter in any part, but sometimes they have only narrow entrances into large and spacious hollows. It is the common opinion of the people about the place, that these caverns are prepared by nature for the circulating of the *sea* water; but that operation, however necessary, may be performed as well without, as with these caverns, and they seem in reality to be only accidental.

We daily meet with immense hollows and caverns, naturally made in rocky mountains; and as this part of the bottom of the *sea* is almost all rock, and its sides of the same nature, it is no wonder that the same accidents should happen, and like hollows be found, though with no particular intent of providence in their use. Nay there is this farther reason to expect them in the rocks buried under the *sea* than in those in hills, that the latter are in a state of rest and quiet, whereas the former are in continual reach of water, which will insinuate itself into every crack or crevice nature has left in them, and may be easily supposed to have burrowed its way in a small hole made by nature, till it has formed of it a very large one.

It seems plain from the whole, that the bason of the *sea* was at the creation, or at its second formation after the universal deluge, covered with, or composed of the same substances, as the surface of the rest of the earth is, that is of rocks, clay and sand, and other such substances. The common observations of seamen seem indeed to make against this opinion, but they may be easily solved, so as not to overthrow it. The plummet which they let down in founding, usually brings up with it a matter composed of mud, tartarous incrustations, or of dead weeds and broken shells, or numbers of various bodies of this kind, cemented together into a firm mass by some sparry or tartarous matter, deposited from among the water, and agglutinating them together: these form an artificial bottom, covering the natural one; but it is easy to see, that such a crust or coat as this must needs have been formed over the true bottom, in places where numbers of animals and vegetables are produced, and decay again, and where the waters being at rest have time to deposit their stony matter, in the same manner as the waters of several of our petrifying, or rather incrustating springs do. And that these decayed substances, and this stony matter, falling to the bottom together, and there lying undisturbed, must necessarily have formed just such a crust as is found; and the natural bottom of the *sea*, whether of stone, of sand, or of clay, must be covered by such accidental concretions, and that probably to such a depth, that it is not easy now to break through it.

There are places however where, by some accidents, this sort of adventitious crust either has never been formed, or else has been removed. In these places we find the natural

tural bottom, as described, that is of the same nature with the strata in the body of the earth. The simile the Count Marsigli has made, between the bason of the *sea* and a cask of wine, is very expressive and just. When wine has been a long time kept in a cask, the whole internal surface of that cask is so covered and encrustated over with tartar, that it seems within to be really composed of it; yet as we know that this cask is of wood, we are very certain that the true inner surface of it is of the same texture and nature with the tree from which it was cut, though we cannot get off the accidental surface formed by the liquor kept in it, and wholly covering it.

We very frequently meet with fine and pure sand at the bottom of the *sea*, and in these places are apt to believe that we certainly have the true and original bottom, but this is rather to be looked on as a probability than a certainty; and where the sand is more than ordinarily fine, there is always reason to suspect that the course of some subterranean river has brought it there, by opening into the *sea* in this part; and that this is one of those particular basons, which these rivers form to themselves within the bason of the *sea*, and which continue only to a small distance from their source. *Marsigli*, Hist. de la Mer. p. 15.

The bottom of the *sea* is covered with a variety of matters, such as could not be imagined by any but those who have examined into it, especially in deep water, where the surface only is disturbed by tides and storms, the lower part, and consequently its bed at the bottom, remaining for ages perhaps undisturbed. The soundings, when the plummet first touches ground on approaching the shores, gives some idea of this. The bottom of the plummet is hollowed, and in that hollow there is placed a lump of tallow; this being the bottom of the lead, is what first touches ground, and the soft nature of this fat receives into it some part of those substances, which it meets with at the bottom: this matter, thus brought up, is sometimes pure sand, sometimes a sort of sand made of the fragments of shells, beat to a sort of powder, sometimes it is made of a like powder of the several sorts of corals, and sometimes it is composed of fragments of rocks; but beside these appearances, which are natural enough, and are what might very well be expected, it brings up substances which are of the most beautiful colours. Things of as fine a scarlet, vermillion, purple, *&c.* as the finest paint could make them, and as yellow as a solution of gamboge, are common; and sometimes, though not so frequently, the matter brought up is blue, green, or of a pure snowy whiteness. These coloured matters sometimes seem to have made up the whole bottom or mass of the surface, but more usually they have been formed upon other things, as upon the mud, or upon larger pieces of shells, corals, and the like, in the manner of tartarous crusts, and those in some degree resembling the crustaceous coats of some of the *sea* plants. The colours of these substances are not merely superficial and transient, but many of them are so real and permanent, that they may be received into white wax melted, and poured upon them, or kept in fusion about them; and when thus examined, they seem as if a proper care might make them of great value, as paints of the finer kinds, where little is to be used.

The same coloured matters that thus coat the substances, found at the bottom of the *sea* in these places, are also sometimes found extended over the surface of *sea* plants of the harder kind, which grow in deep water. They are always, in this case, in a sort of liquid form, being lodged within, or embodied among a sort of jelly or glue of a transparent substance, which in these cases perfectly coats over the whole plant. In this state it gives the naturalist, who is present at the fishing up his treasures, a transient prospect of a very elegant kind; but this vanishes while he admires it. A piece of coral, or other hard *sea* plant, thus coated over, appears, as it rises to the surface of the water, of a delicate green, blue, or purple, but when taken above water, it is found that this fine colour is only in the coat of glue or jelly which covers the plant: as soon as this is wiped off, the colour is carried away with it, and the coral shews its own native tinge; and it is to no purpose to attempt the preserving it, by suffering this glue to dry upon the plant, for the colour flies away by degrees, as the moisture evaporates, and the coral or plant, whatever it be, is only so much the less beautiful, than it naturally would have been, as it is covered with a dry yellowish dirty looking horny matter. These are beauties in the submarine plants, therefore, which can be only seen by those who venture out, in order to take them up.

The small quantities of these elegant colours, which we thus find spread over the surfaces of plants and other bodies, as we approach deep water, may give a rational idea of what we should find, were we able to examine the bottoms of the *sea* in its deep and unfathomable recesses. It is easy to conceive, that in these places we should find great quantities of the most beautiful substances. *Marsigli*, Hist. Phys. de la Mer.

Dead SEA. Dr. Perry made several experiments on the water of the *Dead sea*, in order to find what particles it contained. Upon infusing some scrapings of galls in it, it becomes of a bright purple colour, but that not till it has stood a considerable time. On adding oil of tartar *per deliquium* to it, it becomes turbid, and looks as if globules of fat were fluctuating in it; this unctuous matter, upon its long standing in repose, comes together in form of a sediment at the bottom. On pouring spirit of vitriol into it, it deposits a milk-white greasy sediment, which, after standing twelve hours, occupies about one fifth part of the liquor. On putting a small quantity of saccharum saturni to it, it deposits a small quantity of a greyish powder. Being severally and separately mixed with a solution of sublimate, with spirit of sal armoniac, and with sugar of violets, it neither ferments, nor deposits any sediment, nor changes colour, except with the sugar of violets, with which it becomes green. It is highly saturated with salt, so that it is to common water in specific gravity, as five to four; and it has so acrid and styptic a taste, that on being held in the mouth, it constringes it in the manner of alum.

From all these experiments it appears, that this water is impregnated with a sort of an acrid and alkaline nature, and a matter partly of a sulphureous, partly of a bituminous nature. Philos. Trans. N° 462. p. 50.

SEA *adder*, an English name for a sea fish of the acus kind, called by Willughby the *acus lumbriciformis*.

It is a small fish of a cylindric shape, without scales, and of a greenish brown colour, with some admixture of a reddish yellow. The snout is long and hollow, and the mouth opens upwards at its end. The eyes are small, and their iris red. The gills are four on each side, but are covered by a membrane, and the whole body divided into rings like the common earth-worm. It is usually about three or four inches long, and of the thickness of a goose quill. It has but one fin, which is situated on the back. The anus is much nearer the head than the tail; and under the snout there is always a fleshy tubercle. The fish is common on the coast of Cornwall. *Willughby*, Hist. Pisc. p. 160.

SEA *breaches*, a term used by the farmers to express the overflowing of their low lands near the *sea* by the *sea* water.

Sea salt, moderately used, is a great improvement to all lands, but too much of it kills all sorts of vegetables, except such as nature has intended to live among it. The *sea* breaking in upon lands thus, injures them greatly. The owner is to stop the breach by which it entered with all possible diligence, and then trenches and drains must be cut through all parts of the land, to carry the salt water into some one low place, from which it may be emptied by means of an engine; or if it be small in quantity, it may be laded out by hand over the bank; or if yet less, the sun and winds may dry it away: but in either case, the place where it was suffered to rest must be covered with a large quantity of fresh earth, to take off from the too great saltness of the other; and the whole land should be plowed for three or four years, to let in the rains and air to freshen it. *Mortimer*'s Husbandry.

SEA *bream*, in ichthyology, the English name for the fish called by the generality of authors the *pagrus* and *phagrus*. According to the new system of Artedi, it is a species of the *spari*, and is distinguished by the name of the *red sparus* with the skin carried into a sinus at the roots of the back fins, and the pinna ani. See PAGRUS and SPARUS.

SEA *calf*, *vitulus marinus*, in zoology. See PHOCA.

SEA *cow*, the English name of the *manati*, a species of fish so different from all the other of the cetaceous tribe, to which it properly belongs, that Artedi, in his new system of ichthyology, allots it a peculiar generical name, which is *trichechus*.

It is called by Herrera *taurus marinus*, or the *sea bull*, and by others the *tachas* and *la donna*. The French call it *lamantin*, or *namantin*, and the Portuguese *pezze mouller*.

It may seem strange, that so ill shaped a creature as this should have given rise to the stories of the syrens and mermaids, the *sea* men and *sea* women, yet there is great reason to believe, that all the fabulous accounts of these monsters are owing to the seeing this animal raise its head and shoulders above the water. See SEA *man*.

SEA *crow*, in zoology, a name given by the common people of many counties of England to the *pewit*. See the article PEWIT.

SEA *devil*, in ichthyology, an English name for the *rana piscatrix*, or *lophius*. See RANA *piscatrix*.

SEA *fox*, an English name for a fish of the squalus kind, called also the *sea ape*; both names being given on occasion of the length of its tail in proportion to the body.

It is a very singular fish, and, according to the new Artedian system, is a species of *squalus*, distinguished by that author by the name of the *squalus cauda longiore quam ipsum corpus*.

The old Greek writers have called it *alopæcia*, and the later *vulpes marina*, and *simia marina*, whence the names *sea fox*, and *sea ape*. See the articles VULPES and SQUALUS.

SEA-*gate*, at sea. When two ships are aboard one another, by means of a wave or billow, the seamen say they *lie aboard one another in a sea-gate*.

SEA *green*. To make this colour in the glafs trade, the fineft cryftalline glafs only muft be ufed, and no manganefe muft be added at firft to the metal. The cryftal fritt muft be melted thus alone, and the falt, which fwims like oil on its top, muft be taken off with an iron ladle very carefully. Then to a pot of twenty pound of this metal, add fix ounces of calcined brafs, and a fourth part of the quantity of powdered zaffer: this powder muft be well mixed, and put into the glafs at three times, it will make the metal fwell at firft, and all muft be thoroughly mixed in the pot. After it has ftood in fufion three hours, take out a little for a proof; if it be too pale, add more of the powder. Twenty four hours after the mixing the powder the whole will be ready to work, but muft be well ftirred together from the bottom, left the colour fhould be deepeft there, and the metal at the top lefs coloured, or even quite colourlefs. Some ufe for this purpofe half cryftal fritt, and half rochetta fritt, but the colour is much the fineft when all cryftal fritt is ufed. *Neri's* Art of Glafs, p. 39.

SEA *gudgeon*, an Englifh name given to the fifh called by the generality of writers *gobius niger*, and the *gobius marinus*.
Artedi, who has made a genus of the *gobii*, excludes the common *gudgeon*, or *gobio fluviatilis*, from it, but he admits this fifh as a genuine fpecies of it.
Athenæus tells us of three kinds of *gudgeons*, the black, the yellow, and the white. This feems to have been very plainly the black *gudgeon* of that author. Salvian, in his figure of this fifh, has given three fins on the back, but it really has only two.

SEA *hen*, in zoology, a name given by fome to the *lomwia*, a webfooted bird, common on our coafts, and called the *guillemot*, or *kiddow*. See LOMWIA.

SEA *horfe*, the Englifh name of the *hippocampus*, a fpecies of the *acus*, according to the older writers, and one of the *fyngnathi* of Artedi. See thefe heads.
The many idle tales reported of this vaft amphibious creature, fuch as his method of bleeding himfelf when diftempered, his vomiting fire when enraged, and the like, have made people, in almoft all ages, defirous of feeing the animal. The Romans were fond of exhibiting it in their fhews of wild beafts, and the defcription Pliny gave of it from thence, was all the world knew of the creature for many ages. That author's account, however, of its feeding on grafs on the banks of the Nile, no way agrees with the teeth we find its mouth furnifhed with.
The fceletons of thefe animals, as rare as they are with us at prefent in their recent ftate, yet are found not unfrequently, in part at leaft, buried under ground, and that at great depths. The bones of the head are different from thofe of any other known animal, and when found in fome parts of France, had always puzzled the wits of the naturalifts there, who had in vain compared them with thofe of oxen, horfes, &c. but at length one of the heads of thefe animals being fent over to France, cleared up the whole difficulty. The two jaws of this weighed forty five pounds, and were two feet long, a foot deep, and a foot and half wide. It is eafy to conceive from this, that the accounts we have of the fize of the animal are not fabulous, thefe bones correfponding very well with them. Mem. Acad. Par. 1724.

SEA *loufe*, *pediculus marinus*, a name given to the Molucca crab. See SQUILLA.

SEA *man*. We have many accounts, even from authors of credit, of fomething refembling the human figure feen at *fea*, and fancy has carried them to fuch a height, that the truth of the defcription is loft in moft of them.
The fyrens, which we have accounts of even in Bartholin, and the *fea man*, or *homo marinus*, as it was called, feen and defcribed by Barchewitz, give the greateft credit to the ftory; but writers are fo fond of telling marvellous things, that great allowances are to be made in the reading.
The general defcription of the *fea man* is, that from the navel downwards the whole is only a fhapelefs lump of flefh, without any the leaft mark, either of limbs, fins, or tail. On the breaft there ftand two pectoral fins, which are each compofed of five bones or rays, refembling the human hand, and connected together by a membrane like the toes of a duck, or fome other water fowl's foot.
Thefe fins are what have the appearance of fomething human, and when feen about the bofom of a white bellied fifh, may be taken for hands with fhort arms, and the refemblance of a head is eafily fancied. Thefe fins are not peculiar to any one kind of fifh, but the manati, or *fea* cow, the rana pifcatrix, or lophius, and many others have them. It is probable from moft of the accounts we have, that the manati, or *fea* cow, is the creature, which being feen raifing its head above water at a diftance, and extending thefe pectoral fins, which are what it fwims with, has given rife to the idea of the upper part of a human figure.
As to the defcription of a fhapelefs lump of flefh making up the lower part of the animal, it feems too contrary to the courfe of nature in all other *fea* animals, to have any foundation in reality, and probably was only the invention of the defcriber, to make out what he did not fee above water.
It is true that Barchewitz takes great pains to prove that the *fea man*, or *homo marinus*, he defcribes, was a wholly different creature from the *fea* cow; but his defcription of it carries too little the air of any thing in nature, to meet with an eafy credit.
It is wonderful, that fo judicious a writer as Artedi fhould give any faith to the exiftence of fo ftrange a fifh as this, but he mentions it with a great air of diftruft, and wifhes a more perfect hiftory of it, if it any where exifts.
The public are often impofed upon by cheats, who fhew different things under the name of *fea men*, mermaids, and fyrens; but if we may judge of the generality of thefe creatures, thus fhewn by the lateft inftance among us, they are very wretched counterfeits indeed. This creature was faid to be a young mermaid, taken on the Acapulca fhore, and maintained its credit fo well in London, as to afford the proprietor a comfortable fubfiftence for ten months among us, though no other than a human fœtus of about eight months, with a hydrocephalus head, and with the two legs growing together, and covered by one common membrane. The toes of this fœtus were beat out into a refemblance of fins.

SEA *owl*, in ichthyology, a name given by many to that fifh, which we more ufually call the *lump fifh*, the *lumpus* of Willughby, &c. and the *cyclopterus* of Artedi, which fee.

SEA *pheafant*, in zoology, the name of a bird of the duck kind, but differing from all the other fpecies in the fhape of its tail; which has two long feathers, ftanding out beyond the reft, and terminating in a point. It is called more generally the *cracker*. See the article CRACKER.

SEA *plants*. Count Marfigli, who was at indefatigable pains to collect the various *fea plants* of feveral places, divides all thofe productions into three claffes.
The firft clafs contains the foft, or herbaceous ones; the fecond the ligneous ones, or fuch as are of a woody hardnefs; and the third, thofe which are of the hardnefs of ftone. Of the firft clafs are the algas, called *fea wracks*, the fucufes, or *fea oaks*, the *fea moffes*, or confervas, and the different fpecies of fpunges.
Of the fecond kind are thofe called *lythophyta* by the antients, as if their hardnefs approached to that of ftones. All thefe confift of two fubftances, a cortical and an internal: the cortical part, while in the *fea*, is foft, but in drying it becomes as hard as chalk, or thereabouts, eafily crumbling to pieces between the fingers; this is what deceived the antients into an opinion of its being of a ftony nature. The internal fubftance, properly fpeaking, feems more the nature of horn than of wood: if it is burnt, it throws out a fpume, or froth, like that which horns or feathers of animals yield in the fire, and their fmell in burning is of the fame kind. The branches of thefe *plants* are very pliable, bending in the manner of whalebone, and they give the fame refiftance to a knife in the cutting.
The ftony *plants*, which fhould properly be called the *lythophyta*, but which never are called fo, are the feveral fpecies of coral, madrepora, and the like. The madrepora differs from the coral, in having its furface pierced with almoft innumerable holes.
The algas are the only *fea plants* which have any roots, properly fo called; thefe therefore grow out of the foft bottom of the *fea*, as other plants out of the earth, but all the other *fea plants*, without exception, appear fixed upon hard and folid bodies, incapable of affording them any nourifhment; fuch as ftones, fhells, pieces of iron, of wood, &c. and fometimes on other *plants*; and they are not faftened to thefe fubftances by fibres paffing into, or furrounding them, but merely by a foot or pediment, capable of only fixing them down, not of drawing nourifhment from the fubftances, were there any there. From this obfervation the author concludes, that all the *plants* which have no roots may be properly faid to be all root, or to perform the office of roots in their whole fubftance, or that they take in nourifhment in every part by certain pores, which in many are vifible, and cover the whole furface.
This manner of receiving nourifhment, he alfo obferves, very well fuits their condition, fince they are always furrounded, on all fides, with that water by which they are to be nourifhed; whereas the plants, which grow at land, have only a part of them buried in the earth, from whence they are to be fupplied with the proper juices. The roots of land plants, therefore, have only the neceffary organs for receiving fupplies; whereas the *fea plants* he finds to be all over covered with fmall glandules, whofe office it is to receive and to convey, into the internal parts of the *plant*, the proper juices for its nourifhment, and thefe he obferves are, in general, of a glutinous and milky nature. The great difference between the land and *fea plants* is feen in this familiar inftance; a land plant will remain frefh for a long time, in all its parts, on one end of the ftalk only being plunged in water, but a *fea plant*, if part of it be out of water and part in, will always be frefh and vigorous in that part which is under water, while the part that is dry will wither and decay. It is eafy hence to fee, that the feveral parts of the land plants have connections with, and dependances on one another; whereas, in the *fea plant*, every part takes in its own

own nourishment, and lives and flourishes wholly independent of the rest.

After having gone through this general system, the author descends to several remarkable particulars. He mentions an instance of a fucus, whose stalk, when in its growing state, is a quarter of an inch in diameter, yet in drying shrinks up so much, as to be not thicker than a single thread. Another species, called by the fishermen the *sea orange*, from its resemblance to an orange in shape, he observes is properly a fucus; it has neither stalk nor branches, but consists wholly of this globular body; it is not a solid substance, but a membrane of about , of an inch in thickness, regularly distended into this shape, by being filled with *sea* water. All over the sides of this cavity there are fixed slender filaments, which traverse the whole, and probably receive nourishment from the water contained in the cavity, and distribute it to the several parts of the sides where they are inserted.

Another *sea plant* this author mentions, only appears in the shape of a bark; it affixes itself to the branches of the lythophyta, when they have lost their natural bark, and sometimes, in the same manner, coats and crusts over the surfaces of stones. When it is fresh, it is of a lively red, of the consistence of a mushroom, and about the thickness of the back of a common knife, and its external surface is full of small prominences, which contain a glutinous juice; round about these also there stand several yellow tubercles, which, with the red of the ground of the *plant*, make upon the whole a very beautiful appearance. Its under surface is perfectly smooth and glossy. This seems a much more remarkable *plant*, as to the manner of its vegetation, than those which grow on other plants at land.

The same author observes, that several of the spunges, when taken out of the *sea*, have a motion of the nature of a systole and diastole, which lasts as long as there remains any of the *sea* water in their cavities. Some of the *sea plants*, which while growing are as soft as the fucuses, yet when dried are as easily rubbed to powder between the fingers, as the bark of the lithophytons. There is one of the lithophytons, which carries so large a quantity of branches, that they make the resemblance of leaves; but as these leaf-like branches are all truly of the same nature with the rest of the *plant*, this is no exception to the general rule, that the lithophyta have no leaves. One of the species of lithophyton is naturally destitute of a bark, and is covered in the place of one with a glutinous substance, of the nature of varnish; this is most abundant at the foot. The whole *plant* is full of prickles, and these appear the most plainly on the summits of the branches, where this glutinous varnish is more thinly spread. On this part of the *plant*, also, there appear certain globules of a glutinous matter, when it is taken out of the water, which, when it is again plunged into it, spread themselves over the whole surface of the branches.

The madreporæ grow in the same places with the coral; they often hang pendulous from the hollow rocks, and often grow erect on the flat ones. They usually change colour when taken out of the water, and are of very different kinds and different degrees of hardness; many of them are as hard as common stones, and many others are so brittle, that it is scarce possible to touch them without breaking their branches.

The flowers of the thorny and naked lithophyton appear to be wholly like those of coral, and like them they are not found to contain any solid seed. Mem. de l'Acad. Par. 1710.

The many uses of the numerous *sea plants* to the system of the world are not yet sufficiently known. Among others, Dr. Lister has observed that they serve to render a great deal of the *sea* water fresh, and give it in mists to the clouds, whence it again falls on the earth. This is easily proved by experiment thus: if a quantity of *sea* water be put into a long glass body, and into it there be put a large and vigorous *sea plant*, such as the common *sea* wrack, and the head placed on the glass, and a receiver fitted for it without cutting the joints, there will daily distil into the receiver, without giving any fire below, a clear and sweet water, fresh and potable, and without any disagreeable or unwholesome quality. The quantity is but small that is obtained this way, but it is evident, that in the same manner a very immense quantity of the *sea* water is every hour made fresh, and raised up into the air from the infinite number of *plants* that grow in it. Dr. Lister even thinks that the tropic winds, which blow constantly one way, may be owing to this sort of cause. Philos. Trans. Nº 156. See the article TROPIC *winds*.

SEA *salt*. The chemists have, for many ages, been acquainted with many of the qualities, and much of the nature of this common substance, but not with the whole; they know what they can separate from it, and what they can afterwards procure, by admixtures with the residuum of the distillation, which is its basis; but they do not seem to have thought, of a long time, of enquiring into what that base was. They have always known how to separate an acid liquor from this *salt*, called the spirit of it, by breaking its union with the basis of the *salt*; and they know, that if a vitriolic acid be added to this basis, it makes what is called *Glauber's salt*, if a nitrous one, they procure what is called *quadrangular nitre*: but they never procured, and brought into view this basis of *sea salt* separate and pure, exempted from its acid, and in a state of being known as to what it is; they have found out that the basis of alum is a white calcarious earth, that the basis of green vitriol is iron, and that the basis of blue vitriol is copper; but they have been unacquainted with the basis of this most common of all *salts*. For want of this knowledge, no body has been able to recompose *sea salt*, or regenerate it after it has been decompounded by fire; and the judicious chemist never thinks he is master of a subject, till he can both destroy, and at pleasure reproduce it.

It has been generally agreed, that the basis of this *salt* is either an earth or an alkali; and it might be very possible to reconcile these opinions, by supposing it an alkaline earth, as there are many such, and so blending the two opinions in one. Mr. Du Hamel, however, has been at great pains on this subject, and has communicated to the Academy of Sciences, as the result of them, a very accurate and valuable account of this body.

A hasty observer may fancy to himself, that he has found out this basis at a very easy rate, by observing, that on the dissolving *sea salt* in oil of tartar by deliquium, there precipitates to the bottom a white earth. This was the first subject of Mr. Du Hamel's enquiries, but he found this could not be the real basis of the *salt*, nor indeed any thing essential to it, since it was in too small quantity to have sufficed for so great a purpose; and after the precipitation of it, there remained much fine and unaltered *salt*, on which the menstruum did not operate; and on all the trials he could make, he found it impossible to reproduce *sea salt* from the mixture of this earth with spirit of salt. It seems therefore most probable, that this earth was only accidentally mixed with the *salt*, at the time of its formation, but having no essential share in its composition. When an inflammable substance is mixed with nitre, its acid dissipates itself with a very little heat, and leaves its basis naked to the eye. Inflammable substances, mixed with vitriols, also greatly diminish the force of the union of their acid to their base, and consequently facilitate their separation; and on this principle Mr. Du Hamel had hopes that powder of charcoal, or filings of iron, might prove happy mediums for the separation of the acid of *sea salt* from its basis, but these had no effect. Chemists had observed that the *sea salt*, which enters the stomachs of animals with their food, was decomposed in their bodies; hence this gentleman tried animal and vegetable substances for this purpose, as also the inflammable minerals, but all these also without success.

When these trials had all proved fruitless, there appeared no way left, but that of the mixture of the vitriolic and nitrous acids, and the producing the Glauber's salt, and quadrangular nitre, for the subjects of after experiment. Having carefully made some Glauber's salt, the business was to drive off the acid from that mixt by fire; but no sort of distillation was found able to do this, as no fire is strong enough to disunite this acid from any mixture with an alkaline salt. It is well known, however, that the vitriolic acid easily unites itself to inflammable substances, and in that union constitutes common sulphur. The mixture of powder of charcoal with this Glauber's salt, produced readily a sulphur, but the acid, in running into this union, had carried the basis of the *sea salt* along with it, not left it behind as was expected; but the separation was afterwards effected, by pouring vinegar upon this sulphur; the consequence of which was, that the basis of the *sea salt* then remained charged only with the vegetable acid of the vinegar, much weaker than the mineral acid of vitriol, and therefore forming a combination much more easily broken, and from which the acid was to be raised into vapour, without any great difficulty, as it contained a large portion of an oily matter with it. This having then been wrought over by distillation, and the residuum strongly calcined, the basis of the *sea salt* was at length obtained pure.

A second operation of the same gentleman in this research, was the adding a nitrous acid to the residuum of the distillation of *sea salt* instead of a vitriolic one, and obtaining by that means a quadrangular nitre, instead of a Glauber's salt; and dissipating this spirit, by burning in a red hot crucible, with powder of charcoal, the basis of the *salt* was also prepared pure; and both this, and that by the former trial, appeared wholly the same substance.

The basis of *sea salt*, when thus found, appeared not to be an earth, as had been by many suspected, but a true salt itself, easily soluble in water, and proving itself to be an alkali by its effects with acids. It will not run into a liquor in the air, but moulders away into a fine powder, and is very cold upon the tongue, and has a bitterish taste. This salt appears much like the natrum, or nitre of the antients, or our common salt of the kali. The first of these is a native salt, found in the eastern countries, and which always has with it a large quantity of marine salt; and it is no wonder, when we know this to be what might have made

the basis of *sea salt*, that there should be found some places in the world where this basis may have concreted of itself, without any of that acid being near, which would have made it common salt, and that it therefore remained in the state of the base alone, and constituted this natrum. The other is also accounted for on the same principles, it being the salt produced by burning from a common *sea* plant, which must have imbibed a vast quantity of *sea salt*, and which may have been decomposed in its vessels, and left us only the base without the acid; which base cannot therefore but appear on the burning the plant, and evaporating water which had been poured upon its ashes.

This accurate account of Mr. Du Hamel's gives us a very perfect idea of what was, however, no new discovery in him, since Stahl had before affirmed this alkali to be the basis of *sea salt*, though he had wrapt up his meaning in so much obscurity, that it would never perhaps have been perfectly understood, without Mr. Du Hamel's assistance. Mem. de l'Acad. Par. 1736. See SALT.

SEA *sand*. This is one of the best improvements for many sorts of land, and if rightly understood by our farmers, might be of almost universal use; most of our shores are covered with it, where it is unregarded, and there are few places where it might not be had by water carriage. This *sand* is not of the nature of the common sand found in our pits, nor indeed properly to be called by that name, though it will be best understood by it among the people whose use it is recommended to. It is the fragments of *sea* shells beat to pieces against the shore, and ground almost to powder by the waves continually washing upon it. It is sometimes composed of shelly matter alone; but sometimes it is made up partly of this, and partly of broken stones: in this last case it is called *shelfy sand*, and is not much esteemed. See SAND.

In Cornwall they use this with great advantage, and have it of three colours. About Plymouth it is grey, or bluish, like ashes, which is owing to its being in great part made up of muscle and oister shells. Westward, near the Land's End, it is white; and in Scilly glistering, from a mixture of some spangles of talc among it. This last kind is made of the powder of scallop shells, and of the mouldering of a sort of moor stone, or white granite, not so hard as the common kind, and containing, like it, a large quantity of talc. On the northern side the *sand* is rich, and of a brownish or reddish colour, and is principally composed of the broken shells of cockles; and it owes that colour to the wash of the Severn, which falls foul and dirty with a yellowish mud into the Severn sea.

Beside these differences in the colour of the *sand*, there is also another difference, which is in the largeness or smallness of the grain. In many places the different parts of the same shore afford a larger and a smaller sort, and these are chosen according to the several occasions. The smallest sort gives its virtues out the soonest, but the large kind keeps the land in heart for the longest time together: the tenant therefore is always best pleased with the smaller, and the landlord with the larger. Philos. Trans. Nº 113.

SEA *sickness* is said to be prevented by drinking *sea* water mixed with wine.

SEA *swallow*, the name of a bird of the *larus*, or gull kind, called by authors *stema*, and common on our coasts. See the article STEMA.

SEA-*turtle-dove*, in zoology, the name by which we commonly call the little diver, called by Mr. Ray *columba Greenlandica*.

It very much resembles the coulterneb, or *anas arctica* of Clusius, only it is much smaller, and its legs are red, and it has no hinder toe. Its beak is long, not compressed, or flatted sideways, as in that bird, and a little crooked and sharp at the end. It has a large white spot on each side of the forepart of its head, and excepting that it is all over black. *Ray*'s Ornitholog. p. 245.

SEA *water*. See the article WATER.

SEAH, in Jewish antiquity, a measure of capacity containing six cabs. See CAB.

SEAMS (*Cycl.*)—SEAMS *of a ship*, are places where her planks meet and join together. There is also a kind of peculiar *seam* in the sowing of sails, which they call a *monk's seam*.

SEAMS *of a sail*, are of two sorts, *monk's seam*, and *round-seam*. See MONKS, *&c.*

Round SEAM, of a sail, is so called, because round like the common *seam*.

SEASIN, or SEASING, in a ship, the name of a rope by which the boat rides by the ship's side when in harbour, *&c.*

SEAT (*Cycl.*)—SEAT, in the manege, is the posture or situation of a horseman upon the saddle.

To *seat* a horse upon his haunches or hips, see the article PUT.

SEB, a word used by some chemists to express gold, and by others for alum.

SEBAR, or CEBAR, in the materia medica, a name by which the Arabians call the *lignum aloes*, or aloe wood, a perfumed aromatic drug.

SEBEL, an Arabian name for the disorder of the eye, usually called a *pannus*.

SEBESTENA, in botany, the name given by Dillenius to a genus of plants called *cordia* by Plumier, and under that name characterised by Linnæus. See CORDIA.

SECACUL, in the materia medica of the antients, a name given by Avicenna, Serapion, and others, to a root which was like ginger, and was brought from the East-Indies, and used as a provocative to venery.

The interpreters of their works have rendered this word *iringo*, and hence some have supposed that our eryngium, or eryngo, was the root meant by it; but this does not appear to be the case on a strict enquiry, and there is some reason to believe that the famous root, at this time called *ginseng*, was what they meant.

SECALE, *rye*, in the Linnæan system of botany, makes a distinct genus of plants, the characters of which are these. The cup is a case or cover, composed of two valves, and containing two flowers. The valves are strait, erect, and placed opposite to one another; and are sharp pointed, and smaller than the leaves of the flower. The flower is bivalve; the outer valve is rigid bellied, pointed, somewhat compressed with a rim upon its lower edge, and is terminated by a long awn or beard: the interior valve is flat, and pointed. The stamina are three capillary filaments, hanging out of the flower. The antheræ are oblong, and split at the ends. The germen of the pistil is of a turbinated form. The styles are two, reflex and hairy. The stigmata are single. The flower closely wraps up the seed, and when it is ripe opens, and lets it out. The seed is single, oblong, somewhat cylindric, naked, and pointed. *Linnæi* Gen. Plant. p. 17.

SECAMONE, in botany, a name by which the Ægyptians call a species of periploca common there, and distinguished by Mr. Tournefort by the name of *periploca foliis oblongis angustioribus*, the long narrow leaved periploca. See the article PERIPLOCA.

SECESPITA, among the Romans, a knife with a round ivory handle, adorned with gold and silver, which the flamins and priests used at sacrifices. *Pitisc.* in voc.

SECIUM, among the Romans, a term used to signify every thing the priests cut with the knife *secespita*, as the *libum*, *placenta*, &c. See LIBUM, *&c.*

SECLIA, a name by which some authors have called wormwood. See SANTONICUM *semen*.

SECTINEUS, a small, flat, and pretty long muscle, broad at the upper part, and narrow at the lower; situated obliquely between the os pubis, and the upper part of the os femoris.

It is commonly a single muscle, but is sometimes found double. It is fixed above by fleshy fibres to all the sharp ridge, or crista of the os pubis, and to a small part of the oblong notch, or depression on the foreside of the crista, in which the upper extremity of this muscle is lodged; from thence it runs down obliquely towards the little trochanter, under, and a little behind which, it is inserted obliquely by a flat tendon between the superior insertion of the vastus internus, and inferior insertion of the triceps secundus, with which it is united. *Winslow*'s Anatomy, p. 206.

SECOMIÆ, in natural history, the name of a genus of fossils, of the class of the *septariæ*, the characters of which are; that they are bodies of a dusky hue, divided by septa, or partitions of a sparry matter, into several more or less regular portions, of a moderately firm texture, not giving fire with steel, but fermenting with acid menstrua, and easily calcining.

The *septariæ* of this genus are, of all others, the most common, and are what have been known by the little expressive, or mistaken names of the *waxen vein*, or *ludus Helmontii*. The English name was acquired by the likeness of the body of the mass in some of the species, and of the septa in others, to yellow wax: and the Latin one was owing to this, that the famed Paracelsus, who had the cubic pyritæ in great esteem for dissolving the stone, called those bodies, from their resembling a die in shape, *ludus*; and Van Helmont afterwards mistaking the bodies of this genus for the *ludus* of Paracelsus, gave them in the same cases, and called them by the same name.

We have many species of these bodies common among us. Of the whitish or brownish kinds we have thirteen; of the yellowish five; and of the ferrugineous ones four.

Of the white or brownish kinds are, 1. A brown one, externally grey, with yellowish white septa. This is very common in Germany, and the chemists and apothecaries there, who use it as a remedy for the stone, always choose this species. We have it also common among us, and that in the neighbourhood of London; the clay-pits behind Gray's Inn Lane, and about Islington, affording it in great abundance. 2. A hard brown one with fewer septa, common in the same places with the former. 3. A hard blackish brown one with whitish partitions. This is a coarser, and much less beautiful kind than any of the former, and generally lies near the surface. It is common about Pancras, and in many other places. 4. A hard brownish yellow one, with yellowish white

white fepta. This alfo is common about London, and generally lies near the furface. 5. A hard greyifh brown one with brown fepta. This is a very firm and hard one, and is found in the clay pits about London, but generally lies deep. 6. A hard ferrugineous brown one with brown partitions. This is a particularly ftrong and firm kind, and is lefs common than the preceding kinds. It is found however in Surry, and on the coafts of Yorkfhire. 7. A foft whitifh one with brownifh yellow fepta. This is the moft foft, lax, and crumbly, of all the bodies of this genus, and is lefs common than moft of the kinds. It is found in Leicefterfhire and Yorkfhire, and has been met with at Paddington. 8. An elegant cruftated one with a bluifh nucleus, and brownifh yellow crufts. This is very rare, and has been found only about Loughborough, and once in the neighbourhood of Deptford. 9. A hard dufky brown one with very thick fepta. This is common in the cliffs, and on the fhores of Yorkfhire, and has been found alfo in the clay-pits about Richmond and Deptford. 10. A hard greyifh brown one, divided into talc by thick whitifh partitions. This is found in Leicefterfhire, Yorfhire, and Norfolk. 11. A brown compreffed kind with yellow fepta. This is often found of three feet in diameter. It is common in the cliffs, and on the fhores of Yorkfhire, Suffex, and Kent. 12. A whitifh grey very hard kind, looking like flint. This is a very fingular fpecies, and greatly fuperior to all the reft in the clofenefs of its texture. It is found near Peterborough in Northamptonfhire, and fometimes in the neighbourhood of London. And 13. a bluifh one, brown on the outfide, with white fepta. This is a very fingular, though not very beautiful fpecies, and is very fcarce. It is not known of any where, except at Loughborough in Leicefterfhire, and in the great clay-pit at Richmond. Thefe are the *fecomiæ* of thefe colours.

The yellow *fecomiæ* are, 1. A hard pale yellow one with few and thin partitions. This is found about Highgate, and is common on the fhores of Yorkfhire. 2. A foft dufky yellow one with very thick fepta. This has but little beauty, but it is very frequent in our clay pits, thofe about Deptford abounding with it. 3. A hard bright yellow one, with variegations of brown. This is a fingular and very beautiful fpecies, the brown variegations being fometimes found in veins, fometimes as a central nucleus. This is not known of any where, except on Mendip-hills. 4. A very hard brownifh yellow undulated one, with very few, and thofe whitifh partitions. This elegant fpecies is found alfo only on Mendip-hills. And 5. a hard greyifh yellow one, divided into talc by thin yellow partitions. This is a very beautiful mafs, and is frequently met with on the Yorkfhire fhores; fometimes alfo about Highgate.

The ferrugineous *fecomiæ* are thefe, 1. A round yellowifh ruft coloured one, with thin ftraw coloured partitions, found in Somerfetfhire, and about Iflington. 2. A roundifh ferrugineous red one with yellow fepta, very common in Northamptonfhire and Yorkfhire, and fometimes found in the clay-pits about Iflington. 3. A ferrugineous brown one with whitifh fepta; a fpecies of very little beauty, found on the fhores of Yorkfhire. And 4. a hard blackifh brown one, with a yellow cruftated coat, found about Richmond, and in fome other places. *Hill*'s Hift. of Foff. p. 510, feq.

SECOND (*Cycl.*)—SECOND, in mufic. What is faid in the Cyclopædia under this head wants correction; the truth is this. There are three kinds of *feconds* occurring in practice, the leffer, the greater, and the fuperfluous *fecond*; to which, if the enharmonic genus were reftored, we might add, the diminifhed *fecond*. The leffer *fecond* is the femi-tone major, and is nearly equal to $5\frac{1}{3}$ commas. The greater *fecond* is the tone, which being either major or minor, there muft alfo be two greater *feconds*; one nearly equal to $8\frac{1}{2}$ commas, and the other to $9\frac{2}{3}$ commas: but practitioners ufually confound thefe two. The fuperfluous *fecond* is a tone major, and femi-tone minor [a]; the other fuperfluous *fecond*, arifing from the tone minor and femi-tone minor, is not in ufe. Laftly, the diminifhed *fecond* is a femi-tone minor lefs than the leffer *fecond*; that is, equal to the diefis enharmonica. Thus between E and F ♭, or between A and B ♭ ♭, would be a diminifhed *fecond*, as alfo between G fharp and A ♭. This laft has been practifed by an eminent mufician of this age [b]. —[[a] See the Table, under INTERVAL. [b] Mr. Handel, in the Oratorio of Samfon, in the fecond part of the fong, *Return, return, O God of hofts.*]

Some authors, as Ozanam [c], call the femi-tone minor by the name of *diminifhed fecond*; but this is contrary to the analogy in like cafes, where diminifhed is ufually applied to intervals a femi-tone minor lefs than a true diatonic interval. Thus the diminifhed feventh is a femi-tone minor lefs than the flat feventh, or feventh minor.—[[c] Dict. Mathemat. p. 653.] See the Table, under INTERVAL.

Diminifhed SECOND, in mufic. See DIMINISHED *fecond*.

SECOND *de l'oreille*, in anatomy, a name given by Vieuffens and others to a mufcle of the ear, called by Cowper and others *ftapidaceus*, and *ftapedis mufculus*; and by Albinus *ftapedium*. Winflow calls it *le mufcle de l'etrier*. See EAR.

SECOND *deliverance*, *fecunda deliberatione*, a judicial writ that lies after nonfuit of the plaintiff in replevin, and a returno habendo of the cattle replevied, adjudged to him that diftrained them; commanding the fheriff to replevy the fame cattle again, upon fecurity given by the plaintiff in the replevin for a redelivery of them, if the diftrefs be juftified. It is a *fecond* writ of replevin, &c. F. N. B. 68. Terms of Law. *Blount*, *Cowel.*

SECRETARIUM, among the Romans, a reclufe room, where the judges confidered the caufes that had been litigated before them, and came to a refolution what fentence they were to pronounce from the tribunal. It was moft ufually feparated from the tribunal by a veil. *Pitifc.* in voc.

SECTA (*Cycl.*)—SECTA *ad curiam*, a writ which lieth againft him who refufeth to perform his fuit to the county court, or court baron. F. N. B. 158. *Blount*, *Cowel.*

SECTA *curiæ*, in our old writers, fuits and fervice done by the tenants at the court of their lord. *Paroch.* Antiq. 320.

SECTA *facienda per illam quæ habet æniciam partem*, a writ to compel the heir that hath the elder's part among coheirs, to perform fervice for all the coparceners. Reg. orig. 177. *Cowel.*

SECTA *faldæ*. See FALDEGE, *Cycl.* Not.

SECTA *molendini*, a writ lying where a man by ufage, time out of mind, &c. has ground his corn at the mill of a certain perfon, and afterwards goes to another mill with his corn, thereby withdrawing his fuit to the former. And this writ lies efpecially for the lord againft his tenants, who hold of him to do fuit at his mill. Reg. orig. 153. F. N. B. 122. *Blount*, *Cowel.*

SECTA *regalis*, a fuit by which all perfons were bound twice in a year to attend the fheriff's tourn, and was called *regalis*, becaufe the fheriff's tourn was the king's leet; wherein the people were to be obliged by oath to bear true allegiance to the king, &c. *Blount.*

SECTA *unica tantum facienda pro pluribus hæreditatibus*, a writ that lies for an heir who is diftrained by the lord to do more fuits than one, in refpect of the land of divers heirs defcended to him. Reg. orig. *Blount*, *Cowel.*

SECTILIA, among the Romans, pavements laid with ftones cut into various forms. Suetonius diftinguifhes them from thofe that were teffelated. *Pitifc.* in voc.

SECTION (*Cycl.*)—*Cæfarian* SECTION. Many have exclaimed againft the cruelty of this operation, and certainly it is too terrible to be ufed on any, but the moft emergent occafions; but there feem three cafes in which it is juftifiable, nay abfolutely neceffary. The firft is when the mother is dead, either in labour, or by fome other accident, and the child is perceived to be alive. The fecond is when the mother is living, and the fœtus dead, and incapable of being extracted by the common paffages by any help of the midwife. And the laft, when the mother and child are both living, and there is found an utter impoffibility of delivery any other way. In all thefe cafes the Cæfarian practice is juftifiable to fave life, that muft otherwife be inevitably loft.

In the firft cafe, the operation muft be performed immediately after the death of the mother, otherwife it is to no purpofe, for the child can live but a very little time afterwards in the body. The furgeon is, in this cafe, to make a crucial incifion, as in the common diffections; or a longitudinal one on one fide, without regard to the courfe of the fibres or veffels; and if the fœtus fhould have fallen into the cavity of the abdomen, through a rupture of the uterus, it fhould then be taken out; or if it he yet in the womb, or in the fallopian tube, thefe parts muft be carefully opened, and the child heing taken out, muft have Hungary water, or the like, held at fome fmall diftance from its nofe to revive it, and the navel ftring be tied up as ufual. The fœtus is not always preferved, or found alive after this operation; but as there is often a probability of it, it is certainly better to open an hundred dead women in vain, than to lofe the life of one infant.

In the fecond cafe, when a dead fœtus is contained in the cavity of the abdomen, in the fallopian tube, or in a kind of hernia or facculus without the abdomen, of all which cafes there are inftances recorded; or when from the particular ftructure of the parts, as is fometimes the cafe in crooked women, and others; and when, as in many inftances, there is no poffibility of the extraction of the infant, even by incifion of it, there is no way but the opening the abdomen, and, if neceffary, the uterus of the mother, and taking out the fœtus; and this is often the means of preferving the mother, and when in parallel cafes the child is alfo alive, there have been not a few inftances of both being preferved. *Heifter*'s Surgery, p. 29.

The Cæfarian *fection* is recommended by feveral authors, and Mr. Helvetius communicated to the Academy of Sciences at Paris, a well attefted hiftory of a woman recovering after the operation had been performed upon her by a midwife. Vid. Hift. de l'Acad. des Scienc. 1731.

We have alfo an account of this operation fuccefsfully performed by a midwife in Ireland. See Med. Eff. Edinb. Vol. 5. art. 37.

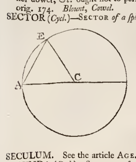
There

There is likewise an account of the Cæsarian operation successfully performed by a butcher on a woman in Ireland. Vid. Phil. Transf. N° 461. sect. 17.

Cyprianus, professor at Franeker, gives an extraordinary case of the Cæsarian operation, whereby a fœtus, which had been dead twenty one months, was drawn out of the tuba uteri, yet the mother preserved [d]. M. Jobert, physician at Chateau Thierri, relates the history of a woman in the neighbourhood of that place, who was twice delivered of children by the Cæsarian operation; the first time in 1682, the second time eleven months after, and recovered from both [e]. —[[d] Act. Erud. Lips. An. 1711. p. 82, seq. [e] Jour. des Scav. Tom. 21. p. 374.]

SECTIS *non faciendis*, a writ brought by a woman, who for her dower, *&c.* ought not to perform suit of court. Reg. orig. 174. *Blount, Cowel.*

SECTOR (*Cycl.*)—SECTOR *of a sphere.* The *sector of a sphere*, generated by the revolution of the *sector* of a circle C A E about the radius A C, is equal to a cone, whose base is equal to the portion of the spherical surface generated by the arch A E, or to the circle described with the radius A E, and whose height is equal to C A, the radius of the sphere. Arch. de Sphær. et Cyl. *Mac Laurin*'s Fluxions, Introd. p. 15.



SECULUM. See the article AGE.

SECUNDA (*Cycl.*)—SECUNDA *super oneratione pasturæ*, a writ which lieth where admeasurement of pasture hath been made; and he that first surcharged the common doth it a second time, notwithstanding the admeasurement. Old Nat. Br. 73. *Blount, Cowel.*

SECUNDANS, in mathematics, an infinite series of numbers, beginning from nothing, and proceeding as the squares of numbers in arithmetical progression, as 0, 1, 4, 9, 16, 25, 36, 49, 64, *&c.*

SECUNDINES (*Cycl.*)—It very often happens that these are retained in the womb after childbirth, and great mischiefs ensue from it. The assistance of a skilful hand is, in many cases, necessary to the getting them out; and this is to be done with great care and speed, before the uterus closes itself upon them, otherwise they occasion terrible hæmorrhages, faintings, and often inflammatory and putrid fevers.

The patient herself may greatly promote the expulsion of these, by any forcible emotion of the body, as by a forced cough, or by sneezing; the midwife at the same time is gently to pull them by the navel string, but this must be done very cautiously, for fear of its breaking. If this fails, the cautious introducing the hand often sets all right, or the use of gently pellent medicines may be called in; and to these may be added broths, with saffron in them, and by the use of common clysters great good is often done: but, if after all this care, there yet remain some fragments of them behind, there usually arises a fever within twelve hours; and in this case the utmost care must be taken to prevent putrefaction, and expel the remains of them. To these purposes medicines prepared with myrrh, amber, saffron, and the cortex eleutherii, are of the greatest service; and to these may be added occasionally the colliquating and attemperating salts, such as tartarum vitriolatum, and nitre. *Junker*'s Consp. Med. p. 723.

Notwithstanding the great danger that usually attends the leaving any part of this behind, at the time of delivery, there are instances of some persons lucky enough to escape; the substance left behind remaining uncorrupted, till the time of its being afterwards discharged.

Kerkring gives us an instance of this which fell under his own knowledge. A woman had a large portion of it left behind, where it remained four months, and at the end of that time was discharged uncorrupted, and without any hurt to the person. *Kerkring*'s Spicileg. Anat.

SECUNDUS (*Cycl.*)—SECUNDUS *mallei*, in anatomy, a name given by Duverney, and some others, to one of the muscles of the ear. It is the *internus auris* of Cowper and others, and is most properly named by Albinus *tensor tympani*.

SECUNDUS *oculum movens*, in anatomy, a name given by Vesalius to that muscle of the eye, called by Riolanus and others *superbus*, and *elevator oculi*, and by Albinus the *subductor*, one of his four musculi recti of the eye.

SECURIDACA, in botany, the name of a genus of plants, the characters of which are these. The flower is of the papilionaceous kind, and its pistil, which arises from the cup, finally becomes a strait, flatted, annulated, and jointed pod, which contains in every joint one seed, of a rhomboidal form, and marginated on its inner side.

There is only one known species of this genus, which is the yellow *securidaca*. *Tourn.* Inst. p. 699.

SECURITATEM *inveniendi quod se non divercat ad partes exteras sine licentia regis*, an antient writ lying for the king against any of his subjects, to stay them from going out of this kingdom into foreign parts; the ground whereof is, that every man is bound to serve and defend the commonwealth, as the king shall think fit. F. N. B. 85. *Blount, Cowel.*

SECUTOR, among the Romans, most commonly signified an attendant upon great men. *Pitisc.* in voc.

Secutor, in a more limited sense, denoted the gladiator who engaged with the *retiarius*. *Pitisc.* Lex. Ant. in voc. See the article RETIARIUS.

SEDAB, in botany, a name given by the Arabian physicians to the wild, or mountain rue, a plant common in Syria, Greece, and other places. Avisenna supposes the gum, which he calls *gentum*, or *jentum*, to be produced from this plant, but very erroneously, that gum being obtained from the roots of the thapsia, or deadly carrot.

SEDATIVUM *sal.* This *salt* may be obtained by crystallization in the following manner. Take four ounces of borax, and one ounce one drachm of the most concentrated oil of vitriol; put the borax into a glass retort, pour on it half an ounce of common water after the oil of vitriol, and expose the mixture to a fire gradually encreased: after the phlegm has passed off, and even while it is passing, there arise flowers, or a volatile salt, in beautiful foliated laminæ, some of which always melt by the heat of the fire; after the operation is over, the finest of the flowers are to be carefully gathered: these are what stick to the neck of the retort. Those that are grey, are to be thrown upon the remaining mass; this mass is to be dissolved in water, filtrated, and evaporated gradually; sometimes, even without evaporation, the shining talcous laminæ are to be seen in the liquor: after twenty four hours standing the water is to be poured off from these laminæ, they are to be washed with fresh water, and then dried carefully in a warm place. If these crystals do not calcine in the place where they are put to dry, nor in the sun's heat, it is a sign there is nothing crystallized but the sal neutrum; if they do calcine, it is a proof that there is some Glauber's salt formed of the borax and the vitriolic, and crystallized in the mass. This method of procuring the *sal sedativum* by crystallization, was an invention of Mr. Geoffroy; every body had before thought it could only be obtained by sublimation. Philos. Transf. N° 436. p. 40. See SAL.

SEDEM *attollens*, in anatomy, a name given by Vesalius and others to the muscle, now more generally known by the name of *levator ani*.

SEDENTARIUM *os*, a name given by some anatomical writers to the protuberance of the os coxendicis, on which the whole weight of the body rests in sitting.

SEDINA, in the materia medica, a word used by some writers to express dragon's blood.

SEDITION, among civilians, is used for an irregular commotion of the people, or an assembly of a number of citizens without lawful authority, tending to disturb the peace and order of the society.

This offence is of different kinds: some *seditions* more immediately threatening the supreme power, and the subversion of the present constitution of the state; others tending only towards the redress of private grievances. Among the Romans, therefore, it was variously punished, as according as its end and tendency threatened greater mischief. See l. 1. cod. *de Seditiosis*, and Math. *de Crimin.* l. 2. n. 5. *de læsa majestate.* In the punishment, the authors and ringleaders were justly distinguished from those, who with less wicked intention joined, and made part of the multitude.

The same distinction holds in the law of England, and in that of Scotland. Some kinds of *sedition* in England amount to high-treason, and come within the Stat. 25 Edw. III. as levying war against the king. And several *seditions* are mentioned in the Scotch Acts of Parliament as treasonable. *Bayne*'s Crim. Law of Scotland, p. 33, 34.

The law of Scotland makes riotous and tumultuous assemblies a species of *sedition*. But the law there, as well as in England, is now chiefly regulated by the Riot Act, made 1 Geo. I. only it is to be observed, that the proper officers in Scotland, to make the proclamation thereby enacted, are sheriffs, stewards, and bailies of regalities, or their deputies; magistrates of royal burroughs, and all other inferior judges and magistrates; high and petty constables, or other officers of the peace in any county, stewartry, city or town. And in that part of the island, the punishment of the offence is death and confiscation of moveables: in England it is felony. See RIOT, *Cycl.*

SEDMA, a word used by some as a name for the *lapis hæmatites.*

SEDUM, *houseleek*, in botany, the name of a large genus of plants, the characters of which are these. The flower is of the rosaceous kind, consisting of several petals, arranged in a circular form. The pistil, which arises from the cup, finally becomes a fruit, composed of several cases or sheaths, constipated together into a sort of head, and containing a number of small seeds.

The species of *houseleek*, enumerated by Mr. Tournefort, are these. 1. The great tree *houseleek*. 2. The common great *houseleek*. 3. The narrower leaved great *houseleek*. 4. The largest

largest common *sedum*. 5. The broad leaved *sedum* with large white flowers. 6. The large mountain-*sedum* with dentated leaves. 7. The large mountain-*sedum* with whole leaves. 8. The woolly mountain-*houseleek*. 9. The smaller woolly mountain-*sedum*. 10. The large Alpine rose-*sedum* with sharp pointed leaves. 11. The middle sized Alpine rose-*sedum* with red prickles. 12. The greenish hairy Alpine rose-*sedum*. 13. The long leaved hairy Alpine *sedum*. 14. The hairy Alpine *sedum* with the disk of the flower green, and the corona purple. 15. The smaller white flowered cylindric leaved *sedum*. 16. The larger cylindric leaved white flowered *sedum*. 17. The small cylindric leaved *sedum*, called the *lesser houseleek* of the shops. 18. The smaller cylindric leaved yellow flowered *sedum*. 19. The small round leaved *sedum*. 20. The sharp pointed leaved small yellow *sedum*. 21. The lesser *sedum* with broad and thick stalks. 22. The lesser yellow *sedum* with inflated stalks. 23. The deep yellow flowered long leaved *sedum*. 24. The red flowered field-*sedum*. 25. The little yellow flowered sharp tasted *sedum*. 26. The smallest yellow flowered *sedum*, insipid to the taste. 27. The little insipid white flowered *sedum*. 28. The pale flowered Alpine *sedum*. 29. The Alpine *sedum* with large red flowers. 30. The hairy purple marsh-*sedum*. 31. The white flowered echinated, or stellated *sedum*. 32. The yellow flowered echinated *sedum*. 33. The *sedum*, commonly called *cepæa*. 34. The purple flowered *cepæa*. 35. The smallest mountain-*sedum* with little purple flowers, and stellated seeds. 36. The coris-leaved Alpine *sedum*. 37. The shrubby heath-like African *sedum*. These are the genuine species of *sedum*; but beside these, authors have called many other plants by this name, most of them properly of the saxifrage kind. *Tourn.* Inst. p. 262.

The great *houseleek* was called by many names among the Greeks, as *zoophthalmus*, and *buphthalmus*; the latter of these confound it with one of the corymbiferous plants, and it is not to be known which of two so different vegetables the authors mean, without examining the virtues they ascribe to it.

There is however another name, by which it is called, which yet more perplexes the sense; this is *ambrosia*, a word by which we express the botrys, or oak of Jerusalem, a small garden plant, but by which they expressed the lilly, the *houseleek*, and several other plants.

SEED (*Cycl.*)—The exterior form, and even the internal structure, of the generality of vegetable *seeds*, have been supposed by some so much alike in the several kinds, and of so little curiosity and beauty in the whole, that they have been little regarded by the curious; but when nearly examined with the help of microscopes, they are found to be worthy of a greater attention: those which appear most like to one another, when viewed by the naked eye, often proving as different, when thus examined, in their several forms and characters, as the different genera of any other bodies of the creation. If their external forms carry all this variety and beauty about them, their internal structure, when laid open by different sections, appears yet more admirable.

The *seed* of the musk scabious is amazing in its shape and structure: it resembles in figure an octagonal vase, with a scalloped brim; the whole is bell-fashioned, having ribs or divisions, which run down from the mouth of the vase, and thence becoming narrower, form the bottom. Between these ribs, down to the beginning of the narrow part, it is clear, though not wholly transparent, and from thence to the bottom the ribs are hairy. This vase contains a *seed*, which is like a pestle standing in a mortar. The pestle stands loose in an octagonal case, but the narrowness of the mouth of this vase hinders the pestle's being drawn out, because its extremity within is rounded, and thicker than any other part of it. From its upper end there arise five spiculated aristæ, or awns, whose little thorns are directed upwards, and are thereby prepared to cause the *seed* to recede from any thing that might injure it on being touched. The bason, from which these aristæ rise, is of a fine green colour, and they are of an elegant shining brown.

The *seed* of the angelica is one of the most fragrant in the smell in the world. When the outer husk of this *seed* is pulled off, the nucleus appears of a brownish colour, and of an elliptical shape. By the help of the microscope we soon discover what it is that produces this charming smell; this is a fine amber coloured gum, which appears laid in ridges, dispersed alternately with others of a brownish colour, longitudinally, all over the *seed*, and on the flat side there is a white part, which is a sort of theca, which receives a very minute stylus from the pedicle that supports it.

The medicinal *seed*, commonly known in the shops under the name of *grain of paradise*, is one that promises very little from its external appearance, being only a brown *seed* of an irregular surface, with many flats and angles, and having an apex like the mouth of a purse when drawn together with a string; from this unpromising aspect, however, there arises a very wonderful appearance on dissection. In a longitudinal section we see first the edge of the brown cortex, next within that appears a black pithy substance, and within that a very white matter, lodged in a radiated form: this resembles a fine white salt, and is probably a mixture of a volatile salt, and a farinaceous matter. Its radiated disposition, and extremely pungent taste, favour also this opinion. But there is in this *seed* a yet far more curious particular than these; the center of every *seed* is occupied by a small piece of perfect camphor: this is, in all respects, the same with the common camphor sold in the shops, and is always of the figure of a vinegar cruet, having a round large bottom, and a long and narrow neck. This is invariably the appearance in every *seed*, and that not only in this, but in other *seeds* of the same kind.

The *seed* of the great maple, which we commonly, but improperly call the *sycamore-tree*, consists of a pod and its wing: two of these grow upon a pedicle with the pods together, which makes them resemble the body of an insect with its expanded wings. The wings are finely vasculated, and the pods are winged with a fine white down, resembling silk: this contains a round compact pellet, covered with a brown membrane, that sticks very closely to it. When this is pulled off, instead of discerning a kernel, as in other *seeds*, there appears an entire green plant, folded up in a most surprising manner. The pedicle of this is about two eighths of an inch long, and its seminal leaves of about six eighths each: between these the germina of the next pair of leaves are plainly visible to the naked eye, but with a microscope they are seen with the greatest beauty and perfection. See Tab. of Microscopical Objects, Class 2.

These, and a number of such other beauties in this part of the creation, are described at large by Dr. Parsons in his work, entitled *A Microscopic Theatre of Seeds*, to which we refer for the rest. Philos. Trans. N° 474. p. 187.

The increase of the *seeds* of plants is surprising. The upright mallow, for instance, has been computed to produce 200000 *seeds* from one. See Philos. Trans. N° 468. sect. 4.

Most kinds of *seeds* should be prepared for a microscopical examination, by steeping them in warm water till their coats are separated, and their seminal leaves may be opened without laceration. But *seeds*, while dry, and without any preparation, are of an almost infinite variety of shape, and afford a number of pleasing objects for the microscope.

The *seeds* of strawberries rise out of the pulp of the fruit, and appear themselves like strawberries. The *seeds* of the several sorts of poppies resemble kidneys in shape, but have a number of furrows and ridges on their surfaces, very curiously disposed with regular sides and angles. From these *seeds* there may also be commonly shaken a dust, which looks very pretty before the microscope, having nearly the same appearance with the surface of the *seeds*, but having the advantage of being transparent. This dust is composed of the fine membranes which have lain between the *seeds*, and which by the pressure of the *seeds* against them have received the very marks of every part of the *seeds*.

The *seeds* of the lesser moonwort, of tobacco, chervil, lettuce, thyme, parsley, and a multitude of others, afford also a very pleasing entertainment. The antients imagined, that the ferns and capillary plants produced no *seeds*, and their mistake could never have been rectified by the naked eye; but the microscope has discovered, that all the several sorts of fern, harts-tongue, maiden-hair, and the like, are so far from being barren in this respect, that they are really amazingly fruitful. The *seed* vessels of these plants are placed on the back part of their leaves, and the dust which flies off from them in such great quantities, when we handle them, is no other than their *seeds*. The *seed* vessels appear to the naked eye like brown or black scurff, on the backside of the leaf, but when viewed by the microscope, they resemble little circular tubes, divided into several cells, and containing a multitude of *seeds*. When the *seeds* are ripe, the vessels fly open with a spring, and throw them out every way in form of dust. *Baker*'s Microscope, p. 250.

Mr. Lewenhoek observes, that the meally substance in the *seeds* of beans, pease, wheat, barley, and other kinds of grain, and the generality of other large *seeds*, is always enclosed in certain small membranes, representing so many little bags or sacks. On observing these membranes more nicely, they were found to be all full of small holes, through which he could see the light, and which he judged to be no other than the remains of truncated vessels, which had been torn off in separating the part, and which serve to compose a great part of the membranes; and it is probable, that each minute particle of the farina of these *seeds* is nourished by the vessels, of which we, in this view, see the truncated ends. These vessels are more easily seen in beans and pease, than in the grains of wheat, *&c.* whose membranes are so extremely thin and brittle, that they are destroyed with the least touch. In wheat, however, there is this singularity, that one globule of the farina being broken, is always seen to be composed of many more, or that many much smaller globules were contained in every one of these larger ones. The membranes in barley, in which the small globules of farinaceous matter are contained, are much thicker and stronger than in wheat, but much less strong than in the leguminous *seeds*. See Tab. of Microscopical Objects, Class 2.

There is great reason to believe, that in all *feeds*, which contain a large quantity of farinaceous matter, the cafe is the fame as in thefe, and that they all confift internally of fmall globules, collected into larger ones, and enclofed in membranes; which, on a ftrict examination, appear to be little other than congeries of veffels deftined to fend nourifhment to the feveral inclofed globules.

The oil in almonds, and other fuch *feeds*, is in the fame manner contained in a fort of fmall veffels, which are very numerous, and diftinctly vifible. When a fmall piece of the pulp is examined with a good microfcope, all thefe fmall veffels, and the membranes they make a part of, proceed from the fkin or inner covering of the *feed*, in which they are found; and as the meally fubftance receives its encreafe from the veffels which are in the cells; and as the plant is formed between the cells, during the time that the *feed* lies in the earth; and as the little orifices in the fkins of animals, and of fruits, are fo formed, as to difcharge the fuperfluity of their moifture, and are fhut in fuch a manner, that no moifture from the common air can be received into them: fo, on the contrary, the orifices of *feeds* are fo formed, that they will admit moifture to pafs inwards, and accordingly moifture is driven into them as they lie in the earth. The *feed* upon this muft neceffarily fwell, after this a fermentation arifes, it requires then a greater fpace, and according to the particular ftate of the fibres, and the particles which lie in the cells, and which have derived their nourifhment from the cells, the meally fubftance is by degrees driven out of them into the fubftance of the young plant; which by this means encreafes fo much in bulk, that the root is become able to furnifh it with nourifhment from the earth. The office of the internal part of the *feed* is then over, and we fee accordingly, that it is by that time almoft wholly wafted. Phil. Tranf. Nº 368. p. 203. See Tab. of Microfcopical Objects, Clafs 2.

Many experiments have been made, in order to prove that the *feeds* of all plants derive their conftituent matter from the woody central parts of the plant. Thus apple trees, when they grow hollow, will bear good fruit, but with empty and imperfect *feeds*. Barberry trees, when the roots are bored through, are faid to bear fruit abfolutely without *feeds*; and the gardiners fay, that if the woody part of the roots of parfley be cut out, the plant will continue to thrive in all appearance, but that it will never afterwards produce *feeds* that will propagate the fpecies. It is to be acknowledged that hollow oaks and elms produce *feed* that is as good as that growing on the foundeft trees of the fame fpecies; but the elm is all timber to the bark, and an oak, when it is putrid to the heart, may ftill have firm wood enough to convey a proper nourifhment from the root to the acorn. The roots may be found, when the body of the tree is very much decayed by water let in at the top of the pollard tree, or at the loppings of the branches; and we fee that beans, wheat, and other grain, grow well, if the eyes and parts next adjoining be whole, though the beans be full of great holes in other parts, or the main body of the wheat be cut off with fciffars.

The people who recommend boring of the barberry roots, to have fruit without ftones, order therefore that the borings be very compleat in the roots for that purpofe. It is obferved, in countenance of this doctrine, that fome trees are lefs fruitful, or even altogether barren, by the exceffive growth and hardnefs of the timber, and thefe are cured by crofs hackings or cuts, done with fharp inftruments through the bark, and into the wood: they alfo do the like injuries to the roots on the fame occafion, and often fplit them lengthwife, putting a ftone into the flit, that they may not grow together again. When this remedy is applied both to the ftem and roots, it feldom fails of fuccefs, but when only to one, it fometimes miffes.

As the heart of the wood, or its more folid fubftance, are fuppofed thus to furnifh the matter of the *feeds*, the bark is fuppofed to furnifh the matter of the pulp of the fruit. The experiment has been made, by debafing and vitiating its juice, and the fruits have accordingly been debafed. Thus if refts be made for water on the body of a Kentifh codling tree, and water poured frequently into thefe cavities, fo as always to keep up a fupply for the bark, the apples will grow to an immoderate fize, and be infipid; part of their pulp will be fo relaxed, as to look like the pulp of a lemon, and on hanging but a moderate time on the tree, they will be as rotten, as if laid on heaps when fully ripe. Philof. Tranf. Nº 46.

Change of SEED, a term ufed by the farmers to exprefs the common, and, as they fuppofe, neceffary cuftom, of changing among one another the *feed* of their lands, as wheat, and the like, it being a received opinion, that the *feed* produced on one land will grow better on another, than on that which produced it, though the fame fpecies of plant be fown.

Seeds, in their natural climate, do not degenerate, unlefs culture has improved them; they then indeed are liable, upon omiffion of that culture, to return to their natural ftate again. Whatever benefit arifes to the farmer from the changing the *feed* of the fame fpecies, is from caufes which are themfelves the effects of different climates, fuch as heat and moifture, which may vary very much in the fame neighbourhood. There is a mountain in the Mogul's country, which on the fouth fide produces Indian plants, and on the north fide European ones, from different expofures. Some land retaining water longer is colder, and fome letting it pafs off quicker is warmer; as it may alfo be from the nature and figure of its parts, which retain more of the fun's heat than others. Sandy and gravelly grounds are always warmer than others, if they have fome hollow and fpungy ftratum underneath, that will let the water pafs off.

The benefit arifing from the change of *feed* is owing to thefe changes, not to the change of food, and thefe caufes fhew their effects chiefly in the generation of the *feed*. Flax *feed*, brought from Holland, and fown here, will produce as fine flax as it does there, but in the next generation it will degenerate, and become coarfer; by this means it will continue to degenerate every year, till after two or three years it is no better than our own *feed* produces, and yet the land fhall be as good for this coarfe fort, as when it produced the fine; fo alfo it is, when the *feeds* of our own wheat are changed between farmer and farmer. And thus filk worms hatched and bred in France, of eggs brought from Italy, will make as fine filk as the Italian; but the eggs of thofe laid in France, will produce worms that make no better filk than thofe produced in France, though their food is all the while the fame.

Common barley, once fown in the burning fands in Wiltfhire, will for many years after, if fown on indifferent warm ground, be ripe fooner than any other barley by two or three weeks; but if fown on cold grounds farther north, it will be as late as any other barley, after two or three years. The weeds, which perplex the farmers in every field, grow as ftrong and troublefome one year as another, and that without any change of *feed* at all. Thefe feem therefore to have been the natural produce of our foil, and corn and other ufeful plants to have been brought from other places, and improved by culture; thefe will therefore no longer retain their perfection and value, than fuch culture is continued to them.

Laurembergius has carried this notion of degeneracy and change from the foil, fo far as to affirm that wheat will, in fome places, degenerate into rye; and in other places, rye will be exalted into wheat by the foil: but thofe who are acquainted with botany know, that a horfe might as foon be changed into a bull by feeding in an improper pafture, as one plant degenerate into another by fault of the foil. *Tull's* Hufbandry, p. 116.

SEEDY, in the brandy trade, a term ufed by the dealers to exprefs a fault that is found in feveral parcels of French brandy, and which renders them unfaleable. The French fuppofe that thefe brandies obtain the flavour, which they exprefs by this name from the weeds which grew among the vines, from whence the wine, of which this brandy was made, was preffed.

However it be, the thing is evident, and the tafte not of any one kind; but fome pieces of brandy fhall tafte ftrongly of annifeed, fome of caraway feed, and fome of other of the ftrong flavoured feeds of plants, principally of the umbelliferous kind; fo that it fhall be rather taken for annifeed, caraway, or fome other water, than for brandy.

The proprietor of fuch brandies is always at great trouble to get them off, and ufually is reduced to the neceffity of mixing them in fmall quantities with pieces of other brandies, fo as to drown and conceal the tafte; and where he has not opportunities of doing this, is obliged to fell them on very difadvantageous terms.

The bufinefs of rectification of fpirits is very little underftood abroad, though very much practifed with us; and a man in France or Holland, who could take off this tafte from thefe brandies, might get great advantages by it. There is no doubt but that the fame means, which we ufe to rectify malt fpirits, that is to clear it of its naufeous and ftinking oil, which always rifes with it in the firft diftillation, would alfo ferve to purify thefe brandies, and by leaving thefe extraneous oils behind, render them as well tafted as any others; fince there is no queftion, but that the oil of malt, which is a principle of the fame ingredient with the fpirit, is more firmly united to it than thefe flavouring oils in the brandy, which are not the produce of the grape, but of fome foreign matter only accidentally mixed with it. See the article RECTIFICATION.

It is a miftake to imagine, that all the brandies made in France are fo fine as thofe which we meet with on the keys of London; on the contrary, there are many hundred pieces made every year, which are as badly flavoured as our coarfeft malt fpirit. But the cafe is this, they fend the beft brandies, and the beft wines to England, where they can get the beft prices for them. In Holland, on the contrary, the mart of goods of all forts, it is fometimes difficult to pick one piece of good brandy out of fifty, the general run of them being either *feedy*, or mufty, oily, or otherwife infected with fome unnatural and difagreeable flavour; and thefe

these are the sorts which in France they despair of curing by re-distillation, or bringing to the state of three fifths, or *trois cinques*, as they express their stronger brandies. *Shaw's* Essay on Distillery. See TROIS *cinques*.

SEELING (*Cycl.*)—SEELING, at sea, is used in the same sense nearly with heeling. When a ship lies down constantly, or steadily on one side, the seamen say she *heels*; and they call it *seeling*, when she tumbles on one side violently, and suddenly, by reason of the sea forsaking her, as they call it; *i. e.* the waves leaving her for a time in a bowling sea. When a ship thus tumbles to leeward, they call it *lee-seel*; and in this there is not much danger, even in a storm, because the sea will presently right her up again; but if she rowls or *seels* to windward, there is fear of her coming over too short or suddenly, and so by having the sea break right into her, be either foundered, or else have some of her upper works carried away.

SEGITH, a word used by some of the chemical writers as a name for vitriol.

SEGMENTUM, among the Romans, an ornament of lace used by the women on their shoulders, which, according to some, resembled our shoulder knots. *Pitisc.* in voc.

Segmenta were likewise a kind of tessellated, or Mosaic pavements, made up of pieces of various shapes and colours, but which had an uniform and regular arrangement. *Pitisc.* Lex. Ant. in voc.

SEGUE, in the Italian music, is often found before *aria*, *alleluja*, *amen*, &c. to shew that those portions or parts are to be sung immediately after the last note of that part over which it is writ. But if these words, *se piace*, or *ad libitum*, are joined therewith, it signifies that these portions may be sung, or not, at pleasure.

SEGUENZA, in the Italian music, a kind of hymn sung in the Roman church, generally in prose. The *seguenze* are often sung after the gradual, immediately before the gospel, and sometimes in the vespers before the magnificat. They were formerly more used than at present.

The Romish church has retained three *seguenze*, called *le tre seguenze dell' anno*. They are *lauda Sion salvatorem*, &c. *victimæ paschali laudes*, &c. *veni sancte Spiritus*, &c. These are sung to music in many places. There is also one called *dies iræ*, *dies illa*, in the funeral service, which is admirably well set, and on which Legrenzi, Lully, and others, have made excellent compositions. *Brossard.*

SEIGNETTE's *salt*, a name given in France to a kind of sal polycrestus, famous a long time in that kingdom as a purge. It was otherwise called *sal rupellensis*, and was invented by Mr. Seignette. The Paris Academy took it into consideration, and Mr. Geoffroy discovered that it was only a kind of soluble tartar, formed of cream of tartar and common pot-ashes. See RUPELLENSIS *sal*.

SEIGNIORY, *dominium*, in our law, is used for a manor or lordship. *Blount*, *Cowel.*

SEIM, in agriculture, a term used by the farmers of Cornwall to express a certain determinate quantity of sea sand, which they use as manure to their lands.

They dredge this up on the sea coasts, and carry it as far toward the lands, where it is to be used, as they can by water. At the landing place the farmers bring a train of horses to receive it, each horse carrying a *seim*, that is a sack of it, containing thirteen gallons. The land carriage of this sand, in Cornwall alone, is supposed to cost thirty two thousand pounds annually; and yet the farmers find abundant encouragement to continue the use of it, it is so rich a manure. Philos. Trans. N° 103.

SEISACHTHEIA, Σεισαχθεια, in antiquity, a public sacrifice at Athens, in memory of Solon's ordinance; whereby the debts of poor people were either entirely remitted, or at least the interest due upon them lessened, and the creditors hindered from seizing upon the persons of their debtors, as had been customary before that time. *Potter*, Archæol. Græc. Tom. I. p. 430.

The word signifies the shaking off a burden.

SEISINA *habenda*, *quia rex habuit annum*, *diem et vastum*, in law, a writ that lies for delivery of *seisin* to the lord of lands or tenements, after the king, in right of his prerogative, hath had the year, day, and waste, on a felony committed. Reg. orig. 166. *Blount*, *Cowel.*

SEITAN, a name given by Avisenna, and other of the Arabian writers, to a species of prickly tree, often recommended in their prescriptions.

The word is sometimes also written *seten*, *sitan*, *setah*, or *setim*.

Pliny mentions this as a wood remarkably durable. He says it grew most plentifully in Egypt, and that it remained uncorrupted in waters. It is called by him, and others of the old Latin writers, *spina nigra*, the black thorn: and the durable nature of our common sloe tree, or black thorn, growing in our hedges, has tempted some to believe it to be the same with the *setin*, or *spina nigra* of the antients; but this is overthrown by the common account of Pliny, and others, of ships being built of this wood, the small size of our black thorn rendering it wholly impossible to put it to such uses.

Theodotion is to be understood of this wood, when he speaks of the *setah*, or *acanthina*.

It is plain from Avisenna, that this *setan*, or *seitan*, is no other than that species of *acacia*, which, from its producing our gum arabic, is called the gum arabic tree. Avisenna calls the fruit of this *alcarad*, or *alcarath*; and in his account of it, he says that it is the fruit of a great thorny tree growing in Egypt, and in the region called Bassera, and that the gum arabic exsudates from its trunk, and the acacia juice is prepared from its fruit alcarath. He adds, that the Ægyptians themselves call it *sitan*; and Prosper Alpinus tells us, that at this time they call it *sant*. This word is easily derived from *sitan*, and then the name is not a little instrumental to the proving what the tree was, as the *sant* is evidently what Avisenna says of the *sitan*, the gum arabic tree.

We find the word *sant* in some of the Arabians also, and they write it *satn*, whence the softer word *sant* is as easily formed, as *botn*, the name of turpentine, is formed into *bont*, or, as some write it, *botin* or *botim*, and many other words in the materia medica of the antients, are spelt in the same manner. *Prosper Alpinus*, de Plant. Ægypt.

SEL, in the materia medica of the antients, a name given to the fruit of an Indian plant, resembling the cucumber in its manner of growth, but bearing a fruit like a pistachia nut.

There are three of these fruits mentioned by the Arabian writers, the *bel*, *sel*, and *fel*. See BEL and FEL.

They tell us expressly that the *bel* and *fel*, as also the fruit *sel*, were not the fruit of a tree, but of a plant, and that of the creeping kind. It is very probable, that the other *fel* of Avisenna is the root of the *nymphæa indica*, which he mentions in the chapter of *nenuphar*, as possessing the same virtues which he attributes to this sort of *fel*, that is the same with those of mandrake.

SELAGINOIDES, in botany, the name of a genus of mosses, the characters of which are these. The capsules are produced in the alæ of the leaves, in the manner of those of the selago, but they are of a different form, being tricoccous, and sometimes quadricoccous, and opening, when mature, into so many valves. See Tab. of Mosses, N° 16.

Of this genus of moss we have only one known species, which is the prickly *selaginoides*, commonly called *feeding mountain moss*. This is found in the mountainous parts of Yorkshire, and in Wales, and loves rocky and moist places. *Dillen.* Hist. Musc. p. 461.

SELAGO, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these. The perianthium is small, and remains after the flower is fallen. It is composed of one leaf, divided into four segments at the edge. The flower consists of one petal, formed into a tube, which is very small, and scarce sensibly perforated, and a limb or verge, which is expanded, and divided into five segments; the two upper of which are the smallest, and the under one the largest of all. The stamina are four capillary filaments, of the length of the flower, into which they are fixed at the base; the two upper ones of these are longer than the rest, and their antheræ are simple. The germen of the pistil is roundish. The style is slender, and of the length of the stamina. The stigma is simple and acute. The flower finally involves the seed, which is single, and of a roundish figure. *Linnæi* Gen. Plant. p. 300.

The characters of this genus of mosses, according to Dillenius, are these. The capsules are produced in the alæ of the leaves, and are either reniform, or globular, and have neither pedicle, operculum, nor calyptra, like the capsules of the other mosses. They have only one cavity, and part into two valves when ripe. To this it may be added that the plants are all rigid and shrubby, and the stalks as well as roots are dichotomous. See Tab. of Mosses, N° 13.

Of this genus of mosses the following are all the known species. 1. The common upright fir moss, or *selago*, resembling the common spruce fir. This grows to four or five inches high, and is found in the crevices of stones, and in some places on the ground, in the mountainous parts of Yorkshire and in Wales. There are three or four varieties of this moss, found in different places, which might lead a new observer into the error of supposing them new species. 2. The American *selago* with notched and reflected leaves. This grows in Pensylvania, in wet clayey soils. 3. The camphorated leaved *selago*, called by some authors the *coris-leaved american moss*. It is found in North America, and its branches are often a foot long, divided at different parts in a dichotomous manner; so that it spreads greatly, taking root all the way that it passes. It generally creeps upon the barks of trees. 4. The coris-leaved *selago*, called by Plumier the *great savin-leaved moss*. This also grows in North America. 5. The toad-flax-leaved *selago*. This also is an American moss, and grows on the trunks and branches of trees. *Dillen.* Hist. Musc. p. 436.

SELANION, in botany, a name by which some authors have called the common *crocus vernus*, or the garden spring flower we call the *crocus*. *Ger.* Emac. Ind. 2.

SELATUS, one of the many names by which the chemical writers have called quicksilver.

SELENÆ, Σεληναι, in antiquity, a kind of cakes ufed in facrifices, and fo called from their being broad and horned, in imitation of the new moon. *Potter*, Tom. I. p. 214.

SELENDERS, in the manege, are chops or mangy fores in the bending of a horfe's hough, as the malenders are in the knees. See MALENDERS.

SELENEUSIACA *terra, earth of Seleneufia*, in the materia medica of the antients, a light fungous earth called by later naturalifts *agaricus mineralis*, and when found in form of powder, or in a difcontinuous ftate, *lac lunæ*.

It is an earth common enough, wherever there are ftone quarries, all over the world; but the fineft ever met with, is that from Sicily, the place where the antient *Seleneufia*, or *Selinus* ftood, and from whence the antient phyficians had it. Some of them have called it the *creta Seleneufiaca*; but all their defcriptions agree in proving it to be this very earth now found there. Diofcorides and Galen mention its remarkable diffufibility in water, and Pliny mentions its melting into a kind of juice, or fmooth homogene fubftance with it; properties fo very applicable to this earth, and fo little fo to any other, as to leave no doubt of their having been originally applied to the very fame fubftance.

The antients gave it internally as an aftringent; but its principal ufe was external, as a cofmetic among the ladies. And Dr. Plot recommends our lac lunæ, on perfonal experience, for the fame purpofes. *Hill*'s Hift. of Foffils, p. 40. See the article AGARICUS *mineralis*.

SELENIACON, a name for a kind of amulet worn for the epilepfy.

SELENITES, (*Cycl.*) in natural hiftory, the name of a large clafs of foffils, the characters of which are thefe. They are bodies compofed of flender, and fcarce vifible filaments, arranged into fine, even, and thin flakes; and thofe difpofed into regular figures, in the feveral different genera, approaching to a rhomboide, or hexangular column, or a rectangled parallellogram: fiffile, like the talcs, but that not only in a horizontal, but alfo in a perpendicular direction: they are flexile in a fmall degree, but not at all elaftic: they do not ferment with acid menftrua, but readily calcine in the fire. See Tab. of Foffils, Clafs 2.

Of this clafs there are feven orders of bodies, and under thofe ten genera. The *felenitæ* of the firft order are thofe compofed of horizontal plates, and approaching to a rhomboidal form. Of the fecond are thofe compofed of horizontal plates, arranged into a columnar and angular form. Of the third are thofe whofe filaments are fcarce vifibly arranged into plates, but which, in the whole maffes, appear rather of a ftriated, than of a tabulated ftructure. Of the fourth are thofe which are flat, but of no determinately angular figure. Of the fifth are thofe formed of plates, perpendicularly arranged. Of the fixth are thofe formed of congeries of plates, arranged into the figure of a ftar. And of the feventh, are thofe of a complex and indeterminate figure. *Hill*'s Hift. of Foff. p. 119, 120.

Of the firft of thefe orders there are three genera. 1. The *leptodecarhombes*. Thefe are thin *felenitæ* of a rhomboidal figure. 2. The *pachodecarhombes*. Thefe are thicker *felenitæ* of a rhomboidal figure. The *felenitæ* of both thefe genera confift of ten planes each. 3. The *tetradecarhombes*. Thefe are *felenitæ* of a rhomboidal figure, but confifting of fourteen inftead of ten planes. See the articles LEPTODECARHOMBES, PACODECARHOMBES, and TETRADECARHOMBES.

Of the fecond order there are alfo three genera. The firft the *ifchnamblluces*. Thefe are *felenitæ* of a flatted columnar octohaedral figure, confifting of fix fides, and two broken ends. 2. The *iamblluces*. Thefe are *felenitæ* of an octohaedral columnar form, but not flatted. 3. The *oxuciæ*. Thefe are *felenitæ* of a columnar form, but not truncated, or with broken ends, but tapering off at each end to a point. See the articles ISCHNAMBLUCIS, &c.

Of the third order there is only one known genus, the *inamblucia*. Thefe are columnar *felenitæ* with abrupt ends, and of a fibrofe, not tabulated texture.

Of the fourth order there is alfo only one known genus, the *fanidia*. Thefe are *felenitæ* of no determinate figure, but of a tabulated ftructure, and refembling the foliaceous tubes. See the articles INAMBLUCIA and SANIDIA.

Of the fifth order there is alfo only one known genus, the *cathetolipes*. Thefe are octohaedral *felenitæ* with perpendicular plates, and obtufe angles. *Hill*'s Hift. of Foff. p. 121, 122, 123.

Of the fixth order there are two genera. 1. The *lepaftra*. Thefe are *felenitæ* compofed of filaments, arranged into plates, and difpofed in form of a ftar. 2. The *trichaftra*. Thefe are *felenitæ* compofed of filaments, fcarce vifibly arranged into plates, but difpofed in threads into the form of a radiated ftar, and appearing merely of a ftriated texture. See the articles LEPASTRA and TRICHESTRA.

Of the feventh order there is only one genus, the *fymplexia*. Thefe are *felenitæ* compofed of various irregularly connected bodies, of the ftructure and general figure of one or other of the former genera. See the article SYMPLEXIUM.

The ftructure of the *felenitæ* of all the genera of the firft order is exactly alike, they are all compofed of a great number of broad flakes or plates, in a great meafure externally refembling the flakes of the foliaceous talcs. Thefe are of the length and breadth of the whole mafs. The top and bottom being each only one fuch plate, and thofe between them, in like manner, each compleat and fingle, and the body may always be eafily and evenly fplit, according to the direction of thefe flakes. Thefe differ, however, extremely from the talcs; for they are each compofed of a number of parallel threads, or filaments, which are ufually difpofed parallelly to the ends. In many of the fpecies they are alfo divided by parallel lines, placed at a confiderable diftance from each other, and the plates in fplitting often break at thefe lines: add to this, that they are not elaftic, and that they readily calcine. *Hill*'s Hift. of Foff. p. 120.

The ftructure of thofe of the fecond order is the fame with that of the firft; but that in many of the fpecimens of them, the filaments, of which the plates are compofed, run in two directions, and meet in an obtufe angle; and in the middle there is generally feen in this cafe a ftrait line, running the whole length of the column, and fmall parcels of clay infinuating themfelves into this crack, reprefent in it the figure of an ear of grafs fo naturally, as to have deceived many into a belief, that there was really an ear of grafs there. The other orders confifting only of fingle genera, the ftructure of each is explained under the generical name. *Hill*'s Hift. of Foff. p. 121. See the articles LEPTODECARHOMBIS, &c.

SELF (*Cycl.*)—SELF *opens*, a term ufed by the miners in the north of England to exprefs certain natural cavities, or chambers, which are frequently met with, fome near the furface, fome at very great depths, fome fmall, and others very large.

Thefe are of various figures, and often run into ftrange finufes. Dr. Lifter, in accounting for the origin of earthquakes, fuppofes the whole cruft of the earth to be more or lefs hollowed in this manner; which he alfo argues for, from the ftreams of waters which arife in large quantities from the fides of mountains, and muft have communication with thefe *felf opens* and fupplies from them.

Thefe natural hollows the doctor thinks to be the means of continuing, and propagating earthquakes; the firft caufe of which he afcribes to the breath of the pyrites, which he alfo fays is the pyrites itfelf *tota fubftantia*. This he obferves takes fire of itfelf, on being expofed to the air in our fight, and may do fo, from various other caufes, underground. The fulphureous fmell of the air and waters, before and after earthquakes, in the places where they happen, feems a proof that they owe their origin to fome fuch fulphureous matter as this ftone; and the rolling, and defultory noife of an earthquake, feems alfo to fhew that it is not expanded every way at once, but is propagated through a chain of thefe fubterranean hollows.

It is not neceffary that we fhould fuppofe a continued chain of them, from the place where the earthquake begins to be felt, to the fpot where it ends; but if there are many of them irregularly fcattered about the earth, the force of the explofion will be fufficient to burft through the folid parts between, and open a paffage from one to the others, which may continue open no longer than the force continues, and after the fhock is over clofe together again, fo as to leave no trace where it was.

Our miners not only find the natural caverns, but they alfo find them often full of what they call *fire damps*, which are inflammable vapours, of the very nature of thofe which occafion earthquakes, and when fired make the fame explofions, and caufe the fame effects in a certain degree. Thefe fometimes require a candle, or other actual fire, to come in contact, in order to kindle them; but fometimes they are found kindled of themfelves, and flaming on the furface of the waters, in the bottoms of the pits, or at the fiffures of the coal. Philof. Tranf. N° 157.

SELI, in botany, a word formed by an abbreviation of the word *fefeli*, and fignifying the fame plant. See the article SESELI.

SELICHA, a name given by the Arabians to a kind of cinnamon. See the article CINNAMUM.

SELIGONION, in botany, a name by which fome authors have called piony. *Ger.* Emac. Ind. 2.

SELION *of land*, *felio terræ*, is derived from the French, *feillon*, which fignifies a ridge of land, or ground arifing between two furrows, and contains no certain quantity, but fometimes more and fometimes lefs. Therefore Crompton fays, that a *felion of land* cannot be in demand, becaufe it is a thing uncertain. *Crompt.* Jurif. 221. Terms of Law.

SELKIE, the name in Zetland for a feal. Many of thefe are found in that ifland. Philof. Tranf. N° 473. fect. 8.

SELL *bed*, in mining, a term ufed in fome parts of England to exprefs fome particularly rich parts of the vein of ore.

In Cornwall they fometimes find the tin ore fo pure, that it requires only bruifing to drefs it, without the wafhing and feparation by grates, launders, and the like means: they call thefe collections of ore the *fell beds* of tin; and it is obferved

ferved that thefe never have any ftrings iffuing from them, as the other lands have. Philof. Tranf. N° 69.

SELLA, among the Romans, a chair in which the old and infirm were carried by fervants through the city, and in journeys. Sometimes the phyficians prefcribed it as an exercife. *Pitifc.* in voc.

SELLA *curulis*, among the Romans. See CURULE *chair*, *Cycl.*

SELLIGA, in the materia medica, a name by which fome authors have called the *nardus Celtica*, or Celtic fpikenard of the fhops. *Ger.* Emac. Ind. 2.

SELLI, Σελλοι, in antiquity, an appellation given to thofe who firft delivered oracles. Thefe, according to Strabo and Euftathius, were men, and the name *felli* is faid to come from *Sellæ*, a town in Epirus, or from the river called by Homer *Selleis*. *Potter*, Archæol. Græc. l. 2. c. 8. Tom. I. p. 267, feq.

SELTZER-*water*, the name of a mineral water of Germany, which arifes near Neider Seltz, and is now ufed in England and many other countries.

We called it *Seltz*, or *Seltzer water*, and the phyficians prefcribe it in many cafes, as fcurveys, fpafmodic affections, and in confumptions; in the laft cafe, mixing it with affe's milk.

Hoffman, in his examination of the principles of this water, obferves, 1. That on the mixing any acid with it, whether it be a weak or a ftrong one, there is an immediate effervefcence; and on the mixing it with Rhenifh wine and fugar, there is a very remarkable emotion and noife, and the whole body of the liquor appears milky for fome time. 2. If they are mixed in equal quantities with fine old Rhenifh wine alone, they become turbid, and acquire a brown colour, with a caft of reddifhnefs; like that produced by mixing oil of tartar, or the urinous fpirit of fal armoniac, with good wine. 3. The tafte of thefe waters is not of that penetrating, fubacid kind, which moft of the other mineral waters are of, but rather has a flavour like that of a diluted folution of a lixivial falt. 4. On putting powder of galls into them, they do not become purple, nor do they blacken the ftools of thofe who drink them. 5. On adding oil of tartar to them they become milky, but throw down no precipitate. 6. A quart of thefe waters gently evaporated, yields a drachm and twelve grains of a faline matter, and this diffolved and filtrated, yields, on a fecond evaporation, two fcruples of a pure alkaline falt. This falt diffolved in water, and added to a folution of corrofive fublimate, precipitates a yellow powder, or turbith mineral; and mixed with an infufion of rhubarb, gives it a reddifh colour; mixed with fal armoniac, it raifes a pungent fmell. 7. A quart of this water being faturated with fpirit of vitriol, to the ceafing of the ebullition on dropping it in, and afterwards gently evaporated, affords a drachm and a half of falt, no way diftinguifhable from tartarum vitriolatum.

8. No medicinal water is fo fubject to fpoil and corrupt as this in the keeping; for which reafon the jars muft be well filled, and nicely fecured with found corks, pitched over. 9. If a quantity of this water be fet for a day or two in an open veffel, it wholly lofes its natural flavour, and taftes only as if oil of tartar had been mixed with common water: in this change it is obfervable alfo, that there is no earthy matter precipitated.

It appears from all thefe obfervations, that this water abounds with an alkaline falt in a much greater quantity, than any other of the known mineral waters; and it feems to contain no particle of the common ingredients of the other mineral waters, which are a ferrugineous earth, and a bitter purging falt, of the nature of Glauber's falt. Hence it does not purge by the belly, but generally goes off by urine. It is one of the mildeft, and moft innocent of all the mineral waters, and may be taken by perfons of the weakeft conftitution. *Hoffman*, Opera, Vol. 5. p. 144.

SEMAMPLEXICAULE *leaf.* See LEAF.

SEMBELLA, among the Romans, a fmall filver coin, equal in value and weight to half the *libella*. *Pitifc.* in voc. See the article LIBELLA.

SEMICIRCULARIS *palpebrarum mufculus*, in anatomy, a name given by Spigelius, and fome others, to one of the mufcles of the face, called by Albinus and Winflow the *mufculus orbicularis palpebrarum*. See MUSCULUS.

SEMI-CUBICAL *parabola*, a curve of the fecond order, wherein the cubes of the ordinates are as the fquares of the abfciffes. Its equation is $a x x = y^3$.

SEMI-DITONUS, in mufic, is ufed by fome writers, as Salinas, for the third minor.

SEMIFLOSCULOUS, in botany, a term ufed to exprefs the flowers of a certain clafs of plants, of which the dandelion, hawkweed, and the like, are kinds.

This fort of flower confifts of a number of *femiflofculi*, which are either difpofed into one or more circles, and all comprehended in the fame cup, which often becomes inverted as the flower ripens. Thefe *femiflofcules* are petals, hollow in their lower part, but in their upper half are flat, and continued in the fhape of a tongue. Thefe are often feparated from each other by intermediate leaves, and are placed upon the embryo fruit, from which there ftands out a flender capillament, divided at the end into two parts; often carried beyond the vagina, fupported by five props. The embryos are placed in the thalamus, or bottom of the cup, and finally become feeds, fometimes winged with down, fometimes naked, fometimes coronated, and fometimes foliated. See Tab. 1. of Botany, Clafs 1. *Tourn.* Inft. p. 467.

SEMI-INTEROSSEUS *indicis*, a fmall fhort flat flefhy mufcle, very like the antithenar, or internal *femi-interoffeus* of the thumb. It is fituated obliquely on one fide of that of the thumb, between the firft phalanx thereof, and the firft metacarpal bone. It is fixed by one end to the outfide of the bafis of the firft phalanx of the thumb, and a little to that bone of the carpus, by which this phalanx is fupported; and by the other end it is fixed near the head of the firft phalanx of the index, on that fide next the thumb. It lies almoft parallel to the antithenar, croffing it a little; this mufcle lying on the convex fide of the hand, and the antithenar on the concave. *Winflow's* Anatomy, p. 202.

SEMILUNARES *cochleæ*, in natural hiftory, the name of a genus of fea fnails, fo called, from their having femicircular mouths. See Tab. of Foffils, Clafs 9. and Tab. of Shells, N° 6.

The characters of the genus are thefe. They are univalve fhells of a compact body, with a flat femicircular, and often dentated mouth. Some of the fpecies have exerted apices, and fome depreffed.

There are many diftinctive and fpecific characters in the feveral fpecies of this genus, which arrange together confiderable numbers of the fpecies under each. Thus the *neritæ*, which are of this genus, are fome of them umbilicated, and others have teeth, and a kind of gums. The *fnail* kinds, diftinctly fo called, that fall under this genus, are very different from the *neritæ*, in that they have no teeth, no gums, and no palate. The term *femilunares cochleæ* was invented by Rumphius to exprefs their mouths, being of the fhape of half of a circle.

Bonani is of opinion that the *neritæ* were fo called, from their being born of the fea, and called by a name expreffive of that origin by way of eminence, as an honour to their watery parent. To make out the juftice of this derivation, it was neceffary to fuppofe the *nerita* more beautiful than other fhells; and in order to give them a claim to this character, the author has introduced into the family of the *neritæ* the trumpet fhells and porcellanes. Some authors have called them *natrices*, from their fwimming, affirming that they fwim in the manner of the nautilus, by fetting their mouths before the wind. This is an opinion as old as Pliny, but it is as erroneous as many others of the opinions of that author. The *neritæ* generally inhabit caverns in the fides of rocks, and ufually ftick faft to the ftone. *Bonani*, Recreat. Ment. et Ocul. p. 56. *Aldrovand.* de Teftac. l. 3. c. 80. *Plin.* l. 9. c. 33.

All the fpecies of the *femilunar* fhells have few convolutions, and have the extremity of the voluta fmall, and ufually ftanding a little out.

The fpecies of the *femilunar cochleæ* are thefe, as arranged under the two general divifions of dentated *neritæ*, and umbilicated *cochleæ*. 1. The dentated *nerita*, commonly called the *gum-fhell*. 2. The bloody tooth-*nerita*. 3. The ox-palate-*nerita*. 4. The ftriated and punctulated *nerita*. This fpecies, when robbed of its outer coat, and polifhed, affumes a very different appearance, and is feen in the cabinets of the curious, under the name of a fafciated *nerita* with black and yellow variegations. 5. The canaliculated *nerita*. 6. The furrowed *nerita*. 7. The thrufh-*nerita*. 8. The partridge-*nerita*.

Of the *neritæ* which have no teeth, the following are the known fpecies. 1. The jafper-*nerita* with a long beak. 2. The jafper-*nerita* with an operculum. 3. The lemon-coloured pea-*nerita*. 4. The yellow pea-*nerita*. 5. The prickly *nerita*. 6. The reticulated *nerita*. 7. The *nerita* variegated with black fpots. 8. The red and white fafciated *nerita*. 9. The lightly ftriated green *nerita*. 10. The undulated *nerita*.

Of the umbilicated *fnails*, we have the following fpecies. 1. The long umbilicated *cochlea*. 2. The *cochlea* with an exerted apex. 3. The *cochlea* with a depreffed apex. 4. The tefticulated *cochlea*. 5. The hermit *cochlea*. 6. The umbonated *cochlea*. 7. The fmall nipple *cochlea*. 8. The heavy white *cochlea*. And 9. the orange-coloured *cochlea*. Hift. Naturel. Eclairc. Part 2. p. 256.

SEMIMEMBRANOSUS, in anatomy, a long thin mufcle, partly tendinous, and fituated on the backfide of the thigh, a little toward the infide.

It is fixed above by a ftrong broad tendon, or long aponeurofis, in the irregular obtufe, prominent line, which goes from the acetabulum to the tuberofity of the ifchium, a little above the infertion of the feminervofus, and between thofe of the gemellus inferior, and quadratus; mixing fome fibres with the triceps tertius. From thence it runs down flefhy, in an oblique direction, behind the inner condyle of the os femoris; below which it terminates in a thick tendon, which is inferted in the pofterior and interior fide of the inner condyle of the tibia, by three fhort branches; the firft,

or uppermost of which, goes a little toward the inside, the second more backward, and the third lower down. Before it is inserted, it sends off sometimes an aponeurosis, like that of the biceps. *Winslow's* Anatomy, p. 216.

SEMINAL (*Cycl.*)—SEMINAL *leaves*, two soft, plain, and undivided leaves, that first shoot forth from the greatest part of all sown seeds, and are different from those of the succeeding plant in figure, texture, and all other respects.

SEMINAL *root*, in natural history, a name given by Grew to that part of the seeds of plants, which may otherwise be called the inner body of the seed: this is distributed through the parenchyma of the seed, but is wholly different from it, and distinguished by Dr. Grew from the radicle, which becomes the plant root in its future growth. The parenchyma of the seed is, in some degree, that to the *seminal root*, which the mould or earth is to the plant root, or radicle; and the *seminal root* is to the plant root, what the plant root is to the trunk. *Grew's* Anat. of Plants.

SEMINALIS, in botany, a name by which some authors have called horsetail. *Ger.* Emac. Ind. 2.

SEMINARY, (*Cycl.*) in gardening, the term used for the seed plot, or place allotted for raising plants from seed, and keeping them till they are fit to be removed into the garden, or nursery.

When the *seminary* is intended for trees, it must be large, and of a soil adapted to the generality of the trees intended to be raised in it: but that which is most in use, is for the supply of the flower-garden, and is the place where flowers are to be raised from their seeds, to procure varieties, or, as the florists express it, new flowers; as also for the sowing all the biennial plants, to succeed those which decay in the flower garden.

The *seminary* should always be situated at some distance from the house, and be walled or paled round, and kept under lock and key, to keep out dogs, &c. and to prevent a great deal of damage, that is frequently done by those who are not acquainted with gardening, before they are aware of it. The several directions, for the management of the *seminary*, are to be seen under the names of the several plants intended to be raised in it. *Miller's* Gard. Dict.

SEMINERVOSUS, in anatomy, a name given by Riolan, and some others, to a muscle of the thigh, more generally known by the name of the *semitendinosus*. The French in general, however, call it *le demi nerveux*. Cowper calls it *seminervosus seu semitendinosus*; and Albinus seems to claim the merit of ascertaining its true name of *semitendinosus*.

It is a long muscle, half fleshy and half tendinous, or like a nerve. It is situated a little obliquely on the posterior and inner part of the thigh. It is fixed above to the posterior part of the tuberosity of the ischium, immediately before, and a little more inward than the biceps. It is afterwards fixed by fleshy fibres to the tendons of the biceps, for about the breadth of three fingers, much in the same manner as the coraco-brachialis is fixed to the biceps of the arm. From thence it runs down fleshy toward the lower part of the inside of the thigh, having a sort of tendinous intersection in the inner part of its fleshy portion. Having reached below the middle of the thigh, it terminates in a small long round tendon, which runs down to the inside of the knee, beside that of the gracilis, where it expands in breadth. It is inserted in the inside of the upper part of the tibia, about two or three fingers breadth below the tuberosity of the spine, immediately under the tendon of the gracilis internus, with which it communicates. It has the same oblique form with the gracilis and sartorius, and sends off a like kind of aponeurosis. *Winslow's* Anatomy, p. 215.

SEMINIUM, a term used by the writers on fossils to express a sort of first principle, from which the several figured stones, or, as they are more usually called, the extraneous fossils, are supposed to have their origin.

The generality of the learned world, at this time, suppose these to be the remains of real shells, &c. brought from the sea to the places where they are now found, at the time of the universal deluge. See the article FIGURED *stones*.

But those who dissent from this system pretend, that these fossile bodies, though they exactly represent shells, &c. yet never were in the sea at all, but that their minute first principles, or, to use their own term, their *seminia* have been carried from the sea, through subterranean passages, to the places where we now find the compleat shells, &c. into which they have grown. Langius, who has written expresly on this subject, though he has candidly collected all that has been said in favour of the diluvian system, by the abettors of it, yet is not convinced by those arguments, but rather inclines to the other side of the question, or the rise of such fossils from *seminia*.

The substance of this hypothesis is as follows: that the sensible and perfectly formed seeds, or principles of growth of shell-fishes, and other sea productions, which, yet extremely small and light, is raised from among the flesh of putrid, or at least of dead sea fish of these kinds; and thence, by its extreme lightness, is wafted up and down in the water, and after that is raised among the vapours issuing from that water; and being then received into the air, fluctuate about in that vehicle also, till it is received into the pores or intestines of the earth; and when there, is wafted about by the ascent and motion of the vapours, and a number of other accidents, through the fissures of the several strata; and even through the pores of stone; and that it thus wanders about, at the will of such irregular agents, till in its course it chance to find some bed, or matrix, proper to its growth or expansion, and when received into that it adheres firmly to it, and is no more the sport of the passing exhalations, but remains there, till by the mediation of the subterranean heat its principles of growth are put in action, and its latent plastic power excited. Then they say, that by means of its seminal aura, and the lapidific, or petrifying nature of the place where it lies, all such fluid matter, as is fitted to make a part of its substance, is collected to it, and is petrified, or hardened into stone, and consequently that a stony body is thus found, of the same shape and figure in which a shelly one would have been formed in the sea, where there would have been no petrifying principle to have made it assume the nature of a stone.

The arguments used, in support of this hypothesis, are these. That there are difficulties attending every system, by which men have attempted to account for the finding of sea shells at the tops of mountains; but that this system is liable to less than the others, as it is much more easy to conceive how the *seminia*, or minute first principles of these things, should be carried to such distant and high places, than how the full grown bodies themselves should; and particularly, that it is very difficult to conceive how such large and tender shells, as those of the cornua ammonis, should be carried unhurt to such heights; though not very wonderful, that the *seminium* of such a shell should be carried thither, and there grow into the shape of its parent animal.

The congeries of extremely minute shells, that we find in some places immersed in hard stones, are urged as another argument against the diluvian hypothesis, as it is supposed that their tender structure in that state could never have supported the tossing about in an ocean of waters; and Langius adds to these general arguments two others, from the cornua ammonis of the fossile kingdom, which were in his own possession; the one of which he says was truly in an embryo state, and very incomplete, and the other had a vast number of small shells of other kinds enclosed in it, which he supposes to have grown there. To this he adds the impossibility, as it appears, of certain conchitæ, which are composed of thin laminæ, bearing the dashing of the waters, by which they must have been brought to the places where we find them, without being broken all to pieces, which yet are found whole and unhurt on mountains; and finally, that there occur in some stones the figures of shell-fish, of an uncommon, and even monstrous kind, such as it is supposed never existed in their mutilated or compleated figures in any living state.

These fossile shells are usually found throughout of one and the same substance, and that the most different imaginable from the substance of the living creatures which they represent; and often, though found in pairs, and perfectly closed on all sides, yet when broken they are found full of the substance of the stone in which they lie, and the armature of several kinds of them, particularly of many of the cornua ammonis, is supposed to plead greatly in favour of this hypothesis; as it is not of the nature of, or at all owing to the substance of the matrix, in which they lie, or of the matter of which they are formed, and is therefore to arise solely from the nature of the *seminium*, from which they are formed.

The immense number of the sea shells, as they are called, thus found fossile, is also thought to argue much on this side of the question; as the favourers of this hypothesis suppose that the sea could not, at any one time, have given up such numbers as the earth is stocked with, though there are no limits to the numbers supposed to be raised from *seminia*; and the immense columns of black marble, found in Ireland, and found of such regular joints, are brought as a proof of the possibility of such a formation of fossils as this from *seminia*, which they suppose must have given origin to those pillars.

The system of the deluge, as delivered by Woodward, is the hardest thing for the abettors of this doctrine of the *seminia* to get over; but tho' they affirm that this author's account is contrary to reason, and to the scripture account of that fatal catastrophe, yet it is not easy to account for many things, in regard to fossils, on any other foundation. They observe that as this deluge was universal, all places throughout the earth ought to have been furnished with fossile shells by it; but that this is not the case, since many large tracts of land have none of them. It is usually observed, that the deluge only could carry shells into the heart of mountains; but the assertors of this doctrine affirm, that this may be done according to their system, since the *seminia* of fossils may be as easily sustained in the air, as those of plants and animals, and that they may so be conveyed into the inmost recesses of the earth through pores and cracks, not visible to us: and they say, that when there they do not want a proper

proper nutritious matter, since the stony particles they find there are much of the nature of their natural shells in the sea.

The growth of the fossile shell from its *seminium* is supposed, by these writers, to be instantaneous, not progressive; and the reason they give for this is, that there is abundant matter for the formation of it in readiness altogether. They advance, that it is not at all more difficult for nature to form a shell from such a *seminium* in the earth than in the sea, provided all the necessary requisites are in readiness, which they suppose, in this case, to be plainly the fact; and they disallow the analogy between the formation of these bodies and crystals, because they observe that these are formed from *seminia*, those only from apposition of particles. They also observe that these shells, as they are formed in the earth, can never have been inhabitants of the sea in that form, because they never have any thing truly of the nature of shelly matter about them. This is, however, absolutely an error. The fossile nautili have usually a great deal of the true pearly matter of the shell about them, and all the arguments, given in favour of this strange hypothesis, seem as easily confuted. The reader has an opportunity, however, of examining this system in its full force; and on comparing it with the diluvian system, delivered under the article of FIGURED *stones*, will be able to judge whether the present age be in the right or not, in giving the preference to that system. *Langii* Hist. Lap. Fig.

SEMIORBICULARIS *labiorum*, a name given by Winslow, and others, to the muscle called by Albinus *orbicularis oris*, and by others *constrictor*, and *sphincter labiorum*.

SEMIREVERBERATORY *fire*, in chemistry, a term used to express such a reverberatory fire, in which the flame is only beaten back upon the bottom of the vessel.

SEMIS, among the Romans, the half of the *as*. See the article As, *Cycl.*

SEMISICILICUS, a word used by some pharmaceutic writers to express a drachm.

SEMISIDERATUS, a word used by some for a person struck with a hemiplegia.

SEMI-SOSPIRO, in the Italian music, a little pause, of the eighth part of a bar in common time. See PAUSE, REST, CHARACTER, *Cycl.*

SEMI-SPINALIS, a muscle, called also *transverso-spinalis dorsi*. It is a fleshy mass, which, from all the spinal and transverse apophyses of the back and loins, is extended in distinct fasciculi over the vertebræ themselves.

It is made up, like that of the neck, of several oblique converging muscles, the uppermost of which is fixed below to the third transverse apophysis of the back, and above to the first spinal apophysis. The lowest is fixed below to the third transverse apophysis of the loins, and above the last spinal apophysis of the back. They are divided by anatomists into the external, which are first discovered, and the internal, which lie immediately on the vertebræ. The external, from the first vertebra to the seventh inclusively, appear to be longer than the internal, which are covered by them. *Winslow*'s Anatomy, p. 248.

SEMI-SPINALIS *colli*, a muscle, called also *transverso-spinalis colli*, and taking into its composition all that fleshy mass, which lies between the transverse and spinal apophyses, from the second vertebra of the neck to the middle of the back, under the splenius and complexus major.

It is composed of several oblique converging muscles, which may be divided into external and internal, of which the external are the longest. These are fixed below to the transverse apophyses of the sixth, seventh, eighth, or ninth vertebræ of the back, by tendinous extremities, which as they ascend become fleshy, and mix with each other. Their superior insertions in the neck are six in number, whereof the first, which is tendinous, is in the seventh spinal apophysis, and the others, which are fleshy, are in the five next spinal apophyses. The internal are shorter, and more oblique than the external, and are partly covered by them. They are fixed, by their lower extremities, to the transverse apophyses of the three or four upper vertebræ of the back, and to the oblique apophyses of the four or five lower vertebræ of the neck, and by their other extremities, they are inserted in the six spinal apophyses of the neck. Some of these internal muscles are very short, lying wholly between the spinal apophyses, and the oblique or transverse apophyses next them. *Winslow*'s Anatomy, p. 243.

SEMISPINATUS, (*Cycl.*) in anatomy, a name given by Riolanus, and some others, to the muscle, more generally known by the name of *longissimus dorsi*.

SEMITALES, among the Romans, a name given to the Gods, who were the protectors of roads. See Hist. de l'Acad. des Inscrip. Vol. 2. p. 22.

SEMI-TONE, (*Cycl.*) in music, is of two kinds, distinguished by the addition of greater and less. The first is expressed by the ratio 16 to 15, or $\frac{16}{15}$; and the second by 25 to 24, or $\frac{25}{24}$. These two are so far from being nearly equal, as it is said in the Cyclopædia, from Malcolm, that they differ by a whole enharmonic diesis; which is an interval practicable by the voice [b], and was much in use among the antients, and not unknown even among the modern practitioners [c].—[b See DIESIS. c See Handel's Oratorio of Samson, in the second part of the song, *Return, return, O God of hosts*.]

SEMI-TONE *major*.—The octave contains ten *semi-tones major*, and two dieses, nearly; for the measure of the octave being expressed by the logarithm 1.000000, the *semi-tone major* will be measured by 0.093109. *Euler*, Tent. Nov. Theor. Mus. p. 107. See INTERVAL.

SEMI-TONE *minor*.—The octave contains seventeen *semi-tones minor*, nearly. If the measure of the octave be the logarithm 1.000000, the measure of the *semi-tone minor* will be 0.058894. *Euler*, Tent. Nov. Theor. Mus. p. 107. See the article INTERVAL.

SEMIVULPA, in zoology, a name by which Gesner, and some others, have called the *opossum*. See OPOSSUM.

SEMODIUS, or the sixth part of the amphora. See MODIUS and AMPHORA, *Cycl.*

SEMODIUS, among the Romans, a measure equal to half the modius, or the sixth part of the amphora. See MODIUS and AMPHORA, *Cycl.*

SEMONES, among the antients, a class of Gods that were of a middle nature, between the celestial and terrestrial Gods. Justin Martyr has mistaken one of these for Simon Magus. Mem. de l'Acad. des Inscrip. Vol. I. p. 270.

SEMYDA, in botany, the name of a tree, mentioned by Theophrastus, and by some supposed to be the same with the *betula*, or birch tree, but very erroneously.

Gaza indeed has translated the word by *betula*, and most of the later authors having consulted only the Latin translation, in their references to this author, have taken it upon credit that he meant the birch by this name.

Theophrastus says that the *samyda*, or *semyda*, has a leaf like the walnut tree, only something narrower; now that the *betula*, or birch tree, has no such leaf, every one must know that ever saw it. He says also, that the bark of the *semyda* is variegated. This as little agrees with the *betula*, as the use he says was made of it. It was esteemed the lightest of all woods, and therefore cut out into all things that required strength without much weight. The use of the birch in rods for malefactors, is as old as any thing we know; and had it been the birch that the author was here describing, he would not have omitted this use.

SENA, in botany, the name of a genus of plants, the characters of which are these. The flower is of the rosaceous kind, being usually composed of five petals, disposed in a circular form. The pistil finally becomes a pod of a flatted shape, usually somewhat crooked, and composed of two membranes, between which are lodged seeds, resembling grape stones, and divided from one another by thin partitions. See Tab. 1. of Botany, Class 21.

The species of *sena*, enumerated by Mr. Tournefort, are these. 1. The Alexandrian *sena* with sharp pointed leaves. 2. The Italian *sena* with obtuse leaves. And 3. the privet-leaved American *sena*. *Tourn.* Inst. p. 618.

The purgative virtue of this plant is found, though very different in degree, in infusion, according to the manner in which that infusion is made. In a cold infusion it purges very gently, but this, according to the time it remains in the water, is different in degree; and in a warm infusion it purges much more briskly. It is easy to see from this, that its operation is very difficult to ascertain, since the degree of heat, which it is not easy to reduce to any certainty, makes it stronger or weaker, though the quantity of the medicine be the same, and the variety of its effect depends on the manner in which it is penetrated by the water, which is to dissolve its active principles.

It is observed that the follicles, or pods of *sena*, operate more gently in infusion, than the *sena* itself: the reason of this is, that the texture of these pods is much more firm than that of the leaves, and therefore the water penetrates less into it, and extracts less of its active principles. It is certain that these pods are equally purgative with the leaves, nay every part of the plant is so; the very stalks, or pedicles of the leaves, having as much virtue as the rest, but only requiring a longer time to boil, to communicate it to water, because of their closer texture. See the article INFUSION.

The most certain way, therefore, of giving this medicine is in the form of Mr. Geoffroy's dry extract, which is made of a very strong infusion, evaporated to a dry and pulverisable substance, easily taken, and of no ill taste, and which operates in a very small quantity, one third part containing the virtue of the whole, or nearly so; the nicest calculations shewing, that twenty four grains of the extract, some part of which may be supposed to be earth, or other accidental or useless matter, possesses the virtues of a drachm in substance. Mem. de l'Acad. des Scienc. Par. 1738.

SENATE (*Cycl.*)—It has been a question among the learned how senators were created, and how the vacancies of the *senate* in old Rome were supplied.

Dr. Middleton is of opinion, that the constant and regular supply of the *senate* was from the annual magistrates; who, by virtue of their several offices, acquired an immediate right to sit and vote in that assembly. The usual gradation of these offices was that of quæstor, tribune of the people, ædile,

ædile, prætor, and conſul; which every candidate, in the ordinary forms of the conſtitution, was obliged to take in their order, with this exception only, that he might forego either the tribunate, or the ædileſhip, at his own choice, without a neceſſity of paſſing through them both. *Middleton's* Treat. of Rom. Senate, p. 6. See the articles QUÆSTOR, TRIBUNE, &c.

But though theſe offices gave both an immediate right, and actual entrance into the *ſenate*, yet the ſenatorian character was not eſteemed complete, till the new ſenators had been enrolled by the cenſors at the next luſtrum, or general review of all the orders of the city, which was generally held every five years. Yet this enrolment was but a matter of form, which could not be denied to any of them, except for ſome legal incapacity, or the notoriety of ſome crime, or infamy upon their characters; for which the ſame cenſors could expel, or deprive any other ſenator, of what rank or ſtanding ſoever. *Middleton* of Rom. Sen. p. 8. See the article CENSOR.

M. Vertot ſeems to perplex the queſtion; firſt, by conſidering the authority of the people, and that of the cenſors, as oppoſite and inconſiſtent with each other in the creation of ſenators, whereas they were both of them jointly neceſſary to make the act complete. Secondly, by aſſerting the cenſorian power to be the original and principal in that affair, whereas it was but ſecondary, or miniſterial to the ſovereign prerogative of the people. *Middleton* of Rom. Sen. p. 13.

It has been the opinion of ſome, that under the kings of Rome the choice and nomination of all the ſenators depended wholly on the will of the prince, without any right in the people, either direct or indirect; and the conſuls, who ſucceeded to the kingly power, enjoyed the ſame prerogative, till the creation of the cenſors, who ever after poſſeſſed the ſole and abſolute right of making and unmaking ſenators. But Dr. Middleton is of opinion, that the kings, the conſuls, and the cenſors, acted in this affair but miniſterially, and ſubordinately to the ſupreme will of the people, in whom the proper and abſolute power of creating ſenators always reſided. And the Doctor aſſures us, upon the ſtricteſt ſearch into the ſtate of the preſent queſtion, as it ſtood under the kingly government, he cannot but conclude, from the expreſs teſtimony of the beſt hiſtorians, the concurrence of ſimilar facts, and the probability of the thing itſelf, that the right of chuſing ſenators was originally and conſtitutionally veſted in the people. *Middleton* of Rom. Sen. p. 36.

The ſupreme power at home was in the collective body of the people, yet where haſte perhaps, or ſecrecy was required, and where the determinations of the *ſenate* were ſo juſt and equitable, that the conſent of the people might be preſumed, and taken for granted, the *ſenate* would naturally omit the trouble of calling them from their private affairs, to an unneceſſary attendance on the public; till by repeated omiſſions of this kind, begun at firſt in trivial matters, and proceeding inſenſibly to more ſerious, they acquired a ſpecial juriſdiction and cognizance in many points of great importance, to the excluſion even of the people; who yet, by the laws and conſtitution of the government, had the abſolute dominion over all. For example:

1. They aſſumed to themſelves the guardianſhip and ſuperintendence of the public religion; ſo that no new God could be introduced, nor altar erected, nor the Sibylline books conſulted, without their expreſs order. *Liv.* 9. 46. *Tertull.* Apol. 5. *Cic.* de Div. 54. ib. 1. 48.

2. They held it as their prerogative, to ſettle the number and condition of the foreign provinces, that were annually aſſigned to the magiſtrates, and to declare which of them ſhould be conſular, and which prætorian provinces. *Cic.* pro Dom. 9. Vid. in Vatin. 15.

3. They had the diſtribution of the public treaſure, and all the expences of the government; the appointment of ſtipends to their generals, with the number of their lieutenants and their troops, and the proviſions and cloathing of their armies. *Polyb.* l. 6. 461. *Cic.* pro Balb. 27.

4. They nominated all ambaſſadors ſent from Rome, out of their own body, and received and diſmiſſed all who came from foreign ſtates, with ſuch anſwers as they thought proper. *Cic.* in Vatin. Vid. *Polyb.* 461.

5. They had the right of decreeing all ſupplications, or public thankſgivings, for victories obtained, and of conferring the honour of an ovation, or triumph, with the title of emperor on their victorious generals. *Liv.* 5. 23. *Cic.* Phil. 14. 4, 5.

6. It was their province to inquire into public crimes or treaſons, either in Rome, or the other parts of Italy; and to hear and determine all diſputes among the allied and dependent cities. *Polyb.* 461. *Liv.* 30. 26. *Cic.* Off. 1. 10.

7. They exerciſed a power, not only of interpreting the laws, but of abſolving men from the obligation of them, and even of abrogating them. *Cic.* pro Dom. 27. pro Cornel. 1. pro Leg. Manil. 21. *Val. Maxim.* 8. 15. It. *Cic.* Phil. 5.

8. In the caſe of civil diſſenſions, or dangerous tumults within the city, they could arm the conſuls by a vote with abſolute power, to deſtroy and put to death, without the formality of a trial, all ſuch citizens as were concerned in exciting them. *Salluſt.* de Bell. Catilin. 29. *Cic.* in Cat. 1. 11.

9. They had a power to prorogue, or poſtpone the aſſemblies of the people, to decree the title of king to any prince whom they pleaſed; thanks and praiſe to thoſe who had deſerved them; pardon and reward to enemies, or the diſcoverers of any treaſon; to declare any one an enemy by a vote; and to preſcribe a general change of habit to the city, in caſes of any imminent danger or calamity. *Cic.* Epiſt. ad Att. 4. 16. pro Mur. 25. pro Deiat. 3. Vid. *Liv.* 30. 17. *Salluſt.* Bell. Cat. 30. *Cic.* in Catil. 4. 3. 3. 4. Phil. 11. 12. Ep. Fam. 12. 10. pro Sext. 12. *Middleton*, ibid. p. 118. ſeq.

The tribunes ſoon ſnatched from them that original right, which they had enjoyed from the very foundation of the city, of being the authors, or firſt movers of every thing, which was to be enacted by the people, and excluded them from any ſhare or influence in the aſſemblies of their tribes [d]: and though in the other aſſemblies of the curiæ and the centuries, they ſeemed to have reſerved to them their antient right, yet it was reduced to a mere form, without any real force; for inſtead of being what they had always been, the authors of each particular act, that was to be propoſed to the people's deliberation, they were obliged, by a ſpecial law, to authoriſe every aſſembly of the people, and whatever ſhould be determined in it, even before they had proceeded to any vote [e]. And C. Gracchus afterwards, in his famous tribunate, uſed to boaſt that he had demoliſhed the *ſenate* at once, by transferring to the equeſtrian order the right of judicature in all criminal cauſes, which the *ſenate* had poſſeſſed from the time of the kings [f].—[[d] Vid. *Dionyſ. Hal.* l. 41. 49. *Cic.* pro Planc. 3. [e] *Liv.* 8. 12. [f] *Appian.* de Bell. Civ. l. 1. *Middleton*, ibid. p. 125, ſeq.]

In the early ages of the republic, when the precincts of the city were ſmall, the ſenators were perſonally ſummoned by an apparitor [g]; and ſometimes by a public crier, when their affairs required immediate diſpatch [h]: but the uſual way of calling them, in later days, was by an edict, appointing the time and place, and publiſhed ſeveral days before, that the notice might be more public [i]. Theſe edicts were commonly underſtood to reach no farther than to thoſe who were reſident in Rome, or near it; yet when any extraordinary affair was in agitation, they ſeem to have been publiſhed alſo in the other cities of Italy [k]. If any ſenator refuſed, or neglected to obey this ſummons, the conſul could oblige him to give ſurety for the payment of a certain fine, if the reaſons of his abſence ſhould not be allowed [l]. But from ſixty years of age they were not liable to that penalty, nor obliged to any attendance, but what was voluntary [m].—[[g] *Cic.* de Sen. 16. [h] *Liv.* 3. 38. *App.* Bell. Civ. 1. [i] *Cic.* Phil. 3. 8. [k] *Cic.* de J. Cæſare ad Att. 9. 17. [l] *Liv.* 3. 38. *Cic.* Phil. 1. 5. [m] *Middleton* of Rom. Senate, p. 130, ſeq.]

The *ſenate* could not regularly be aſſembled in any private or profane place, but always in one ſet apart, and ſolemnly conſecrated to that uſe by the rites of augury. *A. Gell.* 14. 7. *Middleton*, ibid. p. 133.

The *ſenate* frequently met in certain curiæ. See CURIA. But their meetings were more commonly held in certain temples, dedicated to particular deities; as in that of Jupiter, Apollo, Mars, Vulcan, Caſtor, Bellona; of Concord, Faith, Virtue, the Earth, &c. *Middleton*, ibid. 134.

Theſe temples, on account of the uſe which the *ſenate* made of them, were called likewiſe *curiæ*; as well as the proper curiæ, or *ſenate* houſes, on account of their ſolemn dedication, are frequently called temples. *A. Gell.* 14. 7. *Cic.* pro Mil. 33. *Alex. Sev.* c. 6.

The *ſenate* uſed to meet on ſome occaſions in the open air, and eſpecially whenever a report was made to them in form, that an ox had ſpoken; which prodigy, as Pliny tells us, was common in the earlier ages. *Liv.* 26. 10. *Plin.* Hiſt. Nat. 8. 45. *Middleton*, ibid. p. 135, ſeq.

On two ſpecial occaſions the *ſenate* was always held without the gates of Rome, either in the temple of Bellona, or of Apollo. 1ſt. For the reception of foreign ambaſſadors; and eſpecially of thoſe who came from enemies, who were not permitted to enter the city. 2dly. To give audience, and tranſact buſineſs with their own generals, who were never allowed to come within the walls, as long as their commiſſion ſubſiſted, and they had the actual command of an army. *Liv.* 34. 43. Id. 42. 36. Id. 36. 39. *Senec.* de Benef. 5. 15. *Middleton*, ibid. p. 137, ſeq.

The *ſenate* met always of courſe on the firſt of January, for the inauguration of the new conſuls, who entered into their office on that day. *Middleton*, ibid. p. 140, ſeq.

The month of February, generally ſpeaking, was reſerved intire by old cuſtom to the *ſenate*, for the particular purpoſes of giving audience to foreign ambaſſadors. *Cic.* ad Frat. 2. 3. *Aſcon.* in Verr. 1. 35. Ep. ad Fra. 2. 12.

In all months, univerſally, there were three days, which ſeem to have been more eſpecially deſtined to the *ſenate*, the kalends, nones, and ides, from the frequent examples found in hiſtory, of its being convened on thoſe days. But Au-

gustus enacted afterwards, that the *senate* should not meet regularly, or of course, except on two days only of each month, the kalends and ides. *Suet*. Aug. 35. *Middleton*, ibid. p. 142.

On their days of meeting, they could not enter upon any business before the sun was risen, nor finish any after it was set; every thing transacted by them, before or after that time, was null and void, and the author of it liable to censure [n]. Whence it became a standing rule, that nothing new should be moved after four o'clock in the afternoon [o].—[[n] *A. Gell*. 14. 7. [o] *Middleton*, ibid. p. 143.]

The *senate*, as has been shewn above, was composed of all the principal magistrates of the city, and of all who had borne the same offices before them; and consisted therefore of several degrees and orders of men, who had each a different rank in it, according to the dignity of the character which he sustained in the republic.

At the head of it sat the two consuls in chairs of state [p]. Manutius thinks that the other magistrates sat next to the consular chair, each according to his rank; the prætors, censors, ædiles, tribunes, quæstors [q]. But Dr. Middleton rather thinks that the consular senators, who, in all ages of the republic, were the leaders and first speakers in the *senate*, used to sit next in order to the consuls; and after them the prætors, and all who were of prætorian dignity, or had been prætors; then the ædiles, the tribunes, and the quæstors, on distinct benches; and on the same bench with each, all who had borne the same offices: but the curule magistrates, as the prætors and ædiles, were perhaps distinguished, at the head of their several benches, by seats somewhat raised, or separated at least from the rest, in the form of our settees, or of that *longa cathedra*, which Juvenal [r] mentions, to denote the curule dignity.—[[p] *Cic*. in Cat. 4. 1. [q] Vid. *Paul Manut*. de Senatu Rom. cap. 9. [r] Sat. 9. 52. *Middleton*, ibid. p. 144, seq.]

All the private senators sat on different benches, and in a different order of precedency, according to the dignity of the magistracies which they had severally borne. First the consulars, then the prætorians, ædilitians, tribunitians, and quæstorians; in which order, and by which titles, they are all enumerated by Cicero [s]. And as this was their order in sitting, so it was the same also in delivering their opinions, when it came to their turn.—[[s] *Cic*. Phil. 13. 13, 14.]

The *senate* being assembled, the consuls, or the magistrate, by whose authority they were summoned, having first taken the auspices, and performed the usual office of religion, by sacrifice and prayer, used to open to them the reasons of their being called together, and propose the subject of that day's deliberation; in which all things divine, or relating to the worship of the Gods, were dispatched preferably to any other business [t]. When the consul had moved any point, with intent to have it debated and carried into a decree, and had spoken upon it himself as long as he thought proper, he proceeded to ask the opinions of the other senators, severally by name, and in their proper order, beginning always with the consulars, and going on to the prætorians, &c. It was the practice originally to ask the prince of the *senate* the first; but that was soon laid aside, and the compliment transferred to any other antient consular, distinguished by his integrity and superior abilities; till in the later ages of the republic, it became an established custom to pay that respect to relations, or particular friends, or to those who were likely to give an opinion the most favourable to their own views and sentiments on the question proposed [u]. But whatever order the consuls observed, in asking opinions on the first of January, when they entered into their office, they generally pursued the same through the rest of the year. Julius Cæsar indeed broke through this rule; for though he had asked Crassus the first, from the beginning of his consulship, yet, upon the marriage of his daughter with Pompey, he gave that priority to his son-in-law, for which, however, he made an apology to the *senate* [w].—[[t] *A. Gell*. 14. 7. [u] Ibid. [w] *Suet*. Jul. Cæsar. 21. *A. Gell*. 4. 10.]

This honour of being asked in an extraordinary manner, and preferably to all others of the same rank, though of superior age or nobility, seems to have been seldom carried farther than to four or five distinguished persons of consular dignity [x]; and the rest were afterwards asked according to their seniority. And this method, as has been said, was observed generally throughout the year, till the election of the future consuls, which was commonly held about the month of August; from which time, it was the constant custom to ask the opinions of the consuls elect, preferably to all others, till they entered into their office, on the first day of January following [y].—[[x] *Cic*. ad Attic. 1. 13. *A. Gell*. 4. 10. [y] *Cic*. Epist. Fam. 8. 4. Vid. It. in Phil. 5. 13. *Middleton*, ibid. p. 149, seq.]

As the consuls elect had this preference given in speaking before all the consulars, so the prætors, and tribunes elect, seem to have had the same, before the rest of their particular orders. Vid. *Sallust*. Bell. Cat. 51, 52. *Cic*. Ep. ad Att. l. 12. 21. It. *Pigh*. Annal.

None were allowed to speak till it came to their turn, excepting the magistrates, who seem to have had a right of speaking on all occasions, whenever they thought fit; and for that reason, perhaps, were not particularly asked, or called upon by the consuls. *Middleton*, ibid. p. 153.

Several different motions might be made, and different questions be referred to the *senate* by different magistrates, in the same meeting [b]. And if any business of importance was expected or desired, which the consuls had omitted to propose, or were unwilling to bring into debate, it was usual for the *senate*, by a sort of general clamour, to call upon them to move it; and upon their refusal, the other magistrates had a right to propound it, even against their will [c]. If any opinion, proposed to them, was thought too general, and to include several distinct articles, some of which might be approved, and others rejected, it was usual to require that it might be divided, and sometimes by a general voice of the assembly calling out *divide*, *divide* [d].—[[b] *Cic*. Phil. 7. 1. [c] *Liv*. 30. 21. *Cic*. Ep. Fam. 10. 16. *Cic*. pro Leg. Man. 19. [d] *Senec*. Epist. 21. *Cic*. Ep. Fam. 1. 2. Vid. *Ascon*. in Orat. pro Mil. 6.]

If in the debate several different opinions had been offered, and each supported by a number of senators, the consul, in the close of it, used to recite them all, that the *senate* might pass a vote separately upon each: but in this he gave what preference he thought fit to that opinion which he most favoured, and sometimes even suppressed such of them, as he wholly disapproved. *Cæs*. Comm. Bell. Civ. 429.

In cases, however, where there appeared to be no difficulty or opposition, decrees were sometimes made, without any opinion being asked or delivered upon them. *Cic*. Phil. 1. 1.

When any question was put to the vote, it was determined always by a division, or separation of the opposite parties, to different parts of the *senate* house; the consul, or presiding magistrate, having first given order for it in this form: *Let those, who are of such an opinion, pass over to that side; those, who think differently, to this*. *Fest*. in voc. *Cic*. Ep. Fam. 1. 2.

What the majority of them approved was drawn up into a decree, which was generally conceived in words prepared and dictated by the first mover of the question, or the principal speaker in favour of it; who, after he had spoken what he thought sufficient to recommend it to the *senate*, used to conclude his speech, by summing up his opinion in the form of such a decree as he desired to obtain [e]. Which decree, when confirmed by the *senate*, was always signed and attested by a number of senators, who chose to attend thro' the whole process of it, for the sake of adding their names to it, as a testimony of their particular approbation of the thing, as well as of respect to the person, by whose authority, or in whose favour it was drawn [f].—[[e] Vid. *Cic*. Philip. 3. 5. 89. x. 13. 14. [f] *Cic*. Ep. Fam. 15. 6. It. 8. 8. *Middleton*, ibid. 156, seq.]

When the *senate* appeared to be disposed, and ready to pass a decree, it was in the power of any one of the ten tribunes of the people to intercede, that is, to over-rule it. See the article INTERCESSION.

In all cases, where the determinations of the *senate* were over-ruled by the negative of a tribune, of which there are numberless instances, if the *senate* was unanimous, or generally inclined to the decree so inhibited, they usually passed a vote to the same purpose, and in the same words, which was called *an authority of the senate*, and was entered into their journals. *Cic*. Ep. Fam. 1. 2. *Liv*. 4. 57. Vid. *Dio*. 55. 550. See SENATUS *auctoritas*.

In order to deter any magistrate from acting factiously and arbitrarily, in affairs of importance, they often made it part of the decree, which they were going to enact, that if any one attempted to obstruct it, he should be deemed to act against the interest of the republic [g]. Yet this clause had seldom any effect on the hardy tribunes, who used to apply their negative in defiance of it as freely, as on any other more indifferent occasion [h].—[[g] *Cic*. Ep. Fam. 88. ad Att. 4. 2. [h] *Middleton*, ibid. p. 160, seq.]

The factious, and leaders of parties, had several arts of obstructing, or postponing a decree, by many pretexts and impediments which they could throw in its way. Sometimes they alledged scruples of religion, that the auspices were not favourable, or not rightly taken; which, if confirmed by the augurs, put a stop to the business for that day [i]. At other times, they urged some pretended admonition from the Sibylline books, which were then to be consulted and interpreted to a sense, that served their purpose [k]. But the most common method was to wast the day, by speaking for two or three hours successively, so as to leave no time to finish the affair in that meeting: yet when some of the more turbulent magistrates were grossly abusing this right, against the general inclination of the assembly, the senators were sometimes so impatient as to silence them, as it were, by force, and to disturb them in such a manner, by their clamour and hissing, as to oblige them to desist [l].—[[i] *Cic*. Ep. Fam. 10. 12. [k] *Dio*. 39. p. 98. *Cic*. ad Fra. 2. 2. *Cic*. Ep. Fam. 1. 1. [l] *A. Gell*. 4. 10. *Cic*. ad Att. 4. 2. *Middleton*, ibid. 162, seq.]

It seems probable that a certain number of senators was required by law, as necessary to legitimate any act, and give force to a decree: yet there is no certain number specified by any of the old writers, except in one or two particular cases. *Middleton*, ibid. p. 164, seq.

The decrees of the *senate* were usually published, and openly read to the people soon after they were passed; and an authentic copy of them was always deposited in the public treasury of the city, or otherwise they were not considered as legal or valid. *Cic.* Phil. 5. 4. *Tacit.* Ann. 3. 51. *Middleton*, ibid. p. 166, seq.

As to the force of these decrees, it is difficult to define precisely what it was. It is certain that they were not considered as laws, but seem to have been designed originally as the ground-work, or preparatory step to a law, with a sort of provisional force, till a law of the same tenor should be enacted in form by the people; for in all ages of the republic, no law was ever made, but by the general suffrage of the people. *Middleton*, ibid. p. 167, seq.

Even under the kings, the collective body of the people was the real sovereign of Rome, and the dernier resort in all cases. But their power, though supreme and final, was yet qualified by this check, that they could not regularly enact any thing, which had not been previously considered and approved of by the *senate* [m]. This indeed continued to be the general way of proceeding in all quiet and regular times, from the beginning of the republic to the end of it: and the constant style of the old writers, in their accounts of the public transactions, is, that the *senate* voted or decreed, and the people commanded such and such an act [n].—[[m] *Dionys. Hal.* l. 7. 38. Edit. Oxon. *Middlet.* of Rom. Sen. p. 115. [n] *Liv.* 37. 35. *Middleton*, ibid. p. 117.]

SENATOR (*Cycl.*)—In antient Rome, the number of *senators* is commonly supposed to have been limited to three hundred, from the time of the kings to that of the Gracchi. But this must not be taken too strictly. The senate generally had that number, or thereabouts, and upon any remarkable deficiency, was filled up again to that complement by an extraordinary creation. But as the number of the public magistrates increased with the increase of their conquests and dominions, so the number of the senate, which was supplied of course by those magistrates, must be liable also to some variation. Sylla, when it was particularly exhausted, added three hundred to it at once from the equestrian order, which might probably raise the whole number to about five hundred; and in this state it seems to have continued, till the subversion of their liberty by Jul. Cæsar. For Cicero [o], in an account of a particular debate, in one of his letters to Atticus, mentions four hundred and fifteen to have been present at it, which he calls a full house [p].—[[o] Ad Attic. l. 1. 14. [p] *Middlet.* of Rom. Sen. p. 93, seq.]

In antient Rome, a certain age was required for a *senator*, as is often intimated by the old writers, though none of them have expressly signified what it was. The legal age for entring into the military service was settled, by Servius Tullius, at seventeen years [q]; and they were obliged, as Polybius [r] tells us, to serve ten years in the wars, before they could pretend to any civil magistracy. This fixes the proper age of suing for the quæstorship, or the first step of honour, to the twenty eighth year; and as this office gave an admission into the senate, so the generality of the learned seem to have given the same date to the *senatorian* age. Some writers indeed, on the authority of Dion Cassius, have imagined it to be twenty five years; not reflecting that Dion mentions it there as a regulation only, proposed to Augustus by his favourite, Mæcenas [s]. Dr. Middleton takes the quæstorian age, which was the same with the *senatorian*, to have been thirty years complete [t].—[[q] *A. Gell.* 10. 28. [r] *Polyb.* de Instit. rei milit. l. 6. p. 466. [s] Vid. *Dio.* l. 52. p. 477. *Lips.* de Magistratib. Rom. [t] *Middleton* of Rom. Sen. p. 96.]

The laws concerning the age of magistrates were not very antient; and were made to check the forward ambition of the nobles, and to put all the citizens upon a level in the pursuit of honours [t]. And Livy [u] tells us, that L. Villius, a tribune of the people, was the first who introduced them, A. U. 573, and acquired by it the surname of Annalis [w].—[[t] *Cic.* Phil. 5. 17. [u] Lib. 40. 44. [w] *Middlet.* of Rom. Sen. p. 99.]

There was another qualification also required, as necessary to a *senator*, an estate proper to support his rank, the proportion of which was settled by the law. We may collect from Suetonius, that it was settled at eight hundred sestertia before the reign of Augustus [x], which are computed to amount to between six and seven thousand pounds of our money; and must not be taken, as it is by some, for an annual income, but the whole estate of a *senator*, real and personal, as estimated by the survey and valuation of the censors [y].—[[x] *Sueton.* in Aug. cap. 41. [y] *Middleton*, ibid. p. 100.]

This proportion of wealth may seem perhaps too low, and unequal to the high rank and dignity of a Roman *senator*, but it must be considered only as the lowest to which they could be reduced; for whenever they sunk below it, they forfeited their seats in the senate. *Middlet.* ibid. p. 101.

There was some law also subsisting from the earliest times, concerning the extraction and descent of *senators*, injoining that it should always be ingenuous; and as their morals were to be clear from all vice, so their birth likewise from any stain of base blood. In consequence of which, when Appius Claudius, in his censorship, attempted to introduce the grandsons of freed slaves into the senate, they were all immediately turned out again. *Middleton*, ibid. p. 104.

These are some of the laws by which the censors were obliged to act, in the enrollment of the new, or the omission of old *senators*: and when we read of any left out, without any intimation of their crime, it might probably be for the want of one or other of these legal, or customary qualifications. *Middleton*, ibid. p. 106.

It was from the *senatorian* order alone, that all ambassadors were chosen and sent to foreign states: and when they had occasion to travel abroad, even on their private affairs, they usually obtained from the senate the privilege of a free legation, as it was called; which gave them a right to be treated every where with the honours of an ambassador, and to be furnished on the road with a certain proportion of provisions and necessaries, for themselves and their attendants [b]: and as long as they resided in the Roman provinces, the governors used to assign them a number of lictors, or mace-bearers, to march before them in state, as before the magistrates in Rome [c]. And if they had any law-suit, or cause of property depending in those provinces, they seem to have had a right to require it to be remitted to Rome [d].—[[b] *Cic.* Epist. Fam. 11. 1. It. ad Att. 15. 11. *Cic.* Ep. Fam. 12. 21. *Suet.* in Tiber. 31. [c] *Cic.* Ep. Fam. 12. 21. [d] *Cic.* ibid. 13. 26. *Middleton*, ibid. p. 173, seq.]

At home, likewise, they were distinguished by peculiar honours and privileges; for at the public shews and plays they had particular seats apart, and appropriated to them, in the most commodious part of the theatre [e]: and on all solemn festivals, when sacrifices were offered to Jupiter by the magistrates, they had the sole right of feasting publickly in the capitol, in habits of ceremony, or such as were proper to the offices which they had borne in the city [f].—[[e] *Cic.* pro Clu. 47. Vid. It. *Plutarch.* in Flaminin. p. 380. A. [f] *Suet.* Aug. 35. *A. Gell.* 12. 8. *Dionys.* 55. 554. C. *Middlet.* ibid. 175, seq.]

The peculiar ornament of the *senatorian* tunic was the *latus clavus*, as it was called, being a broad strip of purple sewed upon the forepart of it, and running down the middle of the breast, which was the proper distinction between them and the knights, who wore a much narrower stripe of the same colour, and in the same manner [g]. The fashion also of their shoes was peculiar, and different from that of the rest of the city: this difference appeared in the colour, shape, and ornament of the shoes. The colour of them was black, while others wore them of any colour perhaps, agreeable to their several fancies; the form of them was somewhat like to a short boot, reaching up to the middle of the leg, as they are sometimes seen in antient statues and bas-reliefs; and the proper ornament of them was an half moon sewed, or fastened upon the forepart of them, near the ancle [h].—[[g] *Suet.* Jul. Cæs. 80. *Plin.* Hist. 33. 1. [h] *Juv.* 7. 192. *Hor.* sat. 1. 6. 28. *Middlet.* ibid.]

Consuls, prætors, ædiles, tribunes, &c. during the year of their magistracy, always wore the prætexta, or a gown bordered round with a stripe of purple [i]. In which habit also, as has been signified above, all the rest of the senate, who had already borne those offices, used to assist at the public festivals and solemnities [k].—[[i] *Cic.* post. red. in Sen. 5. [k] *Cic.* Phil. 2. 43. *Senec.* Controv. l. 1. 8. *Middleton*, ibid. p. 176, seq.]

As to other matters, relating to Roman *senators*, see SENATE, *supra*.

SENATUS *auctoritas*. In cases where the determinations of the senate were over-ruled by the negative of a tribune, if the senate was generally inclined to the decree so inhibited, they usually passed a vote to the same purpose, and in the same words, which, instead of a decree, was called *senatus auctoritas*, or the authority of the senate, and was entered into their journals; yet had no other force than to testify the judgment of the senate on that particular question, and to throw the odium of obstructing an useful act on the tribune who hindered it. Vid. *Cic.* Ep. Fam. l. 2. & 8. 8. ad Attic. 4. 2. *Liv.* 4. 57. *Dionys.* 55. 550. *Middlet.* of Rom. Senate, p. 161, 162. See SENATE.

SEND, is used by seamen, when a ship, either at an anchor or under sail, falls with her head, or stern, deep into the trough of the sea, *i. e.* into a hollow made between two waves, or billows. They say she *sends* much that way, whether it be a-head or a-stern.

SENDAL, in our old writers, a kind of thin fine silk, mentioned in the Stat. 2. Rich. II. cap. 1. *Blount.*

SENECIO, *groundsel*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the flosculous kind, being composed of several small floscules, divided into many segments at the ends, and contained in a one-leaved cup; which is first of a cylindric shape, and afterwards of a conic, and is divided into many segments at the

the end, which, as the feed comes to maturity, ufually turn downwards and backwards. The flofcules ftand on embryos, which finally ripen into feeds, winged with down.

The fpecies of *groundfel*, enumerated by Mr. Tournefort, are thefe. 1. The common fmall *groundfel*. 2. The taller *groundfel* with ragwort leaves. 3. The tall, large-leaved American *groundfel*. And 4. the American *groundfel* with bluifh purple flowers. *Tourn.* Inft. p. 456.

The common *groundfel*, taken in a ftrong infufion, is an emetic. It is prefcribed in fmaller dofes in dropfies, jaundices, and hæmorrhages. Externally it is ufed in ointments againft cutaneous foulneffes.

SENECTA *anguium*, the exuviæ, or floughs of ferpents. The fnakes caft their whole fkin, and with it were fuppofed to caft off their age, and be born anew; whence the name of thefe caft fkins. A decoction, or infufion of thefe, is recommended by medical writers againft pains of the ears and eyes; and fome fuperftitious people recommend it to women, to tye about their waftes, to prevent mifcarriages, and about their thighs, in time of labour, to haften delivery.

SENEKA, *rattlefnake-root*. This is a root lately brought into ufe among us, and which feems to deferve very great regard. It is the root of a fpecies of *polygala*, or milkwort, diftinguifhed by Gronovius, in his *Flora Virginica*, under the name of the erect *polygala* with a fimple ftalk, with oval leaves pointed at the end, and with an erect clufter of flowers. We generally call it the *rattlefnake-root*, and the French, from the place whence it comes, *Seneka*. See POLYGALA.

The *root* is perennial, the thicknefs of it is generally about that of a man's little finger. It is four or five inches, or more, in length, and is varioufly contorted and twifted, and divides into many branches, furnifhed with fmall fibres, and with a membranaceous rim running all along it. It is yellowifh on the outfide, and white within; very acrid, and fomewhat bitter to the tafte, and has fomewhat of an aromatic flavour. From this *root* arife numerous ftalks, all fimple, and without branches; fome lie on the ground, others ftand erect. Thefe are ten or twelve inches high, when full grown. The leaves ftand alternately on the ftalks, and the flowers are white, and perfectly like thofe of our own kinds of polygala.

Dr. Tennent, who brought over a vaft quantity of this *root* from America fome years ago, and took great pains to introduce it into practice, praifes it very largely as a diuretic, a diaphoretic, and an alexipharmic, and a very powerful attenuant and refolvent. He fays it will fometimes vomit and purge.

The Indians firft taught the ufe of it to the Europeans: they efteem it a fovereign remedy againft the bite of the *rattlefnake*; and Dr. Tennent affures us that he faw two perfons, who had been bitten by this creature in the month of July, when its poifon is moft fatal, perfectly reftored to health by it.

He afterwards gave it in pleurifies and peripneumonies with great fuccefs, and in all other cafes where the blood is infpiffated. If the firft dofes of it provoke a vomiting, it is not at all the worfe, except in cafes in which the patient is very weak; and in fuch this effect is eafily prevented, by giving fome of the teftaceous powders with it.

In pleurifies it is beft to take away ten ounces of blood, before the entering on the ufe of the medicine; in other cafes no precaution is required, but it is to be given in powder, or tincture, in white wine, and the ordinary drink, during the ufe of it, fhould be marfhmallow tea. *Gronov.* Flora Virgin. p. 80. *Geoffroy*, Mat. Med. Vol. 2. p. 140. *Tennent's* Effay on the Pleurify.

This medicine may be given either in powder or decoction; but Dr. Tennent prefers the decoction, having obferved it to give relief fooner than the powder does. The dofe of the powder is thirty five grains, and he gives at once three fpoonfuls of the decoction, prepared by boiling three ounces of the *root* bruifed in a quart of water to near the half. The dofe is repeated every fix hours. He is alfo fond of this *root* in the rheumatifm, dropfy, and gout, in which laft difeafe, he fays, he has given it with fuccefs. See his letter concerning the *Seneka*, or *rattlefnake-root*.

Meffrs. Lemery, Du Hamel, and Juffieu, vouch for the good effects of the *Seneka-root* in pleurifies, and other inflammatory difeafes. Mem. de l'Acad. des Scienc. 1739.

SENEMBI, in zoology, the name of a fpecies of Brafilian lizard, more commonly known by the name *iguana*. See IGUANA.

SENESCHALLO *et marefhallo quod non teneant placita de libero tenemento*, a writ, directed to the fteward and marfhal of England, inhibiting them to take cognizance of an action in their court that concerns freehold. Reg. Orig. 185, 191. *Blount, Cowel.*

SENORIÆ, in botany, a name by which fome authors have called the bonana-tree, or *mufa fructu breviore*. Jonf. Dendr. p. 143.

SENSITIVE (*Cycl.*)—SENSITIVE *fluid*. Some have imagined a *fenfitive fluid* as the principle that preferves animals from corruption, and to which we owe our fenfation and motion. This animal fluid paffes in the proper nervous tubes to the organs of motion, but is contained in the fibrous coats of the nerves to become an organ of fenfation. This *fenfitive fluid* is, according to Mr. Le Cat, capable of thinking, and is fo modified by the ganglions, that what is lodged in each part, is capable of being impreffed by the object proper to each organ. And from the doctrine concerning this animal fluid, he endeavours to account for moft operations, which are generally faid to depend on the foul. Med. Eff. Edinb. Abrid. Vol. 2. p. 481.

But all thefe attempts to account for fenfation and thought, from the properties of matter, feem to be very defperate undertakings, not to fay abfurd.

SENSITIVE *plant*. This is an herb fufficiently known to the world for its remarkable property of receding from the touch, and giving figns, as it were, of animal life. Philofophers in general have, however, contented themfelves with admiring the fact, without giving themfelves any trouble about the caufe.

Mr. Hook indeed has made fome conjectures about it; but the greateft light, that has been given into the thing, is from the inquiries which Meffrs. Du Fay and Du Hamel, gentlemen of the Academy of Sciences at Paris, concerted together, and afterwards made feparately on different fhrubs, or at different times, that each might be able to correct the errors of the other.

The ftructure of the *fenfitive plant* is this. From the large ftems, or main branches of the whole, there part off feveral other leffer ones, and from thefe there go off others ftill lefs, which by way of diftinction may be called the ribs of the leaves, as they ferve to fupport a number of leaves arranged on each fide, and ftanding on fhort pedicles in pairs, over againft one another. Several other plants have thefe fort of compound leaves, as the caffia, colutea, and the like; and all thefe fhut their leaves together at night, and open them again in the morning, in the fame manner as the *fenfitive plant* does. This periodical opening and fhutting of the leaves is therefore common to many plants, not peculiar to the *fenfitive plant*; but the marvel in this is, that befide having this motion periodical and regular, it is to be brought on at other times, and by accidents, there requiring no more than the touching the *plant* to make it clofe its leaves at any time of the day, which it foon afterwards naturally opens again. This is peculiar to this *plant*, and refembles the action of an animal which had been injured or frighted. A clofe obfervation alfo of the manner in which this is performed, will give many hints toward the finding its caufe. It is a very difficult thing to touch the leaf of a vigorous *fenfitive plant* fo lightly, as not to make it clofe. Its fenfation is extremely delicate, and its large rib or nerve, which runs along its middle, is as it were a hinge, on which the two halves of the leaf move when they turn up on being touched, till they ftand erect, and by that means meet one another. The flighteft touch imaginable gives this motion to the fide of the leaf which is touched, which is communicated immediately to the other fide, or half, and they move together; and if the touch have been a very little rougher, the oppofite leaf on the fame rib receives the impreffion, and clofes up in the fame manner with that which was actually touched.

Nor is this all; for when the two fides of each of thefe leaves move upwards, the pedicle of each half moves upwards at the fame time, and by this means they in fome meafure approach toward each other, and make the angles of their pedicles with the main rib, or ftalk of the compofit leaf, lefs than before; and the total motion of each leaf is compofed of thefe two motions.

If the touch be ftill rougher, the whole arrangement of leaves on the fame rib feel its influence on each fide, and all clofe in the fame manner with the fingle pair in the precedent inftance: and if the touch be yet ftronger than this, the rib itfelf feels it, and attempts to clofe in its way; moving itfelf upwards toward the branch from which it is produced, juft as the fingle pedicles of the leaves did toward it: and if the touch be yet more hard and rough, the very branches have the fenfation propagated to them, and apply themfelves to the main ftem, or trunk of the fhrub, as the fimple leaves did before to their rib, and that rib to the branch; fo that the whole *plant* in this ftate forms itfelf from a very complexly branched figure, into a fort of ftrait cylindric one. That motion which has, of all others, the greateft effect upon this *plant*, is a fhaking one.

Thefe three motions of the *plant* are performed by means of three diftinct and fenfible articulations; the firft that of the fingle leaf to its pedicle, the fecond that of the pedicle to its branch, the third that of the branch to the trunk. The primary motion of all which, is the clofing of the two halves of the leaf upon their rib, which ought alfo to be performed in a fimilar manner, and by a fimilar articulation. This, however, is much lefs vifible than the others.

Thefe motions are wholly independent on one another, as may be proved by experiment. It fhould appear, that if the ftalks are moved and collapfe toward the branches, or thefe toward the trunk, that the leaves, whofe motion is ufually primary to thefe, fhould be affected alfo; yet experiment

ment proves that it is possible to touch the branches in such a manner, as to affect them only, and make them apply themselves to the trunk, while the leaves feel nothing of the touch: but this cannot be, unless the branches are so disposed, as that they can fall to the trunk without suffering their leaves to touch any other part of the *plant* in their passage; because if they do, they immediately become affected. Winds and heavy rains cause the *sensitive plants* to shut up their leaves, while easy showers do not at all affect them: it is plain hence, that the agitation of the *plant* by the wind, and the strokes given by the large and hasty drops of rain, are what cause the contraction.

By whatever accident the *plant* has been made to close its leaves, it always regularly opens them again afterwards. This however requires different times, according to several circumstances, as the time of the day, the season of the year, and the more less or vigorous and healthy state of the *plant*: sometimes this is done in ten minutes, sometimes it requires half an hour. And the manner is not less different than the time; for sometimes the leaves unfold themselves first, and sometimes the branches, whereas sometimes all is done at once, and the whole *plant* seems in motion at a time.

In endeavouring to account for the motions of this *plant*, these gentlemen have conjectured that they are performed by means of a sort of very nice and fine hinges, which communicate one with another by means of very minute and slender cords, which occasion them to act as we see when the *plant* is sufficiently disturbed, and these cords shaken; and what gives a strong probability to this conjecture is, that the decayed and dying leaves of the *plant* perform this motion as regularly and vigorously, as those which are fresh and full of juice. It seems plain, that while the juices are evaporating, and the parenchymatous substance of the leaves drying up, these more solid parts, the lines and cordages, retain their figure; and consequently, if it is by means of these that the motion is always performed, it will be as well performed in these as in the fresher leaves; which could not be the case, were it owing to the juices.

The natural opening and shutting of the leaves of this *plant* at night and morning, are not so fixed but that they are variable also, according to circumstances of place, temperature, &c. In the month of August a *sensitive plant* was carried in a pot out of its usual place into a dark cave, the motion that it received in the carriage shut up its leaves, and they did not open till twenty four hours afterwards. At this time they became moderately open, but were afterwards subject to no changes at night or morning, but remained three days and nights with their leaves in the same moderately open state. At the end of this time they were brought out again into the air, and there recovered their natural periodical motions; shutting every night, and opening every morning, as naturally and as strongly, as if it had not been in this forced state; and while in the cave, it was observed to be very little less affected with the touch than when abroad in the open air.

Repeated experiments have proved, that it is not the light of the day that opens the leaves of this *plant*, nor the darkness of the night that closes them; neither is it the alternate warmth of the day, and cold of the night, that have this effect, since it shuts in nights which are much warmer than the days often are in which it opens; and the encreasing the heat of the place in which it is kept, and marking the encrease or decrease on the thermometer, have been found to have not the least effect, as to its sooner or later opening or shutting its leaves.

The most probable conjecture seems, that it is not great heat, or great cold, such as it can bear, that bring on this effect, but the sudden change from one to the other; and this is confirmed by this experiment, that if one of these *plants* be raised under a glass bell, or case, and the bell or covering be taken off, it immediately closes, even though it be in the middle of the day; and this is also observed, that the more open or exposed the *plant* stands, the more strong and lively are its shutting and opening; and that they are most observable in summer, and much less so, when it is kept in a close stove in winter.

The great heats of summer, when there is open sunshine at noon, affect the *plant* in some degree like cold, causing it to shut up its leaves a little, but never in any very great degree. The *plant*, however, is least of all affected about nine o'clock in the morning, and that is consequently the properest time to make experiments on it. A branch of the *sensitive plant* cut off, and laid by, retains yet its property of shutting up and opening in the morning for some days; and it holds it longer if kept with one end in water, than if left to dry more suddenly.

The leaves only of the *sensitive plant* shut up in the night, not the branches, and if it be touched at this time, the branches are affected in the same manner as in the day, shutting up, or approaching to the stalk or trunk, in the same manner, and often with more force. It is of no consequence what the substance is with which the *plant* is touched, it answers alike to all; but there may be observed a little spot, distinguishable by its paler colour in the articulations of its leaves, where the greatest and nicest sensibility is evidently placed.

The *sensitive plant*, plunged into water, immediately closes its leaves, which is partly owing to the touch, partly to the coldness of the water; afterwards the leaves expand again; and if they are then touched, close again as before, as if in the open air, only that they do it with less force.

If the end of one of the leaves be burned with the flame of a candle, or by a burning glass, or by touching it with hot iron, it closes up in a moment, and the opposite leaf does the same, and after that the whole series of leaves on each side the rib, then the rib itself, then the branch, all do the same, if the burning has been in a sufficient degree. This proves that there is a very nice communication between all the parts of the *plant*, by means of which the burning, which only is applied to the extremity of one leaf, diffuses its influence through every part of the shrub.

If a drop of aquafortis be carefully laid upon a leaf of the *sensitive plant*, so as not to shake it in the least, the leaf does not begin to move till the acrid liquor corrodes the substance of it; but at that time, not only that particular leaf, but all the leaves placed on the same rib, close themselves up. The vapour of burning sulphur has also this effect on many leaves at once, according as they are more or less exposed to it; but a bottle of very acrid and sulphureous spirit of vitriol, placed under the branches unstopped, produces no such effect. The wetting the leaves with spirit of wine, has been observed also to have no effect, nor the rubbing oil of almonds over them; though this last application destroys many *plants*.

A branch of the *plant* was cut away longitudinally, till only a third part of the substance remained, yet it communicated the effects of the touch, in the same manner as before, to those branches which arose lower on the shrub. The transpiration of the *plant* being retarded, is of no effect as to its periodical opening and closing; for one kept under a close glass bell shuts and opens as regularly, night and morning, as when it stands in an open green-house. A branch of it put into the exhausted receiver of an air-pump, is found to have its force of opening and closing up much impaired, but not wholly taken off. Mem. de l'Acad. des Scienc. Par. 1736.

SEPHIROS, a word used by Paracelsus, and his followers, to express a sort of dry and hard impostume, or kind of spurious scirrhus.

SEPHIROTH, a Hebrew word signifying brightnesses; and the cabbalists give the name of *sephiroth* to the most secret parts of their science.

The knowledge of the *sephiroth* is not acquired but with much study and labour, and is the highest step of the contemplative theology. They reckon up ten *sephiroths*, which are sometimes represented by ten different circles, included in each other; and sometimes by the figure of a tree, pretty much like what, in the schools, they call Porphyry's tree, to shew the different categories of ens or being. *Calm.* Dict. Bibl. in voc.

SE PIACE, in the Italian music, signifies that the part it is joined to may be repeated, or not, at pleasure.

SEPS, in zoology, the name of a very peculiar animal of the lizard kind, but seeming as if of a middle nature between that genus and the snakes, and appearing rather a serpent with feet than a lizard. See Tab. of Quadrupeds and Serpents, № 31.

It is a small species; its body is rounded, and its back variegated with longitudinal lines of black. Its eyes are black; it has ears, and a small and very slender tail. What appears most singular in it is, that it has four legs with feet, divided into toes; but these are wholly useless to the creature in its motions, and not at all assisting it in walking. The first pair are placed very near the head, the other by the anus. The scales are laid in a reticulated manner; they are of an oblong figure, approaching to a rhomboides, and laid longitudinally. Its belly is white, with a slight cast of blue, and it has nostrils near the end of the snout. Columna took five living young ones out of the body of one of this species, some of which were included in membranes, and others loose, as is the case in the fœtus found in the viper. *Ray's* Syn. Quad. p. 272.

The bite of the *seps* is said to occasion an instant putrefaction of the flesh of the whole body.

SEPTANA, a word used by the antient physicians for a septenary fever, or one that performs its regular period in seven days.

SEPTARIÆ, in natural history, the name of a large class of fossils, called by some *ludus Helmontii*, and by others the *waxen veins*. They are defined to be fossile bodies not inflammable, nor soluble in water, naturally found in loose detached masses of a moderately firm texture, and dusky hue, divided by several *septa*, or thin partitions, and composed of a sparry matter greatly debased by earth, not giving fire with steel, fermenting with acids, and in great part dissolved by them, and calcining in a moderate fire.

Of this class there are two distinct orders of bodies, and under those six genera. The *septariæ* of the first order are those which are usually found in large masses, of a simple uniform

uniform construction, but divided by large *septa* either into larger and more irregular portions, or into smaller and more equal ones, called *talc*.

Those of the second order are such as are usually found in smaller masses of a crustated structure, formed by various incrustations round a central nucleus, and divided by very thin *septa*.

The genera of the first order are four. 1. Those divided by *septa* of spar, called *secomiæ*. 2. Those divided by *septa* of earthy matter, called *gaiophragmia*. 3. Those divided by *septa* of the matter of the pyrites, called *pyritercia*. And 4. those divided by *septa* of spar, with an admixture of crystal, called *diaugophragmia*. See all these under their several heads.

Of the second order there are only two genera. 1. Those with a short roundish nucleus, enclosed within the body of the mass. And 2. those with a long nucleus, standing out beyond the ends of the mass. *Hill's* History of Fossils, p. 500.

SEPTERION, Σεπτήριον, in antiquity, a Delphic festival, celebrated every ninth year, in memory of Apollo's victory over Python. The chief part of the solemnity was a representation of Python pursued by Apollo. *Potter*, Archæol. Græc. Tom. I. p. 430.

SEPTIMONTIUM, among the Romans, a festival celebrated in December on all the seven hills of Rome; whence also it had this name, being otherwise called *agonalia*. See the article AGONALIA, *Cycl.*

SEQUATUR *sub suo periculo*, a writ that lies when a *summons ad warrantizandum* is awarded, and the sheriff returns, that the party hath nothing whereby he may be summoned; then goes forth an *alias* and a *pluries*; and if he comes not in on the *pluries*, this writ shall issue. Old Nat. Br. 163. *Cowel.*

SEQUESTRATION (*Cycl.*)—SEQUESTRATION, *sequestratio*, in chemistry, a term used by some writers to express separation.

SEQUESTRO *habendo*, a writ judicial for the discharging a *sequestration* of the profits of a church benefice granted by the bishop at the king's commandment, thereby to compel the parson to appear at the suit of another. The parson, upon his appearance, may have this writ for the release of the *sequestration*. Reg. Judic. 36. *Blount*, *Cowel.*

SERACH, in the Turkish military orders, an officer who holds the stirrup of the caia of the janizaries in charge, attends him when he goes out on horseback, and serves him as a messenger on all occasions. After this office he has the title of *chous*; and after he has passed through this, he has the same office under the aga of the janizaries. *Pocock's* Egypt, p. 168.

SERANGODES, a word used originally as an epithet for the pumice stone, and expressing cavernous, spungy, or full of holes. It has been hence used to sinuous ulcers, and to all sorts of things that are cavernous, or of a spungy texture.

SERAGE, in zoology, an English name for a bird of the larus, or gull kind, more usually called the *sea-swallow*, and by authors *sterna*. See STERNA.

SERAPIAS, in the materia medica, the official name of the dried root, called *salep*. *Dale's* Pharm. p. 254.

SERBAJEE, in the Eastern military orders, is a captain in the horse in the service of the grand seignior. *Pocock's* Egypt, p. 166.

SERIANA, in botany, a name given by Plumier to a genus of plants, the same in its generical characters with his *cururu*; both which are comprised by Linnæus under one genus, with the new name *paulinia*. *Plumier*, Gen. 35. See the article PAULINIA.

SERICH, the name of a seed used in the food of the Egyptian coptis. It is produced by an herb called *simsim*, and is pounded and put into oil. In this they dip their bread, which is always new, being baked as often as they eat in small flat cakes. These they eat dipped in this oil with raw onions, or else they break the cakes to pieces, and put them into a syrup of sugar, made when the canes are green. *Pocock's* Egypt, p. 183.

SERICUM, *silk*. See the article SILK.

SERICUM is also a name given by several chemical writers to the flowers of zink raised by sublimation in an inclined open crucible. These flowers are not reducible into zink again, and are of a fibrose texture, and a beautiful bright white colour. This has made them be called also the *philosophic cotton*, and others have named them the *aqua sicca philosophorum*. What has given the greatest confusion, however, in regard to them is, that some writers have chosen to call them talc, and a sort of solution of them in vinegar, oil of talc. Others have restrained the word oil to a genuine oil, separated from a solution of these flowers in vinegar; and have attributed to this oil the power of concentrating metals, and fixing silver, or reducing it to the solidity and weight of gold, and making it, like that metal, soluble only in aqua regia. These, however, are mere chimeras, and this boasted oil is, in reality, no other than the essential oil of the grape, and can have no such properties.

SERINUS, in zoology, the name of a small bird common in Germany and Italy, and called by the Austrians *baerngril*, or *birngryl*. See Tab. of Birds, N° 37.

Its back is of a reddish brown, and its head yellow; the colour being deeper in the male, and paler in the female. The rump is of a beautiful yellowish green, as is also the breast. The belly is white, and the sides have some oblong blackish spots. The tail, and long feathers of the wings, are black, and a little greenish at their extremities. The beak is very thick, strong, and short, and is very sharp at the point. It is kept in cages, and sings very sweetly. *Gesner*, de Avibus. *Aldrovand.* de Avib. lib. 18. cap. 20.

SERMOCINATION, *sermocinatio*, in rhetoric, denotes discourse in general, whether held by a person alone, or in company, and is the same with what is called *dialogism*. See the article DIALOGISM.

SERPEGER, in the manege, was used to denote the riding a horse in a serpentine way, or in a tread with waved turnings, like the posture of a serpent's body; but is now become obsolete.

SERPENT, (*Cycl.*) *serpens*, in zoology, the name of a genus of animals, which Mr. Ray defines to be creatures breathing by means of lungs, having only one ventricle in the heart, having no feet, and having a long body, covered with scales. To which he adds, that in cold seasons they can bear hunger a long time. The greater part of the *serpent* class are poisonous, and dangerous in their bite, leaving a mischievous liquor in the wound made by their tooth, which mixing by this means immediately with the blood, is of fatal consequence; though the whole creature may be eaten with safety, or even the poisonous liquor, which does this mischief in the wound, tasted without hurt.

Notwithstanding that *serpents* respire by means of lungs, they do not take in and discharge their breath by such short intervals as other animals, but what they have once inspired will serve them a long time; for as they are of a cold nature, and their naturally necessary vital warmth very small, they do not require such an eternally renewed supply of that pabulum of vital heat, as those which have more of it; and as with us they lie half the year torpid, and half dead, their vital warmth at that time, like fire smothered under ashes, barely exists, and needs perhaps no more air than what the creature took in at one inspiration, before its laying itself down for the season, which serves it till the life-renewing spring returns.

Serpents, according to Mr. Ray, may be divided into the poisonous and the harmless; the first having long dentes exerti, with poisonous liquors contained at their bottom, which on biting they discharge into the wound; the others wanting these teeth, and this poison.

They may also be divided, in regard to their generation, into the oviparous and viviparous; but this is a less firmly founded distinction than may be supposed, since all *serpents* are truly and properly produced of eggs; and the only difference is, that some deposit their eggs in dung-hills, and the like places, to be hatched by accidental heat; while others retain those eggs to be hatched in their own bodies, and so bring forth living young ones. Of the first kind is the common snake, of the latter the viper. *Ray's* Syn. Quad. et Serp. p. 284. See Tab. of Quadrupeds and Serpents.

SERPENS *bubalinus*. Mr. Cleyer has given a very remarkable account, in the German Ephemerides, of the prodigious size, and voracious appetite of this *serpent*, and its manner of feeding.

This gentleman assures us that they grow to the length of twenty five feet, and are surprisingly daring in attacking large creatures for prey. Their neck, he observes, is so small, in proportion to the creatures they seize, that it is a wonder that they can swallow them whole, which yet experience shews they certainly do, having no power of tearing them to pieces. This gentleman saw a compleat stag taken out of the belly of one of these *snakes*, with all its limbs remaining on; and at another time a wild goat, which had been swallowed in the same manner; and from another a compleat porcupine, a very troublesome morsel; and there was once an instance, in the Molucca islands, of a woman big with child being thus sucked down whole by one of these creatures. *Ray's* Syn. An. p. 333.

The method of their managing their prey is this. When thoroughly lank, lean, and hungry, the *snake* lies in wait for any thing it can seize; he darts out upon the prey, and seizing it with his mouth, winds his body round that of the creature; and this he is able to do with such force, that he will often, in twisting himself firmly round the creature, break the bones within its skin. This he continues, and at the same time is biting with his terrible mouth all the tender parts of the creature, till he has destroyed it; or if it be an animal too strong to be killed by these simple folds, it will drag it to some neighbouring tree, and tying it fast against that, draw its body so forcibly round it, as to crush all its bones to pieces by the help of that solid resisting body. The part it usually seizes with its teeth, at the same time, is the creature's nose, which he bites so forcibly, as not only to stop the breath, but to occasion a discharge of blood, which helps to forward its destruction.

But the most singular attack, ever known to have been made by this creature, is that recorded by the same author, of

of its seizing a buffalo; which it destroyed in the manner above described, though it was a long time about it, and was obliged to have recourse to the method of tying it up to a tree, against which it broke its bones severally, with a noise that was heard to a great distance. When the creature had thus destroyed its prey, it continued breaking of the bones, till there was not one left whole in the body, and the whole resembled a shapeless mass of matter.

The jaws and throat of this, and of the other *serpent* kind, though small and narrow, are prodigiously extensible, and made so by nature for the swallowing these morsels. The *snake*, when the prey lay in this state before it, licked it all over, and covered it thick with its saliva, and that so regularly, that the whole carcase looked as if daubed over with glue. This done, it opened its jaws to a monstrous extent, and sucked in the head of the prey, and continuing incessantly sucking, at length drew down the whole body.

This is a work of time, and very often two or three days are employed in it. And when the animal is thus got down, the *snake* is swelled and bloated up all over with it, and is no longer in a state of offending, or even of defending itself, or so much as running away; and the people of the places where this species is common, well know this, and find it an easy thing to destroy them in this state, and are very happy when they catch one, as their flesh is a very delicate food. Ephem. Germ. Ann. 12. Obs. 7.

SERPENS *marinus*, *sea serpent*, the name of a fish of the eel kind, usually of five or six feet in length, and a furrowed body, continuing all the way of the same thickness, till near the tail. See Tab. of Fishes, N° 12.

Its back is of a dusky yellow, and its belly a shining blue. Its snout is long, slender, and pointed, and the opening of its mouth extremely large. Near the end of the under jaw it has four or five large and sharp teeth, which bend backwards, the rest of the teeth are very small, and stand close together. At the very extremity of the upper jaw it has four very large teeth, and all the rest are small, and like those in the under one; but the largest teeth of all are placed in a row, in the middle of the palate. It has only one pair of fins, which are placed near the gills. The openings of the gills are at a considerable distance from the head, and it is marked with dotted lines down its sides. It is common in the Mediterranean, and its flesh is very fine tasted, but full of small bones. *Willughby*, Hist. Pisc. p. 108.

SERPENS *rubescens*, the *red serpent fish*, in ichthyography, the name of a fish, properly of the tænia kind.

It resembles the common snake in figure, and is of a fine strong red in colour, and marked with oblique lines all down the sides, and long ones from the gills to the tail, one on each side. Its mouth is but small, and its teeth sharp and serrated; and it has all over its back a number of fine capillaments, set at distances from one another, even to the tail, and the same on the belly. Its tail ends in a single fin. *Aldrovand.* de Pisc. lib. 3. cap. 28.

SERPENT-*stones*, a name given by some to the cornua ammonis, a beautiful fossile shell, which resembles a *serpent* coiled up.

These are frequent in many parts of the world, beside the plenty we have of them in England, and elsewhere. The accurate observer, Mr. Harenberg, found prodigious numbers of them on the banks, and among the sand of a river in Germany. He traced this river through its several windings for many miles, and among a great variety of belemnitæ, cornua ammonis, and cochlitæ, of various kinds. He found also great quantities of wood, of recent petrifaction, carrying in it at that time the plain marks of the axe, by which it had been cut from the trees then growing on the shore. The water of this river he found, in a dry season, and when the supplies of its natural springs were not diluted with rains, to be considerably heavier than common water; and many experiments shewed him that it contained ferrugineous, as well as stony particles, in great quantity, whence the petrifactions in it appeared the less wonderful, though many of them of recent date.

Of the cornua ammonis, or *serpent-stones*, he there observed more than thirty different species, and doubts not but there are many more yet unobserved. They lie immersed in a bluish fossile stone, of a soft texture, and fatty appearance. They lie in this in prodigious numbers, and of a great variety of sizes, from the larger known sorts, down to such as could not be seen without very accurate inspection, or the assistance of a microscope. Such as lie in the softest of these stones are soft, like their matrix, and easily crumble to pieces; others are harder. In a piece of this stone, of the bigness of a finger, it is common to find thirty, or more of these fossils; and often they are seen only in form of white specks, too minute to shew their figure, till examined by the microscope. But what is most observable of the cornua ammonis of this place is, that they are often found growing not only to, but into one another, in such a manner, that they cannot be supposed ever to have been inhabited by any living fish, especially the specimen which is pierced by the other. This author is of opinion that they grow, and are formed where they are; and attempts to prove it by affirming, that they have an actual increase in size there in a little time, and that not only if left in their beds, but if taken out, and put into a glass of the water. This is an opinion wholly different from the received one at present in the world, and perhaps will be found erroneous on farther trials. Act. Erudit. 1727. p. 140.

SERPENS *terrenus*, the *earth serpent*, a name given by some of the chemical writers to nitre. It was originally given to the nitre of the antients, a salt very different from that which we call nitre, but it has since been applied also to that salt.

SERPENTS *tongues*. The island of Malta abounds with *glossopetræ*, or the petrified teeth of sharks, which, from their resemblance to a tongue, are by the vulgar supposed to be the tongues of *serpents* turned into stone by some miracle of St. Paul, when he was there. This island abounds not only with these, but with bufonitæ, and vast numbers of other remains of sea productions. These things, notwithstanding their perfect resemblance of the same bodies now found recent in the mouths of living fishes, &c. are by some supposed never to have been real parts of fishes, but to have been formed where they now lie by some lusus of nature, or plastic seeds. This, however, is an idle and absurd opinion; and Agustino Scilla, who has written at large on the fossils of this island, gives a very rational account of their being the real remains of animals, which, according to his system, it is no way wonderful to find there. The universal deluge has doubtless been of power to bring all the fossils we find into the places where we now see them buried, even in the midst of quarries of stone, in the middle of inland countries; but in regard to the island of Malta, which so abounds with them at this time, he supposes that long since the time of the creation, and even without the assistance of the general deluge, it may have been formed out of the sea, and that it appears plainly to have been at first no other than a mass of soft mud, with an immense number of sea shells, teeth of fishes, and other remains of sea animals, mingled among it; and that these subsiding as low as they could among that thickening matter, have made the island what we now find it, that is, a heap of earth with these things, in vast quantities, buried in it, and that at different depths, but principally not far from the surface. Philos. Trans. N° 219. p. 182.

That this collection of matter was occasioned by a flood of some kind, is highly probable, but it is not necessary to have recourse to Noah's flood for it, though that might as well cause it as any other; but it might also be formed by an irruption of the ocean into the Mediterranean, or by an inundation of the Tuscan sea driven by vehement winds, or any other means, that way: and when the origin of this island is thus allowed, it is not to be wondered at, that an immensity of the refuse parts of animals, inhabitants of those waters, should be left in the places where they had time to subside. And though there are found among these teeth, &c. in the island of Malta, great quantities of shells, of such species as are not natives of those seas, this is no objection to the opinion; since it is well known that the winds when violent, as they probably were about the time of the formation of that island, will bring such light bodies as shells a vast way in water.

It is a common observation, that the east, and south-east winds, bring to the coast of Calabria great quantities of beautiful shells, none of which are found living in the seas thereabout. The *bufonitæ*, or toadstones of Malta, are plainly the grinder teeth of the lupus and sargus dentex, as also of the aurata, and several other fish, which have such round teeth in the hinder part of their jaws. The shells found in this island, and other places, are so plainly those of once living animals, that the remains of the body of the fish is plainly to be distinguished in some of them; and in others the lamellæ are laid together, and coated over one another, in the very same manner as in the recent shell fish. Philos. Trans. N° 219. p. 186.

It is objected, that these shells are produced in the places where they lie, because they are found in great clusters together, all of the same kind; but this is no material objection, but is easily solved upon the common principles: for if we suppose a number of dissimilar bodies, several of every kind, to be suspended in the same quantity of water, and that water be put in motion, we shall see them all confusedly blended together, while the motion is violent, but they will, as that becomes more calm, separate themselves, and those of the same nature will, in a great measure, get together, and subside in parcels separately from the rest. Thus if straws, sticks, egg-shells, pebbles, and common cockle-shells, were to be thus shook together, the consequence would be, that in a large tub of water they would naturally each parcel subside together in different parts of the bottom; and though in the neighbourhood of one another, yet the straws would not be mixed with the pebbles, nor the egg-shells with the cockles, any more than it is really found, that the different species of shells are mingled in the earth.

It is to be added alfo, that thefe fhells have fubfided, not in water, but in a thicker fluid, compofed of mud and water, and this has kept them more afunder than common water alone would have done; and we fhall find, on examining the bowels of the earth, that though the fhells, in the fame mafs of earth, or ftone, are generally principally of one kind, yet they are neither always fo, nor perfectly fo, but that often they are confufedly blended among other kinds, and more often have fome few of other fpecies blended among them; as a few cockle-fhells might be among the pebbles, in the familiar inftance mentioned above, and by fome particular accidents, even in that cafe, the whole fet of bodies, excepting the very lighteft, might happen to be blended together.

The mountains of Sicily afford fome few *gloffopetræ*, or *fnakes-tongues*, but they are few in number, and worfe prepared than thofe of the ifland of Malta; which is probably owing to the high ground of thofe mountains being lefs likely to receive the refufe of the fea, and its foil, which is fandy, being lefs fitted to preferve them when there, than the marl, of which the ifland of Malta confifts.

The *echini marini*, or fea eggs, and their fpecies, which are very frequent among the *ferpents-tongues* of Malta, all lie upon the furface of the ground, or near it; whereas the *gloffopetræ* lie deeper, though at no great depth. This is a plain effect of all thefe things having been really animal bodies, and having floated in the mud, of which that ifland was formed; for in this it could not be otherwife, but that the *gloffopetræ*, or *ferpents-tongues*, being heavy, would fubfide in the water; while the light fhells of thefe other animals would float on, or near the furface.

The opinion of thefe bodies growing from feminal principles, is alfo greatly weakened by the fituation of them in the earth. If they grew from feeds, as plants, we fhould doubtlefs fee them, like plants, all bending one way, the points of all upwards, and their roots downward; but on the contrary, both in the ifland of Malta and elfewhere, thefe things are found in the moft different directions imaginable; fome with their bottoms upwards, fome downwards, fome horizontal, and others in all the intermediate angles. Some have fuppofed the *gloffopetræ*, in particular, to grow from roots in the earth, becaufe they ufually have roots different from the other parts, and becaufe they ftick very firmly in the earth at thefe roots, but are very eafily loofened in any other part. It is certain indeed that thefe parts, at the bottom of the *gloffopetræ*, are their roots, and that their fpungy texture was intended for their taking in nourifhment; but this was their ufe when in the head of the fifh, not when in the earth; and the reafon of their adhering more firmly to the earth in this, than in any other part, is only that they are more fpungy and porous here, and that in other parts, where they are fmooth and even, the earth can have no hold of them; but where they are thus rough, as they fubfided with a moift earth like mud about them, they naturally become connected ftrongly to it in drying, as part of it was received into their pores, and not broken from the reft, till by forcing them out afterwards. Philof. Tranf. N° 219. p. 189.

Some affirm that the *gloffopetræ* are natural cryftallizations of falt, and that to this their regular figure is owing; but it is to be anfwered, that their figure is not fo regular as thefe objectors feem to fuppofe, but that there are as many different fhapes of them as there are of teeth, in the different parts of the jaw of the fame fhark, or in the jaws of different fpecies of fharks now found living; and if they were cryftallizations of falt, the whole cryftallization would be of one and the fame furface and texture; which is not the cafe, fince the root, as before obferved, is always very different from the body of the tooth, and the fubftance different in even the various parts of the body. Salts are falts throughout, and a ruby, a cryftal, or a diamond, is the fame in all its parts; but this is not the cafe in the *gloffopetræ*, but they are compofed of a cortical and a medullary part, like the teeth of living fharks: and it is to be obferved, that when any of thefe *gloffopetræ* are found broken, as they frequently are, the fracture is found raw and unaltered, which fhews that it has happened before they came to the place where they are now found, and that they have no growth or vegetation there, to heal or cover it; for if there were, it would be fkinned over, as the wounds of plants and animals always are, when in a perfect ftate and living.

Whenever the *gloffopetræ* are taken carefully up out of the earth in Malta, the marl or earth, which ferved for their bed, is found to contain all their minuteft traces and lineaments, like wax from a feal. This is a proof that the marl was as foft as melted wax when they were put into it, and that they were of their full fize and growth when placed there, not having grown, or had any encreafe in that place.

The apophyfes, or proceffes in the *gloffopetræ*, are alfo a ftrong proof of their being no other than real fharks teeth, fince they exactly anfwer to thofe in the teeth of recent fharks, by which every tooth is received or inferted into its neighbour in the jaw. Nay, whereas fharks teeth are mortifed into one another in fuch a manner, that a man may eafily tell which belongs to each fide, which lie near the throat, and which near the front of the mouth; and whereas in a fhark's mouth, the teeth on the left fide will not fit on the right, nor thofe above ferve below, but that on feeing a recent tooth, a perfon of judgment will be able to fay what part of the mouth it belonged to; fo in the foffile fhark's teeth, or *gloffopetræ*, there is not any one which may not be referred to the particular part of the mouth of the living animal, and could have belonged to no other. *Agustino Scilla*, de Petrifac.

SERPENTINÆ, in natural hiftory, a name given by later authors to the marbles which the antients called *ophitæ*, from their fpots refembling thofe of ferpents. See the article OPHITES.

SERPENTINE, (*Cycl.*) in the manege. A horfe is faid to have a *ferpentine* tongue, if it is always frifking and moving, and fometimes paffing over the bit, inftead of keeping in the void fpace, called the liberty of the tongue.

SERPYLLUM, *mother of thyme*, in botany, the name of a genus of plants, the characters of which are thefe. The flowers and feeds are the fame with thofe of the common thyme, but the ftalks are lower, lefs hard, and lefs woody. The fpecies of *ferpyllum*, enumerated by Mr. Tournefort, are thefe. 1. The broad-leaved hairy *ferpyllum*. 2. The common large *ferpyllum* with purple flowers. 3. The common large *ferpyllum* with white flowers. 4. The common leffer *ferpyllum*. 5. The common leffer *ferpyllum* with white flowers. 6. The common fmall *ferpyllum* with flowers variegated with green and white. 7. The common fmall *ferpyllum* with woolly heads. 8. The citron-fcented *ferpyllum*. 9. The larger citron-fcented *ferpyllum*. 10. The narrow-leaved fmooth *ferpyllum*. 11. The narrow-leaved hairy *ferpyllum*. 12. The loweft thyme-leaved *ferpyllum*. *Tourn.* Inft. p. 197. For the medicinal virtues of *mother of thyme*, fee the article THYMUS.

SERRA-*pifcis*, in zoology, a name given by many authors to the *piftris*, or faw-fifh. *Rondelet*. p. 114. See the article PISTRIS.

SERRA is alfo a name given by Pliny to a fpecies of the baliftes, called by the generality of writers *fcolopax*. It is diftinguifhed by Artedi by the name of the *balifles* with two fpines in the place of the belly fins, and one behind the anus.

SERRATA, a name given by fome of the Roman authors to the plant which the Gauls, according to Pliny, had named *betonica*, and which the Greeks called *ceftrum pfuchrotrophon*, and *priorites*. This was evidently the fame plant with our *ferratula*, or faw-wort. But befide this there was another plant called by this name, and which, according to Pliny, was the *chamædrys* or *germander* of the Greeks. He fays that the *chamædrys* of the Greeks was a plant called by the Latins *trixago*, and by fome *chamedrope* and *teucrion*. He adds, that it had leaves like thofe of mint in fhape, but refembling thofe of the oak in their colour and divifion, and that the flower was purple. He adds, that the leaves were fo nicely ferrated at the edge, that it was fuppofed men had taken the idea of a faw from them.

This author is not however to be abfolutely depended upon, and though he here exprefsly fays that this *ferrata* is the fame with the *chamædrys* of the Greeks, yet he feems to run away from this affertion in his defcription, and to make it the fame with the other *ferrata*. Diofcorides fays nothing of the *chamædrys*, but that its leaves were fmall. And it is much more probable that the world fhould take the idea of a faw from the leaves of the *ferratula*, than from thofe of this plant, they being much lefs nicely denticulated than thofe. So that thofe who have been influenced by Pliny, to fuppofe the *germander* and *ferrata* of the antients to be the fame plant, are in the wrong, though they have the countenance of this fo generally reputed authentic author for it.

SERRATE *flies*, in natural hiftory, a name given by authors to certain flies, diftinguifhed from all the other kinds by their having a weapon, refembling a double faw, placed at the hinder part of the body: this ferves feveral fpecies of them to make holes in the branches of trees, in which they depofit their eggs; but there are fome of them which do not feem to make any ufe of this curious inftrument, though they have it. See ROSE-*fly*.

The *fly* of this kind that lays its eggs on the goofeberry bufh, depofits them only on the furface of the middle rib of the leaf; and the ofier-fly, which is one of this genus, produced from a baftard caterpillar of the ofier, lays its eggs on the intermediate furface of the leaves between the ribs. There appears to be no ufe made of this curious inftrument in the depofiting of thefe eggs, fince they are only laid in rows upon the leaves, and fixed to them by means of a vifcous fluid which covers them. It is a very remarkable property in the eggs of this genus of *flies*, that they grow much larger after they are laid. This is obfervable in the eggs of the common rofe-fly, which are at firft buried in the wood, and by their growth force out the furface into tumours of an oval figure: but in thefe of the ofier-fly it is moft beautifully feen, and the whole growth of the fœtus in them is clearly feen, on examining them at different times of

of their growth, which may be easily done without disturbing them, as they lie naked on the surface of the leaf.

When first laid, these eggs are oblong, perfectly pellucid, and of a whitish colour; in a few days they are perceived to be much larger than at first, and a small yellow speck is seen in each of them: they after this continue to grow larger, till they are of twice the bigness that they were at first, and this yellow spot encreasing, soon begins to put on the oblong form of the false caterpillar, which is to be hatched from it. After some days, there are evidently seen two black spots on one extremity of it, which are the eyes, and after this the growth of the included animal becomes so quick, that in a day or two after, if the egg be examined by holding it against a strong light, the compleat animal may be seen in it, doubled in two in such a manner, that its head and tail are brought to touch. These eggs, when deposited on the leaf, are fixed down to it by so strongly viscous a fluid, that they cannot be taken off without breaking; but there does not appear to have been any aperture made by the saw of the animal in the places where they are laid. It is possible that there might be a small wound made in the leaf under each, which though not capable of receiving the egg, might however serve to pour forth a juice sufficient to keep the egg moist; but these apertures must be very small, if there are any such, since the microscope discovers no traces or remains of them. There seems a plain proof that the egg receives some sort of benefit, and that a very essential one to its preservation, from the juices of the plant on which it is deposited, since if those leaves be pulled off from the plant, and left to dry, the eggs always dry up with them, and perish; whereas, if the ends of these leaves be put into water, and the leaf be by that means preserved fresh and juicy, the creature hatches from it as well, as if it was left upon the tree. It should seem from this that the eggs of these *flies*, when introduced into wounds in the branches of trees, become a sort of grafts, and live on the juices of the plant, and that those on the leaves have the same juices conveyed to them in some other manner. This is certain, that whereas the freshness of the plant is absolutely necessary to the hatching of these eggs, it is not at all so to the eggs of other insects which lay upon them. The butterfly lays its eggs on some particular species of plant, according to its kind; but this is only that the caterpillar, when hatched from it, may have proper food; for if the leaf, or which these eggs are laid, be dried, the eggs nevertheless hatch at their proper period, and shew that the juices of the plant, or its continuing fresh, were of no necessity or use to them. The osier-fly gives yet another difficulty, however, in regard to this system, of the eggs of these *flies* receiving nourishment from the juices of the plant; for it frequently lays several rows of eggs on a leaf, and the eggs in some of these lie two deep: now the question is, in what manner the juices of the plant, so necessary to these eggs, are carried to the upper tow? unless we can solve this, by supposing that the eggs of the under row convey juices to the upper ones, by communications of vessels, where they touch, the solution of this difficulty appears no easy task. *Reaumur*'s Hist. Inf. Vol. 9. p. 164.

SERRATED *leaf*, in botany. See LEAF.

SERRATULA, *saw-wort*, in botany, a name given to several species of *jacea*. See JACCA.

It seems very expresly proved by Dioscorides, Pliny, Antonius Musa, and several other of the antients, that the *betonica*, or, as they sometimes wrote it, *vettonica*, was our *serratula*. They mention its growing in woods, and having leaves deeply sinuated, or cut in, and indented all about the edges, and say it grew in wet shady places. All this agrees very well with our cut-leaved *serratula*, and with the *betonica*, or *vettonica* of the antients. Apuleius confounds the *brittanica antiquorum* with the *betonica*, and says that it has large leaves like the dock.

Pliny and this author seem to have drawn their knowledge from the same source; and if Pliny, though he has not said it, supposed, as this author does, that *betonica* and *brittanica* were the same, it is then no wonder that he says the *betonica* had leaves like a dock, for Dioscorides himself says this of the *brittanica*.

SERRATUS (*Cycl.*)—SERRATUS *major*, in anatomy, a broad, fleshy, and pretty thick muscle, lying on the lateral part of the thorax, between the ribs and scapula, by which it is covered. Its figure is that of an irregular square, its greatest breadth being in the back part, where it terminates by digitations of unequal lengths in a radicated disposition, their extremities describing an arch or curve. From these digitations it is that it has its name.

It is inserted backward in the internal labium of all the basis of the scapula, from the superior to the inferior angle; from thence running forward wholly fleshy, it encreases gradually in breadth, and is inserted in all the true ribs, and often in one or two of the false ones, by the same number of digitations. Though the digitations of this muscle give it a radiated appearance from the scapula to the ribs, yet these radii do not all lie in that disposition, which at first sight one would be apt to imagine. The muscle is made up of two planes, one great, the other small: the small plane looks like a distinct narrow muscle, closely adhering to the superior edge of the great plane. It is fixed by one extremity under the superior angle of the scapula, and by the other to the first rib by a small insertion, and to the second rib by a broad one. This plane is easily seen by turning the scapula forward, having first separated the rhomboides; but when it is turned back, the pectoralis minor being first cut off, this plane does not appear, being covered and hid by the broad one. The broad plane may be divided into two portions, one superior, the other inferior, adhering to each other at their edges.

The superior portion is thin, and takes up about three quarters of the basis of the scapula, reckoning from the superior angle; from thence it contracts by small degrees, and forms two digitations, very like those of the small plane, which they cover by their insertions in the two first true ribs, or in the second and third, and sometimes in all the three. The inferior portion is fixed in the lower quarter of the basis scapulæ, from whence it expands itself by six or seven very long fleshy digitations, which decrease in breadth as they descend, and are inserted in the manner beforementioned, in the six or seven ribs which follow the two first. *Winslow*'s Anatomy, p. 176.

SERRATUS *minor*, in anatomy, a name given by Riolanus to the muscle, more commonly known by the name of the *serratus anticus*. See SERRATUS, *Cycl.*

SERRATUS *posticus superior*, a flat thin muscle, situated on the upper part of the back, fixed on one side by a broad aponeurosis to the lower part of the posterior cervical ligament, and to the spinal apophyses of the two last vertebræ of the neck, and two first of the back; from thence it runs down a little obliquely forward, and is inserted by broad fleshy digitations in the posterior part of the second, third, fourth, and sometimes of the fifth true ribs, near their angles; but sometimes it has no insertion in the second rib. It is covered by the rhomboides, and closely united with it. *Winslow*'s Anatomy, p. 231.

SERRATUS *posticus inferior*, a flat thin muscle, lying on the lower part of the back.

It is fixed in the last spinal apophysis of the back, and in the three first of the loins by a broad aponeurosis; from thence it runs up a little obliquely, and is fixed by fleshy broad digitations in the last four false ribs. Its insertions in the lowest rib are near the cartilage, and in the other three near their angles. It is covered by the latissimus dorsi, to which it adheres very closely, and it covers the sacro-lumbaris, and longissimus dorsi. *Winslow*'s Anatomy, p. 231.

SERTA, *garlands*, among the antients. See the article GARLAND, *Cycl.*

SERTULA *campana*, in botany, a name given by some authors to melilot. *Ger.* Emac. Ind. 2.

SERTULARIA, in botany, the name of a genus of sea plants, comprehending, according to Linnæus, the *corallines* and *acetabulums* of Tournefort, and the *opuntioides* of Boerhaave. The generical character of these plants is, that they are a kind of lithophyta, which are jointed and composed of separate parts, fastened to each other by the ends, in the manner of the gems of a bracelet, or beads of a lady's necklace.

SERVE, in the sea language. To *serve* a rope, is to lay spun yarn, rope yarn, sinnet, a piece of canvas, or the like, upon it, which is rolled fast round about the rope, to keep it from fretting or galling in any place.

SERVITIIS *acquietandis*, a writ judicial that lies for a man distrained for services to one, when he owes and performs them to another, for the acquittal of such services. Reg. Judic. 27. *Blount*, *Cowel.*

SERULA, in zoology, the name of a webfooted sea-bird, a kind of mergus, very common about Venice, and called by Mr. Ray *mergus cirratus fuscus*, the brown crested diver, and supposed to be the *anas longirostra*, or long beaked duck of Gesner.

It is very nearly of the size of the duck; its head, and the upper part of its neck, are of a dusky yellow. The crown of the head is of a much duskier and browner colour than the rest, and has a crest of feathers hanging down from it. Its back is of a brownish hue, with a very faint admixture of grey. Its throat is of a pure white in its upper part, but lower down it is variegated with white, black, and a reddish brown. Its belly is all white. Its beak is slender, and rounded, and is three fingers breadth long. The upper chap is of a brownish green, and the under one red. It terminates in a hooked point, and both chaps are all the way serrated, or notched like the teeth of a saw. The wings are very small and short. *Aldrovand.* Vol. 3. p. 281. *Ray*'s Ornitholog.

SERUM (*Cycl.*)—There have been instances, in which the blood has been found to contain with its coagulum a substance, very different from what we usually understand by the word *serum*. Dr. Stuart has given an account of a man in an inflammatory fever, from whose arm eight ounces of blood was taken, which, when it had stood some time, afforded, instead of *serum*, half its quantity of a white liquor, like

like milk, fwimming on the coagulum. This had no fmell at firft; but being kept for obfervation, after fix days it contracted a fmell like that of rotten eggs; and after ftanding three weeks more, it neither altered its confiftence nor fmell.

If this liquor was chyle, then is chyle a fubftance very different from milk, milk being apt to turn fower, and become thick by keeping, and never contracting the fmell of rotten eggs, as this liquor did. Whether it be not chyle turned putrid, and brought near to purulency by a long circulation in the blood veffels, without being converted into blood, through fome defect in the fanguification, is a queftion not eafily decided. Five days after this being blooded again, the blood was found of the common kind, the *ferum* being a thin pellucid water as ufual. Philofoph. Tranf. Nº 442. p. 290.

SERUM *aluminofum*, *alum-whey*, a form of medicine prefcribed in the late London Pharmacopœia, made of a pint of milk boiled to whey with a quarter of an ounce of alum. *Pemberton's* Lond. Difp. p. 255.

SERWOY, in natural hiftory, a name given by Theodore de Bry, and others, to the animal called by us the *opoffum*, and by the natives of Brafil the *carigueya*. Phil. Tranf. Nº 239. p. 107. See OPOSSUM.

SESAMION, a word ufed by the antients to exprefs a preparation of the *fefamum*, or oily grain. It was a cake made of fefamum, honey, and oil.

SESAMOIDE *bones* (*Cycl.*)—The *fefamoide bones* are very fmall, and have their name from the feed of the *fefamum*, or oily grain, to which they are fuppofed to bear fome refemblance. There are feveral of them found, both in the joints of the toes and fingers. They are for the moft part very fmall, and affixed chiefly to ligaments, and only two of them are large enough to be commonly preferved in fceletons: thefe refemble a large flat oval pearl, and are hollowed on one fide.

They are of about the third of an inch in length, and are half as broad as long. They are connected very near each other, by a fmall fhort ligament, to the bafis of the firft phalanx of the great toe, fo as to flide on each fide of the middle eminence of the double pulley, in the firft metatarfal bone, like two fmall patellæ. Though thefe are generally faftened in fceletons to the firft bone of the metatarfus, they neverthelefs belong only to the firft phalanx of the great toe, as the patella belongs not to the os femoris, but to the tibia. *Winflow's* Anatomy, p. 104.

SESAMOIDES, in botany, the name of a genus of plants, the characters of which are thefe. The flower is wholly the fame in fhape with that of the refeda, but the fruit is very different in the different fpecies: in fome it confifts of feveral horns or capfules, each containing one feed of a kidney-like fhape; and in others it is multicapfular, or ftellated.

The fpecies of *fefamoides*, enumerated by Mr. Tournefort, are thefe. 1. The white-flowered *fefamoides* with hoary leaves. 2. The thick-leaved *fefamoides* with purplifh green flowers. 3. The *fefamoides* with ftellated fruit, called by many the *toad-flax-leaved refeda*. *Tourn.* Inft. p. 424.

SESAMUM, in botany, a name given by fome authors to the *myagrum*, or gold of pleafure. *Volk.* Flor. Norimb. 312.

SESELI, in botany, the name of a genus of plants, the characters of which, according to Linnæus, are thefe. The general umbel is uncertain in figure; the partial ones are very fhort, multiple, and almoft round. There is no general involucrum, and the partial ones are compofed of feveral leaves, of the length of the umbellule, narrow, and pointed. The perianthium is fcarce obfervable. The general corolla is nearly uniform; and the fingle flowers are compofed of five inflexo-cordated, and nearly equal petals. The ftamina are five fubulated filaments. The antheræ are fimple. The germen of the piftil ftands under the receptacle. The ftyles are two, and reflex. The ftigmata are obtufe. The fruit is ovated, fmall, ftriated, and feparable into two parts. The feeds are two in number, oval, convex on one fide, and plane on the other.

Tournefort has referred the fpecies of *fefeli* to the genus of fennel, *fœniculum*, from which, however, they greatly differ, in regard to their involucra. *Linnæi* Gen. Plant. p. 120. See FOENICULUM.

SESELI *feed*, in the materia medica, the name of the feed of a plant, called alfo by fome *libanotis*, and growing three or four feet high, with leaves like fennel, but of a paler green. It is a native of warm climates. The *feed* ought to be chofen moderately large, of a longifh fhape, heavy, clean, and of a greenifh colour, frefh, and of a grateful fmell. It affords, by diftillation, a very large quantity of an effential oil, and is hot and dry. It incides, opens, and difcuffes, and is cephalic, neurotic, pectoral, and nephritic. It is good againft epilepfies, apoplexies, vertigos, and all diforders of the head and nerves. *Lemery's* Dict. of Drugs.

The feeds of the *fefeli creticum* are diuretic, uterine, and good in all diforders of the breaft and lungs. They are given in fuppreffions of urine, and of the menfes, and in all kinds of flatulencies; and are, among the German phyficians, a common ingredient in medicines, intended to promote expectoration.

The feed of the french Hartwort, or *fefeli maffilienfe*, is efteemed of great virtue in difeafes of the head and nerves, in convulfions and epilepfies, and in weakneffes of the fight. It is alfo given in electuaries, intended againft all diforders of the breaft and lungs, in coughs, catarrhs, and afthmas, and in obftructions of the liver. Some have recommended it fingly, as a medicine of great efficacy againft obftructions of the menfes; and Schroder tells us, that it has the credit of being an antidote to the poifon of hemlock.

The common hartwort is poffeffed of the fame fort of virtues with the other two, but its feed is more warm and acrid than that of either of them. It is efteemed a very efficacious remedy in obftructions of the menfes, and in all diforders arifing from indigeftion, crudities, and flatulencies.

SESERINUS, in zoology, a name given by Rondeletius, and fome other authors, to a broad and fhort fea fifh, feeming the fame with the *lampuga* of Italian fifhermen; and defcribed by authors in general, and by this very author in another place, under the name of *ftromateus*. *Willughby*, Hift. Pifc. p. 137. See STROMATEUS.

SESQUITERTIONAL *proportion*. When any number or quantity contains another once and one third, they are *fefquitertional proportionals*.

SESSILE *roots*, among botanifts, fuch tuberous roots as adhere to the bafe of the ftalk. See ROOT.

SESSILE *leaf*, among botanifts. See LEAF.

SETS, a term ufed by the farmers to exprefs the young plants of the white thorn, and other fhrubs, which they ufe to raife their quick, or quick-*fet* hedges.

The white thorn is the beft, of all trees, for this purpofe, and under proper regulations, its *fets* feldom fail of anfwering the farmers utmoft expectations.

The firft thing to be confidered by the perfon, who is about to plant a quick-*fet* hedge, is what nature the land is of where it is to ftand, as whether it be clay, fand, or gravel. It is always proper to take the *fets* from a worfe land, than that they are to be planted on, otherwife they will never grow well. The *fets* are about the thicknefs of a man's thumb, and cut within four or five inches of the ground. If the quick is intended only for a hedge, without a bank or ditch, let the *fets* be planted almoft perpendicular in two rows, at about twelve inches diftance from each other; and if there is to be a ditch and a bank, that is to be firft provided. The ground is to be marked out with a line, and a ditch dug three feet wide at the top, one foot wide at the bottom, and two feet deep. When the ditch is digging, on that fide where the quick is to ftand, let the turf be laid evenly on the ground, with the graffy fide downwards: upon this fome fine mould is to be laid, to bed the quick-*fets* in, and they are to be laid upon it with their ends enclining upwards, and at about twelve inches afunder. They muft be carefully gathered, and fuch as are ftrait, fmooth, and well rooted, are only to be chofen. At every thirty feet there fhould be planted with the *fets* a young oak, afh, or fome other fuch tree, to grow up along with the hedge. When a compleat row of the *fets* is thus laid, cover them with a layer of fine mould, and lay over that another layer of the turf; add upon this a third layer of mould, fo deep, that its furface may be a foot above the row of *fets*: on this bed place another row of the like *fets* at the fame diftances, but placed between the others; cover this as the other, and then make up the bank with the earth dug out of the bottom of the ditch, and on its top fet the dry, or dead hedge: this will fhade the under plantation, and will be a defence till the *fets* are grown up into a live hedge. The ftakes for the dead hedge are to be driven into the bank fo low, as to reach the firm ground, and are to be placed at two feet and a half diftance from one another. Oak ftakes are the beft for this purpofe, and fallow and black thorn are efteemed next to thefe. The fmall bufhes cut from them muft be laid below, but not too thick, that they may fhade the young plantation without fmothering it, and defend its young fhoots from the biting of cattle: the long bufhes are to be laid at top to bind in the ftakes, by interweaving them. To add a farther ftrength to the hedge it may be eddered, as the farmers call it: this is binding the tops of the ftakes with fome fmall long poles, or fticks, on each fide. When this is all done, the ftakes fhould be new drove a little, becaufe the making the hedge, and the eddering it, are apt to loofen them a little.

The young plants muft be conftantly weeded, and great care muft be taken to preferve them from the bitings of cattle, efpecially of fheep. If they have been cropped, or are not found to grow well, it is a good cuftom among the farmers to cut them down to the ground, or within an inch of it, for after this they ufually fend out new roots, and fhoot very vigoroufly. *Mortimer's* Hufbandry.

SET-*bolts*, in a fhip. See BOLTS.

SETACEUS *vermis*, in natural hiftory, a name given by Dr. Lifter to that long and flender water worm, which fo much refembles a horfe-hair, that it has been fuppofed by the vulgar to be an animated hair of that creature.

Thefe

These creatures, supposed to be living hairs, are a peculiar sort of insects, which are bred and nourished within the bodies of other insects, as the worms of the ichneumon flies are in the bodies of the caterpillars.

Aldrovand describes the creature, and tells us it was unknown to the antients, but called *seta aquatica*, and *vermis setarius* by the moderns; either from its figure resembling that of a hair, or from the supposition of its having once been a hair of some animal. We generally suppose it, in the imaginary state of the hair, to have belonged to a horse, but the Germans say it was once the hair of a calf, and call it by a name signifying *vitulus aquaticus*, or the water-calf.

Albertus, an author much reverenced by the common people, has declared that this animal is generated of a hair; and adds, that any hair thrown into a standing water will, in a very little time, obtain life and motion Other authors have dissented from this opinion, and supposed them generated of the fibrous roots of water plants, and others of the parts of grasshoppers fallen into the water. This last opinion is rejected by Aldrovand, as the most improbable of all, yet in reality it comes nearest the truth of any of them. Standing and foul waters are most plentifully stored with them; but they are sometimes found in the clearest and purest springs, and sometimes out of the water, on the leaves of trees and plants, as on the fruit-trees in our gardens, and the elms in hedges. They are from three to five inches long, of the thickness of a large hair, and are brown upon the back, and white under the belly, and the tail is white on every part. *Aldrovand.* de Insect. Phil. Trans. N° 83. See the article AMPHISBÆNA *aquatica*.

SETAH, in botany, a name used by the oldest writers for the acacia. It is an orginal Hebrew word, and is explained by the lexicographers, by a thorn growing in the desert. It is rendered by Theodotion *acantha*, one of the names of the acacia.

SETICAUDÆ, in natural history, a term used to express such flies as have one or more hairs growing out at their tails. There are many species of these, distinguished by their having one, two, or three hairs.

SETINUM, in botany, a name given by some to the larch-tree, and by others to some other trees. The reason of giving it as the name of a tree is, that Dioscorides mentions the agaric as growing on it, according to the accounts of some writers of his time. But it is an error in the copies of that author, that has given rise to this imaginary name of a tree. The author says only, that it grew sometimes on beams, and other timber, when exposed to the weather. He has expressed beams by the word *stelechos*, and transcribers have made this *setinos*, or *setinum*.

This appears not only from some of the old manuscript copies retaining the word properly written, but also by the accounts the Arabians give of this drug. Avisenna and Serapion have both copied the words of this author, and they do not render the word in the original author, signifying the place of growth, or production of the agaric, by the name of any particular tree, but both say that it was formed of the putrefaction of trees and beams of timber, when they had been eaten by worms, or corrupted by wet; and they add from the same author, that the production of agaric seemed like that of the funguses.

From this, and from Pliny's account, it appears that the female agaric of the antients was not a fungus, or any thing like our agaric; but by Dioscorides's description of its texture, and Pliny's account of its giving light like a fire in the night, it appears to have been only a peculiar kind of rotten wood, which they knew by that name. The other, or male agaric, was yet more unlike to ours, it being a root of some kind, and in shape resembling the silphium.

SETSE, in botany, the name of a Chinese tree, called also *chitse*, and much esteemed by the people of that country for its beauty, and for the goodness of its fruit. In the provinces of Cantong and Honan there are whole plains covered with these trees, many of which grow to the size of our wallnut-tree. The fruit ripens every where in the East, where the tree grows, but it is of a much more delicious flavour in some places than in others. The leaves are of the colour and shape of those of the wallnut-tree, only that they are more round at the ends. The fruit is sometimes round, sometimes pointed at one end, sometimes oval, sometimes flat, and not unfrequently composed of two pieces, as it were, and resembling two apples cut and joined together. The rind is always green, never changing yellow or red, and the fruit keeps its freshness all the winter. They are about the size of the orange, and the skin is very tender and thin, and the fruit has a mixed taste of the sharp and the luscious. It is very wholesome and good. Observ. sur les Coutumes de l'Asie. p. 198.

SETTEE, a vessel, very common in the Mediterranean, with one deck, and a very long and sharp prow. They carry, some two masts, some three, without top-masts. Their yards and sails are all like the misen. The least of them are of sixty tons burthen. They serve to transport cannon, and provision for ships of war, and the like.

SETTING, (*Cycl.*) the term used by sportsmen to express a manner of attacking partridges, in order to the taking them, by means of a dog peculiarly trained to that purpose. The *setting*-dog generally used is a long land-spaniel, taught by nature to hunt partridges more than any other game, and in his untaught state running over the fields, in search of them, with an alacrity that is truly wonderful; yet by art this creature is brought under such excellent command, that he will, in the midst of his highest career, attend to the least hem from his master, and stand still to look in his face, and take his orders by the slightest signals; and when he is so near his game, that it is almost in his mouth, he will stand stock still, or lie down on his belly, till his master arrive, and he receives his directions.

The *setting*-dog being taken to the haunt of the partridges, is to be cast off, and sent to range; but he must be made to keep near the sportsman, and not to run wildly on, but to beat all the ground regularly. On being reproved for ranging too wildly and too far, he will keep close the whole day, and at times look up in his master's face to know if he does right or wrong. If in the dog's ranging he stop of a sudden, the sportsman is to make up to him, and as there is certainly game before him, he must be ordered to advance; if he refuse this, and look back and shake his tail, it is a signal that they are close before him, and the sportsman is then to take a circumference, and look with a careless eye before the dog's nose to see where they are, and how they lie; then going up, and staking down one end of the net, he is to command the dog to lie still, and to draw the net gently over the birds, then making in with a noise, he is to spring them, and they will be entangled and taken as they rise. It is a rule with fair sportsmen, when they take a covey in this manner, always to let the cock and hen go.

SETTING *of bricks*. See the article BRICKS.

SETTLING *a deck*, at sea, a term for taking a deck lower than it was at first.

SEVENTH (*Cycl.*)—SEVENTH, in music. In thorough basses the *seventh*, whether double, simple, major, or minor, is marked by a figure of 7; but if it be accidentally flat, or minor, thus, $^b7$, or 7^b. If sharp, or major, thus, $\sharp$ 7, or 7 $\sharp$. Again, if when it is naturally minor, it be marked with a flat, it must be diminished.

Diminished SEVENTH, in music. See the article DIMINISHED *seventh*.

SEVERAL (*Cycl.*)—SEVERAL *inheritance*, in law, an inheritance conveyed, so as to descend, or come to two persons *severally*, by moieties, or other parts.

SEVERAL *tenancy*, *tenura separalis*, a plea, or exception taken to a writ that is laid against two persons as joint tenants, who are *several*. Bro. 273. *Blount*, *Cowel*.

SEVERANCE (*Cycl.*)—SEVERANCE *of corn*. The cutting and carrying it from off the ground; and sometimes the setting out the tithes from the rest of the corn, is called *severance*. 2 Cro. 325.

SEVIL, in the manege. The *sevil* of the branches of a bridle is a nail turned round like a ring, with a large head, made fast in the lower part of the branch, called *gargouille*. See the article BANQUET.

SEVIR, among the Romans, an officer who, according to Pitiscus, commanded a whole wing of horse; tho' others make him only the commander of a troop, *turmis*, a division answering to our regiments.

SEVIRI, were also magistrates in the colonies, so called, from their being six in number. *Pitisc.* in voc.

SEW, in the sea language. When a ship at low water comes to lie on the ground, and to lie dry, they say she is *sewed*; and if she be not quite left dry, they say she *sews* to such a part.

SEWEL-*coronde*, a name given by the natives of Ceylon to a species of cinnamon, which, when chewed, is of a mucilaginous nature, like the cassia: this dries well, and is very firm and hard, and has the appearance of a very fine cinnamon; but it has very little taste, and a disagreeable smell. The natives take advantage of the handsome appearance of this kind of cinnamon, and are very apt to mix it with the good kind, to the great detriment of the buyer. Philos. Transf. N° 409.

SEXANGLE, in geometry, a figure having six sides, and consequently six angles.

SEXTANS, (*Cycl.*) a word used by pharmaceutic writers for the sixth part of a pound, that is, two ounces troy-weight, or sixteen drachms. It is also used by some authors for a sixth part of any other standing weight, or measure.

SEXTERY *lands*, are lands given to a church, &c. for maintenance of the sexton. *Blount*.

SEXTULA, a word used by some pharmaceutic writers to express the sixth part of an ounce, that is, four scruples, or one drachm and one scruple.

SEXTUS *oculi*, in anatomy, a name given by Fallopius to one of the muscles of the eye, called by Albinus, and others, the *obliquus oculi inferior*, and by some the *obliquus oculi brevis*. See the articles OBLIQUUS *inferior*, and EYE.

SEXTUS *thoracis*, in anatomy, a name given by Fallopius, and others, to a muscle, now generally known by the name of the *triangularis sterni*.

SEXUALISTÆ, among botanical authors, thofe who have eftablifhed the claffes of plants upon the differences of the fexes, and parts of fructification in plants, according to the modern method, as Linnæus, &c.

SEXUNX, in pharmacy, the weight of fix ounces, or half a pound troy.

SEYGAR, in the materia medica, a name ufed by fome authors for the nutmeg. *Ger.* Emac. Ind. 2.

SHACKLES, aboard a fhip, are thofe oblong iron rings, bigger at one end than at the other, with which the ports are fhut faft, by thrufting the wooden bar of the port through them. There are alfo a fort of *fhackles* to lift the hatches up with, of a like figure, but fmaller. They are faftened at the corners of the hatches.

SHAD, *alaufa*, in zoology, the name of a fea-fifh of the herring-kind, called alfo the *mother of herrings*, and by fome authors *clupea* and *triffa*, and by the antients *trichis*, or *trichias*. See Tab. of Fifhes, N° 39.

It very much refembles the herring in its general form, but it is flatter and broader, and grows to a cubit long, and four inches broad. It is of the colour of the pilchard, of a bluifh black on the back, and a filvery white on the belly and fides, and the coverings of the gills are fometimes purplifh, and fometimes a little yellow. Near the gills it has alfo on each fide a large black fpot, and five or fix others on each fide, which are fmaller, and placed behind them. Thefe are all moft diftinguifhable when the fifh is fcaled. The fcales are large, and eafily fall off, and are dotted with fmall black fpots at their edges.

It is very common in many feas, and in fome of our large rivers which lie near the fea. They run up thefe in great numbers in the months of March and April, and are then very fat; in May they become lean, and then go down to the fea again. They ufually fwim in large fhoals together. *Willughby*, Hift. Pifc. p. 227.

SHAFT (*Cycl.*)—SHAFT, in mining, is the fame with a groove, or pit. *Shafts* are funk fome ten, fome twenty fathoms deep into the earth, more or lefs. *Houghton*'s Compl. Miner, in the Explan. of the Terms.

SHAGGE, in zoology, a name by which we commonly call a water fowl common on the northern coafts, and called by Mr. Ray *corvus aquaticus minor*, or the leffer cormorant, being properly a bird of the cormorant-kind.

It is fomewhat larger than the common duck, and weighs about four pounds. Its beak is ftrait and flender, and is not flatted, but roundifh. It is four fingers breadth long, and is hooked at the end. Its mouth opens very wide, and its eyes are fmall. Its head, neck, and back are of a fine fhining black, with an admixture of a purplifh, or greenifh glofs, fhining like fattin. Its breaft is brown, and the middle of its belly greyifh. Its tail is fhort, and its wings, when folded, reach juft to the end of it, and no farther. Its legs are covered with a cancellated fkin, not a congeries of fcales, and its toes are all connected by a membrane. It fwims with its head erect, and moft of its body under water, and is very fhy, and with difficulty fhot. It builds in trees as the common cormorant, and is evidently a fpecies of that bird, though different in fize, and in the colour of its belly. *Ray*'s Ornitholog. p. 219.

SHAKER *pigeon*, a kind of pigeons, of which there are two forts, the broad tailed, and the narrow tailed.

The firft is the fineft, and moft valued. It has a beautiful long thin neck, which bends like the neck of a fwan, leaning towards the back. It has a full breaft, a very fhort back, and a tail confifting of a great number of feathers, feldom lefs than four and twenty, which it fpreads in an elegant manner, like the tail of a turkey-cock, and bends it up fo, that it meets the head. It is commonly all white, but fometimes is red, yellow, or blue-pied. The longer the neck of this bird is, the more it is valued.

The fecond, or narrow-tailed *fhaker*, has a fhorter and thicker neck, and a longer back. It is efteemed by many a different fpecies, but feems only a mixed breed with fome other pigeon. They are called *fhakers*, from a tremulous motion which they have with their necks when courting. *Moore*'s Columbarium, p. 54.

SHAMBLE, in mining, a term ufed to exprefs a fort of nich, or landing place, left at certain diftances in the adits of mines. The method of digging the tin mines in Devonfhire, and fome parts of Cornwall, is this; they fink their way in fuch a breadth, as is fufficient for them to ftand and work, and at every fathom they leave a fquare place vacant, to which the ore is to be thrown up with fhovels as it is dug. This they do from caft to caft; that is, as far as a man can conveniently throw up the ore with his fhovel. Thus the ore, as it is dug by the beelmen, is thrown up by the fhovellers, who follow them from *fhamble* to *fhamble*, till it comes to the top of the mine. This, however, is but an inconvenient way, and the ufe of thefe *fhambles* is generally fupplied by a winder at the opening of the mine, which manages two buckets, the one of which is fent down empty, while the other is fent up full; and one man employed below to load, and another above to empty. Phil. Tranf. N° 69. See the article DIGGING.

SHAMBRIER, in the manege, is a long thong of leather, made faft to the end of a cane, in order to animate a horfe, and punifh him, if he refufes to obey the rider.

SHANK *of an anchor*, on board a fhip. See ANCHOR.

SHANK, in the manege, is that part of a horfe's fore leg, which lies between the knee and the fetlock, or paftern-joint.

SHANK, or *Shank-painter*, in a fhip, is a fhort chain faftened under the foremaft-fhrowds, by a bolt, to the fhip's fides, having at the other end a rope faftened to it. On this *fhank-painter* the whole weight of the aft part of the anchor refts, when it lies by the fhip's fide. The rope, by which it is haled up, is made faft about a timber-head.

SHARE, the name of that part of the plough which cuts the ground, and the wood to which it is fixed. The extremity of the iron forwards is called the point of the *fhare*, and the end of the wood behind is called its tail.

The length of the whole *fhare*, from point to tail, fhould be three feet nine inches; at the top of the iron it has an upright piece, called the *fin*, and near the iron, at the other end, there is an oblong fquared hollow, called the *focket*; the ufe of which is to receive the bottom of the fheat. Near the tail there is a thin plate of iron, well rivetted to the wood; by means of this plate the tail of the *fhare* is held firmly to the hinder fheat of the plough by a fmall iron pin, with a fkrew at the end, and a nut fkrewed on it, on the inner or right fide of the fheat.

The point of the *fhare* is that part in which it does not run up into the fin: this point is generally made of three inches and a half in length, and fhould be flat underneath, and round at the top, and the lower part of it muft be of hard fteel. The edge of the fin fhould alfo be well fteeled, and fhould make an acute angle with the *fhare*.

The focket is a fort of mortife; it fhould be a foot long, and about two inches deep: the fore end of it muft not be perpendicular, but oblique, conformable to the end of the fheat which enters into it. The upper edge of the fore part muft be always made to bear againft the fheat; but if this end of the focket fhould not be quite fo oblique as the fheat, it may be helped, by paring off a fmall part of the wood at the point. *Tull*'s Hufbandry, p. 140. See the article PLOUGH.

SHARK. We know two different fifh under the fame name of *fhark*, with the addition of their colour, blue and white. See Tab. of Fifhes, N° 2, 3, 4.

The blue *fhark* is that fpecies of fqualus called *glaucus*, and *galeus glaucus*, by authors, and diftinguifhed by Artedi by the name of the *fqualus* with a triangular dent, or furrow, in the extremity of the back, and with no foramina about the eyes. See GALEUS.

The other is the *lamia*, or *canis carcharias* of authors, commonly called by us fimply *the fhark*. This is diftinguifhed by Artedi by the name of the *fqualus* with a flat back, and with numerous teeth, ferrated at the edges. See the article SQUALUS.

The white *fhark*, or *lamia*, is a very dreadful and voracious fifh, the largeft of all the *fharks*. They have been feen of four thoufand weight, with throats capable of fwallowing a lufty man whole; nay, men have been found whole in them when opened. Some have, for this reafon, imagined this, and not the whale, to have been the fifh in whofe belly the prophet Jonah lay. Its teeth are very fharp and terrible; they are difpofed in fix rows, and are all triangular, and notched like a faw on their edges. Thefe are, in the whole, a hundred and forty four in number, and are placed in various directions. Their number is not exactly determinate. Its back is fhort and broad, in comparifon of the other fifh of this kind, and its tail compofed of two fins of a cubit in length each. Its fkin is rough, and its eyes large and round. It is found both in the Ocean and Mediterranean, and is of all fifh the moft voracious of human flefh.

It has its name from the Greek, λαίμος, a voracious feeder, or glutton. The foffile bodies, called *gloffopetræ*, or ferpents tongues, and fuppofed to be real ftones, are the teeth of this fifh. *Willughby*, Hift. Pifc. p. 47.

Hammer-headed SHARK. See the article ZYGÆNA.

SHARP (*Cycl.*)—SHARP, in the fea language, is to hale taut. Thus when they fay, *fharp the bow line*, it fignifies to hale it taut.

SHARP *third*, in mufic, the third major. See the article INTERVAL.

SHARPLING, in ichthyology, the Englifh name of the gafterofteus. See GASTEROSTEUS.

SHASTRAM, the name of the bible of the Bramins. See the article BRAMINS.

SHAW, in our old writers, a grove of trees, or a wood. It is mentioned 1 Inft. 4. *Blount.*

SHEAR *off*, in the fea language, the fame as to get away.

SHEARING (*Cycl.*)—The beft time for *fhearing* of fheep is about the middle, or the latter end of June, becaufe it is good for them to fweat in the wool before it is cut. They muft be very well wafhed before the *fhearing*, for this is a great addition to the price of the wool: after the wafhing, let them go three or four days in a clean dry ground. When they are cut, the fhearer muft be very careful not to wound their

their skins, because this gives occasion to the flies to teaze the poor creature in a terrible manner. Some *shear* their lambs, the first year especially, behind; but before the doing of this they ought to be carefully tagged, as it is called, that is, their tails and thighs behind should be well cleared of wool, that the dung may not hang there, which would else make them sore, and subject them to the flies, which would blow them, and make them full of maggots.

In Gloucestershire they house their sheep every night, and litter them with clean straw. Their dung makes this a very good manure for the land, and the wool of the sheep is rendered so much finer by it, that the farmers have a double advantage from the practice.

In Middlesex, and about London, they have Way-hill sheep: these come from Hampshire, Wiltshire, &c. and lamb very early, before Christmas. *Mortimer's* Husbandry.

SHEARING, in the sea language. See CHEST-*rope*.

SHEAT *of a plough*, a word used by our farmers to express a part of a plough, passing through the beam, and fastened to the share. The *sheat*, or, as it is sometimes called, the *fore-sheat*, (there being another timber behind it, called the *hinder-sheat*) should be seven inches wide, and is fastened to the beam by the retch, a piece of iron with two legs, and by a wedge driven with it, into the hole in the beam. The angle made by the *sheat*, with the beam of the plow, should be forty two, or forty three degrees. *Tull's* Husbandry. See the article PLOUGH.

SHEATS, in a ship, are ropes bent to the clews of the sails, serving in the lower sails to hale aft, or round-off the clew of the sail; but in top-sails they serve to hale home, as the word is, or to hale the clew of the sail close to the yard-arm.

If the main-sail-*sheats* are haled aft, it is in order to make a ship keep by a wind, but when the fore-*sheats* are haled aft, it is that the ship may fall off from the wind; and if she will not do it readily, they then hale the fore-sail, by the *sheat*, flat in, as near the ship's sides as they can; and this they call *flatting in the fore-sail*. When they say, *ease the sheat*, they mean veer it, or let it go out gently; but when the word is, *let fly the sheat*, they mean, let it go all at once, and run out as fast as it can; and then the sail will hang loose, and hold no wind. In a very great gale, or gust of wind, there is another rope bent to the clews of the main-sail and fore-sail, above the *sheat*-block, to succour and ease the *sheat*, and this they call a *false sheat*.

SHEATS, in a ship, also, are those planks under water which come along her run, and are closed into the stern-post; so also that part within board, in the run of the ship, is called the *stern-sheats*. The seamen say, when they would have the *sheats* of the main or fore-sail haled aft, *tally the sheats*.

False SHEAT, on board a ship, is a rope bent to the clews of the main-sail and fore-sail, above the *sheat*-block, to succour and ease the *sheat* in a violent gust of wind.

Overhale the SHEAT, in the sea language, a word of command to hale upon the standing part of the *sheat*.

SHEAT *anchor*, in a ship. See ANCHOR.

SHEATHING (*Cycl.*)—SHEATHING *of a ship*, is casing that part which is to be under water, with something to keep the worms from eating into her planks. It is usually done by laying tar and hair, mixed together, all over the old plank, and then nailing on thin new boards; but this hinders a ship's sailing, and therefore of late some have been *sheathed* with milled lead.

It is very well worth the trying what the new stone-pitch will do in this case; if it will defend from the worm, as perhaps it may, a ship might be paid with it cheaper than with the crown-pitch; and it will not crack nor scale off, as that will do, but keeps always soft and smooth. It has been found to continue on thirteen months, and to remain very black and soft all the time.

SHEDDING *of the hair*, in the manege. See CAST.

SHEEP, *ovis*, in zoology. See the article OVIS.

This is a kind of cattle that is kept at the least expence of any to the farmer, and will thrive upon almost any ground, and for this reason many prefer them before the larger cattle.

The best sort of *sheep* for fine wool, are those bred in Herefordshire and Worcestershire, but they are small, and black faced, and bear but a small quantity.

Warwick, Leicestershire, Buckingham, and Northamptonshire, breed a large-boned *sheep*, of the best shape, and deepest wool we have good. The marshes of Lincolnshire breed a very large kind of *sheep*, but their wool is not good, unless the breed be mended by bringing in *sheep* of other counties among them, which is a scheme of late very profitably followed there.

The northern counties in general breed *sheep* with long, but hairy wool, and Wales bears a small hardy kind of *sheep*, which has the best tasted flesh, but the worst wool of all.

The farmer should always buy his *sheep* from a worse land than his own, and they should be big-boned, and have a long greasy wool, curling close and well. These *sheep* always breed the finest wool, and are also the most approved of by the butcher for sale in the market.

For the choice of *sheep* to breed, the ram must be young, and his skin of the same colour with his wool, for the lambs will be of the same colour with his skin. He should have a large long body, a broad forehead, round, and well rising, large eyes, and strait and short nostrils. The polled *sheep*, that is those which have no horns, are found to be the best breeders. The ewe should have a broad back, a large bending neck, small, but short, clean and nimble legs; and a thick deep wool covering her all over. To know whether they be sound or not, the farmer should examine the wool, that none of it be wanting, and see that the gums be red, the teeth white and even, and the brisket skin red, the wool firm, the breath sweet, and the feet not hot. Two years old is the best time for beginning to breed, and their first lambs should not be kept too long, to weaken them by suckling, but be fold as soon as conveniently may be. They will breed advantageously, till they are seven years old.

The farmers have a method of knowing the age of a *sheep*, as a horse's is known by the mouth. When a *sheep* is one shear, as they express it, it has two broad teeth before; when it is two shear, it will have four; when three, six; and when four, eight: after this their mouths begin to break. The difference of land makes a very great difference in the *sheep*. The fat pastures breed strait, tall *sheep*, and the barren hills and downs breed square short ones; woods and mountains breed tall and slender *sheep*, but the best of all are those bred upon new-plowed land, and dry grounds. On the contrary, all wet and moist lands are bad for *sheep*, especially such as are subject to be overflowed, and to have sand and dirt left on them. The salt marshes are, however, an exception to this general rule, for their saltness makes amends for their moisture; any thing of salt, by reason of its drying quality, being of great advantage to *sheep*.

As to the time of putting the rams to the ewes, the farmer must consider at what time of the spring his grass will be fit to maintain them and their lambs, and whether he has turneps to do it till the grass comes; for very often both the ewes and lambs are destroyed by the want of food; or if this does not happen, if the lambs are only stunted in their growth by it, it is an accident that they never recover. The ewe goes twenty weeks with lamb, and according to this it is easy to calculate the proper time. The best time for them to yean is in April, unless the owner has very forward grass, or turneps, or the *sheep* are field-*sheep*, where you have not enclosures to keep them in, then it may be proper they should yean in January, that the lambs may be strong by Mayday, and be able to follow the dam over the fallows, and water furrows; but then the lambs, that come so early, must have a great deal of care taken of them, and so indeed should all other lambs at their first falling, else, while they are weak, the crows and magpies will peck their eyes out.

When *sheep* are turned into fields of wheat or rye to feed, it must not be too rank first, for if it be, it generally throws them into scowerings. Ewes that are big should be kept but bare, for it is very dangerous to them to be fat at the time of their bringing forth their young. They may be well fed indeed, like cows, a fortnight beforehand, to put them in heart. *Mortimer's* Husbandry, p. 243.

The feeding *sheep* with turneps is one great advantage to the farmers, from the crops they raise of them: they soon fatten upon them, but there is some difficulty in getting them to feed on them; the old ones always refuse them at first, and will sometimes fast three or four days, till almost famished, but the young lambs fall to at once.

The common way, in some places, of turning a flock of *sheep* at large into a field of turneps, is very disadvantageous, for they will thus destroy as many in a fortnight as would have kept them a whole winter. There are three other ways of feeding them on this food, all of their several advantages.

The first way is to divide the land by hurdles, and allow the *sheep* to come upon such a portion only at a time, as they can eat in one day, and so advance the hurdles farther into the ground daily, till all be eaten. This is infinitely better than the former random method, but they never eat them clean even this way, but leave the bottoms and outsides scooped in the ground; the people pull up these indeed with iron crooks, and lay them before the *sheep* again, but they are commonly so fouled with the creature's dung and urine, and with the dirt from their feet, that they do not care for them; they eat but little of them, and what they do, does not nourish them like the fresh roots.

The second way is by enclosing the *sheep* in hurdles, as in the former, but in this they pull up all the turneps they suppose the *sheep* can eat in one day, and daily remove the hurdles over the ground, whence they have pulled up the turneps: by this means there is no waste, and less expence, for a person may in two hours pull up all those turneps; the remaining shells of which would have employed three or four labourers a day to get up with their crooks out of the ground, trodden hard by the feet of the *sheep*; and the worst is, that as in the method of pulling up first, the turneps are eat up clean; in this way, by the hook, they are wasted, the

the *sheep* do not eat any great part of them, and when the ground comes to be tilled afterwards for a crop of corn, the fragments of the turneps are seen in such quantities on the surface, that half the crop at least seems to have been wasted.

The third manner is to pull up the turneps, and remove them in a cart or waggon to some other place, spreading them on a fresh place every day; by this method the *sheep* will eat them up clean, both root and leaves. The great advantage of this method, is, when there is a land not far off which wants dung more than that where the turneps grow, which perhaps is also too wet for the *sheep* in winter, and then the turneps will, by the too great moisture and dirt of the soil, sometimes spoil the *sheep*, and give them the rot. Yet such ground will often bring forth more, and larger turneps than dry land, and when they are carried off, and eaten by the *sheep* on plowed land in dry weather, and on green sward in wet weather, the *sheep* will succeed much the better; and the moist soil, where the turneps grow, not being trodden by the *sheep*, will be much fitter for a crop of corn, than if they had been fed with the turneps on it. The expence of hurdles, and the trouble of moving them, is saved in this case, and this will counterbalance at least the expence of pulling the turneps, and carrying them to the places where they are to be eaten. They must always be carried off for oxen. *Tull's* Horsehoeing Husbandry.

The use of salt preserves *sheep* from the rot. The animals must be made to take a small handful of it two or three times in a few days, without permitting them to drink any thing for some hours afterward. *Boyle's* Works abridged, Vol. 1. p. 109.

Folding of SHEEP. See the article FOLDING.

SHEEP's *dung*. This is one of the best manures we know. It succeeds better upon cold clayey lands, than any other dung whatever; but as it is not so conveniently to be collected as the dung of larger animals, it is commonly conveyed to the land, it is intended for, by folding the *sheep* upon it. The urine, as well as the dung, is thus given to the land, and is of very great advantage; but the farmer always should plow in this sort of manure as soon as he can, for the sun soon robs it of a great part of its virtue.

In Northamptonshire they begin to fold the *sheep* upon the lands that they would dung by them, after the month of July, and the drier the lands are, the later they fold them. In Flanders they make many thousand loads of manure annually from their *sheep*: they cover the bottom of the folds considerably deep with some light and spungy earth, and when this has received the dung and urine of the animals for seven or eight days, they remove it, and lay fresh in its place: the earth thus impregnated, becomes an excellent improvement to land, and they raise large crops by means of it, in places where very little could be expected without it. In England we have a contrivance like this, which is the covering the bottoms of the folds deep with sand, and changing it once in a week, or thereabouts: this is a kind of manure finely calculated for clayey lands, both the sand, and this peculiar kind of dung, being appropriated things for it. *Mortimer's* Husbandry.

SHEEP-*nose-worms*, in natural history, a species of fly-worm, found in the noses of *sheep*, goats, and stags, and produced there from the egg of a large two-winged fly.

The frontal sinuses above the nose in *sheep*, and other animals, are the places where these *worms* live, and attain their full growth. These sinuses are always full of a soft white matter, which furnishes these *worms* with a proper nourishment, and are sufficiently large for their habitation; and when they have here acquired their destined growth, and come to the state in which they are fit to undergo their changes for the fly-state, they leave their old habitation, and falling to the earth, bury themselves there; and when these are hatched into flies, the female, when she has been impregnated by the male, knows that the nose of a *sheep*, or other animal, is the only place for her to deposit her eggs, in order to their coming to good. *Reaumur's* Hist. Inf. Vol. 4. p. 552.

Mr. Vallisnieri, to whom the world owes so many discoveries in the insect class, is the first who has given any true account of the origin of these *worms*. Though their true history had been, till that time, unknown, the creatures themselves were very early discovered, and many ages since were esteemed great medicines in epilepsies.

It is very common to find only one *worm* in the head of the creature that has them, often two are found, and sometimes three, but very seldom any more than that. *Reaumur*, ibid. p. 554.

Redi has given a very imperfect figure of this creature, nor is that of Mr. Vallisnieri much better. The *worm* is of the first class, and has two brown hooks at the anterior part of its head, placed parallel, or nearly parallel to one another. It is composed of eleven rings, which together form a conic figure, something flatted, of which the head of the *worm* is the point. When the *worm* is young, it is very white, but has two brown spots placed over against each other, in the hinder part of its body, which are its two posterior stigmata. Each of these spots is parted into two by a concentric circle, which is sensible; as it is whitish, the rest of the spot being brown. It is plainly this very separation which gives passage to the air. When the creature pleases it shews these, but it can also draw them into a sort of purse in its posterior ring. The anus is just below, and is usually hid by the folds of the skin. The hooks are brown and strong; just above these are two little fleshy horns, and between them is placed the mouth. *Reaumur*, ibid. p. 555.

This *worm*, when at its full growth, is considerably large, and becomes brownish, or of a dirty white. Its belly, examined by the microscope, is seen furnished with a number of fine short prickles between the rings: the points of all these are turned backward, and one may even feel these prickles, in drawing the finger along the belly from the hinder part toward the head.

These *worms* are capable of moving themselves very swiftly; and it is doubtless owing to their motions in the head of the creature, and to the pain that the sensible membranes there must have from being wounded by the hooks and prickles of this creature, that *sheep* are often seen to grow outragious, and strike their heads against trees, and other hard bodies. Ibid. p. 556.

When these *worms* are taken out of the heads of *sheep*, if they are put upon the earth, they immediately bury themselves very deeply in it; and if not, yet at their full growth, or in a proper state for their changes, they die there: but if it be near the time that they would naturally have quitted their antient habitation, which may be known by their being changed from their fine white to a brownish colour, then they undergo all their proper changes under a shell, made by the hardening of their own skin. This shell is of the same shape with the animal itself, but is of a deep brown. Ibid. p. 557.

It takes some time for the creature to undergo its several changes, and that more or less, according to the season. Mr. Vallisnieri had one produced in the perfect fly-state, after forty days from the time of its first change. Mr. Reaumur found those, which formed their shell on the twenty fourth of April, not to produce the fly before the twenty seventh of June. Ibid. p. 558.

The creature, when ready to appear in the fly-state, has no great difficulty in the getting out of its case; the swelling and inflating its head, and throwing out its bladder, which is the practice of these creatures on this occasion, easily detaches a piece of the shell, originally loose, and gives the fly a sufficient passage.

The fly, produced from this worm, has all the time of its life a very lazy disposition, and does not like to make any use either of its legs or wings. Its head and corcelet together are about as long as its body, which is composed of five rings, streaked on the back; a pale yellow and brown are there disposed in irregular spots; the belly is of the same colours, but they are there more regularly disposed, for the brown here makes three lines, one in the middle, and one on each side, and all the intermediate spaces are yellow. The wings are nearly of the same length with the body, and are a little inclined in their position, so as to lie upon the body; they do not, however, cover it, but a naked space is left between them. The ailerons, or petty wings, which are found under each of the wings, are of a whitish colour, and perfectly cover the balancers, so that they are not to be seen without lifting up these. The upper part of the corcelet is full of small black prominences, which, when examined by the microscope, appear as so many corns of gunpowder. Its head is large, in proportion to the size of the body, and its reticular eyes are of a deep changeable green. These eyes take up less space in the head, than those of most other flies; they leave a considerable space between them, and in that are placed the three smaller, or glossy eyes, which are placed in form of a small triangle, and stand so near, as to touch one another. The rest of the upper part of the head is yellowish, and viewed by the microscope, appears cavernous like a spunge, or morel, and in the bottom of each of these small cavities is a little black prominence. There are two other hollows in the anterior part of the head, in which the antennæ are placed: these are of the battledoor form, but rather round than flat, and have each a large hair going from them. The under part of the head, which is rounder than the upper, is whitish, and very smooth; it has two sorts of bands directed downward, which are the elongations of the rims of the arches where the antennæ are lodged. The smoothness of the underpart of the head makes one see very distinctly these three little tubercles; the upper one brown, the under ones of a pale deadish yellow. The mouth of the fly seems to be placed between these, immediately under the upper tubercle. Ibid. p. 559, 560.

The fly will live two months, after it is first produced from the shell, but will take no nourishment of any kind; and possibly it may be of the same nature with the butterflies, which never take any food during the whole time of their living in that state. Ibid. p. 561.

SHEEP-*ſtealing*, is now made felony without benefit of clergy. See the article CATTLE.

The like penalty is enacted for killing *ſheep*, with an intent to ſteal the fat, or any part of the carcaſe, or for aſſiſting in any ſuch offence. Stat. 14 Geo. II. cap. 6. ſect. 1.

SHEERS, aboard a ſhip, a name the ſeamen give to two maſt's yards, or poles, ſet up and ſeized acroſs each other aloft, near the top. This pair of *ſheers*, as they call it, is placed below on the chain-wales of the ſhrouds, and laſhed faſt to the ſhip's ſide, to keep them ſteady aloft. Their uſe is to ſet in, or take out a maſt; for which end there is faſtened at the place where they croſs one another, a ſtrong double block with a ſtrap. They ſerve alſo to hoiſe in or out, of boats that have maſts, ſuch goods as are wanted to be taken in or out.

SHEER-*water*, in zoology, an Engliſh name for a bird common on our coaſts, and not known by any of the common authors, nor honoured with a Latin name. It is nearly of the ſize of a duck. Its head, which is large, neck and back, are of a browniſh black; its throat, breaſt and belly, white; its legs are red. Its three fore toes are connected by a membrane, but its hinder one is looſe. Its wings are very long, and when folded reach to the end of the tail. Its beak is ſtrong and ſharp, and is hooked at the end. It flies very ſwiftly along the ſurface of the water, whence it has its name. *Ray's* Ornitholog. p. 252.

SHEET, in the manege. See CAPARASON, *Cycl.*

SHEIK, in the Oriental cuſtoms, the perſon who has the care of the moſques in Egypt; his duty is the ſame as that of the imams at Conſtantinople. There are more or fewer of theſe to every moſque, according to its ſize or revenues. One of theſe is head over the reſt, and anſwers to a pariſh prieſt with us, and has under him, in large moſques, the readers, and people who cry out to go to prayers; but in ſmall moſques the *ſheik* is obliged to do all this himſelf. In ſuch it is their buſineſs to open the moſque, to cry to prayers, and to begin their ſhort devotions at the head of the congregation, who ſtand rank and file in great order, and make all their motions together. Every Friday the *ſheik* makes an harangue to his congregation. *Pocock's* Egypt. p. 171.

SHEIK-*bellet*, the name of an officer in the Oriental nations. In Egypt the *ſheik-bellet* is the head of a city, and is appointed by the paſha. The buſineſs of this officer is to take care that no innovations be made, which may be prejudicial to the port, and that they ſend no orders which may hurt the liberties of the people. But all his authority depends on his credit and intereſt, not his office: for the government of Egypt is of ſuch a kind, that often the people of the leaſt power by their poſts have the greateſt influence; and a caia of the janizaries, or Arabs, and ſometimes one of their meaneſt officers, an oda-baſha, finds means, by his parts and abilities, to govern all things. *Pocock's* Egypt, p. 163.

SHELF, (*Cycl.*) a term uſed by the miners, in many parts of England, to expreſs a diſtinction of the inner ſtructure of the earth, ſo little known to philoſophers, that they have no word to expreſs it by. Theſe workmen ſometimes alſo expreſs it by the term *faſt ground*, or *faſt country*. What they mean by this, is, that part of the earth, which they find lying even, and in an orderly manner, and evidently having retained its primitive form and ſituation, unmoved by the waters of the general deluge, while the circumjacent, and upper ſtrata, have plainly been removed, and toſſed about.

It is evident to reaſon, that there muſt have been a very violent concuſſion of the ſuperficial part of the earth, in the time of its being covered by the waters of the deluge; and experience as much evinces this as reaſon. Before this concuſſion it appears probable, that the uppermoſt ſurface of mineral veins, or loads, did in moſt places lie even with the then ſurface of the earth. The remains of this ſurface, found at different depths in digging, the miners expreſs by the word *ſhelf*.

In this concuſſion of the waters covering the whole earth, its natural ſurface, together with the uppermoſt ſurface of thoſe mineral veins, were then in many places looſened, and torn off; and the earth, and with it the mineral nodules, called *ſhoad-ſtones*, were carried down with the deſcending waters from hills into the adjacent valleys, and ſometimes into the ſtreams of rivers, by which they were waſhed to yet greater diſtances from their original place. On this depends the method of training mines. Philoſoph. Tranſ. N° 69. See the article TRAINING.

SHELL (*Cycl.*)—SHELL-*fiſh*, *conchylia*. The world has for a long time wanted a regular method of claſſing of *ſhell-fiſh*, which a late author of the French nation has attempted, upon a new and very valuable plan. In this he throws aſide the vulgar diſtinction of *ſhells*, into the ſea, freſh water, and land kinds, and very judiciouſly arranges all under the ſame claſs, which have the ſame general characters.

The *ſhells* are all naturally to be arranged under three principal claſſes; theſe will contain all the ſpecies, and are afterwards to be divided into a number of families, or genera, and under theſe the ſeveral ſpecies regularly recounted; and at the end of each deſcription, the varieties may be added. The firſt general claſs of *ſhells* contains thoſe which are found all of one piece, or have only one *ſhell*, not a pair. Theſe have been called by the Greeks *monothyræ*, and by the Latin authors *univalvia*, univalves.

The ſecond general claſs contains thoſe *ſhells* which are of two pieces, called *bivalves*, ſuch as oiſters, cockles, and the like. See Tab. of Shells, paſſim.

The third claſs contains thoſe which are compoſed of more than two pieces. Theſe are called *multivalves*; and of this kind are the pholas and balanus.

This method takes in the freſh-water-*ſhells*, as well as thoſe of the ſea; and as thoſe hitherto known are all of one or other of the firſt claſſes, their ſeveral ſpecies will be compriſed among, or after the ſea *ſhells* of each of thoſe claſſes.

The land-*ſhells* are of two kinds, the recent and the foſſile; the firſt kind, as far as hitherto known, are all univalves, and the latter are of all the three claſſes.

As each of theſe general claſſes contains a very great number of ſpecies, it may ſeem difficult to enter on this ſtudy, from the multiplicity of the bodies; but method renders all this eaſy, and it is no way difficult, in the following manner, to find of what claſs, what family, and what genus, any given *ſhell* is, from a bare inſpection.

The *ſhell* is firſt to be examined, to ſee whether it is compoſed of one, two, or more pieces. If it is found to conſiſt only of one piece, it is known thence to belong to the claſs of univalves; if of two, to the bivalves; and if of more, to the multivalves. When it is thus referred to its proper claſs, its family and genus will be found by farther examination of its general form, and the ſhape of its mouth, or aperture.

As ſoon as a given *ſhell* is found to be univalve, the five genera of that claſs are to be uſed in compariſon with it, in order to ſee to which of them it belongs. If it has no turn or twiſt, but forms one ſimple figure, approaching to a cone, and pointed at the top in the manner of the common limpet, or patella, it is known to be of the family of the *patellæ*; the character of which is to have only one valve, and that fixed in its natural ſtate to a ſtone, or other hard body, and of a flatted ſhape, though elevated into a ſort of point in the middle.

If the *ſhell* be not conic, but extremely flat, and ſomewhat of the ſhape of a man's ear, it is of the ſecond family of the *aures marinæ*, diſtinguiſhed by the epithet *planæ*, flat or plane. If it forms a tube or pipe, it is of the nature of the common *tubuli marini*, and is of that family. If, on the other hand, it reſemble a ſort of veſſel or boat, it is of the *nautilus* claſs, and belongs to the *naviculæ*.

Theſe are the diſtinctions, if it be plain, and without turnings; but if it have ſeveral twiſts, or wreaths, its aperture, commonly called the *mouth*, is to be examined, for this forms, in this caſe, the generical character. If the mouth be exactly round, the *ſhell* is of that family of the *cochleæ*, or ſnails, called by the antients *lunares*. If it be of a ſemicircular figure, it is of that family of ſnails called *ſemilunares*; under which family are compriſed the *neritæ*, as one genus.

If the *ſhell* approaches to a conic figure, and grows larger at the baſe, and has a flatted or oval mouth, it is of a ſeventh order of *cochleæ*, or ſnails diſtinguiſhed by the title *cochleæ ore depreſſo*.

If the *ſhell* have the exterior figure of a trumpet, and has a large tail, it belongs to the family of the *buccina*; of which, however, it is to be remarked, that there are ſome ſpecies which have not long tails: in this diſtinction we alſo have recourſe to the mouth, which is larger than that of the murex, leſs long, and its lower part is formed into a crooked beak. Theſe are the eſſential characters which diſtinguiſh this family of *ſhells*; a family, concerning which there is great confuſion among authors.

If the baſe of the *ſhell* be ſmall, and the whole diminiſh gradually in ſize from this to the end, which is pointed, then the *ſhell* is of the family of the *turbines*. If a *ſhell* form a cone, or cornet, there is no occaſion to look at the mouth, this figure alone determines it to be a *voluta*; and if one of its extremities is nearly as large as the other, it is then a rhombus. This genus of *ſhells* has been called *cylindri* by the Latins, and *rouleaux* by the French. When this rhombus, or cylinder, has a pointed baſe, frequently ornamented alſo with ſeveral ſmall eminences; and when its middle is large, and is in the ſame manner ſurrounded with tubercles, and its head is elongated by ſeveral turns, and its mouth of an oblong figure, and furniſhed with teeth; and when, as is often the caſe, there is an excreſcence of the plate that covers the mouth, called by authors an *ala*, or wing, this *ſhell* muſt be placed among the family of the *murex*, or, as the French call it, the *rocher*.

The *purpura* is diſtinctly not a ſynonymous term with the precedent, but expreſſes ſuch a *ſhell*, which, inſtead of being furniſhed with points, is cut and curled from top to bottom, in the manner of the leaves of our curled cabbages, or of the endive raiſed for ſallads. The body in this genus is alſo more compact, and more detached from the other parts,

parts, than in the other genera of this kind, and the mouth is usually small and round, and the tail long and crooked, furnished with long points, and hollowed within in form of a pipe.

If the *shell* is round, it belongs to that family of *shell-fish* called, from their figure, *globosæ*, and in French *tonneaux*. It is to be observed, however, that all *shells*, which appear at first sight of a rounded figure, are not to be placed at once in this family; for the helmet *shell*, for instance, which appears roundish, though somewhat triangular, is not to be supposed of this family, but is a murex. The summit of the head, and the little tuberosities, on this occasion, give the essential character, and point out its proper genus: for the *shells* of the globose kind are truly of a spherical figure; they are inflated in the middle, have no tubercles on the head, and have a large and hollowed mouth, but no teeth.

The last family of the univalves is the porcelain, or *concha veneris*, a genus so well known, that it needs no particular description. Sometimes at the summit of this *shell* there is a small spiral, and sometimes its opening is not exactly in the middle. Some are light and thin, others very thick and hard: but these are only varieties of the same genus, the proper family of the *shell* being always thus determined by the mouth.

Bivalve SHELLS. The former are all the genera of the *shells* composed of one piece, and thence called *univalves*: and as any given *shell* may, by the characters given of each, be easily referred to that to which it belongs, so, in regard to the *bivalves*, the task is not more arduous, when entered on upon the same principles; and it is the easier in this respect, that the families of this class are much less numerous than those of the other, these being only six. The first genus, or family of the *bivalves*, is that of the *oister*, *ostreæ*. The variety in this one genus is almost infinite, and is extremely agreeable. Some are echinated so, as to represent the echini; others have excrescences of parts in undulatory, or jagged forms, representing the ears of animals, or the comb of a cock; and others form themselves into very remarkable figures, by adhering and growing to trees, stones, corals, and other substances, either naturally growing in the sea, or such as have accidentally fallen into it. Sometimes also, the upper *shell* in an oister is smaller and flatter than the under one. These, however, are all trifling varieties, and the *shells* are still of the oister kind.

When the *bivalve shells*, under examination, differs from the oister kind, in being more elevated in the middle, and equally convex, or nearly so, in both *shells*, then it belongs to the family under the name of *chamæ*. These differ also from oisters, in that they are more smooth on the surface, and they often do not close so evenly and regularly at the mouth, whence some have called them *conchylia ore patulo, et hianti*.

The third family is that of the *muscles*. These are all of the general shape of the common muscle, and are thence easily known. It is to be observed, however, that some of them are equal at both ends; these are called *tellinæ*: and some others are extremely long at one end, and broad and short at the other; these are called *pinnæ marinæ*.

The fourth genus, or family, is the cordiform kind, called in French *cœurs*. The essential character of this family is, that the *shells* are of a roundish elevated figure, and that they have no ears, as the pectens have, and they always represent the figure of a heart, in whatever view they are taken; tho' this is sometimes of a triangular figure. Most of the species of this family, as well as of the following one of the pectens, are striated.

The fifth family of the *bivalves*, is that of the *pectens*, or scallop-*shells*. Among these, some have two ears at the head of the *shell*; others have only one ear; and others have none at all. Some species are deeply furrowed, and others are full of small protuberances. The general character of the pectens is to have the upper *shell* plain, and the under one somewhat hollow; and the ears are also a very obvious character in those that have them.

The sixth, and last family of the *bivalves*, is the *solen*, or razor-fish, called by the French *manche de couteau*. These are very easily known by their figure, which resembles that of a knife-haft, and therefore need no other mark of distinction.

Multivalve SHELLS. These are not less easily distinguished, than the other two general classes, into their separate families. Of these also there are six families. The first is that of the *echini marini*, called in English *sea-eggs*, and by the French *oursins*, *boutons*, and *herissons de mer*. These carry a very obvious distinction, in their being covered with spines, or prickles; and if we meet with them in a state, when these are fallen off, they are still easily known by the marks of their insertion. This, and their general figure, which is alike in all, and in all unlike to all other species, is such a distinction, as cannot suffer them to be mistaken.

The second family of these, is that of the *vermiculi marini*, particularly charactered in the species called the *sea-organ*. These are usually of a beautiful red colour, and are of a very elegant structure. They generally are found in very large clusters, and are easily distinguished from all other genera.

The third family of the *multivalves* consists of the *balani marini*, called by the French *glands de mer*. These are all so like one another, that they are easily known from all the other genera, by their all resembling the common balanus, a *shell* too well known to need description.

The fourth family is that of the *pollicipedes*, or, as the French call them, the *pousspieds*. These are so easily known by their perfect resemblance to one another, that there needs no other character than referring to their figure in the plate of *shells*.

The fifth family of the *multivalves* is that of the *conchæ anatiferæ*. These were once supposed to produce a bird of the goose kind; and these are all so like to one another, that the referring to the figure of the common species, in the general plate, will shew the characters of all the species.

Finally, the sixth genus of the *multivalves* is that of the *pholas*. These *shells* are easily distinguished by their figure, which is usually oblong, and their colour, which is simply white in all the species. These *shells* are often found enclosed in stone in the sea, and some of them are composed of five valves.

By these characters it will be easy for an utter stranger to these studies, to refer any *shell*, he occasionally meets with, to its proper class and family. When this is done, it will be easy to observe the lesser differences, which, though not sufficient to constitute different families or genera, yet very well distinguish different species of the same genus, or family; and by comparing these with the names of the several species, to be found enumerated under the head treated of, in the name of that genus or family to which the *shell* is found to belong, it will be soon discerned whether, and which of these species it is of, or whether agreeing with none of those names, it is a new species. In order to enquire into these specific differences, it is necessary attentively to consider the exterior parts of the *shell*, its figure, its mouth, its volutions, its alæ, and its smoothness or roughness, and its two extremities, the end of the clavicle, and the mouth. After the exterior parts have been thus examined, the interior ones must be taken into consideration, as the length and hollow of the mouth, and whether it be furnished with teeth, or with ridges; and whether it have a chamber, or a tongue within.

In regard to *bivalves*, when the species are to be distinguished, we must observe whether the two valves are equal, or unequal in shape and size; whether one is, or is not more elevated than the other; and whether these valves are smooth, or are covered with wrinkles and tuberosities, or points; whether they have, or have not ears; and whether their striæ are charged with points, or tubercles, or are plain and smooth on the surface; and finally, whether they are longitudinal, or transverse, and whether the ends of the *shells* are even, or are terminated by a point, or beak.

The insides are next to be observed, to find whether the *shells* naturally close evenly and exactly, or whether they remain naturally open; and whether the fish is affixed to them by a single ligament, as is the common case, or by six regular muscles, as the sea-muscle does.

The mouth of a *shell* generally distinguishes it from others, but there are some species in which recourse must be had to the other external parts of the *shell*: and we are not to be puzzled, on finding in the same family some small differences in the figure of the mouth, as its being longer in one species, and wider in another; the one species having a tail, and the other not; the one having a summit elevated very high, the other flatted at the top; or, lastly, the one being smooth, and the other covered with tubercles, do not prevent both from being of the same family, when the general characters are the same. These then only distinguish the species and genera of the same family, which are to be placed one after another in the descriptions of it.

The species are distinguished, when the generical characters being the same, one *shell* is umbilicated, another is not; one smooth, another rough, and so on. The varieties of the several *shells*, which are very numerous, and have by many been taken for real species, are distinguished by less essential differences; such as the size, the length, and the thickness of the *shell*, the difference of the colours, and the depth, or slightness of the furrows.

It may not be amiss to explain all this in some one family of *shells*, in which there are many different genera, species, and varieties. When the buccinum, for example, has a long or a short mouth; when its clavicle, or pyramid, is long, or is flatted; or when its beak is strait, or crooked; these are the marks of genera, being very great and essential characters, and each of them belonging in common to a great number of *shells*, which are to be called species, and are to be distinguished from one another only by some epithet, expressive of their slighter differences. Thus if the surface is smooth, it is called *buccinum læve*; if rough, *buccinum tuberosum*; if it imitate a spindle, it is called *fusus*; if it be of the figure of a tower, it is called *turris*; and if of a tiara, it is called *mitra papalis*. The varieties are after this distinguished by their proper epithets; the white, red, or yellow, are so called, and the large and small distinguished by those words

lowing the trace of the wreath. The neck of the growing snail is the part which principally forms the *shell*; this is always naked, and is always making itself a covering, which, while the neck grows beyond it, serves for the next part. Now if we suppose this neck to be yellow, with one black spot in a particular part; or rather, that it all over exsudates a yellow liquor, except in some one spot, where it exsudates a black one; then it necessarily follows, that as the growth of the animal is performed in a spiral line, and the *shell* made accordingly, while the yellow matter makes a wreath of yellow *shell* surrounding the former, the black part must also be drawn in the same spiral form, as we see a spiral line of that colour in the wreath. And accordingly, if there be more points than one of this kind, then there must be more rays or lines also in the *shell*; and if these points are of different colours, then the rays formed by them will be also of different colours; neither are these black points, or spots, to be treated as a mere conjecture; they in reality ever appear upon the animal; and if a growing snail be nicely inspected, they are always found placed just even with the black lines, or rays, which are carrying round the *shell*.

The part of the body of the snail which immediately follows the neck, and fills up that part of the *shell* it has just formed, discharges neither a yellow nor a black liquor, but only a thin aqueous whitish humour; this condensing on the inside of the new formed *shell* coats it over, and forms its inner covering, which therefore is always whitish, and has no varieties of colour.

It will be very easy for every naturalist to extend what is here related of the common garden snail to all the other animals which are covered in the same manner with *shells*; and the differences of colour in the matter transpired through the neck of the growing animal, with the different number and disposition of the variegating points or dots on it, may give sufficient room to account for all the beautiful variety of colours, and all the variegations in the most elegant sea-*shells*.

The other varieties of them may also be accounted for upon the same principle; thus, suppose the growing fish of one kind has a number of eminencies on its body, there cannot fail to be prominences of the same kind in the *shell* that is formed by the regular transpiration of its juices; and these will go on regularly, enlarging to the end of the *shell*, because the prominences which form them will grow larger in the animal as it grows. If there be any certain season of the year when the *shell* ceases to grow, that is when the animal ceases to enlarge its body, suppose this to be the summer or the winter, or whatever particular season; in this case, the traces of the different times of the creature's beginning to grow again, will not fail to be marked upon the *shell*; and the age of the *shell* might, if these times were known, be perhaps, in many cases, as well determined by these several junctions of new to the old matter, as trees are known by their annual concentric circles. Thus we see, that these tender animals are themselves the architects of these their elegant habitations, which are so beautifully regular, merely because they grow as it were with the body of that architect, whose different age and state of life, if perfectly understood, they would be found elegantly to denote. Mem. Acad. Par. 1709.

The durable hardness and excellent polish of many of the *shells* of sea-fishes, and that even in the thinnest and tenderest kinds, is a thing very amazing. In the ruins of the abbey of St. Edmundsbury, which is built of a kind of stone composed of grit or sand, interspersed with an infinite variety of very minute *shells*, principally of the small smooth cockle-kind, Mr. Collinson observed, that the stone having suffered greatly by the injuries of the air, the grit or sand of which it was composed had disunited and mouldered away, while the smallest of these *shells* stood the same injurious accidents unaltered, and were found standing forth in the utmost perfection, and with all their beautiful natural polish; yet these are as thin and tender a *shell* as almost any of the same size that we know of.

It is possible, indeed, that these *shells* might have been altered in their nature, by the insinuation of stony matter into their pores, as is a common case in *shells* lodged in stone; but those, here mentioned, did not seem to have undergone any such alteration; and it is very certain, that many of the like thin and tender *shells* are found preserved through a long series of ages, in places where they have been in the way of no such alterations from the insinuation of stony matter into their pores, and out of which they are taken fair and beautiful, and with all their natural polish, though not at all hardened in the time. Of this kind are the *shells* of the tender buccinums, and other thin kinds, found buried in earth, in the strata of marl, clay, or loam, and even in chalk.

As hard as these *shells* naturally are, they do not, however, preserve the fish, which inhabit them, from becoming the food of others, which seem to have no organs with which to break them. It is common to see the soal-fish with its belly prominent and hard, as if well filled with spawn, and yet when opened to find no spawn at all; but the prominence and hardness is occasioned by the stomach and guts being filled with *shell*-fish, which the creature had swallowed whole, as food, without having any power of breaking or destroying them. A small species of pectunculus, or cockle, is the fish that the soal usually feeds upon; and when the guts are taken out of this fish, they often resemble so many strings of necklaces, from the continued series of these *shells* which appear prominent in them. When these *shells* are taken out, many of them are usually found in part dissolved, and many entire and unaltered.

Shell-fish are well known to be the food of some other fishes of the larger kinds, particularly the sea-porcupine, and a kind of the wray-fish, are known principally to feed upon them; but these fish are provided by nature, with a suitable apparatus fitted for the grinding, or reducing them into a state more proper for digestion; their jaws being furnished with bony substances, extending to the palate and under part of the mouth, which are capable of reducing much stronger *shells* than these into an absolute pulp. The soal-fish has no apparatus of this kind, and neither its jaws nor stomach are furnished with any thing capable of wearing them to pieces by attrition; but what appears to be the case, is, that nature has furnished this creature with a menstruum in the body capable of digesting them. Phil. Trans. N° 473. p. 39.

The crab, like the lobster, &c. casts its *shell* once every year. Against this extraordinary event, the creature always chooses a close and well secured retreat in the cavities of rocks, or under great stones; there they creep in, and wait till all the parts are by degrees disengaged, which is effected by withdrawing their legs from their old *shells*, and leaving them and the upper part of their body *shell* behind. In this naked state they make a very strange appearance, being a mere ill-shapen lump of a fleshy matter, covered with a sort of jelly; this by degrees hardens into a *shell*, a degree larger than the old one cast off. Phil. Trans. N° 478. Sect. 14.

Polishing of SHELLS. See the article POLISHING.

Fossile SHELLS. The number and variety of sea-*shells* which are found far from seas buried at great depths in the earth, and often immersed in the hardest stones, is an object of great wonder.

Of these some are found remaining almost entirely in their native state, but others are variously altered by being impregnated with particles of stone, and of other fossiles; in the place of others there is found mere stone, or spar, or some other native mineral body, expressing all their lineaments in the greatest nicety, as having been formed wholly from them, the *shell* having been first deposited in some solid matrix, and thence dissolved by very slow degrees, and this matter left in its place, on the cavities of stone and other solid substances, out of which *shells* had been dissolved and washed away, being afterwards filled up less slowly with these different substances, whether spar or whatever else: these substances, so filling the cavities, can necessarily be of no other form than that of the *shell*, to the absence of which the cavity was owing, though all the nicer lineaments may not be so exactly expressed. Beside these, we have also in many places masses of stone formed within various *shells*; and these having been received into the cavities of the *shells* while they were perfectly fluid, and having therefore nicely filled all their cavities, must retain the perfect figures of the internal part of the *shell*, when the *shell* itself should be worn away, or perished from their outside. The various species we find of these are in many genera, as numerous as the known recent ones; and as we have in our own island not only the *shells* of our own shores, but those of many other very distant ones, so we have also many species, and those in great numbers, which are in their recent state, the inhabitants of other yet unknown or unsearched seas and shores. The cockles, muscles, oisters, and the other common bivalves of our own seas are very abundant: but we have also an amazing number of the nautilus kind, particularly of the nautilus græcorum, which though a *shell* not found living in our own, or any neighbouring seas, yet is found buried in all our clay-pits about London and elsewhere; and the most frequent of all fossile *shells*, in some of our counties, are the conchæ anomiæ, which yet we know not of in any part of the world in their recent state. Of this sort also are the cornua ammonis and the gryphitæ, with several of the echinitæ and others.

The exact similitude of the known *shells* recent and fossile in their several kinds, will by no means suffer us to believe, that these, though not yet known to us in their living state, are as some have idly thought, a sort of lusus naturæ. It is certain, that of the many known shores, very few, not even those of our own island, have been yet carefully searched for the *shell*-fish that inhabit them; and as we see in the nautilus græcorum an instance of *shells* being brought from very distant parts of the world to be buried here, we cannot wonder that yet unknown shores, or the unknown bottoms of deep seas, should have furnished us with many unknown *shell*-fish, which may have been brought with the rest; whether that were at the time of the general deluge, or the effect of any other catastrophe of a like kind, or by whatever other means, to be left in the yet unhardened matter of our stony and clayey strata. *Hill's* Hist. of Foss. p. 616.

quent there. Beſide theſe, and many other *ſhells*, there are found on this coaſt all the ſpecies of nautili, many of which are very beautiful.

The Canary iſles are found to abound with a vaſt variety of the murexes, and ſome other good ſhells; and we have, from Madeira great variety of the echini marini, or ſea-eggs, different from thoſe of the European ſeas. Several ſpecies of muſcles are alſo common there, and the auris marina is no where more abundant.

The Red Sea is beyond all other parts of the world abundant in *ſhells*, ſcarce any kind is wanting there; but what we principally have from thence are the purpuræ, porcelains, and echini marini.

The Mediterranean and northern Ocean contain a great variety of *ſhells*, and many of very remarkable elegance and beauty; they are upon the whole, however, greatly inferior to thoſe of the Eaſt-Indies. The Mediterranean abounds greatly more in *ſhells* than the Ocean. The gulf of Tarentum affords great variety of purpuræ, of porcelains, nautili, and elegant oiſters; the coaſts of Naples and Sardinia afford alſo the ſame, and with them a vaſt number of the ſolens of all the known ſpecies. The iſland of Sicily is famous for a very elegant kind of oiſter which is white all over; pinnæ marinæ and porcelains are alſo found in great plenty there with tellinæ and chamæ of many ſpecies, and a great variety of other beautiful *ſhells*. Corſica is famous, beyond all other places, for vaſt quantities of the pinnæ marinæ, and many other very beautiful *ſhells* are found there. *Liſter*, Hiſt. Conchyl.

About Syracuſe are found the gondola-*ſhell*, the alated murex, and a great variety of elegant ſnails, with ſome of the dolia and neritæ.

The Adriatic ſea or gulf of Venice is leſs furniſhed with *ſhells* than almoſt any of the ſeas thereabout. Muſcles and oiſters, of ſeveral ſpecies, are however found there, and ſome of the cordiformes or heart-*ſhells*; there are alſo ſome tellinæ. About Ancona there are found vaſt numbers of the pholades buried in ſtone, and the aures marinæ are particularly frequent about Puzzoli. *Bonani* Recreat. Ment. et Ocul.

The ports of Marſeilles, Toulon, and Antibes, are full of pinnæ marinæ, muſcles, tellinæ and chamæ. The coaſts of Bretagne afford great numbers of the conchæ anatiferæ and pouſſepieds, they are found on old rotten boards, on ſea-plants, and among cluſters of ſpunges. The other ports of France, as Rochelle, Dunkirk, Breſt, St. Malos, and others, furniſh oiſters, excellent for the table, but of the common kind, and of no beauty in their *ſhells*; great numbers of muſcles are alſo found there; and the common tellinæ, the onion-peel-oiſters, the ſolens and conchæ anatiferæ are alſo frequent there. At Granville, in Lower Normandy, there are found very beautiful pectens, and ſome of the cordiforms, or heart-*ſhells*. Our own Engliſh coaſts are not the leaſt fruitful in *ſhells*, though they do not produce ſuch elegantly painted ones as the Indies.

About Plymouth are found oiſters, muſcles, and ſolens in great abundance; and there, and on moſt of our other ſhores are numbers of the aures marinæ and dentalia, with pectens, which are very excellent food; and many elegant ſpecies of the chamæ and tellinæ are fiſhed up in the ſea, about Scarborough, and other places.

Ireland affords us great numbers of muſcles, and ſome very elegant ſcallop-*ſhells* in great abundance, and the pholades are frequent on moſt of our ſhores. We have alſo great variety of the buccina and cochleæ, ſome volutæ, and on the Guernſey coaſt a peculiarly beautiful ſnail, called thence the Guernſey-ſnail.

The coaſts of Spain and Portugal afford much the ſame ſpecies of *ſhells* with the Eaſt-Indies, but they are of much fainter colours, and greatly inferior in beauty. Hiſt. Nat. Eclairc. p. 172.

There are according to Tavernier and others ſome rivers in Bavaria, in which there are found pearls of a fine water. About Cadiz there are found very large pinnæ marinæ and ſome fine buccina. The iſles of Majorca and Minorca afford a great variety of extremely elegant *ſhells*. The pinnæ marinæ are alſo very numerous there, and their ſilk is wrought into gloves, ſtockings, and other things. The Baltic affords a great many beautiful ſpecies, but particularly an orange-coloured pecten, or ſcallop-*ſhell*, which is not found in any other part of the world.

The freſh-water-*ſhells* are found much more frequently, and in much greater plenty than the ſea-kinds. There is ſcarce a pond, a ditch, or a river of freſh water, in any part of the world, in which there are not found vaſt numbers of theſe *ſhells* with the fiſh living in them. All theſe *ſhells* are ſmall, and they are of very little beauty, being uſually of a plain greyiſh or browniſh colour. Our ditches afford us chamæ, buccina, neritæ, and ſome patellæ; but the Nile, and ſome other rivers, furniſhed the antients with a ſpecies of tellina, which was large and eatable, and ſo much ſuperior to the common ſea-tellina in flavour, that it is commonly known by the name of *tellina regia* the royal tellina. We have a ſmall ſpecies of buccinum common in our freſh waters, which is very elegant, and always has its operculum in the manner of the larger buccina; a ſmall kind of muſcle is alſo very common, which is ſo extremely thin and tender, that it can hardly be handled without breaking to pieces. The large freſh-water-muſcle, commonly called in England the *horſe-muſcle*, is too well known to need a deſcription, and the ſize of this, gives it a difference from all other freſh-water-*ſhells*.

Formation of Shells. The world, in general, has been much more inquiſitive, into the nature of the colours, and marks of the great variety of *ſhell*-fiſh, than what might appear much more worthy of enquiry, the manner of their production. It has been generally ſaid, that theſe *ſhells*, and thoſe of crabs and lobſters, which are of the cruſtaceous kind, were a ſort of bones, all of which in theſe creatures are placed by nature on the outſide of the body.

It has been ſuppoſed that both the *ſhell* and the body of the animal are produced from the ſame egg, and that the one developes and enlarges as the other does. But this, though a ſpecious reaſoning, does not ſeem to be the true ſtate of the caſe. On the contrary, it ſeems, as if the animal alone is produced from the egg, or contained in it, and that the production of the *ſhell* is a future piece of workmanſhip.

Mr. Reaumur is the firſt author who has publiſhed an account of the true production of *ſhells*, and has been at vaſt pains to make the neceſſary obſervations for this purpoſe. He obſerved, that the *ſhell* of the common garden-ſnail was plainly made of a viſcous matter, which tranſpired from the body of the creature in a liquid form, and hardened by degrees on contact with the air.

It is very well known that all animals continually perſpire, and are ſurrounded with a ſort of atmoſphere of their own, which is of the figure of their body; and all that is ſingular in the perſpiration of ſnails, is, that this atmoſphere of theirs hardens about them, till it forms a ſort of ſtony caſe, which being moulded upon their body muſt be of the ſame ſhape; while that of other animals, in general, diſſipates itſelf, and is loſt among the ambient air; and this difference plainly ariſes wholly from the nature of the matter perſpired, which in the ſnail is of a viſcous, and as it were a ſtony nature. It is evident, that this *ſhell* therefore is not at all of the nature of the bones of animals, being neither formed as they are, nor yet as any other parts of an animal body, but merely by an appoſition of particles: ſo that we have here an inſtance of a part of an animal body, which borrows its manner of formation from the ſtones, and other parts of the foſſile world. The head of the ſnail is always at the mouth or opening of the *ſhell*, and its tail at the other extremity, or as we uſually expreſs it, at the top of the *ſhell*; and the body of the ſnail from whatever cauſe, naturally turning itſelf into a ſpiral, gives origin to the volutæ of the *ſhell*.

When the ſnail is juſt hatched naked from the egg, and is in its utmoſt degree of ſmallneſs, it does not ceaſe to tranſpire, and immediately there is formed a *ſhell*, ſuited to its preſent ſmall ſtate, and exactly fitting every part of its body, which is yet too tender to twiſt itſelf into a ſpiral, ſo that this *ſhell* is only the center of that ſpiral, which is afterwards to be formed on that center, with a little part of the ſpiral proceeding from it. The animal after this grows, and if it now ceaſed to perſpire, it muſt be a neceſſary conſequence that the future part of the body muſt be naked. This, however, is not the caſe: it continues to perſpire, and every part of the body, as it is formed, becomes covered with the ſame ſhelly cruſt made by the hardning of that newly perſpired matter, as it comes in contact with the air. The body of the ſnail, in growing, turns itſelf round the firſt point, and afterwards round that again, ſo there is ſpiral upon ſpiral formed, and at the ſame time the *ſhell* is formed in the ſame ſhape to cover them. The other turns of the *ſhell* are afterwards formed juſt in the ſame manner, and theſe in the garden-ſnail ſometimes run as far as to the number four and an half.

It is a neceſſary conſequence of this manner of formation of theſe *ſhells*, that the firſt circles of a young ſnail, which has not yet above two of them, are of juſt the ſame ſize with the two firſt turns of a grown ſnail, which has four in the whole; for whatever part of the *ſhell* has been once formed, becomes ſubject to no increaſe in ſize afterwards in itſelf, but all the addition to it is made by the continual joining on of more new formed *ſhell* to its extreme edges. There is, however, an addition of matter to the inſides of theſe, to give them a greater ſtrength afterwards; for it may always be obſerved, that though theſe firſt turns, or ſpiral wreathes, in a young ſnail, are of the ſame ſize with thoſe in a more grown one, yet they are thicker afterwards by much than they are at firſt. The new grown part of the animal, which would otherwiſe have been naked, thus forms itſelf a covering by its perſpiration; to which the already covered part adds thickneſs and ſtrength.

In the common ſmaller and more beautiful garden-ſnails, the ground colour of the *ſhell* is uſually yellowiſh, whitiſh, or reddiſh, and is variegated with rays or lines of black, following

ſomewhat toward a triangular figure, and are free from any long ſpines. See MUREX.

Leopard-SHELL, in natural hiſtory, the Engliſh name of the pardus, a kind of voluta; ſo called, from its ſpots reſembling thoſe of a leopard. There are three kinds of this, one ſpotted with black, another with yellow, and another with red.

Leveret-SHELL, in natural hiſtory, a name given by many to a ſpecies of porcelain, reſembling a young hair in colour. See the article PORCELLANA.

Lightning-SHELL, in natural hiſtory, a name given by ſome authors to a ſpecies of murex with variegations on its body, reſembling the pictures we commonly ſee of flaſhes of lightning. See the article MUREX.

Map-SHELL, in natural hiſtory, the name given by ſome to a peculiar ſpecies of porcelain-*ſhell*, the figures on which repreſent the lines on a map. See PORCELLANA.

Noah's ark-SHELL. See the article NOAH.

Oiſter-SHELL. See the article OISTER.

Old wife-SHELL, the name given by ſome to that ſpecies of chama, which the French alſo have called *vielle ridée*. See the article VIELLE *ridée*.

Onion-SHELL. See the article OSTREA.

Pipe-SHELL, in the materia medica. See ENTALIUM.

Saddle-SHELL, in natural hiſtory, the name of a ſpecies of oiſter, which in ſome degree repreſents a ſaddle in its ſhape. See the article OSTREA.

St. James's SHELL, in natural hiſtory, a name given by writers on *ſhells* to a very beautiful ſpecies of variegated pecten. See the article PECTEN.

St. Michael's SHELL, in natural hiſtory, a name given by authors to a ſpecies of pecten, or ſcallop-*ſhell*. It is of a bright yellow colour. See PECTEN.

Scorpion-SHELL, in natural hiſtory, the name of a ſpecies of murex, very much approaching to the nature of the ſpider-*ſhell*. This is a common *ſhell* in cabinets. It is of a yellow colour, and very deeply ridged, and full of tubercles; there ariſe from the lip of the *ſhell* five large ſpines, or, as they are uſually called, fingers, and two others, which are very much bent, the one from the head, the other from the tail: theſe are very elegantly radiated with white and a fine violet colour on the lips. See the article MUREX.

Screw-SHELL. See the article TURBO.

Small-pox-SHELL, in natural hiſtory, a name given to a remarkable kind of concha venerea, or porcelain-*ſhell*, the protuberances on the ſurface of which are ſuppoſed to repreſent the puſtules of the ſmall-pox. There are two ſpecies of this *ſhell*, the one white with flattiſh protuberances, the other greeniſh with more elevated ones. See the article PORCELLANA.

Snake-SHELL, in natural hiſtory, the name given by many to that beautiful ſpecies of porcelain-*ſhell*, the ſpots of which repreſent thoſe of a ſnake's ſkin. See the article PORCELLANA.

Spider-SHELL, the name of a kind of murex. See the articles ARANCHA, CONCHA, and MUREX.

Strawberry-SHELL, in natural hiſtory, a name given by collectors of *ſhells* to a very beautiful ſpecies of cordiformis, ſpotted with ſmall round red ſpots.

Swallow-SHELL, in natural hiſtory, the name given by authors to a ſpecies of oiſter, which in ſome degree repreſents the figure of a ſmall bird flying. See OSTREA.

Swan-SHELL. See the article CIGNE.

Tiger-SHELL, in natural hiſtory, the name of a ſpecies of porcelain, or concha venerea, ſuppoſed to repreſent the ſpots on a tiger's ſkin. See PORCELLANA.

Trumpet-SHELL. See the article TRUMPET.

Turban-SHELL. See the article TURBAN.

Turnep-SHELL. This is a ſpecies of ſea-*ſhell*, by others called the *radiſh-ſhell*. It is exactly of the ſhape of a turnep, and is of the dolium, or concha globoſa kind. Thoſe who have called it the *radiſh-ſhell*, allude to the great black roundrooted radiſh, not to our common radiſh. See the article DOLIUM.

SHELL-*apple*, in zoology, an Engliſh name for the loxia, or croſsbill; given from his manner of ſplitting an apple, and feeding on the kernels, leaving the *ſhell* of the pulp untouched. *Ray's* Ornitholog. p. 181. See the article LOXIA.

SHELL-*drake*, in zoology, a common Engliſh name for the tadoma. See the article TADOMA.

SHELL-*fiſh*. Theſe animals are in general oviparous, very few inſtances having been found of ſuch as are viviparous. Among the oviparous kinds, anatomiſts have found that ſome ſpecies are of different ſexes in the different individuals of the ſame ſpecies, but others are hermaphrodites, every one being in itſelf both male and female: in both caſes their encreaſe is very numerous, and ſcarce inferior to that of plants, or of the moſt fruitful of the inſect claſs. The eggs are very ſmall, and are hung together in a ſort of cluſters by means of a glutinous humour, which is always placed about them, and is of the nature of the jelly of frogs ſpawn; by means of this they are not only kept together in the parcel, but the whole cluſter is faſtened to the rocks, *ſhells*, or other ſolid ſubſtances, and thus they are preſerved from being driven on ſhore by the waves, and left where they cannot ſucceed. *Langius*, Method. Teſtac.

SHELL-*gall-inſect*, an inſect of the gall-inſect claſs, ſomewhat reſembling thoſe which are called the boat-faſhioned ones, but differing in this, that as the two ends of that ſpecies are not very different in form, in this kind one of the ends is ſharp and pointed, in compariſon with the other. It has its name of *ſhell-inſect*, from the reſemblance it bears to a muſcle-*ſhell*; as it is, in its whole form, not unlike one of the two *ſhells*, in which the common ſea-muſcle is encloſed, but the pointed end of this *inſect* is much more extended in length, than the ſmaller end of this *ſhell*.

This ſpecies is extremely ſmall, and may be eaſily miſtaken for the minute caſe, out of which ſome ſmall inſect has eſcaped; or in another ſtate, for the neſt in which ſome ſmall inſect had depoſited its eggs: but if the aſſiſtance of the microſcope be called in, they will eaſily be diſcovered to be true gall-inſects, even as ſoon as they are hatched from the eggs. This ſpecies, at its full growth, is ſo ſmall, that it requires good eyes to diſcover it. It is brown, very ſmooth, and poliſhed on the ſurface, and much of the colour of the bark of ſome trees. It has uſually an edge of a cottony matter, viſible where its ſides touch the tree, and its eggs are always depoſited on a fine cottony bed. The young ones are white, flat, and have two ſmall horns, and ſix legs. In this ſtate they are known to be of the gall-inſect claſs; not by their likeneſs to their parent, but to the young gall-inſects of other ſpecies. They march about very briſkly for ſome time after they are hatched, and after that fix themſelves, and then begin to grow, and by degrees alter their form, till they at length are of the ſame ſhape with their parent. *Reaumur*, Hiſt. Inſ. Tom. 4. p. 69, 70.

SHELL-*ſand*, a name given by the farmers, in ſome parts of England, to the fragments of *ſhells* found on the ſea-ſhores, and ground to a ſort of powder, ſo that they reſemble ſand. There is alſo another kind uſed as this is, in ſome parts of Cornwall, and compoſed of fragments of a ſort of tender white coral This is found principally about Falmouth, and is called by the ſame name of *ſhell-ſand*, though very improperly. All the kinds are of great uſe in agriculture, but they are differently eſteemed by the farmers, as they are more or leſs rich, which they know by their colours. The reddiſh kind is eſteemed moſt of all, next to this the blue is judged the beſt, and after this the white. Such as is dredged up from under the water, is always found better, than ſuch as is found dry on the ſhores; and ſuch as is entirely compoſed of *ſhells* is to be choſen, rather than ſuch as has fragments of ſtone among it, which is a very common caſe.

In Cornwall they uſe this as the general manure of their land; they carry it up in lighters as near the lands, where it is to be uſed, as they can, and thence it is ſometimes carried to the place, where it is to be uſed, by carts, and ſometimes by men with horſes, a horſe being able eaſily to carry thirteen gallons of it at a load. One man drives ſeven or eight of thoſe horſes in a train, and the farmers find it worth their while to carry it ten or twelve mile from the water ſide in this manner. At this diſtance it uſually coſts about eight pence the load, but where the lands lie near the water, the price is very inconſiderable. So much of this *ſand* is uſed in the county of Cornwall, that the land-carriage alone, at this eaſy rate, is found to amount to more than thirty thouſand pounds a year, and the advantages from it is very great; ſo that it is wonderful, that the practice is not extended all over the kingdom where the ſea-coaſts are near. Phil. Tranſ. N° 113.

SHELL-*toothed*, in the manege, an appellation given to a horſe that from five years old to old age naturally, and without any artifice, bears mark in all his fore teeth, and there ſtill keeps that hollow place with the black mark, which is called in French *germe de feve*, i. e. the eye of a bean; inſomuch, that at twelve or fifteen he appears with the mark of a horſe that is not yet ſix: for in the nippers of other horſes, the hollow place is filled, and the mark diſappears, towards the ſixth year, by reaſon of the wearing of the tooth. About the ſame age it is half worn out in the middling teeth, and towards the eighth year it diſappears in the corner teeth: but after a *ſhell-toothed* horſe has marked, he marks ſtill equally in the nippers, the middling, and the corner teeth; which proceeds from this, that having harder teeth than other horſes, his teeth do not wear, and ſo he does not loſe the black ſpot. Among the Poliſh, Hungarian, and Croatian horſes, we find a great many of them hollow-toothed; and generally the mares are more apt to be ſo than the horſes.

SHELTIE, the name of a ſmall, but ſtrong kind of horſe, found in the iſland of Zetland, commonly called *Shetland*. In the country, the price of one of theſe horſes is about a guinea. Phil. Tranſ. N° 473. ſect. 8.

SHERARDIA, in the Linnæan ſyſtem of botany, a diſtinct genus of plants, the characters of which are, that the cup is a ſmall perianthium, divided into four ſegments, ſituated on the germen, and remaining after the flower is fallen. The flower conſiſts of one petal, which is a long cylindric tube, divided into four ſegments at the end; the ſegments are pointed, and the flower placed flatwiſe. The ſtamina are four

four filaments, placed at the upper part of the tube. The antheræ are fimple. The germen of the piftil is double, oblong, and placed below the receptacle. The ftyle is flender, and bifid at top; and the ftigmata are headed. The fruit is an oblong body, feparable longitudinally into two feeds, which are long, convex on one fide, and plane on the other, and marked with three points at their fummit. *Linnæi* Gen. Plant. p. 25.

SHERARDIA is alfo a name given by Pontedera to the genus of plants, called by Linnæus *galenia*. *Ponteder*. Epift. 14. See the article GALENIA.

SHERIF, in the Egyptian orders, the relations of Mahomet, the fame tribe of perfons called *emir* by the Turks.

The word is Perfian, and fignifies great or noble; and thefe perfons have the privilege of being exempt from appearing before any judge but their own head: and if any of the military orders are obliged to punifh them for any mifdemeanor, they firft take off their green turban, in refpect to their character; and the fame is done, even when they are punifhed by their own magiftrate. *Pocock*'s Egypt, p. 171.

SHIELD (*Cycl.*)—The *fhield* was that part of the antient armour, on which the perfons of diftinction in the field of battle always had their arms painted; and moft of the words, ufed at this time to exprefs the fpace that holds the arms of families, are derived from the Latin name for a *fhield*, *fcutum*. The French *efcu*, and *efcuffion*, and our Englifh word, *efcutcheon*, or, as we commonly fpeak it, *fcutcheon*, is evidently from this origin; and the Italian *fcudo* fignifies both the *fhield* of arms, and that ufed in war.

The Latin name *clypeus*, for the fame thing, feems alfo to be derived from the Greek word, γλυφειν, to engrave; and it had this name from the feveral figures engraved on it, as marks of diftinction of the perfon who wore it. *Beckman*, Diff. 6. cap. 8.

The *fhield* in war, among the Greeks and Romans, was not only ufeful in the defence of the body, but it was alfo a token, or badge of honour to the wearer, and he who returned from battle without it, was always treated with infamy afterwards.

People have at all times thought this honourable piece of the armour, the propereft place to engrave, or figure on the figns of dignity of the poffeffor of it; and hence, when arms came to be painted for families in after-times, the heralds always chofe to reprefent them upon the figure of a *fhield*, but with feveral exterior additions and ornaments, as the helmet, fupporters, and the reft. *Nifbet*'s Heraldry, p. 11.

The form of the *fhield* has not only been found different in various nations, but even the people of the fame nation, at different times, have varied its form extremely; and among feveral people there have been *fhields* of feveral forms and fizes in ufe, at the fame period of time, and fuited to different occafions. *Baron*'s Heraldry.

The moft antient and univerfal form of *fhields*, in the earlier ages, feems to have been the triangular. This we fee inftances of in all the monuments and gems of antiquity: our own moft early monuments fhew it to have been the moft antique fhape alfo with us, and the heralds have found it the moft convenient for their purpofes, when they had any odd number of figures to reprefent; as if three, then two in the broad bottom part, and one in the narrow upper end, it held them very well; or if five, they ftood as conveniently at three below, and two above. The other form of a *fhield*, now univerfally ufed, is fquare, rounded and pointed at the bottom: this is taken from the figure of the famnitic-*fhield* ufed by the Romans, and fince copied very generally by the Englifh, French, and Germans. The Spaniards and Portuguefe have the like general form of *fhields*, but they are round at the bottom without the point; and the Germans, befide the famnite-*fhield*, have two others pretty much in ufe: thefe are, 1. The bulging-*fhield*, diftinguifhed by its fwelling or bulging out at the flanks; and 2. the indented-*fhield*, or *fhield* chancrée, which has a number of notches and indentings all round its fides. The ufe of the antient *fhield* of this form was, that the notches ferved to reft the lance upon, that it might be firm while it gave the thruft; but this form being lefs proper for the receiving armorial figures, the two former have been much more ufed in the heraldry of that nation.

Befide this different form of the *fhields* in heraldry, we find them alfo often diftinguifhed by their different pofitions, fome of them ftanding erect, and others flanting various ways, and in different degrees. This the heralds exprefs by the word *pendant*, hanging, they feeming to be hung up not by the center, but by the right or left corner. The French call thefe *ecu pendant*, and the common antique triangular ones *ecu ancien*. The Italians call this *fcuto pendente*; and the reafon given for exhibiting the *fhield* in thefe figures in heraldry is, that in the antient tilts and tournaments, they who were to juft at thefe military exercifes, were obliged to hang up their *fhields*, with their armories, or coats of arms on them, out at the windows and balconies of the houfes near the place; or upon trees, pavilions, or the barriers of the ground, if the exercife was to be performed in the field.

Thofe who were to fight on foot, according to Columbier, had their *fhields* hung up by the right corner, and thofe who were to fight on horfeback, had theirs hung up by the left. This pofition of the *fhields*, in heraldry, is called *couché* by fome writers, though by the generality *pendant*.

It was very frequent, in all parts of Europe, in arms given between the eleventh and fourteenth centuries. But it is to be obferved, that the hanging by the left corner, as it was the token of the owner's being to fight on horfeback, fo it was efteemed the moft honourable and noble fituation, and all the pendant *fhields* of the fons of the royal family of Scotland and England, and of our nobility at that time, are thus hanging from the left corner. The hanging from this corner, was a token of the owner's being of noble birth, and having fought in the tournaments before; but no fovereign ever had a *fhield* pendant any way, but always erect, as they never formally entered the lifts of the tournament.

The Italians generally have their *fhields* of arms of an oval form: this feems to be done in imitation of thofe of the popes, and other dignified clergy; but their herald, Petro Sancto, feems to regret the ufe of this figure of the *fhield*, as an innovation brought in by the painters and engravers, as moft convenient for holding the figures, but derogatory to the honour of the poffeffor, as not reprefenting either antiquity, or honours won in war, but rather the honours of fome citizen, or perfon of learning. Some have carried it fo far, as to fay that thofe, who either have no antient title to nobility, or have fullied it by any unworthy action, cannot any longer wear their arms in *fhields* properly figured, but were obliged to have them painted in an oval, or round *fhield*. In Flanders, where this author lived, the round and oval *fhields* are in the difrepute he fpeaks of; but in Italy, befide the popes and dignified prelates, many of the firft families of the laity have them. The fecular princes, in many other countries, alfo retain this form of the *fhield*, as the moft antient, and truly expreffive of the Roman clypeus. *Nifbet*'s Heraldry, p. 12. *Componille*, Herald.

SHIFTERS, on board a man of war, certain men who are employed by the cooks to fhift or change the water, in which the flefh or fifh is put, and laid for fome time, in order to fit it for the kettle.

SHILLING (*Cycl.*)—In the year 1560, there was a peculiar fort of *fhilling* ftruck in Ireland, of the value of nine pence Englifh, which paffed in Ireland for twelve pence. The motto on the reverfe of thefe, is *pofui deum adjutorem meum*. Eighty two of thefe *fhillings*, according to Malynes, went to the pound; they therefore weighed twenty grains one fourth each, which is fomewhat heavier in proportion than the Englifh *fhilling* of that time, fixty two whereof went to the pound, each weighing ninety two grains feven eighths; and the Irifh *fhilling* being valued at the Tower at nine pence Englifh (that is one fourth part lefs than the Englifh *fhilling*) it fhould therefore proportionably weigh one fourth part lefs, and its full weight be fomewhat more than fixty two grains, but fome of them found at this time, though much worn, weighed fixty nine grains. In the year 1598, five different pieces of money of this kind were ftruck in England for the fervice of the kingdom of Ireland.

Thefe were *fhillings* to be current in Ireland as twelve pence each, half *fhillings* to be current at fix pence, and quarter *fhillings* at three pence. Pennies and halfpennies were alfo ftruck of the fame kind, and fent over for the payment of the army in Ireland. The money thus coined was of a very bafe mixture of copper and filver, and two years after there were more pieces of the fame kinds ftruck for the fame fervice, which were ftill worfe; the former being three ounces of filver to nine ounces of copper, and thefe latter only two ounces eighteen pennyweights, to nine ounces two pennyweights of the alloy. *Simon*'s Irifh Coins.

SHINGLING, in the iron-works, in many parts of England, is the operation of hammering the fow, or caft-iron, into blooms. The tongs, ufed for holding the iron in this operation, are called *fhingling-tongs*, and the iron to be thus wrought is called a *loop*. *Ray*'s Englifh Words, p. 128. See the articles LOOP and BLOOM.

SHIP (*Cycl.*)—It is highly neceffary, to the health of feamen, that *fhips* fhould be cleared of foul air; for it has been found by frequent experience, that air fhut up, and confined in a clofe place, without a fucceffion and frefh fupply of it, becomes unwholfome, and unfit for the ufe of life. This is more fenfibly fo, if any ftagnating water be pent up with it. But it grows ftill worfe, if fuch an air as this is made ufe of in refpiration; that is, becomes moifter and hotter, by paffing and repaffing through the lungs. Thefe bad effects in different degrees, according to the different manner in which air is inclofed, are obferved in many cafes; particularly in deep wells, and caverns of the earth; in prifons, or clofe houfes, where people are fhut up with heat and naftinefs; but moft of all in large *fhips*, in which, with the ftench of water in the hold, many men being crouded up in clofe quarters, all the mentioned circumftances concur in producing greater mifchiefs than would follow from any of them fingle.

Mr.

Mr. Sutton did therefore, a few years ago, propofe, in order to clear the holds of *fhips* of the bad air they contain, that the fire-place and afh-place of the copper or boiler fhould be both clofed up with fubftantial and tight iron doors; and that a copper, or leaden-pipe, of fufficient fize, fhould be laid from the hold into the afh-place, for the draught of air to come in that way to feed the fire. And thus, from the natural elafticity of the air, it feems plain, that there will be from the hold a conftant difcharge of the air therein contained; and confequently, that the air fo difcharged muft be as conftantly fupplied by frefh air below the hatches, or fuch other communications as are open into the hold; whereby the fame muft be continually made frefh, and its air rendered more wholfome, and fit for refpiration. And if into this principal pipe, fo laid into the hold, other pipes are let in, communicating refpectively either with the well, or lower decks, it muft follow, that part of the air, confumed in feeding the fire, muft be refpectively drawn out of all fuch places, to which the communication fhall be fo made. Phil. Tranf. N° 462. p. 42, 43.

To prevent *fhips*, whofe bottoms are worm-eaten, from leaking, this method has been propofed [b]. Calk well the infide planks, or lining; then fill the vacant fpaces between the timbers, and the out and infide planks with boiling pitch, or refin, fo high as the main-gun-deck. The pitch being put in very hot, will run into the fmalleft cranny, and make the *fhip* as tight as a bottle. There will be no room left for vermin, as rats, &c. and the pitch will ferve for other ufes when taken out; therefore the expence will be but fmall.—[[b] Phil. Tranf. N° 476. p. 372.]

SHIP *of pleafure*, among the antients. See the article THALAMEGUS.

SHIP, in the falt-works, is a large ciftern, out of which the falt-pans are fupplied for boiling.

This ciftern is built clofe to the faltern, and is made either of wood, brick, or clay; and it ought always to be covered with a fhed, that the fea water, contained in it, may be kept clean from foot, and other impurities, and not mixed with frefh water in rains; and it muft be always placed fo high, that the water will eafily run out of it into the pans, to fupply them for boiling.

SHIRE (*Cycl.*)—SHIRE-*clerk*, he that keeps the county-court; and his office is fo incident to that of the fheriff, that the king cannot grant it away. 4 Rep. *Blount*, *Cowel.*

SHIRE-*man*, was antiently the judge of the *fhire*, by whom trials for land, &c. were determined. Lamb. Peramb. 442. *Blount.*

SHIRE-*mote*, in our old writers, an affembly of the county or *fhire* at the affizes, &c. *Blount*, *Cowel.* See the article SCYREGEMOT, *Cycl.*

SHIVERS, in a fhip, the feamen's term for thofe little round wheels, in which the rope of a pulley or block runs. They turn with the rope, and have pieces of brafs in their centers, (which they call the *cocks*) with holes in them, into which the pin of the block goes, and on which they turn.

Thefe *fhivers* are ufually of wood; but fome are of brafs, as thofe in the heels of the top-mafts.

SHIVERY *falt*, a name given by the falt-workers to a fort of falt, very little different from the common brine-falt.

It is prepared in the fame manner, as that falt from the falt fprings in Chefhire, and other places, and is of a larger and firmer grain than that prepared in the common way, and is ftronger, and therefore more fit for the preferving meat. When they would make this *falt*, they fill the pans on Saturday night, and then, as they draw out no falt on Sundays, there is a very moderate fire kept up all that day, and on the Monday morning all the *falt* is taken out at one draught, having had time to form itfelf into larger cryftals than ordinary, as it is eight and forty hours, inftead of four and twenty in forming. *Brownrig* of Salt, p. 108. See the article SALT.

SHOAD, in mining, a term for a train of metalline ftones mixed with earth, fometimes lying near the furface, fometimes at confiderable depths; but always ferving to the miners as a proof, that the load or vein of the metal is thereabout. The deeper the *fhoad* lies, the nearer ufually the vein is. *Ray's* Words, p. 120.

SHOAD-*ftones*, a term ufed by the miners of Cornwall, and other parts of this kingdom, to exprefs fuch loofe maffes of ftone, as are ufually found about the entrances into mines, fometimes running in a ftrait courfe, from the load or vein of ore, to the furface of the earth.

Thefe are ftones of the common kinds, appearing to have been pieces broken from the ftrata, or larger maffes, but they ufually contain mundic, or marcafitic matter, and more or lefs of the ore to be found in the mine. They appear to have been at fome time rolled about in water, their corners being broken off, and their furface fmoothed and rounded. The antimony mines in Cornwall are always eafily difcovered by the *fhoad-ftones*, thefe ufually lying up to the furface, or very nearly fo; and the matter of the *ftone* being a white fpar, or debafed cryftal, in which the native colour of the ore, which is a fhining bluifh black, eafily difcovers itfelf in ftreaks and threads.

Shoad-ftones are of fo many kinds, and of fuch various appearances, that it is not eafy to defcribe, or know them; but the miners, to whom they are of greateft ufe in the tracing, or fearching after new mines, diftinguifh them from other ftones by their weight: for if very ponderous, though they look ever fo much like common ftones, there is great reafon to fufpect that they contain fome metal. Another mark of them, is their being fpungy and porous; this is a fign of efpecial ufe in the tin countries, for the tin *fhoad-ftones* are often fo porous and fpungy, that they refemble large bones of animals thoroughly calcined. There are many other appearances of tin *fhoads*, the very hardeft and firmeft *ftones* often containing this metal.

When the miners, in tracing a *fhoad* up a hill, meet with fuch odd ftones and earths, that they know not well what to make of them, they have recourfe to vanning, that is, they calcine and powder the ftone, clay, or whatever elfe is fuppofed to contain the metal; and then wafhing it in an inftrument, prepared for that purpofe, and called a *vanning-fhovel*, they find the earthy matter wafhed away; and of the remainder, the ftoney, or gravelly matter lies behind, and the metalline matter at the point of the fhovel. If the perfon, who performs this operation, has any judgment, he eafily difcovers not only what the metal is that is contained in the *fhoad*, but alfo will make a very probable guefs at what quantity the mine is likely to yield of it, in proportion to the ore. Phil. Tranf. N° 69.

SHOE (*Cycl.*)—SHOE, in the manege. A horfe-*fhoe* is a piece of flat iron, with two branches or wings, which being commonly forged according to the form of the hoof for which it is defigned, is made round at the toe, and open at the heel.

A *fhoe* for all feet, is one that is cut at the toe into two equal parts, which are joined by a riveted nail; upon which they are moveable in fuch a manner, that the *fhoe* is inlarged or contracted, lefs or more, at pleafure, in order to make it fit all forts and fizes of feet.

To *fhoe* a horfe after the form of a lunette, a patin, &c. See LUNETTE, PATIN, &c.

SHOEING-*hammer*, in the manege, a hammer that the fmith or farrier makes ufe of to adjuft and fit the fhoes upon the anvil, both hot and cold.

SHOOT, in the fea language. They fay the ballaft *fhoots*, when it runs over from one fide to another.

SHOOTING (*Cycl.*)—SHOOTING *of falts*. It is to be obferved, that the figures arifing from the *fhooting* of diffolved falts are not conftantly the fame, but vary according to different circumftances; fuch as when they happen to *fhoot* more or lefs haftily, or in different proportions of liquor. *Boyle's* Works Abridged, Vol. I. p. 241. See the article SALT.

SHORES (*Cycl.*)—The *fhores* of the fea are divided, by Count Marfigli, into three portions, according to which all his defcriptions, in his accounts of the bafon of the fea, are given.

The firft part of the *fhore*, is that tract of land to which the fea juft reaches in ftorms and high tides, but which it never covers; the fecond part of the *fhore*, is that which is covered in high tides and ftorms, but is dry at other times; and the third is the defcent from this, which is always covered with water.

The firft part is only a continuation of the continent, and fuffers no alteration from the neighbourhood of the fea, except that it is rendered fit for the growth of fome plants, and wholly unfit for that of others, by the faline fteams and impregnations; and it is fcarce to be conceived by any, but thofe who have obferved it, how far in land the effects of the fea reach, fo as to make the earth proper for plants, which will not grow without this influence; there being feveral plants frequently found on high hills, and dry places, at three, four, and more miles from the fea, which yet would not grow, unlefs in the neighbourhood of it, nor will ever be found elfewhere.

The fecond part or portion of the *fhores* is much more affected by the fea than the former, being frequently wafhed and beaten by it. Its productions are rendered falt by the water, and it is covered with fand, or with the fragments of fhells in form of fand, and in fome places with a tartarous matter depofited from the water, and the colour of this whole extent of ground is ufually dufky and dull, efpecially where there are rocks and ftones; and thefe are covered with a flimy matter.

The third part of the *fhores* is more affected by the fea than either of the others, and is covered with an uniform cruft of the true nature of the bottom of the fea, except that plants and animals have their refidence in it, and the decayed parts of thefe alter it a little.

SHORLING *and morling*, in our old writers, words ufed to diftinguifh fells of fheep; *fhorling*, being the fells after the fleeces are fhorn off the fheeps back; and *morling*, the fells flead off after they die, or are killed: in fome parts of England, they underftand by a *fhorling*, a fheep whofe fleece is fhorn off; and by a *morling*, a fheep that dies. Stat. 3 Ed. 4. c. 1. *Blount.* See MORLING.

SHORT (*Cycl.*)—SHORT-*jointed*, in the manege. A horſe is ſaid to be *ſhort-jointed*, that has a ſhort paſtern. When this joint, or the paſtern, is too ſhort, the horſe is ſubject to have his fore-legs, from the knee to the cronet, all in a ſtrait line. Commonly your *ſhort-jointed* horſes do not manege ſo well as the *long-jointed*; but out of the manege the *ſhort-jointed* are the beſt for travel or fatigue.

SHORT-*ſightedneſs*.—A learned author thinks it probable, that out of ſo great a number of *ſhort-ſighted* perſons as are daily to be met with, few are born ſo. For it generally grows upon young people at the age of twenty or twenty-five, and therefore might poſſibly be prevented by uſing their eyes, while young, to all ſorts of conformations; that is, by often looking through glaſſes of all ſorts of figures, and by reading, writing, or working with ſpectacles, of ſeveral degrees of convexity. For whatever be the powers by which the eye conforms itſelf to diſtinct viſion, they may poſſibly grow weak, or loſe their extent one way or other, for want of variety of exerciſe. It ſeems an opinion, without foundation, to think that ſuch an exerciſe of the eyes can any wiſe injure them; provided, due care be taken to avoid looking at objects that are too bright. See Dr. Smith's Optics, Vol. 2. Rem. p. 10.

Short-ſightedneſs may come by accidents. Of this we have a remarkable inſtance, mentioned by Dr. Briggs in his Ophthalmographia, of a perſon, upwards of ſeventy years old, who had uſed ſpectacles for ten years, and yet by catching cold, he ſuddenly became ſo *ſhort-ſighted*, that he could not diſtinguiſh objects three feet off; and after the cold and defluxion were cured, he continued to read the ſmalleſt print without ſpectacles for many years. Dr. Smith mentions a young gentleman, who became *ſhort-ſighted* immediately after coming out of a cold bath, in which he did not totally immerſe himſelf, and has ever ſince uſed a concave glaſs for many years. Ibid.

It is commonly thought that *ſhort-ſightedneſs* wears off in old age, but the learned Doctor queſtions whether this be matter of fact, or hypotheſis only. Ibid.

It is remarkable, that *ſhort-ſighted* perſons commonly write a ſmall hand, and love a ſmall print, becauſe they can ſee more of it at a view. That it is cuſtomary with them not to look at the perſon they converſe with, becauſe they cannot well ſee the motion of his eyes and features, and are therefore attentive to his words only. That they ſee more diſtinctly, and ſomewhat farther off, by a ſtrong light, than by a weak one; becauſe a ſtrong light cauſes a contraction of the pupil, and conſequently of the pencils, both here, and at the return; which leſſens their mixture, and conſequently the apparent confuſion: and therefore to ſee more diſtinctly, they almoſt cloſe their eye-lids; for which reaſon they were antiently called *myopes*. Ibid. ſect. 62.

Dr. Jurin obſerves, that perſons who are much, and long accuſtomed to view objects at ſmall diſtances; as ſtudents in general, watchmakers, gravers, painters in miniature, &c. ſee better at ſmall diſtances, and not ſo well at great diſtances, as the reſt of mankind. The reaſon is, that in the eye, as well as in other parts, the muſcles, by conſtant exerciſe, are enabled to contract themſelves with more ſtrength, and by diſuſe are brought to leſs ſtrength. Hence, in the perſons beforementioned, the greater muſcular ring of the uvea contracts more eaſily and ſtrongly, and the cornea more readily obeys the contraction of the ring; whence they ſee better at ſmall diſtances. And the cornea, by being thus often and long bent into a greater convexity, does by degrees loſe ſomething of its elaſticity, ſo as not to return to its natural elaſticity, when the muſcular ring ceaſes to act upon it. This is one cauſe of their not ſeeing ſo well at great diſtances. Alſo the ligamentum ciliare, being ſeldom employed to leſſen the convexity of the capſula, does by degrees become leſs capable of performing that office: and the capſula being ſeldom drawn out, and put into tenſion, muſt loſe ſomething of its diſtenſile quality, ſo as leſs eaſily to comply with the action of the ligament. And this is another cauſe of their not ſeeing ſo well at great diſtances. *Jurin*, Eſſ. on diſt. and indiſt. Viſion.

SHORTFORD, an antient cuſtom in the city of Exeter, when the lord of the fee cannot be anſwered rent due to him out of his tenement, and no diſtreſs can be levied for the ſame. The lord is then to come to the tenement, and there take a ſtone, or ſome other dead thing off the tenement, and bring it before the mayor and bailiff, and thus he muſt do ſeven quarter-days ſucceſſively; and if on the ſeventh quarter-day, the lord is not ſatisfied his rent and arrears, then the tenement ſhall be adjudged to the lord to hold the ſame a year and a day; and forthwith proclamation is to be made in the court, that if any man claims any title to the ſaid tenement, he muſt appear within the year and day next following, and ſatisfy the lord of the ſaid rent and arrears. But if no appearance be made, and the rent not paid, the lord comes again to the court and prays that, according to the cuſtom, the ſaid tenement be adjudged to him in his demeſne as of fee, which is done accordingly; ſo as the lord hath from thenceforth the ſaid tenement, with the appurtenances, to him and his heirs.

SHOT (*Cycl.*)—SHOT *of a cable*, on ſhip-board, is the ſplicing of two cables together, that a ſhip may ride ſafe in deep waters and in great roads; for a ſhip will ride eaſier by one *ſhot of a cable*, than by three ſhort cables out a-head.

SHOVELER, in zoology, the name of a ſpecies of ſea-duck, remarkable for the breadth of its bill, and called by authors *anas latiroſtra*, the broad-beaked duck, and *taſchenmul*, and by ſome *anas clypeata*.

It is ſomething ſmaller than the common duck. The beak is remarkably broad, and grows broader and rounder toward the end, where it is hollowed like a ſhield. The iris of its eyes is very yellow, and the legs and feet red. The feet are ſmaller than in moſt other ducks. The head, and upper part of the neck, are of a very beautiful blue, ſometimes of a duſky green; the under part of the neck is white, the upper and the ſhoulders variegated with white and brown. The belly, and lower part of the breaſt, are red, but the feathers behind the anus, and immediately under the tail, are black. The back is brown, with a fine caſt of blue, purple and green. The tail is ſhort, and is variegated with black and white. *Ray*'s Ornithol. p. 280.

SHOULDER (*Cycl.*)—SHOULDER, in the manege, is the joint of a horſe's fore-quarters, that joins the end of the *ſhoulder*-blade with the extremity of the fore-thigh.

SHOULDER *of a branch*, is that part of it which begins at the lower part of the arch of the banquet, overagainſt the middle of the fonceau, or chaperon, and forms another arch under the banquet. The *ſhoulder of a branch* caſts a greater, or leſſer circumference, according as it is deſigned to fortify, or weaken the branch. See the articles BRIDLE, BANQUET, and BRANCH.

SHOULDER-*pegged horſes*, called in French *chevillées*, are ſuch as have their *ſhoulders* gourdy, ſtiff, and almoſt without motion. A horſe charged with *ſhoulders*, is one that has thick, fleſhy, and heavy *ſhoulders*.

Cartilages of the SHOULDER, in anatomy. The ſcapula in many ſubjects has a ſmall cartilaginous border along its whole baſis, which in children is remarkable enough, but in grown perſons it diſappears. The glenoide cavity of this bone is covered with a cartilage, which is thicker toward the circumference than in the middle, and a little raiſed above the edge of the bone. The ſmall cartilaginous ſurface of the acromion is thicker in freſh bones, than it appears in a dried ſceleton, and is a little convex. The ſmall triangular ſurface, at the extremity of the ſpine of the ſcapula, near the baſis, is covered with a very thin, ſmooth cartilaginous lamina; but this being tranſparent, does not appear very white. There are no other cartilages but theſe uſually found in the ſcapula in freſh ſubjects, notwithſtanding that in ſceletons of prepared bones, ſeveral places beſide ſeem to have been cartilaginous; theſe, however, are owing only to the dried remains of ligaments and tendons. *Winſlow*'s Anatomy, p. 137.

Ligaments of the SHOULDER. The articulation of the acromium with the extremity of the clavicle, is ſtrengthened all round by ſeveral ſmall, but ſtrong ligaments, which go directly from one bone to the other. Theſe ligaments lie very near one another, and withal are ſo tightly braced over the joint, as to hide it altogether: they appear indeed more like a cartilaginous covering, than a ligamentary texture; and the internal ſurface of theſe ligaments is lined with the capſula of the joint. When the ſmall inter-articular cartilage is found in this joint, its whole circumference is ever found connected to theſe ligaments. The articulation of the clavicle with the ſternum is ſuſtained by ſeveral ligaments, fixed by one end round the pectoral extremity of the clavicle, and inſerted at the other in the ſternum. There is alſo a long narrow ſtrong ligament, which goes from one clavicle to the other, behind the furca of the ſternum: this is fixed to the internal angle of the contiguous extremities of the bones, and may be properly called the *inter-clavicular ligament*. The neck of the ſcapula, at a ſmall diſtance from the glenoide cavity, gives inſertion to the capſular ligament, or mucilaginous bag, and to the articular ligaments of the joint of the ſcapula and os humeri. And beſide theſe articular ligaments of the ſcapula, there are three ligamentary cords fixed to the tuberoſity of the coracoide apophyſis; two of which, by their other extremities, are inſerted in the oblique eminence on the lower ſide of the humeral extremity of the clavicle, the third under the acromium. There is alſo a thin flat broad ligament, reaching between the criſta of the ſpine of the ſcapula, and the edge of the inferior coſta. *Winſlow*'s Anatomy, p. 138.

SHOULDER *of a baſtion*, in fortification, is where the face and the flank meet.

SHOUT, *clamor*, in antiquity, was frequently uſed both on eccleſiaſtical, civil and military occaſions, as a ſign of approbation, and ſometimes of indignation. Thus as Cicero, in an aſſembly of the people, was expoſing the arrogance of L. Antony, who had had the impudence to cauſe himſelf to be inſcribed the patron of the Romans, the people on hearing this raiſed a *ſhout*, to ſhew their indignation.

In the antient military diſcipline *ſhouts* were uſed, 1. upon occaſion of the general's making a ſpeech, or harangue to the army, from his tribunal. This they did in token of their approving

what had been propofed. 2. Before an engagement, in order to encourage and fpirit their own men, and fill the enemy with dread. This is a practice of great antiquity, befides which it wants not the authority of reafon to fupport it; for as mankind are endowed with two fenfes, hearing and feeing, by which fear is raifed in the mind, it may be proper to make ufe of the ear, as well as the eye, for that purpofe. *Shouts* were alfo raifed in the antient theatre, when what was acted pleafed the fpectators. See ACCLAMATION.

It was ufual, for thofe prefent at the burning the dead, to raife a great *fhout*, and call the dead perfon by his name, before they fet fire to the pile. See BURIAL.

SHREW, or SHREW-*moufe*, in zoology, the common name of the creature called by authors *mus araneus*. See the article MUS *araneus*.

Hardy SHREW. See the article HARDY.

SHRIKE, in zoology, an Englifh name for the lanius, or butcher-bird, a fmall bird of the hawk-kind, a terrible deftroyer of the little birds. *Ray's* Ornithol. p. 52. See the article LANIUS.

SHRITE, in zoology, a name ufed by fome for the larger thrufh, or *turdus vifcivorus major*, commonly known by the name of the *miffel-bird*. It ftays the whole year with us, and fings very fweetly. See MISSEL-*bird*.

SHRUB (*Cycl.*)—*Hardy* SHRUBS. See the article HARDY.

SI *action*, in law, the conclufion of a plea to the action, when the defendant demands judgment, if the plaintiff ought to have his action, &c.

SIAGONAGRA, a name given by fome medical writers to the gout in the jaws.

SIALISMUS, a word ufed by the antients to exprefs a difcharge of faliva, brought on by the holding hot things in the mouth; and by us for a falivation by mercury.

SIALOCHI, a term ufed by the antients to exprefs fuch perfons as had a plentiful difcharge of faliva, by whatever means. Hippocrates ufes it for a perfon in a quinfey, who difcharges a very large quantity of faliva; others exprefs by it perfons, whofe mouths naturally abound with a bitter faliva; and others fuch perfons, as from having a very large tongue, fpit into people's faces while talking with them.

SIALOGOGA, a term ufed by medical writers to exprefs fuch medicines as promote a copious difcharge of the faliva, fuch as pellitory of Spain, and all the other hot and acrid vegetables; and mercury, the moft powerful of all.

SIANKE, or SYNKE, in natural hiftory, a name given by the people of fome parts of the Eaft-Indies to the caryophyllus, or clove-fpice. The people of the Moluccas, according to Garcias, call it *chanque*, which is only a fmall difference of pronunciation. The Turks and Perfians call the fame fpice *calafur*.

SICCHASIA, a word ufed by fome writers to exprefs that uneafinefs at the ftomach, and loathing of food, which women are often afflicted with in their pregnancy.

SICCINNIS, in antiquity, a mixed kind of dance. See the article DANCE, *Cycl.*

SICERA, in the Jewifh antiquities. The hellenift Jews give this name to any inebriating liquor. St. Chryfoftom, Theodoret, and Theophilus of Antioch, who were Syrians, and who therefore ought to know the fignification and nature of *ficera*, affure us, that it properly fignifies palm-wine.

Pliny acknowledges, that the wine of the palm-tree was very well known through all the Eaft, and that it was made by taking a bufhel of the dates of the palm-tree, and throwing them into three gallons of water; then fqueezing out the juice, it would intoxicate like wine.

The wine of the palm-tree is white: when it is drank new, it has the tafte of the cocoa, and is fweet as honey: when it is kept longer, it grows ftrong, and intoxicates. After long keeping, it becomes vinegar. V. *Renaudot's* Notes upon the Voyage to China, p. 12. *Calm.* Dict. Bibl.

SICILIANA, in botany, a name given by Dodonæus, and fome other authors, to the great androfæmum, called *tutfan*, and *park-leaves*. *Ger.* Emac. Ind. 2.

SICILICUM, the name of a weight in ufe among the antients, which fome fay was equal to three drachms of our weight; others fay only to two.

SICUB, or SICAP, in natural hiftory, a name given by the inhabitants of the Philippine iflands to a fpecies of hawk, of the bignefs of their common hawk, or banoy, which is fomewhat larger than our fparrow-hawk. This bird is very elegantly variegated all over its body with yellow, white, and black.

SICUS, in ichthyology, a name ufed by fome authors to exprefs that fpecies of coregonus, called by the generality of authors *albula nobilis*. See the articles COREGONUS and ALBULA.

SICYOIDES, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is fhaped like a bell wide open at the mouth, and divided into feveral fegments. Some of the flowers on this plant are fteril, or male-flowers, having no embryo; others are fruitful, or female, having an embryo, which ripens into a fruit of the fhape of an almond, flefhy, prickly, ufually collected into a head, and containing only one feed under a thin fkin.

The fpecies of *ficyoides*, enumerated by Mr. Tournefort, are thefe. 1. The American *ficyoides* with angular leaves and echinated fruit, called by fome authors *cucumis Canadenfis monofpermos*, or the fingle-feeded Canada cucumber. 2. The American *ficyoides* with echinated fruit and deeply jagged leaves. *Tourn.* Inft. p. 103.

SICYONE, a word ufed by Hippocrates to exprefs colocynth, and by others for a fpecies of hard-fhelled gourd, in the fhape of a pear, and by fome for a cupping-glafs.

SICYONEUM *oleum*, a word ufed by the antients to exprefs a medicinal oil, of which there was among them three kinds in ufe. The firft was called *ficyonium fimplex*. This was compofed of two ounces of the root of the wild cucumber boiled feveral hours in a pint of oil. The fecond fort was called the *compound ficyonium*, and was made of the root of the fame plant, with many other ingredients. The third was another compound kind, made not with an infufion of the root, but with the juice of the fruit of the wild cucumber.

SICYONII, among the Romans, were fhoes of a more delicate form, and better ornamented than ordinary, and chiefly worn by the ladies and their gallants. *Pitifc.* in voc.

SIDA, in botany, the name of a genus of plants, conftituted by Linnæus, and comprehending the *malvinda* of Dillenius, and the *abutilon* of the fame author and of Tournefort. The characters are thefe: the perianthium is compofed of one leaf, of the figure of a cup, erect, and lightly divided into five fegments, and does not fall with the flower. The flower confifts of five petals, which are broad at the top, and furrounded with a rim: they are much narrower at the bottom, and grow together there. The ftamina are a great number of filaments, which at the bottom grow into a fort of tube, and at the top are free. The antheræ are roundifh. The germen of the piftil is roundifh. The ftyle is fhort, and is lightly divided into feveral fegments. The ftigmata are flender and obtufe. The fruit is a roundifh capfule, terminating in a point, and compofed of feveral horns, which finally feparating, tear the complex veffel to pieces. The feeds are roundifh and pointed, the one fide convex, and the other of an angular figure.

This genus is very nearly allied to the melochia, but differs in its numerous antheræ. The malvinda and abutilon agree in all the characters of this genus, but differ in this, that the firft has always only five capfules which compofe the general fruit, and the other has more. *Linnæi* Gen. Plant. p. 329. *Dillen.* Hort. Elth. p. 171. *Tournefort*, p. 25.

SIDA is alfo ufed by fome authors for the *althæa*, or marfhmallow. *Ger.* Emac. Ind. 2.

SIDE (*Cycl.*)—SIDES *of a fhip*, are diftinguifhed into the *ftarboard* and *larboard*; that is, into the right and left-hand-*fide*, when ftanding with the face towards the head of the veffel. See the articles STARBOARD and LARBOARD.

Broad-SIDE, in the fea language, is to fire all the guns on one *fide* of the fhip.

SIDE-*wind*, at fea. See the article WIND.

SIDERIA, in natural hiftory, the name of a genus of cryftal. The word is derived from the Greek, σίδηρος, iron, and is ufed to exprefs cryftals altered in their figure by particles of that metal. Thefe are of a rhomboidal form, compofed only of fix planes. Of this genus there are four known fpecies: 1. a colourlefs, pellucid, and thin one, found in confiderable quantities among the iron ores of the Foreft of Dean in Gloucefterfhire, and in other the like places. 2. A dull, thick, and brown one, not uncommon in the fame places with the former. And 3. a black and very gloffy kind, a foffil of very great beauty, found in the fame place with the others, as alfo in Leicefterfhire and Suffex. See Tab. of Foffils, Clafs 3. *Hill's* Hift. of Foff. p. 197.

SIDERITIS, (*Cycl.*) *iron-wort*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of the labiated kind. The upper lip is erect, the lower divided into feveral fegments. The piftil arifes from the cup, and is fixed in the manner of a nail into the hinder part of the flower, and furrounded by four embryos, which afterwards become fo many feeds, ripening in an open capfule, which was the cup of the flower. To thefe marks it may be added, that in all the *fiderites* the flowers grow in circles round the ftalks, at the joinings of the leaves.

The fpecies of *fideritis*, enumerated by Mr. Tournefort, are thefe. 1. The hairy procumbent *fideritis*, called *tetrahit* by many authors. 2. The hairy procumbent *fideritis* with leaves very flightly crenated. 3. The hairy *fideritis* with very deeply crenated leaves. 4. The hyffop-leaved Alpine *fideritis*. 5. The hyffop-leaved Alpine *fideritis* with leaves notched at the ends. 6. The narrower-leaved erect Spanifh *fideritis*. 7. The large procumbent Spanifh *fideritis* with crenated leaves, and white flowers. 8. The narrow-leaved crenated bituminofe *fideritis*. 9. The fmooth ftinking Spanifh *fideritis* with purple flowers, and hoary fpikes. 10. The woody fhrub Spanifh *fideritis*. 11. The fmall procumbent hyffop-

hyssop-leaved Pyrenean *sideritis*. 12. The mountain-*sideritis* with trifid leaves. 13. The tall yellow-flowered Canada *sideritis* with leaves like those of figwort. 14. The purple-flowered tall figwort-leaved Canada *sideritis*. There are some other plants, beside these, called by authors *sideritis*, but they are properly of the galeopsis, betony, or marrubiastrum-kind, which see. *Tourn.* Inst. p. 191.

SIDEROMANTIA, Σιδηρομαντεια, in antiquity, a kind of divination performed with a red-hot iron, upon which they laid an odd number of straws, and observed what figures, bendings, sparklings, &c. they made in burning. *Potter*, Archæol. Græc. l. 2. c. 18. Tom. I. p. 353.

SIDEWAYS, in the manege. To ride a horse *sideways*, is to passage him, or make him go upon two treads, one of which is marked by his shoulders, and the other by his haunches.

SIGAH-*gush*, in zoology, the name of a Persian animal, of the lynx-kind, and no way differing from the lynx itself, but in that it has no spots. Its ears have the fine velvety black pencil of hairs at their top, which are the distinguishing character of the lynx; and these creatures differ so much in the variations and different dispositions of their spots, that probably this is no other than an accidental variety of the same species. *Ray*'s Syn. Quad. p. 168.

SIGHT (*Cycl.*)—The Acta Leipsiensia give us an account of a man, who received a smart stroke on the pupil of one of his eyes from the end of a fiddle-string, which broke while he was tuning the instrument, and chanced to fly that way. Some cooling things were applied to the eye, and a bandage used to shade it from the light; but at midnight the patient chancing to wake in the dark, found that he could see with that eye, though not with the other: this continued a long time, and on trial he found that he could read a small print at midnight with this eye, but could scarce distinguish any thing with it in a bright and clear day.

We have, in the same collections, an account of a man, who, after the cure of a confirmed pox, saw every object double for a long time. Act. Leips. 1690.

It is a very common, and a very just observation, that children do not see any thing clearly when new-born, and if their eyes be then examined, they are found to want that brilliancy which they afterwards acquire; and finally, when any object is presented to their view, they at first turn their eyes about in such a manner, that it is evident they either do not see at all, or at best but very imperfectly and obscurely.

This imperfection may either be owing to a fault in some one of the humours, or in their capsules, or, finally, in the retina, or complexly in them all together. It is impossible to discover whether there be any imperfection in the retina in this state of life, that membrane being ever, in new-horn infants, tender and soft like a jelly: if it be in any of the other parts that the imperfection lies, it must be either in their nature, or extent. Mr. Petit, of the Academy of Sciences at Paris, determined to enquire thoroughly into the cause of this, was at the pains of dissecting the eyes of several infants which had died soon after their birth, and in three fourths of them he found the vitreous, the crystalline, and the capsule, all greatly deficient in their transparence. The uvea appeared also more opake than in adults, and the pupil over large; and that there was either none, or, at the utmost, very little of the aqueous humour: and in those eyes, where the humours had not this opacity, they were all, as were also the membranes, of a reddish colour; and this was observed in fœtuses of seven and nine months old.

The cornea in these eyes was also remarkably thick, which is, in general, found to be the case in the eyes of all fœtuses. The thickness and opacity in these corneas gradually diminish in time, and that soon; so that the eyes of children appear much brighter at two or three months old, than when new-born. The aqueous humour seems also, in most fœtuses, to be wholly wanting; and where it is found, is ever greatly in an under proportion to the other humours.

It therefore appears, that the dimness and imperfection of *sight*, in new-born infants, is owing to the over-thickness of the cornea, and to the too small portion of the aqueous or watery humour. It appears plainly also, from experience, that the eye is not able, in infants, to bear the light, till the pupil is greatly contracted; as is the case also, though in a less degree, in adults: and it is very probable, that the extreme softness of the retina in this state may make every ray of light affect it much more plainly, than when grown more firm.

Mr. Petit having continued his examinations of the eyes of infants, up to the age of five or six weeks, found in all his dissections, that the cornea daily grew more and more convex and glossy; and this may be rationally concluded to be owing to the daily encrease of the aqueous humour, which must, by that accretion, throw it out into a greater convexity, and make it daily more and more thin and transparent. The uvea also acquires a greater extension, and its fibres become more moveable; whence the pupil acquires a power of enlarging or contracting itself, at the approach or absence of light, with much more ease and readiness than it could before. The humours thus all become capable of letting in a larger quantity of light; the retina is at the same time every day gaining a new firmness, and the pupil becomes capable of an easy dilatation, or restriction, for the letting in occasionally a greater or less number of rays, and the refractions are perfected by the augmentation of the aqueous humour. It is plain, therefore, that the clearness of vision must every day encrease. All this change comes on in infants only by time; and it may be judged of, as to its state, by inspection, by the brilliancy and convexity of the cornea, and by the manner of their turning their eyes toward objects set before them: and this time is not certain, or limited, but differs greatly in different children, some being able to see clearly at the end of a month, others not till after many months.

At the time that this gentleman was dissecting the eyes of human fœtuses and infants, he also curiously observed the eyes of young quadrupeds. The puppy, when newly brought forth, has always its eyes opake; the kitten, on the contrary, has them clear, and every way like those of adults of the same species. In fœtuses of other quadrupeds, the lamb has its cornea a little turbid and opake; the calf and the pig have them more or less opake, but the calf most so of all. Mem. de l'Acad. Par. 1727.

SIGIA, a name given by some authors to the liquid-styrax.

SIGILLUM (*Cycl.*)—SIGILLUM *mariæ*, *lady's seal*, in botany, a name by which some authors have called the *bryonia nigra*, or black bryony, a climbing plant, common in hedges. *Ger.* Emac. Ind. 2.

SIGMA, among the Romans, the same with the *stibadium*. See the article STIBADIUM.

SIGMOIDES, a word used by medical writers to express any thing that is in the shape of the letter sigma. The valves of the heart have this epithet applied to them; the coracoide process of the scapula is also expressed by the same word; the semicircular cavity of the cubit, at the articulation of the fore-arm with the humerus, is sometimes also called the *sigmoidal-cavity*; and the cartilages of the *sigmoide*-circles of the *aspera arteria*, or wind-pipe, have their denomination from the same occasions.

SIGNS, or SYMPTOMS, in medicine. See ASSIDENT.

Negative SIGN. See the article NEGATIVE *sign*.

SIGNA, *standards*, among the Romans, were of different sorts; on some of them the image of the emperor was represented, and they that carried them were called *imaginiferi*; others had a hand stretched out, as a symbol of concord; and these ensign-bearers were called *signiferi*; some had a silver eagle, the bearers of which were called *aquiliferi*; others had a dragon with a silver head, and the rest of his body of taffety, which was blown by the wind as if it had been a real dragon, and the bearers of this ensign were called *draconarii*; lastly, the emperor's ensign was called *labarum*, and those that carried it *labariferi*, which they carried out when he went in person to the field: it was of a purple colour, beset with gold fringe, and adorned with precious stones.

All these ensigns were sustained with a half-pike, sharp at the end, that it might be the more easily fixed in the ground. *Danet.* in voc.

SIGNATORES, among the Romans, witnesses who sealed wills and marriage-contracts. *Pitisc.* in voc.

SIGNIFER, among the Romans, an ensign-bearer, or the person who carried the standard on which was represented a hand stretched out. See the article SIGNA.

SIGNINUM, among the Romans, a kind of pavement much esteemed: it was made of poudered shells mixed with lime. *Pitisc.* in voc.

SIGNUM *pugnæ*, the signal of battle, among the Romans, was a coat of arms, of a purple colour, set upon the general's pavilion. *Danet.* in voc.

SIGUETTE, in the manege, is a cavesson of iron, with teeth or notches; that is, a semicircle of hollow and vaulted iron, with teeth like a saw, consisting of two or three pieces joined with hinges, and mounted with a head-stall and two ropes, as if they were the cavessons that in former times were wont to be put upon the nose of a fiery stiff-headed horse, in order to keep him in subjection.

There is a sort of *siguette*, that is a round iron all of one piece, sewed under the nose-band of the bridle, that it may not be in view. This *siguette* we employ with a martingale, when a horse beats upon the hand.

SIL, in natural history, a name given by the antients to a red ochre, of which they had three distinct kinds, the *sil syricum*, *sil atticum*, and *sil marmorosum*; all of which are to be had at this time, and all very valuable paints.

SIL *syricum* is a substance well known among the painters of the present age, though not by name, being the red ochre, commonly used for a purple colour, in their coarser works; though it is capable of yielding, by proper management, a colour fit for their finest. It is very heavy, and of a fine strong red with some tendency to purple, of a loose friable texture,

texture, and very rough and dusty surface. It adheres firmly to the tongue, is somewhat soft to the touch, crumbles easily to pieces between the fingers, and stains the hands very much. It melts freely in the mouth, and has a strongly astringent taste. It burns to a much paler colour, and makes no effervescence with aqua fortis. These are the characters by which this is distinguished from all the other red earths. It is dug in many parts of England, and is sent to London in great quantities. *Hill*'s Hist. of Foss. p. 57.

SIL *atticum* is the purple ochre, called of later times *almagra*. See the articcle ALMAGRA.

SIL *marmorosum* is also a substance in some degree known in the world at this time. It sometimes falls into the hands of our painters who call it Indian stone red, but it has many other valuable qualities extremely worth enquiring into. It is the hardest and driest of all the ochres, and while in the stratum appears absolutely stony, forming thin, flat, regular strata, and is so hard that it is not to be dug without the pick-ax; it is also of an obscurely and irregular laminated structure, and naturally breaks into flat pieces. It is of a fine purplish red, and very heavy, and contains a multitude of fragments of a fine lead ore which are bright and bluish, and make a very pretty appearance, and beside these has always among it a small quantity of pure native cinnabar; both these substances are so nicely mixed with it, that it is scarce possible to break off a piece of an inch square from any part of the strata, that has not more or less of both in it. It is of a dusty surface, and rough to the touch, and adheres very firmly to the tongue, and stains the hands. It is of a very austere and astringent taste, and makes no effervescence with acids. There are considerable strata of it on the borders of China, and it is much used as a paint in the East-Indies. There is some of it at times brought over to us, but not enough to make it a regularly marketable commodity. Beside its use as a paint, it is worth enquiring into an account of the cinnabar it contains; three ounces of it having yielded, on trial, two drams and a scruple of pure quicksilver. *Hill*'s Hist. of Foss. p. 62.

SILACH, a word used by medical authors for a disorder of the eye-lid, consisting in a preternatural thickness of it, or a swelling without inflammation.

SILATUM, a word used by the antient Romans to express a morning's draught of wine. This was usually of a wine medicated with the plant sili, or seseli, and thence had its name. It has always been the custom to medicate the morning draughts of any strong liquor; we do it with wormwood, or the common bitter tincture, the Indians with ginger.

SILAUM, in botany, a name used by some authors for the *saxifraga pratensis*, or common meadow-saxifrage. *J. Bauhin.* Vol. 3. p. 170.

SILENE, in botany, the name of a genus of plants, the characters of which are these. The perianthium is oblong, smooth, and clavated, and consists of one leaf, divided into five segments at the edge. The flower consists of five petals: the ungues of these are as long as the tube of the cup, and their extremities form a limb, which lies flat and expanded: the apices of all the petals are obtuse and marginated. The nectarium is composed of certain denticuli, two of which are inserted near the base of every petal. The stamina are ten subulated filaments, inserted into the ungues of the flower. The antheræ are oblong. The germen of the pistil is cylindric. The styles are either three or five, and are of the length of the stamina, or somewhat more. The stigmata are always bent against the sun. The fruit is the germen enlarged, and divided into as many cells as there were styles: these contain numerous kidney-shaped seeds. Dillenius, in the Hortus Elthamensis, has described these plants under the name *viscago*. *Linnæi* Gen. Plant. p. 197. *Dillen.* Hort. Elth. p. 309.

SILER, in botany, a name given by the Latin writers of the later ages to the plant called by others *seseli*, an umbelliferous herb, growing in mountainous places.

The antient Roman authors, however, mean a very different thing by the word *siler*, a shrub growing in watery places, and having twigs very ductile and tough, and fit for basket-work, or any other use of that kind. The poets have often mentioned it, and always with the epithets of *molle* and *lentum*, soft and tough.

Nothing can be more obvious, than that the *siler* of the later authors is a plant wholly different from this; and it is very properly that some have denominated the umbelliferous plant *siler montanum*, to distinguish it from the shrub-*siler*, which only grows about waters.

Some of the old scholiasts and interpreters of the Roman authors have told us that the *siler*, mentioned by them, is the cyperus; but this must be a mistake. For though this plant grows in watery places, and has considerable tough stalks; yet it is not a shrub, but an herbaceous plant, and is remarkably harsh, and of all plants least deserves the epithet *molle*, which the antients bestowed on their *siler*.

Some have supposed it to be the willow; but this cannot be true: for the willow and *siler* are continually named together, by the same authors, as different plants. The willow, alder and *siler*, being the three shrubs generally mentioned together, as the shrubs that grow about the banks of rivers; the osier is a kind of willow, very frequent at the sides of rivers, and has all the qualities attributed to the *siler* by the antients. It has been supposed by some that this cannot be their *siler*, because as it is a kind of willow, they would have called it by the common name, *salix*; but our own example may plead against this, for we know it to be of the willow-kind, yet we call it by another name: osier is more different in sound from willow, than *siler* from salix, and probably both one and the other signify the same plant.

The error of confounding so different a plant as the *seseli* with this shrub, arises from the unhappy custom of abbreviation, so common among the old Greeks; instead of *seseli* they wrote the word sometimes only *seli*, and *sile*, thence it was easy for people, less acquainted with botanical distinctions, to add an *r* at the end, to reduce the word, which they did not know, to one that they did; and thus grew *siler* as a name for *seseli*. Hippocrates calls the seseli *sili*; and Pliny both *sili* and *seli*. See the article SILI.

SILESIACA-*terra*. See the article TERRA-*silesiaca*.

SILEX, *flint*, in natural history, the name of a genus of semipellucid stones, the matter of which is a crystal, debased by an admixture of a peculiar and appropriated earth, which is of a blackish grey; always free from veins, but, according to the different quantity and disposition of the earth in its composition, subject to clouds of a darker or paler colour, and naturally invested with a thin whitish crust.

Naturalists, in general, have accounted various species of *flint*, but erroneously; nature has established it into a genus of itself, and allowed no other species than one, which is ever composed of the same matter, and differs only in the proportions of its admixture. When crystalline matter is debased by earths of other colours, or clouded and veined, it ceases to be *flint*, and becomes the pebble, the agate, or the onyx; and the not attending to this distinction, has made many describe these variously-coloured bodies twice over: once under the name of *coloured flints*, and a second time under that of *English agates*, &c.

The characters of genuine *flint* are, that it is a stone of an extremely fine and even texture; of a very uncertain surface, sometimes rough, sometimes smooth; of a colour always, in some degree, between blackish and whitish, unless accidentally tinged, as all other fossils are subject to be; very readily giving fire with steel; not fermenting with acids. *Hill's* Hist. of Fossils, p. 508. See the article FLINT.

SILI, in botany, a name given by the old Greeks to a plant called also *seseli*. Hippocrates always calls this *sili* and *sile*, and Pliny uses the same words as some of its names.

This however is not the only meaning of the word, for the epithet *cyprium* being added to it, it signified a very different plant, namely, the ricinus; and the letter *r* being added to the end, and the word written *siler*, it became the name of the osier, as well as of the seseli. This has occasioned great errors about the meaning of the antients, some misunderstanding them as speaking of the osier, when they are describing the virtues of the seseli.

SILICERNIUM, among the Romans, a funeral supper, which is otherwise called *exequium*. *Pitisc.* in voc. See the article EXEQUIUM.

SILILICON, in botany, a name given by some of the old Latin writers to the carob-tree, or *siliqua dulcis*. The Latins borrowed this name from the Greek *xyloglycon*, ξυλογλυκον, the sweet, or sweet-fruited tree. Isidore mispels the word *sililicon*, and making it only *silicon*, supposes it to be a barbarous way of spelling the word *siliqua*; but the evident derivation of the genuine word from the Greek shews his error, both as to the word itself, and the origin of it.

The Latins called this tree *siliqua*, because its fruit was in pods, and the Greeks *ceratium*, κεράτιον, because its pods were bent so, as to resemble horns; but the names *xyloglycon*, and its derivative, *sililicon*, were wholly different from these. The same Isidore observes, that the expressed juice of the fruit of this *silicon* is the drug called *acacia* in the shops; but in this he is guilty of a very great error, the fruit of the *silicon* being esculent, and the acacia a very powerful astringent.

What has led him into this error, has been an observation of the Glossaries on Avisenna, and the other Arabian physicians. These authors have called by the same name, *charub*, or *charnub*, both the carob, or *sililicon*, and the acacia, only distinguishing them by proper epithets. Isidore found in their Glossaries, that charnub was the *siliqua*, or carob-tree, and that the juice of the pods of charnub was acacia; he therefore not observing that there were two charnubs, gave to the latter the properties of the former, and so made the styptic and astringent drug the juice of an esculent plant.

SILICULA, in botany, a name given by some authors to fœnugreek. *Ger.* Emac. Ind. 2.

SILIQUA, (*Cycl.*) in botany, the name of a genus of trees, the characters of which are these. The flower is of the apetalous kind, being composed only of a number of stamina, which arise from the segments of the cup, the middle of which is occupied by a pistil, which finally becomes a flatted

flatted pod of a fleshy substance, and containing flat and roundish seeds.

The species of *siliqua*, enumerated by Mr. Tournefort, are these: 1. The common *siliqua*, called the *eatable siliqua*, or carouge. 2. The esculent *siliqua* with shorter pods. 3. The esculent *siliqua* with various pods. 4. The wild carouge, or not esculent *siliqua*. *Tourn.* Inst. p. 578.

SILIQUA, κεράτιον, among the antients, the third part of an obolus, or, what comes to the same, the sixth part of a scruple. See the articles OBOLUS and SCRUPLE, *Cycl.*

SILIQUA *nabathæa*. See NABATHÆA *siliqua*.

SILIQUARIUS, among the Romans, an officer who exacted, or raised the toll *siliqua*. *Pitisc.* in voc.

SILIQUASTRUM, *Judas-tree*, in botany, the name of a genus of trees, the characters of which are these. The flower is of the papilionaceous kind; the wings, however, stand over the vexillum, and the carina is composed of two leaves. The pistil arises from the cup, and is surrounded by stamina; this finally becomes a flat membranaceous pod, filled with seeds of a kidney-like form. To this it is to be added, that the leaves stand alternately. See Tab. 1. of Botany, Class 22.

The species of *siliquastrum*, enumerated by Mr. Tournefort, are these: 1. The common *siliquastrum*, or *Judas-tree*. 2. The white-flowered *siliquastrum*. 3. The *siliquastrum* with large pods and pointed leaves. 4. The round-leaved Canada-*siliquastrum*. Tourn. Inst. p. 646.

SILIQUASTRUM was used in the botanical writings of the antients for the name of a podded plant, growing wild in some places of Italy, and in others cultivated for domestic and medicinal uses. Pliny, and many other of the antients, have mentioned this, but they have given such imperfect accounts of it, that they have led their followers into many errors about it. At this distance of time, and with the few lights they have left us, it is not easy to say what this plant of the antients was; but it may be a means of leading the reader out of many errors, to say what it was not.

Many have supposed it to be the *zinziber caninum* of Avisenna, and the *hydropiper* of Dioscorides; but the name *siliquastrum* implying its having pods, is a sufficient refutation of its being this plant, which is the common *persicaria*, or biting arsmart.

Others have thought that the *siliquastrum* was the capsicum, or *Guinea-pepper*, as we call it; but however well this plant may agree with the name, as being podded, it can by no means be the plant, since Pliny describes it as common in Italy, and growing wild, which it is very certain that this plant never did.

Many have supposed it to be the plant we call *piperitis*, or *dittander*; but though Pliny has called this plant *piperitis*, from its hot taste of pepper, yet he plainly shews that it was not our *dittander*: for he afterwards describes that as another sort, saying, that there is another broad-leaved kind, which approached to the nature of iberis, but that the large leaves distinguished it: this is plainly enough our *lepidium*, or *dittander*; and therefore the other *siliquastrum*, originally and properly so called, cannot be that plant. Julius Scaliger observes, that there is a shrub growing in Provence at this time, called *siliquastrum*; he supposes this to be the *siliquastrum* of Pliny: it has leaves resembling those of the olive, and short crooked pods. But we do not find any thing either in Pliny, or any other of the antients, to countenance the opinion of the *siliquastrum* being a shrub.

SILIQUASTRUM, in natural history, the name given by Mr. Lhuyd, and others, to the bony palates of fishes, when found fossile. See the article ICHTHYPERIA.

SILIQUATICUM, among the Romans, a custom or toll paid for merchandise. This the Greeks called *ceratismus*. See the article CERATISMUS.

SILK (*Cycl.*)—Raw *silk*, which is a substance of no remarkable smell or taste, yet contains a surprising quantity of a volatile salt. Fifteen ounces of raw *silk* cut small, and put into a retort, when distilled with a gentle fire, will yield two ounces and two drachms of a dry volatile salt; whereas fifteen ounces of hartshorn, a substance usually supposed to contain more volatile salt than any other substance, except sal armoniac, yields only half an ounce and half a drachm: from the same quantity of *silk* there may also be drawn three ounces and an half of volatile spirit; whereas, from the like quantity of hartshorn, the quantity of spirit exceeds this, being four ounces and a half. But we are to consider, that there requires but a small proportion of volatile salt to be dissolved in phlegm, to make it what they call a volatile spirit; and that upon the whole there is no doubt, but that the *silk* contains greatly the larger portion of salt. The caput mortuum, from this quantity of hartshorn, weighed nine ounces and two drachms; whereas that from the *silk* was only five ounces and five drachms: whence it is plain, that the hartshorn contains greatly more earth in the same quantity, and consequently less active principles.

It has generally been agreed, that the spirit of hartshorn is no other than a phlegm, impregnated with a volatile salt, and an extremely penetrating sulphur: this is proved by the following experiment. If spirit of wine be poured upon spirit of sal armoniac, or spirit of *silk*, there is immediately produced a large quantity of a saline concretion; and when the spirit of *silk* is used, this concretion is manifestly composed of considerably large and separate granules of salt; whereas, in case the spirit of sal armoniac has been used, the concretion is perfectly fine, and of an even texture, and it is not easy to say, at first sight, whether it be saline, or sulphureous: this is what has been called by authors *offa Helmontii.* It is proved, however, to be wholly saline, on the adding water to it, since that readily dissolves it. The sulphur, which is contained in these volatile spirits, manifests itself sufficiently by its smell.

The spirit of raw *silk* rectified with some essential oil, is the medicine commonly known by the name of *guttæ Anglicanæ*, or English drops. Mem. de l'Acad. Par. 1700. See the article DROPS.

Silk being properly an animal fluid hardened by the air, is usually much mended or depraved in its nature and qualities, according to the nourishment the worm receives from a good or bad leaf; a great deal, therefore, depends on the goodness or badness of the spring of the year, in the value of the *silk* produced. A warm spring is best, and it should be moderately moist, not overmuch so, because too great a fall of rain is always found to rot the leaves. Southerly winds also are to be feared, because they burst the worms; and northerly ones, when strong, usually spoil the leaves. All these being destructive, either of the animals themselves, or of their food, very just presages may be formed upon them of the produce of the ensuing year.

When these mischiefs do not happen, but the spring is favourable, the people have little to do but to watch the feeding of the worms, and about Midsummer they are to begin to draw the *silk* from its cocoon, to see what it yields, and judge of its encrease or scarcity, and estimate its goodness and perfections; the principal of which are, that it proves clean, light, and strong.

Great use may be made of these observations, provided the management be good. It requires great care to hatch the eggs, and when hatched, there must be a careful eye over the worms, even to the time of drawing off the *silk*. If the season foretels a scarcity, the business of the prudent manager is to buy up all the old *silk* he can procure, and keep as much of the other as he can, to be employed in the best fabrics, that so they may not be obliged to hazard all the good at the price of the worst: but when the season proves favourable, they collect the new for the best fabrics, and compare it with the old, to see whether it be of a better quality, before they venture to determine their prices.

The goodness of *silk* is best distinguished by its lightness, that being its most essential quality: this every one knows carries a very great profit with it, being bought by weight, and sold by measure, at the first hand, after the collectors. The Organcine *silk* is the best of any made in the country of Piedmont, and two threads are equal in fineness, that is in smoothness, thickness, and length, for the thread of the first twist. For the second, it matters not whether the single thread be strong before the two are joined, unless to see whether the first twist prove well. It is necessary that the *silk* be clean, and it is to be observed, that the straw-coloured is generally the lightest, and the white the heaviest of all. The skains should be even, and all of an equality, which shews that they were wrought together; otherwise we may with justice suspect that it is refuse *silk*, and cannot be equally drawn out and spun, for one thread will be shorter than the other, which is labour and loss.

It will also be requisite to search the bale more than once, and take from out of the parcels a skain to make an essay; for unless it be known by trial what one buys, there is the greatest danger of being cheated in this commodity. To make an estimate, and know the lightness, fix the essay upon one eighth of a portée, or hand of *silk* of a hundred and ten aunes or ells of Lyons in length, and see what it makes of aunes by the eighth part. The skain, which is of eighty threads, must be multiplied by a hundred and ten aunes of Lyons, and from this number must be deducted one eighth; as for example, 110 by 80 makes 8800, the eighth part of which is 1100; and this is the eighth part of a portée, or hand of *silk*. Now to calculate what these 1100 aunes weigh, which is the eighth part of a portée, or of 110 aunes of Lyons, it will be proper to take a skain out of the parcels, which you take from out of the bale which you judge may contain, at least, 1100 aunes, to make the one eighth part of a portée, which portée must be divided on two bobbings, half on each; then fix the two bobbings on the center, or beam, and from thence pass it through the comb hurdissoir, *viz.* 550 from the two bobbings, will make 1100, which will be one eighth part of what you desire to know. This done, you cut off your *silk*, and carry it to put on the hurdissoir; then weigh it, and multiply the weight by eight, it will weigh just as much as a portée of 110 aunes of Lyons, which is the general rule for calculating. When they draw the *silk* out by this means, one may learn to adjust the weight.

There are *silks* of Piedmont which are very light and clean, and are to be preferred before any on the sale: the portée of *silk* of the lightest weighs near twenty four pennyweights, and

and from this it arifes in gravity to twenty five, and twenty fix pennyweights the portée, and fometimes to twenty feven and twenty eight; but even thefe weights may be difpenfed with, provided that the other qualities be good, that is, that it be well wrought, even, and clean. When the *filk* is more than twenty eight pennyweights the portée, it muft always be proportionably cheaper. Philof. Tranfact. N° 252. p. 186.

SILK-*worm*, *bombyx*. This infect confifts of eleven rings, and each of thefe of a great number of other fmaller ones, joined to each other; and the head, which terminates thefe rings, is furnifhed with two jaws, which work and cut the food, not by a perpendicular, but a lateral action. The humours, found in the body of this creature, all feem approaching to the nature of the *filk* which it fpins, for on being rubbed in the hands, they leave a hard or folid cruft behind them. Under the fkin there is always found a mucous rofy-coloured membrane, enveloping the animal, and fuppofed to be the new fkin in which it is to appear, on throwing off the old one. The heart of this creature reaches from the head to the tail, running the whole length of the body: it is indeed rather a feries of many hearts connected together, than one. The motion of fyftole and diaftole is very evident in this whole chain of hearts; and it is an elegant fight to obferve the manner of the vital fluid's paffing from one of them to the other. The ftomach of this animal is as long as the heart, reaching, like it, from one end of the body to the other. This large receptacle for food, and the fudden paffage of it through the animal, are very good reafons for its great voracity.

In the fides of the belly, all about the ventricle, there are depofited a vaft number of veffels, which contain the *filky* juice; thefe run with various windings and meanders to the mouth, and are fo difpofed, that the creatures can difcharge their contents at pleafure at the mouth; and according to the nature of the juices, that they are fupplied with, furnifh different forts of *filk* from them, all the fluid contents of thefe veffels hardening in the air into that fort of thread, that we find the web, or balls of this creature confift of.

Thefe creatures never are offended at any ftench of whatever kind, but they always feel a fouthern wind, and an extremely hot air always makes them fick. *Malpighi* de Bombyce.

Chryfalis of the SILK-*worm*. See the article FEVE.

SILVER (*Cycl.*)—*Silver* works, as fpurs, wrought hilts, &c. are boiled in falt, alum and argol, to give it a whitenefs and clearnefs. *Boyle*'s Works Abr. Vol. I. p. 135.

Silver burnt on a glafs-plate tinges it of a fine yellow or golden colour. *Boyle*'s Works, Vol. I. p. 147. See alfo p. 458. and Vol. II. p. 64.

Chemifts have made frequent attempts to diffolve *filver* in vegetable acids, but with little fuccefs, according to Mr. Marggrave; who fays, that he himfelf, at laft, fucceeded in the attempt.

The chief art required, is to find a proper precipitate of *filver*. Mr. Marggrave's is formed by precipitating a folution of *filver*, in the beft fpirit of nitre, with that falt of urine which he fays is the bafis of phofphorus. See SALT *fufible of urine*.

This precipitate reduced to a fine powder, and digefted in a fand-heat with diftilled vinegar, well concentrated by freezing, will in part be diffolved thereby.

But if this precipitation of the *filver* be made with falt of tartar, and then dried and pulverized, a confiderable quantity of it may be diffolved in diftilled vinegar, in juice of lemons, in Rhenifh wine, and in other vegetable acids. The like may be done with mercury. Mem. de l'Acad. de Berlin, 1741. See MERCURY.

Purified SILVER. The moft commodious and regular manner of purifying *filver* is this: put a large teft, inclofed in an iron ring, into a furnace; when the teft has been red-hot about half an hour, put into it the *filver* to be purified, wrapt up in pieces of cloth or paper, and divided into fmall portions; then fill the orifice of the furnace with burning coals, and blow with a pair of hand-bellows, till the *filver* is in fufion; then add, at feveral times, fome lead, reduced to globules of a determined weight; continue adding lead, and keep the fire in fuch a degree, as is juft fufficient to keep the metal in fufion, and continue thus, till the *filver* is rendered quite pure. This may be partly gueffed, by the before made trial of its degree of impurity on the touchftone, and by the quantity of lead, judged neceffary for the operation, having been confumed; and farther known, by trial of it on a wire thruft into it while in fufion, and the examining what is found adhering to it when it is taken out. When the operation is finifhed, pour water in a fmall ftream on the *filver* to make it grow folid, and taking it out of the teft, clean it from all impurities that may adhere to its furface with a brufh made of fmall brafs wire. *Cramer*'s Art of Affaying, p. 204. 208.

The way of purifying *filver* by means of nitre is this: reduce the *filver* to grains, or fmall thin plates, put it into a crucible, and add one quarter part of nitre, well dried and powdered: put upon this crucible another of a fmaller fize, having a hole as big as a pea in its bottom; lute the joint of the two crucibles, and place them in a wind-furnace; put charcoal about them as high as the rim of the lower crucible, but no higher, then light the fire at top, and encreafe it till the veffels are middlingly red-hot, then with a pair of tongs hold a burning coal directly over the hole in the upper crucible, but at the diftance of one finger; if you fee a fudden clear light produced near and about the coal, together with a crackling noife, this fhews that the fire has the right degree of ftrength; but if this does not appear at all, or but very faintly, the fire muft be encreafed: but if, on the contrary, you hear a violent blaft of air from the hole, and a loud crackling noife, without holding the coal over, the fire is then too fierce, and muft be diminifhed, otherwife you will not only lofe a large quantity of *filver*, but very often the veffels will burft.

When this is perfectly over, encreafe the fire fo far, as to be able to melt *filver* without any addition; then take out the veffels, and when they are cooled break the under one, and you will find the regulus of *filver* at the bottom, and an alkaline fcoria, commonly green, at the top. If the *filver* is not yet thoroughly purified, put it into another crucible, and this open into a wind-furnace, throwing upon it a little nitre, and as foon as it melts, pour it into a mould for ingots; thus will it be purified from every thing but gold. *Cramer*'s Art of Affaying, p. 246.

When any quantity of this metal is contained in iron, it may, according to the rules of affaying, be precipitated from it by fcarification, by the affiftance either of ftrong acid menftrua, or of crude antimony; the latter method is the eafier, and is performed thus: put one centner of the iron reduced to very fine filings, and two centners of crude antimony, into a fmall crucible, clofe it with a tile, and fet it in a ftrong fire, that it may melt; when it has been in a perfect ftate of fufion for fix or eight minutes, take it out, and let it cool, break the crucible, and you will find a mafs, compofed of fcoria at top, and a regulus underneath; throw away the fcoria, and powder the regulus, mix it with twelve centners of granulated lead, and fcorify it in a continual, but not over-ftrong fire, till the lead is feen covered all over its furface with fcoriæ, then take it out, and pour the mafs into a mould: the regulus fhould now be tough, and of a light lead-colour, both within and without; if it be blackifh and brittle, it muft be returned into the teft, and fcorified again, and when brought to its proper ftate, and the antimony all confumed, let it be put into the coppel; and when the bead of *filver* is produced pure, fubtract from its weight the before known quantity of the *filver* contained in the lead ufed in the procefs, and the reft is the weight of the filver obtained from the iron. *Cramer*'s Art of Affaying, p. 223.

SILVER, in medicine, is mightily cried up for its virtues by chemical writers; accordingly, they have endeavoured to introduce a train of lunar medicines, as they call them, fuch as *argentum potabile*, *diaphoreticum lunare*, *bezoardium lunare*, and fifty others, as pompous as infignificant.

The only preparations of *filver*, which keep up their credit in the fhops, are the lunar cryftals, and the lunar cauftic, called *lapis infernalis*; both which are violent cauftics, eating away the flefh, and even the bones, they are applied to. See CAUSTIC.

Inflammable SILVER, a chemical preparation of the lapis infernalis made by a fmall heat. The procefs is this: take an ignited piece of Dutch turf, after it ceafes to fmoak, place it with its upper flat furface parallel to the horizon, make a little cavity in the middle, and therein put a drachm of dry lapis infernalis; it will immediately melt and glow, and finally it will take flame, and hifs and fhine like nitre: after the flame ceafes, pure *filver* will be found in the hollow, as much in quantity as was ufed in the making fo much lapis infernalis.

This curious experiment fhews the phyfical manner in which acids do but fuperficially adhere to *filver*; and the manner wherein acids operate, when united to metals, while furrounding their metallic mafs, they arm the ponderous principles thereof with fpiculæ: it fhews alfo the immutability of *filver* diffolved in an acid, and the various ways in which it may be concealed, yet ftill have its action: it alfo fhews the difference of potable *filver*, while exifting in a faline form, by means of an adhering acid, from that potable *filver* of the adepts, where the principles of *filver* are fuppofed converted into a fluid, that will mix with the juices of the body, and cannot be reduced to *filver* again; but the great thing to be here obferved, is, that the acid fpirit of nitre, adhering in a folid mafs of *filver*, is in this ftate as inflammable, on coming in contact with an ignited combuftible body, as crude nitre itfelf: this feems to happen with *filver* alone, which is unchangeable with fpirit of nitre. Hence alfo we fee one way, by which *filver* may be obtained pure from other adhering matters, by bare burning: the acid here acts neither upon the mercurial part of the *filver*, nor on its fixing fulphur. *Boerh.* Chem. Part 2. p. 297.

SILVER-*ores*. Some of the *ores* of *filver* are rendered very refractory in the working, by means of a mixture of unmetallic earths, from which no art can wafh them clean. The

method to procure the *silver* from these by an assay is this: powder the *ore* very fine, and to a docimastical centner of it add an equal quantity of glass of lead, mix these thoroughly together; the glass of lead must, for this purpose, be reduced to as fine a powder as the *ore*; put this powder, when well mixed, into a test, with twelve centners of granulated lead, and put the test under a muffel in a furnace, make a strong fire, till the lead boils well; when it is in this state, diminish the fire a little, and keep it in this weaker state for some time, then encrease it again to a great strength, till the lead is reduced to scoriæ, and the *silver* is seen pure in the test; or else when the scorification is perfected, take out the matter together, and putting it into a coppel with more granulated lead, separate the *silver* in a bead. Sometimes a refractory *ore* of this kind cannot be thus sufficiently dissolved, but a mass, which has the clammyness of pitch, swims upon the surface of the regulus, and upon the scoriæ that are in part subdued: in this case, diminish the fire, and touch this clammy mass with a small cold iron hook, to which it will immediately stick; take it all carefully off, reduce it to fine powder, and mixing it with more glass of lead in powder, put it back into the test, then continue the scorification till it is perfected: but always observe that the scoriæ of these refractory *ores* must be examined, to see if some of the regulus does not remain among them, for sometimes the scoriæ, by their clammyness, will retain part of the metal; if this appears to be the case, powder the scoriæ very fine, and the metal will be discovered and separated, as it cannot be reduced to a fine powder. *Cramer's* Art of Assaying, p. 218.

The method of precipitating *silver* out of an easily fusible *ore* is this: pound the *ore* very fine in an iron mortar, and for an assay weigh one docimastical centner of it, and eight centners of granulated lead; pour into a new test about half the lead, stir it about with a finger, and spread it over the cavity of the test; put upon this lead the pounded *ore*, and then cover it with the remainder of the lead; put the test, thus loaded, under the muffle of an assay-furnace, and in the hinder part of it make the fire, and encrease it to a considerably high degree. The *ore* will soon be raised out of the melted lead, and swim upon it; a little after it will grow clammy, melt, and be thrown toward the border of the test; then the surface of the lead will appear clear in the middle of the test, and will smoak and boil; the fire must now be made a little less, till the boiling ceases, for a quarter of an hour, and then made violent again, and the surface of the lead will then diminish by degrees, and be covered with a mass of scoriæ. At this time have at hand an iron hook ready heated, and with this stir all the matter from the sides into the middle of the test; if the matter, adhering to the hook from the stirring, melts quickly again, and the extremity of the hook, when cold, is found covered with a shining crust, the scorification is perfected; but if the scoriæ feel clammy while stirred, and adhere in quantity to the hook, and are of a rough surface, the scorification is not perfect, but the matter adhering to the hook must be struck off with a hammer, and beat to powder, and returned into the test, and the fire continued till the scorification is perfected; then take out the test, and pour the whole contents into a mould, heated and greased. This is the first process, and this usually takes up three quarters of an hour: the *silver* is now in form of a regulus, and must be separated by the coppel in the usual way. *Cramer's* Art of Assaying, p. 205. See the article REGULUS.

Mundic is a very common thing in *silver-ores*, especially in the less rich ones, and gives great trouble in working the metal. The method of separating the *silver* from an *ore*, rendered refractory by this admixture, is thus: break the *ore* into a rough powder, and put a centner of it into a test for an assay; put upon this another test, by way of a cover, and put it under the muffle in a furnace; when the muffle is near red-hot, encrease the fire by degrees, there will be a crackling noise, which being ended, take away the upper test, for when the vessels have been red-hot about a minute, the *ore* ceases to split; leave the *ore* under the muffle, till the arsenic and sulphur are in a great measure evaporated, which will be known by the cessation of the smoak from the *ore*, and of the smell of garlick, or the acid; then take out the test, and leave it in a place not too cold, that it may cool leisurely of itself; take the roasted *ore* clean out of the test, powder it very fine, and mix it with an equal quantity of glass of lead in fine powder; and finally, scorify the mass in the same, or in a new test, if that was cracked, till the *silver* appear in form of a bright bead in the middle, after it has stood a minute or two; after this take it out of the fire, and when cold take out and weigh the pure *silver*. *Cramer's* Art of Assaying, p. 221.

Alonso Barba tells us, that the original method of extracting *silver* from the *ore*, in the mines of Potosi, was only by quicksilver, but this was very difficult in many cases. Those *ores* which partake of copperas, which are very numerous there, will not bear quicksilver, but consume and scatter it, breaking its particles, and rendering them unfit for the purposes they were intended for, of taking up the *silver* contained in the *ore*. Burning the *ore* was another method heretofore used with too little caution, and great losses were sustained by it. The grinding the *ore* is always proper, and the finer it is ground, the better it will always succeed. Alonso Barba also greatly recommends boiling the *ores*, in which the quicksilver is used, as of great advantage. The burning of *ores* is of no service, but to render the stony matter more friable; but when there is marcasite among the *ore*, this is never done without loss, and that often very great. *Alonso Barba* de Metall.

The largest piece of *silver-ore* we have account of any where, is at this time preserved in the king of Denmark's Museum of Curiosities at Copenhagen; this was dug in the mines of Norway, and weighs five hundred and sixty pounds. It is five feet six inches long, and measures four feet about: it is valued at five thousand crowns. There is in the same place another also, which was dug in the same mine, valued at three thousand two hundred and seventy crowns. These are both so very rich, that they seem at least three parts *silver*, and the metal appears in very elegant forms in them, and rises up out of their surface in form of small trees and bushes. There are also several pieces of pure native, or virgin *silver* there, all of which represent trees or plants.

SILVER-*pill*, a chemical preparation of *silver*, formerly highly commended as a remedy for dropsies, and in many other diseases.

The method of making it is this: dissolve an ounce of pure nitre in distilled water, then dissolve an ounce of crystals of *silver* made in the common way, with pure *silver* and aqua fortis, in three times the weight of water, so that the solution may be perfectly limpid; mix the two solutions together, they will become a clear homogene liquor, evaporate this to a pellicle, and crystals resembling nitre will shoot; pour off the remaining nitre as before, and the remaining nitre will shoot with the *silver*, in form of crystals, again, upon a second evaporation: let these crystals be dried upon a paper, and then placed in a glass vessel in a very gentle heat, enough to make them smoak, but not run, stir it with a piece of glass all the time, and keep it over the fire, till no more fumes arise; thus the acid spirits will be driven off, and the *silver* remain of a very bitter taste, and purging quality. It must be kept in a dry close vessel. This discovery has been made to serve to many other purposes, beside its uses in medicine, and has furnished the dishonest pretenders to alchemy with one of their most cunning methods of deceit. They have been able, by this means, to conceal *silver* in nitre, and that in a very large proportion, as in one tenth part of the whole quantity; and this nitre being projected in an equal quantity on melted lead, gives an increase of one tenth part in *silver*, which remaining upon the test, will deceive the ignorant, as if a tenth part of the lead were converted into pure *silver*. People who are upon their guard may, however, discover the cheat, by dissolving the pretended nitre in ten times its weight of water, and putting a polished plate of copper into the solution; for every particle of the *silver* will then be precipitated out of the liquor upon the copper, and to the bottom of the vessel. *Boerh.* Chem. Part 2. p. 296.

The medicinal use is this: the dried mass, consisting of the salts of *silver* and nitre, is to be reduced to a fine powder; this powder applied to ulcers, acts in the manner of the lapis infernalis, or *silver*-caustic, only much milder: but for internal use, the quantity of two grains of it is to be ground to a fine powder, with six grains of loaf-sugar, in a glass mortar, this is to be then mixed with ten grains of the crumb of bread, and formed into nine *pills*: these are to be taken by a grown person upon an empty stomach, drinking after them four or six ounces of hot water, sweetened with honey. It purges gently, and brings away a liquid matter like water, often unperceived by the patient. It is said to kill worms, and perform great things in many obstinate ulcerous disorders. It purges without griping, but it must not be used too freely, nor in too large a dose, for it always proves weakening, and in some degree corrosive on the stomach; but this inconvenience is greatly alleviated by rob of juniper. *Boerh.* Chem. Part 2. p. 297.

SILVERING (*Cycl.*)—To *silver* brass: fine *silver* is dissolved in aqua fortis in a broad bottomed vessel of glass, or glazed earth, and the aqua fortis being afterwards evaporated, water is poured upon the remaining calx. This water must also be evaporated, and the operation repeated as often as there is occasion; the fire being increased towards the latter end, so as to leave a perfectly dry and white calx, which will be thus tolerably freed from the aqua fortis. Of this calx take one part, and an equal measure, not weight, of common salt, and of the crystals of tartar, and mix them together into a fine powder; then having first plunged the scowered brass into fair water, rub some of the powder upon it with your wet fingers, till the cavities of its surface be sufficiently filled therewith. Lastly, wash the metal well in water, and give it a gloss by rubbing it hard with a dry cloth.

This waſhing, Mr. Boyle obſerves, is expeditious, cheap, requires no quickſilver, and may be made to laſt ſome years, and is eaſily renewable, when it begins to wear. See his Works Abr. Vol. I. p. 151.

SILVERING *of glaſſes*. An excellent method of turning ſpherical, and other glaſſes, into ſpeculums by *ſilvering*, is this: take half an ounce of pure lead, and melt it into a maſs with the ſame quantity of fine tin, then immediately add half an ounce of biſmuth, and carefully ſkim off the droſs; remove the ladle from the fire, and before the matter is cold, add to it five ounces of pure quickſilver, ſtir the whole together, and then put the fluid amalgam into a clean glaſs.

When this is to be uſed for foiling, or *ſilvering*, let it be ſtrained through a linnen rag, and then gently pour ſome ounces of it into the glaſs intended to be foiled, by means of a paper funnel, reaching almoſt to the bottom, to prevent its flying up to the ſides; then dexterouſly inclining the glaſs every way, endeavour thus to faſten the foil. When this is done, let the glaſs reſt for ſome hours, then repeat the operation, till at length the whole fluid maſs is evenly ſpread and fixed over the whole internal ſurface; then let the ſuperfluous amalgam be poured out, and the outſide of the glaſs poliſhed. This is the method by which glaſs ſpheres are made to look as if full of quickſilver, and deſerves to be tried on the common looking-glaſſes, as having many advantages over the uſual way of *ſilvering* them. *Shaw*'s Lectures, p. 428.

SILURUS, in zoology, the name of a very large fiſh, commonly called in Engliſh the *ſheat-fiſh*.

It is caught in the Viſtula, and other large rivers, and grows to an immenſe ſize, ſome having been caught of more than an hundred weight, and of fixteen feet long, and ſometimes conſiderably larger than that. It reſembles the eel in colour, but the belly is variegated with black, white, and duſky ſpots. The body is without ſcales, and is covered with a mucous ſubſtance. The head is flat, ſhort and broad, the opening of the mouth extremely large. The body down to the fundament is thick and cylindric, but the bottom of the belly is flat, and from the anus to the tail it is broader and flat. Its eyes are large, and have two antennæ, or ſlender excreſcences before them; and four beards hang from the lower jaw. The gills are four on a ſide. It has only one ſmall fin upon the back, and the tail is not forked. Its fleſh is much eſteemed for food, and is dreſſed for the table as the eel. It is a very voracious fiſh, and much dreaded whenever it comes among the ſmaller fry.

Geſner mentions two other ſpecies of it, one flatted toward the tail, and the other of a mixed green and yellow colour, and having two beards on the upper jaw, and three on the under: he only calls theſe *ſiluri ſecunda*, and *tertia ſpecies*. *Willughby*, Hiſt. Piſc. p. 128.

The name is of Grecian origin, and is derived from the words σειν, to move or ſhake, and ουρα, a tail. It is given to this fiſh, from its remarkable quality of being almoſt continually moving its tail in the water.

SILURUS is alſo a name given by ſome authors to the ſturgeon, called by others *accipenſer*, but by the generality of writers *ſturio*. *Salvian*, de Aquat. See the article STURIO.

SIMARONA, a name given by the Spaniards in America to a ſpecies of vanilla, called alſo *baſtard-vanilla*. The pods of this kind are every way ſmaller than thoſe of the true kind, and have very little liquor, or pulp in them when broken, and contain very few ſeeds. Theſe are greatly inferior to the true kind, having ſcarce any ſmell. It is not yet certainly known, whether this ſpecies be the fruit of a different kind of vanilla-plant from the common, or whether it be the ſame fruit gathered at a different ſeaſon, or from a plant growing in a different ſoil. See the article VANILLA.

SIMAROUBA. The bark of this plant is very ſucceſsful in the cure of dyſenteries, as Mr. Juſſieu aſſures us from his experience. It is a thick yellow bark, of an aſtringent bitteriſh taſte, and reſembling, as it is ſaid, the *macer* of the antients. It was firſt brought into Europe from America, in 1713; but of the tree, which produces it, we have no certain account.

This medicine is more ſucceſsful in decoctions than in ſubſtance. The doſe is about the third part of a quart of decoction, having two drachms of the bark in it. See Mem. de l'Acad. des Scienc. Anno 1729.

SIMARUM *muſculus*, in anatomy, a name given by ſome of the old writers to a muſcle, called by the moderns the *ſerratus magnus*. See SERRATUS.

SIMBALATH, in the materia medica, a name given by Avifenna and others to the ſpikenard, or *nardus Indica*.

The exact interpretation of the word is *ſpicigera*, and Avifenna, under this general name, diſtinguiſhes it into ſeveral kinds; the firſt he calls *alnardin*, or *nardin*. It has been ſuppoſed by ſome that he means the Indian *ſpikenard* by this word, but, on the contrary, it appears plainly that he means the Celtic *nard*; he calls it the *nardus Romani orbis*, and ſays that it is of European growth. After this he mentions the Aſiatic *nards* of ſeveral kinds, which are only the Indian *ſpikenard*, growing in different places, and ſuch as uſed to be brought thence in different degrees of perfection. See the article NARDUS.

SIMIA, the *ape* or *monkey*, is made by Linnæus a diſtinct genus of animals, the character of which is, that the creatures of this kind have teeth, have feet compoſed of five toes, and made for climbing, and have their paps on the breaſt. *Linnæi* Syſtem Nat. p. 34.

This genus comprehends the *monkey*, *ape*, and *baboon* claſſes, but more regularly, the word *ſimia* is the name of that kind only which has no tail, the tailed ones being, in diſtinction, called *cercopitheci*, or *tailed monkeys*.

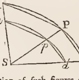
The proper name of the *ſimia*, in Engliſh, is *ape*, and thoſe which have tails, are diſtinguiſhed by the name *monkey*. See CERCOPITHECUS.

There are many ſpecies of *apes*, and even many more than were ſuppoſed by authors; America affording us frequent inſtances of ſuch as have not been deſcribed in any book. *Ray*'s Syn. Quad. p. 149.

SIMIA *marina*, the *ſea-ape*, a name uſed by Bellonius, and ſome other authors, for the fiſh called *vulpes marina*, a kind of ſhark, remarkable for its long tail, from which probably it had both one and the other of theſe names. *Willughby*, Hiſt. Piſc. p. 54.

SIMICON, in antiquity, a muſical inſtrument of the ſtringed-kind, with thirty-five ſtrings. Mem. de l'Acad. Inſcript. Vol. 5. p. 168.

SIMILAR (*Cycl.*)—SIMILAR *curves*, in geometry. The *ſimilarity* of curvilinear figures may be derived from that of rectilinear figures, that are always *ſimilarly* deſcribed in them; or, we may comprehend all ſorts of *ſimilar* figures, planes, or ſolids, in this general definition: figures are *ſimilar*, when they may be ſuppoſed to be placed in ſuch a manner, that any right line being drawn from a determined point to the terms that bound them, the parts of the right line, intercepted betwixt that point and thoſe terms, are always in one conſtant ratio to each other. Thus the figures ASD, *a* S *d*, are *ſimilar*; when any line S P being drawn always from the ſame point S, meeting A D in P, and *a d* in *p*, the ratio of S P to *ſp* is invariable. It is manifeſt, that the rectilinear inſcribed figures *a p d* S, A P D S, are *ſimilar* in this caſe, according to the definition of ſuch figures given in Euclid's Elements, Book 6. See *Mac Laur.* Flux. Art. 122.



When the *ſimilar* figures are in the ſituation here deſcribed, they are alſo *ſimilarly* ſituated, and all their homologous lines are either placed upon one another, or parallel.

SIMILAR *diameters* of two conic ſections. When the diameters in two conic ſections make the ſame angles with their ordinates, they are ſometimes ſaid to be *ſimilar*.

SIMILAR *ſolids*, ſuch as are contained under equal numbers of *ſimilar* planes, alike ſituated.

SIMILAR *bodies*, in natural philoſophy, ſuch as have their particles of the ſame kind or nature one with another.

SIMILAR *animals*. We have a treatiſe by Dr. Martin, wherein he treats of the laws and proportions of the motions and forces of the ſolids and fluids of animals, of however different magnitudes, which are ſuppoſed of *ſimilar* make and conſtitution. See Tractat. de Similibus animalibus.

SIMON, in zoology, a name by which ſome authors have called the dolphin. It is affirmed that this fiſh loves the name, and will come to a perſon who calls him by it; but this, though recorded by authors of credit, meets with no faith among the judicious readers. *Ray*'s Ichthyography, p. 31.

SIMPLE (*Cycl.*)—SIMPLE *leaf*, among botaniſts. See the article LEAF.

SIMPLE, or *ſingle eccentricity*. See ECCENTRICITY, *Cycl.*

SIMPLE *problem*, in mathematics. See LINEAR *problem*, *Cycl.*

SIMPLE *roots*. See FIBROSE *roots*.

SIMPLE *waters*, in diſtillery. See WATERS.

SIMPULUM, among the Romans, a veſſel with a long handle, and made like a cruet. It was uſed in ſacrifices and libations, for taking a very little wine at a time. *Pitiſc.* Lex. Antiq. in voc.

SIMULACRUM, among the Romans. See the articles IDOL and IDOLATRY, *Cycl.*

SIMUS, in zoology, the name uſed by ſome authors for the *naſus*, or *naſe*, a fiſh common in the large rivers in Germany, and ſomewhat reſembling our chub, and in ſome reſpects our common rudd. *Geſner*, de Piſc. p. 213. See the article NASUS.

SINAPI, *muſtard*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is compoſed of four leaves, and is of the cruciform-kind. The piſtil ariſes from the cup, and finally becomes a long pod, divided by an intermediate membrane into two cells, and containing roundiſh ſeeds; the pod alſo uſually terminates in a fungoſe horn, which has ſome ſeeds in it. To this it is to be added, that theſe plants have all a hot, acrid, and biting taſte.

The species of *sinapi*, enumerated by Mr. Tournefort, are these. 1. The turnep-leaved *mustard*. 2. The white *mustard* with hairy pods, and red and white seeds. 3. The early wild *mustard* with black seeds, called by many *charlock*. 4. The early black-seeded field-*mustard*, or charlock, with undivided leaves. 5. The rocket-leaved *mustard*. 6. The Spanish *mustard* with lobated leaves, and sulphur-coloured flowers. 7. The cress-leaved Spanish *mustard*. 8. The small radish-leaved Spanish *mustard*. 9. The dwarf white Spanish *mustard*. 10. The largest Indian lettuce-leaved *mustard*. 11. The large Indian lettuce-leaved *mustard* with narrower leaves. *Tourn.* Inst. p. 227. See MUSTARD.

SINAPI *Persicum*, *Persian mustard*, a name by which some botanical authors have called the *thlaspi*, or treacle-mustard. *Ger.* Emac. Ind. 2.

SINAPISIS, a word used by some writers as a name for *Armenian bole*. *Cast.* Lex. Med. in voc.

SINAPISTRUM, in botany, the name of a genus of plants, the characters of which are these. The flower consists of four leaves, disposed in the form of a cross. The pistil arises from the cup, and at length becomes a long cylindric bivalve pod, usually containing roundish seeds.

The species of *sinapistrum*, enumerated by Mr. Tournefort, are these. 1. The more prickly seven-leaved Egyptian *sinapistrum* with flesh-coloured flowers. 2. The lesser, not thorny, five-leaved Indian *sinapistrum* with flesh-coloured flowers. 3. The trifoliate, not thorny, Indian *sinapistrum* with flesh-coloured flowers. 4. The shrubby trefoil American *sinapistrum* with the taste of cresses. 5. The trifoliate red-flowered Portugal *sinapistrum* with horned pods. *Tourn.* Inst. p. 231.

SINASBARIUM, in botany, a name given by some authors to the *sysimbrium*, or water-mint, common in all our ditches and watery places. *Ger.* Emac. Ind. 2.

SINE (*Cycl.*)—SINE *of incidence*, in catoptrics and dioptrics, is used for the *sine* of the angle of incidence. See the article INCIDENCE, *Cycl.*

SINE *of reflection*, in catoptrics, is used for the *sine* of the angle of reflection. See REFLECION, *Cycl.*

SINE *of refraction*, in dioptrics, is used for the *sine* of the angle of refraction. See REFRACTION, *Cycl.*

SINE *assensu capituli*, in law, a writ that lies where a bishop, dean, prebendary, or master of an hospital, aliens the lands holden in right of his bishoprick, deanery, house, &c. without the assent of the chapter or fraternity; in which case his successor shall have this writ. F. N. B. 195. *Blount*, *Cowel.*

SINEW (*Cycl.*)—SINEW, in the manege. To *unsinew* a horse, called in French *enerver*, is to cut the two tendons on the side of the head, about five inches under the eyes; which two join in one at the tip, or end of the nose, in order to perform its motion. This tendon, at the tip of the nose, is likewise cut. We *unsinew*, in order to dry the head, and make it smaller.

SINEW-*shrunk*, is said of a horse that is over-rid, and so worn down with fatigue, that he becomes gaunt-bellied, through a stiffness and contraction of the two *sinews* that are under his belly.

SINEW-*sprung*, is a violent attaint, or over-reach, in which a horse strikes the toe of his hinder feet against the *sinew* of the fore legs.

SINF, in the materia medica of the antients, a word used to express the same as *agallochum*, or lignum aloes.

The Arabians formed an adjective of this word, and called the yellowish lignum aloes *sinficum*, and the blackish *indicum*. Not that the sinficum came from any other place, or that the Indicum was given as the name of the country, but that the colours only were expressed by these epithets; *indicum* being with the antients as a common word to express black by. The only species of myrobalan they had of a black colour, was called the *Indian myrobalan*; not for its being peculiarly the produce of that country, but because of its being of the colour they expressed by that word.

SINGERS, in the Jewish antiquities. See CHANTERS.

SINGLE (*Cycl.*)—SINGLE *cast*, in husbandry, a term used by the farmers for that sort of sowing, that disperses the necessary quantity of corn at one bout. *Plot*'s Oxfordshire, p. 251.

SINGULATOR, among the Romans, a horseman who rode with one horse only. *Pitisc.* in voc.

SINKING, or ABSORPTIONS *of the earth.* Kircher has written very largely on this subject, and antient and modern histories agree in relating many such facts. The *absorptions* themselves are indeed too common, and are the effects of earthquakes, subterranean fires, and many other accidents of the macrocosm; but there are much fewer instances of the restoring the places thus *absorbed*, and there are but few of those instances, which are recorded of it, that deserve credit, though some are unquestionable.

Pliny tells us, that in his own time the mountain Cymbotus, with the town of Eurites, which stood on its side, were wholly *absorbed* into the earth, so that not the least trace of either remained; and he records the like fate of the city Tantalis in Magnesia, and after it of the mountain Sypelus, both thus *absorbed* by a violent opening of the earth. Galanis and Garnatus, towns once famous in Phœnicia, are recorded to have met the same fate; and the vast promontory, called Phlegium, in Æthiopia, after a violent earthquake in the night-time, was not to be seen in the morning, the whole having disappeared, and the earth closed over it. These and many other histories, attested by the authors of greatest credit among the antients, abundantly prove the fact in the earlier ages; and there have not been wanting too many instances of more modern date. *Kircher*'s Mund. Subter. p. 77.

The mountain Picus, in one of the Molucca isles, was so lofty, that it appeared at great distances as an immense column reared erect in the air, and served as a land-mark to sailors; an earthquake in this island destroyed it; at one instant the whole mountain was *absorbed* into the bowels of the earth, and no mark of its place remained but a vast lake of water, exactly answering to the shape of the base of the mountain. A like accident, but of a more terrible kind, happened in China, in the year 1556, when a whole province of the mountainous parts of that kingdom was in one moment *absorbed* into the earth, and all the towns buried, the whole number of the inhabitants *sinking* with it, and an immense lake of water remaining in its place to this time. Of much later date is the destruction of a city in the confines of Swisserland; but this, though generally said to have been swallowed up into the earth, was not properly an *absorption*; for the whole city was buried by the fall of a mountain upon it.

The burning mountains, Vesuvius and Strongylus, both once very high, have in length of time lost half their height, the upper part having been undermined by the burning, and having fallen into, and been *absorbed* by the under part. And in the year 1646, during the terrible earthquake in the kingdom of Chili, several whole mountains of the Andes disappeared, and were one after another wholly *absorbed* in the earth.

These, and a thousand other accidents of a like kind, prove the truth of *absorptions* in general; some of them leaving level ground in the place of the things *absorbed*, some immense chasms and cracks, and some lakes of fresh or salt water; and it may be, that many immense lakes were formed in ages, of which we have no histories, by the like *absorptions*.

Pliny gives many accounts of the restoring of places thus *absorbed*, but later observations do not give an equal credit to these parts of his history. He tells us, that these restorations are made sometimes in the same place, where the original mountain or island was *absorbed*; sometimes in others, as large spaces of ground arising out of the sea in one place, which had been taken from the land in another; but these seem very vague relations. The islands of Rhodes and Delos, he says, are of this origin, as also that of Anephe beyond Melos, and Nea near Lemnos; that of Ajoue between Lebadus and Teus, and Hiera among the Cyclades; and finally, the island Thia, which he says appeared in his own time. A modern instance of this kind, is the sudden production of the new island near Santorini; but this, and probably all the others also, was not the restoration of any thing before *absorbed*, but the effect of a vulcano under water, which threw up a vast quantity of cinders and sciarri, the whole island, as it is called, consisting of nothing else. In the same manner, in the year 1638, an island was raised near St. Michael's, in the Atlantic ocean, by subterranean fires, which threw up stones, and other subterranean productions, in such quantities, that they formed an island of five miles in length. The mountain raised in one night, in the sea near Puzzoli, is another instance of this sudden production of these mountains: this appeared after one night's violent subterranean conflict, and still keeps its place, and is known under the name of the *Mons Sanctus*. Not one of these, however, appeared in the place of any thing that was *absorbed*; and there is more imagination, than judgment, in supposing them to have any connexion in the laws of nature with the *absorptions* of other places, very distant, and at distant times. *Kircher*'s Mund. Subter. p. 79.

SINKOO, in the materia medica, a name given by some authors to the *lignum aloes*, or agallochum, used in medicine. *Dale*'s Pharm. p. 347.

SINNET, aboard a ship, is a line or string made of rope-yarn, consisting generally of two, six, or nine strings, which are divided into three parts, and are platted over one another, and then it is beaten smooth and flat with a wooden mallet. Its use is to serve the ropes, that is, to keep them from galling.

SINOPICA *terra*, in natural history, the name of a red earth of the ochre-kind, called also *rubrica Sinopica*, and by some authors *sinopis*.

It is a very close, compact, and weighty earth, of a fine glowing purple colour, but in some specimens much deeper than in others, and in some degenerating into paleness; but even in its worst condition, it is a very fine colour. It is of a pure texture, but not very hard, and of an even, but dusty surface. It adheres firmly to the tongue, is perfectly fine and smooth to the touch, does not crumble easily between the fingers, and stains the hands. It melts very slowly in

in the mouth, and is perfectly pure and fine, and of a very auftere aftringent tafte, and ferments very violently with aqua fortis.

It was dug in Cappadocia, and carried for fale to the city Sinope, whence it had its name. It is now found in plenty in the New Jerfeys in America, and is called by the people there *blood-ftone*, from its ftaining the hands to a blood colour, and may probably be had in many other places; and this deferves thoroughly enquiring into, fince there feems not one among the earths more worthy notice. Its fine texture and body, with its high florid colour, muft make it very valuable to painters, and its powerful aftringency equally fo in medicine. The antients were well acquainted with it in fluxes and hæmorrhages, and experience fhews it poffeffes the fame virtues at this time. The deepeft coloured is ever the moft aftringent. *Hill's* Hift. of Foff. p. 60.

SINOPIS, in natural hiftory, a name by which fome authors have called the Sinopic ochre, commonly called *rubrica Sinopica*. *Hill's* Hift. of Foffils, p. 60. See the article SINOPICA *terra*, fupra.

SINUATED *leaf*, in botany. See LEAF.

SINUS (*Cycl.*)—SINUS *of an artery*, is ufed by fome for any part of an artery, where its fides are ftretched out beyond the ordinary proportional dimenfions elfewhere. Med. Eff. Edinb. Abridg. Vol. 2. p. 410.

Morgagni has obferved four fuch *finufes* in the aorta; three of them anfwering to the femilunar valves, and the fourth is all that part of the aorta, between the former *finufes* and the origin of the common trunk of the right fubclavian and carotid arteries. He gives fome reafons to prove, that the nervus acceffforius arifes from the eighth pair, to be joined to the medulla fpinalis. Med. Eff. ibid.

SINUS *of the womb*, is ufed for any cavity within its fubftance. Thefe *finufes* are much of the fame texture with the cells of the fpleen, or rather of the corpora cavernofa penis; being membranous cavities communicating with each other, and having numerous arteries fpread on them, whofe lateral branches open into the cells, from which veins go out to be joined to other veins, that return the blood from the other parts of the womb.

Thefe *finufes* are diftended with blood in the time of the menfes; and their orifices are then alfo enlarged.

During the time of pregnancy the *finufes*, and their canals, that open into the womb, are gradually diftended and enlarged; fo that, at the end of nine months, the *finufes* will contain the largeft fingers, and the canals from them will receive the little finger. Vid. *Monro*, in Medic. Eff. Edinb. Vol. 2. Art. 9.

SIPHAC, a name ufed by fome authors for the *peritonæum*.

SIPHILIS, a name ufed by fome authors for the *lues venerea*, or French-pox.

SIPHITA, a word ufed by Paracelfus, and his followers, with the addition of *parva* and *magna*, for two diforders. The *fiphita parva* fignifies the *chorea fancti Viti*, or St. Vitus's dance; and the *fiphita magna*, walking in time of fleep.

SIPHNIUS *lapis*, in the natural hiftory of the antients, a fubftance found in great plenty in the ifland Siphnus, in the Ægean fea.

It was dug up in large maffes in the neighbourhood of the fea, and when frefh might be cut or worked by the turner into any forts of veffels, by reafon of its foftnefs; but when afterwards burnt and oiled over, it became black and folid, and was fit for any fervice; and the veffels made of it bore the fire very well, and as thofe of earthen-ware with us, for the common offices of boiling, &c. In many parts of Europe they ftill find the fame fubftance, and call it *lapis lebetum*, ufing it in the fame manner. It is no other than the *fteatites*, or *foap-rock*, as it is called with us, common in Cornwall, though our people have not thought of putting it to that ufe. *Hill's* Theophr. p. 106. See the article STEATITES.

SIPHONANTHEMUM, in botany, the name of a genus of plants eftablifhed by Dr. Amman. The name is derived from the Greek σιφον, a tube, and ανθεμον, a flower. The characters of the genus are thefe. The flower confifts of one petal, and is tubulated and divided into feveral fegments at the edge. The piftil arifes from the cup, and finally becomes a fruit refembling four berries, nicely joined together. It is divided into four cells, and contains a number of roundifh feeds. The ftalks of the plant are green and ftriated. The leaves ftand very clofely together, and are placed in no order; they are very narrow, about three inches in length, and much refemble thofe of the willow; they ftand on very fhort pedicles, and are of a very deep green, both on the upper and under-fide. From the alæ of the leaves, or a little above their infertions toward the top of the ftalks, there arife feveral pedicles, of about an inch in length, which divide into feveral others at their tops; ufually each part into three, but often into four or five: thefe are difpofed in the manner of the pedicles of the umbelliferous flowers, and each is terminated by a one-leaved cup, divided into five fegments, from which arife flowers compofed of a flender tube, two or three inches long, of a yellowifh green, which at the end expands into four fegments of a pale yellow: in the middle of thefe there ftands a purple ftyle, which is crooked, and is furrounded by four ftamina of a purple colour, fuftaining each a triangular brown apex. In each of the four cells of the capfule there is contained one large greenifh yellow feed. Act. Petrop. Vol. 8. p. 216.

SIPTACE, in natural hiftory, the name given by the antients to a beautiful bird, of which they were very fond, and which was often kept in their houfes. Some have conjectured this to be the goldfinch, from the fine yellow they defcribe about it; but Pliny plainly makes it the parrot: he tells us, among other things, that it imitated the human voice the beft of all birds.

SIRA, a name by which fome of the chemical writers have called orpiment.

SIRACAUSTUM, a name given by Mefue to a medicine he recommends in acute difeafes.

SIRÆUM, a word ufed by fome to exprefs a fweet decoction, whether given in that form, or firft infpiffated into a fort of rob by evaporation.

SIREN (*Cycl.*)—SIREN, in ichthyology, a name given by Artedi to the fea-monfter often defcribed by authors, but either not exifting at all, or not fo like man as their defcriptions make it.

Artedi fuppofes it to conftitute a peculiar genus of the plagiuri, or cetaceous fifhes. The characters he gives of it are thefe: it has no pinnated tail; the head, neck, and breaft, down to the navel, reprefent thofe of the human fpecies; there are only two fins on the whole body, and thofe ftand on the breaft.

Bartholine, in his Hiftory of Curiofities, defcribes fuch a fifh as this, under the name of *fyrene*, and Barchewitz under the name of *homo marinus*. This author fays that he faw one at fea, and that it is wholly different from the manati, and from all other fifhes. The Philofophical Tranfactions alfo contain an account of a fea-man feen in the American feas, and feveral other writers of credit give countenance to the ftory. Their defcriptions tell us, that from the navel to the tail it is one fhapelefs mafs of flefh, without any appearance of finny tail, or any other part of the ftructure of a fifh. The pectoral fins refemble hands, and are compofed of five bones, or fingers, joined by a membrane. With thefe it fwims. It were much to be wifhed, that fome accurate ichthyologift might have an opportunity of feeing and examining this creature, if it really exifts different from the other animals of the fea. Artedi feems to doubt the truth of the accounts, but thinks it better not to judge of a thing not yet feen, than to pronounce any thing rafhly againft the accounts of creditable authors. *Artedi*, Gener. Pifc. p. 52.

SIREN is alfo a name given by Mouffet, and other authors, to a fpecies of bee; of which they diftinguifh two kinds, a larger and a fmaller. Thefe differ greatly from the common bee, in that they live folitary, and never unite into fwarms, or build nefts, or make combs.

SIRI, among the Romans, were fubterranean caves, or vaults, in which wheat could be kept found and frefh for fifty years. *Pitifc.* Lex. Ant. in voc.

SIRIASIS, a name given by medical writers to a difeafe to which children are fubject; it confifts in an inflammation of the brain and its membranes, and is attended with a depreffure of the fontanella, or hollownefs of the eyes, a burning fever, a palenefs and drynefs of the whole body, and an utter lofs of appetite.

SIRICON *plumbi*, a name given by fome chemical writers to calcined lead, or the grey powder made of lead by a flight calcination in an open fire.

SISARUM, *fkirret*, in botany, the name of a genus of umbelliferous plants, the characters of which are thefe. The flower is of the rofaceous kind, being compofed of feveral petals, arranged in a circular form. The cup becomes a fruit compofed of two feeds, which are flender and gibbofe on one fide, and flat on the other. To this it is to be added, that the roots are feveral large and long ones, hanging from the fame head.

We know of no other fpecies of this genus, but the common *fifarum*. *Tourn.* Inft. p. 308. See SKIRRET.

The tafte of the *fkirret*-root has fomewhat of a bitternefs and fubaftringency in it. It ftrengthens the ftomach, and is of good nourifhment. It proves diuretic, and is by fome pretended to be a remedy againft the ill effects of mercury; but this is an idle opinion.

SISER, in botany, a name given to the fkirret, otherwife called the white carrot, or yellow parfnep. See the article SISARUM.

SISKIN, in zoology, the common Englifh name of a finging bird, kept in cages in fome parts of England, where it is common, and called by authors *fpinus* and *ligurinus*. *Ray's* Ornithol, p. 192. See the article SPINUS.

SISON *fyriacum*, in botany, a name given by fome authors to the ammi, or bifhop's weed, a plant, whofe feeds were once much in ufe in medicine. *Ger.* Emac. Ind. 2.

SISSITIEPTERIS, in botany, a name ufed by Pliny, and fome others of the old authors, for the *pimpinella*, or burnet. *Ger.* Emac. Ind. 2.

SISTRUM, in antiquity, an inftrument ufed for beating time in concerts. It was a plate of founding metal, of an oval form, the upper part of which was adorned with three figures; that of a cat with a human face in the middle, the head of Ifis on the right-fide, and the head of Nephthys on the left. It was filled with wires of the fame metal, which ferved to beat againft the plate when fhaken. Mem. Acad. Infcript. Vol. 7. p. 249, feq.

SISYMBRIUM, *fpearmint*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of four leaves, and is of the cruciform kind. The piftil arifes from the cup, and is finally turned into a long pod, divided into two cells by an intermediate membrane, and furnifhed with roundifh feeds. To thefe marks it may be added, that there is a peculiar general appearance of all thefe plants, which will eafily diftinguifh them, at firft fight, from all the others of the fame clafs.

The fpecies of *fifymbrium*, enumerated by Mr. Tournefort, are thefe. 1. The water-*fifymbrium*, or common water-crefs. 2. The purple-flowered broad-leaved Pyrenean *fifymbrium*. 3. The fmooth rocket-leaved *fifymbrium* with yellow flowers, commonly called *barbarea*, and *winter-creffes*. 4. The fmall early-flowering fmooth rocket-leaved *fifymbrium*, or winter-crefs. 5. The double-flowered fmooth rocket-leaved *fifymbrium*. 6. The rough-rocket-leaved *fifymbrium* with yellow flowers. 7. The fhort-podded radifh-leaved water-*fifymbrium*. 8. The radifh-leaved fhort-podded water-*fifymbrium* with variegated leaves. 9. The fhort-podded water *fifymbrium* with more deeply divided leaves. The three laft are ufually called by authors *water-radifhes*. 10. The creeping water-*fifymbrium* with leaves like thofe of the nafturtiums. This is called by fome *water-rocket*. 11. The fmall rough-podded marfh-*fifymbrium*, called by many *rough-podded muftard*. 12. The fmall fmooth-podded marfh-*fifymbrium*. 13. The wormwood-leaved annual *fifymbrium*, called by many authors *fophia chirurgorum*. *Tourn.* Inft. p. 226.

Sifymbrium, among the Romans, was one of the ingredients, whereof the nuptial garlands were compofed. See NUPTIAL and GARLAND.

SISYMBRIUM, in botany, is alfo a name ufed to exprefs the wild water-mint. *Dale*'s Pharm. p. 205. See the article MENTHA.

SISYRA, among the antients, a woolly fkin ufed for a covering to beds. *Hofm.* Lex. Univ. in voc.

SISYRINCHIUM, in botany, the name of a genus of plants, the characters of which are thefe. The flower and fruit are the fame with thofe of the iris and xiphion, but the root is compofed of two bulbs, the one lying upon the other, as in the gladiol and crocus.

The fpecies of *fifyrinchium*, enumerated by Mr. Tournefort, are thefe. 1. The large *fifyrinchium* with the flower marked with a yellow fpot. 2. The large *fifyrinchium* with the flower marked with a white fpot. And 3. the leffer *fifyrinchium*. *Tourn.* Inft. p. 365.

SITHCUNDMAN, in our old writers, one whofe province it was to lead the men of a town or parifh. Leg. Inæ. c. 56. Dugdale fays, that in Warwickfhire the hundreds were formerly called *fithefoca*, and that *fithefocundman* and *fithcundman* was the chief officer within fuch a divifion, i. e. the high-conftable of the hundred. *Dugd.* Antiq. Warwick. *Blount.* in voc.

SITHESOCA, in our old writers, is ufed to denote the diftrict now called an *hundred*. The word is Saxon, fignifying a franchife, or liberty. Rot. Parl. 16 Hen. II. *Blount.*

SITICINES, among the Romans, perfons who founded a kind of trumpet, having a very mournful tone, at the burying the dead. *Danet.* in voc. See the articles BURYING and BURIAL.

SITONÆ, Σιτῶναι, among the Athenians, officers appointed to lay in corn for the ufe of the city, for which purpofe the ταμίας τῆς διοικήσεως, or the public treafurer, was to furnifh them with as much money as they had occafion for. *Potter*, Archæol. Græc. l. 1. c. 15. Tom. I. p. 83.

SITTA, in the Linnæan fyftem of zoology, the name of a diftinct genus of birds, ufually confounded with the woodpecker-kind. The characters of this genus are, that the foot has three toes before, whereas the woodpecker has but two fore-toes on each foot; the bill is angular, and ends in the form of a wedge, and the tail is raifed. The grey, or afh-coloured picus is of this genus. *Linnæus*, Syftem. Natur. p. 45.

The *picus cinereus*, or grey woodpecker, is called in Englifh the *nut-hatch* or *nut-jobber*.

It is a fmall bird, not quite fo large as the chaffinch. Its head, neck and back are grey; its fides under the wings are red, and its throat and breaft of a pale yellow, with a mixture of a chefnut brown. The lower part of its belly is covered with red feathers, with white tips or ends, and it has a long black ftreak on each fide, running from the angle of the beak to the neck. Its long wing-feathers are black, and its tail variegated with black and grey. Its legs are red, and its toes ftand three before, and one behind; not as in the woodpecker, two each way. It builds in holes of trees, and when their entrance is too large, artfully ftops them up with mud. It feeds on infects and fruits. It hoards nuts for the winter, and breaks them by fticking them in a cleft of a tree, and ftriking them with its beak. *Ray*'s Ornitholog. p. 98.

SIUM, in botany, the name of a genus of umbelliferous plants, the characters of which are thefe. The flower is of the umbelliferous kind, being compofed of feveral unequal leaves, arranged in a circular form. The cup finally becomes a roundifh fruit, compofed of two feeds, which are gibbofe and ftriated on one fide, and flat and plain on the other. To this it is to be added, that the leaves ftand by pairs on the ribs, and have a fingle one to terminate the ends.

The fpecies of *fium*, enumerated by Mr. Tournefort, are thefe. 1. The common, or long-leaved *fium*, or water-parfnep. 2. The *fium* with ferrated leaves. 3. The great broad-leaved *fium*. 4. The *fium* with deeply jagged leaves. 5. The creeping umbelliferous *fium*. 6. The *fium* which has umbels at the joints of the ftalks. 7. The field-*fium*, called *honewort*, or *corn-parfley*, and by authors *felinum fii foliis*. And 8. the aromatic *fium*, or *fifon* of the fhops, called by many *amomum*, and *Macedonian parfley*. *Tourn.* Inft. p. 308.

SIXTH (*Cycl.*)—SIXTH, in mufic, is not properly an original concord, as is advanced in the Cyclopædia, fince it arifes from the fubtraction of the third from the octave. There are properly but three original concords, the octave, fifth, and third major. Philof. Tranf. Nº 481. p. 267. See the article INTERVAL.

Diminifhed SIXTH, in mufic. See DIMINISHED *fixth*.

SIZE (*Cycl.*)—The fhreds and parings of leather, parchment, or vellum, by being boiled in water, and ftrained, make *fize* [b]. This fubftance is ufeful in many trades. Mr. Boyle mentions, among other ufes, that fine red ftands, and hanging fhelves, are coloured with ground vermilion tempered with *fize*, and when dry, are laid over with common varnifh [c].—[[b] See GLUE, *Cycl.* [c] *Boyle*'s Works Abridged, Vol. 1. p. 150.]

Gold SIZE. See GOLD *fize*.

SIZEL, in coining, is ufed where pieces of money are cut out from the flat bars of filver, after having been drawn through a mill into the refpective fizes or dimenfions of the money to be made; the refidue is called *fizel*, and is melted down again. *Lownd*'s Eff. upon Coin, p. 96.

SIZING, in mineralogy, a term ufed by the Cornifh miners for a peculiar method of feparating the purer from the impurer parts of an ore by means of fieves. When the ore has been powdered, they put it into a wire-fieve with fine holes, and in this they fift it till the fine part goes through: this is properly what is called *fizing*. They fend the larger, or coarfer part, to be powdered again, and putting the reft into a fieve with a clofe bottom, they let in a ftream of water from a cock, and by means of continued fhaking it about, they caufe the lighter and fouler parts to be wafhed over the rims of the fieve, and the remaining powder is the black tin.

SKAITE, in ichthyology, the Englifh name of a fpecies of the ray-fifh, called by the generality of authors *raia undulata*, and *raia lævis*, and by fome *rubus*.

It is diftinguifhed by Artedi by the name of the variegated *ray-fifh* with the middle of the back fmooth, and with only one row of fpines in the tail. See RAJA.

SKEGG, in a fhip, that fmall and flender part of the keel, which is cut flanting, and left a little without the ftern-poft. It is now much out of ufe.

SKELETON (*Cycl.*)—We have, in the Philofophichal Tranfactions, an account of an human *fkeleton*, all the bones of which were fo united, as to make but one articulation from the back to the os facrum, and downwards a little way. On fawing fome of them, where they were unnaturally joined, they were found not to cohere throughout their whole fubftance, but only about a fixth of an inch deep all round. The figure of the trunk was crooked, the fpinæ making the convex, and the infide of the vertebræ the concave part of the fegment. The whole had been found in a charnel-houfe, and was of the fize of a full grown perfon.

Vegetable SKELETON. The preparations of leaves, fruits, roots, &c. called *vegetable fkeletons*, are made in this manner. Chufe for this purpofe the leaves of trees or plants, which are fomewhat fubftantial and tough, and have woody fibres, fuch as the leaves of orange, jafmine, bay, laurel, cherry, apricot, peach, plum, apple, pear, poplar, oak, and the like; but avoid fuch leaves as have none of the woody fibres, which are to be feparated and preferved by this method; fuch are the leaves of the vine, lime-tree, and the like. The leaves are to be gathered in the months of June or July, and fuch to be chofen as are found and untouched by caterpillars, or other infects. Thefe are to be put into an earthen or glafs veffel, and a large quantity of rain-water to be poured over them; and after this they are to be left to the open air, and to the heat of the fun, without covering the veffel; when the water evaporates, fo as to leave the leaves dry, more muft be added in its place: the

the leaves will by this means putrefy, but they require a different time for this, ſome will be finiſhed in a month, and others will require two months, or longer, according to the hardneſs of the parenchyma of them. When they have been in a ſtate of putrefaction ſome time, the two membranes will begin to ſeparate, and the green part of the leaf to become fluid; then the operation of clearing them is to be performed. The leaf is then to be put upon a flat white earthen-plate, and covered with clear water; and being gently ſqueezed with the finger, the membranes will begin to open, and the green ſubſtance will come out at the edges; the membranes muſt be carefully taken off with a finger, and great caution muſt be uſed in ſeparating them near the middle rib. When once there is an opening toward this ſeparation, the whole membrane always follows eaſily; when both membranes are taken off, the *ſkeleton* is finiſhed, and it is to be waſhed clean with water, and then preſerved between the leaves of a book.

The fruits are diveſted of their pulp, and made into *ſkeletons* in a different manner. Take, for inſtance, a fine large pear that is ſoft, and not ſtrong; let it be nicely pared without ſqueezing it, and without hurting either the crown or the ſtalk; then put it into a pot of rain-water, cover it, ſet it over the fire, and let it boil gently till it is perfectly ſoft, then take it out, and lay it in a diſh filled with cold water; then hold it by the ſtalk with one hand, and with the other hand rub off as much of the pulp as you can with the finger and thumb, beginning at the ſtalk, and rubbing it regularly towards the crown. The fibres are moſt tender toward the extremities, and are therefore to be treated with great care there. When the pulp is thus cleared pretty well off, the point of a fine penknife may be of uſe to pick away the pulp ſticking to the core. In order to ſee how the operation advances, the foul water muſt be thrown away from time to time, and clean poured on in its place. When the pulp is in this manner perfectly ſeparated, the clean *ſkeleton* is to be preſerved in ſpirit of wine.

Skeletons of roots which have woody fibres, ſuch as turneps, and the like, muſt be made by boiling the root without peeling it till it be ſoft, that the pulp may be ſqueezed away by the fingers, in the ſame manner, in a diſh of water. Many kinds of roots are thus made into elegant *ſkeletons*, and the ſame method ſucceeds with the barks of ſeveral kinds of trees; which when thus treated, afford extremely elegant views of their conſtituent fibres. Philoſ. Tranſ. Nº 416.

SKEW, or SKILL *facets*, among jewellers. See FACETS.

SKIN (*Cycl.*)—The cuticle, or ſcarf-*ſkin* of the human body, is remarkable for its ſcales, and for its pores. Its ſcales are wholly a microſcopical diſcovery, for being ſo very minute, that two hundred of them may be covered with a grain of ſand, they never could have been diſcovered by the naked eye. Theſe are placed on our *ſkin* as on fiſhes, that is three deep, or each ſcale ſo far covered by two others, that only a third part of it appears; and theſe lying in this manner over one another, ſeem the reaſon of the *ſkin's* appearing white; for about the mouth and lips, where they only juſt meet together, and do not fold over, the blood-veſſels are ſeen through, and the parts appear red. The perſpirable matter is ſuppoſed to iſſue from between theſe ſcales, which lie over the pores, or excretory veſſels, through which the watery and oily matters perſpire; and theſe may find vent in a hundred places round the edges of each ſcale: ſo that if a grain of ſand can cover two hundred of theſe ſcales, it may cover twenty thouſand places through which perſpiration may iſſue forth.

A piece of the *ſkin* taken from between the fingers, from the forehead, neck, arms, or any other ſoft part of the body, which is not hairy, ſerves to ſhew theſe ſcales; for where the ſkin is become hard and callous, they are faſtened confuſedly together. They are generally compoſed of five ſides, and may be ſeen very diſtinctly if ſcraped off with a penknife, and applied to the microſcope in a drop of water. *Baker's* Microſcope, p. 169.

Every part of the *ſkin* of the human body is alſo full of excretory ducts, or pores, which continually emit the ſuperfluous humours from among the maſs of the circulating fluid. In order to view theſe pores, cut a ſlice of the upper *ſkin* with a ſharp razor, as thin as poſſible, then immediately cut alſo a ſecond ſlice from the ſame place, which apply to the microſcope; and in a piece of this, not larger than what a grain of ſand can cover, there may be diſcovered innumerable pores as plainly, as little holes pricked in paper by a fine needle may be perceived, when it is held up againſt the ſun. The ſcales of the upper *ſkin* prevent any diſtinct view of the pores, unleſs they are thus cut off firſt, or elſe ſcraped away with a penknife; but if a piece of the *ſkin* between the fingers, or in the palm of the hand, be ſo prepared, and then examined, the light will be ſeen very beautifully through its pores. *Lewenhoek*, Arcan. Nat. Tom. 3. p. 413.

Mr. Lewenhoek has attempted to give ſome ſlight notion of the number of the pores in the human body: he ſuppoſes that there are a hundred and twenty ſuch pores in a line one tenth of an inch long; however, to keep within compaſs, he reckons only a hundred; an inch in length will then contain a thouſand in a row, and a foot twelve thouſand. According to this computation, a foot ſquare muſt have in it a hundred and forty four millions; and ſuppoſing the ſuperficies of a moderate ſized man to be fourteen feet ſquare, there will be in his ſkin two thouſand and ſixteen millions of pores.

Dr. Grew has obſerved that the pores, through which we perſpire, are more remarkably diſtinguiſhable in the hands and feet; for if the hands be well waſhed with ſoap, and examined with but an indifferent glaſs in the palm, or upon the ends and firſt joints of the thumb and finger, there will be found innumerable little ridges parallel to each other, and of equal bigneſs and diſtance; and upon theſe ridges the pores may be diſcovered by a very good eye, even without a glaſs, lying in rows, but viewed through a good glaſs, every pore ſeems like a little fountain, with the ſweat ſtanding therein as clear as rock water; and this, when wiped away, will be found to be immediately renewed again.

Probably fleas, gnats, and other inſects, which feed on our blood and humours, make no new holes, but prey upon us through theſe pores. Philoſ. Tranſ. N 159.

SKIN, in commerce. The Indians in Carolina and Virginia dreſs buck and doe-*ſkins* in this manner: the felt being taken off they ſtrain them with lines, or otherwiſe, much like the clothiers racks, in order only to dry them. When the hunting time is over the women dreſs the *ſkins*, by putting them in a pond, or hole of water, to ſoak them well; then with an old knife, fixed in a cleft ſtick, they force off the hair whilſt they remain wet. This done, they put them into a kettle, or earthen-pot, and a proportion of deers brain dried and preſerved for this purpoſe, is put in along with them; this veſſel is ſet on the fire till they are more than blood-warm, which will make them lather and ſcour clean; after this, with ſmall ſticks, they wreſt and twiſt each *ſkin*, as long as they find any wet to drop from them, letting them remain ſo wreſted for ſome hours, and then they untwiſt and ſtretch each of them in a ſort of rack, ſo that every part is extended; and as the *ſkin* dries they take a dull hatchet, or ſome ſuch inſtrument, and rub them well over to force all the water and greaſe out of them, till they become perfectly dry, and then their work is done.

In this manner one woman (for the men never employ themſelves in this work) will dreſs eight or ten *ſkins* in a day, that is, begin and finiſh them. Phil. Tranſ. Nº 194.

SKINK, *ſcincus*, in zoology, &c. See SCINCUS.

SKINUS, σκῖνος, a name given by the antient naturaliſts to the lentiſk-tree, and alſo to a peculiar ſpecies of the ſquill, or ſcilla; which was not nauſeous and emetic as the common ſquill, but eſculent and pleaſant to the taſte.

The generality of writers, even among the antients themſelves, have not obſerved the ſynonymous uſe of this word, and tranſcribing at random paſſages from one another, have confounded the names of the lentiſk-tree and of this eſculent ſquill, and related of the one what the original writer ſaid of the other. Hence many of the abſurdities which we find in the works of ſome, but which are by no means to be attributed to all of them.

Pericles was called, by way of deriſion among the comic writers of his time, *Skinocephalus*, this term expreſſing his having a head like the *ſkinos*, muſt be wholly unintelligible to thoſe, who ſuppoſed it meant as the name of the lentiſk-tree; but when it was underſtood to be meant of the ſquill, the ſatire was plain, as a large and miſhapen head, ſuch as that of Pericles was, could not eaſily be better likened to any thing, than to the irregular, large, and oblong bulbous root of this plant.

Epicharmus, in Athenæus, names the *ſkinos* as a kind of eatable ſquill; and Theophraſtus expreſsly ſays, that the roots of all ſquills were not eatable, but that they only eat thoſe of the *ſkinos*, or, as others called it, the *Epimenedian ſquill*, a ſort of that plant ſo called, after the name of one Epimenides, who firſt brought it into uſe. The after-writers run into great errors about this word, ſome of them tranſlating Theophraſtus's epithet into a ſubſtantive, and diſtinguiſhing the Epimenedium from the ſcilla. Pliny, in particular, is guilty of this error. This is the peculiar ſpecies of ſquill, which the Athenians afterwards diſtinguiſhed from the common kind, by the name *ſkinus*. Theopompus mentions the *ſkinus* as an eſculent kind of ſquill; and, in general, the word oftener occurs as the name of the ſquill, than as the name of the lentiſk-tree.

Theophraſtus mentions the inſerting an eſculent root on the *ſkinos*, or ſkilla, giving the choice of either of thoſe roots, and ſays that it will thrive much better on this, than in the earth alone; the tranſlators have rendered this the lentiſk: but where is the probability of this excellent botaniſt's adviſing the grafting an eſculent root upon a tree, or giving a tree, and a common bulbous plant, as indifferent to the choice which was to be uſed? *Pliny*, lib. 23. cap. 5. *Theophraſtus*, lib. 5. c. 7. See LENTISCUS.

SKIPPER, an Engliſh name for the common gar-fiſh. See ACUS.

SKIRRET, *ſiſarum*, in botany, &c. See SISARUM.

The *ſkirret*, though one of the moſt wholeſome and nouriſhing of all the eſculent roots, is very little cultivated with us,

It may be propagated either by fowing the feeds, or by planting the flips and off-fets, but the firft is much the beft method. It fhould be fowed on a moift rich foil, in the beginning of February; in April the young plants will come up, when they muft be cleared of weeds, and houghed up to three inches afunder; and about a month afterwards they muft be thinned a fecond time, leaving them only fix inches diftant. After this they muft be carefully kept clear from weeds, and when their leaves are decayed, they fhould be taken up for ufe; but this fhould only be done as they are wanted, for they fpoil with lying out of the ground. The leaves decay in October, and from that time till the middle of March the roots are in feafon; after this the roots become good for little. *Miller's* Gard. Dict.

SKITTISH, in the manege. A horfe is faid to be *fkittifh*, in French *ecouteux*, or *retenu*, that leaps inftead of going forward; that does not fet out, or part from the hand freely, nor employ himfelf as he ought to do.

SKOUT, in zoology, a name given by the people of Yorkfhire to the *lomwia*, called in many places the *kiddaw*, and in Scotland the *auk*, or razor-bill, another of the webfooted water-fowl. *Ray's* Ornitholog. p. 244. See the articles ALKA and LOMWIA.

SKRABBA, in ichthyology, a name given by fome to a fifh called by Jonfton and Schoneveldt the *fcorpius marinus*, but wholly different from the *fcorpæna* of other authors.

It is a fpecies of cottus, and is diftinguifhed by Artedi by the name of the *cottus* without fcales, with feveral prickles upon its head, and with the upper jaw fomewhat lower than the other. See the article COTTUS.

SKULL (*Cycl.*)—It is not uncommon to find in fome human *fkulls* a different ftructure and conformation from that which nature has given to others, or to the generality of the fpecies.

Frequently there are met with heads, the fagittal future of which is prolonged to the root of the nofe, and divides the coronal bone into two parts: and there have been anatomifts, who have judged this fort of conftruction of the *fkull* peculiar to one fex, rather than common to both.

To find the true caufe of this, we are to have recourfe to the ftate of the *fkull* in the infancy. This bone is, at that time, always found divided into two lateral portions; fo the fame feparation, which is found between the two fides, is found alfo between the two pieces, which afterwards compofe the coronal bone. The two pieces of this coronal bone unite one with another, by means of their indented edges, and thefe afterwards coalefce fo perfectly, that the future is obliterated; and this coalefcence, which thus in proper time takes place in the coronal bone, fometimes extends itfelf, alfo, to almoft all the other bones of the *fkull*; but this only happens in old age. But if, on the contrary, the two pieces, of which the coronal bone is compofed, acquire their full thicknefs and hardnefs, before this coalefcence is brought about, the future remains, and is not obliterated, except in extreme old age. This reflexion may be alfo carried much farther.

In the *fkulls* of a great number of infants, the coronal and the two fides fo perfectly unite, as not to leave the leaft trace of their original feparation. It feems as if the bones, having expanded and grown in thefe early ftages too faft for the brain, have been united to one another while yet foft and tender: but when the brain, on the other hand, grows too faft for the bones of the *fkull*, thefe bones, preffed more from within outwards than any other way, have little difpofition to unite with one another; and thus acquiring their thicknefs and hardnefs before their coalefcence, they become much lefs inclined to coalefce than before.

From thefe confiderations we may conclude, that in thofe infants, in which the growth of the brain is flow, and that of the bones of the *fkull* quick, the future, which is between the two portions of the coronal bone, is very quickly obliterated; and, on the contrary, when the encreafe of the brain is quick, and the growth of the bones is flow, the future, which divides the coronal bone into two pieces, is found to a great age.

That which is the *fkull* in the more advanced ftate of the infant, is originally no other than a membrane, which is afterwards to offify: not unfrequently the offification is impeded, in different parts of this membrane; and in the *fkulls* of young fubjects it is common to fee thefe diftinct parts, which remain membranous while the reft of the *fkull* has acquired its proper bony hardnefs. If the caufe, which impeded the progrefs of the offification, fubfifts fo long, as till the other parts of the *fkull* are hardened into bone, and have their full growth and hardnefs, then will that, which fhould have been naturally only one bone, form two.

This is the origin of the fingular and unnatural futures, found in fome human *fkulls*, and called by fome *fupernumerary futures*. Sometimes there are, from this caufe, fuch fupernumerary futures in almoft all the bones of the *fkull*. The os planum frequently is found thus divided into two; and from the fame principle in nature it is, that a fmall future is fometimes found in the maxillary bone, below the orbit, along the canal, which forms the lower orbitary cavity: the place where this little future is found has happened to remain a long time membranous, and the offification at laft taking place on the two edges of the remaining membrane, there has been found a future.

In other bones of the *fkull* we alfo frequently meet with larger or fmaller fpaces, which have continued membranous; and there are inftances, in which the offification may be plainly perceived juft begun in the center of the membranous fpots.

It might be fuppofed that the brain was little liable to an unnatural growth, or expanfion, when we confider that the brain is no other than a vaft affemblage of pipes, or tubes, of a moft extreme finenefs, and that the particles, which compofe thefe tubes, have but a very weak band of union one with another. Indeed we know very well, that when an injection has penetrated to the cortical fubftance of the brain, if that fubftance be macerated a little in water, its parts detach themfelves from one another, the veffels become wholly deftroyed, and there remains nothing but a number of extremely fine filaments of the matter of the injection, which has found its way into thefe veffels, and been formed into their fhape by cooling in their cavities. As there are found, however, a great number of *fkulls*, which have a fingular and odd configuration, it cannot but be, that the brain muft be expanded into the fame form. We are informed, that the people of fome nations prefs the forepart of the heads of their children, as foon as born, with confiderable violence, and continue this, in order to reduce the forehead to a flatnefs; but thefe *fkulls* are always found to get in length behind what they want before.

Sometimes there has been obferved, in the *fkulls* of perfons of an advanced age, in the middle of the fagittal future, a deep impreffion, or finking in, which had remained there from infancy; but nature, in this cafe, fupplies the cavity with two protuberances of bone from the fides of the adjoining parts; and fome *fkulls* are found very narrow, and of a remarkable length, nature giving one way the room fhe denied the other. Many other fingular conftructions of the *fkull* have been obferved by anatomifts; and probably in the perfons, to whom they have belonged, the brain has been able to perform its functions but badly. Be that as it will, it is certain that the brain has expanded, and formed itfelf to the fhape of the *fkull* in all thefe its unnatural figures; and neceffarily the parts, of which the brain in fuch cafes is compofed, have taken a very different figure and arrangement from what nature intended: and in this cafe it cannot be, but that fome portions of the brain have extended themfelves farther than they naturally fhould have done, and others much lefs than was allotted to them. Mem. Acad. Scienc. Par. 1740.

Bones of the SKULL. The eight principal bones of the *fkull* are ordinarily divided into common and proper. By proper bones anatomifts mean thofe, which are wholly employed in forming the globe of the *fkull*, and of thefe they reckon fix; the os frontis, the two parietal bones, the occipital bone, and the offa temporum: the common bones are thofe which contribute to form the face, as well as the *fkull*, *viz.* the os ethmoides, and the os fphenoides. But this divifion is not juft, for the os frontis, and offa temporum, deferve as much to be called common, as the two that are ufually reckoned fo; and thus, inftead of fix, there would be only three proper bones, the offa parietalia, and os occipitis; and inftead of two, there would be five common ones, the os frontis, offa temporum, os ethmoides, and os fphenoides. *Winflow's* Anatomy, p. 21.

The adhefion of the pericranium to the *fkull*, has been thought a fure fign of the bones being entire, but this is a miftake; and the feparation of the cranium from the *fkull*, is as uncertain a fign of the cranium's being broken. Mem. de l'Acad. de Chirurg. Tom. 1.

We have fome very particular obfervations on the bones of the human *fkull*, by Mr. Hunauld, in the Memoires de l'Acad. Royale des Sciences, An. 1730.

Concealed injuries of the SKULL. When a blunt inftrument is the occafion of an injury on the cranium, if the injured part does not fufficiently appear of itfelf, great induftry is to be ufed to difcover it. Where the common integuments appear tumid and foft, they are in this cafe to be divided to the bone; but in making the incifion, great care muft be taken not to lay too much ftrefs upon the knife, left fplinters of the fractured cranium fhould by that means be forced in upon the brain. The beft way to make this incifion is in form of the letter X, and about an inch and half in length; lifting up the fkin at each angle, and leaving the bone bare. The blood that is fpilt is to be taken up with a fpunge, and dry lint ftuffed between the fkin and the cranium; and having thus found out the injured part of the cranium, the trepan is to be applied, if it be found neceffary. If fplinters of the bone are now found, they muft be removed either with the fingers or the forceps, or, when they hang to the pericranium, with fciffors; but when they adhere pretty firmly to the neighbouring parts of the cranium, it is more advifeable to replace them, than to endeavour to remove them by violence. *Heifter's* Surgery, p. 85.

Fissures of the SKULL, cracks in the bone of the *skull*, made by falls, blows, or other injuries. When these are attended with no other bad symptoms but white, yellow, or brown spots upon the face of the bone, they may be remedied with boring several small holes through the surface of the *skull*, down to the diploe, and dressing with balsamic medicines: but where violent symptoms come on, which demonstrate an extravasation of blood in the cavity of the cranium, the trepan is to be used without delay.

Depressions of the SKULL, a denting in of the bone of the *skull* by a blow, without any manifest fracture, or, at the utmost, with such a fracture, that from its flexibility it does not start out by means of it, but continues to adhere firmly to the neighbouring bones. The *skulls* of infants are frequently subject to this, but in adults this case cannot happen; for the bones in them are become so rigid, that it is impossible to beat in any part of the cranium, without beating the bone to pieces. These injuries of the cranium are called by the surgeons *fractures*, and the brain is frequently injured by these accidents, and its actions disturbed. The first thing to be done, to give relief in this disorder, is to lift up any part of the bone that is depressed, or beaten in upon the brain, or to remove any other body by which it is compressed. Sometimes a splinter, which is quite separated from the rest of the bone, is driven into the cavity of the cranium, and lies constantly vellicating the brain and its membranes with its pointed parts; this is to be removed without delay.

When slight depressions are made in the *skulls* of infants, without bringing on any bad symptoms, the forcible methods of raising the depressed part are not to be used, but medicated bags, boiled in spirit of wine, warm fomentations, and such remedies, are to be applied; and lastly, a plaster of melilot to cover all. These slight applications frequently cure such little depressions, and prevent the mischievous consequences which might be expected from them. When a very large depression, however, happens to infants, the elevation, or restitution of the parts is to be performed in the following manner. After shaving the part, apply a plaster made of gummy and very sticking ingredients, and spread upon very strong leather, with a cord fastened to the middle of it: this plaster is to be laid on pretty warm, and left in its situation till grown cold; the surgeon then taking hold of the cord, which is fastened to it, is to pull it directly upwards, and with it the depressed part of the cranium will often rise, and be restored to its place. When this method does not succeed at the first trial, it is to be repeated; and when this fails, the application of a cupping-glass to the depressed part will sometimes succeed, especially if you stop the patient's breath, both at the nose and mouth, during the operation: but if neither the plaster nor cupping prove successful, it will be necessary to take in the assistance of an instrument.

But when the cranium is so depressed, whether in adults or infants, as to suffer a fracture or division of its parts, it must instantly be relieved. Some praise very much the use of a sternutatory powder on this occasion, affirming, that the distention of the brain is so violent in the act of sneezing, that it will restore the depressed parts of the bone to their former situation: but the ill consequences, that may attend this practice, are so grievous, that it ought wholly to be rejected, and the trepan and elevatories always to be used. *Heister's* Surgery, p. 87.

Wounds of the SKULL. In wounds of the cranium, or *skull*, the first business is to find whether they are terminated in the external parts of the cranium, or whether they penetrate into its cavity. This is to be known by the eye. 2. By the probe, which however must be used very gently here, for fear of bringing on farther mischief. 3. By examining the instrument with which the blow was given, and considering the degree of force with which it was impelled. And lastly, the presence, or absence of violent bad symptoms. A violent blow upon the head will always be attended with vomitings and vertigoes, and blood will be discharged by the nose, ears, and mouth, and the wounded person will lose also his speech and senses. These disorders will appear sometimes sooner, sometimes later, but always are more violent than otherwise, when the wound is made by a fall, or by some blunt instrument; in which cases the cranium is usually much shattered. The blood which discharges itself by the wound, when that is made by a sharp instrument, will insinuate itself between the common integuments and the cranium: in the contusions that are made with blunt instruments, sometimes it will be concealed under the cranium, and by corrupting the pericranium and cranium, will bring on ulcers, and caries of the bone, and frequently occasions fevers, convulsions, and death. *Heister's* Surgery, p. 82.

SKY (*Cycl.*)—SKY-*colour*. To give this colour to glass, set in the furnace a pot of pure metal of fritt from rochetta, or barillia, but the rochetta fritt does best; as soon as the metal is well purified, take for a pot of twenty pound of metal six ounces of brass calcined by itself, put it by degrees, at two or three times, into the metal, stirring and mixing it well every time, and diligently scumming the metal with a ladle: at the end of two hours the whole will be well mixed, and a proof may be taken; if the colour be found right, let the whole stand twenty four hours longer in the furnace, and it will then be fit to work, and will prove of a most beautiful *sky-colour*. *Neri's* Art of Glass, p. 40.

SLABBERING-*bit*, in the manege. See the article MASTIGADOUR.

SLABS *of tin*, the lesser masses, which the workers at the tin-mines cast the metal into: these are run into moulds made of stone. *Ray's* English Words, p. 124.

SLACK *a leg*, in the manege, called in French *mollir la jambe*, is said of a horse when he trips or stumbles.

SLACK *the hand*, is to slack the bridle, or give a horse head.

SLACKEN, in metallurgy, a term used by the miners to express a spungy and semivitrified substance, which they use to mix with the ores of metals, to prevent their fusion. It is the scoriæ or scum, separated from the surface of the former fusions of metals. To this they frequently add limestone, and sometimes a kind of coarse iron-ore, in the running of the poorer gold-ores.

SLATCH, at sea. When a rope or cable hangs slack, the seamen call the middle part, which hangs down, *the slatch of the cable*, or rope: so also, after long foul weather, if there come a small interval of fair, they say, *this is a slatch of fair weather*.

SLATE (*Cycl.*)—The strata of this stone usually lie very much inclining, and are of a considerable extent. At Mullinecke, in Wales, the *slate* lies thus, and reaches from near the surface to the level of the tide that flows up the river, in the cliffs of which it lies. It may go much deeper, for it has not been examined to the bottom there; but what is observable in this place, is, that there are evident flexures or bendings in several parts of the strata, and these always run from the top downwards; in the other parts of the same strata there are several perpendicular fissures or cracks, but they are small like cracks, and always empty.

It appears from this, that at the time when the bed of *slate* cracked in some places, it was so tough, as to abide being bent in others, by which means these flexures were formed. Sometimes the beds of *slate* are cracked at the angles of these flexures, the intermediate mass, though parted from the rest, lying obliquely. It is observed thus cracked, also, in many parts of Yorkshire. *Woodward's* Cat. of Fossils, Vol. 2. p. 5.

Irish SLATE. See TEGULA *Hybernica*.

SLAVE. For the custom of marking, or stigmatizing slaves, see STIGMATIZING.

SLAUGHTER (*Cycl.*)—SLAUGHTER-*skins*, a term used by our curriers and leather-dressers for the skins of oxen, or other beasts, when fresh, and covered with the hair: such as they receive them from the *slaughter*-houses where the butchers flea the carcase.

SLEDGE (*Cycl.*)—SLEDGE is a large smith's hammer, to be used with both hands: of this there are two sorts, the *uphand-sledge*, which is used by under workmen, when the work is not of the largest sort; it is used with both the hands before, and they seldom raise it higher than their head. But the other, which is called the *about-sledge*, and which is used for battering or drawing out the largest work, is held by the handle with both hands, and swung round over their heads, at their arm's end, to strike as hard a blow as they can.

SLEDGE, among miners. See DIGGING.

SLEEPERS, in natural history, a name given to some animals which *sleep* all the winter: such are bears, marmotes, dormice, bats, hedge-hogs, swallows, &c. These do not feed in winter, have no sensible evacuations, breath little, or not at all, and most of the viscera cease from their functions. Some of these creatures seem to be dead, and others to return to a state like unto that of the fœtus before birth. In this condition they continue, till by length of time maturating the process, or by new heat, the fluids are attenuated, the solids stimulated, and the functions begin where they left off. See Dr. Stevenson in Med. Ess. Edinb. Vol. 5. Art. 77.

SLEEPERS, in the glass trade, are the large iron bars crossing the smaller ones, and hindering the passage of the coals, but leaving room for the ashes. *Neri's* Art of Glass, Appendix.

SLEEPERS, in a ship, timbers lying before and aft in the bottom of a ship, as the rung-heads do: the lowermost of them is bolted to the rung-heads, and the uppermost to the futtocks, in order to strengthen and fasten the futtocks and rungs.

SLICH, in metallurgy, the ore of any metal, particularly of gold, when it has been pounded, and prepared for farther working. The manner of preparing the *slich* at Chremnitz, in Hungary, is this: they lay a foundation of wood three yards deep, upon this they place the ore, and over this there are four and twenty beams, armed at their bottoms with iron; these, by a continual motion, beat and grind the ore, till they reduce it to powder: during all this operation, the ore is covered with water. There are four wheels used to move these beams, each wheel moving six; and the water, as it runs off, carrying some of the metalline particles with it, is received into several basons, one placed behind another;

and finally, after having paffed through them all, and depofited fome fediments in each, it is let off into a very large pit, of almoft half an acre of ground; in this it is fuffered to ftand fo long, as to depofit all its fediment, of whatever kind, and after this it is let out. This work is carried on day and night, and the ore taken away, and replaced by more, as often as occafion requires. That ore which lies next the beams, where it was pounded, is always the cleaneft, or richeft.

When the *flich* is wafhed as much as they can, an hundred weight of it ufually contains about an ounce, or perhaps but half an ounce of metal; which is not all gold neither, for there is always a mixture of gold and filver, but the gold is in the largeft quantity, and ufually is two thirds of the mixture: they then put the *flich* into a furnace with fome lime-ftone, and flaken, or the fcoriæ of former meltings, and run them together. The firft melting produces a fubftance, called *lech*; this lech they burn with charcoal, to make it lighter, to open its body, and render it porous, after which it is called *roft*; to this roft they add fand in fuch quantity as they find neceffary, and then melt it over again. They have at Chremnitz many other ways of reducing gold out of its ore, but particularly one, in which they employ no lead during the whole operation; whereas, in general, lead is always neceffary, after the beforementioned proceffes. See the article GOLD-*ore*.

SLING (*Cycl.*)—SLING, at fea, a word ufed varioufly. There are *flings* to hoife up cafks, or any other heavy things; which are made of ropes fpliced into themfelves at either end, with an eye big enough to hold the thing to be *flung*.

There are other *flings*, which are made longer, and with a fmall eye at each end; one of which is put over the breech of a piece of ordnance, and the other eye comes over the end of an iron crow, which is put into the mouth of the piece, to weigh and hoife the gun as they pleafe.

There are alfo *flings* for the yards; which is done by binding them faft to the crofs-tree aloft, and to the head of the maft, with a ftrong rope or chain, that if the tie fhould happen to break, or to be fhot to pieces in fight, the yard, neverthelefs, may not fall down upon the hatches.

SLINGING (*Cycl.*)—SLINGING *a man overboard*, in order to ftop a leak in a fhip, is done thus: the man is truffed up about the middle in a piece of canvafs, and a rope to keep him from finking, with his arms at liberty, a mallet in one hand, and a plug, wrapped in oakum and well tarred in a tarpawling clout, in the other, which he is to beat with all difpatch into the hole, or leak.

SLOANEA, in botany, the name of a genus of plants, defcribed by Linnæus and Plumier, the characters of which are thefe. The perianthium confifts of one leaf, divided into feven fegments. There are no petals. The ftamina are a great number of flender filaments, broader at the end than in any other part, and of the length of the cup. The antheræ grow to the fides of thefe filaments. The germen of the piftil ftands in the bottom of the cup. The ftyle is fubulated, and longer than the ftamina. The ftigma is acute. The fruit is a large roundifh echinated capfule, compofed of four valves. The feeds are oval, obtufe, and flefhy, and have oblong nuclei. *Linnæi* Gen. Plant. p. 242. *Plumier*, p. 15.

SLOATH, in natural hiftory, the name of an animal remarkable for its flow motion. This creature is fo very tedious in all its motions, that it will be three or four days in climbing up, and coming down a tree, and does not go the length of fifty paces upon even ground in a day. The found of its voice feems only to exprefs the word *haii*, for which reafon the Brafilians call him by that name; but he ufually repeats the found about fix times together, defcending, as if one fhould fing, *la*, *fol*, *fa*, *mi*, *re*, *ut*. Whatever he takes hold of, he does it fo ftrongly, or rather fo ftiffly, that he will fometimes fleep fecurely while he hangs at it. *Bartæus*, de Reb. Braf. p. 222.

Clufius, Margrave, Pifo, and others, have given defcriptions of this animal, but they none of them mention the length of his fore feet; which, according to the animal preferved in the Mufeum of the Royal Society of London, is double that of the hinder pair. *Grew*'s Muf. p. 11.

From the fhag of his body, the fhape of his legs, and his having little or no tail, as alfo from the flownefs of his gate, and his climbing up trees, as little bears ufe to do, he feems to come near the bear-kind; from which he differs chiefly, in having but three claws upon a foot. This creature breeds principally in Florida and Brafil. Id. ibid.

SLOATS *of a cart*, the underpieces which keep the bottom of the cart together. See CART.

SLOE, *prunus fylveftris*, the Englifh name for the wild plum. See the article PRUNUS.

SLOE-*worm*, in natural hiftory, the name of an infect found on the leaves of *floe*, or black-thorn, and fometimes on thofe of the garden-plum.

This, and a like worm, found on the leaves of the oak, both remarkable for the hairs which cover them, each of which is forked or divided into two at the ends, are ufually efteemed caterpillars, but they are in reality animals of a very different clafs; the caterpillar has, at the utmoft, but fixteen legs, thefe have each twenty two, and have all the other characters of that clafs of infects, called by the French naturalifts *fauffes-chenilles*, or baftard-caterpillars.

All the animals of that clafs are very remarkable for the different figure they make after the laft change of their fkins, but this is in none feen fo obvioufly, as in thefe two fpecies; that of the oak is of a greenifh colour, and its hairs, which are fo ftiff that they almoft deferve the name of fpines, are black: that of the *floe* is of a greyifh hue, and its fpines longer, and of a deep brown; every one of thefe is, toward the extremity, divided into two, in the manner of the tines of a fork. Thefe give the animal a very remarkable figure, and are caft off with the feveral fkins, while the new fkins leave others in their place; but in the laft change, before that into the nymph ftate, the change made into the creature is fuch, that it could never be fufpected to be the fame animal by any one, who was not an eye-witnefs of the change.

The creature in this, throwing off its fkin, becomes perfectly fmooth, and of a dirty yellowifh colour, with not the lighteft variegation on it, nor the leaft appearance even of the remains of the fpines. In this ftate it remains till it goes into the nymph ftate, and from that, after about fixteen days, it comes out in the fhape of a four-winged-fly. The whole procefs of the change is the fame, in the two fpecies of the oak and the *floe*, but the flies they produce are very different. *Reaumur*'s Hift. Inf. Vol. 9. p. 119.

SLOT, (*Cycl.*) in the fportfman's language, a term ufed to exprefs the mark of the foot of a ftag, or other creature proper for the chafe, in the clay or earth, by which they are able to guefs how long the creature has been gone by, and which way he went. The *flot*, or treading of the ftag, is very nicely ftudied on this occafion: if the *flot* be large, deep printed in the ground, and with an open cleft, and added to thefe marks, there is a large fpace between mark and mark, it is certain that the ftag is an old one. If there be obferved the *flots*, or treadings of two, the one long, and the other round, and both of one fize, the long *flot* is always that of the larger beaft. There is alfo another way of knowing the old ones from the young ones by the treading; which is, that the hinder feet of the old ones never reach to their fore feet, whereas thofe of the young ones do.

Old ftags alfo are long jointed, and they never tread doubly, or falfely, as the young ones do, becaufe the tendons, that hold the joints of their feet, are ftronger; but the feet of the young ones are fometimes forced, for want of thefe ftrong finews, to turn away double. It is to be obferved alfo, that there is a great difference between the *flot* of a ftag or hart, and that of a hind; for there is no hart of the fecond head fo young, but that he leaves a larger and wider *flot* than the hind, excepting when the hinds are big with young, for on that occafion their claws will open as wide as thofe of the hart.

Another method of knowing the age of a ftag is by his fumets, though fome general rules are to be known, before any thing can be judged from this article. Thefe are, that in April and May, they caft their fumets, as it were, in cakes, and in June and July they caft them in thin, long, and large crotels, and from thence to the end of Auguft they hold the fame form and fize; but they are in this laft month always hard and knotty. In all thefe cafes, the largeft and longeft fumets are efteemed to be the marks of the largeft and oldeft ftags. If they have been difturbed, or if they have received any hurt, they ufually caft them fharp at one end, and dry. This alfo is conftantly the cafe, when their new horns are juft grown to their hardnefs, and they rub them againft the trees to get off the cracked membranes, which were the velvetings in their firft ftate. There is always alfo a difference between the fumets of the morning and thofe of the evening: thofe made at night, when they go to relief, are better digefted, and confequently moifter than thofe made in the morning, becaufe having taken their reft all day, there is a more perfect digeftion made than can be in the night, as they are, during that time, feeking food.

There are alfo feveral other ways of judging of the growth and fize of a ftag, as by his carriage, or bearings, according to the huntfman's phrafe; that is, according to the breaking of the tender branches of trees which he makes with his horns in paffing through. When the boughs are found bruifed and broken very high, and to a good width, there is no doubt of his being an old one: but this judgment is not to be made in the months of March, April, May, and June, becaufe their horns are at that time either wholly wanting, or they are young and velvety. The heighth of the creature's entries into the woods is alfo another mark of his fize, for the old ones are always proud and ftately, and go in erect, but the young ones will creep.

The older the ftag is the fooner he goes to fray, and the larger are the trees he choofes for this ufe; the young ones go later to it, and always choofe the weaker and lower trees. Notwithftanding that, after the fixth year, the age is not certainly known by the horns, as there is, after this time,

time, no increafe in the number of their branches, yet a probable guefs may be made from their being all thicker and more robuft, and the tops more open.

SLOUGH (*Cycl.*)—SLOUGH-*filver*, in our old writers, a rent paid in fome places in lieu of certain days work in harveft, heretofore referved to the lord from his tenants. *Blount.*

SLOW (*Cycl.*)—SLOW-*worm*, the Englifh name of the *cæcilia*, called alfo the *blind-worm*, and by fome the *deaf-adder*. See the article CÆCILIA.

SLUDS, a term ufed by the miners in Cornwall for half-roafted ores. See the article ORE.

SMALL (*Cycl.*)—SMALL-*craft*, in the fea language. See the article CRAFT.

SMALL-*pox*. See the article POX.

SMALL-*ftones*, among jewellers, denote diamonds under the weight of a carrat. *Jeffreys* on Diamonds, p. 21.

SMALL-*work*, among jewellers, is ufed to denote the ftar and fhell-facets of diamonds. *Jeffreys* on Diamonds. See the article FACETS.

SMALLAGE, in botany, &c. See APIUM.

SMALT (*Cycl.*)—There is not a more precarious procefs in all metallurgy, than the preparation of this fine blue glafs from cobalt, nor any manufacture, in which fo expert workmen are neceffary. The carrying the heat to too great a degree, in the roafting the cobalt, is a very mifchievous error, and the fuffering as much of the arfenic, as may be, to remain in the earth, is greatly to the advantage of the *fmalt*; and its colour may be greatly heightened, by adding common arfenic to it while it is in fufion.

It is always neceffary to make careful and repeated experiments on a new ore, or a kind of cobalt, which has not been worked before; by trying it with various degrees of heat in the roafting, and with different proportions of the flints and pot-afh in the fufion. On comparing the feveral products of thefe experiments, it will eafily be feen which yields the fineft colour, and this muft be always after followed in the great operations.

It is well known that the beautiful blue glafs, called *fmalt*, is prepared from the fixed earth of cobalt; but experiments have proved, that this earth alone will not acquire that fine colour. Dr. Link tried fome of it, by keeping it eight hours in the moft intenfe heat, yet on taking it out, it was only a grey glafs, excepting that there were a few blue fpecks in it near the edges of the crucible. Thefe fpecks make no objection to this doctrine, when properly confidered; for they were owing, doubtlefs, to the fame fubftance which is found neceffary to be ufed, in order to procure the blue colour.

Flints are the neceffary addition to cobalt for the making the blue glafs, or *fmalt*, and the crucible being made of earth, might eafily contain fome particles of fand. Every piece of fand is a fmall ftone, of the nature of flint; that is, a piece of cryftal debafed by earth; and thefe fmall flints mixing with the glafs of the cobalt-earth, while in fufion, rendered the fmall fpecks, where they were mixed, true *fmalt*, while the reft remained grey and unaltered.

This earth of cobalt evidently contains fome portion of copper, though fo fmall in quantity, that it can never be difcerned by the common figns, and fo intimately blended with the earth, that it can never be procured feparate. The lightnefs of this earth alfo, in which the copper refides after the fublimation of the arfenic, is a proof that its quantity muft be very fmall; yet that it exifts there, is evident from the colours it affords.

Copper is well known to yield a green colour with acids, and a fine blue with alkalies. Thus a folution of this earth in aqua fortis is of a deep green, and its glafs, when mixed with the alkali of flints and of pot-afh, is the fine deep blue *fmalt*: nor is it wonderful, that the vitrified earth of cobalt will never become blue by calcination alone, fince, if it owes this colour to copper, it cannot be fuppofed to fhew itfelf till called forth by an alkali. Philof. Tranf. N° 396. p. 201.

Some cobalt yields *fmalt* before roafting, even better than it would afterwards; this is a peculiar kind of cobalt, but is fo like the reft, that it cannot be diftinguifhed by the eye, but experiment alone fhews this property in it. Though cobalt in general requires roafting, in order to fit it for yielding the *fmalt*, yet its different kinds require fome more, and fome lefs roafting; and the degree can never be judged of by the infpection of the mineral, but is only known by the experienced artift in the procefs. Hence it is, that expert and intelligent perfons are neceffary in the *fmalt*-works more than in almoft any other branch of this fort of bufinefs.

The addition of a fmall quantity of arfenic, or of the arfenical flowers, during the time that the *fmalt* is in fufion, adds greatly to the beauty of the colour: this is a practice kept fecret by the workmen of fome places; and by this means their *fmalt* is always rendered better than that of their neighbours. It is eafy to fee from this, that the roafting of the cobalt is the neceffary beginning of the *fmalt*-work, not the divefting it of its arfenic, which only happens accidentally in that procefs; and it would be much better if it did not happen, fince we find the arfenic added afterwards exalts the colour. From hence it is evident, that thofe cobalts which will make *fmalt* without previous roafting, muft, as they are found to do, make the very fineft *fmalt*, becaufe their arfenic is yet left in them in great part: and from this alfo appears the neceffity of having expert workmen for the *fmalt*-making; fince the knowing the degree of fire neceffary to the ore is a moft effential article; and after the roafting has been carried to a fufficient degree, every moment's heat divefting it of more of its arfenic than was neceffary, makes the colour of the *fmalt* to be made afterwards fo much the worfe. From this alfo appears the reafon why the blue, made by precipitation from a folution of cobalt, is fo much fuperior to the common *fmalt* made by fire; becaufe in this the arfenic is all preferved, whereas, in the common way of preparing it by fire, it is driven off. Philof. Tranf. N° 396.

SMARAGDUS, the *emerald*, (*Cycl.*) a very beautiful gem of a fine green colour.

The gem known by the antients under the name of the *fmaragd*, or *emerald*, was the fame with that we call at this time by the fame name, which has not been the cafe in the hyacinth, fapphire, and many others.

In the days of Pliny we find, however, that a great deal of error and confufion had crept into the world in regard to this gem, that author giving a long lift of the different kinds of *emeralds*, as he calls them; among which there are evidently jafpers, coloured cryftals, and fpars, reckoned among the fpecies of this gem.

Our jewellers know only what they call two fpecies of the *emerald*, the Oriental and the Occidental, and fuch there are without queftion; that is, the *emeralds* of the Eaft-Indies are, in their pureft ftate, much finer than thofe of any other part of the world, as is the cafe in the other gems: but our jewellers feldom meeting with thefe fine ftones, call the American *emeralds* Oriental, and ufually fell cryftal, accidentally tinged green, under the name of *Occidental emeralds*. Thefe laft being alfo greatly more common than the others, there has grown an opinion among our lapidaries, that the *emerald* is no harder than cryftal; and this has no other foundation, than their ufually meeting with cryftal under the name of the *emerald*.

The genuine *emerald*, when in its moft perfect ftate, is perhaps the fineft and moft beautiful of all the gems. It is found of various fizes, but ufually fmall. Multitudes are met with of about the fixteenth of an inch in diameter, and they are found from this up to the fize of a wallnut. We have accounts of fome of immenfe fize among the antients; but they were evidently not *emeralds*, but jafpers, or other green ftones. The large fpecimens at prefent are very fcarce, and whether they are Oriental or Occidental, are of very great value. *Hill's* Hift. of Foff. p. 596.

The *emerald* is naturally of different figures, like the diamond, and many of the other gems. It is fometimes found in a roundifh, or pebble-like form, but much more frequently in a columnar, or angular one, refembling common cryftal. The pebble *emeralds* are always the hardeft and brighteft, but are feldom found exceeding the fize of a pea, very rarely coming up to that of a horfe-bean. The cryftalliform ufually grow feveral together, and are often confiderably large. The pebble *emeralds* are found loofe in the earth of mountains, and in the fands of rivers; the columnar are ufually found adhering to, or bedded in a white opake cryftalline matter, and fometimes to the jafper, or to the prafius; which laft has been therefore called by fome the mother of the *emerald*.

The rough *emerald*, of whatever form, is ufually of a very bright, and naturally polifhed furface, and is ever of a pure and beautiful green, without the leaft admixture of any other colour. It is of all the various fhades of green, from the deepeft to the paleft, and doubtlefs is fometimes wholly colourlefs; but it is then efteemed a fapphire, all the harder gems, when colourlefs, being called by our jewellers *white fapphires*.

The Oriental *emerald* is of the hardnefs of the fapphire and ruby, and is fecond only to the diamond in luftre and brightnefs; the American is of the hardnefs of the garnet; and the European is ftill fofter than that, but confiderably harder than cryftal; yet the coloured cryftals, ufually fold under the name of *emeralds*, have very much debafed the credit of this gem. It lofes its colour in the fire, and becomes undiftinguifhable from the white fapphire.

The Oriental *emeralds* are very fcarce, and are at prefent found only in the kingdom of Cambay: very few of them have of late been imported into Europe, infomuch, that fome have fuppofed that there were in nature no Oriental *emeralds*; but within thefe few years fome have been brought from Cambay into Italy, which greatly exceed all the American ones in beauty, as well as hardnefs.

The American *emeralds*, which, as they are the fineft that come to us, are called by our jewellers *Oriental*, are found principally about Peru, in the earth of fome mountains. The European *emeralds* come principally from Silefia, though there are of them in other places; and the coloured cryftals,

which are what we usually meet with under the name of *Occidental emeralds*, are from the mines of Germany.

The scarcity of *emeralds* from the East-Indies has so generally confirmed the opinion of there being none there, that the most skilful of our dealers in gems generally tell us, that there is no such stone as an Oriental *emerald*, but that the fine ones are all from Peru; and Tavernier supposes that many *emeralds*, which, in the memory of the jewellers in his time, had certainly been brought from the East-Indies, were originally brought from Peru; and to support this, he gives us an account of the Peruvians trading by the South-Sea to the East-Indies before the Europeans discovered America: but this is a far-fetched conjecture, as no footstep of such a trade subsists. The truth, in regard to the present scarcity of the Oriental *emeralds* with us, seems to be this; that though the people of the East-Indies were once in an humour to part with their *emeralds*, they have since chose to keep them in their own hands; as it is well known to travellers, that the princes of the East are at least as well acquainted with the value of gems as we, and are willing to purchase those, which are not of the produce of their own country, at as great a price. *Hill's* Hist. of Foss. p. 597.

SMARIS, in zoology, the name of a small fish caught in the Mediterranean, and common in the markets of Rome, Venice, and elsewhere, and sold to the poorer sort of people at a very small price.

It is seldom of more than a finger's length, and of a round, not flatted body, of a dusky blackish green on the back and sides, and not marked with any variegations, but having on each side, near the middle of the body, one large black spot. Its gill-fins and tail are of a faint red. The iris of the eyes is of a brownish white, and the tail is forked. *Gesner*, de Pisc. p. 616.

SMATCH, in zoology, a name by which the common œnanthe is called in many parts of England. See the article OENANTHE.

SMECTIS, in natural history, a name used by several authors for the common fuller's earth, more commonly called *cimolia purpurascens*. *Hill's* Hist. of Foss. p. 49. See the article FULLER'*s earth*.

The *fuller's earth* of England is a much more valuable article of commerce, than many would believe. It has the property of imbibing oil or grease, or any other fat substance; and the great use that is made of it, is for the cleansing of woollen-cloth. Every one knows, that tar is often employed in the external distemperatures of sheep, as are also tallow, grease, and many other fatty and unctuous substances. The wool itself, after shearing, cannot be worked up without being first oiled, or greased. For these, and many other reasons, all our woollen-cloth must necessarily be greased, but then all this grease must necessarily also be taken out of it again, before it can be sold or worn, and nothing yet known serves to this purpose so well as this *earth*.

The *fuller's earth* is very plentiful in England, and as much excels that of all other nations in goodness, as in quantity and cheapness, and this is one great reason why we have the advantage of other nations in the woollen manufacture; to preserve and secure this to us, the *fuller's earth* is forbid to be exported, under large penalties, by Act of Parliament. This *earth* is one great instance of the value of the English fossils; and Dr. Woodward's love for his native country has carried him so far, as to make him affirm, from his own observation, that this island wants no fossile substance known in the world, except diamonds, and some other gems, and quicksilver ores. *Woodward's* Cat. Foss. Vol. I. p. 8.

SMEGMA, a kind of wash in use among the antients. See the article DETERSORIUM.

SMELL, (*Cycl.*) is used as the name of a peculiar sort of wine, of which there are two species; the one sort is very fragrant, muscatelline, and aromatic; this is called simply the *smell-wine*: but the other, which is very rank and offensive to the nose, is called by the Germans *smel-bruntzer*. Many have been the conjectures about the occasion of the rank smell of this wine, it not being owing to the grape it is made from, those of the same vineyard often affording the aromatic, and often the rank wine: some have imputed the strange difference to the vessel, others to the vine, and others to the earth it grows in; but the first of these is too trifling a cause for such an effect, and the others are confuted by experience of the same vine, in the same place, yielding both. The opinion of Portzius, that the rankness of the *smell* of some of this wine is owing to some irregularities in the working; this is certain, that it never is perceived before the working. The *smell* is truly urinous, and is that of a volatile alkali; which not being embodied in, or subdued by the acid of the grape in this imperfect fermentation, shews itself in this rank manner. It is evident that the *smell* is of a volatile nature, for it is often lost in the drawing the wine several times out of one vessel into another, evaporating during the time of the drawing it out. *Portzius*, de Vin. Rhen.

SMELLING (*Cycl.*)—The sense of *smelling* seems extremely fine in some insects. It is reported of bees, that they will smell honey or wax above a mile; and on this quality, in that little creature, is founded a very profitable sort of hunting in the woods in New-England, and some other places, for the honey which the wild bees collect. These insects are very numerous in the woods there, and have great stores of wax and honey; but it was always very difficult to find them, till this method was invented.

The hunter always chooses for his purpose a fine, clear, and sun-shiny day: he then goes out into the woods with a trencher in his hand, on which there is some honey; this he sets down upon the stump of a tree. The bees soon find this out, and come to feed on it: as soon as three or four are come about it, he catches them severally in little boxes, and after a few minutes he lets them out one by one, and observes their course. The creature always mounts to a little height in the air, and then goes directly forward in a strait line to the tree in which the hive is. As the hunter cannot pursue this little creature in her flight through a thick wood, he always takes with him his pocket-compass, rule, and other instruments, with a sheet of paper, and on this he sets down the course; suppose it, for instance, to be west. By this he is certain, that the tree where the hive is must be somewhere in a line due west from the place where he is; but he wants to know the exact distance from his station. In order to do that, he makes an off-set, either south or north, suppose north, of an hundred perches, or rods; if it be more, it will be still more exact, because the angle will not be so acute. Then he goes to this second station, and lets out another bee, and observes its course also very carefully; for being loaded it will certainly, after mounting to a small height in the air, fly directly to the hive as the former did. This second course the hunter finds to be south fifty four degrees west; then there remains nothing but to find out where the two courses intersect, for in that place the tree, and the hive in it, certainly is.

The foundation of all this, is the strait or direct motion of bees, which, when loaded with honey, always fly directly to their hive; and this is found to be an unalterable law of nature in these animals, so that the hunter is never disappointed, when he takes his measures rightly, and vast quantities of honey are thus taken every year.

One very remarkable part of this history is, that though the bees are now so vastly plentiful in this part of the world, they are not natives there, and are only the produce of such bees as were carried thither from England about an hundred and fifty years ago: for the first planters never saw a bee in the woods till long after the place was settled, and hives of bees, among other things, had been brought from us. What is a greater proof of this, is, that the natives of the place knew nothing of the bee till they saw ours; they have no word in their language to express that creature, but commonly called it, for a long time, the *Englishman's fly*. Before this method of finding the hives was brought into practice, the planters used to watch the bees which they found in the woods by the eye, and after observing several, one after another, fly the same way, they would sometimes hit upon the place; but it was with great uncertainty, as well as great difficulty. It is observed of the bees in that part of the world, that in swarming they never move northward, but always either due south, or something inclining that way. Philos. Trans. N° 367.

SMELT, *apua phalerica*, in ichthyology. See APUA.

These fish will live almost any where, but they are very apt to degenerate. They are common in the rivers of New-England, and are as large as with us, often weighing two ounces and a half; but a pail-full of these being taken from one of their rivers, and put into an adjoining pond, they all degenerated in such a manner, that they were afterwards found so small, that the largest did not weigh more than five pennyweights. Though thus small, however, they are much valued, and are better tasted than the others. They are very transparent, and of a beautiful shining pearl colour. Philos. Trans. N° 374. p. 232.

They are called *smelts*, because they melt, as it were, or dissolve between the fingers in handling them.

SMELT, among the fishermen in Yorkshire, and some other parts of England, is also a name given to the salmon while in its first year. *Willughby's* Hist. Pisc. p. 189. See the article SALMON.

SMELTING (*Cycl.*)—SMELTING-*house*, a house where they run and melt the ore into lead; one of these will run a ton in ten or twelve hours; a fodder is their usual day's work, that is, twenty two hundred and an half weight. *Houghton's* Compl. Min. in the Explan. of the Terms.

SMEW, in zoology, the English name of the common mergus, known among authors by the name *albellus*, and *mergus cirratus*. See MERGUS.

SMILAX, in botany, the name of a genus of plants, the characters of which are these. The flower is of the rosaceous kind, being composed of several petals arranged in a circular form. The pistil finally becomes a soft roundish berry, containing a roundish or oval seed.

The species of *smilax*, enumerated by Mr. Tournefort, are these. 1. The rough *smilax* with red berries. 2. The rough *smilax* with fewer prickles, and with black fruit. 3. The

rough *ſmilax* with broad and blunt-pointed leaves, and no notches or prickles at their edges. 4. The one-leaved dwarf *ſmilax*, called *one-leaf*, *unifolium*, and *little lilly of the valley*. 5. The rough racemoſe *ſmilax* with Solomon's ſeal leaves. 6. The ſpiked *ſmilax* with Solomon's ſeal leaves. *Tourn.* Inſt. p. 654.

SMILAX *aſpera*, is uſed for great ſcarlet oak, or ilex. *Tourn.* Inſt. p. 553.

SMILAX *lævis*, in botany, a name given by many authors to our common great white bind-weed. See the article CONVOLVULUS.

SMIRIS, in natural hiſtory. See EMERY.

SMITING-*line*, in a ſhip, is a ſmall rope faſtened to the miſſen-yard-arm, below at the deck, and is always furled up with the miſſen-ſail, even to the upper end of the yard, and from thence it comes down to the poop. Its uſe is to looſe the miſſen-ſail without ſtriking down the yard, which is eaſily done, becauſe the miſſen-ſail is furled up only with rope-yarns; and therefore when this rope is pulled hard, it breaks all the rope-yarns, and ſo the ſail falls down of itſelf. The word of art is, *ſmite the miſſen* (whence this rope takes its name) that is, hale by this rope that the ſail may fall down.

SMOKE (*Cycl.*)—SMOKE-*ſilver*, in our old writers. Lands were held in ſome places by the payment of the ſum of ſixpence yearly to the ſheriff, called *ſmoke-ſilver*. Pat. 4 Edw. 6. *Smoke-ſilver*, and *ſmoke-penny*, are to be paid to the miniſters of divers pariſhes as a modus, in lieu of tithe-wood; and in ſome manors, formerly belonging to religious houſes, there is ſtill paid, as appendant to the ſaid manors, the antient Peter-pence, by the name of *ſmoke-money*. *Blount.*

SMORZATO, in the Italian muſic, is uſed to ſignify that the bow, or fiddle-ſtick, ſhould be drawn to its full length, not with the ſame ſtrength of hand throughout, but bearing lighter and lighter on it by degrees, till at laſt ſcarce any ſound be heard. This term is not much uſed at preſent. *Broſſard.* Dict. Muſ.

SMUT (*Cycl.*)—SMUT, in huſbandry, a diſeaſe in corn, in which the grains, inſtead of being filled with flower, are full of a black ſtinking powder.

Many things have been ſuſpected as the cauſes of this diſtemperature in corn; but Mr. Tull ſeems convinced by experiment, that it is cauſed only by too much moiſture, the ſeveral plants of corn, which he had taken up by the roots and planted in troughs of very moiſt earth, all bringing forth *ſmutty* ears, while very few ſuch were found in the corn of the field from whence theſe plants were taken. It is obſervable, alſo, that thoſe ears, the grains of which are to be *ſmutty*, never ſend up any flowers at all.

The two things, recommended by writers of huſbandry as remedies, or preventions of this diſeaſe, are brining, and changing the ſeed. The firſt of theſe methods was accidentally diſcovered about a century ago: a ſhip load of wheat was, about autumn, ſunk near Briſtol, and afterwards was taken up at the ebbs at ſeveral times, after being thoroughly ſoaked in ſea-water. When the wheat was all taken up, it was found unfit to make bread of, but a farmer trying ſome of it for ſowing, found it anſwer very well, and himſelf, and the neighbouring farmers, bought it all up at a ſmall price; the country all about was ſown out of this cargo. It happened that *ſmuttyneſs* in the wheat-corn was a reigning diſtemper in all parts of the kingdom at that time, but it was remarkable, that all the fields ſown with this ſalt wheat were abſolutely free from the miſchief: this eaſily introduced the practice of ſoaking wheat, before ſowing, in a brine of ſalt and water, to prevent it in other places, and it has ſucceeded well. Mr. Tull gives an inſtance of the certainty of its effect, in the caſe of two farmers whom he perſonally knew, and whoſe farms lay intermixed: theſe men bought the ſame ſeed between them from a very good change of land, and parted every land between them in the field; the oldeſt farmer believed the brining to be a fancy, and ſowed his ſeed unbrined, the other brined all his ſeed, and the conſequence was, that the old farmer had a great deal of *ſmut* in his corn, while the other had not one *ſmutty* ear.

When wheat is intended for drilling, it muſt be ſoaked in no other brine than that of pure ſalt and water, for if there be any greaſe among it, it will never be dry enough for this manner of ſowing. If ſeed wheat be ſoaked in urine, it will not grow, and if it be only ſprinkled with it, it will moſt of it die, unleſs it be planted preſently. The moſt expeditious way of brining wheat for drilling, is to lay it in a heap, and waſh it with a ſtrong brine ſprinkled on it, ſtirring it up with a ſhovel, that it may be all equally brined, or wetted with it; after this ſift on ſome fine lime all over the ſurface, and ſtir it up, ſtill ſifting on more in the ſame manner till the whole is duſted with the lime, it will then be ſoon dry enough to be drilled without farther trouble. It muſt be quick lime, in its full ſtrength, that is uſed on this occaſion.

Bad years will cauſe *ſmut* in corn, and good years will prevent it: it is, however, obſervable, that the crops in which there is *ſmutty* corn will, if uſed for feed, be liable to produce *ſmutty* corn again, rather than other ſeed. The brining is a defence againſt bad years, and againſt the miſchiefs attending the ſowing corn among which there has been *ſmut*.

The other method of changing the ſeed is by many held effectual to prevent *ſmuttyneſs* in the crop; ſeveral, who have tried this with due care, have found perfect ſucceſs from it: and it is to be obſerved, as to the great ſucceſs of the drowned wheat at Briſtol, that it was a change of ſeed to the lands on which it was ſown, as well as a brined ſeed.

Seed-wheat ſhould be bought from the crop on a ſtrong clay-land, whatever kind of land it is to be ſowed upon. A white clay is a good change for a red clay, and a red clay for a white; but whatever the land be, from which the ſeed is taken, it may be infected, if that be not changed there the preceding year; and then there may be danger, though it be had from ever ſo proper a land. It is a rule among the farmers, never to buy ſeed-wheat from a ſandy ſoil; they expreſs their diſlike of this by the coarſe rhime; *ſand* is a change for no *land*.

A crop of wheat, very early planted, is not ſo apt to be *ſmutty*, as one planted leſs early; and the farmers have obſerved, that the largeſt and plumpeſt ground fat wheat is more liable to be *ſmutty* than the ſmall ground wheat. *Tull's* Horſehoeing Huſbandry.

The *ſmut* of corn uſually happens after rain, followed by a bright ſunſhine; and when the *ſmutted* ſtalks are examined, they are found to be ſpotted, and pricked as it were with ſmall burnt places. The cauſe of the malady, therefore, probably is, that thoſe ſmall drops of rain, which remain upon the ſtalks before they are dried up by the ſun, act as ſo many lenſes, or ſmall burning-glaſſes, and their focus being very near them, their effect falls upon the ſtalk which ſupports them; wherefore the ſun's rays, collected in this point, muſt burn, and this burning dries up the ſtalk, and prevents the ear from graining, or producing its proper ſeeds. See the article BLIGHT.

Smutty corn is of a very miſchievous nature to thoſe who eat it. Schober has publiſhed a diſſertation on a terrible epidemical malady that raged, in the year 1722, in many parts of Germany, and carried off a great many people of all ages and ſexes: this he attributes wholly to their eating flower and bread made of corn, among which a larger than ordinary quantity of this *ſmut* had been produced the year before, and ground down with it. From this it appears, that theſe black ears have a ſtupefactive and narcotic quality, depending on a peculiar ſulphur they are endowed with, and to this ſulphur it is owing, that they are ſo inflammable beyond other corn. This ſulphureous principle is very hurtful to the nerves, and never fails to cauſe diſorders of them, of various kinds, when taken in any quantity; contractions, and convulſions of the limbs, vertigos, ſleepineſs, and, in fine, light-headedneſs, were the ſymptoms of the diſeaſes brought on by the eating it on the occaſion abovementioned; and ſometimes true, and incurable epilepſies come on. Some were ſeized with fevers, and children in particular were found more ſubject to the ſmall-pox that year, than they had been obſerved to be, and they had commonly very bad kinds.

SMYRHIZA, in botany, a name uſed by Pliny, and ſome other of the old authors, for the common myrrhis, or chervil. *Ger.* Emac. Ind. 2.

SMYRNIUM, *Alexanders*, in botany, the name of a genus of the umbelliferous plants, the characters of which are theſe. The flower is of the roſaceous kind, conſiſting of ſeveral petals, arranged in a circular order on a cup, which afterwards becomes a fruit of a ſort of globular figure, compoſed of two thick and, in ſome degree, lunated ſeeds, being gibboſe and ſtriated on one ſide, and flat and ſmooth on the other. See Tab. 1. of Botany, Claſs 7.

The ſpecies of *ſmyrnium*, enumerated by Mr. Tournefort, are theſe. 1. The common great *ſmyrnium*, or herb *Alexanders*. 2. The round-leaved Candy *ſmyrnium*. 3. The leſſer parſley-leaved Portugal *ſmyrnium*. *Tourn.* Inſt. p. 31.

The antient Greeks have plainly deſcribed two different plants under this name; the one the common *Alexanders*, the other the *petroſelinum Cilicium*, or Cilician parſley. The former of theſe plants loves moiſt and rich ground, and the other grows no where but on rocky hills, and in the drieſt and moſt barren places. Pliny, not obſerving that the antient writers knew two plants under this name, accuſes them of an error, in ſaying that the *ſmyrnium* loved dry and barren places, whereas the Romans, who cultivated the *ſmyrnium* at that time, found it delighted only in rich moiſt ſoils; but the antients, whom he cenſures thus, had ſpoke what he records of the *petroſelinum*, not of the great water-*ſmyrnium*.

SMYRUS, in ichthyology, a name ſometimes given by Pliny to the fiſh called by authors *myrus*, and by Willughby the *ſea-ſerpent* with a compreſſed tail.

It is a ſpecies of the muræna, according to Artedi, and is diſtinguiſhed from all the others by that author, under the name of the *muræna* with a ſharp ſnout, variegated with white

white spots, and with the edge of the back fin black. See the article MURÆNA.

SMYTHAM, in mineralogy, lead-ore stamped and pounded down, like powder or sand, to cleanse the stones and earth from the ore. *Houghton's* Compl. Miner in the Explan. of the Terms.

SNAFFLE, in the manege, a well known kind of bridle. The *snaffle*, after the English fashion, is a very slender bit-mouth without any branches: they are much used in England instead of true bridles, which are only employed in the service of war. The French call them *bridons*, by way of distinction from *brides*, i. e. bridles.

The *snaffle*, or small watering-bit, is commonly a scatch-mouth, accoutred with two little very straight branches, and a curb, and mounted with a head-stall and two long reins of Hungary leather.

SNAIL, in ichthyography. See LIPARIS *nostras*.

Perrault doubts of *snails* having eyes, and Dr. Brown denies it; but according to Dr. Porterfield, a good microscope shews them distinctly. Med. Ess. Edinb. Vol. 3. Art. 12.

The eyes of *snails* are lodged in their four horns, one at the end of each horn, which they can retract at pleasure. Id. ibid.

The manner of examining these eyes is this: when the horns are out, cut off nimbly the extremity of one of them, and placing it before the microscope, you may discover the black spot at the end to be really a semiglobular eye.

The dissection of this animal is very curious; for by this means, the microscope not only discovers the heart beating just against the round hole near the neck, which seems the place of respiration, but also the liver, spleen, stomach, and intestines, with the veins, arteries, mouth, and teeth, are plainly observable. The guts of this creature are green, from its eating of herbs, and are branched all over with fine capillary white veins. The mouth is like a hare's, or rabbet's, with four or six needle-teeth, resembling those of leeches, and of a substance like horn.

Snails are all hermaphrodites, having all each sex united in the individual; they lay their eggs with great care in the earth, and the young ones are hatched with shells compleatly formed.

Cutting off a *snail*'s head, a little stone appears, which is supposed to be a great diuretic, and good in all nephritic disorders. Immediately under this stone the heart is seen beating, and the auricles are evidently distinguishable, and are membranous, and of a white colour; as are also the vessels which proceed from them.

Snails discharge their excrements at a hole in their neck; they also breathe by this hole, and their parts of generation are situated very near it. The penis is very long, and in shape resembles that of a whale. *Baker's* Microscope, p. 217.

So small an animal as the *snail* is not free from the plague of supporting other smaller animals on its body; and as in other animals we find these secondary ones either living only on their surface, as lice, *&c.* or only in the intestines, as worms, it is very remarkable that this creature infests the *snail* in both these manners, being found sometimes on the surface of its body, and sometimes within its intestines.

There is a part of the common garden-*snail*, and of other of the like kinds, commonly called the *collar*; this surrounds the neck of the *snail*, and is considerably thick, and is the only part that is visible, when the animal is retired quietly into its shell. In this state of the animal these insects, which infest it, are usually seen in considerable numbers marching about very nimbly on this part: this nimble motion is almost peculiar to them, most other creatures of this kind being very slow in their motions: they may be seen in many other circumstances of the animal, but it is this in which they are most obvious to the naked eye. Though they are very small, they cannot however make their way under the shell, to run over the rest of the body of the *snail*, every part of it adheres too firmly to the shell to suffer that; but they have another very different way of enlarging their place of abode: the *snail*, every time it has occasion to open its anus, gives them a place by which to enter into its intestines, and they often seize the opportunity. The anus of this creature is situated not within the shell, but in this collar, which surrounds the mouth of it; and the *snail* seldom moves, to go a little way out of its shell, without opening it, as it does also in many other circumstances.

These insects always take advantage of the opening, and swiftly get in and run up into the intestines, insomuch that their natural residence seems there, and that they never are upon the surface of the animal but by accident, and much against their will; they seem to be driven thither by this accident: the fæces of the *snail* fill up the whole width of the intestine, and when they are discharged, must necessarily carry out with them whatever is between them and the anus; now it may easily happen, that a number of these small animals may be in that part of the intestine, which is between the anus and the fæces: all these must be discharged with them, and while they are walking about upon the neck of the animal, the aperture of the anus closes, and leaves them no power of entering back again, till another opportunity; and the frequency of this accident may easily drive out enough of these insects, to keep always some upon the neck, though every one of them, while there, is seeking the first opportunity of getting into the intestines again.

These insects infest every kind of *snail*, though they are most frequent on the common large garden-kind; but there is a small species of *snail*, remarkable for a sort of cover, nearly as hard as the shell, with which the creature closes up its mouth upon occasion: in this these creatures may be distinguished, even within the intestines. The skin of this *snail* is very thin and transparent; and if the shell be broken off a little way, and the eye kept attentively on that part, these little insects will be distinguished through the skin running nimbly about in the intestines.

Though these insects are found in all sorts of *snails*, they are not to be seen at all times; rainy seasons seem particularly disadvantageous to them, and it is only in dry times that they are always to be found when looked for; whether it be that the rain destroys the animals, when already formed, or that they are in themselves but short-lived, and the rain prevents the hatching of the eggs for more. The insects are content with the naked body of the *snail* alone as their habitation, they never get upon the shell, and if they are forced to it, they as soon as possible quit it again, and get to their old post. They appear of a whitish colour to the naked eye, some of a dirty greyish white, and some of a white with a mixture of reddishness; but a microscope is necessary to give us a view of their different parts and structure. They have a regular trunk, in the manner of many other insects, which they occasionally can bend downwards, and in a great measure hide from the sight: this trunk, which serves them to suck in their nourishment from the body of the *snail*, is placed between two little horns, which are extremely moveable every way, and are capable of being extended in length, or shortened, in the manner of the horns of the *snail*, which is a circumstance not observable in the horns, or antennæ of other insects. The body is divided into six rings, beside the anterior part, on which are placed the horns and the trunk. The creature has four legs on each side, two of which on each are articulated into the anterior part, which gives rise to the horns and trunk, and the other two into the first ring of the body; so that they stand in pairs, the second and third on each side being greatly more distant from one another than the first and second, or the third and fourth: these legs are all furnished with very long hairs, and seem to terminate, each in two or three points, in the manner of the legs of many of the beetles. The back is elevated into a convex form, the sides also are rounded, and each ornamented with three or four hairs; but there are none under the belly. Mem. Acad. Par. 1711.

Snails are great destroyers of fruit in our gardens, especially to the bitter sorts of wall-fruit. Lime and ashes sprinkled on the ground where they most resort, will drive them away, and destroy the young brood of them. It is a common practice to pull off the fruit they have bitten, but this should never be done, for they will eat no other till they have wholly eat up this, if it be left for them.

The Romans were fond of *snails*, and had them fed on purpose for their tables. Their taste is not delicious, but rather disagreeable; but this they disguised by means of good sauces, and had other reasons for the receiving them into the list of foods. They used them as provocatives, or inciters to venery, and with this intent they eat only the necks, as the part in which the parts of generation of the creature were placed; and they had the greater opinion of the efficacy of these, as the parts of generation were double in each individual, that is, the male and female parts both situated in the neck of every *snail*.

Aristotle, and the old Greeks, had no idea of the generation of these insects, in the manner of other animals, but supposed them produced spontaneously; but the Romans shew, by many passages in their writings, that they had got over this error, and even seem, by the preference they gave to the neck of this animal, in this intention to have understood the hermaphrodite structure of this insect, which much later ages have pretended to make a new discovery.

The Eastern nations at present run much into the opinions of the Romans of old, as to provocatives; they use, as the others did, every thing that serves to the purposes of generation in other animals, and every thing that has but the resemblance of the external figure of the parts subservient to it. The orchis roots, which resemble the testicles of animals in shape, and contain a white and slimy, or viscous liquor, have introduced themselves into use on this plan, and so of many other things. Phil. Transf. N° 50.

Oat-SNAIL, a name given by Dr. Lister, in the Philosophical Transactions, to a small *snail*, which he observed under the loose bark of old willows, elms, and others trees, and which is of a very singular structure; the shell resembling an oat-corn, whence the name, and its volutæ, or wreaths, running contrary to the direction of them in other *snails*, that is

is eaſt and weſt, as the philoſophers expreſs it, referring it to the motion of the ſun; but theſe ſhells, to uſe that language, have the turns weſt and eaſt, or more plainly, they have the turns running from the right-hand to the left, not from the left to the right as other ſnails. Philoſ. Tranſ. N° 250.

SNAKE, *(Cycl.) anguis.* See the article ANGUIS.

The poiſonous qualities of ſome of the *ſerpent*-kind, have given the generality of the world a diſtaſte to all of them, but our common *ſnake* is a harmleſs and inoffenſive animal, and might even be kept tame in our houſes, where it would deſtroy vermin, and never be of any hurt to any thing. This animal may be ſuppoſed as far from tameneſs in its nature, as any that could be thought of, yet, in the Acta Leipſienſia, we have an account of ſeveral which were kept tame in a houſe, and taught ſo far, as to go regularly into their boxes every night. The perſon, who diverted himſelf with keeping theſe, had the entertainment of ſeeing them change their ſkins ſeveral times, and of obſerving their laying their eggs, of which they would depoſit twelve or thirteen in the ſpace of half an hour. Act. Leipſienſ. Anno 1670.

That *ſnakes* are viviparous, ſee Philoſ. Tranſact. N° 8. p. 138.

SNAKE *with two heads*, a kind of *ſnake* in Braſil, having a ſwelling at its tail, which at a diſtance has the appearance of a head.

The Portugueſe call it *ſnake* with two heads; their fear of this creature, for the bite of which they pretend there is no remedy, having prevented their examining into the truth. They alſo pretend that it is dangerous to meddle with theſe *ſnakes* after they are dead, and that barely touching them will give the itch. Mr. Couplet was, notwithſtanding, bold enough to flea ſeveral of them, but found himſelf, after having performed this operation on two or three, all covered with puſtules filled with a reddiſh water. Theſe remained on him a conſiderable time, and he was not quite well in three months.

The country of Braſil abounds with large *ſnakes*, the bite of which is venomous; but the natives and blacks make no ſcruple of eating them. Mem. de l'Acad. des Scienc. 1700. p. 228, 229.

Blood-SNAKE. See the article HÆMORRHOUS.

Rattle-SNAKE. See RATTLE-*ſnake*.

Sea-SNAKE. See the article SERPENS *marinus*.

Spectacle-SNAKE. See COBRAS *de capello*.

SNAKE-*ſtone*, *ammonitæ*, in natural hiſtory, the name of a large genus of foſſile ſhells, very few, if any, of which are yet known in their recent ſtate, or living either on our own, or any other ſhores, ſo that it ſeems wonderful whence ſo vaſt a number and variety of them ſhould be brought into our ſubterranean regions. They ſeem indeed diſperſed in great plenty throughout the world, but no where are found in greater numbers, beauty, and variety, than in our own iſland. See SERPENT-*ſtones*.

They are of very different ſizes, as well as ſpecies, ſome being found of the ſize of a ſixpence, or leſs than that, and others of more than two feet in diameter: they are all made up of ſeveral circles, like thoſe of a *ſnake* when rolled up, the tail lying in the center, and the larger end, where was the mouth of the fiſh, at the other. Some of them are rounded, others greatly compreſſed, or flatted, and they are at times found lodged in almoſt all the different ſtrata of earth or ſtone.

Some of them repreſent the nave of a cart-wheel, and of theſe ſome are plain, and others ſtudded; ſome alſo are ſmooth, or wholly free from ridges, and others have ridges more or leſs broad; and among theſe, the ridges in ſome only reach acroſs the ſides, without going to the back, and others paſs the back, and form continued lines, going quite round the ſeveral volutæ of the ſhell; and ſome are plain, others ſtudded at their ends; ſome ſpecies have ſimple, and others bifurcated ſtriæ, and ſome are ſtudded and umbilicated; ſome alſo, both of theſe and of the nautili, have a ſort of foliaceous work about their ſutures, which gives a great beauty to the whole. The back of theſe ſhells alſo greatly differs in the different kinds; many of them have a ridge running all the way along the back, which in ſome is plain, and in others is denticulated, or ſerrated; and of theſe ſome have a furrow on each ſide of the ridge, which others want, and ſome have elegant rows of ſtuds running on each ſide this furrow; and finally, ſome have only a ſingle furrow running all the way along their backs. They all conſiſt of ſeveral volutæ, which are different in number in the different ſpecies; and their ſtriæ are alſo extremely various, ſome very deep, and the ridges very high between them, others very ſlight, ſome ſtrait, others irregularly crooked, others undulated, and ſome terminating in dots, tubercles, or cavities, toward the back, and others having tubercles in two or three places.

They are all compoſed of a great number of chambers, or cells, in the manner of the *nautilus Græcorum*, each having a communication with the others, by means of a pipe or ſiphunculus. There is a ſmall white ſhell-fiſh of Barhadoes, which ſeems truly a recent animal of this genus; and in the Eaſt-Indies there is another alſo, ſmall and greyiſh; but the large, and beautifully marked ones, are found only foſſile.

They are compoſed of various foſſile bodies, often of quarry-ſtone, ſometimes of the matter of the common pyrites, and of a great variety of other ſubſtances; and though they appear uſually mere ſtones, yet in ſome the pearly part of the original ſhell is preſerved in all its beauty. Sometimes alſo, while the outer ſubſtance is of the matter of the pyrites, or other coarſe ſtony, or mineral matter, the inner cavity is filled with a pure white ſpar of the common plated texture. This gives a great beauty to the ſpecimen. *Hill's* Hiſt. of Foſſ. p. 649, 650.

The cornua ammonis, or *ſnake-ſtones*, are found in many parts of England, particularly in Yorkſhire, where it is very plentiful in the alum rocks of ſeveral ſizes. See Tab. of Foſſils, Claſs 9.

The people of the place have a tradition, that all the country hereabouts was very much annoyed with *ſnakes*, but that by the prayers of St. Hilda, who lived there, they were all ſent down into the earth, and there turned into ſtone. The common people of this part of the kingdom pay an unſhaken credit to this idle ſtory; but they ſhould conſider, that if a miracle at all, it muſt have been a much more extenſive one of their ſaint than they imagine, for theſe foſſils are found not only in Yorkſhire, but in almoſt every part of the known world. Phil. Tranſ. N° 142.

SNAKE-*weed*, in botany. See BISTORT.

SNAPDRAGON, *antirrhinum*, in botany, the name of a genus of plants, the characters of which are theſe. The flower conſiſts of one leaf of a tubular form, perſonated, and having two lips, the upper of which is bifid, and the lower trifid. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, in the hinder part of the flower; and afterwards becomes a ſeed-veſſel, of the ſhape of the head of a hog, divided into two cells, and uſually filled with ſmall ſeeds fixed to a placenta. See Tab. 1. of Botany, Claſs 3.

The ſpecies of *ſnapdragon*, enumerated by Mr. Tournefort, are theſe. 1. The common *ſnapdragon*. 2. The larger long-leaved *ſnapdragon* with purpliſh white flowers. 3. The white-flowered *ſnapdragon* with reddiſh edges. 4. The white-flowered *ſnapdragon* with very red edges. 5. The white-flowered *ſnapdragon* with yellow edges. 6. The yellow-flowered *ſnapdragon*. 7. The broad-leaved *ſnapdragon* with large pale yellow flowers. 8. The great narrow-leaved *ſnapdragon* with bright red flowers. 9. The Portugal *ſnapdragon* with very large and beautiful red flowers. 10. The great long-leaved Italian *ſnapdragon* with large ſnow-white milky flowers. 11. The hairy origanum-leaved Spaniſh *ſnapdragon*. 12. The hairy Spaniſh *ſnapdragon* with red valerian leaves. 13. The talleſt Spaniſh *ſnapdragon* with very narrow leaves. 14. The middle-ſized *antirrhinum* with a large and wide-open white flower. 15. The greater field-*ſnapdragon* with red flowers. 16. The greater field-*ſnapdragon* with white flowers. 17. The great ſtone *ſnapdragon* with very narrow leaves, and a ſmall purple flower.

The plant called by Caſpar Bauhine, and ſome others, the *cut-leaved ſnapdragon*, is properly a ſpecies of *pedicularis*, and the leſſer field-*ſnapdragon*, and the ſtone mother-of-thyme-leaved *ſnapdragon*, are both ſpecies of toad-flax, or *linaria*. *Tourn.* Inſt. p. 168. See the articles PEDICULARIS and LINARIA.

Many of the ſpecies of this plant are very beautiful, and much eſteemed in gardens, and are all eaſily propagated from ſeeds, which muſt be ſown in a dry ſoil, not too rich, in April or May. In July the plants may be planted out into large borders, where they will flower the ſpring following, or they may be ſown early in ſpring, and they will then flower in the next autumn; but then they are not ſo likely to ſtand the winter, and if the autumn prove not kindly, they will hardly produce a perfect thin ſeed. They all grow very well on old walls, where they have happened to ſow themſelves. *Miller's* Gard. Dict.

SNATCH-*block*, in a ſhip, is a great block with a ſhiver in it, having a notch cut through one of its cheeks, for the more ready receiving in of any rope; for by this notch, the middle part of a rope may be reeved into this *block*, without paſſing it in endways. This ready *block* is commonly faſtened with a ſtrap about the main-maſt, cloſe to the upper-deck, and is chiefly uſed for the fall of the winding-tackle, which is reeved into this *block*, and then brought to the capſtan.

SNIEGULKA, in natural hiſtory, a name given by the common people of Poland to a bird of paſſage, that only comes to them in the colder months.

The name ſignifies the ſnow-bird, and Rzaczinſki, in his Hiſtory of Poland, calls it *nivalis avis*. The people preſage, from its coming, the mildneſs or ſeverity of their winter.

SNIGGLING, a method of fiſhing for eels, chiefly uſed in the day-time, when they are found to abſcond themſelves near wears, mills, or flood-gates. It is performed thus: take a ſtrong line and hook, baited with a lob or garden-worm, and obſerving the holes where the eels lie hid, thruſt your bait into them by help of a ſtick, and if there be any, you ſhall

ſhall be ſure to have a bite; and may, if your tackling hold, get the largeſt of eels. Vid. *Cox*, Gentl. Recr. Part 4. p. 39.

SNIPE, in zoology. See the article GALLINAGO *minor*.

Theſe birds are eaſily taken, by means of lime-twigs, in this manner: take fifty or ſixty birchen-twigs, and lime them all very well together; take theſe out into places where there are *ſnipes*, and having found the places which they moſt frequent, which may be ſeen by their dung, ſet the twigs in theſe places, at about a yard diſtance one from another. Other places, are thoſe where the water lies open in hard froſty and ſnowy weather: in theſe places alſo, and where-ever they are ſuſpected to come to feed, let more lime-twigs be placed in the ſame manner. The twigs are not to be placed perpendicularly in the ground, but ſloping, ſome one way, ſome another; the ſportſman is then to retire to a diſtance, and watch the coming of the birds to theſe places. When they fly to them, they naturally take a ſweep round the earth, and by this means they will almoſt always be caught by one or other of the twigs. When a firſt *ſnipe* is taken, the ſportſman is not to run to take it up, for it will feed with the twig under its wings, and this will be a means of bringing down more of them to the place. When three or four are taken, they may be taken up, only leaving one faſt to entice others; and thus the ſport may be continued, as long as there are any birds of this kind about the place. It may be very proper, when the twigs are planted, to go about, and beat all the open and watery places near, that they may be raiſed from thence, and fly to thoſe places where the twigs are placed to receive them.

SNORT, in the manege, called in French *ebrouer*, denotes a certain ſound which a horſe of fire makes by breathing through his noſtrils; as if he had a mind to expel ſomething that was in his noſe, and hindered him to take breath.

This noiſe or ſound is performed by means of a cartilage within the noſtrils, called in French *ſouris*. Horſes of much mettle *ſnort*, when you offer to keep them in. See the article SOURIS.

SNOTTOLF, a name uſed by ſome authors for a ſpecies of the *orbis*, or globe-fiſh, called by Cluſius, and other authors, the *orbis ranæ rictu*, or frog-mouthed globe-fiſh.

It is uſually of about ſixteen inches in length. It is of a brown colour, variegated with white ſpots. Its head is very thick, and its mouth large and wide, and very much reſembling that of a frog. It has one irregular fin on the back, running nearly all the way to the tail, and two rows of tubercles on each ſide, one on the middle part of the body, the other nearer the belly. It is frequent in the German, and in many other ſeas. The name is Dutch. *Geſner*. p. 747. *Bartholin*. Cent. Obſ. 2. Hiſt. 1.

This fiſh is the *cyclopterus* of Artedi, and the *lumpus* of other authors. See the article LUMPUS.

SNOW (*Cycl.*)—*Snow* may be preſerved by ramming it down in a dry place underground, and covering it well with chaff. At Leghorn they uſe barley-chaff for this purpoſe. See Phil. Tranſ. Nº 8. p. 140.

Snow and ice are alſo preſerved with ſtraw or reeds. Mr. Boyle has deſcribed the manner in his experimental hiſtory of cold.

It is uſual in hot countries to mix *ſnow* and ice with their wine. Hence Pliny [b] ſays, *Hi nives, illi glaciem potant, pœnaſque montium in voluptatem gulæ vertunt*.—[[b] Lib. 19. cap. 4. Martial has an epigram on this ſubject, Lib. 14. Epigr. 117.]

SNOW-*drop-tree*, a very beautiful American tree, which bears the cold of our climate in the open air; but it is very difficult to encreaſe, the layers being two years before they take root, nor will they ever take root at all, except the branches are very young, and are ſlit in the joint, as in the laying carnations. When thoroughly rooted, they may be tranſplanted into ſmall quarters of flowering-ſhrubs, where, among thoſe of a middling growth, they add much to the variety. *Miller*'s Gard. Dict.

SNOW-*ſtone*, in natural hiſtory, a name given by ſome to a very beautiful ſtone found in America; of which the Spaniards are very fond, making it into tables, and other ornaments in their houſes. Alonſo Barba, who had ſeen much of it, tells us, that it is found in the province of Atocama, and is uſually found in pieces of four feet long, and four or five inches broad; ſo that it is forced to be joined in the working. Its general thickneſs is about two inches. It has a great variety of colours, which form clouds and variegations of a very beautiful kind. The principal colours are red, yellow, green, black, and white. The white is generally formed into ſpots on the very blackeſt parts of the maſs, and is ſo beautifully diſpoſed, that it repreſents *ſnow* falling in all its whiteneſs upon a jetty ſurface. *Alonſo Barba* of Metals.

SNUFF (*Cycl.*)—The many miſchiefs attending an unnatural practice of taking this powder of tobacco at the noſtrils, have been deſcribed by the writers in general on theſe ſubjects, ſince this pernicious cuſtom has reigned in the world; but one of the moſt remarkable accidents, occaſioned by it, is related in the Acta Eruditorum.

The caſe is this. A fat perſon, greatly addicted to the taking Spaniſh *ſnuff*, after many years continued uſe of it, complained one day of a mighty uneaſineſs which it occaſioned in the middle of his œſophagus, and ſoon after this he began to find his ſwallowing difficult. He applied for relief to a phyſician, and naming nothing of the pain which had preceded this difficulty of ſwallowing, it was treated as a complaint ariſing from ſome glutinous humor in the œſophagus, it is no wonder that the medicines in this intention had no effect. The patient grew worſe, and tired of this doctor, applied to another, who ſuppoſing the complaint aroſe from ſome ſharp humor vellicating the parts, gave medicines in that intention, equally without ſucceſs. After this a common quack tried the moſt violent medicines on him, but without ſucceſs; and finally he applied to the uſe of the excutia ventriculi, an inſtrument made to be thruſt down the œſophagus into the ſtomach, but this he never could get down; and in the uſe of this inſtrument he firſt felt, that there was abſolutely a lump of fleſh, which ſtopped its paſſage farther than the place where the ſeat of his complaint was. The diſtemper after this encreaſed upon him, till he could only ſwallow liquids, and thoſe at laſt by no other means, but the ſucking them through a quill, by which means he could get down milk, water-gruel, and the like, by a little at a time. At length conſulting another phyſician, and telling him of the immoderate quantity of Spaniſh *ſnuff* he had been uſed to take, and that it often happened to him on taking the drieſt *ſnuff* of this kind; that it got into his œſophagus, and occaſioned violent pain, coughing, and ſpitting of blood, he ſoon concluded that a polypus had formed itſelf in the œſophagus, wounded by this ſharp powder, and that there was no relief, but that the death of the patient was quickly approaching. The man, from a very corpulent habit, was ſo extenuated, that he appeared a mere ſceleton; he died ſome little time after of abſolute hunger, the œſophagus being ſo entirely filled up by this unnatural ſwelling, that not the leaſt drop of a liquid could get down.

After death the œſophagus was opened, and a fleſhy excreſcence, or polypus, was diſcovered, of the bigneſs of the cavity of the part, and taking its origin about the middle, from the back part of the œſophagus, it reached down to the pylorus. This was of a whitiſh colour, and much reſembled a large worm, and its ſubſtance was fibrous, and very tender. Act. Erudit. Anno 1715. p. 457.

SNUFF, or *Snuffler*, in the manege. See the article SNORT.

SOAGGIO, the name of a fiſh common in the markets of Rome and Venice, and of the turbot-kind.

It is the *rhomboides* of Rondeletius, and the *rhombus non aculeatus ſquammoſus* of Willughby.

We have it alſo on our own ſhores, and the Corniſh people, who frequently catch it, call it the *lug-a-leaf*. It has no rough lines at the roots of its fins. Its eyes are large, and ſet at a conſiderable diſtance, and it is covered with extremely minute ſcales. It is extremely flat and thin, and of an aſh-colour.

It is a very ſingular ſpecies of fiſh, differing, in ſome particulars, from both thoſe genera to which it ſeems allied. It differs from the plaiſe-kind, in that it has the eyes, fins, &c. of the turbot, or rhombus; and from that fiſh, in that it is ſcaly, as the plaiſe, and the other fiſh of that genus. *Willughby*, Hiſt. Piſc. p. 95. *Rondel*. de Piſc. p. 358.

SOAL, in ichthyology, the Engliſh name of the fiſh, called by the generality of authors the *bugloſſus*, by ſome *ſolea*.

It is, according to the new ſyſtem of Artedi, a ſpecies of the pleuronectes, and is of that kind which have the eyes placed on the left ſide. Some authors call it the *linguacula*. See BUGLOSSUS and PLEURONECTES.

SOAP (*Cycl.*)—The making of *ſoap* depending only on the mixing the ſalt of pot-aſh with oil or fat, though this is at preſent procured by a tedious operation, and long boiling, it ſeems very practicable to ſhorten, and make the proceſs much eaſier, and leſs expenſive, by ſubſtituting motion in the place of fire. This motion might be eaſily given by an engine to any quantities of the ingredients at a time; and we find it practicable to make *ſoap* by this means, only by mixing in a large vial half a pint of *ſoap*-lees, and an ounce, or more, of oil-olive; for by ſhaking theſe together for a quarter of an hour, an abſolute *ſoap* is procured in a cake at the top of the liquor, which hardens on being expoſed to the air. *Shaw*'s Lectures, p. 160.

The uſe of *ſoap* has, of late, been much extolled in medicine; but then thoſe, who magnify it moſt, except againſt the uſe of it in ſuch caſes where obſtructions are attended with a putrefactive alkali, or where an inflammatory diſpoſition appears. It is acknowledged to be very dangerous in a pthiſis, fever, and ſome other caſes. The biſhop of Cloyne, in his Siris, ſeems to think tar-water an uſeful and ſafe ſubſtitute for it. See the article TAR-*water*.

SOAP-*rock*, or *Soap-earth*, in natural hiſtory. See the article STEATITES.

There is great reaſon to believe, that when we know the proper manner of working, this will, one way or other, make a great ingredient in our porcelain manufactures.

The Chinese have of late discovered a sort of earth, which they call *hoache*. They say that this is hard, smooth, and soft to the touch, like *soap*; these, and its other qualities, seem to prove it to be the same with our *soap-rock*, and this with them makes a sort of porcelain, superior to the common kind in beauty, and in the compactness of its texture, but it is more apt to crack. They use it several ways, sometimes alone, sometimes with the petunse, which is a stone, and sometimes they make a varnish, by dissolving this in water, with which they coat over the common China, covering it finally with the other varnish. All these ways of using it produce very beautiful wares, and it will be extremely worth our while to try them all round, before we give up the use of so valuable a thing. Observ. sur les Coutumes de l'Asie. See the article HOACHE.

SOAR-*hawk*. See the article FALCON.

SOATTO, a Venetian name of a fish, common in the markets there, and of a middle nature between the plaise and turbot. *Willughby*, Hist. Pisc. p. 95. See the article SOAGGIO.

SOAVE, or SOAVEMENTE, in the Italian music, signifies to sing or play in a sweet and agreeable manner.

SOBRE *buena*, a name given by the Spaniards in America to a species of vanilla, which is greatly superior to all the other kinds.

The pods of this are of the same shape with those of the common vanilla, but are nearly twice as large. A bundle, of about fifty of these, usually weighs five ounces, and such a bundle of the *sobre buena* kind often weighs eight. These are full of a blackish balsamic liquor, in which are contained a number of small seeds.

SOCAGERS, in our old writers, such tenants as held by the tenure called *socage*. They were otherwise called *sockmen*. See the article SOCKMEN.

SOCCELLI, among the Romans, were swaths or bands, which covered the leg down to the soccus. *Pitisc.* in voc. See the article SOCCUS, *Cycl.*

SOCII, *allies*, among the Romans. See ALLIANCE, *Cycl.*

SOCK (*Cycl.*)—SOCK and sythe-land. See the article HUSBAND-*land*.

SOCKET (*Cycl.*)—SOCKETS, in a ship, are the holes which the pintles of the murthering pieces go into.

SOCMEN, or SOKEMEN, *socmanni*, such tenants as held their lands and tenements in *socage*; but the tenants in antient demesne seem most properly to be called *socmans*. F. N. B. 14. Briton. c. 66. Terms of Law. *Blount*, *Cowel.*

SOCNA, in our old writers, a privilege, liberty, or franchise. *Blount*. The word is Saxon.

SOCO, in zoology, the name of a Brasilian bird of the heron-kind, but remarkable, beyond all the rest of that genus, for the length of its neck. It is very common in the Brasils. It is smaller than the common heron; its beak is strong, strait, and sharp; its tail short; its head and neck brown, and variegated with black; and its body is of the same colours in different variegations, but its wings have a mixture of whiteness. *Marggrave*'s Hist. Brasil.

SODA, in medicine, the name of a distemper, consisting in an uneasy and troublesome sensation of heat about the orifice of the stomach, which sometimes is owing to external, sometimes to internal causes. It is to be observed, that what we understand by the word *soda* is to be distinguished from the *soda* of the antients, for they expressed by this word a peculiarly sharp and terrible pain in the head.

Signs of a SODA. The persons afflicted with it complain of a disagreeable sensation in the stomach, particularly about the œsophagus, which they do not well know whether to term cold or heat; but it seems rather such a sensation of heat as is produced by the violent colds of winter, than any other, according to the old phrase, that *frigus adurat*, cold burns. With this sensation there is always joined a tensive and pressing weight of the other parts of the stomach, and a light constriction running all the way up the œsophagus, from the stomach to the fauces, attended with a running up of water into the mouth, and a nausea, and frequently a reaching to vomit. It is a distemper that mostly affects persons of plethoric habits, and such as are subject to commotions of the blood.

The internal causes of this disorder are congestions of blood about the stomach and intestines; a bilious foulness in the primæ viæ, and a tremulous motion of the fibres of the stomach. The external causes are the eating great quantities of fat things, and drinking immediately after them, and taking great quantities of the hot aromatics, which exagitate the blood, and bring on a continual irritation. A sudden cooling of the stomach, while the body is very hot, will also occasion this; and the taking of hot medicines, under a notion of strengthening the stomach; and finally, the drinking of feculent liquors, and the eating sower foods.

This is in itself a distemper of no great consequence, but when it is suffered to grow upon the patient, and especially when injudiciously treated, it often is attended with bad symptoms, and sometimes brings on dangerous disorders.

Method of cure. It is often a disease scarce worthy the consideration of a physician, but when it is so, the fixed alkalis, combined with some volatile salt, seem the most proper remedies; such are the tincture of salt of tartar, mixed with spirit of hartshorn, or the alkalis alone, as ten or twenty drops of the oil of tartar: but in those particular cases, where it arises from great commotions of the blood, gentle acids are, on the contrary, the proper means of cure, or the compound powders of nitre and cinnabar. When a bilious foulness is in the cure, the nitrous medicines, with the testaceous absorbents, as crabs eyes, oister-shells, and the like, are the proper remedies; and in all cases, the frequently taking draughts of warm liquors, as of tea, and the like, is extremely proper: and people, who are very much troubled with returns of this complaint, and are of a plethoric habit, are to be advised to bleed and purge every spring and autumn.

The common opinion being, that this complaint is merely owing to an acid humor, has given rise to the use of chalk in it as an universal remedy; and people, who are afflicted with it, usually swallow chalk alone, and that in large quantities, for their cure. But this is by no means a safe, or advisable method: for the chalk meeting with an acid, becomes a violent astringent on mixing with it, and powerfully contracts the tender fibrillæ of the stomach. Whence it often happens, that instead of a cure, the consequences are more painful cardialgias, with obstructions of the viscera, anorexies, and often in women suppressions of the menses. Some give the powder of bricks instead of chalk: but this is more dangerous than the chalk, as it is in itself more astringent. In people, who are afflicted with this complaint from eating fat things, a draught of brandy often proves an immediate cure. *Junker*'s Consp. Med. p. 589.

SODA *subethica*, a term used to express a heavy and dull pain in the head.

SODDING *of brick*. See the article BRICK.

SODE-*shoats*, in botany, a name given by some to the tree, whose inspissated juice is the gum tachamahacca of the shops. Par. Bat. Prodr. p. 379.

SODOMY (*Cycl.*)—There is no Statute in Scotland against *sodomy*; the libel of this crime is therefore founded on the divine law, and practice makes its punishment to be burning alive.

SOFFIETTA, the bellows-fish, a name by which some have called the scolopax, a small sea-fish, common in the markets of Rome and Venice. *Willughby*, Hist. Pisc. p. 161. See the article SCOLOPAX.

SOGETTO, *subject*, in the Italian music, is used for a song or melody, on which some counterpoint is to be made: this may be done variously; thus, 1. *contrapunto sopra il sogetto*, a counterpoint above the subject, is that of which the subject is the bass. 2. *Contrapunto sotto il sogetto*, when the given subject is the higher part. If the subject, in either case, does not change its notes, it is called *sogetto invariato*. But if the notes be changed, either in figure or position, it is called *sogetto variato*. 3. *Sogetto* is also used for the words to which a song is to be made. 4. *Sogetto* is likewise applied to a series of notes, from which a fugue is formed. See the article FUGUE.

SOIL (*Cycl.*)—The land of England, as considered by the farmer, is reduced into nine sorts of *soils*; the sandy, the gravelly, the chalky, the stony, the rocky, the hazely, the black earth, the marsh, and the clay land. Of this last kind there are four varieties, distinguished by their colours; the black, the blue, the yellow, and the red.

In many places these *soils* are mixed and blended together, and where it is so, it is much better than where they are separate or single; especially where the mixtures happen to be of a right kind, as those of the hot and the dry *soils* blended with the cold and the moist. Nature does this often, and art may imitate it. All sands are hot, and all clays are cold, and therefore the laying clay upon sandy lands, or sand upon clayey lands, is the best of all manure: this alters and changes for the better the very nature of the land itself, whereas dung only improves it for a time, and after that leaves it as bad as it was before. Mixt soils, that tend to the clayey-kind, are the best of all others for corn. It is not only the natural *soil* we are to consider, but the depth of it, and what *soil* is underneath; for the richest *soil*, if it be only eight or ten inches deep, and lies upon a cold clay, or upon stone, will not be so fruitful to the farmer as the leaner *soils* that lie upon better under-strata. Gravel or sand are the best under-strata, of all others, to make the land above prolific. *Mortimer*'s Husbandry, p. 64.

Cold and wet clays are much more fruitful in the southern parts of England, than in the north. The climates, therefore, are to be considered, and the quantities or proportions of the different kinds in the mixed soils. The natural produce of the land, as to weeds or grass, is also to be greatly regarded by the person who intends to improve upon it. What is the effect of plowing is next to be enquired into, and experiment must shew what kind of corn agrees best with it.

 All

All land that moulders into duſt with froſt, with all ſorts of warm lands, black mould, yellow clays, if not too ſpewy when wet, and all that turn black after rain, are in general good lands for corn. Land that produces large trees, as alſo ſuch as produces black thorn, weeds, thiſtles, rank graſs, and the like, and that lies in bottoms open to the eaſt or ſouth, being well ſheltered from other winds, may be always eſteemed to bid fair for good land. Thyme, ſtrawberries, betony, and wild ſage, direct to the places where woods will thrive beſt; and camomile is always an indication of a land being diſpoſed to bear corn in large crops.

All land that binds after froſt and rain, all that turns white, and is full of worms, or is very moiſt and cold, or that is too hot and dry, and that lies open to the north on the ſides of hills, expoſed to cold winds and froſts in winter, and to the ſun's ſcorching heat in ſummer; and all that bears naturally holly, box, ivy, juniper, fern or brakes, furzes, broom, and heath; and lands that bear moſſes, ruſhes, yarrow, and wild tanzy, with flags, and other ſuch weeds, which betoken a cold and damp ground, are leſs fit for corn, though other things may ſucceed on it. Where plants appear blaſted, ſhrubby, and curled, theſe are diſtempers in them occaſioned by ſudden changes of wet and cold, and a dry heat. All theſe lands are, by their natural produce, to be judged leſs fruitful than the others. Blackiſh, dun, or yellow ſand, and very hot ſtony gravel, are generally eſteemed very unfruitful. Chalky lands are naturally cold, and therefore they require warm compoſts; and this is the reaſon why chalk itſelf is ſo good a manure for hot and dry lands. Sandy land, well manured with marl, will bear turneps, or white or blue peaſe, to great advantage. *Mortimer's* Huſbandry, p. 68.

The very greateſt article, in the culture of plants, trees, &c. is the *ſoil*; and in many caſes it is not ſufficient to have found a *ſoil*, which once tried proves convenient, to ſuppoſe that it will always continue ſo. In track of time the *ſoil*, which was once proper for the nouriſhment of ſome peculiar vegetable, loſes its virtue; and this ſooner in ſome lands, and later in others. All who are converſant in huſbandry, are well acquainted with this. If a good piece of ground be choſen for the ſowing of wheat, and it produces very well the firſt year, it will not for ever continue to do ſo; the ſecond year's crop will be perhaps good, and the third and fourth tolerable: all this while the land is in heart, as the farmers expreſs it, but after this it becomes improper, and very little wheat will be raiſed if ſown upon it; yet when it refuſes to produce wheat, it will, without any alteration, produce barley in ſufficient plenty for ſome years; when it will yield no more good crops of barley, it may be ſtill ſowed with oats, and will produce that grain as well as freſh land; and when it has been worn out with all theſe, it will produce peaſe. After this it is made quite barren, and can be of no farther uſe to the farmer, the vegetative quality of it being worn off by theſe ſucceſſive crops, each ſort of grain taking off that part which is more peculiarly fitted for its own nouriſhment; the wheat firſt, and the reſt in their order. While one of theſe plants is taking up what belongs to its particular nature, the reſt all remain quiet and undiſturbed; and theſe are afterwards carried away by ſucceſſive changes of plants, which require them; and at length, by the whole, all the vegetable matter is carried away, and the lands ſo drained of it, that there muſt be a ſupply of ſomething in its room, before any thing more of any kind can be raiſed from it. Philoſ. Tranſact. Nº 253. p. 217.

The ſupply of freſh vegetable matter, in the place of that which was drained away by the ſucceſſive growths of plants, is done by ſeveral ways, but by none ſo well, as by letting it lie fallow for ſome time; in this caſe the rain falling upon it, the vegetable earth, which this water contains, is depoſited in ſufficient quantity, and this is alone ſufficient to give nutriment to new crops; and it is proved by this, that the rain water, as well as other water, does contain ſuch earth as is neceſſary to vegetation. The other means of giving a ſupply to the exhauſted earth are the manures laid on it by the farmer, and theſe are, all of them, ſome animal or vegetable remains, and their uſe is to drain into the earth thoſe particles from themſelves, which may be again received into the bodies of new productions of the ſame kinds. Blood, urine, the excrements of animals, with their ſeveral parts, as horns, hoofs, hair, feathers, calcined ſhells, and vegetable bodies in an altered ſtate, ſuch as lees of wine and beer, aſhes of burnt vegetables, leaves, ſtraw, roots, ſtubble, and the like, when in a decaying ſtate, turned under the earth again by plowing, there become diſunited into their component parts, and theſe again are carried up into other new plants.

If we take off our thoughts from the fields, and look among the gardens, we there meet with farther confirmations of the ſame thing: the trees, ſhrubs, and herbs cultivated in theſe, after they have continued in one ſtation, till they have derived thence the greater part of the matter fitted for their encreaſe and nouriſhment, will either decay, or degenerate, unleſs they have a new ſupply of manure added to the earth about their roots, or are themſelves tranſlated into other earth, not ſo drained of that particular matter out of which they are to be fed.

The older trees have ſome more ſupplies of fit matter than the younger, by means of the length of their roots, which, when they have drained one ſpot of ground, uſually are carried much farther into another, and reach a very great way; but at laſt they can reach no farther, and all fails, unleſs ſuch a ſupply of manure, or the being removed into freſh earth, ſupply that nouriſhment they can no longer have where they ſtand. The gardiners, when they tranſplant trees, cut off theſe long roots; but though they only do this to prevent the trouble of opening a larger hole than neceſſary for their reception, yet there is in nature this good reaſon for it, that they have, when brought to a freſh *ſoil*, no occaſion for thoſe long roots to draw nouriſhment from afar off, when there is enough of it every where about them. What is to be learned from the whole of this, is, that the modern ſyſtem is erroneous, which ſays that water is the only thing that gives nouriſhment and encreaſe to plants; ſince, if this was the caſe, there could be no need of manures, nor any need of altering the crop, in order to its ſucceeding, or of tranſplanting trees to make them thrive. It is plain that ſome ſort of terreſtrial matter, taken from among the *ſoil*, is what gives encreaſe and bulk to plants; for were it only water, the rain falling in all places alike, all would alike be at all times ſuited to produce all plants; and if the earth, according to Lord Bacon's ſyſtem, ſerved to no other purpoſe to plants and trees, but to keep their roots firm, and to defend them from over-heat, and over-cold, one earth would do as well for theſe uſes as another, and the ſame earth would do as well for the ſame plant as a different earth. Philoſoph. Tranſact. Nº 253. p. 219.

Mr. Tull thinks, that the only difference of *ſoil*, except the richneſs, is the different degree of heat and moiſture it has; the earth is equally proper, of whatever kind it be, and if theſe additions be properly adjuſted, any *ſoil* will nouriſh any plant. Let a bed of thyme and a bunch of ruſhes be removed into each other's place, without any farther care, and both will die: but let them change their ſoil, by removing the earth wherein the thyme grew, from the dry hill down into the watery bottom, and plant ruſhes therein; and carry the moiſt earth, in which the ruſhes grew, out of its wet place, up the hill, and ſet the thyme in it, it will be found, that the ſame quantity of unchanged earth will ſerve for either: the ruſhes will grow in the earth of the hill when carried into the bogg, and the thyme will grow in the earth of the bottom where the ruſhes before grew, as ſoon as it is carried up the hill. So that while the earth is the ſame, it is only the accidental addition of more or leſs water that makes it fit for the growing of thyme, or the growing of ruſhes.

Earth is the true food of all plants, it is that alone which gives them their encreaſe, and any earth will do for any plant, with the addition of the other acceſſories in due proportion; that is, an acceſſory to vegetation, as water is, but then it does no more than that to give the matter of encreaſe to the plant. The earth of England, when a proper degree of heat is given it in a ſtove, will nouriſh the plants of the Indies; and, on the other hand, the earth of the Indies, when expoſed to the natural cold of the Engliſh climate, will nouriſh Engliſh plants. There is no need, in conſidering the nature of a *ſoil* for plants, to have recourſe to tranſmutation; for whether air or water, or both of them, be, or be not transformed into earth, the thing is the ſame in regard to the plant, if it be earth, when it is taken up by its roots: and it is very certain, from experiments, that neither air alone, nor water alone, as ſuch, can nouriſh plants. Theſe kind of metamorphoſes may properly enough be conſidered in diſſertations purely concerning matter, and to diſcover what the component particles of earth are; but they are not at all neceſſary to be known, in order to the maintaining of plants. *Tull's* Horſehoeing Huſbandry, p. 14.

Brickiſh SOIL, a term uſed by our farmers to expreſs a kind of hazely earth, or land, with a reddiſh caſt. It is frequent in Eſſex, and ſome other counties, and approaches to the nature of a loam. It has no ſtones in it, and does not bind after wet as clay does, but lets all the water in that comes, and has no ſtones in it; whereas all clays hold the water till the ſun exhales, and after rain with a froſt moulder into duſt.

Theſe loams are an excellent mixture for other earths, being a happy medium between two extremes, uniting what is too looſe, cooling what is too hot, and entertaining a moderate ſhare of moiſture.

The beſt produce of the brick earth is rye; if well dunged it will bear white oats, turneps, barley, wheat, buckwheat, and peaſe. The natural produce, in weeds, is broom, fern, quick-graſs, and the like. If it be well dunged, it will produce large crops of clover, but it ſoon wears out of it, and ſhould therefore be ſowed mixed with rye-graſs. The beſt manure for theſe lands is chalk, mixed with coal-aſhes: marl

marl makes a great improvement in them, and there is a ftiff yellow kind of clay, that moulders with the froft, that anfwers the fame purpofe. Whatever amendment is beftowed upon this fort of land by dung, and other enriching things, that do not abfolutely alter the nature of the earth, lafts but a little while. Thefe lands bind very much after rain, and turn whiter; no froft will diffolve the clod, and if they are newly plowed up, and never fo much rain comes on them, people may walk or ride over them almoft as firm as over gravel. If they are not frequently plowed, they are very fubject to worms, which deftroy the winter corn. They yield but poor crops in wet years; the weeds are generally very rank, and the wheat runs all into ftraw. Plowing is a great improvement of them, they always grow well the year after it. Thefe lands are to be ordered for corn in the fame manner with the clay land, only as they are rank, and carry the crop much into ftraw, it is beft to dung them on the etch crop, and to fow them with barley, and never to dung the fallows. Where the farmer has not a mind to plow them, but keep them for grafs, they fhould be mowed one year, and then kept fhort fed with fheep, which will in time fweeten them very much. The red fandy lands in Northamptonfhire are of this kind; they will not hold manure, fo they plow but once for the year's crop, which is juft before the fowing-time, and manure juft before they plow it; for if they plow it oftener, and manure it fooner, they find a great quantity of the beft mould wafhed away below the furface, and out of the reach of the roots of the corn.

In Oxfordfhire they have a fort of red land, which they begin fallowing as foon in the year as they can, before the fun is too high: if it is moderately moift, when fallowed, they efteem it the better, but it fhould not be too wet. They feldom give it a fecond ftirring, and they reckon that if it is too fine and light, it runs to weeds. *Mortimer's* Hufbandry, p. 73.

Soil, in fome parts of England, is ufed as the name for the *phoca*, or fea-calf. See Phoca.

This creature, in Cornwall, they frequently find fleeping on the fhore, and kill him; fometimes by fhooting, fometimes by ftriking over the head with long poles. He defends himfelf, when on fhore, by throwing ftones backward with great violence. *Ray's* Englifh Words, p. 107.

SOJOURNERS, among the Athenians, were permitted to dwell in the city, and follow their own bufinefs, without difturbance, provided they obferved all the laws and cuftoms of the country; but were allowed no fhare in the government. However, they were not allowed to act any thing, or manage any bufinefs in their own names, but were obliged to choofe out of the citizens one, to whofe care and protection they would commit themfelves, whofe duty it was to defend them from all violence and oppreffion. He was called *proftates*. *Potter*, Archæol. Græc. l. 1. c. 10. Tom. I. p. 55. See the article Prostates.

SOKE (*Cycl.*)—Soke-*reeve*, in our old writers, the lord's rent-gatherer in the *foke*, or *foken*. *Fleta*, *Blount*.

SOKHIO, in the materia medica, a name ufed by fome authors for a peculiar fpecies, if it may be fo called, of the lignum aloes.

It is of a greyifh colour, and feems to have been the blea, or outer part of the wood next the bark. *Camell.* Syll. p. 87.

SOLÆUS, in anatomy, a large flefhy flat mufcle, nearly of an oval figure, and thicker in the middle than at the edges. It has its name, from its fuppofed likenefs to a fole. It is fituated on the backfide of the leg, lower down than the gaftrocnemii, by which it is covered, and with which it forms the calf of the leg. It is fixed below, partly to the tibia, and partly to the fibula: it is fixed to above one third of the upper part of the backfide of the fibula, and a little to the articular ligament of the head of this bone. It is likewife fixed to the backfide of the tibia from the oblique line, or impreffion, which terminates the infertion of the poplitæus, down to the middle of the internal angle of the bone; afterwards leaving thefe two bones, it ends in a broad ftrong tendon, which, together with that of the gaftrocnemii, forms what is called the *tendo Achillis*. This ftrong tendon contracts a little in its paffage to the os calcis, and then expanding a little, it is inferted obliquely in the hackfide of that bone all the way to the tuberofity. The flefhy body of the *folæus* feems to confift of, at leaft, two planes of flefhy fibres, that on the backfide of the mufcle being the moft fimple, and the other, or that next the bone, penniform. This mufcle, with the two gaftrocnemii, form what anatomifts call a *true triceps*. *Winflow's* Anatomy, p. 219.

SOLAND, or Solen-*goofe*, in zoology. See the article Goose.

SOLANUM, *night-fhade*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of a rotated form, and divided into feveral fegments. The piftil arifes from the cup, and is fixed in the manner of a nail to the middle part of the flower, and finally changes into a roundifh or oval berry, or foft fucculent fruit, which contains many feeds, ufually of a flatted form. *Tourn.* Inft. p. 148.

The fpecies of *folanum*, enumerated by Mr. Tournefort, are thefe, 1. The common *night-fhade* with black berries. 2. The common *night-fhade* with red berries. 3. The common *night-fhade* with yellow berries. 4. The common *night-fhade* with greenifh yellow berries. 5. The berry-bearing African *night-fhade* with frequent and deeply indented leaves. 6. The great Surinam *night-fhade*, refembling the common *night-fhade* in leaves, &c. 7. The perennial Portugal *night-fhade* with large indented leaves, and red fruit. 8. The common climbing *night-fhade*, or bitter-fweet. 9. The white-flowered climbing *night-fhade*. 10. The double-flowered climbing *night-fhade*. 11. The climbing *night-fhade* with variegated leaves. 12. The fea-*night-fhade*, or dulcamara. 13. The common berry-bearing fhrubby *night-fhade*, called *ftrychno dendron*, and *pfeudo capficum*. 14. The tuberofe efculent *night-fhade*, or potatoes. 15. The white-flowered *potatoes*. 16. The prickly African large-fruited fhrubby *night-fhade* with deeply indented leaves, and flowers like thofe of borrage. 17. Black annual Virginian thorny *night-fhade*, fpreading very far, and bearing white flowers. 18. The thorny American *night-fhade* with fire-coloured fpines. 19. The red-fruited Indian fhrubby *night-fhade*. 20. The borrage-flowered Indian thorny *night-fhade*. 21. The thorny and deeply woolly *night-fhade*. 22. The lefs thorny woolly *night-fhade* of China with fmall flowers, difpofed in a fort of umbels. 23. The Indian *night-fhade* with indented leaves, and purplifh black prickles. 24. The fmooth American *night-fhade* with yellow nerves to the leaves, and yellow thorns, and with large fruit. 25. The thorny American *night-fhade* with leaves like thofe of the mad-apple, or melongena, and large fruit. 26. The fhrubby acanthus-leaved American *night-fhade*. 27. The prickly peach-leaved American *night-fhade*. 28. The prickly bay-leaved fhrub American *night-fhade*. 29. The woolly-leaved climbing American *night-fhade*. 30. The woolly mullein-leaved American *night-fhade* with fmall yellow fruit. 31. The American fhrubby *night-fhade* with the common *night-fhade* leaves, and fmall red fruit. 32. The tree American *night-fhade* with undulated almond-like leaves, and large white flowers and red fruit. 33. The fingle feeded fhrubby American *night-fhade* with polycanthus leaves. 34. The prickly climbing American *night-fhade* with henbane leaves, and flowers, purple without, and white within. *Tourn.* Inft. p. 149.

Solanum *pomiferum*, *apple-bearing night-fhade*, a name given by writers to the *night-fhades*, and plants of feveral genera, allied to thofe, and bearing large fruits. See the articles Melongena and Lycopersicon.

Solanum *fomniferum*, *fleepy night-fhade*, a name given by Cafpar Bauhine, and fome others, to a fpecies of winter-cherry, the whorled alkekengi with fmall fruit. See the article Alkekengi.

SOLAR (*Cycl.*)—Solar *comet*. See the article Discus.

SOLATRUM, in botany, a name given by many authors to the common night-fhade. *Ger.* Emac. Ind. 2.

SOLDANELLA, *fea bind-weed*, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, formed into the fhape of a bell, and jagged or fimbriated at the edges in moft fpecies; from the cup of this flower rifes a piftil, which perforates the bottom of the flower, and is fixed like a nail to its hinder part; this afterwards ripens into a cylindric fruit, which opens at the top, and is filled with feeds fixed to a placenta.

There are only three known fpecies of this plant. 1. The common round-leaved kind. 2. The white-flowered round-leaved Alpine kind. 3. The Alpine kind with lefs rounded leaves. *Tourn.* Inft. p. 82.

In the Linnæan fyftem of botany, the characters of this genus are thefe. The cup is an erect perianthum, divided into five pointed fegments, and remaining when the flower is fallen. The flower confifts of one petal, in the fhape of a bell, widening by degrees to the mouth, where it is notched and jagged. The ftamina are five tapering filaments. The antheræ are fimple. The germen of the piftil is roundifh. The ftyle is flender, of the length of the flower, and remains when that is fallen. The ftigma is obtufe. The fruit is an oblong cylindric capfule, obliquely ftriated, containing only one cell, opening, and having ten indentings on the top. The feeds are very numerous, extremely fmall, and pointed, and their receptacle is columnar in figure, and loofe. *Linnæi* Gen. Plant. p. 64.

Soldanella is alfo a name very improperly given by many authors to fome of the proper and genuine fpecies of bind-weeds; as the purging fea-bind-weed with roundifh leaves and purplifh flowers, the great Italian fea-bind-weeds with finuated leaves, and the common round-leaved fea kind. See the article Convolvulus.

SOLDER (*Cycl.*)—*Silver*-Solder. Though fpelter *folder* be much cheaper than *filver-folder*, yet workmen in many cafes prefer the latter. And Mr. Boyle [u] informs us, that he has found it to run with fo moderate a heat, as not much to endanger

endanger the melting of the delicate parts of the work to be *foldered*; and if well made, this *filver-folder* will lie even upon the ordinary kind itfelf; and to fill up thofe little cavities, that may chance to be left in the firft operation, which is not eafily done without a *folder* more eafily fufible than the firft made ufe of.—[b Works Abridged, Vol. I. p. 135.]

SOLDIDO, a name given to the *tamoato*. See TAMOATO.

SOLDIER (*Cycl.*)—The profits attending the profeffion of a *foldier*, among the Romans, were very confiderable. 1. Booty and plunder, with which they frequently returned home loaded, efpecially after taking any cities or towns; for thefe were generally given up to be plundered. 2. The fubdued countries, which were often divided among the *foldiers*. 3. Their pay. 4. Cloaths. 5. Provifions. 6. Farms and houfes in provinces were alfo given them. 7. Many privileges and immunities, as that none could touch his goods in his abfence in the camp. 8. Legacies, which the emperors left to be diftributed among them. 9. Donatives. 10. Promotions to military honours lay open to every brave man, though of the meaneft birth. *Pitifc.* in voc.

SOLEÆ, among the Romans, were a kind of fandals or flippers, which covered only the fole of the feet, and were bound on with thongs of leather; inftead of which the women, and effeminate perfons of the other fex, tied them on with purple-coloured ribbands, or fuch as were varioufly adorned with gold and filver. *Pitifc.* in voc.

SOLEN, the *razor-fifh*, in natural hiftory, the name of a genus of fhell-fifh, the characters of which are thefe. They have bivalve fhells with an oblong body, and are open at both ends. They are ufually ftrait, but in fome fpecies crooked. It had its name *folen* from the Greek, in which language that word expreffes a pipe or tube; this fifh, when the fhells are clofed, very aptly refembling a tube. The Latin writers have called it *unguis*, from its refemblance in colour and confiftence to the human nail. The common people, in many parts of France, call it *coutelier*, and in Italy it is commonly called *cannolichio*.

Rondeletius obferves that there are, among the *folens* of the fame fpecies, males and females, which are eafily diftinguifhable from one another; and that the females are larger, have no variegations on the fhells, and are much better tafted than the males. Rumphius has defcribed a very remarkable fpecies of *folen*, which always remains buried in fand, and which is not properly a bivalve, confifting only of one piece, though of the fhape of the *folen*; he calls this *folen arenarius*. Lifter has called the crooked fpecies *folenes curvi*, and fome call them the *fcymitar folens*.

We have feveral fpecies of the ftrait *folens*, though but few of the crooked ones. Of the firft kind are, 1. the common white *folen*. 2. The red American *folen*. 3. The variegated *folen*. 4. The zoned *folen*, called the *onyx-fhell*. 5. The brown *folen*. 6. The large dufky *folen*. 7. The *unguis*, properly fo called. This exactly, in texture and appearance, refembles the human nail. 8. The finger *folen*, called *dactylus* by the antients. 9. The flute or pipe *folen*. 10. The reed *folen*. 11. The long brown *folen* with a thick black mufcle at the cardo. See Tab. of Shells, N° 23.

Of the crooked *folens* the following two are the only known fpecies. 1. The fcymitar *folen*. 2. The *folen arenarius*, always found in fand.

The fhell of this fifh is compofed of two pieces, which are the two halves of a hollow cylinder with an elliptic bafe, divided in a longitudinal direction. Thefe two pieces are faftened together near one end by a ligament, like that which joins the fhells of the mufcle or the oifter. From the place where this ligament is fixed, quite to the other end of the fhell, there is a membrane faftened to each edge of the fhells, and this encreafes in breadth in proportion to its diftance from the place of its origin; fo that viewed externally, it forms a fort of ifofceles triangle, the bafe of which has about two lines in breadth. The colour and confiftence of this membrane give it very much the appearance of a piece of parchment; it has a confiderable fpring in it, and ferves on occafion to open, or draw together the two fides of the fhell.

There is another membrane, of the fame kind with this, faftened to the other fide of the fifh, there adhering to each fhell, but this is of an equal breadth all the way down: this ferves alfo to fhut or open the edges of the fhell. When the *folen* fhuts its fhell, it folds itfelf into feveral longitudinal wrinkles, which open again when the fides of the fhells feparate.

Hence it is to be obferved, that though this fhell has a power of opening and fhutting, yet the body of the fifh is always fecured, and is no more expofed to fight at one time than at another, and there is no part where the fifh can be feen but at the ends.

This fifh lives in the fand on the fea-fhore, where it buries itfelf often a foot and a half, or two feet deep; the length of the fhell is, at this time, nearly in a vertical pofition, and the fifh has a power of raifing itfelf at pleafure up to the furface, and finking down again, while the fhell remains all the time buried in its place. Almoft all other animals have an horizontal motion, and the fhell-fifh of the fea crawl along upon its bottom under water, as the common land animals do on dry ground; but this creature's progreffive motion is only vertical, and that confined to a very fmall compafs, all that it is able to do for itfelf, being only to raife itfelf higher or lower, and fink deeper or rife higher in the fand, within the narrow compafs of about two feet at the utmoft, as the going beyond that muft occafion its deftruction. Where thefe fhell-fifh are buried in the fand, there is a hole reaching from every one of them to the furface, by means of which they have a free communication with the water: thefe holes generally are placed in great numbers near one another, and are eafily diftinguifhed at a time when the tide has left the fhore uncovered. They are not round, but oblong, and fomewhat refemble the key-hole of a lock, but that they have a roundnefs at each end, whereas that ufually is rounded only at one. When the winds are violent, they blow the fand about, and ftop up thefe holes, otherwife, whenever there are any of thefe fifh, they are eafily difcovered. When the fea is down, thefe fifh ufually run deep into the fand, and to bring them up, the common cuftom is to throw a little falt into the holes, on which the fifh raifes itfelf, and in a few minutes appears at the mouth of its hole. When half the fhell is difcovered, the fifherman has nothing more to do than to take hold of it with his fingers and draw it out, but he muft be cautious not to lofe the occafion; for the creature does not continue a moment in that ftate, and if by any means the fifherman has touched it, and let it flip away, it is gone for ever, for it will not be decoyed again out of its hole by falt; fo that there is then no way of getting it but by digging under it, and throwing it up with the fand. This fifh has two pipes, each compofed of four or five rings or portions of a hollow cylinder, of unequal lengths, joined one to another, and the places where they join are marked by a number of fine ftreaks or rays. Now the reafon why the falt makes thefe creatures come up out of their holes, is, that it gives them violent pain, and even corrodes thefe pipes: this is fomewhat ftrange, as the creature is nourifhed by means of falt water; but it is very evident, in that if a little falt be ftrewed upon thefe pipes in a fifh taken out of its habitation, it will corrode the joinings of the rings, and often make one or more joints drop off: the creature, to avoid this mifchief, arifes out of its hole, and throws off the falt, and then retires back again. The ufe of thefe pipes to the animal, is the fame with that of many other pipes of a like kind in other fhell-fifh, they all ferve to take in water; they are only a continuation of the outer membrane of the fifh, and ferve indifferently for the taking in and throwing out the water, one receiving, and the other difcharging it, and either anfwering equally well to their purpofe.

When one of thefe fifh is taken out of its hole, and laid upon the fand, if any thing touches it, it immediately gets in order for its progreffive motion. It throws out a long cylindric part, of half the length of the fhell, and of the fhape of a clapper of a bell; this is fufpended to the middle of the animal by a ligament, but in all other parts it is loofe; this ferves as a leg to the creature: as it lies upon the fand, it extends this about an inch from the end of the fhell, and changes its cylindric figure to a flat one, which terminates in a point, flat and fharp at the edges; with this it opens its paffage into the fand. When the opening is made, it extends this part ftill farther, and buries it deeper, and after this bends it back again in fuch a manner, that its point turns up towards the fhell; thus it gives this part a figure of a hook, and by this hook it draws its whole body and fhell down. In this attempt it brings the edges of the fhells every where clofe together, and inftead of lying flat upon the fand, it now by degrees gets into a vertical pofition, and then there remains nothing to do, but to draw it deeper into the fand. To effect this, it now again extends its leg, which it eafily paffes into the fand in its flatted fhape, and when it has thus pierced to its utmoft length, the creature inflates, and extends it by degrees to the fize of the fhell, and to a round or cylindric figure; the confequence of which is, that there is now a hole made of the fhape of the fhell, and equal to its diameter, into which it can eafily fink: to facilitate this, however, the creature fwells out the extremity of the leg into a fort of button, which holding faft in its place, nothing more is neceffary than to contract the reft of the leg, in order to pull down the fhell after it. This operation is repeated as often as is neceffary, and the creature, at every movement of this kind, getting down half the length of its fhell, or thereabouts, is very foon plunged as deep as its occafions require.

When it has occafion to afcend out of its hole, the fame leg ferves for that purpofe; nothing more being required, than the putting out the end of the leg, fwelling it, and thus thrufting itfelf up to the length of that leg; then retracting it into the fhell again, and thrufting out, and inflating its end for a fecond movement of the fame kind. Thefe motions may be all perceived in the creature when out of the fand, particularly that by which it buries itfelf; for if held up in the fingers, it thrufts out the leg, and performs all the motions as if in the fand, making a fruitlefs attempt to

fave itfelf in its old way. Mem. Acad. Par. 1712. See the article DACTYLUS.

Klein, and fome others, have given the name *folen* to the feveral fpecies of *tubuli marini*.

The word is derived from the Greek, σωλη, tubulus. Of thefe there are feveral genera, diftinguifhed by their proper characters.

1. *Solen lignorum*, the wood tubule. This is a *tubulus marinus*, or fhelly cafe of a fea-worm, of a white colour, not cut, of the thicknefs of a goofe-quill, more or lefs, and very irregularly bent and contorted.

2. *Solen arenarius*, the fand tubule. This is defined to be a *tubulus marinus*, in form of a very long tube, which is thick, jointed, and gradually tapering from one end to the other, and divided into new pipes of the fame kind. *Klein*, de Tub. Mar. p. 12.

3. The *folen anguinus*, or fnake tubule. This is defined to be a *tubulus marinus*, which is varioufly bent and waved, in the manner of a fnake. Of thefe there are feveral fubdivifions; fome are fmooth, and terminate in a beautifully twifted end; others are varioufly and very elegantly folded, and others are of a triangular form, and are triangular tubes terminated at one end with a number of flight obtufe notches or teeth, as they are called by fome; and finally, fome are found with a fiffure running down their whole length, and regularly marking the middle of all their fnail-like volutions. *Klein*, de Tub. p. 3.

4. The *folen vermicularis*, or worm tubule. Thefe are diftinguifhed from the others by being very long, and folded like our large earth-worms. Of thefe alfo there are feveral kinds; fome defcribed by Rondeletius, Johnfon, and other authors, under the name of worms hiding themfelves in tubes, *vermes in tubulis delitefcentes*. Thefe are of a cylindric figure, white, rough on the outfide, but very fmooth within, and are fometimes perfectly ftrait, fometimes crooked and folded. Within thefe fhells the exuviæ of the animal-inhabitant may be often diftinguifhed. *Klein*, de Tub. p. 4.

Others of thefe are of an angular figure, often trigonal, and not unfrequently thefe are found twifted into beautiful fpiral lines.

Others, from their fimilitude to the inteftines of fmall fifh, have been called *vifcera pifcium* by authors. Thefe are ufually fomewhat rough, and lie hid in the mud, under and among the rocks: they are commonly of an earth colour, or dufky brown.

Others are fo tough and foft as to be flexile; thefe refemble an earth-worm, or the gut of fome fmall animal in form, and are of a rough fandy conftruction, and often are found above a foot long.

Others are fmall, lightly ftriated, or cancellated, and ufually of a reddifh colour; and finally, others are very fmall, perfectly white, and often turned like a nautilus: thefe are very common on almoft all marine bodies, being fometimes found adhering to the leaves of the fea-fucufes, often to fhells of various kinds, and very frequently to the claws of lobfters, *&c.*

5. The *folen corallorum*, or coral tubule. This is a very capacious tubule, refembling parts of the thicker and larger inteftines, whether empty or ftuffed; and are at one end affixed to the rocks, particularly to thofe on which the corals are found, and open at the other. Of thefe there are two principal kinds, the one fmooth, the other corrugated or wrinkled. Of the fmooth ones fome refemble a boot in figure, and have been called *ocreati*, and *boot-fhells*; others are low and vaulted, and refemble the hollow of an oven; thefe alfo, for this cafe, have been called *clibaniformes*. *Klein*, de Tub. p. 5.

6. The *folen phalloides*, or tubule refembling in figure the membrum virile. This is a large, white, and fmooth tubule, much refembling in figure the part from which it has its name. It frequently refembles a fort of thick root, and at its lower end there ftands out a fort of fiphunculus, which is perforated. Lifter has defcribed this under the name of *phallus*. *Klein*, de Tub. p. 6.

7. The *folen fragilis*, or brittle tubule. This is diftinguifhed from the reft by its fragility, being compofed, in a manner, only of loofe fand, and always falling to pieces with a flight touch. Of thefe fome are of a finger's length, rough on the outfide, and fmooth within, flender, and ufually found full of water; others have a great deal of fand in their compofition, but are fo contrived, that they are fmooth both within and without, and pellucid. *Klein*, de Tub. p. 7.

SOLE, in the manege, is a nail or fort of horn under a horfe's foot, which is much more tender than the other horn that incompaffes the foot, and by reafon of its hardnefs is properly called the *horn*, or *hoof*. A horfe's fhoe ought to be fo fet upon the hoof, as not to bear upon the *fole*; for otherwife the *fole* would be hurt, and not only make the horfe lame, but corrupt the flefh that feparates it from the coffin-bone.

To take out the *fole*, is to do it without touching the horn of the hoof; for if you take off the horn, you make a *hoof-caft*. We take out the *fole* for feveral infirmities, as may be feen in Mr. Solleyfel's Compleat Horfeman. A horfe that is *unfoled*, may recover in lefs than a month.

High-foled, called in French *pied comblé*, is faid of a horfe whofe *fole* is round underneath; fo that it is higher than the hoof, and oftentimes makes the horfe halt, and hinders the fhoeing of him, unlefs the fhoe be vaulted.

SOLEA, the *foal-fifh*, a well known fifh, and much efteemed at table.

It is diftinguifhed from the fifh of the plaife-kind, in that it is of a longer and narrower fhape. Its upper part is of a blackifh grey, its under, or belly, white. It is covered with fmall fcales, armed at their extremities with a fort of fhort prickles. The fins that furround the body are all inclined from the head toward the tail. The eyes are fmall, and covered with a loofe fkin. The pupils are of a fine bright green. It is a firmer fifh, by much, than the plaife. It is common in the Mediterranean, Englifh, and German feas. *Willughby*, Hift. Pifc. p. 100.

SOLFEGGIAMENTO, in the Italian mufic, compofitions, of which the fyllable *ut*, or *do*, *re*, *mi*, *fa*, &c. are the fubject. See SOLFEGGIARE.

SOLFEGGIARE, SOLFIZARE, or SOLMIZARE, in the Italian mufic, is the ufing the fyllables *do*, *re*, *mi*, *fa*, &c. in learning to fing, otherwife called *folfaing*. See the article SOLFAING, *Cycl.*

From this muficians have made what is called a *folfeggiamento*, which properly intimates no more than the practice abovementioned; but the name is more particularly applied to certain compofitions, be they fugues, or others, of which thefe fyllables are the fubject. Several very fine pieces of this kind are extant. *Broffard.*

SOLFIZARE, in the Italian mufic. See the article SOLFEGGIARE.

SOLID *body in geometry*, that which has three dimenfions, length, breadth, and thicknefs. *Ozan.* Dict. Math. p. 117. *Wolf*, Elem. Geom. fect. 421.

Such are prifms, cubes, fpheres, parallelopipeds, cylinders, cones, pyramids, *&c.* *Wolf*, lib. cit. cap. 2. p. 186. See each under its proper article, PRISM, CUBE, CYLINDER, *&c.* *Cycl.*

For the ratio of geometrical *folids*, all prifms, parallelopipeds, cylinders, pyramids, and cones, are in a compound ratio of their bafes and altitudes: fo that if the bafes be equal, they are in the fimple ratio of the altitudes; or, if the altitudes be equal, of the bafes. And as the bafes of cylinders and cones are circles, and circles are in the duplicate ratio of their diameters, it follows that all cones and cylinders are in a ratio compounded of the direct ratio of their altitudes, and the duplicate one of their diameters. *Wolf*, Elem. Geom. fect. 510, feq. Ejufd. Elem. Anal. fect. 106.

Regular SOLID. See the Cyclopædia.

Irregular SOLID, a *folid* which is not terminated, or contained under equal and fimilar furfaces. *Wolf*, lib. cit. fect. 428. *Ozan.* Dict. Math. p. 120.

The *folidity* of a regular body is eafily found from principles of geometry [c]; for that of irregular bodies, mechanical methods are ufed: one is by putting the body in a hollow parallelopiped, and filling up the remaining fpace with water or fand; then taking out the body, and obferving the heighth to which the water or fand rife alone [d]. This gives us a parallelopiped, equal to the given body, whofe folidity is eafily found.—[[c] *Wolf*, lib. cit. fect. 497. [d] Ibid. fect. 498.]

See the article PARALLELOPIPED.

SOLID *root*, among botanifts, expreffes the whole *root* to be one uniform lump of matter. See the article ROOT.

SOLEIL *de mer*, in zoology, a name given by the French writers, and by Rondeletius, to a peculiar fpecies of ftar-fifh, of a fmall fize, the legs of which refemble very much the tails of lizards, and are very brittle.

Gefner defcribes alfo a fpecies under the name of the fea-moon, *luna marina*, which he fays is remarkably fragile, and which, from what elfe he has faid of it in its defcription, appears alfo to be the fame creature. The great character, however, of the creature's legs refembling, both in colour and figure, the end of the common brown land-newt's tail, is fo expreffive, that it cannot but be always known by it.

Thefe rays are fo extremely friable, that it is fcarce poffible to touch them without their breaking, and they are not befet with points in the manner of the common rays of the creatures of this kind: their upper furface is rounded, and covered with a fort of circular fcales; the under furface is, in the fame manner, covered with fcales, but it is flat: thefe fcales alfo differ in figure, being only fegments of circles, whereas the others are compleat rings; thofe on the underfide are beautifully arranged, in an alternate order, of two and one all the way along the rays.

The other rays of ftar-fifhes being furnifhed with many hundred legs, and thefe wanting them entirely, it follows, that in this fpecies the rays themfelves muft fupply the place of legs, and affift the creature in walking; and thence its manner of walking muft neceffarily be different from that of any other kind. Thefe rays are five in number, and are inferted very near the mouth of the creature, which is always placed in the center of the ftar: the part where this aperture is fituated, and which may be called the body of

the animal, is of a roundifh figure; the diameter of it is about a third part of the length of the rays; its under furface is flat, and its upper convex; and it is covered, both above and below, with fcales, but they are arranged in different manners. At the infertion of each of the rays, there is placed a triangular membrane, terminating in a fharp point; and thefe membranes only appear, when the creature is immerfed in water, and moves itfelf about.

The common habitation of the fea-ftars, on the rough fhores of the fea, is no place for thefe tender creatures, every dafh of a wave againft a ftone, if they were in the way, would break off their limbs; they have the caution, therefore, to fix their refidence only in calm places, and where the fhore is covered entirely with a deep fmooth fand. They are often buried in the fand, and often, when the water has forfaken them, are feen walking flowly on the fhore; and in this cafe they ufe their rays as fo many legs. As they divide the body of the fifh into equal parts, there is no ray before or behind any where, fo that the creature goes with equal eafe to any fide that it likes. The beft motion they are able to make is, however, very flow, and the ground on which they march ought to be very even; for if they attempt to haften their pace, or if they find any thing uneven in their paffage, one or more of their legs ufually breaks; and this is the reafon why this fpecies is feldom found with its rays perfect. They never bury themfelves deep in the fand, but juft get under it, fo as to be covered; and this they do by advancing two of the rays together, and burrowing carefully with them, and then following them with the reft of the rays and the body. Mem. Acad. Par. 1712.

SOLIFUGA, in natural hiftory. See SOLIPUGA.

SOLIPUGA, in natural hiftory, that name given by the Romans to a fmall venomous infect of the fpider-kind, called by the Greeks *heliocentros*, both words fignifying an animal which ftings moft in the country and feafons where the fun is moft hot.

Solinus makes this creature peculiar to Sardinia; but this is contrary to all the accounts given us by the antients. Pliny tells us of its being common in Ethiopia, and that in fome places there the inhabitants had been all killed by the ferpents and *folipugæ*; and Lucan gives the hiftory of it among the poifonous reptiles of Africa.

Almoft all the hot countries produce this venomous little creature. It lies under the fand, to feize other infects as they go by; and if it can meet with any uncovered part of a man, will bite him, and the wound will prove very painful and envenomed. It is faid that the bite is abfolutely mortal, but probably this is not true. Solinus writes the word *folifuga*, and fo do many others, erroneoufly deriving the name from its flying from the fun's rays, and burying itfelf in the fand.

Pliny fays that it was an ant of the fhape of a fmall fpider, but his accounts of this kind are too confufed to be much depended on. Some of the old commentators wander yet farther from the truth, and call it a kind of fly; but the defcriptions of it, by thofe moft to be trufted, make it a fpider, and it feems to be that called by Ariftotle *phalangium defticum*, the deadly fpider. It is plain that even Pliny, in fome part of his works, has underftood the creature to be this phalangium; for where he has tranflated the old Greek writers on the fubject of the phalangium, he has very frequently rendered the word not phalangium, but *folipuga*: fo that it is wonderful he fhould, in other places, treat of the phalangium, without any mention of the *folipuga*, and of the *folipuga*, in a different part, as not at all allied to the phalangium. It appears from this, and a great many like things, that Pliny wrote his book at different times, and tranfcribed his accounts from different authors; fo that he fometimes forgot what he had before written on the fame fubject under a different name.

SOLLECITO, in the Italian mufic, is fometimes ufed to exprefs that a piece is to be played in a mournful manner, fit to enforce grief upon the hearer; at other times, that it ought to be done carefully and with exactnefs. *Broffard*.

SOLMIZARE, in the Italian mufic. See SOLFEGGIARE.

SOLO, in the Italian mufic, is frequently ufed in pieces confifting of feveral parts, to mark thofe that are to perform alone; as *flauto folo*, *violino folo*.

It is alfo ufed for *fonatas* compofed for one violin, one German flute, or other inftrument, and a bafs: thus we fay, *Coralli's folos*, *Geminiani's folos*, &c.

When two, or three parts, play or fing feparately from the grand chorus, they are called a *doi foli*, a *tre foli*, &c.

Solo is fometimes denoted by *S*.

SOLOMON's *feal*, a plant, called by authors *polygonatum*. See the article POLYGONATUM.

SOLSEQUIUM, a word ufed by fome chemical writers as a name for fulphur.

SOLOS, σολος, in antiquity, an inftrument with which the exercife of the quoit was performed, which fome will have to be diftinguifhed from the difcus, becaufe that was of iron, this of ftone: but others, with more reafon, report that the difference confifted in this, *viz.* that the σολος was of a fpherical figure, and the difcus broad. *Potter*, Archæol. Græc. Tom. I. p. 443.

SOLVENTS (*Cycl.*)—Among the feveral liquors, which are called *folvents* of the metals, there are fome which entirely diffolve them, others which diffolve only a part of them. Common water is the moft general of all *folvents*; it diffolves all metals by attrition alone. Mercury does not eafily diffolve iron, but it readily enough diffolves all other metals. Acids in general alfo diffolve them all; but thefe acids being of different natures, fome of them diffolve fome particular metals, and do not touch the reft. The general divifion of the acid *folvents* is into two kinds, thofe of the nature of aqua fortis, and thofe of the nature of aqua regia. The laft are either the fpirit of fea-falt alone, or any of the other acids, with the addition of fea-falt, or its diftilled fpirit; and the firft are fpirit of nitre, and all other mixed menftruums, in which fpirit of nitre makes a part, provided there be no fpirit of fea-falt, or of that falt in fubftance in them. There is alfo a third clafs, befide thefe, of what are called the fimple acids; thefe are fuch acid liquors as contain neither nitre nor fea-falt, nor any preparation of them; and of thefe fome are obtained from the animal, fome from the vegetable, and fome from the mineral kingdom.

All the *folvents* of the aqua regia clafs diffolve gold, without diffolving filver, and all thofe of the aqua fortis clafs diffolve filver, without touching gold: but the other acid fpirits, and the aquæ regales, and aquæ fortes, all equally diffolve the leffer metals, if made of a proper degree of ftrength for each metal. It was long fuppofed, that mercury was only foluble in the aqua fortis clafs, but Mr. Homberg has proved that the aquæ regales will alfo diffolve it; and the fame accurate chemift has alfo advanced another fact, which more than this contradicts the received opinions: this is, that filver is alfo foluble in aqua regia, if proper circumftances are obferved. The occafion of his advancing this, was the following obfervation. He often made his aqua regia, by diftilling together two parts of falt-petre, three parts of vitriol, and five parts of fea-falt; in the diftillation he ufed to feparate the phlegm which rofe firft, and keep it in a vial by itfelf, and the fpirit that followed in another.

One day having fome gold to diffolve, he by miftake took down the vial which contained the phlegm of the aqua regia, inftead of that which contained the ftrong fpirit; he poured on a quantity of this phlegm to the gold, and fet it in a proper heat for two hours, when taking it out, the liquor was found to be tinged yellow, but the gold was not diffolved. Not recollecting the miftake, he fuppofed he had taken aqua fortis inftead of the aqua regia, and taking out the gold he weighed it, and found it had not loft a grain. On this he put in a piece of filver to the liquor, and placing it again in the fame heat, this metal was foon diffolved into a fort of black mud. In this folution there appeared nothing of that ebullition, which always attends the diffolving filver in aqua fortis; and Mr. Homberg, furprifed at this, was for repeating the operation; when pouring the liquor upon fome frefh filver, it did not appear to diffolve it at all: in enquiring into the caufe of this, he found that the liquor he had taken was not aqua fortis, but the phlegm of aqua regia. On this the event feemed much more remarkable than before, and he repeated the procefs feveral times, and always with the fame fuccefs; but trying it a year afterwards, he found the event exactly contrary, the fame liquor then diffolving gold, and not touching filver: after this making fome of the phlegm afrefh, he found it would diffolve filver, and not gold, as in the firft experiment; and this, when it had been kept a year, again changed its nature, and would then diffolve gold, and not filver. So that, from the whole, there appear three neceffary circumftances for the making aqua regia diffolve filver; the firft, that it be very weak; the fecond, that it have before had gold in it; and the third, that it be frefh diftilled.

This phlegm of aqua regia is pellucid, and colourlefs as water, before it has been poured upon the gold; after this it becomes lightly tinged with yellow, and when after this it is powered upon the filver, it becomes as black as ink. The folution of filver, in this menftruum, is very different from that in aqua fortis; in the laft it is made with great ebullition, and the folution, when perfected, is limpid as water; in the other there is no ebullition, and the folution appears rather a difunion of the parts, for the whole becomes black and turbid, and differs much from a clear folution. Mem. Acad. Par. 1706.

SOLUTION (*Cycl.*)—*Chemical* SOLUTION. The great Boerhaave has fummed up the doctrine of *chemical folution*, by its feveral agents, in the following fuccinct manner.

1. *Solution* is performed by water, by diluting, infufing, boiling, diftilling, mixing, fermenting, putrefying, and feparating.

2. With oil, by diluting, infufing, boiling, diftilling, mixing, feparating, but not by fermenting, or by putrefying.

3. With fire, by calcining, roafting, burning, melting, fubliming, mixing, feparating, and by the promoting feveral other operations.

4. With the affiftance of air, by fermenting, putrifying, agitating, exciting, and adding other parts capable of diffolving.
5. With fermented fpirits, by diluting, infufing, boiling, diftilling, mixing, and making oils thinner.
6. With alkaline falts, by calcining, torrefying, burning, melting, mixing, and feparating, according to the various force of a dry fire employed.
7. By volatile alkaline falts, by fubliming in the dry way, and by diluting, diftilling, and digefting in the moift way.
8. With fixed alkali falts, affifted and moved by water and fire, by digefting, boiling, diluting, feparating, and mixing.
9. With fixed acid falts, as thofe of alum, fulphur, and vitriol; either feparately in a liquid form, or in their calxes, by diluting, boiling, diftilling, digefting; or in a dry form, by calcining, roafting, burning, and diftilling.
10. With volatile acid falts, by diluting, digefting, diftilling, and infinuating.
11. With compound falts and foaps, by calcining, fubliming, diftilling, and digefting, either in a dry or a liquid form.
And 12. with metals, by fufion and amalgamation.
This feems an accurate and perfect table of the whole work of *folution*, and will eafily be underftood in every article, on recollecting the feveral chemical proceffes. *Boerh.* Chem. Part. 2. p. 338. See MENSTRUUM, *Cycl.* and *Suppl.*
No phænomenon in nature is more univerfally known, than the *folution* of falts in common water, but the world has not yet attended to all that might be learned from the obfervations on it.
Mr. Lemery, who examined into this point with great affiduity, has obferved, 1. That the firft effect of water upon a falt, is the reducing it into an inexpreffibly fine powder. 2. That it is merely the confequence of this pulverifation carried greatly farther, that every particle of falt which, while in larger moleculæ, fubfided to the bottom of the water, according to the known laws of hydroftatics, becomes capable of being elevated and fufpended in the water, though in itfelf greatly heavier than that fluid; that while in a proper ftate of feparation in this manner, they remain imperceptible in all the water, and when by certain accidents they again approach one another, they form concretions like their original ones, and again fubfide in that fluid, in which they floated while in form of this imperceptible powder.
In the *folutions* of falts, the fame author obferves, that all the particles of water do not ferve to the fame purpofe; fome officiating only in the keeping the faline particles fufpended, others in the keeping them afunder, and, as barriers, preventing their reunion.
The quantity of water, neceffary to fuftain the particles of all falts in folution, is the fame, but the quantity, required to keep thofe particles from joining again, is different, in regard to every falt. Hence though a quantity of water, equal to the weight of the falt, be fufficient to the fufpenfion of its particles, yet every falt requires its own appropriated quantity of water to keep it in a ftate of folution; that is, to keep its particles from cohering together again. In fuch falts, the particles of which are not fubject to form hard concretions, fuch as the fixed falt of tartar, and the like, there requires no more water for a *folution* than is neceffary to fufpend the particles of the falt; but in thofe which readily form folid concretions, fuch as common falt, nitre, borax, and the reft, there requires a large quantity befide to act as a barrier.
The more the particles of any falt are difpofed to reunite, the more water they require to keep them in a ftate of *folution*; and hence follows a very remarkable phænomenon, which is the *folution* of feveral falts fucceffively in the fame water: this is known to be poffible, and the reafon of the whole is this, that when a given falt, requiring a large quantity of water for its *folution*, is diffolved in that water; the greater part of that water, which in this *folution* ferves only to the fecond purpofe of keeping the particles of the falt afunder, is ftill at full liberty to act as water upon another falt that fhall be thrown into it.
This, however, can be only the cafe in regard to falts which do not naturally ferment with one another, becaufe the whole procefs is difturbed by fuch a fermentation, and, in confequence of it, there is a third falt formed, which is not the fame with either of the two; and the confequence of the formation of this falt, is the precipitation of the metallic, or earthy matter, which was the bafe of one of the other falts. Thus an alkaline falt, added to a *folution* of alum, or faccharum faturni, takes up the acid of either of thefe falts, and becomes, by its mixture with that acid, a new concrete falt, and at the fame time throws down, in precipitation, the terreftrial bafe of the alum, and the metallic one of the falt of lead.
To return to thofe falts which excite no fermentation with one another. In regard to thefe, when a quantity of water has diffolved as much as it can retain of one, it will readily take in and diffolve a fecond; and the particles of this not fermenting with thofe of the falt firft diffolved, will remain fufpended, and the water which diffolves them, and which in the firft *folution* ferved only as an intermedium to keep the particles of that falt afunder, ferve as well to that purpofe, now they are impregnated with this new falt, as they did before.
The reafon hitherto given for this phænomenon was, that the particles of different falts, though fufpended in fuch manner in the fame fluid, that they were every moment coming into contact with one another, yet had no tendency from nature to cohere, or precipitate one another; but that whenever, by future accidents, they fhould be brought to concrete, they would do it feparately, each in its own pure ftate; but this reafon, though true, is an imperfect one. In thefe fucceffive *folutions* of falts in the fame water, the fecond falt produces a remarkable effect, which no body, till Mr. Lemery, feems to have taken notice of; which is, that while this is diffolved in a liquor, which before ferved as an intermedium to keep the particles of another falt afunder, it encreafes by its whole quantity the quantity of that intermedium, and becomes itfelf a fort of intermedium to the particles of the firft diffolved falt; and by this means the liquor, which had before diffolved as much as it could contain of the firft falt, now becomes able to take up fome more of it, and will, in reality, perfectly diffolve an additional quantity: this was an experiment well known, but never underftood before.
It is well known that falt of tartar does not ferment with falt petre, nor does it take any thing from this falt, or at all alter by being mixed with it, which is quite different from the effect on mixing it, as before obferved, with alum, or faccharum faturni; on this principle, and on the known property of falt of tartar being diffolved in a fmaller quantity of water than any other falt; or, in other words, of water's diffolving more falt of tartar than of any other falt, Mr. Lemery refolved on the trial, whether water, which had already diffolved as much nitre as it could contain, would not, on the addition of falt of tartar, diffolve a larger quantity of frefh nitre, than on the addition of fal armoniac, or any other falt: but what appeared very ftrange was, that after two days ftanding of a *folution* of nitre, with about a fourth part of the quantity of falt of tartar added, there was found a white powder at the bottom. The liquor being examined on this, was found to be a lixivium of falt of tartar, and the powder at the bottom, falt petre.
On adding frefh quantities of falt of tartar, new precipitations were afterwards formed, and, in fine, all the falt petre which had been diffolved was feparated. The falt petre being examined, by all trials proved true falt petre, as pure and unmixed as when put in; and the liquor being evaporated, the falt of tartar was found equally pure. Salt of tartar tried afterwards in the fame manner with *folutions* of other falts, with which it does not raife any fermentation, was found to have the fame effect, precipitating all equally out of the *folution*.
In the common precipitations of falts, fuch as alum and fugar of lead, by means of an alkali, the alkali feizes upon the acid of thofe falts, and by that means effects the thing, and therefore itfelf becomes changed into another falt, and the precipitate, robbed of that acid, is no longer the falt it was, but merely its bafe: but here the falts, both alkali and neutral, remain the fame they were before, both pure and unmixed, and the whole procefs feems only one of them taking the place of the other.
The falts which are capable of fucceffive *folutions* in the fame water, and of remaining fufpended together in it, muft be all of the neutral kind; that is, they muft be falts compofed of acids, engaged in fuch manner in the pores of their bafes, as to fill the whole, and leave no void fpaces for the penetration of other acids. But this is by no means the cafe with falt of tartar, which being wholly fpunge-like in its ftructure, readily admits all forts of acids, and ferments with them; and therefore is very capable of divefting other falts of that, on the prefence of which their natural ftate, as falts of a particular kind, depends.
Every alkali falt is, as it were, an effential falt, in part decompounded; that is, it is the earthy part of fuch falt, the acid parts of which have been driven off by fire, and when there is only fo much left, as may give the whole a faline form; for if all the acids were to be driven off, the remainder would not be an alkali, nor yet a falt, but a mere fimple earth; as is the cafe in the caput mortuum of fpirit of nitre diftilled by a retort, the refiduum from this diftillation being a mere dead earth, indiffoluble in water, and altogether different from the fixed alkali produced by burning the fame nitre with charcoal. What proves, alfo, that thefe alkalis are only the matrix of the compound falts divefted of their acids, is, that if fpirit of nitre be poured upon the alkali falt of nitre made with charcoal, true nitre is regenerated. Mem. Acad. Par. 1724.
When *folutions* of falts are congealed, the ice often affords very pretty figures; but it is to be obferved, that the fame falt does not always give the fame figures. Thus the fame *folution* of verdigreafe, frozen by means of fnow and falt, affords

affords a different figure, from what is produced by the natural cold of the air. And the former ice being thawed, and left to freeze in the same vial, did not give the same figures as at first. See *Boyle*'s Works Abridged, Vol. I. p. 168.

SOLUTION, in metallurgy, is distinguished into dry and moist. The dry *solution* is the blending imperceptibly a small quantity of a metal, or mineral, with a very large one of some other body, dry, hard, and not fluid when cold. The moist *solution* is the distributing a body through the very minutest parts of an aqueous, or in great part aqueous fluid, in such manner, that both may turn into a fluid, to appearance, homogeneous, which goes through all filters, without being detained or separated by them, and the smallest part of which contains in it a proportionable quantity of both the menstruum or dissolvent, and of the dissolved body. The *solution* of gold in aqua regia, and of silver in aqua fortis, as also that of any of the salts in water, are *solutions* of this kind. *Cramer*'s Art of Assaying, p. 194.

In the making the several *metallic solutions*, for the necessary processes in chemistry, the operator is subject to great danger in his health, from the noxious vapours. This has been an accident complained of indeed by many, but scarce attempted to be remedied or obviated by any, in a rational way, till Mr. Geoffroy, whose experiments subjected him greatly to the mischief, employed his thoughts for his own sake, as well as that of the world in general, to the effectual preventing it.

The dissolutions of the metals, in the corrosive acid spirits, are those which send out the most copious and most dangerous vapours. The exhalations of quicksilver, of antimony, and of lead and copper, are all in themselves greatly hurtful, as well as the fiery vapours of spirit of nitre, sea-salt, or vitriol; and if either of these is singly so, how pernicious must they need be in those cases, where two of them are joined together in such a manner, as that this union sends up infinitely more vapours than would otherwise arise? in this case, the utmost care is necessary to prevent the chemist from falling a sacrifice to his zeal for his discoveries.

The common way of avoiding this danger, is by making the *solution* either abroad in the open air, or in a chimney; but sometimes these cautions cannot be used, and under some circumstances they are ineffectual. This gave occasion to Mr. Geoffroy to use a method, which he afterwards proposes to the public, of stopping the rise of the vapours entirely, or at least of diminishing them so greatly, that they shall be harmless and unperceived. All that was necessary to this, seemed to him to be the contriving to cover the surface of the fluid with some body, capable of retaining those vapours, yet not capable of disturbing the operation of the menstruum on the metal; and the common expressed oils of fruits, as the oil of olives, almonds, or the like, were found capable of happily performing this effect; and that particularly, as they would easily receive into themselves the acid salts which arise in the conflict. The thing which gave this gentleman the hint of the discovery was, that in the boiling of sugars, honey, or the like substances, when there is any danger of their boiling over the vessel, the pouring in a little oil stops the swelling. In the *metallic solutions* it has the same effect; and that heightened by this good consequence, that by keeping in the fiery vapours of the acid, it returns them back upon the metal, and by this means does, in effect, add greatly to the power of the menstruum.

This method of using oil has indeed three advantages, 1. The preserving the operator from the injuries from the vapours. 2. The greatly moderating that violent rarefaction which is often of ill consequence. And 3. the same quantity of the menstruum, by this means, dissolves more of the metal. The best method of making *solutions* with this advantage is this: first wet the surface of the metal to be dissolved with water, or spirit of wine; then pour a little water, or spirit of wine, into the glass in which the *solution* is to be made, this will prevent the oil from sticking to the surfaces of either; then put the metal into the glass, and pour in the oil upon it; last of all, pour on the menstruum: this being greatly heavier than the oil, will sink to the bottom and work upon the metal, while the oil perfectly covers the whole surface. There is no need to be exact as to the quantity of the oil, but more or less is to be used, in proportion to the greater or less ebullition which the mixture is expected to make.

The air-bubbles, which arise to the surface with great impetuosity in the making of these *solutions*, are here seen to break by degrees as they enter the covering of oil, and generally are quite dissipated before they arise to the surface of it. The few of them which retain their figure till they arrive at the surface, there burst and give a slight exhalation; and one may continually see the drops of the menstruum falling back again out of the oil into it, after being deserted by the bubbles of air which had raised them so far. On the contrary, in the common way of making *solutions*, the air-bubbles push one another up to the surface, where they form a sort of skum, which continually thickens by their fresh rising and supporting one another, till it often rises over the top of the vessel. These bubbles of air seem to be formed of small parcels of air extremely condensed in the pores of the metal, which, when the particles of it are separated for *solution*, find themselves at liberty to dilute and expand, and arise to the surface in their proper form.

If it be thought necessary, in any *solution* which raises a more than ordinary quantity of vapours, to prevent the flying off of that small quantity which may escape through the oil, there is nothing more necessary than to pour a little spirit of wine upon the oil; for the acid vapours which pass the oil will then be received in the spirit, and will be dulcified in it, and instead of a disagreeable odour, will yield only a very sweet and safe one. Spirit of wine alone, used instead of oil, and poured gently on the *solution*, has very great effects; insomuch, that if used to the *solutions* in spirit of nitre, which usually send up very noxious and coarse red vapours, they by this means are made to send up only very fine light white ones, and those of a very agreeable smell: the bubbles raised in this case are very small, and usually burst before they arrive at the surface of the spirit. The only objection to this method, is, that the spirit of wine soon mixes itself with the menstruum, and there are some cases in which this may be of ill consequence to the process. Mem. Acad. Par. 1719.

SONCHUS, *sowthistle*, in botany, the name of a genus of plants, the characters of which are these. The flower is of the semiflosculous kind, being composed of a number of semiflosculės, each standing upon an embryo seed, and all contained in a general cup, which is considerably thick, and becomes of a conic figure when ripe. The embryos finally become seeds, winged with down, and affixed to the thalamus. See Tab. 1. of Botany, Class 13.

The species of *sonchus*, enumerated by Mr. Tournefort, are these. 1. The prickly *sonchus* with undivided leaves. 2. The prickly *sonchus* with leaves jagged in the manner of those of dandelion. 3. The prickly *sonchus* with undivided leaves, in shape resembling those of the lettuce, or of dipsacus. 4. The Cretic jagged prickly *sonchus*. 5. The great tree prickly *sonchus*. 6. The great creeping *sonchus*, called by many the *great creeping hawk-weed*. 7. The smooth *sonchus* with broad jagged leaves. 8. The white-flowered broad-leaved jagged smooth *sonchus*. 9. The smooth *sonchus* with leaves divided into numerous fine segments. 10. The lesser smooth *sonchus* with less jagged leaves. 11. The smooth narrow-leaved *sonchus*. 12. The narrow-leaved sea-*sonchus*. 13. The smooth *sonchus* with poppy leaves. *Tourn.* Inst. p. 474.

The common *sowthistle* is greatly recommended by authors as a refrigerant and attenuant. It is prescribed by many of the old physicians in stranguries, and other disorders of the urinary passages; and is ordered externally, in cataplasms, in all kind of inflammations.

SONTAGE, in our old writers, a tax of forty shillings laid upon every knight's fee, according to Stow, p. 284. *Blount*, *Cowel*.

SOOT (*Cycl.*)—This is an excellent manure, particularly for cold lands, which have been long over-run with moss; but sea-coal-*soot* is much better for this purpose than wood-*soot*. They usually allow forty bushels to an acre, but some lands require more. It produces an extremely fine and sweet grass, and destroys weeds of all kinds. *Mortimer*'s Husbandry.

The chemical analysis of *soot* shews us, that it is composed of several parts; 1. a fetid, oily, bitter spirit. 2. Water. 3. A sharp volatile alkaline oily salt. 4. A sharp alkaline fat oily spirit. 5. A fetid black bitter inflammable, and almost caustic oil, mixed with an oily salt. 6. A true sal armoniac. And 7. a black fixed earth.

Wood-SOOT has been long known as a good medicine in many cases, but the principles upon which it acted as such were never well understood, till Boerhaave gave a regular analysis of it. The directions he gives for the process are these.

Choose the blackest and driest *wood-soot* from the chimney of an oven, where nothing is baked but bread, and nothing burnt but vegetables; gather this in a dry day, and fill with it a glass retort almost up to the neck; clean the neck of the retort, and luting on a receiver, give a fire of a hundred and fifty degrees, and keep it up equably, a large quantity of transparent water will come over with considerable violence. When no more water will come over, cleanse the receiver, and raising the fire to a little above two hundred degrees, there will then come over a whitish fat liquor; this also comes over with great violence, and the fire must be gradually encreased, till no more of this will come. Change the receiver, and raise the fire to a yet greater degree, and a yellow, copious, volatile salt will come over, and stick all over the sides of the new receiver. When no more of this salt will arise, encrease the fire to the utmost that sand can give, and with a heat of suppression there will arise a black thick oil; when this is all come over, and the vessels cooled, there will be found in the neck of the retort a salt, which could be raised no higher, even by that violent fire; and in the

the bottom of the retort there remains a black feculent matter, the upper furface of which is covered with a white faline cruft, which, both in figure, colour, and the ftructure of its ftriæ, refembles the common fal armoniac. If the milky liquor be rectified, it affords a very penetrating volatile fpirit, and fome fharp volatile falt.

Here we are taught what the agitation of an open fire can move, change, expel, and drive through the air by burning; firft in the form of fmoak, then of flame, and laftly of exhalation, and how high it is able to carry them; for a chimney is a kind of ftill-head, converging in an open top, and *foot* is often carried up thirty or forty feet, or more, to the top of thefe, and after this a black fmoak is difcharged out of the orifice, which difperfes in the air, and finally feems to vanifh.

This fmoak and *foot* confift of feveral parts; as 1. a fetid, oily, unpleafant bitter fpirit, refiding in the water that firft comes over, and is afterwards found difperfed alfo through all its other parts; this fpirit feems to be the oily and more fubtile part of the vegetable, acted on by the force of fire. 2. A water, which is here contained in great plenty in this fpirit; in the firft limpid, and in the fecond milky liquor, as alfo in the faline fpirit, and the volatile falt itfelf, and even in fome degree in the oil. This water can fcarce be feparated pure by any art, being always impregnated with the bitter tafte and naufeous fmell of the fpirit. 3. A fharp volatile alkaline oily falt, which firft comes over, and fticks to the fides of the receiver. From this principle we are well affured, that fuch a volatile alkaline falt always ftrongly impregnates the whole air, where wood fuel is burnt. 4. A fharp alkaline fat fpirit, confifting of the falt juft now mentioned diffolved in water, and fo refembling fpirit in fluidity, pungency, volatility, and the other qualities. 5. A fetid black bitter naufeous, and almoft cauftic oil, mixed with an oily falt. 6. A true fal armoniac, raifed to the neck of the retort, and covering the furface of the black matter left at its bottom. If this falt be carefully collected and feparated from the alkaline kind, it proves to be a perfect and genuine fal armoniac; it is of a whitifh colour, fomewhat tranfparent, and makes no effervefcence with acids, and if mixed with fixed alkalis, it eafily yields a volatile falt, wholly agreeing with that from the commom fal armoniac; whence by the by it is evident, that all fal armoniac owes its origin to *foot*. 7. The laft fubftance found in *foot*, is the remaining black earth left at the bottom of the retort: this has an oil which tenacioufly adheres to it, and when this is driven off in a ftrong open fire, there remains a white calx.

By this accurate analyfis of *wood-foot*, we learn what parts of vegetables are volatile, and fly off by an open fire, and what are fixed and remain behind, and finally, what fire throws off from vegetables into the air; and hence, among other things, we may learn that even earth, which appears fo very fixed in the fire when feparated from the other principles, yet when mixed with them is, by the force of fire, thrown up to the height of forty feet, and more, in the air; whence it afcends to yet greater heights, and finally difperfes in form of a thin cloud.

Hence we may alfo learn that *foot*, which contains fo many active principles, muft be qualified for a powerful medicine. Pills of dry *foot* are found very beneficial in all cold diftempers; the volatile falt of *foot* poffeffes the virtues of the volatile falts of animals. The falt which rifes laft is recommended greatly by Hartman for giving relief in cancers; and this is very probable, fince fal armoniac of the common kind, properly applied, is known to be of great ufe in cafes of running cancers. *Soot* of different fuels is not to be fuppofed all to poffefs the fame virtues; that of pit-coal is found to be a fubftance of a very different kind from that of wood, and that of the common turf, or peat, and of the oak wood, have alfo been found, on experiment, to be very different. Boerhaave very juftly obferves, that the *foot* from kitchen-chimneys, where the fmoak muft have been impregnated with the effluvia of the victuals, muft be very different from pure *wood-foot*. *Boerhaave*'s Chemiftry.

The tincture of *foot* is in ufe; and Dr. Cheyne recommends it as a great and fudden relief in vapours. Nat. Meth. of curing Difeafes.

SOPHORA, in botany, the name given by Linnæus to a genus of plants called by Dillenius, in his Hortus Elthamenfis, *ervi fpecies*; the characters are thefe. The perianthium is fhort and campanulated; it confifts of one leaf, divided into five obtufe fegments at the end. The flower is of the five-leaved papilionaceous kind. The vexillum is oblong and ftrait; it grows broader as it approaches the apex, and is bent back at the edges. The alæ are two; they are oblong, of the length of the vexillum, and appendiculated at the bafe. The carina confifts of two petals, of the fize of the alæ, the under edges of which ftand near together, fo that they form a fort of boat. The ftamina are ten diftinct parallel fubulated filaments; they are of the fame length with the flower, and are hid in its carina. The antheræ are fmall and affurgent; the germen of the piftil is oblong and cylindric; the ftyle is of the length and fituation of the ftamina; and the ftigma is obtufe. The fruit is an extremely long and flender pod, it contains only one cell, and is marked with protuberances where the feeds are contained. The feeds are numerous, and of a roundifh figure. This genus of plants agrees with the other papilionaceous and diadelphous genera, except that in this the ftamina are diftinct and feparate. *Dillen.* Hort. Elth. p. 112. *Linnæi* Gen. Plant. p. 177.

SOPHRONISTÆ, σωφρονισταὶ, among the Athenians, were ten officers appointed to take care that the young men behaved themfelves with fobriety and moderation. *Potter*, Archæol. Græc. l. 1. c. 15. Tom. I. p. 84.

SOPHRONISTERIUM, σωφρονιστήριον, among the Athenians, a houfe of correction like our Bridewell. *Potter*, Archæol. Græc. l. 1. c. 25. Tom. I. p. 130.

SOPIO, a name ufed by fome of the old writers for opium, from its foporific virtue.

SOPORARIÆ *arteriæ*, a name given by fome authors to the carotid arteries.

SOPOROUS (*Cycl.*)—SOPOROUS *difeafes*, a term by which medical writers exprefs the *lethargy* and *coma*, and fome others even the *carus* and *apoplexy*.

The firft of thefe, the lethargy, is an idiopathic affection, depending on a congeftion of blood about the head, whence there foon arifes a ftafis both of that and the other humors; the confequence of which is an univerfal oblivion, or forgetfulnefs of all things. The coma is a fymptomatic *foporous* affection, ufually complicated with deliriums, and taking its origin from a reftriction of the fluids about the head in acute fevers. This is the generally received fenfe of the moderns, as to thefe difeafes, though fome invert the meaning of the words, and make lethargy fignify a fymptomatic affection attending perfons in fevers; and the coma to be the idiopathic difeafe, particularly the fleeping coma. To thefe fome alfo add the carus, which they fay is a flighter kind of lethargy; while others will have that difeafe to be a more violent diforder than the lethargy, and of a middle nature between that and the apoplexy, or little better than the laft. *Junker*'s Confp. Med. p. 666.

Signs of them. A lethargy is ufually prefaged by an univerfal laffitude and inaptitude to motion, and a vertigo, or tremor in the head; or an intenfe pain in its hinder part; by a continual inclination and defire to go to fleep, and fleeping more found than ufual; and finally, by a ringing in the ears, and a general hebetude or dulnefs of the fenfes. When prefent, it is known by the patient's falling into a particularly found fleep, out of which it is very difficult to wake him, and when awaked he is wholly forgetful, both of himfelf, and of every thing about him, and has an immediate propenfity to fleep again; the pulfe, refpiration, colour, and heat of the body, are all the while nearly the fame as in health; and when there is a fever attendant on it, it is ever a very flow, and fcarce fenfible one. The coma is of two kinds, the fleepy and the waking, or *coma vigil.* In the fomnolent, or fleepy coma, the patients fall into a long and found fleep, but that not fo profound as in the lethargy; for in this cafe, though they be immoveable, yet they are much more eafily waked than in lethargies, and are not fo perfectly forgetful of all things when waked, as they are in that difeafe. In the coma vigil, or wakeful coma, the patient has an eternal propenfity and defire to fleep, but cannot really get to fleep; with this he is ufually delirious, and commonly keeps his eyes fhut, but is all the time very quick of hearing whatever is fpoken in the room, and opens his eyes immediately on being touched; and fometimes their delirium proceeds fo far, that they endeavour to get out of the bed, and to do feveral mad actions.

Perfons fubject to them. Lethargies principally affect fat people, who are of a fanguineo-phlegmatic habit, and particularly fuch as are advanced in years, and live upon rich and moift diets, and have accuftomed themfelves to fleeping after dinner. Old people alfo, who have been fubject to catarrhs, whether of the head or breaft, and fuch as have been long ufed to have iffues, and have clofed them up, or to regular cuppings at certain feafons of the year, but have omitted them, on account of their advanced age, ufually fall into it. Thofe alfo who have been much ufed to tobacco, whether fmoaked or taken in fnuff, and have fuddenly left it off, very often alfo fall into this difeafe, or into apoplexies. There are alfo many other caufes, from which old men are fubject to lethargies, fuch as long waking, cares and troubles upon the fpirits, the ufe of narcotic medicines, drunkennefs, contufions, or heavy blows upon the head, and, as fome affirm, the being for a long time together expofed to the rays of the moon. Infants alfo, which are fat, are fubject to the fame difeafe, from the ftriking back of any watery humor.

Comas ufually happen to people in acute malignant fevers, and are preceded by violent pains in the head, and raging deliriums, and are very often owing to the improper ufe of opiates, and ftupifying medicines. *Junker*'s Confp. Med. p. 670.

Prognoftics in them. Old perfons, who are fubject to frequent fleepinefs, unlefs they change their courfe of life, and ufe a coarfer

coarfer diet and more exercife, ufually fall into fatal lethargies. In perfect lethargies, in which the patients cannot be wakened at all, they ufually die between the fourth and the feventh day, unlefs an eruption of fome matter from the nofe or ears happen; which is not unfrequently the cafe in perfons who fall into this difeafe, after violent blows on the head. The coma is much the fame in its prognoftics as the lethargy; but in this a cold fweat ufually prefages immediately approaching death. It is much better that a phrenitis fhould happen to perfons in a lethargy, than that a lethargy fhould happen to thofe in a phrenitis.

Method of cure. In a lethargy the fenfes are to be roufed, and the humors deduced from the head to the lower parts by ftimulating glyfters, and acrid fuppofitories, by ligatures on the oppofite parts, by frictions, blifters, and finapifms, or fuch cataplafms as bring on heat and rednefs of the parts, applied to the foles of the feet and the palms of the hands; as alfo by twitching off the hairs in very fenfible parts, by applying volatile falts to the nofe, by pricking with a needle, and by loud calling: and in plethoric habits, immediately after the clyfter, a vein fhould be opened, and after that leeches applied to the temples; and internally, powders of nitre and cinnabar, with the gentle alexipharmics, are to be given; and all forts of camphorated medicines are proper to be applied externally, after fhaving the head. In many cafes, crudities in the primæ viæ have a great fhare in bringing on thefe difeafes, and in fuch vomits and brifk purges are very proper.

In a coma, whether it be of the fomnolent, or wakeful kind, the fever, which is the primary difeafe, is firft to be regarded; but with the antifebrific medicines, the nitrous and cinnabarine fhould be joined, and the camphorated ones ufed externally.

Prefervatives againft them. Every prefervative muft tend to the taking off what may prove the caufes of thefe diforders. For this purpofe, in old perfons of mucous habits, the matter muft be by all poffible means derived from the head, and carried off by fome fafe way. In this intention, brifk purges of jalap and colocynth, and for thofe of very fanguine habits, of black hellebore, are to be given every quarter of a year. To thefe fhould be added the bitters, and fulphureous medicines, with the gum refins, in form of pills: thefe fhould be taken regularly at the equinoxes; and a proper diet muft be obferved, namely, drier foods muft be principally eaten, and the fpices frequently ufed, and the patient advifed not to eat too heartily. Roafted meats, in general, are better than boiled; and wine fhould be drank in moderation, and fome of it impregnated with bitters. *Junker*'s Conf. Med. p. 678.

SOPRANO, in the Italian mufic, fignifies the treble.

SORA, in botany, the name given by the people of Guinea to a kind of fhrub which they ufe in medicine, boiling it in water, and giving the decoction in cafes of pain of any kind.

The leaves of this fhrub are of the fize and fhape of thofe of fena; they ftand upon fhort footftalks, and are woolly underneath. Philof. Tranf. N° 231.

SORBUS, the *fervice-tree*, in botany, the name of a genus of trees, the characters of which are thefe. The flower and fruit refemble thofe of the cratægus, but differing, in that the leaves are winged as thofe of the afh.

The fpecies of *forbus*, enumerated by Mr. Tournefort, are thefe. 1. The common *fervice*. 2. The cultivated *fervice* with a large red fruit of a turbinated form. 3. The cultivated *fervice* with large turbinated pale-red fruit. 4. The cultivated *fervice* with a reddifh middle-fized turbinated fruit. 5. The cultivated *fervice* with a reddifh middle-fized oval fruit. 6. The cultivated *fervice* with a fmall reddifh turbinated late-ripening fruit. 7. The cultivated *fervice* with fmall turbinated fruit. And 8. the wild *fervice*, or *forbus aucuparia*. *Tourn.* Inft. p. 633.

SORE, among fportfmen, denotes a buck of the fourth year.

SOREL, in the language of fportfmen, a buck of the third year. See the article BUCK.

SOREL, in botany. See SORREL.

SOREX, in zoology, the name of a fpecies of wild or fieldmoufe, called the *dormoufe*, or *fleeper*. There are two kinds of this creature, a larger and a fmaller.

The larger *dormoufe* is nearly of the fize of the common rat. Its colour is a brownifh grey, like that of the common moufe, but variegated with fomewhat of a reddifh caft on the fides, and on the head. The ears are large and fmooth; the belly is white; and the inner part of the legs, and the lower part of the tail, efpecially toward the extremity, are of the fame colour. The noftrils and the feet are red; the tail is all over hairy, and is terminated by a thick tuft of white fur. The eyes are large and prominent, and of a fine jetty fhining black. The beard is partly white, and partly black. Round about the eyes, and round the ears, there is a fine blacknefs; the upper part of the tail is alfo black. The fmell of this creature is the fame with that of the moufe, and its dung is of the fame kind. It lives in caverns underground, and fleeps all the winter, as fome affirm. It feeds on vegetables, and is particularly fond of hazel-nuts, which it ufually hoards up, when ripe, for a fcarcer feafon. *Ray*'s Syn. Quad. p. 219.

The fmaller kind is much more common than the larger one. This is of the fize of the common moufe, and in different countries varies much in colour. In Italy Mr. Ray obferved it all over of a reddifh tawney on the upper part, except the end of the tail, and all its under part white, the tail only excepted; the tail covered with long and thick-fet hairs, and looking fomewhat like a fquirrel's. The eyes are very black and prominent. Thofe which the fame author obferved in England were lefs of the reddifh hue on the back, and were not white under the belly, but only on the throat; neither had they the white tip at the end of the tail. Poffibly the Italian and Englifh may be really diftinct fpecies. This creature feeds on nuts and other fuch fruits. It retires into caves in winter, and fleeps much, but not through the whole winter, as has been fuppofed, for it lays up its winter-provifion in its hole in autumn, and feeds on it at that time. *Ray*'s Syn. Quad. p. 220.

The *forex*, according to the Linnæan fyftem, makes a diftinct genus of animals; the diftinguifhing character of which, is, that its dentes incifores, or cutting-teeth, are two in number, and are ferrated, or notched on each fide. *Linnæi* Syft. Nat. p. 40.

SORGLUM, in the materia medica, the name of the grain of the *milium arundinaceum*, called *Indian millet*. *Dale*'s Pharm. p. 262.

SORNI, a name given by fome of the chemical writers to iron. *Caft.* Lex. Med.

SORRANCE (*Cycl.*)—SORRANCE-*water*, a name given by our farriers to a folution of vitriol and fome other ingredients in vinegar, a medicine much efteemed in many of the difeafes of horfes: it is prepared in the following manner.

Take Roman-vitriol and roach-alum of each an ounce and half, verdigreafe an ounce, copperas two ounces; reduce all thefe to powder together, and put them into a two-quart bottle, into which pour a quart of the ftrongeft and beft wine-vinegar; this is to be fet in balneo mariæ. The fhort way of doing which by the farrier, is this: he puts a wifp of hay into the bottom of a kettle, and then tying fome pieces of lead or iron about the neck of the bottle, to make it heavy enough to fink in water, it is fet upon the hay fo, as to ftand very upright; then three notches are cut lengthwife in the cork to give paffage to fome of the vapours when the bottle is heated, that it may not burft. When every thing is thus prepared, fo much cold water is to be put into the kettle, that the neck of the bottle may ftand two or three inches above it; the kettle is then to be fet over the fire, and the water is to be made to boil, and kept boiling about half an hour, the bottle being at times taken out, and thoroughly fhaken. When the falts are thus thoroughly diffolved in the vinegar, the whole is to be kept for ufe.

The method in which they ufe it is this. Take an earthen pan, which will hold about twelve quarts, let this be filled with urine that has been made by found, healthy, and young perfons; the ftaler the urine is, the better it is for ufe, and it ought indeed always to ftand, at leaft, three weeks before it is ufed. It is proper for the farrier, therefore, always to keep a quantity of this ready, and when the *water* is to be ufed, half a pint of it is to be mixed with a quart of the urine, or if it be required ftronger, more of the *water* is to be added: thefe are to be thoroughly mixed together, and the legs, or other affected part of the horfe, bathed with it with foft rags twice a day.

The virtues of this *water* are highly extolled; it is faid to cure the malanders in two, or three times dreffing; it is alfo a fovereign remedy for the mange, either dry or wet, and for the rat-tails, fcratches, gourded, or fwelled legs and heels; and it alfo cures horfes when the greafe is fallen into their heels, as the farriers exprefs it. The farcy is alfo faid to be often cured by a long continuance in the ufe of it, purging the horfe two or three times, at different diftances of time, during the time of his being under cure by the *water*. They alfo find it a good cleanfer and healer of foul ulcers, and that it prevents the breeding of proud-flefh and worms in wounds, and drives away a flux of humours that were falling upon any part. They ufe it alfo in clefts and cracks of the heels, and in windgalls, efpecially in the prevention of the laft by its repellent qualities. The green *water* alone is an excellent remedy for fiftulas, cankers, and the galled backs of horfes; difpofing fuch *forrances*, as they are called, not to fefter, rot, and grow worfe, as all greafy and oily medicines do, but cleanfing them, and laying the way to a very found and ftanding cure.

SORREL, *acetofa*, the name of a genus of plants, the characters of which are thefe. The flower is of the ftamineous kind, being compofed of a number of ftamina arifing from a fix-leaved cup. The piftil, which is furrounded by thefe, finally becomes a triangular feed, wrapt round in a cup: this is compofed of three of the fix leaves of the cup, the other three withering away.

The fpecies of *forrel*, enumerated by Mr. Tournefort, are thefe. 1. The common meadow-*forrel*. 2. The white-flowered

flowered meadow-*forrel.* 3. The meadow-*forrel* with curled leaves. 4. The great mountain-*forrel.* 5. The Pyrenean *forrel* with very long and narrow leaves. 6. The mountain-*forrel* with a broad and roundifh leaf, fomewhat refembling that of arum. 7. The mountain-*forrel* with leaves like thofe of the lemon-tree, and with branched twigs. 8. The mountain-*forrel* with undulated leaves, and not branched twigs. 9. The dwarf mountain-*forrel* with the fagopyrum leaf. 10. The mountain-*forrel* with knotty points. 11. The tuberofe-rooted *forrel.* 12. The *forrel* with pale green arifarum leaves. 13. The mountain-*forrel* with narrow arrow-headed leaves. 14. The marygold-leaved *forrel.* 15. The atriplex-leaved fhining *forrel.* 16. The great Italian *forrel* with round glomerated feeds. 17. The lanceolated field-*forrel.* 18. The tall narrow-leaved lanceolated, or fheep's *forrel.* 19. The narrow-leaved creeping lanceolated *forrel.* 20. The fmall *forrel* with leaves not lanceolated. 21. The Cretic *forrel* with prickly feeds. 22. The fmall Cretic *forrel* with utriculated feeds. 23. The bafil-leaved *forrel.* 24. The American *forrel* with leaves ftanding on very long foot-ftalks. 25. The roundifh-leaved tree-*forrel.* 26. The round-leaved garden-*forrel.* 27. The round-leaved Alpine *forrel.* 28. The round-leaved creeping Yorkfhire *forrel* with leaves finuated in the middle. 29. The creeping fhielded-*forrel.* 30. The little erect *forrel* with multifid leaves. 31. The trifid-leaved Indian *forrel.* *Tourn.* Inft. p. 502.

Sorrel feeds are found to contain a vaftly larger proportion of the active principles this plant abounds with, than either the leaves or the roots. They are efteemed aftringent, and good in diarrhœas, dyfenteries, and hæmorrhages.

We much neglect this plant, becaufe it is common; yet this plant alone has very often proved a remedy for the fcurvy. Mr. Morin, of the Academy of Paris, who in the Hotel Dieu had many hundred fcorbutic patients, cured the greater part of them only by *forrel* boiled and eaten with eggs.

Wood-SORREL, *lujula*, in medicine, is a very grateful acid; in fevers it quenches thirft, and takes off the heat of the ftomach. It is recommended in fevers of all kinds, and the fcurvy; alfo in obftructions of the liver and of the vifcera. It is fometimes given in decoction in fevers, and the expreffed juice is mixed with the juices of the other antifcorbutic plants againft the fcurvy.

Externally, it is extolled againft inflammatory eruptions of all kinds in decoction, which is to be ufed by way of fomentation. There ufed to be a fyrup, but, at prefent, only a conferve of this plant is retained in the fhops.

SORREL, in the manege, is ufed for a reddifh colour. The mane ought to be red, or white, in a horfe of this colour. It is diftinguifhed, according to the degrees of its deepnefs, into a *burnt forrel,* and a *bright,* or *light forrel.* Generally fpeaking, it is a fign of a good horfe.

SORY, in natural hiftory, the name of a foffile fubftance, much fpoken of by the antients, but fuppofed to be now loft: this, however, proves to be an error, for it is plentifully produced in the eaftern parts of the world, and is in common ufe there, only under another name; neither indeed is it peculiar to that part of the world, though the inaccuracy of the late writers of foffils has made them overlook or miftake it.

It is a firm and not brittle fubftance, though of a fpungy and cavernous ftructure, and is confiderably heavy. It is found in maffes of no regular fhape or fize, fome being roundifh, others angular or flatted, and fome of the fize of a wallnut, others of many pounds weight. It feels very harfh and rough to the touch, and is covered with no inveftient coat or cruft, but fhews its natural furface, which is always corrugated or wrinkled, and ufually full of fmall protuberances and cavities, and when broken, is found to be of a rugged and fpungy ftructure within.

Its natural colour is a rufty black, but it is fometimes reddifh, and fometimes bluifh; and is commonly ftained, in different places, with fpots of a bluifh or ruft colour, when black; and of a greenifh hue, when it is of a reddifh colour: in the places where it is free from thefe, it is ufually fomewhat bright and fparkling. It is of an acrid and difagreeable tafte, and of a ftrong and naufeous fmell: put into the fire it burns to a deep purple, and if boiled in water a great part of it becomes diffolved in it; and this may again be feparated from the water by evaporation and cryftallization, and then appears in the form of pure blue vitriol, forming regular rhomboidal cryftals, and tinging iron to a copper colour, on being firft wetted, and then rubbed upon it. *Hill's* Hift. of Foff. p. 606.

It is found in many parts of the Turkifh dominions, particularly in Gallo-Græcia; as alfo in fome parts of Germany. In this country it is boiled for the blue vitriol it contains. In Turky it is mixed with lime, and made into a pafte with water, which is laid on fuch parts of the body as they would eradicate the hair fiom, and effects that purpofe in a very few minutes. In the eaftern nations, where it is thus ufed, it is known by the name *rufma.*

The antients ufed it externally to take off pimples, and put a piece of it into a hollow tooth, as a remedy for the tooth-ach. There can be no doubt of their *fory* being the fame fubftance with this; fince Diofcorides has defcribed it to be blackifh in colour, full of fmall cavities, moift on the furface (as ours always is in moift weather) and of a difagreeable tafte and fmell.

This fubftance, as alfo the chalcitis, mify, and melanteria, are all properly ores of vitriol, the particles of thofe falts being fo perfectly blended in them, as not to be at all diftinguifhable to the naked eye, yet being always regularly feparable from them by water, which is to the faline ores what fire is to thofe of the metalline kind. *Hill's* Hift. of Foff. p. 607.

SOSPIRO, in the Italian mufic, a paufe or reft, equal to the time of a crotchet. See the articles PAUSE, REST, CHARACTER, *Cycl.*

Canone al SOSPIRO. See CANONE *al fofpiro.*

SOSTENUTO, in the Italian mufic, denotes that the found is to be held out in an equal and fteady manner for the whole time of the note. Thus they fay *arcate foftenute.* See *Corelli,* Concerto 8.

SOTIRELLA, a name given by fome to a compound medicine, in form of a hard mafs, and confifting of opium and fome other narcotics, with camphor, wood-foot, and nutmeg. It is defcribed in the Auguftan Difpenfatory, and is intended to be put into hollow teeth, as a remedy for the tooth-ach.

SOUGH, otherwife called an *addit,* in mineralogy, is a paffage like a vault cut out under the earth, to drain the water from the mines. *Houghton's* Compl. Miner in the Explan. of the Terms.

SOUL (*Cycl.*)—SOUL-*fcot,* a certain fee paid by our Saxon anceftors to the prieft on opening a grave. See the article BURIAL.

SOUL-*trees,* in mining. See the article STOWS.

SOUND (*Cycl.*)—Mr. Euler [b] is of opinion, that no *found* making fewer vibrations than 30, or more than 7520 in a fecond, is diftinguifhable by the human ear. According to this doctrine, the limits of our hearing, as to acute and grave, is an interval of eight octaves.—[[b] Tentam. Nov. Theor. Muf. cap. 1. fect. 13.]

SOUND, in the manege. A horfe is faid to be *found* that does not halt. When a jockey fells a horfe, he warrants him *found* hot and cold; that is, that he does not halt either when you mount him, or when he is heated, nor yet after alighting, when he ftands and cools.

SOUNDING (*Cycl.*)—SOUNDING *the pump,* at fea, is done by letting fall a fmall line, with fome weight at the end, down into the pump, to know what depth of water there is in it.

SOUR *land,* in agriculture, a term ufed by the farmers to exprefs a cold and fomewhat wet clayey foil.

This muft have its tilth according to its ftate and condition, when they fet about it. If it have a ftrong fwarth upon it, then they give it a fallow, by turning it up when the fun is in Cancer: this they call a fcalding fallow, and efteem it of great ufe, becaufe it kills the grafs roots, and makes the land fine; but if it be light, and have but a thin fwarth, they leave it for a cooler tillage, and plow it early in the year, when their clay is fallowed.

Pigeon's dung and malt-duft are the moft proper manures for this foil. The malt-duft is to be fown with the winter-corn, and plowed in with it, for then it lies warm at the roots of the corn all winter. *Plot's* Oxfordfhire, p. 246.

SOURDON, in zoology, the name of a bivalve fhell-fifh found on the coaft of Poitou, and other places. It is a fmall fifh, its length being little more than an inch, and its breadth about three quarters of an inch. Its fhells are both confiderably convex, the outer furface is deeply furrowed, but the infide is perfectly fmooth. The fifh buries itfelf lightly in the fand, and has a pipe of communication, which it raifes to the furface; but as this creature never buries itfelf deep, the pipe is neceffarily very fhort; but they are cut into feveral fegments at the extremity, and appear as it were fringed, and have feveral hairs growing from thefe fegments. The *fourdon* is capable of a progreffive motion by means of a limb, fomewhat refembling that of the other chamæ; but more than any approaching to the nature of a leg, as it in fome meafure reprefents, in miniature, a human leg with a clumfy boot upon it: by means of this limb the creature can eafily bury itfelf in the fand, or rife up out of it, or move horizontally on the furface, and that as well backwards as forwards, and that with more fwiftnefs than could be well fuppofed. Mem. Acad. Par. 1710.

SOURIS, in the manege, is a cartilage in the noftrils of a horfe, by means of which he fnorts. See SNORT.

The cutting of this cartilage is called in French *effourifter.*

SOUTHERNWOOD, *abrotanum,* in botany, the name of a genus of plants, the characters of which are wholly the fame with thofe of wormwood, and the plants are only to be diftinguifhed by their very different general face and appearance.

The fpecies of *fouthernwood,* enumerated by Mr. Tournefort, are thefe. 1. The broad-leaved fcentlefs *abrotanum.* 2. The great narrow-leaved male *abrotanum.* 3. The greateft narrow-

narrow-leaved male *abrotanum*. 4. The lesser narrow-leaved male *abrotanum*. 5. The field-*abrotanum* with white stalks. 6. The broader-leaved field-*abrotanum*. 7. The field-*abrotanum* with red stalks. 8. The hoary field-*abrotanum* with the carline smell. 9. The low *abrotanum* with very large yellow tufts of flowers. 10. The sweet-scented flax-leaved *abrotanum*. 11. The Spanish *abrotanum* with pontic wormwood leaves. 12. The sea Spanish *abrotanum* with thick shining and rigid leaves. 13. The lightly hoary male *abrotanum* of Surinam. And 14. the tall hoary *abrotanum* with very thick-set leaves. *Tourn.* Inst. p. 458.

Southernwood is an attenuant, and recommended by some in suppressions of urine, a drachm of it in powder being the dose. Its decoction is good for recovering the hair when fallen off; and its juice is said to cleanse and heal old ulcers. The leaves of this plant dried and powdered, or given in a strong infusion, are good in all obstructions of the liver and spleen; they are also of considerable virtue as antihysterics, and are given in nephritic cases. The good women give the expressed juice, of the tender tops of the plant, as a remedy against worms, and that with success. There are accounts of persons being cured of jaundices solely by the same medicine. Matthiolus recommends the leaves dried, and taken in powder, as a remedy for the fluor albus.

Female SOUTHERNWOOD. See the article SANTOLINA.

SOUTHING, in navigation, the difference of latitude a ship makes in sailing to the southward.

SOW, in the iron works, the name of the block or lump of metal they work at once in the iron-furnace. The size of these *sows* of iron is very different, even from the same workmen, and the same furnace. These furnaces having sandstone for their hearths and sides, up to the height of a yard, and the rest being made of brick, the hearth, by the force of the fire, is continually growing wider; so that if it at first contains as much metal as will make a *sow* of six or seven hundred weight, at last it will contain as much as will make a *sow* of two thousand weight. *Ray's* English Words, p. 126.

SOW, in zoology. See the articles HOG and SUS.

SOW-*bread*. See the article CYCLAMEN.

SOW-*thistle*, in botany. See SONCHUS.

SOWING (*Cycl.*)—One very great article in *sowing* to advantage, is to know exactly at what depth the seed may be planted, without danger of burying it. Seed is said to be buried, when it is laid at a depth below what it is able to come up at. Different sorts of seeds come up at different depths, some six inches, or more, and others will not bear to be buried at more than half an inch. The way to come at an accurate knowledge of the depth, at which every seed will come up best from the *sowing*, is by making gages in the following manner. Saw off twelve sticks of about three inches diameter, bore a hole in the end of each stick, and drive into each a taper peg; let the peg in the first stick be half an inch long, the next an inch, and so on, every peg being half an inch longer than the other, till the last is six inches long: then in that sort of ground, in which you intend to plant, make a row of twenty holes with the half-inch gage, put therein twenty good seeds, cover them up, and then stick the gage at the end of that row. Proceed in the same manner with the eleven other gages, making the holes in the same row all with the same gage, and sticking it at the end of the row: when the seeds begin to appear, it will be easy to see at what depth they come up best, by observing the most flourishing row, and taking up the gage at the end, and seeing what is its length.

By this means we not only know what is the depth in that sort of ground, at which this sort of seed will come up best, but also we are able to judge of the nature of the seed; for by observing how many of the twenty seeds that were *sown* come up, and how many fail, it is easy to calculate how much bad seed there is among any given quantity, and to allow properly for it in the *sowing*, that the field may be neither overstocked with plants, nor too bare of them. The farmer often sustains great losses by *sowing* bad seed, or by burying good seed, and both might be effectually prevented, by making these easy trials. One caution is to be observed in this, that it is not proper to *sow* the seeds of all plants at the greatest depths at which they will come up, because in wheat, and some other grain, a moist ground will rot the roots at this depth. Experience alone, added to these rules, can perfectly instruct the farmer in the certain way of succeeding; the nature of the land, the manner how it is laid, either flat or in ridges, and the season of planting, must all be considered.

The quantity of seed is to be different also, according to the manner of the *sowing*. The proper quantity to be drilled into an acre, is much less than must be *sown* in the common way; not because the hoeing will not maintain as many plants as the other way, for, on the contrary, it will maintain many more, but the difference is upon many other accounts, as that it is impossible to *sow* it so evenly by hand as the drill will do. For let the hand spread it never so exactly, which yet is difficult enough to do with some seeds in windy weather, yet the unevenness of the ground will alter the situation of the seeds, the greatest part of them rebounding into holes, and the lowest places, or else the harrows, in covering, drawing them down thither; so that these low places may have ten times too much seed, and the highest may have much too little, or even none of it, and this inequality lessens in effect the quantity of the seed, because fifty seeds, in the room of one, will not produce so much as one will do; and where they are too thick, without being in these clusters, they cannot well be nourished, their roots not spreading to near their natural extent, for want of hoeing to open the earth, and give them way. In the common way of *sowing*, some of the seeds are buried out of all hope of ever coming up again, and some others are left naked upon the surface, where they become the food of birds, and of vermin: as so many must, therefore, perish in the common way of *sowing*, and so few can be lost in the way by drilling, there is plain reason why the seed, necessary to *sow* any given quantity of ground, should be much less for the drill-way, than for the other. The farmers, in general, know nothing of the proper depth at which they should *sow* their seed, nor of the difference in quantity that is to be observed in different circumstances; they allow the same quantity to an acre of rough ground, as they do to an acre of fine, and forget that what is too little for one, may yet be too much for the other; it is all mere chance-work, and they put their confidence in good ground, and a large quantity of dung to cover their errors.

The farmers in Wiltshire allow more corn for the *sowing*, than in any other part of England; they use sometimes eight bushels of barley to an acre, so that if it produce four quarters for an acre, there is but four grains for one encrease. This is sown on land plowed once, and double dunged, the seed only harrowed into the hard and stale ground, so that it is very probable that not so much as two bushels out of the eight take place, or come to any thing. Sometimes, in a very dry season, an acre scarce produces four bushels at the harvest.

Instead of all this uncertainty and loss in the common way, in drilling all the seed lies just at the same depth, not one grain of it being placed deeper or shallower than the rest. As none of the seeds, therefore, can be lost by being buried, or by being exposed on the surface to vermin, no allowance is to be made for these accidents; all that is to be allowed for in the *sowing*, is the mischief that may happen from the worm, the frost, or the like unavoidable accidents, common to all seeds.

When a man has (by the use of the gages, and the growth of the seeds planted in the rows marked by them) proved the goodness of the seed, and found the depth it is to be planted at, he is to calculate what number of seeds a bushel, or any other weight or measure, contains; for one bushel, or one pound of small seed, may contain double the number of seeds of a bushel, or a pound of large seed of the same species. This calculation is made by weighing an ounce, and then calculating the number of seeds this ounce is composed of; then weighing a bushel, and multiplying the number of seeds in an ounce by the number of ounces in the bushel, and the product will give the number of seeds in the bushel with sufficient exactness. When this is known, the seeds are to be proportioned by the Rule of Three to the square feet in an acre; or else it may be done, by dividing the seeds of the bushel by the square feet in an acre, and the quotient will give the number of seeds for every foot. Then the farmer is to consider how near he intends to plant the rows, and whether single, double, treble, or quadruple; for the more numerous the rows are, the more seed will be required. The narrow spaces between double, triple, or quadruple rows, suppose seven inches, the double having one, the treble two, and the quadruple three, are called *partitions*. The wide space, suppose of five feet, between any two of these double, treble, or quadruple rows, is called an *interval*.

Examine next what is the produce of one middle sized plant of the annual, but the produce of the best and largest of the perennial sort, because that, by hoeing, will be brought to its utmost perfection; proportion the seed of both to the reasonable product, and when it is worth while adjust the plants to their competent number with the hand-hoe after they are up, and plant perennials generally in single rows. Lastly, plant some rows of the annual thicker than others, which will soon give experience, preferable to all the rules in the world, for the quantity of seed necessary for the drilling.

The distances of the rows is one extremely material point in the obtaining a good crop; but as a much larger distance is to be allowed in these, than common practice has been used to, it is very difficult to persuade the farmer to venture a trial at such distances as he may have experience from. There is a method of planting the rows by the drill at very near distances, and in this work one horse may draw a drill with eleven shares, making the rows at three inches and a half distance from each other, and at the same time *sowing* in them three different sorts of seeds, which do not mix, and these at different depths. Thus the barley-rows may be

be seven inches asunder, and the barley four inches deep; a little more than three inches above that, in the same channels, clover-seed; and betwixt every two of these rows, a row of saint foin seed covered half an inch deep.

Mr. Tull, who tried this method, obtained the first year a very good crop of barley, the next year two crops of broad clover, where that was *sown*; and where hop-clover was *sown*, a mixture of that and of saint foin, and every year afterwards a crop of saint foin. But the same gentleman was afterwards so fully convinced of the folly of these, or any other mixed crops, and of *sowing* with these narrow spaces, that he never practised it afterwards.

Every row of vegetables to be horsehoed, ought to have an empty space, or interval, of thirty inches, on one side of it at least, and of near five feet in all sorts of corn: this will seem a monstrous allowance to those who have not experienced the good effects of it, but all who have will readily come into the practice of it ever afterwards. The line of corn is called one row, though it be double, triple, or quadruple, because when four of these rows grow up in the spring, they unite, and seem to be all one row. Wide intervals are necessary for perfect horsehoeing, and the largest vegetables have generally the greatest benefit by them, though small plants may have considerable benefit from much narrower intervals than those of five feet.

In handhoeing there is always less seed, fewer plants, and a greater crop, *cæteris paribus*, than in the common *sowing*; yet there the rows must be much nearer than in horsehoeing, because as the hand moves many times less earth than the horse, the roots will be sent out in a like smaller proportion; and if the spaces, or intervals, where the broad hoe only scratches a little of the surface, should be wide, they would be so hard and stale underneath, that the roots of perennial plants would be a great while in running through them, and the roots of annual plants would not be able to do it at all. The advantage of the horsehoeing is principally owing to the depth to which it stirs the ground, and familiar instances have proved, that the stirring it to a like depth, by whatever instrument, is of the utmost advantage to whatever plants are set in the place. A poor fellow in Wiltshire was observed to have always his cabbages much larger and finer than his neighbours, though his ground was no better, and he could afford less dung; but the reason was, that instead of clearing away the weeds between them with a handhoe, he used to dig between with a spade, which goes as deep as a horsehoe, and comes the nearest answering its purposes of any instrument whatever. *Tull*'s Horsehoeing Husbandry. See the article INTERVALS.

Man has found out many advantageous ways of propagating, whether by *sowing* or planting such trees and herbs as he best knows the uses of, but nature as much excels him in this article as in all the rest, when any comparison can be made; and it appears evident to the naturalist, that she has taken more care to propagate and *sow* the most trivial weeds, as we esteem them, than we can employ in regard to the choicest plant. It is owing to this care, that no one species of plant has ever been lost, notwithstanding all the accidents they are daily subject to.

There is not, perhaps, a more eminent instance of this care of nature, than in that plant, commonly known in America under the name of the *wild pine*, and called by botanists *viscum caryophylloides*. This is a large plant with leaves like the pine-apple, and it grows on the boughs of other trees, as misletoe does with us, but that its roots do not pierce into the substance of the wood, as is the case in this plant, but only spread themselves upon the surface. The seeds of this plant are small and light, and they have a very long and fine down adhering to them, by means of which, as soon as they are dislodged from the capsules, they are taken up by the winds, and supported in the air till they strike against some branch of a tree which is proper to give them a place of growth: here the downy fibres become of a second use, in that they hold fast the seed, and will not let it drop down, but it remains thus supported till the time of its striking root, which it does from many points at once, and consequently a number of roots are immediately propagated, in different directions, over the surface of the bark. Philos. Transact. N° 251. p. 116.

It is necessary, to the support of this plant, that it should always have a quantity of water within itself to supply its juices. This water is retained in the center of the leaves, which are hollow within, and form a sort of bulb for this purpose; but as it cannot be preserved, unless the plant stands erect, and as the seeds, in their various flight before the wind, are as often struck against the lower, or side parts, as against the upper surface of a bough, so the plant generally begins to shoot in a wrong direction; but so provident is nature, that it immediately turns itself up, whether from the side, or from the very bottom of the branch. This reservatory is not only of use to the plant, but serves also to the birds, and to several small animals, who, in times of scarcity of water, go to it, and seldom fail of finding enough there: nay, Dampier tells us that himself and his sailors, when on shore in some of the American islands, and in distress for water, have been often relieved by it; for that, on striking in a knife a little above the root, the water always came out in large quantities, and they used to catch it in their hats, and drink as much as they had occasion for.

The fastening of the seeds of this plant to the branches of trees, on which they are to grow, is not a single instance of the providence of nature in propagating vegetables: we see in the sea fucuses something of a like kind. The proper place of growth of these is on rocks and stones, and accordingly, as the seeds of the viscum are made light, that they may fly in the air, and ascend to the places where they are to grow, so those of the fucuses are made heavy, that they may descend even in water, and fall upon the stones that are to give them support. This peculiar gravity is given to the seeds of the sea plants, by means of a glutinous jelly with which they are surrounded while in the capsule, and which falls out with them; and is not only of use in carrying them to the bottom, but also in fastening them to the stones on which they alight, otherwise they would easily roll off again, and be tossed about, and lost among this immense bed of waters; but by means of this jelly they are firmly kept in their place, till they have made such shoots as are sufficient to support them against the washing of the waves; then the jelly dries away, and leaves the water free access to them, to nourish them.

The mosses have been by former ages supposed to have no seeds at all; but it has of late been found that they have immense numbers, and those of the only kind that could be of service to their propagation; that is, such as are extremely small and light. It is necessary that the seeds of these minute plants should often be carried upward, in order to their being placed on trees, walls, and other eminences: this is easily performed by the winds, when the seeds are so small, that, on being dislodged, they look like smoak, not like any solid substance; but it could not have been so well executed, had they been larger. The common cup-seeding mushroom produces, on the contrary, large and solid seeds; these cannot grow in any season but a very moist one, and nature providing for this, has so ordained it, that the cup remains closed, and the seeds firm in its bottom, in dry weather; but as soon as a shower of rain falls the cup opens, and the seeds are washed out and thrown upon the wet ground, where they immediately grow. Philos. Trans. N° 251. p. 118.

Many of those plants, whose seeds strike well from the surface, and do not require to be buried as others do, are furnished with a downy substance to every seed, which makes the whole so light, that it floats in the air, and is carried to great distances; by this means every seed is carried a vast distance its own way, and if one falls on an improper soil, another succeeds better. We have a very remarkable late instance of the spreading of plants, from this process of nature, in the small Canada fleabane with toad-flax leaves. This plant was, some years after the settlement of the French in America, brought into Europe, and first *sown* in the gardens of France, and then in those of England; out of both which its downy seeds were wafted by the winds into the fields, and there produced the plant, which thence became a wild inhabitant, both of France and England, and continues so to this day, thriving as well with us as in its native soil.

Other plants, which are destined to grow at some small distances from one another, have been provided by nature with elastic, or springy seed-vessels, which throw their seeds to a distance, without the help of man. The yellow arsmart, and some of the cardamines, called for this reason *noli me tangere*, are of this kind, as also our wild wood-sorrel, and many others. In all these plants, as soon as the seed is perfectly ripe, and fit for *sowing*, the seed-vessel bursts at the first rude shock of wind, and tosses out its seeds to three feet distance in some cases. This distance is also encreased by the action of the wind, which bursts the capsule, and the separated seeds are often carried thus to five, six, or seven feet distance from the mother plant, and scattered different ways, some falling by the way, and the rest spreading abroad as they go along.

There is one remarkable instance of the care of nature of one plant in this way, which is the *spirit weed* of Jamaica. The seeds of this plant can only grow in a wet season; and in consequence of this it is so provided, that the pods containing them can only open in wet weather; they will remain ever so long whole upon the plant in a dry time, but as the first shower falls, the seed-vessels being wetted, burst open, and scatter their seeds several ways, and every one immediately strikes root and grows.

The lychnises, poppies, and snapdragons, all have their seed-vessels open at the top only, and in these the seeds lie securely till a windy season happens, then they are dislodged; and do not fall all together, as they otherwise would, in one spot, raising a cluster of young plants to starve and spoil one another; but they are, according to the same great intent of nature, scattered to such distances, that every one may produce a plant

a plant in fuch circumftances as it may thrive under. Philof. Tranf. N°251. p. 120.

SPA (*Cycl.*)—SPA-*water*. The contents of this *water*, by means of which it is able to do fuch great things in many chronical cafes, are underftood by the following experiments and obfervations.

1. When the *Spa-water* is carried to any diftant place, though ever fo well ftopped down, they always, after a time, will precipitate a fmall quantity of a yellow ochreous earth.

2. If a fingle grain of galls be put into an ounce of *Spa-water*, it tinges the whole with a beautiful purple; but if the *water* be heated before the galls are put in, there will not be the leaft change of colour produced in it.

3. Mixed with milk they do not coagulate it, but when mixed with wine they make a great ebullition, and throw up a large quantity of air-bubbles with a peculiarly pleafing fmell.

4. The *waters* drank at the fpring caufe a fort of drunkennefs, but it does not laft above a quarter of an hour.

5. A fmall vial being filled up to a certain height with *Spa-water*, and afterwards exactly to the fame height with pure diftilled water, and weighed, when filled with each, in a nice balance, was found, when the *Spa-water* was in it, to weigh three ounces, four drachms, and forty grains, and with the other, three ounces, four drachms, and forty one grains; fo that the *Spa-water*, notwithftanding its mineral particles, is fomewhat lighter than the pureft common water.

6. And finally, a pint of the *Spa-water* evaporated over a very gentle fire, leaves behind only a grain and half of a white powder.

Hence it appears, that the *Spa-waters* are the lighteft and moft fubtle of all the mineral waters; and the fmall quantity of earth, and large portion of fubtle mineral fpirit they contain, befpeak their poffeffing the moft exalted virtues of all the mineral waters.

One very remarkable virtue of this *water* is, that it greatly relieves in all diforders of the kidneys, ureters, and bladder, whether occafioned by ftone, gravel, or ulcerations. It poffeffes, befide, all the virtues of the other mineral waters, and is of the greateft fervice in edulcorating fharp, and dividing vifcous humours, and removing all difeafes arifing from thefe caufes, by difpofing them to pafs off by the proper emunctories.

SPADE, (*Cycl.*) is an inftrument for digging up the ground; the handle, or fhaft, is about three feet long; the head of it is all of iron, the upper part being flat, for the workman to fet his foot on to force it into the ground; the length of the head is a foot, or fifteen inches, and the breadth fix or eight.

SPADO, among the Romans, differed from an eunuch only in this, that the latter was deprived both of the penis and teftes, but the *fpado* of the teftes only. *Hofm.* Lex. univ. in voc. See EUNUCH, *Cycl.*

SPAGIRIC *art*, *ars fpagirica*, a name given by authors to that fpecies of chemiftry which works on the metals, and is employed in the fearch of the philofopher's ftone.

SPAGNUOLA, in the Italian mufic, denotes a guitar.

SPANIEL. This fort of dog is of great ufe, but fubject to many diftempers; among thefe the mange is a very frequent one, and is the moft pernicious of all others to his quiet and his beauty, and is very apt, when one dog has it, to fpread to others that come in its way. The beft cure is a decoction of a large quantity of brimftone, with fome common falt and wood-afhes, in water and urine, of each equal quantities; this is to be ufed three or four times a day, wafhing the creature well with it before the fire, or in the warm fun. If this is not ftrong enough, the fame ingredients, with the addition of a confiderable quantity of wood-foot, are to be boiled in ftrong vinegar, and the liquor ufed in the fame manner; but this muft never be ufed in cold weather, as it would then endanger the creature's life.

When this difeafe is not in a violent degree, it may be cured by the herb agrimony internally taken. The method is to pound the roots, leaves, and feeds of this plant in a mortar, and mix them with a large quantity of wheaten-bran; they are to be then made into dough in the common way, and baked in an oven; the dog is to have no other bread but this for fome time, but he is to eat of this as often, and as much as he will: this, without any farther care, has cured many.

Another very troublefome diforder in this creature, is what is called the *formica:* this infefts only the ears, and is caufed by flies, and by the dog's fcratching for them. The beft medicine for the cure of thefe is this: take a quantity of pure and clean gum tragacanth, infufe it in white-wine vinegar; let as much vinegar be ufed as will ferve to foften it, and when it has lain a week in it, let it be taken out and ground on a marble, as the painters grind their colours, adding to it roach-alum and galls, reduced to powder, of each two ounces; all this is to be well mixed together, and the matter, if it grows too ftiff in the grinding, is to be moiftened with fome of the vinegar in which the gum was foaked: when all is thoroughly mixed, and ground fine, it is to be put by in a gallypot, and a fmall quantity of it applied to the creature's ear every night till the complaint is removed.

The fwelling of the throat is another difeafe very common to *fpaniels*, but the cure of this is eafy, there needs only to bath it well with oil of camomile, and afterwards wafh it with a mixture of vinegar and falt; this done night and morning will, in a few days, wholly remove the complaint. *Spaniels* will fometimes, when they have much reft and good food, lofe their fenfe of fmelling, but this is recovered by a brifk purge and repeated airings; a very common dofe, on this occafion, is a drachm of jalap, and two drachms of fal gem, mixed up into a bolus with oxymel of fquills: this is to be rubbed over with fome butter, and will be got down in that manner pretty eafily, and will work brifkly.

SPAR, (*Cycl.*) in natural hiftory. *Spars* are defined to be foffils not inflammable, nor foluble in water. When pure, pellucid and colourlefs, and emulating the appearance of cryftal, but wanting its diftinguifhing characters; compofed of plane and equable plates, not flexile nor elaftic; not giving fire with fteel; readily calcining in a fmall fire, and fermenting violently with acids, and wholly foluble in them.

Of this clafs of bodies there are ten orders, and under thofe twenty one genera, many of which, from their accidental admixtures, deviate greatly in appearance from the natural ftate of pure *fpar*.

Of the firft order are the pellucid cryftalliform and perfect *fpars*, compofed of a column terminated at each end by a pyramid.

Of the fecond are thofe compofed of two pyramids joined bafe to bafe, without any intermediate column.

Of the third are the cryftalliform columnar *fpars*, adhering by one end to fome folid body, and terminated at the other by a pyramid.

Of the fourth are the pyramidal cryftalliform *fpars* without columns.

Of the fifth are the *fpars* of a parallellopiped form.

Of the fixth are the *fpars* externally of no regular form, but breaking into rhomboidal maffes.

Of the feventh order are the cruftaceous *fpars*. Thefe are of a cryftallino-terrene ftructure, or debafed from their native pellucidity by an admixture of earth, and formed into plates or crufts of a ftriated figure within.

The eighth order comprehends the cruftaceous terrene *fpars*; bodies fo highly debafed with earth, as to appear merely earthy, of an irregular ftructure, and not ftriated within. Thefe often encruft fiffures of ftone, and fometimes vegetable and other extraneous bodies in fprings.

Of the ninth order are the *fpars* formed into oblong cylindric bodies, known by the name of *ftalactitæ*, or ftony icicles.

And the tenth comprehends thofe formed into fmall round figures, compofed of various crufts enclofing one another, and generally known by the name *ftalagmitæ*; and adding to thefe the *fpars*, influenced in their figures by metalline particles, we have the whole feries of thefe bodies. Thefe are, 1. the *cubic*, owing their figure to lead. 2. The *pyramidal* with four planes, owing their figure to tin. 3. The *rhomboidal*, confifting of fix planes, owing their figure to iron. *Hill*'s Hift. of Foffils, p. 201.

The genera of thefe feveral orders are thefe.

Of the firft there are three. 1. The *triexahedria*, thofe which are compofed of a hexangular column, terminated at each end by a hexangular pyramid. 2. The *tripentahedria*, thofe compofed of a pentangular column, terminated at each end by a pentangular pyramid. And 3. the *enneahedria*, which are compofed of a trigonal column, terminated at each end by a trigonal pyramid.

Of the fecond order there are three genera. 1. The *dioctahedria*, *fpars* compofed of two octangular pyramids joined bafe to bafe. 2. The *diexahedria*, compofed of two hexangular pyramids joined bafe to bafe. And 3. the *ditrihedria*, which are compofed of two trigonal pyramids joined bafe to bafe.

Of the third order there are alfo three genera. 1. The *hexaedroftyla*, which are hexangular columns, terminated by hexangular pyramids. 2. The *pentaedroftyla*, compofed of a pentangular column, terminated by a pentangular pyramid. And 3. the *triedroftyla*, compofed of a trigonal column, terminated by a trigonal pyramid.

Of the fourth order there are only two genera. 1. The *hexapyramides*, *fpars* in form of hexangular pyramids without columns. And 2. *tripyramides*, thofe in form of trigonal pyramids without columns.

Of the fifth order there is only one known genus, the *parallelopipedia*, *fpars* of a regular parallellopiped figure, as well in their whole maffes, as in their conftituent particles.

Of the fixth order there is alfo only one known genus, the *anomorhomboidia*, *fpars* of no regular external figures, but breaking into rhomboidal maffes.

Of the feventh order there are two known genera. 1. The *placagnodiaugia*, femipellucid, and of a ftriated texture within, and

and of cruftaceous external figures. And 2. the *placagnofcuria*, opake cruftaceous *fpars* of an irregular ftructure within.

Of the eighth order there are two genera. 1. The *cibdeloftracia*, terrene *fpars*, found in form of thin plates on the furfaces of fiffures in ftone quarries. And 2. *cibdeloplacia*, terrene *fpars*, ufually found coating over vegetable, or other extraneous matter in fprings, &c.

Of the ninth order there are two genera. 1. The *ftalactagnia*, cryftalline *fparry* ftalactitæ. And 2. *ftalacto-cibdela*, cryftallino-terrene, *fparry* ftalactitæ.

And of the tenth order there are alfo two genera. 1. The *ftalagmodiaugia*, or pellucid *fparry* ftalagmitæ. 2. *Stalagmofcieria*, dull and opake *fparry* ftalagmitæ. *Hill's* Hift. of Foffils, p. 203.

The obfervation that *fpar* is continually formed at this time in caves and grottos under ground, has given birth to many different conjectures as to the origin of that fubftance. We have accounts from Swifferland, and other places, that the fnow by long lying on the earth, and being fubject to repeated freezing, is at length hardened into *fpar*: this is much of the nature of that opinion of the antients concerning cryftal, that it was water frozen by fevere colds to a fort of ice, much harder than the common kind; both are equally erroneous and abfurd. But more rational conjectures, as to its origin, are, that it is produced either by effluvia alone, or by the joint force of effluvia iffuing up from the depths of the earth, and mixing with water ouzing out of rocks into their cracks and cavities, or by the fame water or effluvia paffing through beds of this *fparry* matter contained in clay. In the firft place we are to obferve, that *fpar* is capable of being diffolved either by water or vapour, and fufpended imperceptibly in either; and that though it remains fufpended a long time, yet there are occafions of its feparating itfelf from either of thefe vehicles, fuch are long ftanding ftill, and evaporation. What is called the growth and formation of *fpar*, therefore, is properly perhaps only the change of place in this fubftance, and all that thefe agents, water and vapours, do, is only to wafh it out of the ftrata of earth or ftone, in which it lay in fcattered particles, and bring it together into the cracks and crevices of ftones, where it may again feparate itfelf, and become more pure and perfect. The operation of nature, in this cafe, is very like that of art in the extracting of falts from the various bodies they are mixed with; and *fpar* in its two ftates, when blended in the ftrata of ftone, &c. and when pure, and in form of cryftals in the cracks, may be compared to alum, for inftance, in its bed, and when purified. The alum in the common ftones, from which it is made, is not perceptible to the eye, but lies in fcattered particles; water being added to this takes up the falt, and when it has been managed by evaporation and reft, yields it again purified and alone, and it forms fuch cryftals on the fides of the veffel as the other does on the fides of the fiffures of ftone, which are the veffels where the water, out of which it was formed, was fet to evaporate, and to reft a proper time. That fome *fpars* grow from vapours alone, is evident from the *ftalactitæ*, or ftony icicles, hanging down from the roofs of our caverns, which, though they grow downwards, yet have many times little plants of the fame fubftance growing out at their fides, and ftanding upwards, contrary to the growth of the other, and evidently formed of the matter feparated from the vapours in their afcent, as the ftalactitæ themfelves are from fuch as have afcended to the roof, and there been condenfed into water, and fent down again in drops. Nor is the *fparry* matter alone thus raifed in vapour, for even the metals, and other bodies, as little likely as thofe to be thus raifed, yet are found to form ftalactitæ. The mundics in general, though they never form regular ftalactitæ, yet often are found adhering to the fides of them, and the metals, particularly iron and lead, form regular ftalactitæ; the iron ones very common, and very perfect; the lead lefs perfect, and more rare; and Dr. Brown gives us abundant inftances, of *fpars* growing entirely from vapours in the baths of Buda in Hungary. Phil. Tranf. N° 129.

Mr. Beaumont [b] is of opinion, that earth by degrees will ripen into *fpar*; but this is an error. He founds his opinion on certain ftalactitæ, and ftalagmitæ, found in caverns, partly earth and partly *fpar*, and fuppofes, that the whole would in time become *fpar*; but there is nothing in nature to warrant this conjecture.—[b Phil. Tranf. ibid.]

Mr. de Juffieu has given us, in the Memoirs of the Paris Academy, a very remarkable account of the recryftallization, or reproduction of the parts of *fpar*, after folution, in the following inftance.

There are found in the mines near St. Bell, where they dig copper-ore, a fort of ftones, which ufually cover the vein of the ore; thefe are compofed of feveral flat plates laid evenly on one another, as our rhomboidal and parallellopiped *fpars*, and thefe, as the diftinctions of foffils were not at that time eftablifhed, the author called, from their eafy calcination, a fort of gypfum, which he diftinguifhed from the reft by their plated ftructure. They are white on their outfide, and greyifh within; and their internal part being heavy, and full of fparkling points, they were fuppofed to contain fome copper, and were thrown into the furnace ufed for roafting the other ftones in which copper was lodged. The calcination reduced thefe ftones into a fort of plafter, or gypfum. After this thefe calcined ftones, which were now as red as colcothar of vitriol, were thrown into tubs, and large quantities of water were poured on them; this took up their cupreous, their vitriolic, and their *fparry* particles. From thefe tubs the impregnated liquor was let out into a bafon, in the midft of which were placed feveral pieces of iron; thefe were all immediately changed in appearance into copper by the liquor. The liquor fent up all this while a thick white vapour, which covered all its furface, and arofe to the height of a foot above the edge of the bafon. This vapour by degrees diffipated itfelf into air; but where it had touched, not only the fides of the bafon that were above the furface of the liquor, but alfo the earth about the edges, were covered with fmall regular cryftals, of a figure approaching to a parallellopiped, and of an infipid tafte, in fome degree tranfparent, and very thin and flat in proportion to their breadth or length. Thefe were the fingle cryftals, but the continual formation of them, one upon another, at length formed of them concrete maffes, refembling large cakes of tartar. Thefe were like the other a true *fpar*, being indiffoluble in water, and eafily calcining in the fire, and having all the other qualities of the ftones from which they were originally obtained. This procefs is the more fingular, as calcination is a very ftrange method of procuring the cryftals of a body, and in this fubftance feems entirely to deftroy them in their original ftate; fo that chance alone could have difcovered a property of their rifing in vapour from this, and again affuming their proper form; but it would deferve a trial whether the common *fpars*, which will recryftallize after folution in the acid menftrua, will alfo do it after calcination. Mem. Acad. Par. 1719.

SPARS, in medicine, have from the earlieft times been recommended in nephritic complaints. Some have ufed one kind, fome another, as the *lapis judaicus*, the *fparry* incruftations of caverns, petrified oyfter-fhells, and water in which large quantities of *fpar* are fuftained. After all, the nephritic virtues of *fpar* want fufficient proof; fome even fufpect its ufe to be more hurtful than beneficial. See CRYSTAL.

It were to be wifhed, that whoever attempts to afcertain this point, would choofe for the experiment fome determinate kind of *fpar* in its natural form, rather than under appearances, whereby its efficacy may be confounded with that of other bodies. See the articles BELEMNITES and OSTRACITES.

SPARAGUS, or ASPARAGUS, *fperage*, in botany. See the articles ASPARAGUS and SPERAGE.

SPARGANOSIS, a word ufed by fome to exprefs a milk-tumor in women's breafts.

SPARGUS, in ichthyology, a name given by Gaza to the common fparus, which he calls alfo *fluta*.

Artedi calls it the plain yellow *fparus* with an annular fpot near the tail. See SPARUS.

SPARLING-*fowl*, in zoology, a name given in fome places by the country people to the female merganfer, called more ufually the *dundiver*. This fo much differs from the male of the fame fpecies, as to have deceived the generality of authors into thinking it a different bird.

SPARRING, or SPARING, among cock-fighters, a term ufed to fignify the fighting of a cock with another to breathe him; in which fights they put hotts on their fpurs, that they may not hurt one another. Sportfm. Dict. in voc. See the article HOTTS.

SPARROW, in zoology. See the article PASSER.

SPARROW-*grafs*, in botany, &c. See ASPARAGUS.

SPARSE-*leaves*, *fparfa folia*, among botanifts. See LEAF.

SPARTIUM, in botany, the name of a genus of plants, the characters of which are thefe. The flower is of the papilionaceous kind; the piftil, which arifes from the cup, finally becomes a fhort roundifh turgid pod, which ufually contains a kidney-fhaped feed.

The fpecies of *fpartium*, enumerated by Mr. Tournefort, are thefe. 1. The yellow-flowered *fpartium* with a kidney-fhaped feed. 2. The white-flowered Spanifh *fpartium*. 3. The prickly ebony-like purfelain-leaved American *fpartium*. And 4. the climbing citron-leaved American *fpartium* with white flowers growing in clufters at the joints. *Tourn.* Inft. p. 645.

SPARTOPOLIAS *lapis*, in natural hiftory, a name given by fome authors to a whitifh agate, variegated with long and flender ftreaks of grey difpofed in a varioufly undulated order, and refembling grey hairs.

SPARUS, in the Linnæan fyftem of zoology, the name of a genus of fifhes of the general order of the acanthopterygii, the characters of which are, that the opercula of the gills are fcaly, and the mouth is furnifhed with grinders covered with lips. Of this genus are the fargus, cantharus, melanurus, &c. *Linnæi* Syft. Nat. p. 54.

In the Artedian fyftem of ichthyology, the characters of this genus of fifhes are thefe. The coverings of the gills are fcaly. The teeth are covered with lips, as in quadrupeds. The

The teeth in the jaws resemble the dentes canini of men. The molares, or grinders, are like those of quadrupeds. The teeth are placed only in the jaws and fauces, their palate and tongue being smooth. There is but one back fin. The eyes are covered with a lax skin, and the tail in most of the species is forked. The intestines are long, and they are twisted in spiral forms, and often fixed to the mesentery. The appendices to the pylorus are large, and few in number, from three to seven being the usual numbers.

Of the *spari* some have acute and cylindric teeth; of these the following are the species of them. 1. The *sparus* with a very acute back, and an arched yellow spire between the eyes. This is the *aurata*, or gilt-head. 2. The silver-eyed *sparus* with yellow parallel longitudinal lines on each side. 3. The red *sparus* with silver eyes. This is the *rubellio* of authors. 4. The reddish *sparus* with the skin formed into a sinus at the root of the back fin and the pinna ani. This is called the *brama marina*, or sea-bream. The tail is forked, and the mouth has granulous tubercles in it. 5. The variegated *sparus* with an acute back, and with four large teeth. This is the *dentex* and *synodon* of authors. 6. The *sparus* with four longitudinal parallel lines, of a golden and silvery colour. This is the *boops* of authors. 7. The variegated *sparus* with a black spot in the middle of each side, and with four large teeth. This is the *mana* of authors. 8. The *sparus* with a black spot on each side, and with the pectoral fins and the tail red. 9. The *sparus* with the upper jaw longest, and with two transverse black lines on each side. 10. The *sparus* with the second bone of the belly fins extended into a long hair. This is the *chromis* of authors. 11. The variegated *sparus* with an equal tail, and a black spot in it near the end. This is the *orphus* of authors. Its head is reddish. 12. The yellowish *sparus* with a single annular spot in the tail. This is the *sparus* of authors, Artedi only having used the name in this extensive generical sense. 13. The *sparus* variegated with yellow transverse lines, with a large and remarkable spot at the tail. This is the *sargus* of authors. 14. The *sparus* variegated with longitudinal lines, with a black spot on each side of the tail. This is the *melanurus* of authors. 15. The *sparus* with eleven lines on each side, which are gold coloured, and run longitudinally and parallel to one another. This is the *salpa* of authors. Thus have the several fishes, which are only so many species of the same natural genus, been treated of under almost as many generical names, to the great confusion of those who apply to this study. *Artedi*, Gen. Pisc. p. 28.

The *sparus* is common in the Adriatic, and some other seas, and esteemed a very delicate fish. *Aldrovand.* de Pisc. lib. 2. cap. 18. *Gesner*, Paralip. p. 1056.

The name *sparus* is of Greek origin, being derived from the verb σπαιρειν, to palpitate, or tremble; and was given to this fish from its remarkable quality of trembling or palpitating all over the body, as soon as taken out of the water.

SPARUS, among the Romans, a kind of rustic weapon, bent backwards like the foot. It was likewise used for a small dart, or missive weapon. *Pitisc.* in voc.

SPASM (*Cycl.*)—A *spasm* may be either universal, extending itself over the whole body, which is a very rare case; or partial, occupying only some one part of the body: these are very frequent, and seize at times on every part, from the head to the foot.

Of the nature of the universal *spasms* are, 1. the *tetanus*, which seizes upon the whole body, and makes it stiff and rigid in every part. 2. The *emprosthotonos*, which bends the body forwards, so that the head is brought to meet the knees. 3. The *opisthotonos*; this enclines the whole body forcibly backwards. And 4. the *catalepsis*, which seizes the whole system in a moment, and fixes it rigidly and unalterably in that posture in which it finds it; so that the position of every limb, and the very turn of the countenance, and look of the eyes, is the same as when the patient was seized. This is a very rare case.

To the class of particular and partial *spasms* belong 1. many of the arthritic complaints. 2. The *incubus*, or nightmare, which is a *spasm* of the breast. 3. The *convulsive asthma*. 4. The *cynic spasm*, which is a peculiar distortion of the face, resembling that of a person while laughing. This endures usually many hours, and is often of very fatal consequence, frequently terminating in an apoplexy, or in the most terrible convulsions. 5. The *sardonic laugh*, which only differs from the former in that it is attended with an absolute delirium, which is not the case in the other. 6. The *priapism*, which is an involuntary and painful erection of the penis. 7. The spastic contraction of the colon in flatulent colics. 8. The *fixt spasms* of Paracelsus, which the author describes as often afflicting podagric and arthritic patients. *Junker's* Consp. Med. p. 608.

Spasms in general, beside these distinctions, are divided by authors into the sudden, or instantaneous, which seize upon any muscle in a moment, and keep it for a considerable time in a painful state of contraction, and the slow ones. The *slow spasms* are also divided into two kinds. 1. The *muscular* and *tendinous*. And 2. the *fibrillary*. In the first of these the whole muscle is affected with tensive pains, and the limb becomes finally contracted. In the other, the separate fibres in the muscle are only affected. This is usually the case in *spasms* in arthritic cases, which seize a few fibres only at first, but finally fasten upon more, and extend themselves over the whole muscle, in which case the pain usually becomes less. A tensive pain in the neck, occasioned by sitting or lying in an uneasy posture, usually called a *crick in the neck*, is also to be enumerated among the partial *spasms*; and finally, these affections are not restrained wholly to the external parts, but often seize also upon the internal, as the œsophagus, the stomach, the bladder, &c.

It is a common error to confound the word *spasm* with *convulsion*; their difference is evident, the one being stationary and immoveable, the other erratic, and flying from one part of a muscle to another, and from one muscle to another; the convulsion also usually extends itself farther than the *spasm*, and is greater in degree; and finally, the *spasm* is a much less dangerous complaint than the convulsion. Men are more subject to *spasms* in general than women, and among them, such as are of a sanguine and plethoric habit, are most of all subject to them. The general cause of *spasms* is an abundance of blood in a body where the vessels are small, and nature is endeavouring to throw off the load of the plethora from vessels, where it is troublesome to her, by this means; which, though an erroneous one, is therefore not without its end.

Prognostics in SPASMS. The universal *spasms* are greatly the most dangerous, as they are frequently attended with internal inflammations; and the partial *spasms* too often degenerate into convulsions. If *spasms* are very frequent in young people, they are to be suspected of threatening arthritic complaints in old age; and when persons have been free from *spasms* in their youth, and become subject to them when old, it is much to be feared that they portend apoplexies, palsies, and suffocative catarrhs: and in general all *spasms*, as they are in reality no other than the incomplete attempts of nature to free herself of somewhat that offends her in particular parts, portend some worse mischief, when they are observed to return frequently, and with violence. *Spasms* happening in acute diseases, and from wounds, are all very dangerous symptoms, and threaten convulsions, and other mischiefs.

Method of cure. The means to be used, when the fits are off, are bleeding in any manner, by the lancet, by leeches, or by cupping, as may be most proper in regard to the part principally affected, and other circumstances; after this the primæ viæ are to be cleared by purges from any foulnesses that may adhere to them; and finally, such medicines are to be given, as are known to attenuate the blood; and with all this, gentle exercise is of great service. In the time of the fit, lenient and paregoric medicines of this kind are amber, and the spirit of hartshorn: to these are to be added the acrid vegetables, such as the more temperate carminatives, and the emulsive diluent medicines, with nitre and cinnabar. This last drug is famous alone in all these cases, and indeed in all emotions of the blood; but neither this, nor any of the others, will take effect till after bleeding, if the *spasm* be violent. The volatile alkalis also succeed best when mixed with a fixed one; such as the spirit of hartshorn with the tincture of salt of tartar, or of antimony. *Junker's* Consp. Med. p. 612. See CONVULSION, *Appendix*.

SPATAGOIDES, in natural history, the name of a genus of the *echini marini*, the characters of which are; that it has the aperture for the anus on one side of the upper surface, and has a large furrow on the back, which makes it of a cordated form; but has no furrows on the vertex, but only four or five smooth rays, made of a number of slight transverse striæ. See Tab. of Testaceous Animals, N° 14.

SPATANGI, in natural history, the name of a genus of the *echini marini*, including all those which are marked in the shape of a heart, and have the aperture for the anus in one of the sides of the upper superficies. These have all a remarkable furrow on the back; their base is nearly flat, and they have several furrows on the vertex. By these characters they are distinguished from the brissi, with which they have in common the marks of two lips to their mouth, and want the teeth the other kinds have. See Tab. of Testaceous Animals, N° 11. *Klein's* Echin. p. 35.

SPATHA, is a word used by different authors in various senses; some express by it a rib; others the instrument called by surgeons a *spatula*, and used for spreading ointments and plasters; and Celsus calls a sort of incision-knife by this name. It is also used for the external covering of the fruit of the palm-tree, and by others for a sword. This last is indeed its proper signification, and all the others are only metaphorical applications of it to different things, which bear some resemblance to a sword.

SPATHA, among botanists, expresses that sort of cup which consists of a simple membrane growing from the stalk. This kind of cup is of various figures; often diphyllous, or divided into two parts; often simple; sometimes more divided: it incloses sometimes a single flower, sometimes several flowers

flowers together, and these have often no perianthium. The *spatha* is of very different texture, and consistence, in different plants.

SPATHA, among the Romans, is sometimes taken for a broad sword, sometimes for a sort of ladle used by cooks, and also for a surgeon's instrument. *Pitisc.* in voc.

SPATHALIUM, among the Romans, an ornament which the women wore about their hands, not unlike the coral ones of the moderns. *Pitisc.* in voc.

SPATHESTER, the name of a chirurgical instrument used to draw the prepuce over the glands.

SPATHINUS, in natural history, a name given by the Greeks to the stag, or deer, when in its second year.

In the first it was called *nebrus*; in the third year *dicrotus*; and after this *cerastes* as long as it lived.

SPATHOMELE, a word used by some to express the spatula, and by apothecaries and surgeons in mixing and spreading ointments and plasters.

SPATLING-*poppy*, a name given to the common field-lychnis, from the white froth found on it in the spring. See the article FROTH-*spit*.

SPATULA, (*Cycl.*)—The use of the *spatula* is to depress the tongue, in order to examine the state of the tonsils, uvula, and fauces, when they are affected with any disorders. It is also used to suspend the tongue, when the frænum is to be divided; for which purpose it has a fissure at its extremity, and should rather be made of silver than of any other metal. These *spatulæ* are made of different shapes. Vid. *Heister's* Surg. Introd. sect. 36. and Plate I. P. Q. R.

SPAX, a name given by some authors to the common tænia, a small fish of the anguilliform-kind, frequent on the shores of Italy. *Rondelet.* de Pisc. p. 112.

SPEAR, in the manege. The feather of a horse, called the *stroke of the spear*, is a mark in the neck, or near the shoulder of some Barbs, and some Turky and Spanish horses, representing the blow or cut of a *spear* in those places, with some resemblance of a scar. This feather is an infallible sign of a good horse.

SPEAR-*hand*, or *sword-hand* of a horseman, is his right hand.

SPEAR-*foot*, of a horse, is the far-foot behind. See the article FAR, *Appendix*.

SPEARWORT, the English name of the *ranunculus flammeus*. See the article RANUNCULUS.

This is with us generally esteemed a poison, but the Scotch use it as a medicine. They beat it, and squeeze out the juice, which they take as a purge, drinking a little melted butter or oil before and after it, to prevent its taking the skin off from the throat. It operates very violently, but with their robust constitutions it does very well.

They use it also externally in cases of pain in the head, or any other part of the body. They bruise the leaves to a sort of paste, and apply them to the part; they soon raise a blister, and a large quantity of water is discharged, after which the pain goes off. This is a short way of blistering, and answers as safely, and as well as ours by the cantharides: but it is a wonder that people, who see this quality in the plant, should dare to take it into their mouths and stomachs.

SPECIES (*Cycl.*)—It has been generally allowed to be true, that no *species* of animal, once created, ever became extinct, or ever will be: but though this may be true in general, yet it does not follow, but that a whole species of animals may be extinct in some particular place by various accidents.

This seems to have been the case with the great moose-deer, now found only in America, which was certainly once an inhabitant of Ireland, though now extinct there, and that so long ago, that no historian mentions its ever having lived there.

There are many animals, as well as trees and plants, common to America and to Ireland. The horns of the moose-deer are found with the bones of the head, and sometimes with other bones, in immense quantities, to this day, in that kingdom, buried in strata of marl at great depths. The writers of fossils, who are fond of resolving every thing into the effects of the deluge, affirm, that these horns were brought from some other country by the waters of the flood; but they seem to be as improbable things to be brought by the sea, and left uninjured in other countries, as can well be conceived; and they are too little altered, and too well preserved, to suffer an unprejudiced observer to agree to this account.

We find numerous instances of the surface of the earth altering, in length of time, in many parts of this kingdom; and it is no forced judgment to determine, that the soil, in which these horns are now found buried, was once the surface of the country, though other substances have been since piled upon it, and made a surface over it. The creatures, whose horns we find buried, probably lived on the island when this was the surface; and as they live in herds, so dying in herds, or at least several together, their bodies were left in heaps upon the surface, where they were afterwards consumed and wasted, only the tough substance of the horns preserving them, they have remained, and being covered with the superadded strata, are now found in this fossile state. In countenance of this opinion it is to be observed, that the deer-kind in general are subject to contagious diseases, which often carry off great numbers of them. The rein-deer in Lapland are sometimes almost all destroyed by these diseases; and it is not impossible that such a distemper, raging longer and more violently than ordinary, might destroy the whole *species* in this place. The inhabitants might also promote the destruction by their hunting; for we see by the destruction of the wolves, once so frequent in this kingdom, that this cause alone may be sufficient to extirpate, or extinguish the race of an animal in one kingdom: Phil. Tranf. Nº 27. p. 501.

What the accurate Artedi has given, as the definition of the *species* in ichthyology, is not confined to fishes alone, but, with proper regulations, may be made the basis of real distinctions of *species* in all other natural bodies. Every fish, which differs from all the other fishes of the same genus in some external part, whether that difference be in excess or defect, in number or in proportion, or even in colour, provided that the difference be fixed and invariable, is properly to be called a distinct *species*. *Artedi's* Ichthyolog.

The specific differences of fishes are to be drawn from these circumstances; but it is not to be supposed that every *species* differs in all of them, sometimes only one, sometimes more, occasion the variation. See SPECIFIC *names*.

If any one fish, in regard to all the others of the same genus, is found to be possessed of some external part which they all want; as for example, if it have cirri, tubercles in the shape of horns on the head, spines or prickles in the head, or on any other part of the body, the fish is then to be esteemed a distinct *species*. If one fish differs from the others of the same genus in the number of any parts, as fins, spines, or tubercles, it is then also a distinct *species*. If one fish differs from another in the proportion of any essential part, as in the having longer jaws, longer teeth, or the like, it is also to be esteemed a truly different *species*. If one fish differs from another in the figure of some essential part, as of the snout, the back, the teeth, or the tail, or the lineæ laterales, it is to be esteemed a distinct *species*. If one fish differs from another of the same genus in the excess of parts, having some part that is deficient in the other; or if in the number, proportion, or figure of some of the essential parts; the distinction will be the more evident as the greater number of parts differ, and the *species* will easily be found to be truly distinct. *Artedi's* Ichthyolog.

If a fish differs from all the others of the same genus in colour, while it has no other distinction from some of them, then it is to be examined whether the colour is always permanent and invariable; if not, there is no distinction of *species* to be founded upon it; but if it be, it remains a matter of doubt whether it may be esteemed a specific difference, colour being one of the least essential characters, and, according to Linnæus, what no distinction of *species* can be founded on. As the colour of fishes is very apt to vary, even in the same *species*, and to be sometimes more intense, sometimes more remiss, this is to be considered in a due light, before any judgment is formed on it; and it is to be observed whether the colour, that makes the difference, be wholly of another nature, or only different in degree. The *perca fluviatilis* of Bellonius will be sometimes pale yellow, sometimes deeper, and sometimes even black, according as the water is clear or more muddy; and thus whatever differences are only in degree of the same colour, or in the changes from that degree toward black, without the intermixture of any other colour, are not to be at all depended upon. *Linnæi* Fund. Bot. 27.

We are not to expect the same precision in the differences of the truly distinct *species* of all the genera of fishes: in some they are found so obvious, and so great, that the first look distinguishes them; but there are some other genera, in which the several *species* are so alike one to the other, in the essential characters, that though there is a general external face, in which they all vary, yet it is not easy to say in what the distinction between *species* and *species* consists. Thus, among the several *species* of salmons, the number and figure of the essential parts is the same in all, and their proportion, in regard to the bulk of the fish, differs but little; the jaws are in some indeed wider, and in others longer, but it is not much. The colours and spots vary indeed greatly, in the different *species*, but then it must be allowed, that they also differ in the several individuals of the same *species*: so that, upon the whole, there is no genus of fish, in which the *species* are so difficultly distinguished. The very bones of the fins, which differ in the several *species* of the same genus, in almost all other fishes, are the same in these. The number of the vertebræ is almost the only mark in which the real difference of these consists: this is a troublesome thing to count, but in the boiled fish it is best done, and is always certain, the number being the same in all of the same *species*, of whatever size, and the several *species* all differing as to this number. Great care is to be taken in the counting of these, and by that means the smallest fish and the largest will be found to have the same number, if of the

fame *fpecies*. There are fome few inftances of the different *fpecies* of the fame genus having the fame number of vertebræ, but this is very rare. Artedi tells us that he never obferved it but in a few of the cyprini; and thofe which have no diftinction in this character, he obferves, have fuch very remarkable external differences, that it is not needful to look for others.

Species *aromaticæ*, a new name given in the late London Difpenfatory to the compofition ufually called *fpecies diambræ*. The College obferved, that the intention of this medicine was beft anfwered, by compofing it of fuch fpices as the daily experience of the table fhews were moft grateful to the ftomach, and by avoiding all ingredients which, though of the aromatic kind, are accompanied with any thing naufeous and difguftful in their flavour; and therefore have ordered it to be now made in the following manner. Take cinnamon two ounces, cardamom feeds, ginger, and long pepper, of each an ounce; make all together into a fine powder. *Pemberton's* Lond. Difp. p. 318.

Species *e fcordio*, the ingredients of the diafcordium electuary in a dry form. The recipe is fumething altered in the late London Pharmacopœia, and ftands thus: take bole armenic four ounces, fcordium two ounces, cinnamon an ounce and half, ftorax, roots of tormentil, biftort, gentian, dittany of Crete, galbanum, and gum arabic and red rofes each an ounce, long pepper and ginger each half an ounce, opium three drachms; this may be left out at pleafure; and all are to be beat to a fine powder. *Pemberton's* Lond. Difp. p. 319.

Species, in mufic. Here, as in other arts, *fpecies* denotes the fubdivifions of the genus. The antients had three genera, the *enharmonic*, *chromatic*, and *diatonic*. The *enharmonic* had no fubordinate *fpecies*. The *chromatic* genus was divided into three *fpecies*, viz. the *molle*, *fefquialterum*, and *toniæum*; or, as others call them, *molle*, *hemiolium*, and *tonicum* [c]. And laftly, the *diatonic* genus was fubdivided into the *molle*, and the *intenfum*; fo that the antients had fix *fpecies*, or divifions of the fourth in ufe. Some of thefe are alfo in ufe among the moderns, but others are unknown, as yet, in theory or practice [d].—[[c] *Wallis's* Append. Ptolem. Harm. p. 164. [d] Vid. Phil. Tranf. N° 481. p. 271, feq.] See the articles Enharmonic, Chromatic, and Diatonic. See alfo Genus.

Species is alfo applied, in antient muficians, to the different difpofitions of the tones and femitones in a fourth, fifth, or octave. Hence they fay there are three fpecies of fourths, four of fifths, feven of octaves. *Wallis's* Append. Ptolem. Harm. p. 171.

The Grecians expreffed this fenfe of the term *fpecies* by εἶδος, or by σχῆμα [e]. The Latin word, *figura* [f], has alfo been taken in the fame fenfe.—[[e] *Ariftox.* p. 6, 74: Ed. Meib. [f] *Wallis*, ibid. p. 170.]

Change of Species. The *change of fpecies* is a term ufed in hufbandry to exprefs an expedient the farmer often has recourfe to, in order to procure good crops: this is the fowing firft one kind of plant, then another, and then a third, and fo on, upon the fame land: by this means the moft is made of the foil; and it is found, when it will no longer give a good crop of the firft corn planted on it, it will ftill give a good one of fome other *fpecies*; and finally, of peafe after all. After this laft *change of fpecies*, it is found neceffary, in the common method of hufbandry, to renew the land with fallowing and manure, in order to its producing any thing again. See Soil.

This *change of fpecies* has been a practice of the farmers of all times, and is recommended, and judged neceffary, by moft of the writers on this fubject; but Tull, in his New Syftem of Horfehoeing Hufbandry, proves, that it is not neceffary, and that the land only wants proper tillage, when exhaufted by one fort of corn, to enable it to produce as good crops of the fame corn again. The three fundamental propofitions he lays down to prove this, are, 1. That plants of the moft different nature feed on the fame forts of food. 2. That there is no plant but what muft rob every other plant, within its reach, of a part of its nourifhment. And 3. that a foil, which is once proper for any kind of vegetable, will continue to be always proper for it, in refpect to the fort of food it gives. If only any one of thefe propofitions were true, it would follow, that there is no need of a *change of fpecies* from year to year; and as they are all fo, this truth is yet the more inconteftible, and experience proves it yet more evidently, for the fame land will produce crops of wheat every year, without any change, only by the practice of the horfehoeing hufbandry, inftead of the common. *Tull's* Hufbandry. See the articles Food *of plants* and Husbandry.

SPECIFIC (*Cycl.*)—Specific *operation of medicines*. Dr. Martin endeavours to defend the doctrine of the *fpecific operations* of cathartic medicines, from the different nature of the drugs, and by an appeal to experience. See his Eff. Phyf. and Medic.

Specific *gravity of metals*. See Metals.

Specific *names*, in natural hiftory, are thofe epithets compofed each of one or more terms, and placed after the generical name, in the denomination of any fpecies of plant, animal, or mineral, expreffing thofe characters by which it differs from all the other fpecies of that genus.

The more accurate of the modern naturalifts have, in their feveral provinces, fet about the reformation of the *fpecific* names of things. They firft obferve, that many of the *fpecific* names of the antients no way anfwered the intent of their formation, but expreffed the more trivial diftinctions, or accidents, while they omitted the realities, and more effential grounds of diftinction. On this foundation the critical writers of our times diftinguifh the old *fpecific* names into the genuine, or true, and the fpurious, or falfe ones.

The genuine names are thofe which exprefs thofe characters, by means of which the thing becomes a different fpecies; thefe are invariable, and by thefe names the thing is, in fome fort, defcribed. The falfe ones are thofe *fpecific* names which do not, nor cannot diftinguifh the fpecies, called by them, from the others of the fame genus, which may as well belong to fome other fpecies as to that, and which therefore are of no ufe to the ftudent. The true formation of thefe names is on the real characters of the body to be named; but inftead of this thefe falfe ones are formed, from the following accidental, or variable diftinctions.

1. From the fifh being common, or fcarce. On this difference are founded the diftinctions of fifh, for inftance, in their *fpecific* names, into *vulgaris* and *rara*; and thus authors abound with *acus vulgaris*, *lupus vulgaris*, *boops rara*, and the like. Names are meant to convey fome idea of the nature of the thing, but what do thefe convey? or how is the perfon, who is fhewn a fifh he does not know, to find out whether it be fcarce or common?

2. From the number of the fpecies of fome genus. Thus we find *acus prima*, and *acus altera*, and the *afellus primus*, *fecundus*, *tertius*, and fo on, in many other genera: thefe convey even lefs than the former.

3. Some of the *fpecific* names of the antients are formed of the place, or habitation of the creatures. Of this nature are the *alburnus lacuftris*, the *apua phalerica*, the *brama marina*, the *lampetra fluviatilis*, and a thoufand others; either alluding to the nature of the water, or peculiar place where the fifh firft met with, of this genus, chanced to be found.

4. Some are formed on the value or bafenefs of the fifh. Of this kind are the *falmo nobilis*, the *albula lauta*, the *afellus lufcus*, the *falmo fpurius*, fo called, from its not having the fine flavour of the other; and fo on.

5. The different bignefs is another foundation of thefe names: thus we have the *acus major*, *albula parva*, *bugloffus maximus*, *harengus minor*, and the like.

6. The colour, though very variable, or only confined to one part of the fifh, has given occafion to others; and in thefe it has been expreffed, as if generally diffufed over the fifh. Thus the *albula cærulea* has only a part blue, though the name feems to exprefs that the whole is fo: the *afellus flavefcens*, and *virefcens*, are names of the fame kind, the yellow and green expreffed in them not being general, but only partial: the *torpedo maculofa*, and *non maculofa*, feem to exprefs two fpecies different only in the fpots, whereas thefe fpots appear and difappear at times in the fame *fpecies*. All thefe, and many hundred others, founded on the fame principles with thefe, are falfe and fpurious, and not at all anfwering the intent of *fpecific* names, nor diftinguifhing the fifhes one from another. An unknown fifh carries no figures of 1, 2, 3, &c. marked on it, to fay whether it be the firft, fecond, or third of the author who defcribes it; nor can it be known, at fight, whether it be a native of falt or of frefh water, whether it lives in rivers or in ponds, and whether it be of American, Afiatic, or European origin; neither can the tafte, the nature, or the manner of life of the fifh, be feen on the outfide of its body: all thefe, therefore, are to be banifhed from the names, though they make a proper part of the hiftory of the fpecies. On firft meeting with a fifh, can any man judge whether it be the greateft, the middle, or the fmalleft of its kind, or fay whether it is longer or broader than the reft, before he knows them? nor can the mention of a colour fignify any thing, when it is not faid what part of the fifh is tinged with it. As the properties, on which thefe *fpecific* names are founded, cannot be known till the fifh is well known, and as the ufe of the name is the leading the perfon, yet ignorant, to know it, it follows that all thefe names are falfe, frivolous, and abfurd, and yet thefe are the names by which almoft all the old authors have called them.

The true, and genuine *fpecific* name, on the other hand, is that which diftinguifhes the fifh called by it, at firft fight, from all the others of the fame genus; or which, if it require thought and deliberation, yet requires no perfon's knowledge of the fifh.

Thefe *fpecific* names are to be taken from fome external part, which in that peculiar fpecies differs from thofe of all the others, either in regard to excefs, defect, number, proportion, or invariable colour.

 The

The *fpecific* names, taken from the excefs of the parts, or from fome particular parts which that fpecies has, and which the others want, are preferable to all others. The principal parts, which fometimes are in excefs, fometimes are deficient, and therefore give the proper origin to thefe names, are thefe. The *cirri*, or long-fhaped flefhy filaments hanging from the mouth; the tubercles, which in the heads of fome fifhes imitate horns; the prickles which are on the heads, and other parts; and the prominences, and other foft apophyfes; and other fuch remarkable things, in whatever part of the body. Inftances of proper *fpecific* names, founded on the excefs or defect of thefe parts, are thefe. *Gadus ore cirrato*, and *gadus c'rris carens. Cottus cornubus quatuor in capite. Cottus cornubus capitis carens*, &c.

After thefe, the beft names are thofe which are taken from the number of certain parts differing in excefs, or fmall numbers, in the feveral fpecies. The fins, and their bones, and the prickles of them, are parts which give thefe names, as alfo the fpines on the heads and bodies of fome fifhes, and the *lineæ laterales*, or fide lines, and the teeth.

Of this kind are thofe expreffive *fpecific* names of the *gadus dorfo dipterygio, gadus dorfo tripterygio, gafterofteus aculeis decem*, &c.

Others of thefe names are taken from the proportion of fome two parts one to another. The difference of this kind is generally in regard to length; and the parts alluded to, are the jaws, the teeth, *&c.* Of this fort are the *clupea mandibula fuperiore longiore*, and the like. In the fquali, and fome other cartilaginous fifhes, the upper part of the tail is always longer than the under part; but as this holds in all the genus, there can be no ufe made of it as a *fpecific* character.

Others of thefe names are made from the figure of fome particular part, different from the reft of the genus. The parts alluded to in thefe names are generally thefe; the fnout, the back and belly, the tail, the lateral line, and the fixed fpots and colours. The fnout of any fpecies, when different from that of the others of the fame genus, in being conic, depreffed, or compreffed, or long and cylindric, gives great opportunity of good names of this kind. Thus we have the names of *coregonus roftro conico*, and *coregonus roftro depreffo*, and the like. The back and belly, when plane ridged, or carinated, give occafion to *fpecific* names in the fame manner; the cyprini in particular give us inftances of this. The tail gives alfo occafion to many names, as it is cufpidated, rounded, ftrait, lightly hollowed, or forked; and the lateral lines give the fame occafions of names, as they are ftrait, crooked, fingle, double, *&c.* The fpots, provided they are permanent, are good for the bafis of *fpecific* names, expreffing whether they are round or long, large or fmall, ftrait, or tranfverfe. The fituation of the fins, and other parts, is generally fo regular in all the fpecies of the fame genus, when that genus is naturally eftablifhed, that very little can be done in the making names from them as *fpecific* ones; but this fituation of the parts is of the utmoft ufe in the generical diftinctions.

All *fpecific* names, founded on thefe characters, are genuine and proper, and fupply real notes for the diftinguifhing the fpecies; and whoever will examine together all the fpecies of any one genus, however badly named by the old authors, will find, in all the really diftinct fpecies, marks fufficient for the making fuch names as are here prefcribed. No fifh can want thefe, fince its being a diftinct fpecies from the reft confifts in fome of the articles, on the defcription and diftinction of which that name is to be formed. *Artedi*'s Ichthyology.

SPECTABILES, among the Romans, a title of honour given to the fecond rank or degree of nobility under the Roman emperors, being unknown in the time of the republic. There were other two degrees; the firft had the title of *illuftres*, and the third that of *clariffimi*. *Pitifc.* in voc.

SPECTER, in conchyliology, a name given by the French naturalifts to a fpecies of *voluta*, on which there are feveral reddifh broad bands, compofed of loofe and irregular figures; the ground colour is a fine white. They are called by Latin writers *concha fpectrorum*. See CONCHA.

SPECTRORUM *candela*, in natural hiftory, a name by which fome have called the belemnites. See the article BELEMNITES.

SPECULA, among the Romans, were places whence a good view might be had of what was doing at a diftance. The word is particularly ufed to fignify watch-towers and beacons. *Pitifc.* in voc.

SPECULARES, in natural hiftory, the name of a genus of foffils of the clafs of the talcs.

The word is derived from the Latin, *fpeculum*, a looking-glafs; the bodies of this kind being naturally of bright gloffy and polifhed furfaces, and in the thicker maffes not tranfparent, but reflecting the images of things.

The *fpeculares* are talcs, compofed of vifibly feparate plates of extreme thinnefs, and each fiffile again into a number of others yet finer. See Tab. of Foffils, Clafs 1.

The bodies of this genus are the common Mufcovy talc; the *fpecularis lucida fufca*, or brown talc, a fpecies little inferior to the former in beauty, and found in Germany and England; and the *fpecularis amethyftina*, called *talc rouge*, or red talc, by the French. This is found in Mufcovy and Perfia, and no where elfe, as far as is yet known, and is often imported into France in maffes, which are of a beautiful purple: we have of it brought into England, but only in thin flakes, fit for the covering miniature pictures. In thefe flakes it has none of the rednefs natural to it in the lump, but is the fineft and moft tranfparent of all the talcs. *Hill*'s Hift. of Foffils, p. 71. 74.

Pliny, and other of the antient writers, as well as feveral of the moderns, ufe the term *fpecularis lapis* for that fpecies of talc, commonly known by the name of *ifinglafs*, or *Mufcovy glafs*.

This has been a fubftance in great ufe among mechanics, from the earlieft times we have any accounts of. It is found in broad flat maffes of ten or twelve inches in breadth, and from half an inch to three inches in thicknefs; and is compofed in thefe of an almoft infinite number of broad and beautifully even plates, or flakes, laid with a perfect regularity on one another, and feldom parting naturally from each other, though by art they may be divided, almoft without end, into broad and extremely thin laminæ. Thefe are very flexile and elaftic, and make no effervefcence with aqua fortis. By the laft of thefe properties they are diftinguifhed from the plated fpars which fome have confounded with them, and by their elafticity from all other foffile bodies.

It is found in many parts of the world. The ifland of Cyprus abounds with it. It is very common alfo in Ruffia, and has of late been difcovered to abound in the Alps, the Apennines, and many of the mountains of Germany. It is imported in large quantities into England, and is ufed by the lanthorn-makers inftead of horn, in their nicer works; by the painters to cover miniature pictures; and by the microfcope-makers to preferve fmall objects for viewing by glaffes. The antients ufed it inftead of glafs in their windows. *Hill*'s Hift. of Foffils, p. 72.

SPECULARIA, among the Romans, a kind of window-cafements, which were ufed before glafs was introduced for this purpofe. They confifted of tranfparent ftones, called *lapides fpeculares*. *Pitifc.* in voc. See SPECULARIS *lapis*, *Cycl.* and *Suppl.*

SPECULARIS *lapis*. See SPECULARES, fupra.

SPECULATION (*Cycl.*)—SPECULATION-*fhell*, in natural hiftory, a name given by the French writers to a very beautiful fpecies of the *voluta*, ufually called by us the *Guinea-fhell*, from its being brought from that part of the world. See the article VOLUTA.

SPECULATIVE (*Cycl.*)—SPECULATIVE *mufic*, called by the Italians *mufica fpeculativa*, or *theorica*, that which treats only of the founds, examines their natures, properties, and effects, without regard to the executive part.

SPECULUM (*Cycl.*)—SPECULUM *linguæ*, a chirurgical inftrument. See GLOSSOSPATHA.

SPECULUM *indicum*, an affected term ufed by fome chemical writers to exprefs filings of iron.

SPEEDWELL, *veronica*, in botany. See the article VERONICA.

We have feveral of the exotic kinds of this plant propagated in the gardens of the curious. They may all be raifed from feeds, but their roots encreafe fo faft, that they are ufually propagated by parting them. The beft feafon for doing this is in September, and the fummer following they will produce their flowers in full perfection. They will grow in any fituation, but they thrive beft in a frefh foil, that is not too wet. They require no care but the being kept clear from weeds, and having their roots parted every autumn, otherwife they multiply too faft, and both choak up themfelves, and injure whatever is near them. *Miller*'s Gard. Dict.

SPEISSE, in mineralogy, a name given by the Germans, and other workers on cobalt, to a fort of impure regulus of bifmuth, fometimes occurring in their proceffes.

It is not uncommon for ores of bifmuth to be mixed with the cobalt in the fmalt-works. Both this ore and the cobalt yield the blue vitrifiable earth of which fmalt is made, but in one of them it is blended with arfenic, and in the other with the bifmuth. The feparating it from thefe two minerals requires different proceffes, and the workmen therefore feparate the two minerals, and work each by itfelf; but it fometimes happens that the ore of bifmuth is fo like to the true cobalt, that it cannot be diftinguifhed by the eye, and fo intimately mixed with it, that it cannot be feparated from it; in this cafe the whole is expofed to the fire together, and after the arfenic is fublimed in form of meal, there remains a coarfe and impure regulus of bifmuth, which having mixed itfelf with the earth of the cobalt, and other extraneous fubftances, is of a reddifh white colour, and very impure and friable. This gives them the trouble of a fecond operation, by which they feparate the pure regulus of bifmuth, and the remainder being a mixture of its earth and that of the cobalt, is run together into the blue glafs, called *fmalt*, the earth of bifmuth ore being of the fame nature with that of cobalt. Philof. Tranf. N° 396. p. 199.

SPELTA, in the materia medica, a name ufed for the grain of the zea dicoccos, commonly called *fpelt corn.* *Dale*'s Pharm. p. 261.

SPELTER (*Cycl.*)—This mineral has been applied lately to fo large a work as the cylinder of a fire-engine, by Mr. Ford of Colebrook Dale in Shropfhire: it runs eafier, and cafts as true as brafs, and bores full as well, or better, when warmed a little. While cold it is as brittle as glafs, but the warmth of the hand will make it fo pliant, that a fhaving of it may be wrapt round the finger like a bit of paper. This metal never rufts, and therefore works better than iron; the ruft of which, upon the leaft intermiffion of working, refifts the motion of the pifton. Philof. Tranf. N° 482. fect. 6.

SPENT, at fea. The feamen fay a fhip hath *fpent* any maft, or yard, when it is broken down by foul weather, or any fuch accident; but if it be done by an enemy's fhot in a fight, they fay, *fuch a yard*, or *maft, was fhot by the board.*

SPERAGE, *afparagus*, in botany. See ASPARAGUS.

The propagation of this ufeful plant is from feed; and as much of the fuccefs depends upon the goodnefs of the feed, it is much better to fave it than to buy it at the fhops. The manner of faving it is this: mark with a ftick fome of the faireft buds, and when they are run to berry, and the ftalks begin to dry and wither, cut them up; rub off the berries into a tub, and pouring water upon them, rub them about with your hands, the hufks will break and let out the feed, and will fwim away with the water in pouring it off; fo that in repeating this two or three times, the feeds will be clean wafhed, and found at the bottom of the tub. Thefe muft be fpread on a mat to dry, and in the beginning of February muft be fown on a bed of rich earth: they muft not be fown too thick, and muft be trod into the ground, and the earth raked over them fmooth; the bed is to be kept clear of weeds all the fummer, and in October, when the ftalks are withered and dry, a little rotten dung muft be fpread half an inch thick over the whole furface of the bed.

The fpring following the plants will be fit to plant out for good; the ground muft therefore be prepared for them by trenching it well, and burying a large quantity of rotten dung in the trenches, fo that it may lie at leaft fix inches below the furface of the ground: when this is done, level the whole plot exactly, taking out all the loofe ftones; this is to be done juft at the time when the *afparagus* is to be planted out, which muft be in the beginning of March, if the foil is dry, and the feafon forward; but in a wet foil, it is better to wait till the beginning of April, which is about the feafon that the plants are beginning to fhoot.

The feafon being now come, the roots muft be carefully taken up with a narrow-pronged dung-fork, fhaking them out of the earth, and feparating them from each other, and obferving to lay all their heads even, for the more convenient planting them, which muft be done in this manner.

Lines muft be drawn, at a foot diftance each, ftrait acrofs the bed, thefe muft be dug into fmall trenches of fix inches deep, into which the roots muft be laid, placing them againft the fides of the trench with their buds in a right pofition upwards, and fo, that when the earth is raked over them, they may be two inches under the furface of the ground. Between every four rows a fpace of two feet and a half fhould be left for walking in, to cut the *afparagus*. When the *afparagus* is thus planted, a crop of onions may be fown on the ground, which will not at all hurt it.

A month after this the *afparagus* will come up, the crop of onions muft then be thinned, and the weeds carefully cleared away. About Auguft the onions will be fit to pull up. In October following cut off the fhoots of the *afparagus* within two inches of the ground, clear well all weeds away, and throw up the earth upon the beds, fo as to leave them five inches above the level of the alleys. A row of colworts may be planted in the middle of the alleys, but nothing muft be now fown on the beds. In the fpring the weeds muft be houghed up, and all the fummer the beds kept clear of weeds. In October they muft be turned up, and earthed again, as the preceding feafon.

The fecond fpring after planting, fome of the young *afparagus* may be cut for the table. The larger fhoots fhould only be taken, and thefe fhould be cut at two inches under ground, and the beds every year managed as in the fecond year. *Miller*'s Gard. Dict.

SPERMACOCE, the name of a plant which, according to the Linnæan fyftem of botany, makes a diftinct genus, the characters of which are; that the calyx is a very fmall perianthium, divided by four notches at its extremity, placed on the germen, and remaining when the flower is fallen. The flower confifts of one leaf, which forms a tube longer than the flower, with its extremity divided into four fegments, fomewhat bent back, and obtufe. The ftamina are four pointed filaments, fhorter than the flower. The antheræ are fimple. The germen of the piftil is roundifh, flatted, and fituated below the receptacle. The ftyle is fingle, but bifid at the top. The ftigmata are obtufe. The fruit is compofed of two oblong capfules growing together, convex on one fide, and flat on the other, obtufe, and each furnifhed with two horns. The feeds are fingle and roundifh. *Linnæi* Gen. Plant. p. 25.

SPERMATOPŒA, a name given to fuch medicines as are fuppofed to encreafe the femen.

SPERVERIUS, in zoology, a name by which Bellonius, and fome other authors, have called the fparrow-hawk, more commonly known by the names of *nifus*, and *accipiter fringillarius*. *Ray*'s Ornitholog. p. 52. See the article FRINGILLARIUS *accipiter*.

SPHACELUS (*Cycl.*)—In cafes of a perfect *fphacelus*, or mortification, where the parts are become abfolutely dead, and wholly without fenfe, and foft, fo as to retain the impreffions of one's fingers ends, and are plainly fetid and corrupted, all the medicines in the world will be ineffectual to reftore the part to its life and fenfe again; and all that remains to be done, is the one miferable remedy of preferving the reft of the body, by cutting off that part, to prevent the mortification from fpreading farther. A different method is to be taken, however, in this operation, according to the degree of the fymptoms, and nature of the part affected.

If only fome extremity of the foot, tarfus, metatarfus, or inftep, or only the bare fkin and fat are *fphacelated*, which is fometimes the cafe, the whole foot is not to be amputated in that cafe, but preferving the limb entire, the furgeon is only to remove that part which is vitiated; and that is frequently beft of all done by fuppuration, or if not to be effected by that means, may be attempted by the cauftic. When it is to be done by fuppuration, that is to be brought on as faft as poffible, and when it is done, the cruft or efchar of the ulcer is to be feparated from the found parts with proper caution.

To haften effectually a fuppuration in thefe cafes, nothing is fo ferviceable as the making numerous long and deep fcarifications near the found parts; and afterwards the incifed parts are to be well anointed with the common digeftive ointment, and after that treated with the balfamic cataplafms and fomentations, in common ufe on the like occafions.

A fomentation, alfo very ferviceable in thefe cafes, is made by mixing, in a quart of a decoction of fcordium, or of barley-water, vinegar of rue fix ounces, fpirit of wine with Venice treacle four ounces, and an ounce, or two ounces of common falt: this is to be applied hot with compreffes to the part, and frequently repeated, till it is feen that the diforder fpreads no farther; which is known to be the cafe, when we fee the tumor of the vitiated parts fubfide, and the edges of the found parts become tumid all round; and on the fecond or third day after this a fuppuration is ufually formed, and the found parts gradually become feparated from the vitiated. After this, to foften and promote a fpeedy feparation of the efchar, the following cataplafm is always found highly ferviceable. Take of fcordium two handfuls, mallows, marfhmallows, and henbane, of each one handful, lavender-flowers half a handful; let thefe be boiled to the confiftence of a cataplafm in vinegar, or oxycrate, and then in that ftate add to them three ounces of flour of linfeed, one ounce of linfeed oil, and two ounces of fal armoniac. This is to be applied warm over the whole, and retained in a proper degree of heat, as long as fhall be found neceffary, by means of a brick boiled in water, and applied wrapped in a linnen cloth, or fome other like means. After thefe methods have been ufed, and the whole furrounding fkin is gently tumefied with rednefs, a cruft, or efchar is then formed by degrees, and the found flefh begins to feparate from the reft: by this we know that the diforder has done fpreading, and that an entire feparation of the vitiated parts will very fhortly follow.

When this feparation fhews itfelf beginning, it muft be promoted as much as poffible, by dreffing the part with the common digeftive, either alone, or mixed with Venice treacle, which muft be retained on between the found and dead parts. To make way for this, it is fometimes neceffary to divide them a little by the lancet; and when that is done, and the dreffing has been applied, the before defcribed cataplafm fhould be again laid on warm; and in all the fucceeding dreffings, whatever is found loofe of the dead part muft be carefully removed. And if it be neceffary, from the adhefion of the vitiated parts to the found, to ufe the fciffors, or fcalpel, to divide them, this is always to be done with very little, either of pain or of danger; it will then be proper to drefs the part with the digeftive, and a plafter of diachylon, or the like, over it, till the corrupted parts are entirely caft off, and the ulcer appears perfectly well cleanfed, and then the cure is eafily perfected in the common way.

This is the gentler, and more common method; fome furgeons, however, from the tedioufnefs of it, have recourfe directly, in thefe cafes, to the cauftic. They anoint either the edges only, or elfe the whole of the corrupted part, every day, with butter of antimony, or the cauftic ftone liquefied, till the living parts are furrounded by a fort of efchar, applying afterwards the cataplafms before defcribed, or others

others of the fame kind, to prevent the diforder from fpreading; and to make the corrupted parts feparate from the found, the corrofive lixivium of Boerhaave is greatly in repute, and much ufed on thefe occafions. It is made of three ounces of very ftrong quick-lime, mixed with nine ounces of pot-afhes, firft ground feparately to powder, and afterwards mixed, adding a little water, they are then to be put into a glafs veffel, and fet in a cellar to run by deliquium.

As foon as they are found to become fluid, the matter muft be put into a filtre of coarfe paper, and the clear liquor that runs through muft be kept for ufe. It is to be ufed by dipping a brufh or feather into it, and rubbing it over the part affected once or twice a day; or fine linnen-rags may be wetted with it, and applied all over the part; not forgetting, however, at the fame time, the ufe of the before ordered cataplafm: this application is to be continued till the corrupted part begins to caft off in crufts or fcales; and when this is the cafe, it muft be dreffed with the common digeftive, and when perfectly cleanfed, healed with a vulnerary balfam.

Another cauftic, highly commended by Bellofte in thefe cafes, is made by diffolving one part of crude mercury in two parts, either of fpirit of nitre, or of aqua fortis. This is to be rubbed over the parts as the former, and will occafion a fpeedy feparation. Several great authors, however, advife the ufing the knife, and actual cautery in thefe cafes, dividing and burning down to the found parts; but the cruelty of this method, and the pain, and fometimes danger that attend it, make the methods of cure by fuppuratives, and mild cauftics, much to be preferred: indeed, the furgeons in general are not now fo fond of calling in the actual cautery as formerly.

Finally, when the *fphacelus* is fo deeply affixed in any part of the upper or lower extremity, that it has penetrated thro' the mufcles as far as the bone, and has either refifted the force of all medicines, or the proper time for the applying them has been neglected; in this cafe, to preferve the reft of the body, the injured part muft be amputated. *Heifter*'s Surgery, p. 217.

SPHÆCULÆ, among the Romans, were tickets of wood, *tefferæ ligneæ*, by which the emperors fcattered their prefents to people of both fexes in the theatre, or *circus*. *Pitifc.* Lex. Ant. in voc.

SPHÆROMACHIA, Σφαιρομαχια, in antiquity, a particular kind of boxing, wherein the combatants had balls of ftone or lead in their hands, which were called σφαῖραι. *Potter*, Archæol. Græc. lib. 2. cap. 21. Tom. I. p. 448. See the article BOXING.

SPHAGITIDES, a name given by fome authors to the jugular veins.

SPHAGNUM, in botany, the name of a genus of moffes, the characters of which are thefe: They produce heads or capfules only of one kind, which differ alfo from thofe of all the other moffes, in that they have no calyptra, or other covering: thefe ftand on very fhort pedicles, and are therefore fo guarded by the leaves, as not to need any other covering. The *fphagna* are divided into two orders, the one comprehending the branched kinds, and the other the unbranched ones: thefe are diftinguifhed by fome by the terms *cauliferous* and *acaulous*. See Tab. of Moffes, N° 8. *Dillen.* Hift. Mufc. p. 242.

Of the firft order there are nine known fpecies. 1. The larger foft and hollow-leaved bog-*fphagnum*. This grows in wet places in vaft beds, and rifes to a foot high, with clufters of leaves at the heads of all the branches. 2. The foft bog-*fphagnum* with finer leaves. This is as tall, or more fo, than the former, but is much flenderer, and the leaves much fmaller and finer. The firft is ufually of a dead white, and this laft of a fomewhat reddifh hue. 3. The bright green-pointed *fphagnum* with oval heads. This grows in large tufts in the boggy places on the Welch mountains. 4. The rough *fphagnum* with red heads. The ftalks of this are not above an inch long, and not branched, but folded, and interwoven one with another into thick tufts. It ufually grows upon rocks, but fometimes on the ftumps of old trees. 5. The hoary nodofe *fphagnum*. This is all over hairy, the ftalks are fomewhat longer than thofe of the former kind, and the heads are ripe in December. This ufually grows on the ftumps of old trees. 6. The *fphagnum* with numerous heads, all bending one way. This is very common on the ftumps of old trees, and produces its heads in November. It is of a very lively and pleafant green. 7. The plain-feathered *fphagnum*. This is an elegant fpecies, and grows on the bodies of old trees in Patagonia. 8. The wavy-feathered *fphagnum* with hairy heads. This is of the fame country with the former, and grows to three or four inches in length. 9. The wavy-feathered *fphagnum* with fcaly heads. This is found on the trunks of trees in the woods of Germany. *Dillen.* Hift. Mufc. p. 253.

Of the *fphagna* of the fecond order, or thofe which have no branched ftalks, there are only four known fpecies. 1. The dwarf hair-leaved *fphagnum*. This is the fmalleft and fineft of all the plants of this clafs, and is common in fmall tufts about way-fides in many places. 2. The larger dwarf bulbous *fphagnum*. This grows only to the height of a few lines, and is compofed of numerous leaves, furrounding one another fo, as to form feveral bulbs. The heads are eafier to be diftinguifhed by the touch than the fight, for they lie hid between the leaves, and are fmaller than poppy-feeds. 3. The leffer dwarf bulbous *fphagnum*. The leaves of this are much fmaller than thofe of the preceding kind. 4. The largeft dwarf *fphagnum* with briftles. The capfules of this fpecies, as well as the leaves, are much larger than thofe of any other of the acaulous kinds, and the middle rib of every leaf runs out into a kind of briftle.

SPHENOIDES (*Cycl.*)—The *fphenoidal*, or cuneiform bone, is fituated in the lower part of the cranium, a little toward its forepart, making the middle or bafis of the fkull, and thence taking its name of *os bafilare*.

It is of a very odd figure, its greateft extent is tranfverfe, and it may in fome manner be faid to reprefent a bat with its wings extended. Its pofterior, or thickeft part, by which it is joined to the apophyfis of the os occipitis, may be called its body; the reft of it is wholly made up of eminences and cavities. And in order to examine thefe methodically, the bone muft be divided into two fides, the one external, the greateft part of which may be feen in one entire fkull, the other internal, which does not appear till the fkull is opened.

The eminences on the outfide are thefe. Two temporal apophyfes, which are the largeft of all the proceffes of this bone, and at the greateft diftance from each other, called *the great wings of the os fphenoides*, and thefe are fometimes, though rarely, feparated from the reft of the bone by tranfverfe futures. Two orbitary apophyfes, which form a confiderable portion of the orbit next the temples. A fmall fharp procefs, formed like a bird's bill between the orbitary apophyfes. Two pterygoide apophyfes, each of which is divided into two alæ: one internal, which is the largeft, the other external, the lower end of which is in the fhape of a hook; and each of thefe alæ is again divided into two fides, the one internal toward the palate; the other external toward the temples. Two fpinal apophyfes. A little anterior eminence above the fharp procefs, for the articulation of this bone with the os ethmoides; but in fome fubjects, inftead of this eminence, there is only a little notch.

The external cavities of this bone are two portions of the temporal foffæ; two pterygoide foffæ; the lower ends of thefe are divided by a little notch, or flit, of an irregular figure, which may be called the *fiffura palatina*: a little oblong foffula at the root of the internal ala; two fuperior orbitary, or *fphenoidal* fiffures; a little notch at the end of each of thefe fiffures, for the paffage of an artery of the dura mater; two temporal notches; two maxillary notches, the edges of which help to form the two inferior orbitary fiffures, which may be called *fiffuræ fpheno-maxillares*: two holes for the fuperior maxillary nerves; two other holes on one fide of the former, called *pterygoide*, which, in an entire fkull, are hid by the other bones: two oval holes, for the inferior maxillary nerves; two little fpinal holes, each of which tranfmits an artery of the dura mater, but fometimes thefe are only notches; a little hole between the two maxillary holes; and a little groove on one fide of the fpinal apophyfis, which forms part of the euftachian tube.

The internal eminences are two thin fharp tranfverfe apophyfes, which form the fuperior orbitary fiffures, called *the little wings of the fphenoidal bone*; a little procefs, in fome fubjects, between thefe two thin apophyfes, for the articulation with the os ethmoides, which in fome other fubjects is a notch. Four clynoide apophyfes, two anterior, two pofterior; which laft are fometimes united in one, and fometimes run forward all the way to the anterior proceffes, forming a kind of bridge, under which the internal carotid artery paffes at its laft curvature. This paffage has alfo fometimes been found divided into two by a thin bony feptum, befide other varieties; one or two fmall productions where the internal carotid enters the cranium; two little ftyloide proceffes, or hooks, which in fome fubjects join the extremity of the os occipitis, before the perfect union of thefe bones.

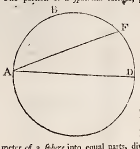
The internal cavities are two portions of the large middle foffæ of the bafis cranii; two fuperior, orbitary or *fphenoidal* proceffes; two optic holes; a fmall fuperior, orbitary hole, near the end of each *fphenoidal* fiffure, which is often no more than a notch; a fmall groove at the extremities of the fame fiffures; a depreffion between the clynoide apophyfes, called *fella fphenoidalis*, *fella turcica*, and *foffa pituitaria*. Here are alfo feen almoft all the holes mentioned on its outfide, and it appears that the fuperior maxillary hole ought more juftly to be called a fhort canal. Befide thefe, there are alfo two very confiderable cavities, called the *fphenoidal finufes*, fituated in the thick portion of this bone, under the anterior part of the fella turcica, and middle fpace between the two optic holes, reaching as far as the fharp procefs, or bill, already defcribed; thefe are commonly divided by a bony feptum, and they open before on each fide of the fharp procefs,

proceſs, juſt behind the ſuperior conchæ of the noſe, or oſſa convoluta ſuperiora.

The figure, ſize, openings, and ſeptum of theſe vary greatly; ſometimes one is wanting, ſometimes both are ſo; ſometimes there are ſeveral cells without any ſeptum, and ſome times the ſeptum is placed more on one ſide than the other. The ſubſtance of this bone is for the moſt part compact, having very little diploe; and what there is of this lies in diſtinct parts of the bone, *viz.* in the thick portion behind the ſella turcica, toward the ſymphyſis with the occipital bone, and in the orbitary apophyſes in a ſmall quantity. It is articulated with all the other bones of the cranium, with the oſſa malarum, oſſa maxillaria, oſſa palati and vomer. *Winſlow's* Anatomy, p. 26.

SPHERE (*Cycl.*)—A *ſphere* is equal to four times the cone, the baſe of which is equal to the generating circle, and the height of which is equal to the radius. Or a hemiſphere is equal to twice the cone of the ſame baſe and height. And a cylinder, of the ſame height and baſe, being triple of the cone, it follows, that the hemiſphere is two thirds of the cylinder, and conſequently the whole *ſphere* two thirds of the circumſcribing cylinder. *Archim.* de Sph. et Cyl.

The portion of a *ſpherical* ſurface, generated by the revolution of an arch ABF, about the diameter AD of a circle, is equal to the area of a circle deſcribed with a radius equal to the chord AF.



The ſurfaces therefore generated by arches, terminated at A, are as the ſquares of their chords, or as their verſed ſines.

Hence parallel planes, which divide the diameter of a *ſphere* into equal parts, divide the ſurface of the *ſphere* into equal parts at the ſame time. *Archim.* de Sph. et Cyl.

SPHERICAL (*Cycl.*)—SPHERICAL *numbers*. See CIRCULAR *numbers*, *Cycl.*

SPHEROID (*Cycl.*)—Dr. Halley has demonſtrated, that in a ſphere Mercator's nautical meridian line is a ſcale of logarithmic tangents of the half complements of the latitudes[b]. But as the earth has been found to be a *ſpheroid*, this figure will make ſome alteration in the numbers reſulting from Dr. Halley's theorem. Mr. Mac Laurin has therefore given us a rule, whereby the meridional parts to any *ſpheroid* may be found with the ſame exactneſs as in a ſphere. We have alſo an ingenious treatiſe of Mr. Murdoch's on the ſame ſubject—[[b] See Phil. Tranſ. N° 219. Mr. Cotes has alſo demonſtrated the ſame propoſition, Harm. Menſ. p. 20, 21.] A ſphere, whoſe diameter is equal to the great axis of a *ſpheroid*, is to that *ſpheroid* in the duplicate ratio of the axis to its conjugate. Hence the *ſpheroid* is quadruple of a cone, the height of which is the ſemi-axis, and the baſe of which is equal to a circle deſcribed upon the conjugate axis as its diameter. *Mac Laurin's* Fluxions Introd. p. 16.

SPHINCTER (*Cycl.*)—SPHINCTER *cutanea*, in anatomy, a name given by Laurence, and ſome others, to the muſcle of the anus, called by Albinus and Winſlow *ſphincter internus ani*.

SPHINCTER *inteſtinalis*. See INTESTINALIS *ſphincter*.

SPHINCTER *labiorum*, in anatomy, a name given by Douglas, and ſome others, to the muſcle of the mouth, called by Riolanus and Albinus *orbicularis*, and *orbicularis oris*, and by Cowper *conſtrictor labiorum*.

SPHINCTER *palpebrarum*, in anatomy, a name given by Molinet, and ſome others, to the muſcle of the eyelids, called by Winſlow and Albinus the *orbicularis palpebrarum*, and *orbicularis*. See the article ORBICULARIS.

SPHINX, (*Cycl.*) in the hiſtory of inſects, a name given by Mr. Reaumur to a very ſingular ſpecies of caterpillar deſcribed in the ſecond volume of his hiſtory of inſects.

The reaſon of the author's having given it that name, is, that when it is not eating it erects its head, and with it more than a third part of its body, into a perpendicular ſituation upon the leaf on which it was before laid all along; it keeps itſelf a long time in this ſituation, looking around it with a ſeeming air of fierceneſs. There are alſo a ſeries of broad belts upon the body, which contribute ſomething towards its reſemblance to the figure of that imaginary monſter.

This caterpillar has a horn on the hinder part of its body, which ſeems to be of no ſort of uſe, but merely a trouble to the creature. It is hollow, and encloſes, in the manner of a ſheath, the new horn which is to appear when the creature changes its ſkin. This the author found to be the caſe by cutting it ſeveral times, and always finding within it the new horn cut off alſo at the ſame place, and had often obſerved the great difficulty the animal had in changing its ſkin, when it came to the horn. *Reaumur*, Hiſt. Inſect. Tom. 2.

SPHONDYLIUM, *cow-parſnep*, in botany, the name of a genus of plants, the characters of which are theſe. The flowers are diſpoſed in umbels, and are of the roſaceous kind, being compoſed of ſeveral petals of a heart-faſhioned ſhape, irregular in ſize, and diſpoſed in a circular order round a cup, which afterwards becomes a fruit, compoſed of two large, flat, oval ſeeds, ſtriated, and uſually marginated at the end, and which frequently depoſit their covering, and are marked with black ſpots on the ſides where they touch one another.

The ſpecies of *ſphondylium*, enumerated by Mr. Tournefort, are theſe. 1. The common hairy *ſphondylium*. 2. The hairy *ſphondylium* with purple flowers. 3. The great *ſphondylium*, called by authors *panax Heracleum*, or Hercules's all-heal. 4. The curled-leaved *ſphondylium*. 5. The hairy *ſphondylium* with narrower leaves. 6. The narrow-leaved *ſphondylium* with blackiſh purple flowers. 7. The little Alpine *ſphondylium*. 8. The ſmooth Alpine *ſphondylium*. *Tourn.* Inſt. p. 319.

The common *cow-parſnep*, which is frequent in our meadows and paſtures, and flowers in July and Auguſt, is recommended by Dr. Willis, and many others, as one of the beſt nervous ſimples our nation produces, and it is pity that it is not brought more into practice. The ſeed is the part in which its virtues are contained in greateſt perfection, and is a very good medicine in hyſteric caſes, given in powder or infuſion.

SPHONDYLUS, in ichthyology, a name given by Pliny, and others of the old authors, to a peculiar ſpecies of the ſyngnathus, or *acus Ariſtotelis*. It is the ſpecies, called by Artedi *ſyngnathus corpore medio hexagono cauda pinnata*; and by other authors the *acus ſecunda ſpecies*; and by Bellonius and Geſner *typhle marina*. *Pliny*, lib. 32. cap. 11.

SPHONDYLUS is alſo uſed by ſome authors, for the ſtones or bones found in the head of a mullet.

SPHRAGIS, the ſeal-ſtone, a name given by ſome authors to the ſingle joints of the aſteriæ, when found looſe, not joined into a column. See the article ASTERIA.

SPHRAGIS is alſo uſed by ſome of the old Greek naturaliſts, to expreſs the ſpots on the back and ſides of a panther.

The ſkin of this creature is of a pale colour, and theſe ſpots are all dark and round, and look like ſo many regular impreſſions of a ſeal, whence the name *ſphragis*. The Romans called any thing, that was variegated in this manner, *pantherina*; and we meet with the phraſe *menſæ pantherinæ*, uſed to expreſs tables found of ſome wood, which was variegated with round ſpots, in the manner of thoſe *ſphrages* on the back of the panther.

SPHYGMICA, in medicine, a term uſed by ſome for that part of the judgment of the phyſician, which regards the differences of the pulſe.

SPHYRÆNA, in zoology, a name by which ſome authors have called the *ſudis*, or *lucius marinus*, the ſea-pike. *Willughby*, Hiſt. Piſc. p. 273. See the article SUDIS.

SPHYRÆNA *altera*, in ichthyology, a name given by Appian, and ſome other of the old Greek writers, to the *eſox*, or common pike. See the articles ESOX and LUCIUS.

SPICCATO, in the Italian muſic, ſignifies that every note ſhould be well ſeparated from others, and diſtinctly ſounded. It is particularly uſed with regard to inſtruments played with a bow; and denotes that every note muſt have a diſtinct bow from that preceding, or ſucceeding.

SPICULUM, in Roman antiquity, a kind of weapon which ſome will have to be the ſame with the haſta, or ſparus. *Hofm.* Lex. in voc.

SPIDER, *araneus*, in zoology, an inſect of which we have a great number of ſpecies common among us, which all agree in the general marks and characters.

They all have weapons iſſuing out of the mouth, but theſe are of two kinds, according to the two principal diſtinctions of the *ſpiders*. They conſiſt, in ſome, of two ſpiculæ, in the manner of a forked hook: this is their ſtructure in all the kinds which have eight eyes. In others they are compoſed of two forcipated arms, or are divided into two claws, in the manner of the legs of a crab: theſe are the weapons of all thoſe *ſpiders* which have only two eyes.

The bodies of all *ſpiders* are covered with a ſort of cruſtaceous coat, but it is tender and brittle; and in the males of all the ſpecies, the forceps, or weapons at the mouth, are larger and ſtronger than in the females.

All *ſpiders* have two antennæ, placed in the forepart of the head over the mouth: theſe are compoſed like the legs of a number of joints. The head of a *ſpider* is not ſeparated from the ſhoulders by any inciſure, but remains fixed to them as all of one piece.

The eyes of the *ſpider* differ greatly in number, ſituation and figure, in the different ſpecies; and ſometimes the different eyes of the ſame *ſpider* are of different ſizes.

All *ſpiders* have eight legs, which are all inſerted into the breaſt, but in the length and figure of theſe there is as much variety as in the eyes in the different ſpecies of *ſpiders*:

they have all three joints in each leg, but in ſome the foremoſt pair are the longeſt, in others the hinder pair are ſo, and in others ſome of the intermediate pairs.

The belly of the *ſpider* is remarkably divided from the head and ſhoulders, ſo as to adhere only by a thread: this is the caſe in all, except the two-eyed kinds, and in the different ſpecies the body is variouſly painted. The appendages near the anus are very obſervable, they ſerve to ſpin the threads out at. Among the many ſpecies of theſe inſects, ſome are ſmooth, others are hairy, and ſome have a harder, ſome a tenderer ſkin. *Ray's* Hiſt. Inſect. p. 12.

Among the great number of ſpecies of this inſect, theſe are the principal diſtinctions among thoſe which have eight eyes. Some ſpin webs for the catching of flies of a rounded figure; theſe have all their eyes of the ſame ſize and figure; they have four middle ones placed in a quadrangular figure, and the other four beſide theſe, but ſtanding ſomewhat obliquely. The firſt pair of legs of theſe *ſpiders* are always the longeſt, the ſecond pair are the longeſt next to theſe, then the fourth pair, the third being much the ſhorteſt of all. Theſe *ſpiders* are always ſmooth, or nearly ſo, and are elegantly figured on the buttocks. Of theſe ſome always live in the center of the web, others have their habitation in a neighbouring corner. Of the firſt of theſe ſorts we have five ſpecies. 1. The yellowiſh *ſpider* with white back and ſides, and a white head with large pellucid black eyes. This is of a middle ſize, and its legs are variegated with brown and white. The males in this ſpecies are ſlenderer than the females, and of a more reddiſh colour; and in both ſexes the head and ſhoulders are ſomewhat pellucid. 2. The hazel *ſpider* with a croſs on its back, and tubercles on the belly. This ſpecies ſpins very large nets. 3. The ſlender green and gold ſpider with a long body. This is of a middle ſize, and its fore-legs are extremely long. 4. The grey wood-*ſpider* with the body terminating in a three-cornered point. This is a ſmall ſpecies, but it ſpins very large webs. Its belly is black.

Of the ſecond kind of *ſpiders*, which ſpin round webs, and have their habitation at a corner of the web, not in its center, there are five principal ſpecies. Theſe are, 1. the grey full-bodied *ſpider* with various delineations on the back. This is a very large kind; its ſhoulders are hoary, its legs thick, not long and ſpotted. 2. The ſmooth black croſs *ſpider* with an oval body. This is of a middle ſize, its legs are ſhort and ſpotted. It is very common among ruſhes and water plants. 3. The yellow *ſpider* with four great white ſpots, and many ſmall ones. This is one of the largeſt *ſpiders*, and generally builds its habitation on the tops of plants. This is called by Mouffet, and ſome others, the *Colcheſter ſpider:* and there are two other ſpecies which much reſemble it; the one diſtinguiſhed by having a cheſnut-coloured head, and a black belly; the other, by a large brown ſtreak running from the ſhoulders to the tail. 4. The black *ſpider* with figures like oak leaves upon its buttocks. It is a very large *ſpider*. 5. The grey round-headed *ſpider* with foliaceous lines on the buttocks, undulated at the edges. This is a middle-ſized one, and is common about houſes. *Ray's* Hiſt. Inſect. p. 24.

Another genus of *ſpiders* are diſtinguiſhed by their building conglobated webs; theſe are all ſmall, and have the fore-legs longeſt of all, next theſe the hinder pair, and then the ſecond, the third being the ſmalleſt of all.

Of theſe there are ſix principal kinds. 1. The black ſmooth houſe-*ſpider*. This is the largeſt of this genus, and has elevated ſhoulders. 2. The white *ſpider* with an oval body, ſurrounded with a ſcarlet ring. 3. The brown *ſpider* with a round body, ornamented with foliaceous figures. 4. The reddiſh brown wood-*ſpider* with a round body, marked with the figure of a ſtar. 5. The ſmall grey *ſpider* with a black ſpot upon its buttocks. And 6. the ſmall livid *ſpider* with denticulated figures on the rump. This uſually erects its conglobated nets on the top of the branches of furze buſhes.

A third genus of *ſpiders* are diſtinguiſhed by the thickneſs and cloſeneſs of the webs; ſome of theſe inhabit the bottom, or funnel-end of their webs, others live near them, but not in them. Of the firſt genus there are two remarkable ſpecies. 1. The yellowiſh hairy long-legged houſe-*ſpider*. This is of a middle ſize, and its eyes are very black and ſparkling. 2. The great grey *ſpider* with the appendices of the anus very remarkably prominent. This is a very large kind, and is of a livid colour.

Of the ſecond kind of theſe, which live at a diſtance from their webs, there are alſo two principal kinds. 1. The ſmooth cheſnut-coloured, or blackiſh *ſpider* with elegant ſnow-white ſpots. This is of a middle ſize, and has long and ſlender legs. 2. The black *ſpider* with white ſhoulders, and a denticulated white mark upon the back. This is of the middle ſize. Its legs are hairy.

To theſe is to be added the cave-*ſpider* of Mouffet. This is a large black *ſpider* with a very large ſpot, of a deeper and more ſhining black upon the ſhoulders.

A fourth genus of *ſpiders*, is diſtinguiſhed by the ſmallneſs of the webs they build: theſe are, however, of a very cloſe texture, and the creature always lives within them. Of the *ſpiders* of this kind there are three principal ſpecies. 1. The grey woolly *ſpider* with a broad black ſpot on the belly. 2. The plain livid, or yellowiſh *ſpider*. This is ſometimes of the one, and ſometimes of the other of theſe colours, but never has any variegations. 3. The yellowiſh cylindric-bodied *ſpider*. This is a large *ſpider*, and has ſix eyes. This has a long ſeries, or chain of ſpots on the back, and a yellowiſh line or ſtreak on each ſide. *Ray's* Hiſt. Inſect. p. 30. See the articles LUPUS and PHALANGIUM.

The *ſpider* affords to the ſagacious obſerver, as well without as with the aſſiſtance of glaſſes, a great many extremely curious particulars. As the fly (which is the *ſpider's* natural prey) is an animal extremely cautious and nimble, and uſually comes from above, it was neceſſary the *ſpider* ſhould be furniſhed with a quick ſight, and an ability of looking upwards, forwards, and ſideways; at the ſame time; and the microſcrope ſhews, that the number, ſtructure, and diſpoſition of its eyes, are wonderfully adapted to the ſerving all theſe purpoſes.

Moſt *ſpiders* have eight eyes: two on the top of the head or body, for there is no diviſion between them, the *ſpider* having no neck; theſe look directly upwards: there are two more in front, placed a little below theſe, and diſcovering all that paſſes forwards, and on each ſide: a couple more, one whereof points ſideways forward, and the other ſideways backward; ſo that it can ſee almoſt quite round it. All kinds of *ſpiders* have not, however, this exact proviſion; for in ſome we find ten, and in others only ſix, or four. The eyes of the *ſpider* are not pearled; and the field-*ſpiders*, or long-legs, have no more than two eyes.

Whatever be the number of the *ſpider's* eyes, they are however all immoveable and tranſparent, and are ſituated in a moſt curious manner. The beſt way of viewing them with the microſcope, is to cut off the legs and tail, and leave only the head for examination.

All *ſpiders* have eight legs, which they employ in walking, and two ſhorter, called *arms*, which they uſe in ſeizing their prey. All the legs are thickly beſet with hairs; each has ſix joints, and ends with two hooked claws, which are ſerrated on their inſide; by means of theſe teeth, or jags in their claws, they ſeize very faſt hold of any thing, and behind theſe there is a ſort of ſpur, which is perfectly ſmooth. Beſide theſe, nature has allotted to this creature, for the ſeizing its prey, a pair of ſharp crooked claws, or forceps, in the forepart of its head. Theſe ſtand horizontally, and when not exerted for uſe, are concealed in two caſes contrived for their reception, in which they fold like a claſp-knife, and there lie between two rows of teeth, which are likewiſe employed to hold faſt the prey.

Each of theſe claws, or pincers, has a ſmall ſlit near its point, according to Lewenhoek, like that in a viper's tooth, through which he ſuppoſes that a poiſonous juice is, in like manner, thrown out. But Dr. Mead, in his Eſſay on Poiſons, diſſents wholly from this opinion, having never been able, on repeated examinations, to diſcover any ſuch opening, not even in the claws of the great American *ſpider*; which being above fifty times bigger than any of the European *ſpiders*, would more eaſily have diſcovered this opening, if nature had allotted any to this part of the animal. Beſides, repeated obſervations alſo convinced him that nothing dropped out of the claws, which were always dry, while the *ſpider* bit any thing, but that a ſhort white proboſcis was, at the ſame inſtant, thruſt out of the mouth, which inſtilled a liquor into the wound. And the ſame author obſerves, that the quantity of liquor, emitted by our common *ſpiders* when they kill their prey, is viſibly ſo great, and the wounding weapons ſo minute, that they could contain but a very inconſiderable portion thereof, if it were to be diſcharged that way. *Baker's* Microſcope, p. 196.

Spiders frequently caſt their ſkins, which may be found in their webs perfectly dry and tranſparent; and from ſuch ſkins the forceps, or claws, for they are always ſhed with the ſkins, may eaſier be ſeparated, and examined with much greater exactneſs, than in the common *ſpider* while living.

The *ſpider's* manner of weaving its web is very wonderful. The creature has five little teats, or nipples, near the extremity of the tail; from theſe there proceeds a gummy liquor, which adheres to every thing it is preſſed againſt, and being drawn out, hardens inſtantly in the air, and becomes a ſtring, or thread, ſtrong enough to bear five or ſix times the weight of the *ſpider's* body. This thread is compoſed of ſeveral finer ones, which are drawn out ſeparately, but unite together at two or three hairs breadth diſtance from the creature's body. Theſe threads are finer or coarſer, according to the bigneſs of the *ſpider* that ſpins them. Mr. Lewenhoek has computed, that a hundred of the ſingle threads of a full grown *ſpider* are not equal to the diameter of the hair of his beard; and conſequently, if the threads and hair be both round, ten thouſand ſuch threads are not bigger than ſuch a hair. He calculates farther, that when young *ſpiders* firſt begin to ſpin, four hundred of them are not larger than one which is of a full growth; allowing which,

which, four millions of a young *spider*'s threads are not so big as the single hair of a man's beard.

The eggs of some *spiders* are a very pleasing microscopic object; they are round at one end, and flattish at the other, with a depression in the center of the flattish end, and a yellowish circle round it. The colour of these eggs is a pearly or bluish white, and when the young *spiders* hatch, they come out in their perfect form, and run about very nimbly. The female *spider* deposits her eggs, to the number of five or six hundred, in a bag composed of her own web, which she either carries under her belly, or hides in some very safe recess. Philos. Transf. N° 272.

The young *spiders* are always very beautiful objects for the microscope. The current of the blood may be easily discovered in their legs, and part of their bodies; and many other curious particulars occur in their dissection.

There are two or three species of this animal, peculiarly worthy the attention of the curious in microscopic discoveries. 1. A little white field-*spider* with short legs. This is found plentifully among new hay, and its body appears like white amber with black knobs, out of which grow short but sharp prickles. The eyes of these may be very distinctly seen, being very brisk and lively, and some have six, some eight of them: each eye has a pupil of a violet blue, which is beautifully clear and transparent, and is surrounded by a circle of pale yellow. 2. The wandering, or hunting *spider*, that spins no webs, but runs and leaps by fits. This has two tufts of feathers fixed to its fore-paws, which make a very beautiful appearance before the microscope. The variety and beauty of colouring also, all over this little creature, afford a very pleasing sight. 3. The *long-legs*, or shepherd-*spider*. This is a most wonderful creature: it has two fore-claws at a great distance from the head, tipped with black like those of a crab, and opening and shutting like the scorpions; these are serrated or indented on their inside. When all the legs are cut from this *spider*, and it is examined by the microscope, it will be seen that the protuberance on the top of its back is furnished with two fine black eyes. *Power*'s Microf. Obs. p. 13. *Hook*'s Micrography. p. 200.

The venom of many kind of *spiders* is greater than usually supposed: we have, in the Philosophical Transactions, an account of a person in New-England who was bitten by a small *spider* a little above his ankle; he perceived the creature biting, and crushed it to death upon the wound, between his stocking and his leg; in half an hour he felt a pain in that leg, which in another half hour extended itself to the groin, and at the same time he had a creeping pain in the calf of his other leg; and in a quarter of an hour after this it affected his stomach, his back, and his head. The pains were not constant and fixed, but erratic, and very acute, and his pulse was extremely low and heavy. He was relieved, by taking internally spirit and salt of hartshorn in viper-wine, and applying a cataplasm of garlick to the part, and in three or four days wholly recovered.

Boccone mentions a species of large *spider*, common in the island of Sardinia, whose bite proves mortal within the space of a few hours; the whole body usually swells almost immediately, in consequence of this bite. The cure is performed by oil of olives, in which the creature is infused over the heat of a stove. This is a medicine they always keep ready in the house, and while they use this externally, they give large doses of Venice-treacle inwardly, dissolved in strong wine: but many die of this bite, either from the want of power in the remedies, or from their being used too late. *Boccon*. Mus. de Fis.

When *spiders* ascend and descend by their thread, they do not spin a new one at every descent; but whenever they ascend, they wind the thread with their feet into a sort of coil, and when they descend, they only unravel it again. Phil. Transf. N° 482. sect. 16.

Some think the white matter, we often find floating in the a irtowards the end of the summer, is produced by *spiders*. Ibid. See the articles *Air*-THREADS, OPILIO, PHALANGIUM, &c.

SPIDER-*wort*, in botany. See PHALANGIUM.

SPIEI, in the glass trade, an iron instrument, hooked at the end and pointed, with which the workmen take the metal up out of the melting-pots for proofs or essays, to see whether it be fit to work. *Neri*'s Art of Glass, p. 241.

SPIGNEL, in the materia medica, &c. the English name of the plant called by botanists *meum*. See MEUM.

SPIGOLA, in ichthyology, a name given by Paulus Jovius, and some others, to that species of pearch which is generally called the *lupus marinus*. See the article LUPUS.

It is a genuine pearch, and is distinguished from the others by Artedi, by the name of the *pearch* with the thirteen rays in the second back fin, and fourteen in the pinna ani. Authors have called two different fish by this name *lupus marinus*, which conveying no distinct idea of the characters of the fish, was applicable to either as much as the other; but this name of Artedi admits of no equivocation, and must always distinguish the fish.

SPIKE, or *Oil of* SPIKE, a name given by our druggists to an essential oil, much used by the varnish-makers and the painters in enamel; and of some use in medicine.

This *oil*, when genuine, is brought from Provence, and some other parts of France, and is there made of lavender. This plant is called in Provence *aspic*, and thence came the name *oil of aspic*, which afterwards degenerated into *oil of spike*.

The manner of making the *oil* upon the spot is this: when the flowers are perfectly ripe, they put them into an alembic with a great quantity of water, and this they distil after several days maceration: there arises with the water a large quantity of an oil of a fine pale amber colour, and this separated from the water, is the true and genuine *oil of spike*.

The flower of this plant is the part which yields the largest quantity of oil; as is the case with all the plants with galeated flowers, of which the husk or flower-cup usually contains almost all the oil of the plant. The aromatic plants, in general, yield indeed but a small quantity of oil, but the vast abundance of this plant, in these places, makes the expence of gathering it so small, that the *oil* is very cheap. The quantity required on several occasions is, however, much greater than what all the lavender of the country can yield; and the price it is expected to be sold at is so small, that it is not to be wondered that there are several common adulterations of it.

The most usual ways of sophisticating it, however, are two; the one with the spirit of wine, which is esteemed the least hurtful, and the *oil* thus sophisticated is often called the very best of the country. The method Mr. Geoffroy took to discover the cheat was this: he procured a long and narrow vial, of an equal diameter all the way up, into this he first put an ounce of fair water, and to this he added an ounce of the *oil*; he marked the height of the water in the vial, then shook the two liquors together, and they became milky, and heated on the mixture, which alone would have been a sufficient proof that there was spirit of wine in the *oil*. After some standing the liquor became clear, and the *oil* floated at the top, but in a much smaller quantity than might have been expected, there being not more than a quarter of an ounce of it, the rest having been spirit of wine, which mixed with the water, and thus left all the true *oil*, which was only one fourth of the quantity, to float alone on the water, which was greatly encreased in height in the vial. A pint of this *oil of spike*, therefore, contains only four ounces of the genuine *oil*, and twelve ounces of plain spirit of wine.

The second method of adulterating this *oil*, which the same gentleman had suspected, was easily discovered next: for on mixing this quarter of an ounce of pure *oil of spike* with three quarters of an ounce of oil of turpentine, there was produced an ounce of a liquor, which appeared wholly the same with the *oil of spike* commonly sold in the druggists shops. And indeed, much of what is usually sold is worse than this, being no other than oil of turpentine scented with a small quantity of the true *oil of spike*.

The ready way of discovering the *oil*, counterfeited with oil of turpentine, is to wet a paper in it, and set it on fire; the turpentine will here be discovered by the thick smoak it yields, it being, of all vegetable oils, that which yields greatly the thickest cloud in burning: and, on the contrary, that which has been adulterated with spirit of wine, will be distinguished by the same trial, by its yielding a much finer and thinner smoak, and burning with a bright blue flame. If they be tried by firing them in a spoon, that which is adulterated with spirit of wine will burn very bright, and yield no fume at first; but as it grows near the bottom, it will smoak a little, and finally will leave no residuum, except that it varnishes over the inside of the spoon: that adulterated with the oil of turpentine will burn more vehemently, smoak more, and leave a coarser varnish upon the spoon; and if it be of the coarsest kind, that is, if it have been adulterated with badly-rectified oil of turpentine, the fume will be the more abundant, and there will be left in the spoon a fetid matter, resembling melted pitch.

Mr. Geoffroy tried whether, in the business of varnishing, the oil of turpentine alone might not do as well as the *oil of spike*; he found that it dried perfectly well, but that it left a stinking smell upon the work, which never went off; whereas the mixture of this oil, with that of *spike*, makes a smell like neither, and which soon goes off.

An ounce of oil of turpentine, with only twenty drops, either of our common oil of lavender, or the pure *oil of spike*, makes a liquor tolerably well scented, and which serves for the purposes of *oil of spike*. If two drachms of our oil of lavender be added to six drachms of spirit of wine, they immediately mix, and this afterwards mixed in a small proportion with oil of turpentine, makes a sort of *oil of spike*. The most regular method, however, that the artificer can use, if he can get the genuine *oil of spike*, is to mix one ounce of it with three of oil of turpentine, which perfectly fits it for his purpose, and makes it the same with that in common use. The method of making this perfectly pure, is to redistil it in a balneum mariæ; there will thus be pro-

cured an oil highly rectified, and pellucid as water, which will dry away as soon as touched on any thing. The great disadvantage attending the *oil of spike* adulterated with spirit of wine, is, that it will not readily mix with all the sorts of varnish.

Having gone through the properties of *oil of spike*, in regard to varnish, it remains to enquire into them in regard to its other great use in enamel, and to consider the effects of the two usual methods of adulterating it in this work.

The *oil of spike* which wants body, is not at all fit for enamelling, because it dries too suddenly, and does not at all assist the natural dryness of the enamel, which is only a sort of powder of glass; and the particles of this powder, with a fluid of too little body, are not manageable by the artists, so that the colour never is brought to a due consistence: and when the *oil* has too much body, the mixture becomes too tenacious, and is as unmanageable in that extreme as in the other; and this fault is attended with another very great mischief, which is, that the fume raised by this *oil*, when heated, is often so gross, as to destroy the beauty of the colours. In short, thick oil of turpentine is always destructive of enamels by its smoak.

The true composition for enamelling is *oil of spike* mixed with spirit of wine, but the proportions must be nicely regulated from repeated trials: for if the quantity of the spirit be too large, it is apt to separate itself from the *oil* and colour in the drying, and this always spoils the gloss and beauty of the work. Artificers observe, that *oil of spike* does best for their purposes, after it has been kept two or three years. But this is only owing to the *oil*'s being adulterated with spirit of wine, and usually containing too large a proportion of the spirit when first sent over, it becomes better for use when a part of that spirit has had time to evaporate in the keeping. It would be a better way for these curious works, to procure the *oil* pure, and then occasionally mix it with such a proportion of spirit of wine, as experience shews to be the most proper. Mem. Acad. Par. 1716.

SPIKENARD, in botany. See the article NARDUS.

Ointment of SPIKENARD. See NARDINUM *unguentum.*

SPIKES, or, as the seamen call them, SPEEKS, in a ship, are large long iron nails with flat heads. They are of divers lengths, some a foot, or two long, and some are jagged, so that they cannot be drawn out again. They are used to fasten the planks and timbers. They call also a kind of small fidd, which serves them to open and splice small ropes, a *marling spike.*

SPINA (*Cycl.*)—SPINA *bifida*, in anatomy, a parting of the *spinal* processes into two rows. The existence of such a case is doubted. See SPINE.

SPINA *burgi*, in botany, a name used by some authors for the *alaternus*, or ever-green privet, a garden shrub, the fruit of which is a mild astringent. *Park.* Theatr. p. 1445.

SPINA *ventosa*, is properly a species of corruption of the bones, which takes its rise in their internal parts, and by degrees enlarges the bone, and raises it into a tumor.

The antients were strangers to this name for this disorder, and called it *sideratio*, *gangræna*, or *cancer ossis*, and sometimes expressed it by the word *teredo*. Some among the French call it also an *exostosis*, though this is a term more properly denoting certain eminences, or preternatural acuminated excrescences in the bones, which happen after fracture, or other accident, and are some.imes attended with a caries.

The name of the disorder seems to have been borrowed from *spina*, a thorn, from the resemblance the eminences of the bone in this case bear to thorns, continually pricking the flesh, and producing the most grievous pains; and the epithet *ventosa* is added, because the tumor seems, to the touch, to be filled with air, though this is very rarely the case. This seems to have been the origin of the name *spina ventosa*, which some after-writers barbarously distorted into *spinæ ventositas*. When this disorder happens to children, Severinus, and many others, call it *pædarthrocaces*.

In the *spina ventosa* the caries, or erosion of the bone, is occasioned by a depravity of the contained fluids, and generally arises spontaneously, or without any external cause, and does not begin upon the surface of the bone, but between its lamellæ, or else in its internal cavity; from whence extending itself by degrees to the external parts, it at length either affects the whole bone, or a greater or smaller part of it, expanding itself to different widths, and rising to a tumor, which is sometimes hard, and without pain, and at others feels as if it were filled with wind, and is attended with a greater or lesser degree of pain, pricking and shooting, and at last grows red, and is attended with other bad symptoms, till the disordered bone being by degrees corroded, the common integuments, and other softer parts that lay over it, remaining at first entire, but at last partaking of the disorder, foul ulcers of a very terrible sort break out. When tumors of the bone are hard, and the soft parts about them not inflated, and are free from redness, inflammation, and pain, as is very frequently the case in ricketty disorders, the bad symptoms just described seldom come on. This is properly the pædarthrocaces, but the painful, red, inflated tumors happening equally to children, and to adults, are properly the *spina ventosa.*

It differs from a caries by being attended with a tumor, and from the rickets by its being accompanied with pain and erosion. It generally begins about the heads, or epiphyses of the larger bones, where they are most tender and spungy, and where the noxious matter may not only have sufficient room to lodge in the cellular substance, but where it will also meet with the least resistance in softening and expanding the parts. Sometimes, however, it also arises in the middle of the bones, between their lamellæ, especially in the tibia. The os frontis is also subject to disorders of this kind in venereal cases, and it is frequently situated in the bones of the face, neck and breast; though those of the arms, legs, fingers, carpus, meta-carpus, tarsus, and meta-tarsus, are more frequently the subjects of it.

Though this disorder usually arises from internal, yet it is sometimes found to be owing to external causes; especially in persons constitutionally addicted to a disorder of this kind, when the vessels between the lamellæ of the bone, or in the medulla itself, are by a blow, fall, or other external violence, injured, or torn, and their fluids extravasated, and by degrees putrefy, corrupt, and destroy the medulla, and soften the very substance of the bone, and corrode it; whence proceed pain, tumors, ulcers, and fistulas of the bone, and adjacent parts, and all the same train of mischiefs which attend these disorders, when begun spontaneously from internal causes.

The proximate cause of this disorder is a collection, or congestion, either of a viscid and thick, or of an acrimonious and corroding humor, or an inflammation arising in the medulla, or in the cellular substance of the bone, degenerating into an abscess, and forming matter, or ichor. As these stagnating fluids can find no discharge from the bones, especially from their cavities, they continue confined there till they putrefy, and become acrimonious, and corrode and destroy the neighbouring parts, converting them, particularly the medulla, into a kind of sanies; and at length they attack the bone and destroy it. The collection of viscid and pituitous humors, and the expansion of the bones, sometimes happens without pain, as in ricketty cases, but the erosion of the parts can never happen without the most acute pains.

When the internal parts of the bones only are affected by this disorder, the pain does not encrease upon external pressure; when the pain encreases upon external pressure, the external parts are brought into consent; and when this happens, the periosteum, and parts which surround it, with the substance of the bone and tunica cellularis, enlarge, from whence a sensation frequently arises, as if the parts were filled with air, or wind. But when the tumor is opened, either spontaneously, or by the knife, the bone, if it lies bare, is found full of small erosions, resembling a spunge or pumice-stone.

Of this terrible disorder there are properly three degrees: the first is, when the patient complains of a continual grievous pain in the bone, which seems to him to proceed from the marrow, and torments him so, that he can have no sleep, and all this while there is no external pain or tumor; in this case the disease is confined to the internal part of the bone. The second degree is when a tumor appears to be arisen on the surface of the bone, and is attended with external pain, more or less. The third degree is when, after the former symptoms, an ulcer is formed in the tumor, which discharges a fetid ichor, or purulent matter, smelling like rank butter or lard.

There are two methods of treating this disorder, one suited to the milder, the other to the more violent state of it, in which the bones, and the parts surrounding them, are entirely corroded and destroyed. In the milder stages, the acrimony of the blood must be endeavoured to be corrected by large draughts of the decoctions of the woods, with the China and sarsaparilla roots. The parts affected should also be fumigated with the steam of decoctions of aromatic herbs, and twice a day, in the intermediate times, the part may be rubbed over with a mercurial ointment, and afterwards covered with the common mercurial plaster. Mercurial medicines should also be given internally, according to the strength of the patient, and sometimes a salivation is necessary.

Mercurial remedies seem indeed so peculiarly appropriated to this case, that nothing is to be done without them; and it hence looks very suspicious, that something venereal is always in the case, or else that the disorder is of itself very much akin to that disease. By diligently pursuing this method for some weeks, the first and second stages of this disease may be cured even where there are bony tumors formed; and the tumors may either be reduced, or at least brought to that state, that they will remain as they are without farther encrease, or without pain, or any farther inconveniency.

But when these tumors are so far advanced, as to be out of the reach of the remedies, the pain and tumors encreasing, and abscesses forming; as there is great reason to fear the

the entire destruction of the bone, if the abscess does not burst of itself, the surgeon should not stay for its maturation, but lay the bone bare in the lowest, or in the most painful part. When the abscess is already burst, if the opening be too small, it must be enlarged with a knife, or if the patient too much dreads the knife, the caustic may supply its place; and after this several small holes must be made in the bone with a small piercer, perforating it into the medulla, to give way for the discharge of the confined matter; and when these small holes are not sufficient, a larger must be made by the trepan, if the bone will admit it: this will not only make more way for the discharge of the matter, but will also give room for the proper application of remedies better than any other method.

While this is under cure, the patient must use internally the decoctions of the woods, and mild mercurial, and antimonial medicines; and externally the wound must be treated with cleansing, and balsamic remedies, such as decoctions of agrimony, sanicle, St. John's wort, or birthwort, and essence of myrrh and aloes. These should be injected warm with a syringe twice every day, as may also a solution of mercurius dulcis made in plantane-water, or in lime-water. Honey of roses should be added in a small quantity to either of the decoctions, used as essences; and after the use of them, the wound should be dressed with the before-mentioned essences, or with those of mastich or amber, spread upon lint, and covered with a mercurial, or other plaster: this method is to be continued till the parts are healed. The actual cautery is sometimes necessary to root out the disorder, especially when it is only between the lamellæ of the bone, for in other cases there is no getting to the bottom with it.

But when all these methods are unsuccessful, and the part is already too much corroded and destroyed, there is no hope of saving it, nor indeed of saving the life of the patient, by any other means than the taking off the limb. When the disorder is situated, however, in some small bone, as on the carpus, tarsus, meta-carpus, or meta-tarsus, or fingers, it will not always be necessary to take off the whole limb, that is to say, the finger, foot, or hand, but it will frequently suffice to remove the corrupted bone alone. In larger bones, where the whole bone is not affected, but only a part of its external surface is disordered by either a caries, or *spina ventosa*, the whole limb is by no means to be taken off, but the diseased part of the bone only removed: but when a large bone, as the os humeri, tibia, or femur, or an entire joint of the arm, knee, or foot, is diseased, there is no remedy but amputating it in the sound parts just above. *Heister's* Surgery, p. 264.

Dr. Schlichting affirms, that the *spina ventosa* may be cured by rubbing the tumor twice a day with ung. Neapolit. preventing salivation by gentle cathartics. Phil. Trans. N° 466. sect. 10.

It appears likewise, from a case related in the Philosophical Transactions, that amputation of the limb is not always necessary. Vid. Phil. Trans. N° 480.

SPINACHIA, *spinach*, in botany, the name of a genus of plants, the characters of which are these. The flowers are of the apetalous kind, consisting only of a number of stamina. These flowers are also barren, and the embryo seeds are found on such parts, or different plants of *spinach*, as have no flowers. These finally become seeds of a turbinated form, and are contained either in a capsule of the same figure, or else in a cornuted or angular one.

The species of *spinach*, enumerated by Mr. Tournefort, are these. 1. The common *spinach* with prickly seed-vessels. 2. The common barren *spinach*. 3. The procumbent Cretic *spinach* with echinated capsules. And 4. the common *spinach* with smooth capsules. *Tourn.* Inst. p. 533.

The common *spinach*, intended for winter use, should be sown on an open spot of ground in the latter end of July, observing to do it, if possible, when the weather is rainy. When the young plants are come up, the weeds must be destroyed, and the plants left at about five inches asunder. The ground being kept clear of weeds, the *spinach* will be fit for use in October. The way of gathering it to advantage, is only to take off the longest leaves, leaving those in the center to grow bigger; and at this rate a bed of *spinach* will furnish the table for the whole winter, till the *spinach* sown in spring is become fit for use, which is common in April. *Miller's* Gard. Dict.

SPINACHIA, in zoology, a name given by some authors to our common stickleback, or barnstickle, more usually known among writers by the names *pugnitius*, or *aculeatus pisciculus*. *Gesner*, de Aquatil. See the article PUGNITIUS.

SPINALIS (*Cycl.*)—SPINALIS *cervicis*, in anatomy, a name given by Albinus to a muscle of the neck, called by Fallopius the *tertium par musculorum dorsi*, and by Cowper and Morgagni *spinalis colli*.

This is the muscle which the French anatomists call *les vertebraux externes du demi-epineux, ou le transversaire epineux du col.* See TRANSVERSALIS, &c.

SPINALES *colli minores*, muscles lying between the six *spinal* apophyses of the neck, and between the last of the neck and first of the back; being inserted in these apophyses by both extremities on one side of the posterior cervical ligament, which parts them from those of the other side. They are likewise termed *interspinales*. Vid. *Winslow's* Anat. p. 244.

SPINALIS *dorsi*, in anatomy, a name given by Albinus to a muscle of the back, figured by Eustachius Tab. 37. and called by Fallopius *quintiparis dorsi musculorum pars implantata in spinas vertebrarum thoracis*.

Others, as Spigelius, have called it a part of the *semispinatus*, and others a part of the *longissimus dorsi*. The French have named it *le grand epineux de dos*. See the articles SEMISPINATUS and LONGISSIMUS *dorsi*.

SPINALIS *dorsi major*, a pretty long and slender muscle, lying upon the lateral part of the extremities of the *spinal* apophyses of the back. It is composed of several muscular fasciculi of different lengths, which crossing each other, are inserted laterally by small tendons in the *spinal* apophyses from the second, third, or fourth vertebræ of the back; and sometimes, though seldom, from the last of the neck, or first of the back, all the way to the first or second vertebra of the loins, with several irregular decussations, which vary in different subjects. The longest fasciculi are all a little incurvated, and the whole muscle terminates in points at its ends, but is considerably broad in the middle. It communicates by some fibres with the longissimus dorsi, and *semispinalis*, and sends off fasciculi to several transverse apophyses of the back, from the fourth to the eleventh. It is called by some *semispinalis*, but very improperly. *Winslow's* Anatomy, p. 247.

SPINALES *dorsi minores*. These muscles are of two kinds; some go laterally from the extremity of one *spinal* apophysis to another, being often mixed with the short fasciculi of the *spinalis* major; the rest lie directly between the extremities of two neighbouring *spinal* apophyses, being separated from those on the other side by the *spinal* ligament. These are smaller and thinner than those of the neck, and are properly enough termed *interspinales*. *Winslow's* Anatomy, p. 248.

SPINALES *et transversales lumborum*. There are some fasciculi which run up from the superior false *spines* of the os sacrum to the lower *spinal* apophyses of the loins, which may be looked upon as so many *spinales lumborum majores*; and there are also some *spinales lumborum minores* between the *spinal* apophyses of the loins, and *transversales minores* between the transverse apophyses, which are sometimes of a considerable breadth. *Winslow's* Anatomy, p. 249.

SPINARELLA, in ichthyology, a name given by Bellonius, and some other authors, to the little fish called by us the *lesser stickleback*, and distinguished by Artedi by the name of the *gasterosteus* with ten spines on the back. See the article GASTEROSTEUS.

The size is an uncertain mark, but this number of the spines wholly determines the species, the common *gasterosteus*, or stickleback, having only three.

SPINATUS, in anatomy, a name given by Riolanus, and others, to a muscle of the neck, called by Albinus *spinalis colli*, and by Winslow, and the other French writers, *les vertebraux externes du demi-epineux, ou transversaire epineux du col.* See the articles SPINALIS and TRANSVERSALIS.

SPINDLE (*Cycl.*)—SPINDLE, in mining, is a piece of wood fastened into either stow-blade. *Houghton's* Compleat Miner in the Explan. of the Terms. See the article STOWS.

These stows give a miner, or any other person that owns them, as good a right to a meer or meers of ground, (so that every meer have a pair of stows set on them) as a deed of conveyance doth to any purchaser. *Houghton*, ibid.

SPINDLE, in ship-building, a part of the capstan. See the article CAPSTAN, *Cycl.* and *Suppl.*

SPINE (*Cycl.*)—This takes in all that order of bones which follow one another without interruption, from the os occipitis downward along the posterior part of the trunk.

It represents a very compound folding pillar, round on the foreside, and on the backside stuck full of prickles or points, representing so many *spines*. It has a canal in the middle through its whole length, into which a great number of holes open on each side. When it is viewed directly on the foreside or backside, it appears strait, and to be made up of different portions of pyramids, in a contrary situation to one another; but viewed sideways, it presents several different curvatures. The pieces which compose the *spine* are of two kinds, one simple, the other compound; the single pieces are generally twenty four in number, called by the name of *vertebræ*; the compound pieces are two, the os sacrum and os coccygis. The single species are also called *true vertebræ*, to distinguish them from the portions which compose the other two, which are called *false vertebræ*. The true vertebræ are divided into three classes, *viz.* seven of the neck, twelve of the back, and five of the loins; and to these are given the names *cervical*, *dorsal*, and *lumbar*. *Winslow's* Anatomy, p. 53.

This bone, when felt through the integuments, seems sometimes divided, and has given rise to the notion of a *spina bifida*, or bifurcation of the *spine*. But some doubt of the existence

exiftence of fuch a cafe, as a perfect *fpina bifida*, fuppofes the very canal and *fpinal* marrow to divide into two branches, and the *fpinal* proceffes to divaricate into two rows. We have a cafe in the Philofophical Tranfactions, where the *fpinal* marrow of an infant was found bare, without any bony covering, and which was taken for a *fpina bifida*. See Phil. Tranf. N° 472. fect. 2. and N° 366. p. 98.

See, in the Mem. de l'Acad. Royale des Sciences anno 1730, fome curious obfervations, by Mr. Winflow, on the motions of the *fpine*.

Cartilages of the SPINE. The cartilages of all the vertebræ in general are of two kinds, one proper to each vertebra, the other common to two vertebræ which lie next one another; the firft may be termed the *cartilages of articulation*, the latter the *cartilages of fymphyfis*.

The proper articular cartilages of each vertebra of the whole *fpine* are thofe four which cover the furfaces of the four fmall articular apophyfes. In the natural ftate they are very white and fmooth, and much thicker than in the dried bones. Their circumference is the fame with that of the articulated fides of the apophyfes, except in thofe places where there are fmall fuperficial notches. The vertebræ of the back, befide the four cartilages of their fmall apophyfes, have others which do not belong to their articulations with one another, *viz.* thofe which cover the lateral foffulæ in the bodies of thefe vertebræ, and the foffulæ in their tranfverfe apophyfes, by both of which they are articulated with the ribs.

The cartilages of the fymphyfis lie between the bodies of the vertebræ, one of them being contained between, and clofely joined to the lower furface of one vertebra, and to the upper furface of the next under it; the breadth and circumference of thefe anfwer exactly to thofe of the furfaces between which they are contained, but their height, or thicknefs, is different in each clafs of the vertebræ. In the vertebræ of the loins they are, according to the ftature of the fubject, a quarter or a third of an inch thick, in thofe of the neck they are not fo thick, and thinneft of all in thofe of the back. Neither are they of equal thicknefs in all their parts, thofe of the neck and loins appear to be thickeft on the forefide, and thofe of the back rather thickeft on the contrary part; but thefe differences are moft remarkable in the vertebræ that lie near the middle of each clafs.

The internal ftructure of thefe cartilages is different from that of all the other cartilages of the body, and indeed they refemble the reft in nothing but in whitenefs and in elafticity. When we view their circumferences only, they appear to be one uniform mafs like the reft, but when divided by an incifion, parallel to the furface of the vertebræ, we fee that they are made up of a great number of concentric cartilaginous rings, contained within each other, with a fmall fpace left between them. Thefe are clofeft and thinneft near the center, and about the middle feem to degenerate into another fofter kind of fubftance. Thefe rings do not form an entire circumference, being turned inward on the backfide, anfwerably to the pofterior flope in the body of each vertebra. They lie horizontally, one edge being fixed to the lower fide of one vertebra, and the other to the upper fide of the vertebra next below the former.

The interftices between the rings are filled with a mucilaginous fubftance, lefs fluid than that of the joints, and their breadth, or heighth, is proportionable to the diftance of the vertebræ between which they lie.

Each cartilaginous lamina taken feparately is very pliable, according to its length, but taken all together they are not fo eafily bent, partly becaufe of their circular figure, and partly becaufe of their proximity and multiplicity. They yield, however, in the inflexions of the *fpine*, and without any inflexion to the weight of the head and upper extremities; but this is done by very fmall degrees, and moft of all, when the upper part of the body is loaded with any foreign weight. After thefe compreffions they reftore themfelves, merely by being freed from the preffure; fo that a man is really taller after lying fome time, than after he has carried a burthen for a great while. Thefe fingular obfervations of the different heights of the fame perfon, at different times, which were firft made in England, and afterwards confirmed at Paris by Mr. Morand, are moft naturally and eafily accounted for, merely by the different ftate of the intervertebral cartilages.

The intervertebral cartilages of the neck lying, for the moft part, between the convex fide of one vertebra, and the concave fide of another, are of a greater extent, in proportion to the fize of thofe vertebræ, than thofe of the back and loins. The os facrum has no cartilage, except that between the upper fide of the firft falfe vertebra, and the laft vertebra of the loins; and thofe by which it is connected to the offa innominata, already defcribed as the cartilages of that bone. The cartilages, which join the different portions of the os coccygis, are preferved in fome fubjects to a very great age, but in others they very foon become entirely bony. *Winflow*'s Anatomy, p. 145.

Ligaments of the SPINE. The vertebræ are ftrongly connected to each other by three kinds of ligaments. Each vertebra is connected to thofe above and below it by a great number of very fhort and ftrong ligaments, which crofs each other obliquely, and are fixed round the edges of the body of each vertebra. Thefe crucial ligaments cover the circumference of the intervertebral cartilages, and adhere clofely to them.

The bodies of all the vertebræ, from the fecond of the neck to the os facrum, are covered by ligamentary half vaginæ on the convex fide, in which thefe vaginæ are fixed, furrounding all the crucial ligaments, and made up of ligamentary filaments partly oblique, but for the moft part longitudinal. All the vertebræ are likewife ftrongly connected by a ligamentary tube, which lines the inner furface of the medullary canal from the occipital hole to the os facrum; it reprefents a long flexible funnel, its cavity at the upper part being equal to that of the occipital foramen, and ending in a point at the os facrum. The firft vertebra is fixed to the os occipitis befide this, by a diftinct and very ftrong ligamentary covering; the fecond has two ligaments peculiar to it, one which connects the apophyfis dentiformis to the os occipitis, and another tranfverfe, which confines this apophyfis within the anterior portion of the cavity of the firft vertebra. The firft may be called the occipital, and the fecond the tranfverfe ligament of the odontoide apophyfis. Along the whole bony canal of the *fpine*, between the bafes of each *fpinal* apophyfis, lies a flat and very elaftic ligament, of a yellowifh colour, which fills up the pofterior great notches of the vertebræ, adhering to their edges, and to the neighbouring portions of the inner ligamentary tube.

Between the extremities, or apices of the *fpinal* apophyfes, are fmall ligamentary ropes, which go from one *fpine* to the next, which are all really double, though they appear fo only in the neck, being there fixed feparately to the forked extremities of the *fpines*. Between all the *fpinal* apophyfes, from their apices to the middle of their bafes, lies a ligamentary membrane, going between each two; and there is a ligament of a like kind between the two tranfverfe apophyfes in all.

The articular ligaments of the *fpina* dorfi are thofe which tie the glenoide cavities of the firft vertebra to the condyles of the os occipitis; thofe that join the cartilaginous furface of the apophyfis dentiformis to the anterior cavity of the firft vertebra, and thofe by which all the oblique, or articular apophyfes, are connected together. Thefe are all fmall, fhort, and ftrong. The vertebral ligaments of the ribs, or thofe which connect the ribs to the vertebræ, are of the fame kind, and are inferted round the cartilaginous foffulæ in the body, and apophyfes of each vertebra. Befide all thefe ligaments of the *fpine*, there is one which goes in form of a membrane from the os occipitis, all the way to the laft two vertebræ of the neck: this is a true intermufcular ligament, and may be properly called the *ligamentum cervicale pofterius*. There are alfo two lateral ligaments of the fame kind, fixed to the tranfverfe apophyfes of the vertebræ of the neck. *Winflow*'s Anatomy, p. 147.

SPINES *of echini*, in natural hiftory. Thefe in their foffile ftate make a great appearance in the cabinets of the curious, and in the works of the learned, and are of an almoft infinite variety of kinds; and many of them are of the fame figures and dimenfions with thofe of the echini now living in our own and other feas, and well known to us. But hefide thefe there are an almoft infinite variety of others, which though allowed on all hands to be truly *fpines* of fome echini or other, yet evidently differ from thofe of all the known recent fifh of that name, and have certainly belonged to fpecies of it which we have not yet the leaft knowledge of. Thefe, however different in fhape from one another, yet all agree in their texture and conftituent matter, both with one another, and with the foffile remains that fupply the places of the fhells of the other fpecies fo common in our chalk-pits, all being compofed of a plated, or tabulated fpar. Both thefe fhells and the *fpines*, though they retain every outer lineament of the bodies they owe their form to, yet have they nothing of their interior texture, nor any the leaft refemblance of it, but are compofed of plates fet edgewife, or aflant, in the fhells, and in the *fpines* always obliquely to the axis of the body; fo that all the foffile *fpines of echini* break regularly in an oblique direction, and always fhew on each part a perfectly fmooth and gloffy flanting furface.

Of the foffile *fpines of echini* fome are long and flender, tapering from a broader bafis to a fine point, and fometimes from a thick part, at or near the middle, to an obtufe point at each end: thefe are ufually ftriated, ridged, or furrowed, and often elegantly granulated, though fometimes they are fmooth. Thefe moft refemble the *fpines* of the more common fpecies of recent or living echini we are acquainted with; others of them are of very different and very ftrange figures; fome are of the fame length with the common long ones, but are very flat, and are ridged more or lefs high, or covered with tubercles of different fhapes; others are ragged, and varioufly jagged, and knotted like a rough branch

branch of fir ſtript of its leaves, or that ſort of fucus called the *ſea ragged ſtaff*. Another very common kind in ſome parts of the world, eſpecially in Syria, but leſs frequent with us, is the body called by authors *lapis judaicus*: theſe are ſuppoſed, in ſome ſort, to reſemble an olive, ſwelling from a ſhort ſtalk to a large thick and ſhort body of an oval figure, and marked very elegantly with longitudinal furrows, and in the different ſpecies with very differently ſhaped tubercles. Of this ſhape there are alſo ſome perfectly ſmooth.

We have alſo with us great numbers of a kind approaching to theſe, but having longer ſtalks and ſmaller bodies, and theſe we meet with of all ſizes, from three inches in length down to the bigneſs of a barley-corn; and there are at times found ſome of all the intermediate figures, between theſe tumid ones and the long and ſlender ſort.

We have numbers alſo of various lengths, and variouſly ſurrounded with granulæ of a ſhape nearly cylindric, and beſide the bodies themſelves, we meet with impreſſions of all the kinds on our flints in gravel-pits. The *ſpines* themſelves are uſually bedded in the ſtrata of chalk, though ſometimes they are found in the ſtone-quarries, and ſometimes, but that moſt rarely, bedded in clay, or looſe among gravel. *Hill's* Hiſt. of Foſſ. p. 652.

SPINNING (*Cycl.*)—The art of *ſpinning*, which nature has given to many animals of different kinds for their preſervation and other purpoſes, is not confined to the inhabitants of the earth or air alone, but is even extended to thoſe of the ſea. Mr. Reaumur has ſhewn, by a ſeries of curious experiments, that the common muſcle, and ſome other ſhell-fiſh of the ſea, poſſeſs it in a great degree of perfection. See the article MUSCLE.

But he obſerves, that though the workmanſhip is the ſame, the manner of producing it is very different. Spiders, caterpillars, and the like, make threads of any length that they pleaſe, by making the viſcous liquor, of which they are formed, paſs through a fine perforation in the organ appointed for this *ſpinning*: but the way in which the muſcles form their threads is very different, as the former reſembles the work of the wire-drawer, ſo this does that of the founder, who caſts metals in a mould. The canal of the organ, deſtined for the muſcle's *ſpinning*, which from its ſhape is commonly called its tongue, is the mould in which its thread is caſt, and gives it its determinate length. Mem. Acad. Par. 1711.

SPINOSA, in zoology, the name by which the Italians call the porcupine. See the article HISTRIX.

SPINOSE-*leaf*, among botaniſts. See the article LEAF.

SPINOSI *piſces*, in zoology, ſuch fiſhes as have ſome of the rays of their backfins running out into thorns or prickles, as the pearch, &c. *Willughby*, Hiſt. Piſc. p. 271.

SPINOZISM (*Cycl.*)—We have an examination of *Spinoziſm*, and of Mr. Bayle's objections againſt this ſyſtem, by Monſ. de Jariges, in the Mem. de l'Acad. de Berlin, Tom. I. p. 121. and Tom. II. p. 295. Wolfius has alſo given a refutation of *Spinoza*, in his Theol. Nat. Part 2.

SPINTHER, among the Romans, a kind of bracelet which the women, in the firſt ages of Rome, uſed to wear on the upper part of their left arm.

SPINUS, in the natural hiſtory of the antients, the name of a foſſile body of a very remarkable quality; for according to the accounts of Theophraſtus, and other authors of the greateſt credit, if broke to pieces, and thrown in an heap expoſed to the ſun, it took fire and burnt, and that the more, if moiſtened or ſprinkled with water.

It ſeems to have been a ſubſtance nearly allied to what they called the *lapis thracius*, but with this remarkable quality, both of them ſeem to have been of the claſs of the harder bitumens, and are wholly unknown to us. Some late writers have imagined, that the common black ſlate-ſtone, ſo frequent with us in the coal-pits, was the ſubſtance called by Theophraſtus, and the antients, by this name, but it has none of the qualities attributed to the *ſpinus*. *Hill's* Theophraſtus, p. 35.

SPINUS, in zoology, the name of a ſmall bird, called by ſome *ligurinus*, and in Engliſh the *ſiſkin*. Its head is black, and its neck and back green. The neck, however, has ſome ſlight admixture of a blackiſh tinge, and the roots of the backfeathers have alſo ſome blackiſhneſs. Its rump is of a greeniſh yellow, as are alſo its breaſt and throat. Its belly is white, and its tail is yellow underneath, with ſome browniſh ſpots. The female is paler coloured than the male, and its throat, and its ſides, under the wings, are whitiſh, with ſtreaks of brown. It is common in Germany and England, and is kept in cages for its ſinging. In winter theſe birds fly in large flocks. *Ray's* Ornitholog. p. 192.

SPIPOLA, in zoology, the name of a ſmall bird of the lark kind, of which there are, according to Aldrovand, three ſpecies, ſuſpected by Mr. Ray to be only varieties of the *ſpipoletta*, or *tordino* of the Venetians. *Aldrovand.* de Avib. lib. 17. cap. 26. See the next article.

SPIPOLETTA, in zoology, the name of a ſmall bird of the lark kind, called *tordino* by the Venetians, and ſeeming to be the *ſtopparola*, as alſo the *griſola*, and *ſpipola* of Aldrovandus. It is ſmaller than the common lark; its head, neck, ſhoulders, and back, are of a greyiſh colour, with an admixture of green; its breaſt and belly white, and its throat ſpotted. The female differs from the male, in that her belly is yellow. The wing-feathers are of a duſky brown, with whitiſh or yellowiſh edges. Its tail is moderately long, and part of the feathers are ſnow-white, the reſt brown or blackiſh. The length of the heel diſtinguiſhes this bird from all others, except the lark kind, and it differs from all the ſpecies of larks in the colour of its beak and legs, which are black. It is common in the markets of Venice and other places. *Ray's* Ornitholog. p. 153.

SPIRÆA, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the roſaceous kind, being compoſed of ſeveral petals arranged in a circular form. The piſtil ariſes from the cup, and finally becomes a fruit compoſed of ſeveral ſmall pods, containing oblong ſeeds.

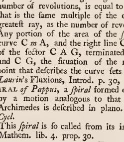
The ſpecies of *ſpiræa*, enumerated by Mr. Tournefort, are theſe. 1. The willow-leaved *ſpiræa*. 2. The opulus-leaved *ſpiræa*. 3. The *ſpiræa* with hypericum leaves, not indented. And 4. the Spaniſh *ſpiræa* with crenated leaves, reſembling thoſe of the hypericum. *Tourn.* Inſt. p. 618.

The ſeveral ſpecies of this plant are very common in our gardens, and make a very beautiful figure. They are propagated either by ſuckers, which they produce in great abundance, or by laying down the tender branches of the old plants. When they have taken root, they ſhould be removed into the nurſery for two or three years, and will then be fit for tranſplanting in the places where they are to remain. *Miller's* Gard. Dict.

SPIRAL (*Cycl.*)—As a curve may approach continually to a right line, or to another curve, while they are both produced, and yet never meet it, ſo a *ſpiral* line may approach continually to a certain point, and not reach it in any number of revolutions, how great ſoever, that can be aſſigned. This happens in the logarithmic, or logiſtic *ſpiral*, and in ſeveral others. See *Mac Laurin's* Fluxions, Book 1. p. 283. ſeq.

Some of theſe *ſpirals*, after having made an infinite number of revolutions, is ſaid, in the modern ſtile, to reach that certain point, and yet the length of the *ſpiral* may be finite, or equal to an aſſignable line. Propoſitions, expreſſed in this manner, ſeem the moſt myſterious of paradoxes; but the wonder diſappears, when we know it amounts to no more than that a line may continually increaſe, and yet the increments acquired may decreaſe in ſuch a manner, that it ſhall never amount to a given line.

SPIRAL *of Archimedes*. The *ſpiral* area CABDE, is equal to one third part of the circle, deſcribed with the radius CE.

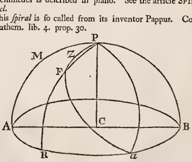


In like manner, the whole *ſpiral* area, generated by the ray drawn from the point C to the curve, when it makes two revolutions, is the third part of a ſpace double of the circle deſcribed with the radius 2 CE; and the whole area, generated by the ray from the beginning of the motion, till after any number of revolutions, is equal to the third part of a ſpace that is the ſame multiple of the circle deſcribed with the greateſt ray, as the number of revolutions is of unit.

Any portion of the area of the *ſpiral*, terminated by the curve C *m* A, and the right line C A, is equal to one third of the ſector C A G, terminated by the right line C A, and C G, the ſituation of the revolving ray, when the point that deſcribes the curve ſets out from C. See *Mac Laurin's* Fluxions, Introd. p. 30, 31.

SPIRAL *of Pappus*, a *ſpiral* formed on the ſurface of a ſphere, by a motion analogous to that by which the *ſpiral* of Archimedes is deſcribed in plano. See the article SPIRAL, *Cycl.*

This *ſpiral* is ſo called from its inventor Pappus. Collect. Mathem. lib. 4. prop. 30.



Thus, if C be the center of the ſphere, ARBA a great circle,

circle, P its pole; and while the quadrant P M A revolves about the pole P with an uniform motion, if a point proceeding from P move with a given velocity along the quadrant, it will trace upon the spherical surface the *spiral* P F *a*.

Now if we suppose the quadrant P M A to make a compleat revolution in the same time that the point, which traces the *spiral* on the surface of the sphere, describes the quadrant, which is the case considered by Pappus; then the portion of the spherical surface, terminated by the whole *spiral*, the circle A R B A, and the quadrant P M A, will be equal to the square of A B. In any other case, the area P M A *a* F P is to the square of the diameter A B, in the same proportion as the arch A *a* is to the whole circumference A R B A. And this area is always to the spherical triangle P A *a*, as the inscribed square is to the circle. See *Mac Laurin*'s Fluxions, Introd. p. 31—33.

The portion of the spherical surface, terminated by the quadrant P M A, the arches A R, F R, and the *spiral* P Z F, admits of a perfect quadrature, when the ratio of the arch A *a* to the whole circumference can be assigned. See *Mac Laurin*, ibid. p. 33.

SPIRINCHUS, a name by which some authors have called the smelt. *Willughby*, Hist. Pisc. p. 202. See the article EPERLANUS.

SPIRITS (*Cycl.*)—*Brandy* SPIRITS. *Brandy* differs from wine *spirit*, in that the former is drawn from the poorer and thinner sorts of wines, the latter from the richer and fuller bodied wines. *Shaw*'s Ess. on Distil. p. 128.

Brandy also differs from *spirit* of wine, as the former is only what they call proof high, or half pure *spirit*, half phlegm; whereas *spirit* of wine is raised higher, or carried by rectification to a further degree of purity.

Brandy also differs from strong waters, as the latter is a compound, whereof the former, or pure *spirit* of wine, is only one ingredient.

The Portugueze are lately come into the way of making *brandy* [b]. The Greek *brandies* are the worst, though made of the best wines [c].—[[b] Atlas Marit. p. 154. [c] *Tournf.* Voyag. du Levant, Tom. I. let. 2. p. 35.]

The Spanish *brandies* are much coarser than the French, though sometimes made to pass for them in Holland, and other places of great traffic [d]. Some prefer Rhenish *brandy* to that of France; and in Holland particularly, it sells for double the price. It is indeed a fine *spirit*, but the English know little of it farther, than that a dash thereof serves to fill up a cask of French [e]. Some tell us of frozen *brandy*, of which Mr. Boyle gives an instance in Russia; but it is only the watery part that is capable of congelation. All the effect of the most intense cold on *brandy*, is to make a separation between its *spirit* and phlegm; the former retires to the center in form of pure alcohol, while the latter invests it with a circumference of ice [f].—[[d] *Shaw*'s Ess. on Distil. sect. 5. p. 139. [e] Id. ibid. p. 141, seq. [f] *Boyle*'s Works Abr. Tom. I. p. 594.]

Brandies always differ, according to the different species and growth of the grapes. We have various kinds of French *spirits*, having each their particular flavours, by which the connoiseurs readily distinguish one sort from another; though the vulgar call them all indiscriminately by the name of *French brandy*. An ordinary judgment may easily distinguish Languedoc *brandy* from that of the isles of St. Martin and Oleron; or Bourdeaux from Cognac. Nor would the similitude between the several species of French *brandies* be so great as it is found, but that only the weakest and lowest flavoured wines are distilled for this purpose; or such as are unfit for other uses. When out of curiosity, or good husbandry, the French distil the bottoms, or refuse parcels of the grosser bodied and fuller tasted wines, the *brandy* got from them is what we in England rather call a wine *spirit*, than a *brandy*. Every kind of grape, as it affords a wine, so does it also a *brandy* of its own peculiar flavour. *Shaw*'s Ess. on Distil. sect. 5. p. 130, seq.

The too free and frequent use of *brandy* is attended with ill effects, as it attenuates the body, and impairs the strength, and stupifies the brain. In persons who have died hereof, the blood has been found thick and coagulated; the pancreas dried; the liver schirrous, and almost petrified; the glands tumefied beyond their natural bulk [g], *&c.* But what shall we say to the Parisian woman, who was burnt to ashes with a fire only kindled from the *brandy* in her body [h]? Conringius even attributes the degeneracy of the modern from the antient Germans, to the prevelancy of drinking this liquor [i].—[[g] Hist. Acad. Scienc. Anno 1706. p. 29. *Barth.* Act. Med. Tom. V. Obs. 118. p. 313. [h] Philos. Trans. N° 97. p. 6138. *Barth.* l. c. Tom. I. Obs. 118. p. 211. [i] *Conring.* de Habit. Corp. Germ. p. 99, seq.]

In the hot climates of America, they are said to make clysters of *brandy*. A person who had experienced the use of one of these fiery enemata, made of a pint of *brandy*, assures us, it not only made him dead drunk, but raving mad. Phil. Trans. N° 37. p. 721.

Brandy is also applied, in a less proper sense, to all *spirituous* inflammable liquors, drawn from vegetables by distillation. In which sense *brandy* includes all ardent, or inflammable *spirits*, used in the way of beverage. Dr. Shaw adds a further limitation to *brandy spirits*, viz. that they be proof high, or consist of equal quantities of water and alcohol. On which footing, *spirits*, either above or below proof, do not come under the appellation of *brandies* [k]. But in the popular use this distinction is not kept to.—[[k] *Shaw*'s Ess. on Distil. sect. 5. p. 130.]

Arrac, rum, malt and melasses *spirits*, in this sense, are *brandies*, though under another denomination.

In the island of Andros they make brandies from the fruits of the arbutus and mulberry trees. Atlas Marit. p. 176.

A patent was some time ago obtained for making *brandy* from carrots and parsneps; the latter of which is said to have nearly resembled French *brandy* [l]. Of late we meet with frequent advertisements of raisin-*brandy*, which, if really made of that fruit, is nearest akin to wine-*brandy*.—[[l] *Hought.* Collect. Tom. II. p. 382. 461.]

Apple, or cider-*brandy*, is also praised by some.

Cider is found to yield an eighth part of good *spirits*, and if close kept a year or two in a cool place, much more. Dict. Rust. Tom. I. in voc.

Brandy is also used to denote certain compound liquors, whereof *brandies* are the basis.

Such are raspberry-*brandy*, cherry-*brandy*, gooseberry-*brandy*, &c.

Cherry-*brandy* is usually made with black cherries, by filling a bottle half full with them, and adding *brandy* thereto till the bottle be full; this being shaken from time to time, within a month will be ready to drink.

If the like quantity of gooseberries, instead of cherries, be put in, it makes a good *brandy*. To dulcify it, and give it a fine flavour, they also put in sugar with raspberries. Dict. Rust. Tom. I. in voc. *cherry-brandy*.

The French method of distilling *brandies* is the same with that practised by our distillers, in working from wash or wines; only that the former throws a little of the natural lee into the still along with the wine, which gives the *spirit* a flavour, on which a great part of its merit depends. *Shaw*, lib. cit. p. 132.

When *brandies* prove foul, feedy, or retain the taste of certain weeds apt to grow among the vines, they draw them over again, in order to cleanse them of that adventitious flavour: in which operation they leave out the faints, or rather change the receiver, as soon as the stream begins to run proof. Then mixing together all that run off before, they call it *trois cinque*, that is, *brandy* consisting of five parts alcohol, and three of flegm; beyond which the French *bruleurs*, or common distillers, rarely go.

The yearly export of *brandies* from France is said to amount to 25000 tuns; an article of itself sufficient to enrich a moderate country [m]. While the duty on French *brandy* continued at 9 *l.* the tun, the English alone took 10 or 11000 tuns off their hands [n]; but now that the duty is raised to 52 *l.* the tun, the importation is greatly reduced, to the advantage of the English Distillery, except that smuggling still intervenes.—[[m] Atlas Marit. p. 146. [n] Compl. Engl. Trad. Tom. II. p. 89. Atlas Marit. p. 107. *Hought.* Collect. Tom. II. N° 387. p. 470.]

Divers reasons may be alledged for the great fecundity of *brandies* in France. All those poor grapes, which prove unfit for wine, are usually first gathered, pressed, and their juice fermented, and directly distilled: this rids their hands of their poor wines at once, and leaves their casks empty for the reception of better. It is a rule with them to distil no wines that will fetch any price as wines, for in this state the profit on them is vastly greater, than when reduced to *brandies*. This large stock of small wines, wherewith they are almost over-run in France, shews one great reason of their making such vast quantities of *brandy*, more than other countries, which lie warmer and better for grapes. But this is not the only fund of their *brandies*; for all the wine that pricks, or turns eager upon their hands, is also condemned to the still; and, in short, all that they can neither export, nor consume at home, which amounts to a large quantity, since much of the wine, laid in for their family provision, is so poor, as not to keep the spending. *Shaw*'s Ess. on Distil. sect. 5. p. 131, seq.

The colour of their *brandies* is acquired from the cask, and the length of time they usually lie therein, which is sometimes twelve or eighteen months, and often two or three years; during which, it is no wonder if they acquire a yellow or brownish cast. Their lying thus long, as it were, in a state of slow digestion, wonderfully takes off from that hot, acrid, and foul taste, peculiar to all *spirits*, or *brandies*, newly distilled; and gives them a coolness and a softness, not easily introduced by art. And on these properties are founded several methods of trying their goodness, or discovering whether they are debased or adulterated by the admixture of coarser *spirits*. Phil. Trans. N° 391. p. 398, seq. *Shaw*'s Ess. on Distil. sect. 5. p. 134.

Brandies are rarely adulterated in France, where they have no cheaper *spirits* to debase them withal; and the like holds, in great measure, in favour of the Dutch, though otherwise

wife fufpected to be great adulterators. The chief temptations for adulterating are in England, where the duties are high, and where there are various kinds of *fpirits* in plenty to mix with them, as malt, melaffes, cyder, and fugar *fpirits*, with all which they are often fophifticated, and fo dextroufly, as frequently to efcape all the ways of detection.

Rules for diftilling brandy SPIRITS. *Brandy*, whether made from wine, malt, fugar, or whatever elfe, is a compound confifting of four different parts, which are inflammable *fpirit*, effential oil, acid and water.

As thefe feveral parts do not differ greatly in their fpecific gravity, or degree of volatility, a ftrong tumultuary boiling heat will drive them all over promifcuoufly together. As at the beginning of the operation there ufually arifes more totally inflammable *fpirit* than water, fo after fome time the ftream contains more water than *fpirit*. This gives the foundation for what the diftillers call *low-wines*, *proof-fpirits*, and *faints*.

The *low-wines* are the whole quantity of *fpirit*, ftrong and fmall, mixed together; *proof-fpirit*, a mixture of about equal parts of totally inflammable *fpirit* and water; and *faints* are what runs after the proof is come off, which is always a mixture of more water than *fpirit*.

The low-wines are commonly rediftilled, to get rid of the fuperfluous aqueous part, and are thus reduced to *brandies*, or proof-*fpirits*. The faints may alfo be ferved in the fame manner; and by this means the produce of the diftillery, which in the ftate of faints, or low-wines, could not be judged of, as to its intrinfic value, is reduced to a certain ftandard, and marketable ftrength.

In the diftilling the fermented liquor, when once the ftream falls from the ftrength of proof-*fpirit*, there immediately begins to rife with it a coarfe and naufeous oil, which, though not fo communicative as the firft, never fails to impregnate the whole ftream with its flavour. Hence all common *fpirits*, or *brandies*, are what the chemifts call dilute quinteffences; that is, they are mixtures of the ardent *fpirit* and effential oil of the concrete, only here let down to proof with water, and impregnated with a fmall proportion of a volatile acid. As foon as the proof falls off, the liquor grows milky; that is, the oil, which before remained diffolved in the ftrong *fpirit* is let loofe by an over proportion of water, and may be commodioufly feparated by the chemical glafs made for that purpofe.

The common cuftom of the diftillers is to continue the diftillation, as long as the liquor that runs off will take flame at a candle applied to the vapour of a fmall quantity thrown on the hot head of the ftill; and indeed there is a certain point of time, after which the *fpirit* that comes will not pay for the fire and labour, as not more than from a twelfth to a twenty fourth part of the *fpirit* will come over in the water. With other views, however, fuch as the obtaining a more fixed vegetable acid, and a groffer effential oil, the operation may be continued till the danger of an empyreuma comes on.

The matter remaining in the ftill, after the operation is ended, has feveral ufes, and may in particular be made to afford Mr. Boyle's acid *fpirit* of wine.

When by repeated diftillation, without addition, any *fpirit* is entirely freed from its aqueous part, it is then called *alcohol*, *totally inflammable fpirit*, *rectified fpirit*, or, in the vulgar phrafe, *fpirit of wine*. On thefe general obfervations, it will be eafy to form fome new practical methods for the improvement of diftillation, as ufed in the way of making inflammable *fpirits*, or *brandies* for fale.

As the fermented liquor affords different parcels of matter of different degrees of fpecific gravity, and of volatility, when a pure feparation of the lighteft part is intended, the fire fhould never be raifed to a boiling heat, which jumbles and confounds all the parts together, rather than feparates them.

In the chemical way this rule may be practifed to great advantage, but great difficulties will attend the obfervance of it in the common bufinefs of diftillation. To render it more commodioufly practicable, thefe two methods may be propofed. 1. The encreafing the height of the ftill above the liquor. And 2. the working by a balneum mariæ, inftead of a naked fire.

As to the firft method it has been expected, that by raifing the ftill-head to the height of two or three yards above the liquor, a boiling heat would carry up the pure inflammable *fpirit*, without any confiderable mixture of phlegm, and yet continue to run in a full ftream from the nofe of the worm: but this does not anfwer to expectation in all particulars, but all the attempts that have been made towards it fhew, that the method is ftill improveable. The ferpentine-pipe, ufed in this fort of diftillation by Lemery, and fome others, though it occafions the *fpirit*, as it creeps up, to depofit a great part of its phlegm, yet has this great objection attending it, that the *fpirit* itfelf will not rife in it without a boiling heat, which never fhould be ufed in a fimple feparatory diftillation, becaufe it throws up fo much oil, as to foul at leaft the breaft and head of the ftill, and bottom of the pipe, whence it infects the fubfequent *fpirit* that wafhes them.

It is evident that this method may be brought to a greater perfection than it yet has been, but the other method, by the balneum mariæ, is preferable on fo many accounts, that it is better to bend our thoughts this way in attempting the improvements fo much wanted, and which would be fo beneficial.

By a proper regulation of the balneum mariæ, we may hope for a pure *fpirit* almoft at the firft extraction. Such an expectation will not appear unreafonable to any one, who will compare the *fpirit* drawn in the common method by the balneum mariæ, where the water is made to boil violently all the time, with another parcel of the *fpirit* prepared from the fame fermented liquor by the hot ftill. The difficulties of working from wafh, in this way of the balneum mariæ, are indeed very confiderable, efpecially in regard to the common malt-diftillers, with whom cheapnefs and difpatch are the only things in view; for to work at the fame time both quick and perfect, is an art not yet learned in the diftilling trade.

The whole application of the balneum mariæ, in this matter, depends on a fuitable engine and apparatus, and perhaps a large and long rectangular boiler might be commodioufly turned into the fort of balneum we are recommending; and this might be fitted with a great number of low alembics, which would work day and night with a very little fire, and ftill lefs attendance. The contrivance in general is obvious; but the great art would be the avoiding encumbrance and lofs. A large number of ftills are abfolutely neceffary, but no worms or refrigeratories are required to them, and by an eafy apparatus, the large number of thefe fmaller ftills may be charged with as much eafe as one great one. When the operation proceeds fo flow, as not to anfwer the cofts, the bottoms of all thefe ftills may be emptied into one large common ftill, and worked off in the ufual way for a coarfer commodity, that may afterwards be rectified.

In order to procure the *fpirit* from the fmaller ftills perfectly pure, the water of the balneum is to be not quite fcalding hot.

By this means, when tried in little, a furprifingly cool and almoft infipid *fpirit* has been obtained at the very firft extraction, though mixed with a confiderable proportion of phlegm, fo that it required no manner of rectification to fit it even for the nicer ufes. The method is curious and ufeful, though it were found worth while thus only in fmall; but will become greatly beneficial to the large dealer, if it could be reduced in the fame methods to practice.

In the common method of fimple diftillations, all means fhould be ufed to prevent the groffer effential oil from getting into the *fpirit*.

Thefe means have regard to the preparation of the fermented liquor, the regulation of the fire in diftilling, the ufe of percolation, and the keeping out the faints.

As to the manner of preparing the fermented liquor, and clearing it of its grofs oleaginous fæces, before it is committed to the ftill, the beft method is to let it ftand fome time after the fermentation is wholly over, that it may depofit all that it can, and become as thin and limpid as may be; and one great means of arriving at a perfection in this refpect, is the making the liquor fufficiently thin; if it be too thick and rich of the ingredient, the *fpirit* muft be coarfe. The liquor thus prepared, muft never fill above two thirds, at the utmoft, of the ftill. A boiling heat is neceffary in this operation; but then care muft be taken that this be not carried too far, and that the whole proceeds uniformly and regularly. The fire muft be kept as even as poffible, and never raifed by ftarts; for that never fails to throw over the coarfe oil, and foul the *fpirit*; fo that, if poffible, the operation fhould begin and end with the fame uniform and invariable degree of heat.

Another method of keeping the groffer oil, at leaft in fome degree, from mixing itfelf with the *fpirit*, is by ftretching a piece of very thick and woolly flannel over the mouth of the ftill, or by fuffering the fteams to pafs through the fame fort of flannel feveral times doubled, and placed at the nofe of the worm. It is furprifing what a large quantity of grofs fetid, offenfive, and unctuous matter will be thus collected, efpecially in the diftilling of malt *fpirits*.

The faints fhould never be fuffered to run among the finer *fpirits*, on account of the large quantity of this grofs oil, or greafy matter, they contain; efpecially if the fire be encreafed, as it ufually is, in order to bring them over. Some of the larger dealers, who value proof more than purity, will always have a dofe of this to give their goods a face, and keep up a head a proper time. This prevailing fondnefs for a ftrong proof, however abfurd in itfelf, is one great reafon why the generality of malt *fpirits* are no clearer. This caution of keeping out the faints fhould alfo extend to the keeping out a little of the firft running, which alfo, in this operation, is a kind of faints, as containing largely of the oil of the concrete, though much more fubtle than that in the proper faints. A farther regard muft alfo be had to the ftill-head and worm, through which the faints have once paffed, as thefe depofit in the head, and along the whole

length of the worm, a coarfe and naufeous oil, which will give a difagreeable flavour to a very large quantity of pure *fpirit*.

When the worm is once infected with this oil, it penetrates fo deep into the pores of the metal, that a fimple wafhing will not get it out, but rather it ought to be filled with a lixivium boiling hot, or elfe fome pure and highly-rectified *fpirit* fhould be put into it, and left in it a whole night, to imbibe and carry off with it the oil. Thefe are cautions that may feem trifling, but they are in reality of fo much confequence, that if rightly attended to, a much purer *fpirit* will be drawn off this way, than by any other common method. *Shaw's* Effay on Diftillery.

Proof Spirits, or *common faleable goods*, are *fpirits* of any kind of a determinate ftrength, being the fame with that of good brandy, and the malt and fugar *fpirits* of the diftillery, as they are ufually fold; containing equal quantities of rectified *fpirit* and water.

The common method of examining whether *fpirits* have this due degree of ftrength is this. Take a long vial, fill it half way with the common malt *fpirit*, and give it a fmart ftroak by its bottom againft the palm of the hand, there will then appear on the furface a chaplet, or crown of bubbles, which will go off again in a ftrong manner; that is, firft remaining a while, and then going off by degrees without breaking into fmaller bubbles, or fwelling into larger.

By this experiment all the traders in *fpirits* judge of the ftrength of the goods they purchafe, yet this is a mere fallacy and deception; for if only a little vinous, or faccharine matter, as treacle, fyrup, muft, rob of fruits, or the like, be added to a quantity of highly-rectified *fpirit* of wine, this flight addition will give a brandy proof to that *fpirit*.

Whether there be any fecret for making weaker *fpirits* fhew this proof, as well as brandies, *&c.* is not certainly known, but the thing is certainly practicable, fince arrack, which is but of half the ftrength of brandy, gives as fair a proof this way; and if a drop or two of any effential oil be added to a pint of brandy, it takes off its proof, and makes it appear much weaker than it is. The true ftrength may, however, always be known, by carefully burning away a meafured quantity of brandy, *&c.* fince if it leaves one half water, it is right, if more or lefs, it is too ftrong, or too weak.

But befide the falfe method of judging of brandies by what is called *proof*, there is another not lefs fallacious one of judging of their goodnefs, though kept as a great fecret in the hands of fome dealers, and imagined a certain criterion to determine whether foreign brandies are mixed with corn *fpirits*. Thefe diftillers are provided with a certain yellow liquor, a few drops of which being poured into a glafs of right French brandy gives it a beautiful blue colour, and by the ftrength, and goodnefs of this colour, they judge and buy; but if common malt *fpirit* were tinged with oak, it would give this colour equally with French brandy, and might be purchafed as fuch. This proof-tincture is expeditioufly made, by diffolving a little green vitriol, firft calcined to a rednefs in a weak *fpirit* of fea-falt, which thus becomes a yellow liquor, a fingle drop or two of which being added to a glafs of any inflammable *fpirit*, coloured yellow or brown with oak, or with long remaining in the cafk, will inftantly turn it of a bright and beautiful blue.

The beft way of judging in thefe cafes is by the nofe and palate. Dilute a quantity of brandy confiderably with water, and you will perceive the malt-tafte, if mixed with malt *fpirits*; or burn a little in a fpoon, and by the fmell and tafte of the water it leaves, you will eafily judge whether there be malt in it. *Shaw's* Lectures, p. 125, 126.

Proof fpirits may be diftinguifhed into three kinds, *perfect proof, more than perfect proof*, and *lefs than perfect proof*. By *perfect proof* is ufually underftood that crown of bubbles, before mentioned, of a certain fize, arifing as a head upon a fmall quantity of a well-qualified *fpirit* fhook in a flender vial.

Proof more than perfect, is that in which the bubbles, raifed by fhaking the *fpirit*, are larger than thofe on the common or perfect proof, and go off more fuddenly; that is, according as the *fpirit* is higher, or approaches more to the nature of rectified *fpirit*, or, as it is ufually called, *fpirit of wine*.

Proof lefs than perfect, is that wherein the bubbles are fmaller, and go off quicker and fainter than in perfect proof; the *fpirit*, in this cafe, being mixed with more than its own quantity of phlegm, or is too poor for fale.

In commerce, with regard to *fpirits*, it would certainly be a much better method to abolifh fuch uncertain proofs, and to make all the goods of the ftrength of what we call *fpirits of wine*; that is, a totally inflammable *fpirit*, whofe purity is much greater, whofe ftrength may always be found out with exactnefs, and whofe bulk, ftowage, carriage, and encumbrance, would be only half, in regard to that of *brandy* or *proof fpirit*; and it might at all times, as occafion called for it, be mixed into a great variety of extemporaneous liquors, and the exact degree of ftrength would be always precifely known. See the article *Rectified* Spirits, infra.

This operation, indeed, in the common way, proves fo tedious and expenfive, and, after all, fo fhort of expectation, and fo generally unfatisfactory, that it is not to be expected that the common diftillers, till they have fallen into a better manner of working, fhould come into the propofal. But if, inftead of the common way of rectifying by the hot-ftill, they would try the ufing a large balneum mariæ, made of a large rectangular boiler, and a fet of tall conical veffels, they will find that little fire, and little attendance, and confequently very little expence, will, in this manner, furnifh them with *fpirits* reduced at once to this ftandard, and greatly fuperior, in all refpects, to the common ones of the fame ftrength. In this cafe there would be no need of any addition of falts; but the diftiller may work more perfectly, and more expeditioufly without them, and thus preferve the fine effential vinofity of the *fpirit*, which in the common way of working they conftantly lofe.

The advantage of this method would be yet greater to the apothecaries, and the makers of compound cordial waters, who want only a pure *fpirit* of fuch a ftrength, and fuffer greatly in the finenefs and perfection of their commodities, by the *fpirit* they are obliged to ufe having in it a fulfome and naufeous oil of its own, which will always mix itfelf with their compofitions, and the oils of the aromatics, *&c.* which they add to it. If *fpirits* were brought to this ftandard for the market, there would be no poffibility of deceit, and no farther examination need be made of it by the buyer, than its burning perfectly dry in a fpoon. *Shaw's* Effay on Diftillery. See the article Strength.

It is however to be obferved, that though the burning *fpirits* away in a fpoon may ferve the trader in the common way, yet Mr. Geoffroy has obferved that they are no proofs for the philofopher, or the chemift, being not at all determinate or exact, though commonly fuppofed fo.

From what has been faid, it appears that brandy is much more inflammable than wine, and *fpirit* of wine much more fo than brandy, and ought to burn away without leaving any remainder. Hence it is vulgarly fuppofed, that fuch *fpirit* of wine as burns wholly away contains no phlegm, and that if two parcels of *fpirit* both burn wholly away in this manner, they muft be the fame in ftrength, and in all their qualities; but Mr. Geoffroy has proved by experiment, that fuch *fpirit* as burns wholly away, does yet contain a great deal of water, and that two parcels both may burn thus away, and yet be very different; and that this trial is not determined by the entire abfence of the phlegm, but by its proportion to the oil.

If the fame *fpirit* of wine, which in the common way of burning leaves no water, be again tried, by burning it in a hollow veffel fet to float in a large quantity of cold water, it will then leave a confiderable quantity of water; nay, all that is rectified only in the common way leaves a large portion of phlegm on this experiment. The plain reafon of which is, that this is the only fair trial, the other in the common way being fallacious. In this there is no more water left than was in the *fpirit*; but in the other, the veffel becoming heated by the burning of the *fpirit*, that heat gradually evaporates the water, as the *fpirit* burns away; fo that the one is as foon gone as the other. But keeping the veffel cool by external water, prevents that evaporation, and confequently retains and difcovers all that cannot burn of the *fpirit*.

The quantity of water thus difcovered in *fpirit* of wine is very great, and it has always been found, that in proportion as the experiment has been made more and more perfect, the *fpirit* has always appeared proportionably lefs and lefs fo.

The quality of the phlegm that is left, is alfo of ufe to judge of the *fpirit* by; if that were perfectly fine, this ought to be perfectly limpid and clear, and without tafte or fmell: as it wants either of thefe properties, it is a proof of the want of perfection of the *fpirit* it is obtained from; but the greateft of all its defects, is its having a coarfe oil fwimming upon it, and giving the colours of the rainbow in different lights. Mem. Acad. Par. 1718.

Rectified Spirit, or *alcohol*. A perfectly *rectified fpirit* of wine, or fuch as is entirely freed from water, is a thing of frequent and neceffary ufe in the nice operations of chemiftry.

It had ufed to be prepared, either by often diftilling the *fpirit*, and every time drawing over only half of it, and repeating this till the half remaining in the cucurbit appeared as ftrong as that drawn over; or elfe by raifing it to a great height from the body of the veffel, and this in a very gentle heat, fo that *fpirit* alone could rife, the water not being capable of being driven fo far by that degree of heat.

But the accurate Boerhaave always found upon trial, that there was ftill remaining fome water in thefe *fpirits*, whether prepared by the firft or fecond procefs, or both. *Boerhaave's* Chem. Part 2. p. 124.

The method he therefore invented is this: fill a still half full with the *spirit* prepared for *alcohol* in one or the other of these ways, add to it half a pound of pure decrepitated, and perfectly dried sea-salt; put this in hot, then place on the head, and carefully lute the junctures; leave this for twelve hours in a heat so small, as not to make the *alcohol* boil, then distil off the *spirit*; keep the first two ounces apart, because some aqueous vapour may have happened to lodge in the head, or worm of the still, which this certainly washes off; after this receive two thirds of the following *alcohol* into a pure dry glass-vessel, and keep it perfectly stopped; then draw off the remainder, and keep that by itself: there will remain a moist salt in the still, which has attracted the aqueous matter of the *alcohol*, and held it so down, that it could not rise by the heat of boiling water, which is all that must be used in this distillation; and the salt having been first decrepitated, never makes any change in the *alcohol*, by adding any thing thereto. By this means an *alcohol* is prepared perfectly pure, and fit for all the uses of chemistry.

The *alcohol* thus perfected is the lightest of all fluids next to air; it is extremely pellucid, thin, and simple, and is totally inflammable, burning without smoak, and without leaving any fæces behind. It has no disagreeable smell in the burning, remains the same after distillation, is very expansive with heat, easily boils over the fire, is of a grateful odour, and agreeable taste. This fluid instantly coagulates all the juices of the body, except pure water and urine; it hardens the solid parts of the body, and preserves both the solids and fluids from putrefaction, or spontaneous resolution; it preserves the bodies of birds, fishes, insects, and other animals suspended in it, perfect for ages. It mixes almost uniformly with water, vinegar, any acid liquors, oils, and pure volatile alkaline salts; and dissolves gummy and resinous bodies. Hence we are acquainted with no liquor, either natural, or produced by chemistry, which will mix with more bodies.

It is in particular an excellent vehicle for the presiding *spirit* of vegetables, as by means of it that *spirit* may be commodiously extracted from its own body, and fitted for medicinal purposes. In the living human body it wonderfully raises, gratefully affects, and stirs the animal, natural, and vital *spirits*, whence it gives encrease to the strength, senses, and agility; but by its power of coagulating the blood, serum, and other juices, it may kill by being imprudently taken. It instantly stops bleeding, by at once contracting the vessels, and coagulating that blood which it touches at the mouths of them; and hence it is a sudden and powerful remedy in these cases.

If the parts of animals, or vegetables, suspended in *alcohol*, contain any thing oily in them, the *alcohol* immediately extracts it from the matter, which thence becomes shrunk, wrinkled, and withered; but small birds with their feathers on, and fish that are well covered with scales, remain perfectly preserved in their recent form, by being plunged in hot *alcohol*. When they have been long enough in the *spirit* to be perfectly penetrated by it, they may be taken out and dried in a slack oven, and afterwards put up in empty glasses well stopped, where they will remain beautiful specimens for ages. *Boerh.* Chem. Part 2. p. 126.

Alcohol being required on many occasions to be perfectly pure, and free from the least drop of water, it may be proper to add here the true and infallible rules of judging when it is so. These are the following.

1. If any oil be contained in the *alcohol*, it turns milky on being mixed with water.

2. If it contains any acid; when a little of it is mixed with *spirit* of sal armoniac, there will be an effervescence, otherwise there will be only a simple coagulation; and if any thing alkaline be contained in it, this will be discovered by the mixing it with acids; as for the other salts, they are scarce ever contained in the *alcohol*.

These are the tests of such admixtures, but they are the least common; water is the most frequent, and most to be suspected in it, and this is the most difficult to be discovered. To this purpose a little of it is to be fired in a spoon in a still place, where there is no wind moving, and if no water be left in the spoon, this is a fair step toward its answering expectation: this, however, alone is by no means to be depended upon. Gunpowder also put into a spoon, and covered with *alcohol*, if when the whole is burnt away it takes fire, gives another proof that there is but little water contained in it; but this does not prove, any more than the former, that there is none. After these trials, the surest is this: take a round chemical vial, capable of holding four or six ounces, and having a long neck; fill two thirds of this with *alcohol*, and add to it a drachm of pure salt of tartar well dried, and heated very hot; shake them well together, and hold them over the fire to make them just so hot, as that the *alcohol* does not quite boil. If after this the salt of tartar is perfectly dry, we may be assured that the *alcohol* contains no water, or if any, not to be discovered by any experiment hitherto known, unless by the water collected from its flame when perfectly burnt.

If after the salt of tartar has remained dry ever so long at the bottom of this pure *alcohol*, only a drop or two of water be added to it, the salt immediately becomes moist, and hangs about the bottom and sides of the vessel. To this it is to be added, that this pure *alcohol*, when distilled, gives no appearance of itself, either in the head or neck of the alembic, nor on the sides of the receiver; neither appearing like the aqueous fluids in moist drops, nor like good *spirit* of wine, running in veins, but remaining invisible to the eye, except at the bottom of the receiver. This property of *alcohol* was known to the antient chemists, as appears by their writings. *Boerhaave*'s Chemistry, Part 2. p. 127.

Water is a solvent to *alcohol*, or *spirit* of wine, in certain circumstances, but not spontaneously, or in all mixtures. If water be gently poured into it, it does not dissolve it, or mix itself with it, but falls through it, and collects itself into a separate body at the bottom of the vessel; as soon, however, as they are shook together, the *alcohol* begins to blend with the water, though at first, or with a little shaking, it only is dispersed in form of unctuous veins through the body of the water, but by continued shaking, they perfectly unite. As *alcohol*, therefore, is a pure vegetable oil, produced by a perfect fermentation, its nature is thus perfected, so as not only to burn in the fire, but to mix perfectly and easily with water: but water impregnated with salts will not dissolve *alcohol*, for a strong solution of salt of tartar in water, will not be brought to mix with *alcohol* by any shaking, nor even by boiling together; but as soon as the mixture has stood a little, the *spirit* gets to the top, and remains perfectly unmixed with the water. Salt of tartar unites itself more intimately than many other salts to water; and if another salt, which more easily separates from water, such as Epsom salt, be, in the place of salt of tartar, dissolved in water, though the solution be ever so strong, the liquor will dissolve *alcohol*; and on their being mixed together, the whole will become turbid and white, and the salt will be precipitated in crystals. *Boerhaave*'s Chem. Part 1. p. 452.

Water has also this remarkable quality, that if mixed with *alcohol*, in which any essential oil has been dissolved, it separates the oil from the *alcohol*. Thus if oil of cinnamon be dissolved in pure *alcohol*, and water be let fall into this solution, the mixture presently becomes white and opake, though it was perfectly pellucid before; and the oil separates itself from the *alcohol*, and gathers into a body. Hence it appears, that *alcohol* is disqualified by water for the dissolving of these oils; that it also more easily and readily unites with water than with them; and finally, that these essential oils, while they appear to be wholly dissolved in the *alcohol*, and no longer look like oils, but like *spirit*, yet are really oils, and easily separable in their true form. *Boerh.* Chem. Part 1. p. 453.

Proof *spirit* cannot be used for burning in lamps, for dissolving rosins, for making varnish, and there are a great number of tinctures, solutions, and mixtures, for which it cannot serve; but *alcohol*, beside its ready use in the medicinal way, may, when the *spirit* is of a proper kind, be made into punch, and all other mixtures, with more purity, and a great deal more certainty and exactness in point of strength. *Shaw*'s Essay on Distillery.

Colouring of SPIRITS. The art of giving to distilled liquors a colour, which takes off their watery appearance, and gives them a resemblance of the foreign brandies, &c.

The colouring is not only necessary on this account, but as we usually esteem the *spirits* by the proof of the crown of bubbles, it is found that the clean rectified *spirit* will not afford this proof till it has received its dose of the colour. The distillers dispense this colour in any proportion that they find convenient or necessary: it is always yellow, but according to the degree differs extremely in deepness, from the palest straw colour to the deepest orange. This art of colouring was first introduced, from observing that all the fine and soft foreign brandies, that had the mellowness necessary to their perfection to the taste, had also a yellow colour. The colour, in this case, has indeed nothing to do with the flavour; but that being kept in casks the same age that was necessary to give them this mellowness, would also give them a colour from the wood. It was hence supposed, that the particular excellence of the foreign brandies depended on the woody colour, and accordingly have been taken to give the same colour to our *spirits*, by various methods.

The way of obtaining it, by many years standing in the cask, proved too tedious for our hasty workmen, and accordingly they provided means of giving it extempore by strong tinctures of several ingredients; the chief of which are logwood, saffron, Japan earth, treacle, burnt sugar, and oak chips: the three former of these have but little to recommend them, but the others are found very ready, and very proper for the use.

Treacle gives a fine colour, not much unlike that of the foreign brandies, and being necessarily used in a large quantity, as its colour is but dilute, it not only mends the bubble, or

or bead proof, impaired by the rectification, but also gives it a fullness in the mouth; both which properties are very agreeable to the vulgar, who are the chief retail consumers of these coarse goods.

Burnt sugar, that is, sugar dissolved in a little water, and scorched over the fire till it turns black, goes much farther in the colouring than treacle, and at the same time gives no sweetness, but rather an agreeable bitterness; and thus recommends itself to the nicer palates, that are not for a luscious *spirit*. Indeed sugar, thus treated, tinges to a great perfection, and that without loss of time, and with as much cheapness as can well be desired.

The last article mentioned, namely, oak chips, is of all others the most natural for the imitating the dye of foreign *spirits*, as it is the very wood whereof the casks they come over in are made, and from which they take that colour we are so fond of. The colouring with oak has also this farther advantage, in *spirits* meant as sophistications of the foreign ones, that it will stand some tests usually had recourse to on the occasion, which the others will not stand.

Common *spirit* poured on oak chips, and digested in a moderate heat, easily fetches out this resinous part of the wood, on which the colouring depends; but then it does not go near so far as the burnt sugar; a large quantity of oak being required to colour a small parcel of brandy, or *spirits*. It is adviseable not to make the tincture every time, but to have recourse to an extract of this wood in a liquid form: this extract is best made in two menstruums, alcohol and water, and may be evaporated to any strength, so that a very small dose of it will tinge a great quantity of liquor. The two liquid extracts must be mixed together, and as they will be apt to separate in standing, it will be proper to add to them, when newly made, a quantity of fine sugar; this will give a body to the whole, and it will keep better from mouldiness than it would without it. *Shaw*'s Essay on Distillery.

Convertibility of SPIRITS. This is a doctrine that has obtained among many of the most curious experimenters, and indeed the most intelligent of our chemists have always allowed, that provided proper care were taken in the getting together the materials, one *spirit* may always be changed into another, as brandy into rum, malt *spirit* into brandy, and brandy into malt *spirit*. The principles on which this is believed are these.

All simple *spirits* (as they are called) consist of four parts, water, oil, phlegm, and alcohol: the last of these is the essential part, and is what constitutes the whole a *spirit*. In reducing *spirits*, therefore, to their utmost degree of simplicity and purity, it is evident that the three superfluous parts are to be got rid of, and the fourth left alone; by this means the alcohol is procured distinct, and is a liquor *sui generis* of many peculiar qualities, not to be found in any other fluid.

Among others it has these remarkable properties. 1. When absolutely purified, it is an uniform and homogene liquor, capable of no farther separation, without loss or destruction of some of its homogeneous parts. 2. It is totally inflammable, having no soot, nor any moisture behind. 3. It has no peculiar taste or flavour, any more than pure water, except what is owing to its nature as alcohol, or perfectly pure *spirit*. 4. It is an unctuous and crispy fluid, running veiny in the distillation, and its drops rolling on the surface of any other fluid, like pease upon a table, before they unite. 5. It appears to be the essential oil of the body it is obtained from, broken very fine, and intimately and strongly mixed with an aqueous fluid, which is assimilated, or changed in its nature in the operation. 6. And lastly, it seems to be a kind of universal fluid, producible with the same properties from every vegetable subject; but to produce it thus, requires some care in the operation.

On these principles is founded the opinion, that all *spirits* may be reduced to a perfect similarity, or sameness, from whatever subject they were procured, and on this depends their convertibility into one another; for when once they are brought to this standard of simplicity, there needs nothing more than to add the oil of such of the finer *spirits* as is required to convert the *spirit* into that particular kind. By this means the same tasteless *spirit*, whether obtained from malt, sugar, or grapes, may be made into either malt *spirit*, brandy, or rum, by adding the essential oil of the grape, sugar, or malt; and thus what was once malt *spirit*, shall become brandy, or whatever else the operator pleases.

Many methods have been attempted to obtain the first point, that is, the reducing the *spirit* to perfect and pure alcohol. The most practicable means seem to be long digestion, and the repeated distillation from water into water, where the essential oil will at once be left upon two surfaces, and the acid imbibed. The shorter ways are those by rectifying from neutral absorbent salts and earths; such are sugar, chalk, and the like. And lastly, the use of fixed alkalies may be tried, for these very forcibly keep down both the phlegm and oil; insomuch that this last method promises to be the shortest of all, if the art were known of utterly abolishing the alkaline flavour, which the alcohol is apt to acquire in this operation, and which, for this purpose, is by no means suitable, as absolutely destroying all vinosity, which universally consists in a fine volatile, pungent acidity. The distillers are the only people, whose business would lead them to make the experiment. This method of converting one *spirit* into another, would be of immense profit to them if they could perfectly succeed in it; but as it would require time and slow processes to bring it about, there is but little hope of its ever being brought to bear among them, while they are in their present scheme of doing every thing with dispatch and hurry.

Dr. Shaw has said a vast deal in the praise of a tasteless *spirit*, which is producible from a vegetable substance, only overlooked, as he tells us, because it is too common, with which all the foreign *spirits* might be imitated to the utmost perfection by means of their essential oils, all thin fine wines raised to any due degree of strength, without giving them the brandy flavour, and many other things of great use performed; but he has not told us what the vegetable substance is from which we are to obtain this. *Shaw*'s Essay on Distillery.

SPIRITS, in medicine, are of use, in external applications, to wounds and sores. They stimulate sores, resist putrefaction, harden the fibres, coagulate the liquors, hinder suppuration, and quicken the pulse when absorbed.

Tinctures of absorbent and aromatic powders are often made with the same intention, and partake of the nature of their ingredients, but principally of the *spirit*. Med. Ess. Edinb. Vol. 5. Art. 24. See the articles ABSORBENTS and AROMATICS.

The power of brandy, or any thing of this kind, in killing worms, is evident from this, that the children of the people in the northern islands of Scotland, who are accustomed from their infancy to drink that coarse sort of brandy which they call *aqua vitæ*, never are troubled with worms. It is a dangerous practice to use brandy in this general manner, but on some occasions it may be very serviceable. Philos. Trans. N° 233.

The danger of the frequent and immoderate use of *spirits* is too well known from experience, and acknowledged by physicians; but a late ingenious writer thinks it not improbable that many, especially ladies, are led gradually to the use of those poisons by a certain complaisant pharmacy, too much used in the modern practice: thus palsy-drops, poppy-cordial, plague-water, and such like, which being in truth nothing but drams disguised, yet coming from the apothecaries, are considered only as medicines. He therefore recommends to them the use of tar-water, a cordial not only safe and innocent, but giving health and *spirit* as surely as other cordials destroy them. See TAR-*water*.

The *spirits* of wine, or other fermented liquors, produce irregular motions, and subsequent depressions in the animal *spirits*; whereas the *spirit*, lodged and detained in the native balsam of pines and firs, is of a nature so mild and benign, and proportioned to the human constitution, as to warm without heating, to cheer, but not inebriate, and to produce a calm and steady joy, without that sinking of *spirits* which is a subsequent effect of all fermented cordials.

Acid SPIRITS. *Acid spirits* extracted from fossils, and applied to animal bodies, coagulate the liquids, and mortify the solids; by being diluted with water, they approach to vinegar.

By dissolving metallic substances in these *spirits*, their corroding sphacelating power is increased, and some of them give such pain, as to bring on convulsions. Med. Ess. Edinb. Vol. 5. Art. 2.

Ætherial SPIRIT *of Frobenius*, *spiritus ætherius Frobenii*, a name given by Frobenius, and others, to a liquor famous for its extreme volatility, and many other qualities, and prepared by him in this manner. Take four pounds of the best oil of vitriol, and the same weight of rectified *spirit* of wine: first pour the *spirit* of wine into a glass retort, and then pour to it, by little and little, an ounce of the oil of vitriol, shake the retort till the two liquors are thoroughly mixed; the vessel will then begin to grow warm; then pour in more of the oil of vitriol, shaking it again, and so on, putting in an ounce of the oil of vitriol at a time, and allowing about an hour's time for making the whole mixture, least the sudden violent heat they excite should burst the vessel. When the whole quantity is perfectly mixed, place the retort in a sand-furnace, the heat of which is as near as possible the same with that of the vessel, which will be at this time very considerable; take out some of the hot sand, and place the retort in the center of the rest; then adding more of the hot sand round it, apply a large receiver to the nose of the retort; let this receiver be placed on a vessel of cold water, and covered with a double flannel wetted with cold water; raise the fire gradually, till the drops fall so fast, that you may count five or six between each; and beside these drops, the upper hemisphere of the receiver appears filled with a white vapour. This heat is to be continued so long as the *spirit* smells like sweet marjoram; as soon as this aromatic flavour goes off, and the smell

ſmell becomes acid and ſuffocating, like that of brimſtone; take away the receiver, and put out the fire, for all that ariſes after this period is only a gas of ſulphur, and is of no uſe.

The greateſt precaution muſt be uſed in this whole diſtillation, otherwiſe the liquors in the retort will run over into the receiver; the fire muſt ceaſe, as ſoon as the *ætherial ſpirits* are gone over, for there remains behind an oleum vini, which is extracted out of the *ſpirit* by the force of the acid, and will ariſe in the retort, and often runs over, or cauſes exploſions. On the ſecond day, when the retort is cold, pour on the matter that remains in it half as much alcohol, or rectified *ſpirit*, as at firſt, that is two pounds by weight; and then repeating the whole proceſs of the diſtillation, exactly as before, there will come over half as much as at firſt of the *ætherial ſpirit*. On the third day after this proceed in the ſame manner, and you will have ſo much more. In this manner the operations are to be repeated, till no more *ætherial ſpirit* can be raiſed, and all turns to a carbo. Then ſeparate it, and alkaliſe it with *ſpirit* of ſal armoniac, made without *ſpirit* of wine, till all effervеſcence ceaſes; then diſtil it once more in a balneum mariæ, and it is fit for experiments.

There are more products to be got out of the proceſs. 1. A balſamic oil. 2. A terra-foliata tartari, which is of a glittering hue, and is not fuſible as the common one, prepared with vinegar and the fixed ſalt, is. This is very uſeful in medicine. And 3. a purple earth is to be extracted out of the caput mortuum. Phil. Tranſ. N° 461. p. 870.

The properties of the *ætherial ſpirit* are, 1. That it is ſo extremely volatile, that it evaporates immediately, and does not appear to wet the finger which is dipped in it. 2. That it is ſo extremely inflammable, that it will take fire at a very great diſtance from any flame. 3. That it is of a very pleaſant and aromatic ſmell. And 4. that it does not mix with water.

We have ſeveral curious obſervations on this *æther of Frobenius* by Mr. Groſſe, in the Memoirs of the Academy of Sciences. This Gentleman had obſerved, that in diſtilling *ſpirit* of wine from a ſolution of alum, there was produced a liquor of an agreeable aromatic ſmell, not unlike that of the *æther*; and on this principle he conceived an opinion, that this *æther* was not to be ſought in the common oils of plants, but in ſome mixture of *ſpirit* of wine with a vitriolic acid: and Mr. Geoffroy's papers affording ſome hints alſo to the ſame purpoſe, Mr. Du Hamel, in concert with Mr. Groſſe, determined to attempt the diſcovery with the utmoſt pains on this baſis, and after many unſucceſsful trials, Mr. Groſſe found out three different methods of making it, of which he gives the following account.

Take a pound of pure, uncoloured, and well-rectified oil of vitriol, and two pounds of well-rectified *ſpirit* of wine. The oil of vitriol muſt be firſt put into a retort, and the *ſpirit* of wine afterwards added by a little at a time. There ariſes a very violent heat on the mixing theſe liquors, and the mouth of the retort is to be ſtopt when they are mixed, and the veſſel ſet by for two or three days; in which time the mixture aſſumes a reddiſh colour. After this the retort is to be placed in a ſand-heat, and the diſtillation being made, there firſt ariſes a ſmall quantity of very ſweet ſcented *ſpirit* of wine; after this there ariſes another liquor in white clouds; and after this, on continuing the diſtillation, there comes over another, which is very ſulphureous and volatile, and very ſtrongly affects the noſe, and would indeed ſuffocate a perſon, if its vapours were received in large quantities. After this there ariſes an acid phlegm, and what remains in the retort is a black maſs.

It appeared very plainly by the ſmell, that the *æther* was contained in theſe diſtilled liquors, the manner of ſeparating it was the only difficulty; and after ſeveral tedious experiments with ſal armoniac, and other things, Mr. Groſſe happily thought of trying common water, as the moſt ſimple and eaſy of all methods, to weaken both the ſulphureous acid and the *ſpirit* of wine, which he judged the only obſtacles to the *æther* from ſhewing itſelf in its true form; and this was founded on that remarkable property of the *æther*, of not mixing with water, though blending itſelf very readily with *ſpirit* of wine. On pouring a large quantity of water on theſe diſtilled liquors, the *æther* immediately ſeparated itſelf from the reſt, and by reaſon of its extreme lightneſs roſe all at once to the ſurface of the water. This did not, however, yield it perfectly pure; but adding a little ſalt of tartar to this, the remainder of the acid ſulphureous *ſpirit* was abſorbed, and the *æther* obtained perfectly pure and fine, as that made by Frobenius himſelf.

As the *æther* had been by this means ſeparated from the whole diſtilled matter, it did not clearly appear which of the ſeveral different matters, that ſucceeded one another in the diſtillation, contained it, the reſt ſeeming only a load to the proceſs: with this thought Mr. Groſſe, to try by the ſmell which was moſt likely to contain it, in a ſucceeding diſtillation pricked the bladder, that luted the junctures of the retort and receiver, with a pin, and judging of the ſeveral liquors, as they ſucceeded one another, by their ſmell, he determined that the firſt was only a very highly-rectified *ſpirit* of wine; the ſecond, which came over in white clouds, ſmelt very ſtrongly, and perfectly like the *æther*: this ſeemed indeed the whole matter of the *æther*, the reſt ſerving only to abſorb it. The third liquor had a very penetrating and ſuffocating ſmell of ſulphur.

From theſe obſervations this gentleman attempted the making the *æther* in this ſecond manner. All being prepared as before, he diſtilled off the *ſpirit* of wine, or firſt liquor, and as ſoon as the white vapours began to appear in the retort, he took off the fire, for there was no doubt but the remaining heat was ſufficient for the diſtillation of ſo very volatile a liquor as the *æther*. This ſucceeded accordingly, and the clouds all coming over, and the remaining *ſpirit*, or third liquor, remaining behind in the retort, the *æther* was now found in the receiver, mixed only with a ſmall quantity of *ſpirit* of wine, or with a very ſmall portion, at the utmoſt, of the ſucceeding *ſpirit*. An addition of water ſeparates the *æther* from the *ſpirit*, as in the former proceſs, and if it be not ſufficiently dry and clean when thus procured, it may be diſtilled over again with a gentle heat; and it is remarkable, that if it be diſtilled this ſecond time, without previouſly adding any water, it comes over firſt into the receiver; though the *ſpirit* of wine comes firſt in the common, or primary operation.

Theſe are very ſimple and eaſy ways of making this famous *ſpirit*; but though they uſually ſucceed, yet they have ſometimes failed, even in the hands of the inventor, and that though all the circumſtances of the proceſs have been the ſame, the failure being owing to ſome imperceptible difference, either in the oil of vitriol, or in the *ſpirit* of wine; though this, however, has ſometimes made the proceſs fail in the two former ways, Mr. Groſſe adds a third, in which he obſerves that it always ſucceeded with him.

By this method the *æther* is procured perfectly dry and pure, without the mixture of water, or of the alkaline ſalts. For the ſeparation, or purification of it, the method is this: when the white vapours have appeared, the whole matter in the receiver is to be poured into a ſmall retort, which being placed over a lamp, the *æther* will immediately riſe, and diſtil into the recipient; when half the liquor is come over, or, at the utmoſt, two thirds of it, the lamp is to be taken away, that the *ſpirit* may not riſe, and make a new mixture. Thus the pure *æther* is, without farther trouble, found in the receiver. Mem. Acad. Par. 1734.

Coal-Spirit. See the article Coal-*ſpirit*.

Fœtid Spirit, *ſpiritus fœtidus*, a new medicine introduced into the practice of phyſic, and directed to be made of any fixed alkaline ſalt a pound and half, ſal armoniac a pound, aſſa fœtida four ounces, and proof-*ſpirit* three quarts, diſtilling off five pints with a gentle heat. *Pemberton's* Lond. Diſp. p. 205.

Foreign Spirits, a general name by which our dealers in theſe things call brandy, rum, and arrack.

It is hard to purchaſe any of theſe genuine and pure, unleſs at the firſt hand, and in large quantities. The dealers generally mix our own *ſpirits* with them. When we had little other *ſpirit* but that of malt made with us, this cheat was eaſily diſcovered, for a nice palate would diſtinguiſh the mixture of only a tenth part of this foul *ſpirit* among the foreign clean ones; but ſince we have the melaſſes *ſpirit* ſo common, and rectified to ſo great a perfection, the deceit is not eaſily found out, though a larger proportion is uſed.

All *foreign ſpirits* are to be ſuſpected of this adulteration, which have not an uniform taſte, and grateful odour. But one of the beſt ways of diſcovering the mixture, is to burn away all that is inflammable in a ſmall quantity by way of trial, and then examine the phlegm.

The great art of this ſophiſtication conſiſts in the purity, and well rectified ſtate of the *ſpirit*; and when the diſtiller can furniſh himſelf with ſuch a *ſpirit* as will not be found out, though mixed in a large quantity with brandy or rum, he is very near the art of making brandy and rum himſelf. *Shaw's* Eſſay on Diſtillery.

Spirit *of lavender*, a form of medicine, which has been uſed to be compounded of a vaſt number of ingredients; but the late London Diſpenſatory has greatly ſhortened the catalogue of them, by ordering this to be made only of lavender flowers and roſemary tops, or the ſimple *ſpirit* of each; and the addition of cinnamon and nutmeg, of each half an ounce, and red ſanders three drachms to two quarts of the *ſpirit*. The ſimple *ſpirits* are to be mixed in the proportion of three parts lavender, and one part roſemary, or elſe the ingredients proportioned in the ſame manner. *Pemberton's* Lond. Diſp. p. 248.

Malt-Spirit. See the article Malt-*ſpirit*.

Spirit *of melaſſes*. See Melasses-*ſpirit*.

Glauber's Spirit *of nitre*, *ſpiritus nitri Glauberi*, in pharmacy, a form of medicine made thus: take of nitre three pounds, and of the ſtrong *ſpirit* of vitriol one pound; let them be mixed with caution, and gradually, under a chimney; and afterwards let them be diſtilled, firſt with a gentle heat, and then with a ſtronger. *Pemberton's* Lond. Diſpenſ. p. 191.

Dulcified Spirit *of nitre*, *ſpiritus nitri dulcis*, a form of medicine ordered to be made thus: take of rectified *ſpirit* of wine one quart, and of Glauber's *ſpirit of nitre* half a pound; mix them by pouring the *ſpirit of nitre* on the other, and diſtil the mixture with a gentle heat, as long as what comes off will not raiſe any fermentation with a lixivial ſalt. *Pembert.* ibid. p. 198.

This is much uſed by our diſtillers to give a vinoſity to thoſe *ſpirits*, whoſe natural flavour of that kind they have deſtroyed by the improper uſe of alkaline ſalts in the rectifications. Nothing can be more proper for this purpoſe than this *ſpirit*, as it really gives the brandy flavour, and is not at all prejudicial to health, but very well falls in with the nature of the *ſpirit*, and promotes its medicinal properties as a diuretic, deobſtruent, and lithontriptic.

In order to bring the uſe of this *ſpirit* to a greater certainty and perfection, it is to be obſerved, 1. that there is a great difference in *ſpiritus nitri dulcis*, according to the manner of its preparation; ſuch of it being moſt apt to fly off from the *ſpirit* as had leaſt pains taken about its incorporation by digeſtion, or repeated diſtillation.

2. Any rectified clean *ſpirit*, impregnated with a proper doſe of *ſpiritus nitri dulcis*, and kept in a ſound glaſs veſſel cloſe ſtopt, will a long time retain that vinoſity it obtains from it, and which it would otherwiſe have loſt in a very ſhort time.

3. The caſks long uſed to receive rectified *ſpirits*, impregnated with this acid, uſually appear yellow and rotten, or corroded within like the bottom of a cork, which ſtops a vial of *ſpirit of nitre*. It hence appears no wonder that the vinous taſte, given by this addition, is ſooner loſt in the caſk than in a bottle.

4. When the inflammable *ſpirit* has been rectified with fixed alkalies, it always requires a much larger proportion of the *ſpiritus nitri dulcis*, to give it this vinoſity, than when rectified only by repeated diſtillation; and this vinoſity given by the acid is ſooner loſt, as the *ſpirit* was more impregnated by the alkalies uſed in the rectification. This is the reaſon of that odd obſervation, that melaſſes *ſpirit* retains the vinoſity given it by *ſpiritus nitri dulcis* much longer than malt *ſpirit*; the former having had little, if any, of the alkaline ſalt uſed in the rectifying it, of which the latter, by reaſon of its natural foulneſs, has had a great deal.

5. The beſt way of making this volatile acid, whether with or without external heat, is not uſually practiſed, *viz.* ſo as to render it a perfectly homogeneous and uninflammable liquor, whence it proves much more volatile than it ought to be. Thus when perfect alcohol, and a well rectified ſtrong *ſpirit of nitre*, are by degrees put together for the making of this vinous acid; one half of the mixture evaporates in the conflict, or may be made to diſtil away ſo, as to leave the other half more fixed. The method of making it is alſo improveable, by uſing in the preparation a *ſpirit* of wine impregnated with ſome fine flavoured ingredient, which has not much oil, for acids do not readily mix where there is much oil.

In the preparation of this *dulcified ſpirit of nitre*, the longer it ſtands in digeſtion with the *ſpirit* of wine, the milder it grows; and by the ſame means, alſo, the violently corroſive oil of vitriol may be ſo blunted, as to be rendered ſcarce perceptible to the taſte. In fine, a *ſpiritus nitri dulcis* may be made by a ſlow digeſtion, greatly ſuperior to that commonly uſed, and of ſo fixed a nature, that it will not be ſubject to have its flavour fly off from the *ſpirit* it is mixed with, any ſooner than the native vinoſity of brandy will of itſelf fly off from that *ſpirit*, as it always will in time. A proper care in the preparation of this acid might free the diſtillers from that troubleſome neceſſity they are under of adding their *ſpirit of nitre*, juſt before they ſend their goods away, for fear the flavour ſhould be loſt before the *ſpirit* is all uſed, and ſo the ſophiſtication be found out. There is no fixing any certain proportion, in which the acid is to be mixed with the *ſpirit*, but in general it is beſt not to overdo it; for though it will give an agreeable vinoſity to any tolerably clean *ſpirit*, the perſon will be much deceived, who attempts to drown the bad flavour of a foul one by it. *Shaw*'s Eſſ. on Diſtillery.

Spirit *of ſalt*. See the article Salt.

Strength of Spirits. See the article Strength.

Spirit *of ſulphur*, the ſame as oil of ſulphur. See the article Sulphur.

SPIRITO, in the Italian muſic, is uſed to ſignify that a performer ſhould ſing or play with vigour, life, and *ſpirit*. Hence we meet with *con ſpirito* in cantatas and ſonatas.

SPIRITUS *rector of vegetables*. See the article Archæus.

Spiritus *tartari*, the name of a medicine very famous in Germany, and probably in the greater eſteem, becauſe of the difficulty of preparing it. It is the *ſpirit* of ſalt of tartar volatilized; and is ordered by Langelot to be made in this manner: let two or three pounds of crude tartar be burnt to a blackneſs, in order to have what is moſt neceſſary, a ferment to ferment the tartar with; put this into a large pot, and pour to it ſo much water as will ſerve to ſtand an inch above it; make this mixture luke-warm, and then pour into it half a handful of crude tartar powdered; bubbles of air will ariſe upon this, and will continue ſome time; when they ſeem to decreaſe, more powdered tartar is to be added from time to time, to keep up this fermentation. The bubbles will be large, and riſe in cluſters, and reſemble bunches of grapes in all but colour. The fire all this time muſt be carefully managed, and the tartar put in gradually, that the fermentation do not become too great, or the pot run over.

After this the matter is to be put together into an iron retort, and a very gentle fire kept under it for ſome time, and gradually heightened, ſo as to force up all the ſalt; this being done, the volatilized ſalt is to be carefully ſeparated, and it is remarkable, that the ſalt is ſo wholly volatilized by this fermentation, that there ſcarce remains any fixed ſalts in the caput mortuum in the retort.

The liquor in the receiver is to be rectified by another diſtillation, the water, neceſſarily uſed in the fermentation, rendering it too weak. When it is rectified ſo far, that it appears whitiſh, it is known to be of a due ſtrength, and it is then the famous *ſpirit of tartar*, not only celebrated for its medicinal virtues, but famous for extracting tinctures that can be obtained from no other menſtruum. *Langelot*, de Digeſt. et Ferm.

Spiritus *volatilis aromaticus*, a name given of late to what uſed to be called *ſal volatile oleoſum*. The modern way of making it is this: take eſſence of lemons, and oil of nutmegs, of each two drachms, oil of cloves half a drachm, dulcified *ſpirit* of ſal armoniac a quart; diſtil the whole with a very gentle heat. *Pemberton*'s London Diſpenſatory, p. 205.

SPISSUM, in the antient muſic, was uſed to ſignify thoſe two ſmaller conjunct intervals of a tetrachord, which taken together, were leſs than the third. *Wallis*'s Append. Ptolem. Harm. p. 165.

The Greek term for this was πυκνον. This happened in the enharmonic, and the three chromatic genera; in each of which the interval, between the hypate and the lichanos, was leſs than the interval between the lichanos and the nete. To the *ſpiſſum* was oppoſed the *non-ſpiſſum*, ἀπυκνον, or *rarum*, as Martianus Capella tranſlates it. The ἀπυκνον happened in the two diatonic genera, where the two ſmalleſt intervals were equal to, or greater than the third. They were ſuppoſed equal in the diatonicum molle, and greater in the intenſum. *Wallis*, ibid. See the article Genus.

SPIZA, in zoology, a name by which the antient naturaliſts called the chaffinch. See the article Fringilla.

SPLANCHNICA, a name given to medicines appropriated to diſeaſes of the bowels.

SPLEEN (*Cycl.*)—Mr. du Vernoi has added one opinion more to the many already given, concerning the uſe of the *ſpleen*. From obſerving a large empty ſpace near the *ſpleen*, in the abdomen of a dead body, the proportional largeneſs of its blood-veſſels, and the ſtructure of the *ſpleen* analogous to that of the penis, he concludes the *ſpleen* in a living perſon to be ſubject to inflations like a bellows: but how it is thus to be moved, or to what purpoſe, he does not tell us. See Comment. Acad. Petrop. Tom. 4. p. 156. ſeq.

Mr. Lieutaud argues for the *ſpleen*'s being larger by a greater quantity of blood in it, when the ſtomach is empty, and that this blood is preſſed out, when the ſtomach is full, to increaſe the ſecretion of bile. Hiſt. de l'Acad. des Scienc. 1733.

We have an account, in the Philoſophical Tranſactions, N° 451. of the extirpation of part of the *ſpleen* of a man, which had begun to mortify; notwithſtanding which, the man recovered.

The *ſpleen* has been cut out of dogs without any damage. Mr. Boyle mentions his having ſeen the experiment tried on a young ſetter, who recovered in a fortnight. Works Abridg. Vol. 1. p. 27.

Dr. Pozzi relates the phænomena he remarked in diſſecting a dog, whoſe *ſpeen* was cut out when he was young. The liver, which was larger and more heavy than ordinary, was alſo more brittle; the vena portarum was enlarged; the gall-bladder was full of bile, more acrid than it is commonly. From theſe appearances he thinks the uſe of the *ſpleen* to be for ſeparating a liquor like to ſpittle, which may dilute the bile, and prevent its too great acrimony. Med. Eſſ. Edinb.

The uncertainty we are in, as to the real uſe of the *ſpleen*, has given ground, perhaps, to the notion that men might live without the *ſpleen*; and that, in many caſes, it might contribute much to health to cut out this uſeleſs viſcus. In the Journal des Savans, there is an account of a method of deſtroying it, without the terrors of the operation of opening the body.

This was done by a perſon who applied a wooden knife to the ſurface of the body where the *ſpleen* is lodged, and ſtriking forcibly on it with a mallet, told the patient that he had broken the ſubſtance of the *ſpleen*; and that after this it required only the taking certain medicines which he prepared, utterly to deſtroy and carry it out of the body.

The folly of a pretence of this kind, one would think, ſhould

have been alone fufficient to have laughed it out of the world; but numbers of people fubmitted to the operation, till a youth in Peterfburg unhappily being killed by a blow of the kind here mentioned; and his belly fwelling greatly, excited the curiofity of his relations to have it opened. The caufe of his death was found to be an hæmorrhage, which had filled the cavity of the abdomen, and which proceeded from the *fpleen's* having been burft by the blow. This convinced them, that attempts to wound the *fpleen* were no longer to be looked upon as the means of health. Act. Petrop. Vol. I. p. 381.

Infarction of the SPLEEN, *infarctus lienis*, a difeafe confifting in an inflation of this lax and cellulofe vifcus, owing its origin to a reftriction of the blood toward the *fplenic* branch, in which nature feems to have intended the relieving herfelf from the load of a plethora, by the difcharging a part of the mafs through the vafa brevia. *Junker's* Confp. Med. p. 194.

The *infarctus lienis* differs from an obftruction of the *fpleen*, in that this laft is a total fuppreffion of the blood in it, this only a partial one. It is too often confounded with nephritic complaints, and is indeed, in general, of the clafs of hypocondriac maladies, but only arifes from a fpecial and peculiar derivation of the blood to that one vifcus, not to any other of the circumjacent parts.

Signs of it. An *infarction of the fpleen* is difcovered by an inflation of the left fide, a little below the fpurious ribs, attended with permanent pains, but thefe not very acute, or violent: thefe complaints have frequent remiffions, feldom continuing above a day or two in the fame ftate. During the time of the fymptoms being worft, there is a difficulty of breathing, and an anxiety of the præcordia, and generally a lownefs of fpirits: to thefe it may be added, that there is ufually a dry cough, and frequent belchings.

Perfons fubject to it. Men are in general much more fubject to this difeafe than women, unlefs at the middle and more advanced periods of life, when they are more fubject to it than the men. People of a melancholic habit alfo are moft afflicted with it, and fuch as have before had hypocondriac complaints, and have been injudicioufly treated with aftringents; and all perfons of a fedentary and ftudious life, or who employ much time in thinking.

Caufes of it. Thefe are a fedentary life, and a diet of too heavy and thick a kind; an omiffion of habitual bleedings, or other evacuations, or a fuppreffion of the menftrual or hæmorrhoidal difcharges; an injudicious treatment of intermittent fevers with aftringents, or of acute ones with too cooling medicines, and an habitual coftivenefs: and to thefe may be added an hereditary difpofition.

Prognoftics in it. This is a difeafe of no immediate danger to the patient, and the more recent it is when taken in hand, the eafier it is cured; if left to itfelf it becomes habitual, and brings no danger of death with it, but if improperly treated, it frequently becomes the bafis of the moft obftinate kind of quartans, or degenerates into a fcirrhus, which may be a long time fuffered without any danger of life; but finally, the whole too often ends in flow hectic fevers, and œdematous and afcitic fwellings. In women it often terminates in a vomiting of blood; and fometimes, but very rarely, an inflammatory and fuppurating ftafis fupervenes, and a black, fetid, and purulent matter is voided by ftool or by vomiting.

Method of cure. The plethoric habit, which gives rife to this complaint, is to be taken down by copious bleedings in the right foot, and then fhould be repeated every fpring and autumn; and the menfes muft be brought to a proper regularity in the ufual way, as muft alfo the hæmorrhoids in the other fex, by the application of leeches to the part. The fpiffitude of the blood is to be amended by decoctions of elecampane, hyffop, and the like; and by moderate and repeated dofes of tartarum vitriolatum, gum ammoniacum, &c. and gentle dofes of rhubarb and fena in infufion muft be taken at times. To thefe may be added the external ufe of refolvents and ftrengthners, fuch as ointment of marfhmallows, the plaifter of gum ammoniacum, and the like; and finally, the preparations of fteel are to be given: to thefe fome add a number of things efteemed fpecifics, fuch are madder and caper roots, dodder, yarrow, white maidenhair, and fpleenwort, and the bark of the afh-tree, and wood of the tamarifk. *Junker's* Confp. Med. p. 197.

Scirrhus of the SPLEEN. This is an indurated tumor of the *fpleen*, caufed by a ftagnation and infpiffation of the humors from the exhalation of their thinner parts. This complaint is fometimes compleat, and fometimes incompleat; but in the moft favourable cafes it is a greatly more dangerous complaint than an infarction of the *fpleen*, and more difficult of cure. *Junker's* Confp. Med. p. 201.

Signs of it. Thefe are a fenfible and palpable hardnefs under the ribs on the left fide, extending toward the loins, with a fenfe of a weight, as it were, hanging in this part; and hence the lying on the right fide is always very painful and uneafy. The face has dull deadnefs in the look, which fometimes is communicated alfo to the fkin of the whole body, and there is ufually a blacknefs about the orbits of the eyes; there is alfo a fenfation of a narrownefs in the breaft, with fome difficulty of breathing, and a dry cough. The appetite is ufually voracious, but fometimes it is affected with naufeas, without any apparent caufe. The bowels are ufually fomewhat coftive, but irregularly fo. The mind alfo feems affected, and a gloomy morofenefs, filence, and anxiety, opprefs the perfon, without any vifible caufe. Finally, there ufually is a fwelling in the right foot, which by degrees extends itfelf farther, and is feldom regarded at firft.

Perfons of both fexes are equally fubject to this diforder, but it is not, however, very common. Men who have lung been fubject to hypocondriac diforders, and women fubject to hyfteric complaints, are moft fubject to it; and to thefe may be added, perfons of an indolent, fpeculative, and fedentary life, and thofe who have been imprudently treated with aftringents in intermittent cafes.

Caufes of it. Befide thofe before mentioned, a fcirrhus is fometimes brought on in the *fpleen* by a violent blow, or other external injury; a too thick diet may alfo be very inftrumental in laying the foundation for it; and not a little may be added to all thefe cafes, by violent paffions of the mind.

Prognoftics in it. In recent *fcirrhufes*, and fuch as are yet incompleat, there is fome hope of fucceeding in the attempt of a cure; and on the contrary, in old cafes and compleat *fcirrhufes*, there is indeed very little hope: but there is this comfort for the patient, that even fuch a one, when wholly left to itfelf, will remain many years without endangering life.

There is in a *fcirrhus* an eternal tendency to corruption, but this is rather to be expected from fphacelation, than from an inflammatory fuppuration; but when emollients are ufed, there is great and imminent danger: for as thefe are nearly allied to the maturating remedies, they may produce their effect; and it is certain, that no laudable fuppuration is ever to be expected in this cafe.

Method of treatment. This cafe is to be treated in the fame general manner with the infarctions of the *fpleen*, already mentioned; but the more powerful refolvents are to be ufed in this, as the more ftubborn cafe. Gentian, bryony, and arum root, with the fine aperient roots, and the capillary herbs, with the powerful gums, as galbanum, fagapenum, ammoniacum, and the reft. Bleeding muft alfo be ordered, as foon as the primæ viæ have been cleanfed; and externally the plaifter of cicuta, with ammoniacum, may be applied: but if the cafe is fixed and obftinate, it is better to let all applications alone, and leave nature to do the beft for herfelf. *Junker's* Confp. Med. p. 202.

SPLEEN, in ichthyology. The *fpleen* in fifhes is ufually fituated near the ftomach, in the left fide of the abdomen. Its figure is generally triangular, fometimes oblong. Its colour is always more dufky and obfcure than that of the liver.

SPLEEN-*wort*. See the article LONCHITES.

SPLENECTOMIA, the name given to the chirurgical operation of cutting out the fpleen. Many have thought that the fpleen was an ufelefs part of the human body, and even noxious; but this feems to be a very rafh opinion.

SPLENIA, a word ufed by furgeons to exprefs compreffes, or rags feveral times doubled, applied to wounds over the plaifters, or other dreffings.

SPLENII *inferior*, in anatomy, a name given by Cowper to a mufcle, called by Albinus *fplenicus colli*, and by Winflow, and others, *maftoidæus pofterior*, and *portio inferior fplenii*. See the article SPLENIUS.

SPLENITIS, in medicine, the name of a fpecies of fever, in which the blood is powerfully directed toward the fpleen by nature, in order to break and diffolve congeftions formed there. The *fplenitis* differs from what authors call an *infarctus lienis* in degree, as in this the blood only ftagnates in fome degree, and is not wholly obftructed; and as there is no acute inflammatory fever here, as there is in the *fplenitis*.

The *fplenitis* is very various in degree; in fome cafes the whole parenchymatous fubftance of the fpleen being affected, in others only its membranaceous and fuperficial parts. It is eafy to conceive that the former cafe is greatly the more dangerous of the two.

Signs of it. This difeafe always firft attacks people with a very remarkable fhivering and coldnefs; this is fucceeded by a very terrible heat, and intolerable thirft; and there is a preffive pain, and a fenfible fwelling in the left hypocondrium. If the patients expofe themfelves a little to the open air, the extremities grow cold almoft immediately; if a hæmorrhage happens, it is always from the left noftril: and finally, the urine is reddifh and turbid, and after the fourth day depofits a rofe-coloured fediment, which has fomewhat of the appearance of matter. Plethoric perfons are more than all others fubject to this difeafe.

Caufes of it. The general caufe is a plethora joined with a thicknefs of the blood, which forms ftafes, and fixed coagulations in the fpleen; and the fever itfelf is no other, than the attempt of nature to break through thofe ftafes, by the additional velocity of the motion of the blood. The ufual accidents that bring on this bad ftate of the blood,

are the omiffion of habitual bleedings, or the fuppreffion of the natural difcharges of the menfes or hæmorrhoids; and the occafional accidents that immediately bring on the difeafe in this ftate of the blood are, violent commotions of the mind, fudden chilling of the body when very hot, as by drinking cold water immediately after violent exercife, the taking violently aftringent medicines in fevers, and an improper ufe of cooling external remedies in diforders of the fpleen, as the infarctions of it, and the like. *Junker*'s Confp. Med. p. 292.

Prognoftics in it. It is always a very dangerous difeafe, though not fo fatal as the hepatitis, or a like inflammatory ftate of the liver; but it is remarkable, that as the vomiting a black matter in the hepatitis is always a fatal fymptom, fo in this difeafe the fame matter is frequently voided, but it is here falutary, and frequently carries off the difeafe. The appearance of the hæmorrhoids has alfo been frequently obferved to have the fame good effect. When the inflammation lies deep, it is moft frequently fatal; when it is fuperficial, it is often carried off: but when it feems cured, it fometimes is found afterwards to have degenerated into an incurable fcirrhus of the part.

Method of cure. The firft thing to be done, is to open the bowels by a clyfter, and they are afterwards to be kept from becoming coftive, by a repetition of the fame means. Bleeding is ufually neceffary, and may be performed once or more in the beginning of the difeafe; then gentle diaphoretics are to be given with juleps flightly acidulated. Thefe are the proper medicines for the morning; and in the afternoon powders of nitre, vitriolated tartar, and crabs eyes, fated with lemon juice, are to be given with the cooling emulfions; and if the pains be very violent, they may be mitigated, by giving fmall dofes of a gentle anodyne, fuch as the ftorax pill, with the beforementioned powders. If the fuppreffion of the habitual hæmorroidal evacuations are fufpected to be the caufe of the difeafe, leeches muft be applied to the parts, and no wine, or any other ftrong liquor, muft be allowed, till the decline of the difeafe. *Junker*'s Confp. Med. p. 293.

SPLENITIS is alfo ufed by fome authors to exprefs a tumor or inflammation of the fpleen.

Splenitis is alfo ufed as the name of a vein in the left hand, the fame as the *falvatella*. The vein of this kind in the right hand is called *jecoraria*.

SPLENIUS, called alfo *maftoidæus pofterior*, in anatomy, a flat, broad, oblong mufcle, fituated obliquely between the back part of the ear, and the pofterior and lower part of the neck.

It is partly fingle, and partly made up of two portions, one fuperior, the other inferior. Thefe two portions are clofely united backward, making only one plain, but they are divided above.

The fuperior portion is fixed to the extremities of the three or four loweft fpinal apophyfes of the neck, and of the firft, and fometimes the firft and fecond of the back. It is not fixed immediately to the apophyfes of the neck, which are above the laft, but only by the intervention of the pofterior cervical ligament. It is likewife fixed to the edge of the interfpinal ligaments of the other vertebræ; from thence it runs obliquely toward the maftoide apophyfis, and is inferted in its upper part, and along the neighbouring curve portion of the tranfverfe ridge of the os occipitis.

The inferior portion of the *fplenius* is fixed to three or four fpinal apophyfes of the back, beginning by the fecond or third, and afterwards running up till it reaches the fuperior and lateral part of the neck. It is inferted in the tranfverfe apophyfes of the three or four fuperior vertebræ of the neck, by the fame number of extremities a little tendinous; thefe, however, are fometimes only two in number. The two *fplenii* reprefent a great Roman V, and the *fplenius*, and fterno-maftoidæus of the fame fide, form a figure like a Roman A, or the legs of a pair of compaffes, the points of which are in an horizontal plane. *Winflow*'s Anatomy, p. 239.

SPLENIUS *capitis*, in anatomy, a name given by Albinus to a mufcle, called by Winflow, and others, the *maftoidæus fuperior*, or upper portion of the *fplenius*. Riolanus, and others, call it the *triangularis fplenii*.

SPLENIUS *colli*, in anatomy, a name given by Albinus to a mufcle, called by Winflow, and others, *maftoidæus pofterior*, or the lower portion of the *fplenius*; and by Cowper the *mufculus inferior fplenii*. See SPLENIUS, fupra.

SPLICE (*Cycl.*)—*Cut*-SPLICE, in a fhip, is when a rope is let into another with as much diftance as one pleafes, fo as to have it undone at any time, and yet be ftrong enough.

Round-SPLICE, is when a rope's end is fo let into another, that they fhall be as firm as if they were but one rope.

SPLINTERS *of bone*, in fractures. In cafes of fractures the furgeon is frequently troubled with *fplinters of the bone* in the way, which vellicate and prick the neighbouring parts, and render the proper execution of his office very difficult. If thefe *fplinters* are loofe, and have no connection with the bone, they muft be carefully lifted out of the wound; if they hang to the bone in fome part by the periofteum, that muft be cut off with the fciffors; but if they adhere pretty firmly to the neighbouring parts, and do not hinder the reduction of the bone, it is beft to replace the bone, and leave them either to loofen, and come out of themfelves by the fuppuration of the parts, or to grow again, as they fometimes will fafely and firmly do, to the reft of the bone. When they adhere pretty firmly to the principal parts of the bone, they fhould never be extracted by force, but replaced with the greateft exactnefs: for when this is properly performed, they will frequently unite to the reft of the bone.

When the points of *fplinters of bone* ftick fo far out, that they are a great hindrance to the reduction of the bone, you are diligently to confider, whether you can, by any means, contrive their reunion to the bone, which may be determined, by obferving at what diftance they are from the large bone, and what quantity of flefh there is intervening: when they cannot be reduced, or reunited to the bone, they muft be removed with a pair of ftrong forceps, or, if they ftick very firmly, with a fine faw. If the *fplinters* are buried under the fkin, and cannot be got at with hands, it is proper firft to try if they can be reduced to their natural fituation; and if they cannot, an incifion muft be made through the fkin, that they may be taken out. *Heifter*'s Surg. p. 109.

SPLIT, in botany, a name given by fome authors to the great *fumaria bulbofa*, or hollow root. *Rupp.* Flor. Sen. p. 216.

SPLIT, at fea. When a fail is blown to pieces, the feamen fay it is *fplit*.

SPLITTING. To *fplit* a thin piece of metal, as an old filver groat, place the metal on the heads of three pins ftuck up triangularly, and let a heap of flower of brimftone burn out upon it; then throwing it hard againft the floor, the upper part will feparate from the lower. *Boyle*'s Works Abr. Vol. I. p. 134.

SPOLIARIUM, among the antient Romans, the third part of the bath, ufed for undreffing and dreffing in. *Pitifc.* Lex. Ant. in voc.

Spoliarium was likewife a part of the gladiatorial fchools, where their cloths and ornaments were laid, and where the wounded and killed were carried. *Pitifc.* l. c.

SPONDIAS, in botany, the name given by Linnæus to the genus of plants, called by Plumier *monbin*; the characters are thefe. The perianthium is plain and permanent, and confifts of one leaf, divided into five fegments at the edge. The flower is compofed of five oval and expanded petals. The ftamina are nine filaments, five of which are placed in a circle, the others are of the fame length with thefe, which is that of the cup. The antheræ are fimple. The germen of the piftil is oval. The ftyle is very fmall, and is terminated by three obtufe and permanent ftigmata. The fruit is an oval berry in every cell, of which there are contained four nuts. *Linnæi* Gen. Plant. p. 175. *Plumier*, Gen. 22.

SPONDYLI, Σπονδυλοι, in antiquity, pellets of brafs ufed in giving fentence, before the κυαμοι, or beans, came into ufe. *Potter*, Archæol. Græc. Tom. I. p. 119.

SPONDYLOLITHOS, a name given by authors to a ftone found in the country of Tyrol, and elfewhere, refembling the vertebræ of an animal. It is in reality no other than the vertebræ of fome fea-fifh petrified, as is common with us.

SPONDYLUS, in natural hiftory, a name given by authors to a kind of oifter of an oblong and umbonated form, of which there are feveral fpecies. See OSTREA.

SPONGIA, *fpunge*, in botany, the name of a genus of plants, the characters of which are thefe: that it is foft and elaftic, naturally growing under water, and pervious by multitudes of holes.

The fpecies of *fpunge*, enumerated by Mr. Tournefort, are thefe. 1. The fineft *fpunge* with very fmall cavities. 2. The great flatted *fpunge*. 3. The globular, or round *fpunge*. 4. The funnel-fafhioned *fpunge*. 5. The cup-like *fpunge*, divided into fegments at the edges. 6. The branched *fpunge*. 7. The conic-fhaped branched *fpunge*. 8. The fhrubby-branched *fpunge*. 9. The branched river-*fpunge*. 10. The hairy *fpunge*. 11. The fail *fpunge*. 12. The tubular long American *fpunge*. 13. The very long-branched rope-like American *fpunge*. 14. The headed and fingered American *fpunge*. 15. The American honeycomb *fpunge*. 16. The flatted and elegantly punctuated American *fpunge*. *Tourn.* Inft. p. 575.

Burnt *fpunge* is much recommended as a fweetner of the blood, and a diuretic. Some have pretended to cure the leprofy with it, and others extol it againft the bite of a mad-dog; but thefe are virtues not univerfally received.

SPONGIOLI, a word ufed by fome authors to exprefs the fmall button mufhrooms, which are gathered before they expand or open their heads.

SPONSUS, one of the many names given by the chemifts to mercury.

SPORADIC *difeafes*, diftempers which feize particular perfons at any time or feafon, or in any place. They are thus called, in contra-diftinction to the epidemic difeafes, which are peculiar to certain times and feafons, or to peculiar places.

SPORTS, in the customs of Flanders, were in great vogue through Flanders and the Low-Countries, some centuries ago. Every city had a solemnity of this kind peculiar to itself: thus Bruges had that called the *Forester*; Valenciennes the *Prince of Pleasantry*, and the *Prince of the Horse-comb*; Cambray the *King of Ribaldry*; and Bouchain the *Provost of Sots*. Lisle, one of the richest towns in Flanders, was not behind hand with its neighbours in celebrating *sports*, by the magnificence and diversions whereof, to draw together a vast concourse of people from all parts. One of the chief of these divertisements was called the *King of the Spinet*, *Roy d'Epinette*; which was celebrated with a great deal of pomp and shew. See Hist. Acad. Inscript. Tom. 4. p. 452, seq.

SPOT (*Cycl.*)—SPOT, in ornithology, the name of a particular species of pigeon, called by Moore the *columba maculata*. It is of the size of a small common pigeon, and was brought over to England from Holland. This species has always a *spot* upon its head, just above its beak, from whence it has its name. The feathers of the tail are always of the same colour with this *spot*, and the rest of the body is all white. The *spot* and tail are black in some, red in others, and yellow in others. They look very beautiful when they spread their tails and fly, and are a distinct species, as they always produce young ones of their own marks. *Moore*'s Columb. p. 44.

SPRING, (*Cycl.*) in mecanics, is used to signify a body of any shape, perfectly elastic.

Length of a SPRING may, according to its etymology, signify the length of any elastic body, but it is particularly used by Dr. Jurin to signify the greatest length to which a *spring* can be forced inwards, or drawn outwards, without prejudice to its elasticity. He observes this would be the whole length, were the *spring* considered as a mathematical line; but in a material *spring*, is the difference between the whole length, when the *spring* is in its natural situation, or the situation it will rest in when not disturbed by any external force, and the length or space it takes up when wholly compressed and closed, or when drawn out.

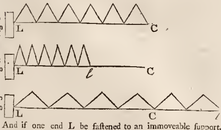
Strength, or *force of a* SPRING, is used for the least force or weight, which, when the *spring* is wholly compressed or closed, will restrain it from unbending itself. Hence also the force of a *spring* bent, or partly closed, is used for the least force or weight, which, when the *spring* is bent thro' any space less than its whole length, will confine it to the state it is then in, without suffering it to unbend any farther.

The theory of *springs* is founded on this principle, *ut tensio, sic vis*; that is, if a *spring* be forced or bent inwards, or drawn outwards, or any way removed from its natural situation, its resistance is proportional to the space by which it is removed from that situation.

This principle was verified by the experiments of Dr. Hook [b], and since him by those of others, particularly by the accurate hand of Mr. George Graham.—[[b] Lectures *de potentia restitutiva*, 1678.]

For the better in elligence of this principle, on which the whole theory of *springs* depends, suppose a *spring* C L resting with the end L against any immoveable support, but otherwise lying in its natural situation, and at full liberty; then if this *spring* be pressed inwards by any force *p*, or from C towards L, through the space of one inch, and can be there detained by that force *p*, the resistance of the *spring*, and the force *p*, exactly counterballancing one another; then will the force 2 *p* bend the *spring* through the space of two inches, 3 *p* through three inches, 4 *p* through four inches, &c. The space C *l* (Fig. 2.) through which the *spring* is bent, or by which its end C is removed from its natural situation, being always proportional to the force which will bend it so far, and will detain it so bent.

Fig. 1.
Fig. 2.
Fig. 3.

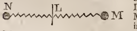


And if one end L be fastened to an immoveable support, (Fig. 3.) and the other end C be drawn outwards to *l*, and be there detained from returning back by any force *p*, the space C *l*, through which it is so drawn outwards, will be always proportional to the force *p*, which is able to detain it in that situation.

And the same principle holds in all cases, where the *spring* is of any form whatsoever, and is in any manner whatsoever forcibly removed from its natural situation.

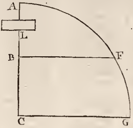
It may be here observed, that the *spring*, or elastic force of the air, is a power of a different nature, and governed by different laws from that of a material *spring*. For supposing the line L C (Fig. 1.) to represent a cylindrical volume of air, which by compression is reduced to L *l*, (Fig. 2.) or by dilatation is extended to L *l*, (Fig. 3.) its elastic force will be reciprocally as L *l*; whereas the force, or resistance of a *spring*, will be directly as C *l*.

This principle being premised, Dr. Jurin gives us a general theorem concerning the action of a body striking on one end of a *spring*, while the other end is supposed to rest against an immoveable support. And lest any objection should be formed against the possibility of an immoveable support, since any body, how great soever, may be moved out of its place by the least force, he observes, that the objection may easily be removed. Thus, if the *spring* L M be supposed continued to N, so that L N = L M, if a body M, with any velocity in the direction M L,



strikes one end of the *spring*, and a body N, at the same time, with an equal velocity, and a contrary direction, N L strikes the other end N of the continued *spring*, the point L, the end of the first supposed *spring* will be immoveable.

Theorem. If a *spring* of the strength P, and the length C L, lying at full liberty upon an horizontal plane, rest with one end L against an immoveable support; and a body of the weight M, moving with the velocity V, in the direction of the axis of the *spring*, strike directly on the other end C, and thereby force the *spring* inwards, or bend it through any space C B; and a middle proportional C G be taken between the line $C L \times \frac{M}{P}$, and 2 *a*, *a* being the height to which a heavy body would ascend in vacuo with the velocity V; and upon the radius R = C G be erected the quadrant of a circle G F A: then,



1°. When the *spring* is bent through any right line of that quadrant, as the body M, is to be C B, the velocity *v* of the original velocity V, as the cosine to the radius; that is, $v = V \times \frac{BF}{R}$.

2°. The time *t* of bending the *spring* through the same sine C B, is to T the time of a heavy body's ascending in vacuo with the velocity V, as the corresponding arch to 2 *a*; that is, $t = T \times \frac{GF}{2a}$.

The doctor gives a demonstration of this theorem, and deduces a great many curious corollaries from it. These he divides into three classes. The first contains such corollaries as are of more particular use when the *spring* is wholly closed, before the motion of the body ceases.

The second comprehends those relating to the case, when the motion of the body ceases before the *spring* is wholly closed. And

The third, in case the motion of the body ceases at the instant that the *spring* is wholly closed.

We shall mention some of the last class, as the most simple; having first premised, that P = strength of the *spring*, L = its length, V = the initial velocity of the body closing the *spring*, M = its mass, *t* = time spent by the body in closing the *spring*, A = height from which a heavy body will fall in vacuo in a second of time, *a* = the height to which a body would ascend in vacuo with the velocity V, C = the velocity gained by the fall, *m* = the circumference of a circle, whose diameter is 1. Then,

1°. If the motion of the body striking the *spring* cease, when it is wholly closed, the initial velocity V is equal to $C\sqrt{\frac{PL}{2MA}}$.

2°. The initial velocity V is proportional to $\sqrt{\frac{PL}{M}}$.

3°. If P L be given, either in the same or in different *springs*, the initial velocity V is reciprocally as $\sqrt{M}$.

4°. The product of the initial velocity, and the time spent in closing the *spring*, or V *t* is equal to $1'' \times \frac{m\,CL}{4A}$; and is proportional to L the length of the *spring*.

5°. The initial quantity of motion, or M V, is equal to $C\sqrt{\frac{PLM}{2A}}$.

6°. M V is proportional to $\sqrt{PLM}$, or to P *t*. And if P L be given, either in the same or different *springs*, M V is as $\sqrt{M}$.

7°. If $\frac{P}{L}$ be given, either in the same or in different *springs*, the initial quantity of motion is as the length of the *spring* into the time of bending it.

8°. If a quantity of motion M V bend a *spring* through its whole length, and be consumed thereby, no other quantity

quantity of motion equal to the former, as $n M \times \frac{V}{n}$, will close the same *spring*, and be wholly consumed thereby.

9°. But a quantity of motion, less or greater than M V, in any given ratio, may close the same *spring*, and be wholly consumed in closing it; and the time spent in closing the *spring* will be respectively less or greater, in the same given ratio.

10°. The initial *vis viva*, or $M V^2$, is equal to $\frac{C^2 P L}{2 a}$; and $2 a M = P L$.

11°. The initial *vis viva* is as the rectangle under the strength and length of the *spring*; that is $M V V$ is as P L.

12°. If $\frac{P}{L}$ be given, the initial *vis viva* is as P^2, or as L^2.

13°. If the *vis viva* $M V^2$ bend a *spring* through its whole length, and be consumed in closing it; any other *vis viva*, equal to the former, as $n n M \times \frac{V^2}{n n}$ will close the same *spring*, and be consumed thereby.

14°. But the time of closing the *spring* by the *vis viva* $n n M \times \frac{V^2}{n n}$, will be to the time of closing it by the *vis viva* $M V^2$, as n to 1.

15°. If the *vis viva* $M V^2$ be wholly consumed in closing a *spring* of the strength P, and length L; then the *vis viva* $n n M V^2$ will be sufficient to close, 1°. either a *spring* of the strength $n n$ P, and length L. 2°. Or a *spring* of the strength n P, and length n L. 3°. Or of the strength P, and length $n n$ L. 4°. Or if n be a whole number, the number $n n$ of *springs*, each of the strength P, and length L, one after another. We may add, that it appears from hence that the number of similar and equal *springs* a given body in motion can wholly close, is always proportional to the squares of the velocity of that body. And it is from this principle that the chief argument, to prove the force of a body in motion to be as the square of its velocity, is deduced. See FORCE, *Appendix*.

The theorem abovementioned, and its corollaries, will hold equally, if the *spring* be supposed to have been at first bent through a certain space, and by unbending itself, to pass upon a body at rest, and thereby to drive that body before it, during the time of its expansion: only V, instead of being the initial velocity with which the body struck the *spring*, will now be the final velocity, with which the body parts from the *spring* when totally expanded.

It is also to be observed, that the theorem, &c. will hold equally good, if the *spring*, instead of being pressed inward, be drawn outwards by the action of the body. The like may be said, if the *spring* be supposed to have been already drawn outwards to a certain length, and in restoring itself draw the body after it. And lastly, the theorem extends to *springs* of any form whatever, provided L be the greatest length it can be extended to from its natural situation, and P the force which will confine it to the length. See Phil. Transf. N° 472. sect. 10.

SPRING, in natural history. Nothing is more certain, than that some *springs* wholly owe their origin to rains, though this is not the case with others. Those intermitting *springs*, which flow very largely after great rains, and then are gradually dried up, are owing wholly and entirely to rains; but those are not the only ones, but some of the perennial *springs*, which run in summer as well as winter, and in dry as well as wet seasons, are owing also to rains or vapours of a like kind: thus those *springs*, found at the tops of mountains, seem to be owing to the thick mists which we every day see hanging about the top of those mountains.

Though some *springs* are thus evidently owing to rain and vapours, yet others are plainly of some very different origin. The temporary *springs*, or irregular fountains we find in many parts of the world, cannot come from rains or dews, much less can those regular periodic fountains, of the nature of the Zirchnitzer sea in Carniola, and the fountain of Loire in France, and that of Lambsbourne in England: and it is yet less possible, that such vast perennial *springs*, as those of Wellowbridge in our kingdom, and of the Sorgue in France, can come from rains; for all the water that falls in the whole country about these places, in rains and dews, is not nearly so much as that which issues from them. *Plot*, de Origin. Font.

It is said [b] that in the diocese of Paderborn, in Westphalia, there is a *spring* which disappears twice in twenty four hours, and always returns at the end of six hours with a great noise, and with so much force, as to turn three mills not far from its source. It is called the *bolder-born*, or boisterous *spring*.—[b Philos. Transf. N° 7. p. 127.]

Burning, or *Boiling* SPRINGS. The *burning spring* near Grenoble in Dauphine is famous: St. Augustin speaks of it as extinguishing lamps which are lighted, and lighting those which are extinct [c]. But it is now cold like others; only near it is a spot of ground, which still emits a light flame; over which some imagine it might antiently have passed [d].—[c *August*. de Civ. Dei, lib. 21. cap. 7. & 11. Mem. Acad. Inscipt. Tom. 9. p. 565. d Mem. Acad. Scien. An. 1699. p. 26.]

At Bosely, near Wenlock in Shropshire, there is a famous boiling well, which was discovered, in June 1711, by an uncommon noise in the night, so great, that it awakened several people, who being desirous to find what it was owing to, at length found a boggy place under a little hill, not far from the Severn; and perceiving a great shaking of the earth, and a little boiling up of water through the grass, they took a spade, and digging up some part of the earth, the water flew to a great height, and was set on fire by a candle. This water was for some time afterwards constantly found to take fire, and burn like spirit of wine; and after it was set on fire, it would boil the water in a vessel sooner than any artificial fire, and yet the *spring* itself was as cold as any whatever. Phil. Transf. N° 334.

This well was at length lost for many years, and not recovered till May 1746, when by a rumbling noise under ground, like to what the former well made, it was hit upon again, though in a lower situation, and thirty yards nearer the river.

The well is four or five feet deep, and six or seven wide; within that is another less hole of like depth, dug in the clay, in the bottom whereof is placed a cylindric earthen vessel, of about four or five inches diameter at the mouth, having the bottom taken off, and the sides well fixed in the clay, rammed close about it. Within the pot is a brown water, thick as puddle, continually forced up by a violent motion, beyond that of boiling water, and a rumbling hollow noise, rising and falling by fits five or six inches. It may be fired by a candle at a quarter of a yard distance; and it darts and flashes in a violent manner, about half a yard high. It has been left burning forty eight hours, without any sensible diminution. It may be extinguished by putting a wet mop upon it, which must be kept there a small time. On the removal of the mop there succeeds a sulphureous smoke, lasting about a minute, and yet the water is very cold to the touch. Phil. Transf. N° 482. sect. 6.

Lancarim SPRING. See the article LANCARIM.

SPRING-*arbor*, in a watch, that part in the middle of the *spring*-box, about which the *spring* is wound or turned, and to which it is hooked at one end.

SPRING-*box*, in a watch, the cylindrical case, or frame, that contains within it the *spring* of the watch.

SPRINGER, in ichthyology, a name given by authors to the grampus, or arca.

SPRINGES, (*Cycl.*) a sort of horsehair nooses, made so as to run very easy, and planted in the places where birds run in some particular path, to take them as they pass.

Those birds that frequent the waters, or love to paddle and feed in wet and plashy places, are the most easily taken by these *snares*.

The sportsmen who would use them to advantage, must first carefully search out the haunts and places where the fowls come in flocks, or in couples, and feed in the morning and evening hours. The furrows and water-tracks in these places are principally to be regarded; and wherever the several furrows, or water-courses, meet in one, and afterwards divide into several others, these places are to be remarked above the rest: the places which have most marks of the birds feet, give also the surest of all proofs, that they are well frequented. When these places are found, there should be placed a number of small and short sticks crosswise overthwart all the other passages, one stick being placed about half an inch from another, and making together a kind of fence, guarding every way, except that one through which it is intended the fowls should pass. This being done, a good stiff stick is to be provided, cut flat on each side; both ends of this stick are to be planted under water, so that the upper part of the flat side may only be upon a level with the surface; then a bow is to be made of a hazel, or willow, in the form of a pear, broad and round at one end, and narrow at the other, and at least a foot long, and five or six inches wide; at the narrow end of this there is to be a nick or dent. Then a stiff young grown plant of hazel, elm, or withy, is to be chosen, being bushy and clear, and without knots, three or four inches about at the bottom, and about an inch at the top. Having made the bottom end of this sharp, at the top of it there must be fastened a very strong loop, made of about an hundred horsehairs, platted very fast together with strong packthread, and made to slip any way with great ease. This noose or loop should be just of the dimensions of the pear-fashioned loop before mentioned. Then hard by this loop, and within an inch of the end of the plant, there is to be fastened with strong horsehair a broad and thin trigger, made sharp at both ends. Then the bigger sharp end of the plant being made fast in the ground, just by the edge of the water; the smaller end, with the loop and the trigger, must be brought down just to the first bridge; and the pear-fashioned hoop being set upon the bridge, one end of the trigger must be set upon the nick in the hoop, and the other end on the nick

ftick made on the fmall end of the plate, which by the violence and bend of the plant will make them all ftick together till the hoop be removed. This done, the loop is to be laid upon the hoop in fuch fafhion as the hoop is proportioned: then from each fide of the hoop little fticks are to be pricked, as before directed, making as it were a kind of impaled path-way, widening it all the way as it goes farther from the hoop, and making it fo confiderably wide at the end, that any fowl that chances to come that way may be entered a confiderable way in, before fhe perceives the fence; by this means the bird will be enticed to go ftrait on to the *fpringe*, and as foon as fhe touches it, either with head or feet, fhe will be certainly caught; and thus if the plant be ftrong enough, the largeft bird may be caught as eafily as the leaft.

When the fmaller fowls, that frequent watery places, are to be taken by this engine, it is to be made only a great deal flighter. When it is intended for fnipes, woodcocks, or the like, the main plant may be of willow, hazel, or grown ozier, or any other pliant wood that will eafily bend, and will recover its ftraitnefs again. The ufe of this engine is limited to the winter-feafon, and to times when there is much wet upon the ground. If there happen any great frofts, fo that there is no advantage to be made of the wet places firft defcribed, then the fportfman is to look for fome place where there is a confiderable fall, and where the current is not frozen, and in this place the *fpringes* are to be fet; and the greater the frofts are in this cafe, the more birds there will be taken.

There is another ufe of *fpringes* for birds, which is the taking, by means of them, certain birds on the boughs of trees and in hedges, which is often attended with very great fuccefs. The fportfman, for this purpofe, muft firft mark fome tree where the birds very much refort; then fix on fome particular branch that is tolerably ftrait, and cutting off all the twigs to within a foot or two of the top, he is there to bore a hole through the branch with a piercer or wimble, large enough to admit a goofe-quill. Then another branch is to be pitched upon, at about a foot diftance from the firft, and all its boughs are to be pared away up to a certain height. There is to be fixed to this branch a packthread of half a foot long, and at the end of this is to be tied a noofe of plated horfehair. The branch to which the packthread is faftened, is then to be ftooped fo far, that the noofe may be brought through the hole in the other branch, and faftened there by means of a little ftick four fingers long, and hooked at the end, juft fitting the hole, and fo brought into it, as juft to ftop the flying back of the other branch. Then there is to be placed beyond the noofe fome bait of a fruit, or infect, as a cherry, a pear, or a worm, or any other thing which the bird, intended to be taken, is known to be fond of: this is to be fet in fuch a manner, that the bird can no way get at it but by fetting its feet on the fmall ftick which fupports the noofe, and ftops the hole. The weight of the bird will throw down the ftick, and the bird will then be caught by the legs, and tied faft to the branch where the hole is, by the flying back of the other branch where the packthread is faftened.

There is yet another method in ufe for the taking many kinds of birds, from the partridge or pheafant to the blackbird. This is made in the following manner, and is to be placed either on the ground, or on a tree, bufh, or hedge, according to the nature of the bird intended to be taken by it. A ftrait and even piece of willow, or fallow, is to be chofen, of about fix feet long, and of the thicknefs of a walking cane; this is to be fharpened at one end, and ftuck down into the ground, and at the other end there is to be faftened a fmall crook; then two holes are to be made in the ftick, the one big enough to admit a goofe-quill, the other fmaller; and a piece of ftick is to be chofen, which being bent will fpring back to its ftraitnefs again, fuch as holly, or the like: this fhould be about three feet long, and the larger end of it is to be fixed in the larger hole of the firft ftick; the fmaller end muft have faftened to it a packthread, at the end of which there is a noofe of horfehair: this is to be brought through the fmaller hole, and be pegged in fo flightly, as juft to prevent its flying back of itfelf. Then the *fpringe*, or noofe, is to be fpread on the peg, and a bait, proper for the bird intended to be taken, is to be placed at a proper diftance; fo that the bird cannot come at it but by treading on the peg, which will give way under its weight, and the ftick, to which the packthread is faftened, will fly back, and the bird will be confequently caught in the noofe, and have its legs drawn clofe to the other ftick.

SPRINGING *a leak*, at fea, is faid of a fhip that begins to leak. See the article LEAK.

SPROD, among the fifhermen of many parts of England, a name given to the falmon while in its fecond year's growth. *Willughby*, Hift. Pifc. p. 189. See the article SALMON.

SPULLERS *of yarn*, in our old writers, perfons that work at the *fpole*, or wheel. It alfo denotes triers of yarn, to fee if it be well fpun, and fit for the loom. *Blount*.

SPUN-*hay*, in the military art, hay twifted in ropes, very hard, for an expedition in the winter-time; each trooper carrying as much as he can behind him.

SPUNGE, (*Cycl.*) *fpongia*, in botany. See the article SPONGIA.

This fpecies of fea plant, when burnt, yields the fame fmell with hair or horns, or other parts of animal bodies.

A pound of *fpunge* when weighed in a humid feafon, on drying carefully in a ftove without injuring its texture, will be reduced to eleven ounces. This quantity being diftilled by the retort in the common way, and the principles feparated, and the falt and fpirit rectified, there will be found an ounce and half of a reddifh phlegm, or a fpirit fo weak, as fcarce to afford any fmell or tafte; an ounce and half of a volatile urinous fpirit; and an ounce, four drachms and a half of a volatile urinous falt; half an ounce of a fetid thick oil; half an ounce of a fix'd falt, which, befide the common lixivial alkali, contains fome fea falt; and five ounces of a caput mortuum, in which the magnet difcovers fome particles of iron.

The weight of all thefe amounts to that of the dried *fpunge* put in, within three drachms, which is a moderate lofs from evaporation, and from fome little remains which will always ftick to the veffels. By this analyfis we find, that *fpunge* gives nearly as much volatile falt as raw filk, which yields the moft of any known animal fubftance; and the difference between the quantity, yielded by that fubftance and this, is not more than four grains from the ounce. Mem. Acad. Par. 1706.

A wet *fpunge* applied to bleeding-veffels, has been found a very fuccefsful method of ftopping the effufion of blood. Vid. Phil. Tranf. Nº 478. p. 33.

Cotton-SPUNGE, a name given by fome writers to a fpecies of fea *fpunge* very fine and light, and refembling cotton in its texture. It is found at confiderable depths, growing on the rocks in form of a coarfely-branched fhrub; it is of a greyifh colour, and very flexile; but it is often rendred coarfe and rigid, by being covered in certain parts with that fort of tartarous, or cruftaceous fubftance, which fome of the antients have defcribed under the name of an *alcyonium*, and others of an *adarce*, and which the druggifts of the late ages have taught us to call *lapis fpongiæ*, the *fpunge*-ftone. It is formed itfelf of bundles of fibres, and though it has the appearance of a very open texture, yet it admits the water but very badly, and does not imbibe it in any thing like the quantity that the common *fpunge* does, nor is it, when imbibed, fo eafily preffed out again.

When examined by the microfcope, this plant appears not at all of the ftructure of the common *fpunge*, but feems a mere affemblage of oblong and flender fibres, like thofe of cotton or wool, not hollow, and very clofely amaffed together: thefe are not capable of imbibing any other moifture than the little that can get between their interftices in the mafs, and the yet much fmaller quantity that can enter the fubftance of the filaments themfelves. Hence it is no wonder, that this plant will not imbibe water fo readily as the common *fpunge*, or retain it fo well when imbibed, and yet will not yield fo to the preffure of a hand, as to part with it as that does.

The *fpunge*-ftone, or tartarous incruftation on this plant, when examined by the microfcope, is found to be very like the incruftations of ftony or fparry matter upon fticks and fhells, in fome of thofe waters which we call *petrifying fprings*, for the whole thicknefs of it is compofed of feveral thin laminæ; but then, as in thofe incruftations, each of thefe laminæ is of one fimple piece, and generally of a tranfverfely ftriated texture. In the *fpunge*-ftone each lamina is not thus ftriated, nor is indeed of one piece, but is a congeries of numbers of fimple fmall cakes, refembling the fcales of fifhes. *Marfigli*, Hift. Phyf. de la Mer.

Loaf-SPUNGE, in natural hiftory, a name given by authors to a peculiar fpecies of *fpunge* of the marine kind. It is called by the French *eponge en mie de pain*.

It grows at confiderable depths to the rocks among coral, and other fea plants. Its fhape is ufually that of a common loaf, and its texture very much refembles that of the crumb of bread. It is very various in colour at different times, being ufually of a fine fcarlet; fometimes, however, it is purple, fometimes of a violet colour, and fometimes fnow white, but this more rarely than of any other colour. It is the fofteft and lighteft of all the *fpunge*-kind, being better fuited to imbibe the water than any other. It would be greatly efteemed for the common ufes of *fpunge*, if it were produced in plenty enough to be had on the common occafions, but it is fcarce. When examined by the microfcope, it is found to be compofed of an almoft infinite number of cavities and protuberances, and is compofed of an infinite fucceffion of fmall fibres, which are arranged in a very beautiful manner, and feem held together by a fort of glutinous matter. *Marfigli*, Hift. Phyf. de la Mer.

SPUNGE, in the manege, is the extremity, or point of a horfe's fhoe that anfwers to the heel of his foot; upon it the calkins are made. Thick *fpunge* ruins the horfe's heels, and therefore ought never to be ufed.

SPURGE,

SPURGE, in botany, the Englifh name of the *tithymalus.* See the article TITHYMALUS.

This plant abounds in a thin and fharp milky juice. On being wounded, it throws this out freely. It is clammy between the fingers, and though perfectly white when firft let out, it turns bluifh, on being held a while upon a knife or lancet, and has the colour and confiftence of blue fkimmed milk. If it be made up into cakes with flower, it feems greafy or oily, and never dries. Moft of the milky juices of plants, as thofe of the wild lettuce, throatwort, and the like, readily break into curds and whey on being expofed to the air; and in the firft of thefe, the whey is of a fine purple colour. The *fpurge* juice requires a long time ftanding before it breaks, but at length it feparates, and the curd is tough and firm, and the whey clear as rock water. The whole is very corrupt and ftinking at this time, and if the cake of curd be dried, it feems a fort of refin, and will break and burn like refin at a candle.

SPURGE-*laurel.* See the article LAUREOLA.

SPURGE-*root,* in the materia medica. See the article ESULÆ *radix.*

SPURKETS, in a fhip, the fpaces in her fide betwixt the upper and lower futtocks, or betwixt the rungs fore and aft.

SPURRE, in zoology, a name given by many to the bird more commonly called the *fea-fwallow,* and by authors *ftema. Ray*'s Ornitholog. p. 269. See the article STEMA.

SPURRY, in Latin *fpergula,* is fown in the Low-Countries twice in a fummer. The firft fowing is in May; thefe plants flower in June and July, and the feed is ripe in Auguft. The fecond time of fowing it is after the rye-harveft; they ufually plow up the rye-grounds, and fow them with this feed to ferve the cows in winter, when the other forts of grafs are low or dead. The cows that feed on this plant are found to yield better milk, and finer butter is made from it, than from that of cows feeding on any other pafture. Poultry alfo are very fond of eating this plant, and the farmers in fome places have an opinion, that it makes them lay the more eggs. *Mortimer*'s Hufbandry, p. 43.

SPYRUS, the *dung of goats.* This is ufually found in fmall round maffes, and is recommended by Hippocrates as a fumigation in difeafes of the womb.

SQUACCO, in zoology, the name of a large bird of the heron kind. Its head and neck are variegated with black, white, and yellow, and it has on the back part of its head a cruft of the fame colour. Its back is of a ferrugineous yellow; its breaft and belly are white, as are alfo its wings and tail, at leaft in great part; and its legs are green. It is a bold and fierce bird. *Aldrovand.* de Avib. p. 400.

SQUAIOTTA, in botany, the name of a bird of the heron kind. Its beak is yellow, but blackifh at the extremity; its legs are green; its head is variegated with grey and black; and its back very elegantly with white and red. It feems to have had its name from its note, which it often repeats in flying. *Aldrovand.* de Avibus.

SQUALIUS, in ichthyology, a name given by Pliny to the chub. Varro, and others of the old writers, have called it *cephalus* and *fqualus,* and the Italians at this time call it *fquaglio;* it is wrong, however, to adapt any generical name to a fifh, which is itfelf but a genuine fpecies of an already eftablifhed genus. This is properly a fpecies of the cyprini, and is mentioned as fuch by Artedi.

SQUALLEY, a note of faultinefs in the making of cloth. 43 Eliz. cap. 10. *Blount, Cowel.* See REWEY.

SQUALUS, in the Linnæan fyftem of zoology, the name of a diftinct genus of fifhes, of the general order of the chondropterygii. The characters of this are, that the body is oblong, and the apertures of the gills are five on each fide. Of this genus are the galeus, lamia, zygæna, &c. *Linnæi* Syft. Nat. p. 52.

The characters of this genus, according to Artedi, are thefe. The foramina, or apertures of the bronchia, are five on each fide, and they are placed longitudinally from the head to the pectoral fins; the head is depreffed; the body oblong, and either rounded, or longifh and angular; the fkin is rough; the eyes are placed at the fides of the head; and the upper part of the tail is longer than the under. The mouth in moft of the fpecies is placed in the under part of the head, and opens tranfverfely. The fpecies of this genus are thefe.

Of thofe which have granulous teeth are the following. 1. The *fqualus* with a long-pointed and bony fnout, flatted and denticulated at each fide. This is the *priftis,* or fawfifh. 2. The fmooth *fqualus* with granulous teeth. This is the *galeus lævis,* or fmooth hound-fifh.

Of thofe which have fharp teeth, and a prickly back, the following are the fpecies. 1. The *fqualus* with no pinna ani, and with a rounded body. This is the *galeus acantheus* of authors, or the prickly dog-fifh. It has three rows of teeth on each fide. 2. The *fqualus* with no pinna ani, with the noftrils placed at the extremity of the fnout. The back of this is flat, and the belly rough and brown. 3. The *fqualus* with no pinna ani, and with a triangulate body. This is the *centrine* of authors. This has three rows of teeth in the upper jaw, and only one row in the under. 4. The *fqualus* with no pinna ani, and with the mouth placed at the end of the head. This is the *fquatina* of authors, the monkfifh, or angel-fifh, by fome called the *mermaid.* It has three rows of teeth in each jaw, the whole number amounting to one hundred and eighty, or thereabout.

Of thofe *fquali* which want the pinna dorfi, the following are the fpecies. 1. The *fqualus* with a broad and tranfverfe head, fhaped like a hammer. This is the *zygæna* of authors, the balance-fifh, or hammer-headed fhark. This has three or four rows of teeth in the jaws, and oblong holes near the eyes. 2. The *fqualus* with a tail longer than the whole body. This is the fifh called by authors the *vulpes marinus.* The tail is falcated, and refembles a fword in fome degree. 3. The *fqualus* with the noftrils placed near the mouth, and with two fmall foramina near the eyes. This is the *galeus canis* of authors. It is called in Cornwall a *tope.* It grows to five feet long, and weighs an hundred pounds. 4. The *fqualus* of a reddifh variegated colour, with the pinna ani at a middle diftance between the anus and the fin of the tail. This is called the *catulus major,* and in England the *bounce.* 5. The *fqualus* with the variegated back, and with the belly fins growing together. This is the *catulus minor* of authors, and is called the *rough hound,* or the *mergay.* 6. The grey *fqualus* with the ventral fins not joined together. This is the *catulus maximus* of authors. 7. The *fqualus* with a triangular hollow in the extremity of the back, and no foramina about the eyes. This is the *galeus glaucus* of authors, or the new fhark. 8. The *fqualus* with a flat back, and with numerous teeth ferrated at the edges. This is the *canis carcharias,* or common fhark. It is the largeft of all the *fquali,* often growing to fuch a fize, as to weigh a thoufand pounds. The fnout is long. The teeth are for the moft part ferrated, and there are fix rows of them above, and as many below, though fometimes they are fewer. The two backfins are placed, one in the middle of the back, the other very near the tail. The fkin is rough. *Artedi* Gen. Pifc. p. 44.

SQUALUS is alfo a name given by Varro, Columella, Salvian, and others, to a fpecies of the cyprinus, diftinguifhed by Artedi by the name of the oblong *cyprinus* with long fcales, and with the pinna ani containing eleven rays, and commonly known with us under the name of the *chub,* or *chevin.* The generality of authors call it *capito* and *cephalus,* but it is very improper to give diftinct generical names to fifh, which are genuine fpecies of other genera.

The name *fqualus* is originally Latin; it is ufed by Pliny, and many other of the old Roman authors, and is derived from the word *fqualor,* becaufe this fifh is found to delight in impure and dirty places.

SQUAMIS, in ichthyology, a name given by Albertus, and others, to the fifh called by us the *monk,* or *angel-fifh,* by the generality of authors *fquatina,* and by the old Greek writers *rhine.*

It is a fpecies of the fqualus, and is diftinguifhed by Artedi by the name of the *fqualus* with the mouth at the end of the fnout. See SQUATINA.

SQUAMMOSE-*culm.* See the article STALK.

SQUAMMOSE-*root,* among botanifts, one compofed of, or covered with leffer flakes. See ROOT.

SQUARE (*Cycl.*)—SQUARE, in glafs-making, an inftrument with which the conciator, or founder, ftirs and mixes together the metal when in fufion in the melting-pots. When this inftrument is grown red-hot, it is always to be quenched in a pail of water, otherwife the metal will ftick to it. *Neri*'s Art of Glafs, p. 240.

SQUARE, in the manege, is ufed for working in a *fquare.* The pifte or tread of a volt, inftead of being always circular, and traced upon a circumference round a center, ought to be imagined as if it formed four ftraight equal lines laid in a *fquare,* and equally removed from the center, or the pillar, which reprefents it in the middle of the manege-ground; fo that to work in a *fquare,* is to ride along each of thefe four lines, turning the hand at every corner, and fo paffing from one line to another.

SQUARE, in the fea language, is to fet even. Thus they fay, *fquare the yards;* that is, fet them right acrofs the fhip. See the article YARD.

SQUARTIA, in ichthyology, a fpecies of fifh found in the Eaft-Indies, the fkin of which makes the fhagreen. *Hofm.* Lex. in voc. See SHAGREEN.

SQUATAROLA, in zoology, a name given by the Venetians to the grey plover, or *pluvialis cinerea.* See the article PLUVIALIS.

SQUATINATORIA, in zoology, a name by which fome authors have called the rhinobatus, a fea fifh of a fort of middle nature between the monk-fifh, or angel-fifh, and the ray. *Willughby,* Hift. Pifc. p. 79. See the article RHINOBATUS.

SQUATINA, the *monk-fifh,* called alfo in Italian the *pefce angelo,* and thence in Englifh the *angel-fifh.*

It is of a middle fhape, between the long and flat cartilagineous fifhes, being much broader than the galei, and rounder

rounder than the rays. It grows to a very large ſize, ſometimes to four, five, or ſix feet long. It is covered all over with a mucous ſubſtance, but under it the ſkin is harſh, and rough enough to ſerve for the poliſhing wood and ivory. It is of a browniſh grey on the back and ſides, and white under the belly. The head is flatted and roundiſh, and the mouth large, and opening at the extremity of the ſnout, not, as in other of the fiſhes of this claſs, under the head. It has three rows of teeth, eighteen in a row. Its eyes are large, and placed near its mouth, and ſeem as if meant for looking ſideway, rather than up or down. Its upper pair of fins very much reſemble wings, from whence it has its name of the *angel-fiſh*, and at the extremities of theſe are a number of ſharp hooked thorns. It has alſo a row of ſhort prickles on its back. See Tab. of Fiſhes, N° 7.

It is common in the Engliſh ſeas, and is not unfrequently caught in Cornwall. *Johnſon*, de Piſc. p. 23.

SQUATT, in mineralogy, a term given by the Engliſh miners to a peculiar ſort of bed of ore, leſs valuable than a load or vein, becauſe of its reaching but a little way.

Though the ore of the *ſquatts* is generally very rich and good, not inferior in quality to the beſt vein-ore, the miners are often terribly diſappointed, on finding theſe *ſquatts* inſtead of the right veins, after a long ſearch. In the tin countries, the way of ſearching for mines is by looking after the ſhoad-ſtones; that is, certain metalline ſtones which contain ſome ore, and which have originally made the upper part of the vein of ore, reaching up to the day, or the ſurface of the earth. See SHOAD.

In the time of the deluge theſe upper parts of the veins have been waſhed off, and carried down the ſides of the hills, in which the mines uſually lie, into the flat country, but they always lie in a regular and continued train, from the orifice of the mine to the fartheſt part of the train; ſo that when but one ſtone of this kind is found, the miners are certain of coming to the bed of metal, on tracing it up to its head by the train. This is a laborious and expenſive work, becauſe the ſtones never lie on the ſurface, but at the different depths of one to ten feet, or any depth between theſe. The *ſquatts* have their trains of ſhoad-ſtones as well as the regular veins, and when theſe are traced to the orifice, there is the appearance of a rich load, which the proprietor is not thoroughly undeceived in, till the diggers come to the end of it.

The *ſquatt* is a bed of ore from three to ten fathom long, and uſually is about half as broad as it is long; few are larger than this ſtandard, but many much leſs. This is always flat, and thence has its name; the round collections of ore of the ſame kind being called *bonnies*. The *ſquatt* communicates with no other load or vein, but is entire of itſelf, and its extremities terminate at once, without running, into ſeveral little ſtrings, in the manner of thoſe of the right veins. It does not lie within walls, as the loads or veins always do, though it is always depoſited in the ſhelf, or faſt ground; that is, in ſtrata that have not been moved by the flood. Phil. Tranſ. N° 69.

SQUATUS, in ichthyology, a name uſed by Pliny, and other of the old Roman authors, to expreſs the fiſh called by the old Grecian writers *rhine*, and by the moderns *ſquatina*.

It is a ſpecies of the ſqualus, and is diſtinguiſhed by Artedi under the name of the *ſqualus* with no pinna ani, and with the mouth in the top of the ſnout. See SQUATINA.

SQUILL, SCILLA, or *ſquilla*. See SCILLA, *Cycl.*

Wagner recommends the powder of *ſquills*, given with nitre, in hydropical ſwellings, and in a nephritis, and mentions ſeveral examples of cures which he performed, by giving patients from four to ten grains with a double quantity of nitre. He ſays it almoſt always operates as a diuretic, ſometimes vomits or purges. Medic. Eſſ. Edinb.

Dr. Heſs ſays, he has made cures of the aſthma with the powder of *ſquills*. The efficacy of this powder of *ſquills*, from four to twelve grains, in curing the aſthma, is atteſted by ſeveral. Med. Eſſ. ibid. from Commerc. Norimb. 1737, & 1739.

SQUILACHI, in zoology, the name by which the modern Greeks call the *jackall*, or *lupus aureus* of authors. *Bellon.* lib. 2. cap. 107. See JACKALL.

SQUILLA *aquæ dulcis*, the *freſh-water ſhrimp*. Few people are aware of the vaſt deſtruction made by this little inſect among the ſmall fry of fiſh. This inſect is commonly very plentiful in ſtanding waters, and particularly in breeding-ponds, where they always have their prey in plenty before them; and often ſuffer none, or ſcarce any of the numerous young fry, hatched from the ſpawn of carp and tench, to live to grow up. They may be obſerved following the ſhoals of the young fry, and ſeizing multitudes one after another; and at other times lurking among the weeds, to ſeize ſuch as ſtraggle by themſelves. If one of theſe inſects be put into a baſon of water with a dozen or two of theſe young fiſh, though as big as himſelf, he will very ſoon deſtroy them all. They kill numbers that they cannot eat, but leave them to rot.

SQUIRREL, *ſciurus*, in zoology. See the article SCIURUS.

There is great diverſion in the hunting this little creature, and its fleſh is very delicate and well taſted. The only ſeaſon for hunting it is in autumn, and the beginning of winter, at which time the creature is fat; and the leaves being off the trees, it may be ſeen as it leaps from bough to bough, which when purſued it does with a ſurpriſing agility.

In the ſummer they build their neſts, which the ſportſmen call *drays*, very artificially in the tops of trees, with ſticks, moſs, and ſuch other things as the woods afford; they fill this lodging, during the ſeaſon, with nuts and other fruits, which are to ſerve them in the ſevere weather, when the trees afford nothing. They ſleep in the midſt of this proviſion a great part of the winter, and that ſo found, that they will not be waked by ever ſo loud a noiſe made juſt under their drays; though at other times they fly out immediately on hearing any noiſe, even at a conſiderable diſtance.

The tail of the *ſquirrel*, which is as large as the body, though compoſed almoſt entirely of hair, ſerves the creature, in ſome ſort, inſtead of wings; for by means of it the body is kept ſuſpended in the air, without any viſible ſinking, while the creature throws itſelf from the boughs of one tree to thoſe of another of equal height. But the more general leaps the *ſquirrel* takes, are from the outermoſt branches of a high tree to another ſomewhat lower at a diſtance; it is wonderful to ſee how far it will be carried in theſe leaps; and if it miſſes the tree it aims at, and by that means falls from the top of ever ſo high a tree to the ground, the tail ſupports it ſo well, that it comes ſoftly down, and receives no harm. The hunting of the *ſquirrel* is moſt agreeably performed in woods of a young growth, the trees of which may be ſhaken by the hand; and it is neceſſary to take out ſome means of diſlodging them from the clefts of trees, in which they will take refuge, and from which they will never be removed by mere noiſe.

Many people uſually go together on this expedition, and ſometimes they carry bows and arrows for the diſlodging the prey from theſe places; ſometimes bludgeons, or ſhort and thick ſtaves, loaded at one end with lead, to prevent their lodging in the trees, when they are thrown up. The *ſquirrel* which in her fright has taken refuge in any part of a tree, and is not to be diſlodged either by hollooing or ſhaking the tree, will always quit the place as ſoon as an arrow, or bludgeon, has been well aimed at her, and will give a farther chaſe.

The *ſquirrel* is always fond of a large oak in time of danger, and runs to the neareſt ſhe can find as ſoon as ſhe ſees herſelf purſued: in ſome part of the upper boughs of this tree ſhe ſits ſecure from the men and dogs, and as it is too troubleſome to the ſportſmen to climb every tree, the only method is to ſhoot arrows, and throw bludgeons at her; ſhe is very ſeldom hurt by theſe, unleſs hit juſt upon the head, for her backbone is ſo ſtrong, that ſhe will bear very nearly as hard a blow as a dog without danger of hurt. So long as the ſtrength and ſpirits of the creature laſt, ſhe always keeps in the tops of the higheſt trees, but when ſhe grows weary ſhe comes down, and takes ſhelter in the hedges; ſhe then ſoon becomes a prey to the dogs, or is very often killed upon the ground, in attempting to gain the hedge in places where there is no continued chain of trees by which ſhe can come at it.

The common *ſquirrel*, when it would croſs a water, is often ſeen to get upon ſome light piece of wood, and ſail over by means of her tail.

Flying-SQUIRREL. The *flying-ſquirrel* is a creature famous in hiſtory for being one of thoſe few animals which ſhew, that nature has given to ſome quadrupeds a power of flying.

This however is an obſervation not ſo well verified in this creature as in the bat, which is truly a quadruped, its fore feet being only expanded into wings, and webbed, and which truly flies; whereas all that is called flying in this *ſquirrel*, is only its ſuſpending itſelf in the long leaps it makes by means of a membrane on each ſide of the body, attached to the fore legs, and reaching to the hinder ones, only growing narrower all the way.

This creature is found in ſeveral parts of America, and in many places on the confines of Ruſſia toward Tartary. It lives in hollow trees, and covers itſelf carefully up with moſs. It ſeldom ſtirs abroad in the day-time, but toward evening goes out in ſearch of food. When kept within doors it ſleeps the whole winter, but revives in ſpring. The manner in which they catch them in Ruſſia is this: they tie a net over the hole in a tree where they ſuſpect any of theſe creatures to lie hid, then they kindle a fire of ſtraw, or light buſhes about the foot of the tree, and as ſoon as this begins to ſmoak pretty much, the creatures come out of the holes, and are taken in the net. Their ſkin is extremely ſoft, and the hair is ſhort, and of a blackiſh grey. Philoſ. Tranſ. N° 427. p. 37.

STABILES, in the antient muſic, was a name given to the extreme chords of a tetrachord.

They were ſo called, becauſe they remained the ſame throughout all the genera and ſpecies of muſic [e]. One of theſe chords was the hypate, and the other the nete. They are

fometimes alfo called *ftantes*, *immobiles*, or *quiefcentes*; and by the Greeks ἑςῶτες, ἀκίνητοι, ἠρεμοῦντες [f].—[e Vid. Philof. Tranfact. N° 481. [f] *Wallis*'s Append. ad Ptolem. Harm. p. 159.]

STABLE. Nothing conduces more to the health of a horfe, than the having a good and wholfome *ftable*. The fituation of a *ftable* fhould always be in a good air, and on a firm, dry, and hard ground, that in winter the horfe may come in and go out clean. It fhould always be built fomewhat on an afcent, that the urine, and other foulneffes, may be eafily conveyed away by means of drains or finks cut for that purpofe.

As there is no animal that delights more in cleanlinefs than the horfe, or that more abominates bad fmells, care fhould be taken that there be no hog-ftie, hen-rooft, or neceffary-houfe near the place where the *ftable* is to be built; for the fwallowing of feathers, which is very apt to happen when hen-roofts are near, often proves mortal to horfes, and the fteams of a bog-houfe, or hog's dung, will breed many diftempers; and particularly, they will bring on the farcy and blindnefs in many horfes. It is much better to build the walls of a *ftable* of brick than of ftone, for the former is always dry, the other often fweats, and is very apt to be damp, and to caufe rheums and catarrhs to horfes that are fet in the *ftable* in damp weather.

The walls ought therefore to be of brick, and to be made of a moderate thicknefs, two bricks, or a brick and half at the leaft, both for the fake of fafety and warmth in winter, and to keep off the heat of the fun in the midft of fummer, which would fpoil the horfe's appetite, and fink his fpirits. The windows fhould be made on the eaft and north fides of the building, that the north air may be let in to cool the *ftables* in fummer, and the rifing fun all the year round, efpecially in winter.

The windows fhould either be fafhed, or have large cafements, for the fake of letting in air enough; and there fhould always be clofe wooden fhutters, that the light may be fhut out at pleafure; by which means the horfe will be brought to fleep in the middle of the day, as well as in the night, when it is judged proper that he fhould do fo.

Many pave the whole *ftable* with ftone, but it is much better to have that part, which the horfe is to lie upon, boarded with oak planks; for it will be not only eafier, but more warm and comfortable to the creature.

The boards muft be laid as even as poffible, for this is the way to make the creature lie moft at his eafe, and in the moft healthful pofture. The dealers in horfes generally indeed make the boards be laid higher toward the top, and flanting down: this fhews a horfe to more advantage as he lies, but it is very uncomfortable to the creature, and his hinder parts are always flipping down, and the hind legs are often made fubject to fwellings by it.

The planks fhould be laid crofswife, not lengthwife, and there are to be feveral holes bored through them to receive the urine, and carry it off underneath the floor into fome drain, or common receptacle. The ground behind fhould be raifed to a level with the planks, that the horfe may always ftand even, and the floor behind fhould be paved with fmall pebbles, and the place where the rack ftands fhould be well wainfcotted. There are to be two rings placed on each fide of the ftall, for the horfe's halter to run through, and a logger is to be fixed to the end of this, fufficient to poife it perpendicularly, but not fo heavy as to tire the horfe, or to hinder him from eating. The beft place for him to eat his corn in is a drawer, or locker, made in the wainfcot partition; this need not be large, and confequently need not take up much room, fo that it may be eafily fixed, and taken out to clean at pleafure: by this means, the common dirtinefs of a fixed manger is to be avoided.

Many people are againft having a rack in their *ftables*; they give the horfe his hay fprinkled upon his litter, and if they think he treads it too much, or too foon, they only nail up three or four boards, by way of a trough, to give it to him in. The reafon of this is, that the continual lifting up the head to feed out of the rack is an unnatural pofture for a horfe, which was intended to take his food up from the ground, and makes him, as they exprefs it, withy-cragged. In the way of fprinkling the hay on the litter, or laying it in a trough even with the ground, he not only takes it up as if from the earth in a natural way, but can eat as he lies, which is a piece of indulgence that a horfe takes great pleafure in.

When there is *ftable*-room enough, partitions are to be made for feveral horfes to ftand in; thefe fhould always allow room enough for the horfe to turn about, and lie down conveniently in, and they fhould be boarded up fo high toward the head, that the horfes placed in feparate ftalls may not be able to fmell at one another, nor moleft each other any way. One of thefe ftalls ought to be covered in, and made convenient for the groom to lie in, in cafe of a great match, or the ficknefs of a valuable horfe. Behind the horfes there fhould be a row of pegs, to hang up faddles, bridles, and other neceffary utenfils; and fome fhelves for the hanging up brufhes, &c. and the ftanding of pots of ointment and other preparations.

The *ftables* of the nobility are often incommoded by bins for oats placed in them, which take up a great deal of room with very little advantage. Dr. Plot has given us, in his hiftory of Oxfordfhire, a very convenient method, ufed by a gentleman of that county, to prevent this. It is done by making a conveniency to let the oats down from above, out of a veffel like the hopper of a mill, whence they fall into a fquare pipe of about four inches diameter, let into the wall, which comes down into a cupboard alfo let into the wall, but with its mouth fo near the bottom, that there fhall never be more than about a gallon in the cupboard at a time; which being taken out, and given to the horfes, another gallon immediately fucceeds it from above, without any trouble to the groom or any body elfe. By this means there is not an inch of room loft in the lower part of the *ftable* where the horfes ftand; and there is this great conveniency befide, that the oats are always kept fweet by it; for every gallon that is taken away puts the whole quantity above in motion, by the running down of the gallon that fupplies its place, and no muftinefs ever comes, where there is this continual airing and motion. There may eafily be contrived two of thefe, the one for the oats, the other for fplit beans; and both of thefe may be let into the range of preffes, the oats and beans being feparated above by partitions. The other requifites for a *ftable* are a dung-yard, a pump, and a conduit; and if fome pond or running river be near, it is greatly the better.

STACCATO, or STOCCATO, in the Italian mufic, intimates that every note fhould be divided and feparated from the next in a very plain and diftinct manner, and is much the fame with *fpiccato*. *Broffard*.

STACHYS, in botany, the name of a genus of plants, the characters of which are thefe. The flower confifts of one leaf, and is of the labiated kind. The upper lip is fomewhat arched, and ftands erect, the lower is divided into three fegments, of which the lower is confiderably the largeft. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and furrounded with four embryos, which afterwards become fo many feeds, and ripen in the cup of the flower into a roundifh fhape. To thefe marks it may be added, that the leaves are hoary, as Diofcorides defcribes thofe of *ftachys* to be.

The fpecies of *ftachys*, enumerated by Mr. Tournefort, are thefe. 1. The great German *ftachys*. 2. The great German *ftachys* with paler flowers. 3. The broad-leaved Cretic *ftachys*. 4. The narrow-leaved Cretic *ftachys*, called *baftard ftachys*. 5. The leffer Italian *ftachys*. 6. The mullein-leaved fhrub American *ftachys*. *Tourn.* Inft. p. 186.

STÆBE, in botany, a word ufed by the Greeks as the name of feveral plants, very different one from another.

Diofcorides frequently calls the hippophaes by this name *ftæbe*; Theophraftus alfo calls his hippopheos and pheos by the fame name; and what Hippocrates fays of the fruit of the hippopheos, is by the modern Greeks interpreted the feed of the *ftæbe*. The pheos and hippopheos were thorny plants of the fhrub kind, growing on the fea-coafts of Crete and other places, and are ftill called by the inhabitants *ftæbis*. But befide thefe there was a fmall plant, called by the old Greek writers *phleos*. This was a fmall foft herb, growing in damp places, and ufed to ftuff beds with, and to other fuch purpofes. This alfo was called by the fame authors *ftæbe*. See the next article.

STÆBIS, in botany, a name given by the modern Greeks to a plant growing very plentifully in the ifland of Crete, and feeming to be the fame with the *ftæbe* of the antient Greeks, when ufed as the name of the pheos or hippopheos; for the antients ufed it alfo as the name of a low plant of the gnaphalium kind, growing in marfhy places, and ufed to ftuff beds, &c. with.

It is evident that Diofcorides calls the pheos and hippopheos, or, as he writes it, hippophaës, by the name *ftæbe*; and Neophytus tells us, that the *ftæbe* of Diofcorides was called in his time, in the vulgar Greek, *ftæbion*, and *ftæbis*.

The defcription Diofcorides gives of this plant, is, that it had fmall and flefhy flowers ftanding in clufters feveral together; and Pliny tells us, that this plant grew in fandy places near the fea-fhores, and had white prickles on the branches, and clufters of berries like the ivy. In this laft article he feems to go beyond his authority, all the Greek writers, from whom he tranflates this part of his work, fpeaking of the flowers of the *ftæbe* growing in Corymbi like the ivy, but not giving it the fruit of that plant. Honorius Bellus fays, that the flowers are mixed of a reddifh and greenifh colour; and Diofcorides fays, that the flowers of his hippopheos are mixed of a reddifh and whitifh.

The whole plant or fhrub is alfo defcribed, both by the antients and the moderns, under the names of *hippopheos* and *ftæbis*, in the fame manner: they fay it grew to about three feet high, fpreading its branches, fo as to form a round bufh, and that the prickles or thorns grew under the leaves. They were both put to the fame ufe alfo, and all the interpreters

terpreters of the old Greeks have agreed in looking upon them as synonymous terms. The fruit of the hippopheos, mentioned by Hippocrates, is rendered the seed of the *stœbis*.

STÆBIUM, in botany, a name given by the modern Greeks to the plant called *hippophaes* by Dioscorides; that author also sometimes called it *stœbe*. See the articles STÆBE and STÆBIS.

STÆCHAS, in botany, the name of a genus of plants, the characters of which are these. The flower consists of one leaf, and is of the labiated kind. The upper lip is erect and bifid, and the lower divided into three segments, the whole so disposed, that the flower has, at first sight, no appearance of a labiated one, but appears meerly a plain flower of five segments. The pistil arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower: this is surrounded by four embryos, which ripen into as many seeds, contained in the cup of the flower. To these marks it is to be added, that the flowers of the *stœchases* are disposed in various series in a sort of scaly heads, from the summits of which there grow certain beautiful-coloured leaves, which Clusius calls their membranaceous ligulæ. See Tab. 1. of Botany, Class 4.

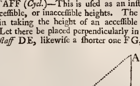
The species of *stœchas*, enumerated by Mr. Tournefort, are these. 1. The common purple *stœchas*, vulgarly called *Arabian stœchas*. 2. The naked-stalked *stœchas* with longer ligulæ. 3. The broad-leaved *stœchas* with white flowers. 4. The Portugal *stœchas* with large ligulæ, variegated with rose colour and purple. 5. The Portugal *stœchas* with green hairy leaves. *Tourn.* Inst. p. 201.

The flowers of the *stœchas* are much used in medicine, in diseases of the head and nerves, especially in such as are supposed to arise from cold causes. They also promote the evacuation by urine, and by the menses, and in some places are esteemed one of the greatest antidotes, and given in large doses against the effect of poisons, and the bites of venomous animals. Mesue, and the Arabians in general, speak of it as a purge, and particularly as good in cases where phlegm was to be evacuated; though they say it did this but slowly and weakly. At present we do not acknowledge any purging quality in it. There is a very fragrant oil drawn from the flowers and tops of this plant, in the same manner as that from lavender; but it is not much in use with us. The flowers are an ingredient in the Venice treacle, mithridate, and some other of the officinal compositions.

It is to be observed that there is another plant, called *stœchas*, in the shops; and by the writers on the materia medica, this has the epithet *citrina*, for its distinction from the *stœchas* we have been treating of, which is either called *stœchas* without any addition, or *stœchas Arabica*. The *citrine stœchas* has none of the virtues of this kind, nor is it of the same genus of plants, but of the elichrysum kind. See the article ELICHRYSUM.

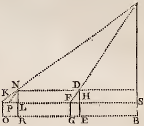
The several species of *stœchas* are propagated by sowing the seeds in March, in a bed of dry light earth; when the young plants are about three inches high, they must be removed into other beds, and placed at about six inches distance, watering and shading them till they have taken root. They must after this be kept clear from weeds, and sheltered from the severity of the winter by mats, or a light covering of peas, haulm, or other such matter; and in March, or the beginning of April, they may be removed into the places where they are to remain. The poorer the soil is, in which they are planted, the better they will stand the winter, and the more fragant will be their flowers. They may be propagated by cuttings planted in spring, but the seeds ripening very well with us, the raising them from those is the much better way. *Miller's* Gard. Dict.

STAFF (*Cycl.*)—This is used as an instrument for taking accessible, or inaccessible heights. The manner of operation, in taking the height of an accessible object, is as follows. Let there be placed perpendicularly in the ground a longer *staff* DE, likewise a shorter one FG, so as the observator may see A, the top of the height to be measured, over the ends D, F of the two *staves*; let FH and DC, parallel to the horizon, meet DE and AB in H and C, then the triangle FHD, DCA, shall be æquiangular; for the angles at C and H are right ones, likewise the angle A is equal to the angle FDH (by 29. 1. Euclid) wherefore the remaining angles DFH, and ADC, are also equal; and FH : HD :: DC : CA, *i. e.* as the distance of the staves, to the excess of the longer *staff* above the shorter; so is the distance of the longer *staff* from the object, to the excess of the height of the object above

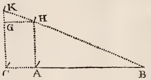


the longer *staff*. Hence CA may be found by the Rule of Three; to which if DE, the length of the longer *staff*, be added, you will have the whole height of the object. Tr. Pract. Geom. p. 19, seq.

Inaccessible heights may likewise be taken by means of two *staves*. This must be done at two stations in a right line from the object, at each of which the *staves* are to be placed in such a manner, that the summit, or top of the height, may be seen along their tops in the same right line. Thus, suppose A the summit of the object whose height is to be measured, DE, FG, the two *staves* at the first station; and RN, KO, the same *staves* at the second, so placed, that the points FDA, KNA, are in the same right line. Through the point N let there be drawn the right line NP, parallel to SFA: wherefore in the triangles KNP, KAF, the angles KNP, KAF, are equal; also the angle AKF is common to both; consequently the remaining angles KPN, KFA, are equal. And PN : FA :: KP : KF. But the triangles PNL, FAS, are similar; therefore PN : FA :: NL : SA. Thence alternately KP : NL :: KF : SA; *i. e.* as the excess of the distance of the *staves* at the second station above their distance at the first, to the difference of their lengths; so the distance of the two stations of the shorter *staff*, to the excess of the height sought above the height of the shorter *staff*. Wherefore SA may be found by the Rule of Three; to which add the height of the shorter *staff*, and the sum will give the whole inaccessible height AB. Tr. Pract. Geom. p. 22. See the articles HEIGHT and ALTITUDE, *Cycl.*



Staves may be used for measuring any distance, suppose AB, to one of whose extremities we have access. Let there be a *staff* fixed at the point A, then going back to some sensible distance, in the same right line; let another be fixed in C, so that both the points A and B may be covered or hid by the *staff* C. Likewise going off in a perpendicular, from the right line CB at the point A, let there be placed another *staff* at H; and in the right line CGK, perpendicular to the same CB at the point C, and at such a point of it K, that the points K, H and B, may be in the same right line, let there be fixed a fourth *staff*. Let there be drawn, or supposed to be drawn a right line HG parallel to CA. The triangles KHG, HAB, will be equiangular: wherefore KG : GH (= CA) :: AH : AB; *i. e.* as the excess of CK above AH is to the distance betwixt the first and second *staff*; so is the distance betwixt the first and third *staff* to the distance sought. Tr. Pract. Geom. p. 25.



STAFF, or *Catheter*, in surgery. The process of cutting for the stone, called the *high operation*, having been attended with some inconveniencies, which occasioned its being hastily left off, Mr. Cleland has attempted to remedy those inconveniencies, by means of a *catheter* of a peculiar structure, which he is of opinion, had it been known at that time when this operation was set on foot and miscarried, would have turned the advantage of the methods to the side of the high operation, and made it allowed much preferable to any other method hitherto practised, and hopes that it will be yet brought into use, and revive that method.

The *catheter* is to be made either of silver or steel, and may be of different sizes to suit different ages. It has the outward appearance of the common *catheter*, and will answer all the same uses; but in respect of this operation it differs from the common one, in that it is composed of two legs with blunt points, a long tube, a sliding bolt, and a handle, which serves to open and shut the legs. The bolt, which is fixed to the extremity of the tube, goes into two holes fixed in the plate of the handle; the one serves to keep the legs close during the time it is to be introduced into the bladder, and the other to extend them to the distance of an inch or more, during the time that the operation is performing. The structure of this *catheter* is well expressed by some figures given in N°401 of the Philosophical Transactions, and the manner of using it is this: after having taken the necessary precautions, and filled the bladder, the *catheter* is to be introduced into the bladder with its points shut; then unbolt it at the handle, and by holding the tube in one hand, and the handle that moves the legs in the other, turn or open the legs till the bolt becomes opposite to the second hole

hole upon the plate, into which it muſt be thruſt; then by preſſing gently downward the handle between the patient's legs, the two blunt points will be eaſily felt above the os pubis, in the protuberance made by the injection into the bladder. The advantages propoſed by uſing this *catheter* are theſe: firſt, it is a director to the operator, ſhewing the place in which the puncture is to be made into the bladder; it alſo ſerves as a ſupport to the bladder when the water is run out, and keeps it from ſubſiding during the time of the operation, or till the ſtone is extracted. It ſerves alſo to reſiſt the preſſure of the abdominal muſcles and the peritonæum, and hinders the inteſtines from being forced down upon the knife, keeping the orifice ſufficiently open, till the ſtone or ſtones are taken out. And finally, it may always be diſcovered, by the help of this inſtrument, whether the bladder be become ſcirrhous.

The method of performing the operation with this *catheter* is thus: after the *catheter* is introduced, and fixed with its legs open, the two points are to be felt for above the os pubis; when theſe are found, the finger and thumb are to be placed gently upon them, and the handle is to be held by an aſſiſtant, to keep it firmly in that poſition; then with a knife in the other hand a puncture is to be made immediately into the bladder, directly in the middle between the two points; but for the more ſecurity, it may be made ſomewhat lower, nearer the os pubis: when the knife is thus introduced, a large inciſion is to be made downward, inclining under the arch of the pubis, in proportion to the bigneſs of the ſtone, taking care not to wound the cartilage that joins the bones together when the knife is withdrawn. The bladder being thus ſupported, the ſtone may be taken out either with the fingers, or with a pair of tenets, there being little danger of breaking it in this method. When the operation is finiſhed, the handle of the *catheter* is to be raiſed; it is to be unbolted and ſhut cloſe, then fixed in this poſition and drawn out, and the patient dreſſed in the uſual way. Philoſ. Tranſ. Nº 401. p. 786.

Flag-STAFF, in a ſhip, the long *ſtaff*, or piece of wood, whereto the flag is made faſt, and along which it is hoiſed up.

Station-STAFF, in ſurveying, an inſtrument conſiſting of two rulers that ſlide to ten feet, divided into feet and inches, with a moveable vane or ſight, two of which are uſed with a level; and on the edges there are the links of Gunter's chain divided. Its chief uſe is for the eaſy taking off-ſets.

STAG, *cervus*, in zoology. See CERVUS.

STAG-*evil*, in the manege. See the article HART.

STAG-*worms*, in natural hiſtory, a name given to a ſpecies of worms produced of the eggs of a fly, and lodged in a very ſtrange place behind, and under the palate of the *ſtag*, or deer's mouth.

They are always found in great numbers together, and are contained in fleſhy bags, which are placed as the almonds of the ears in the human ſpecies. The huntſmen are well acquainted with theſe *worms*, and are of opinion that they are the cauſe of the falling off of the creature's horns; they eat their way to theſe, according to their opinion, through the proper parts of the head, and then gnawing them round at the roots, they are forced to fall like a tree that is ſawed off at the bottom. This however is a vulgar error. Mr. Reaumur has abundantly proved, that theſe *worms* never attempt ſo ſtrange a paſſage; they always remain where they are firſt found till they are in a ſtate to change into the flies, to whoſe eggs they owe their origin, and whoſe forms they are at length to aſſume. *Reaumur*'s Hiſt. Inſect. Vol. 9. p. 8.

STAGGERS (*Cycl.*)—The moſt approved remedy for this diſtemper, which ſhews itſelf in horſes in a giddineſs, and reeling about, in waterineſs of the eyes, and a variety of odd motions of the head, is the following method. The creature is firſt to be blooded largely, then a glyſter is to be given him, compoſed of two quarts of emetic wine, and four ounces of the unguentum populneum. When he has repoſed an hour or two after voiding this glyſter, let another be given him, made of two ounces of the, ſcoriæ of the liver of antimony finely powdered, boiled a little while in five pints of beer, and with the addition of four ounces of the ſame ointment, or of ointment of roſes. This laſt glyſter is to be frequently repeated, and his legs are to be all the while rubbed ſtrongly with whiſps of hay, wetted in warm water, to make a revulſion. His food ſhould be bran and white bread, and he ſhould be walked from time to time in ſome temperate place. If theſe methods do not ſucceed, let an ounce of Venice treacle be diſſolved in a quart of ſome cordial waters, and given him; and after this let the following glyſter be given warm: take Venice treacle and ſal polycreſtum, of each two ounces; diſſolve them in two quarts of a decoction of mallows and camomile flowers; add a quarter of a pint of oil of rue. This repeated two or three times after bleeding, and the other methods, will often cure the worſt ſtages of this diſeaſe.

Mr. Boyle mentions a cure of this diſeaſe in horſes, by rubbing their gums with the coach whip till they bleed. Works Abr. Vol. 1. p. 88.

STAGONIAS, a word uſed by the old authors to expreſs that ſort of male frankincence which is in round drops, and very clear and fine.

STAGONIUS, a name ſometimes given to ſtorax. See the article STORAX.

STAINING, or COLOURING *of porcelain*. The Chineſe, for a great many ages, uſed only white porcelain. The firſt *colour* they employed was blue, and after that they came into the uſe of all the reſt. Their antient blues was prepared by themſelves from a kind of a lapis lazuli; but we now ſupply them with the ſmalt ſo much cheaper, that it is no longer worth their while to make it themſelves. They uſed to prepare this only by giving a gentle calcination to the ſtone; and then beating it to powder, and grinding it to the utmoſt fineneſs in mortars of unglazed porcelain-ware, with peſtles of the ſame. The red, which the Chineſe uſe, is made of our green vitriol, or common copperas. They put about a pound of this into a crucible, and lute on this another crucible inverted: this laſt has a hole cut in the top, which they keep covered or open at pleaſure. They ſet this crucible in a furnace of bricks, ſo contrived, as to throw all the flame upon the lower veſſel, in the way of our chemiſts reverberatory furnaces. They make a large fire of charcoal all round it, and obſerve the hole at the top; for ſo long as there aſcend thick black fumes through that, the matter is not ſufficiently calcined. They watch the going off of this fume, and when there appears in the place of it a fine and thin cloud, they take away the crucible, the matter being then ſufficiently burnt. They try this, however, by taking a little out, and examining the colour; if it is not ſufficiently red, they let it remain longer in the fire. When they find that it is of a good colour, they take away the fire, and leave the veſſels to cool; this done, they find a cake of red matter at the bottom of the crucible, and a quantity of a finer powder about its ſides. They keep theſe ſeparate, the latter being the pureſt, the fineſt, and the brighteſt colour.

One pound of copperas affords about four ounces of this colour, and this is the red which they manage in different ſhades, and vary ſo much.

The Chineſe have alſo a white colour, which they uſe in their figures painted on the China: the ware itſelf is naturally white, and the varniſh, or oil of ſtone, is a great addition to its whiteneſs all over. But they have yet a way of making a much brighter and finer white than theſe, as may be ſeen in moſt of the fine China-ware where there is any white in the figures. This white is made in the following manner: they collect on the ſhores of their rivers a ſort of agate, which is of a whitiſh hue without veins, and tolerably tranſparent. It approaches very much to the nature of cryſtal, and probably cryſtal may be found to ſupply its place with us. They calcine this ſtone to a white powder, and to every ounce of this, when ground in their porcelain mortars to an impalpable fineneſs, they add two ounces of ceruſs in fine powder: this they mix with the varniſh, and lay on in the common way of other colours.

This white mixture ſerves not only for the colouring white, but it is the baſis of ſeveral other of thoſe beautiful colours which we ſee on the China-ware, and which our manufacturers have been often perplexed what to make of. Their green colour is made of copper ruſted with acid; and their fine deep violet colour is made of this green, by adding to it a due proportion of this white. It is not to be ſuppoſed that this effect is produced according to the common laws of mixing colours among our painters, for then the white and green would only make a paler green. But copper being a metal that as well gives a fine blue, as a fine green, according to the nature of the ſubſtances it is mixed with, the white in this caſe alters the very nature of the green, and converts it into that fine and deep violet blue, which we may draw from copper by means of any of the volatile alkalis; ſuch as ſpirit of ſal armoniac, ſpirit of hartſhorn, ſpirit of urine, or any the like liquor. The workmen know how to bring this blue to any degree, by putting in different proportions of the two colours. There is not any admixture of them, that will not produce a blue of ſome kind; but always the more of the green colour is uſed, the deeper the blue will be, and the leſs the paler. The yellow is made by an admixture of ſeven drachms of this white, and three drachms of copperas, or more, if they deſire the colour to be deeper.

Theſe colours are laid on upon the veſſels when they have been once baked, but they do not appear till the ſecond baking is over in their proper ſhades or tinges, and ſometimes ſcarce at all.

The black China is much eſteemed in the Eaſt, and particularly when it is ornamented with gold; this colour looking better with that ornament than any other. The black is always laid on when the porcelain is firſt dried, and is prepared by mixing three ounces of the fine deep blue with ſeven ounces of that fine varniſh, which they call *oil of ſtones*. This admixture gives a fine deep black. When the colour is thoroughly dry, the veſſels are baked, and when this is done the gold is laid on, and the whole is baked again in a particular furnace made for this purpoſe. If they would

have

have the black degenerate into blue, they need only add lefs of the blue, and a little of the cerufs and agate white before defcribed. They have two peculiar ways of applying the red, befide the common one, both which require a nice workman, and make the ware come very dear. They call the one of thefe *oils red*, and the other *blown red*. Obferv. fur les Coutumes de l'Afie. See *Blown* RED.

There are many things practifed by the Chinefe in their *colouring* and forming the feveral kinds of porcelain, which may be well brought into ufe among us, and give a new value to our own wares, even though we fhould never arrive at their art of making the thing itfelf. One kind of *colouring* eafily introduced among us, would be what they call *hoan ton hoan*. This produces veffels of great beauty and price, and is done in this manner. The matter, of which the veffels are made, for this purpofe, need not be fine; they ufually take any of the common veffels baked, without having been varnifhed, and confequently fimply white, and without luftre. When thefe are intended to be of one fimple *colour*, they need only be plunged into a liquid varnifh or oil, as the workmen there call it, *coloured* with fuch ingredients as will ftrike the moft lively tinges: but if it is to be *coloured* in compartments, as is ufually the cuftom with this fort of China, it is to be done by the pencil. The ufual way is to paint thefe in pannels, one green, another blue, and fo on, and they make a very agreeable appearance. There requires no more to this, than the laying on the *colours* tolerably thick with a large pencil; but if the pictures of animals, and plants are to be given, they are to be done with the moft permanent *colours*, and the veffel being again well baked, becomes very beautiful. Obferv. fur les Coutumes de l'Afie, p. 320.

The Chinefe, who are deceivers in every thing, find the way of cheating very much in regard to this fort of China-ware. They paint the flowers of plants, and fome parts of the birds, &c. in very bright colours, after the veffel has been baked. Vermilion is a fine *colour*, which they often add on this occafion; but they cannot ufe this before the baking, becaufe it would be deftroyed by the fire. Thefe *colours* which are laid on afterwards cannot laft, but foon rub off in the wiping, or ufing the things; the others laft for ever; for they are laid on with the greateft heat of all, the veffels being put into the fame furnaces to lay on thefe, as the other things are baked in for the firft time.

Salt petre, and powder of flints, are generally the things added to the *colours* thus laid on, to make them penetrate, and run properly. Thus for the fine deep violet colour, which makes the greateft figure of all others on this ware, they mix together equal quantities of the fine azure, the powder of flints and falt petre, all firft powdered feparately till perfectly fine; this is tempered with water, and then laid on with the pencil, and though it looks rough at firft, it comes out of the furnace of as beautiful a gloffy hue as any thing can be conceived. The yellow is made by mixing together three ounces of cerufs, and three ounces of powdered flints, and adding three, four, or more drachms of the red copperas, till the whole is of the proper degree of *colour*. The white is compofed only of powder of flints and cerufs, with a fmall admixture of the falt petre, or it will fucceed tolerably well without. Thefe are all the particulars neceffary to be obferved for the making a fort of porcelain of great beauty, in which the nature of the ware itfelf is not concerned; fo that it feems eafy to imitate it with any of our own wares.

In the baking of this, or any other kind of *coloured* China, the fecond time, there is, however, fome caution to be ufed in the placing the pieces. The Chinefe are very artful in their difpofition of the whole, arranging them in the moft compact manner, and putting the little ones within the great ones; but great care is alfo neceffary, that the veffels do not touch one another in the parts where they are painted, for the confequence of that would be the fpoiling of both veffels, as the *colours* would run together. The bottom of one veffel may generally be placed on the bottom of another, though both are painted, becaufe the rims are not painted, and they keep the painted parts from touching one another. High and narrow veffels, fuch as chocolate-cups, and the like, are very troublefome on this occafion. The method the Chinefe workmen take with them, is this: they place a range of them, fo as to cover the whole bottom of the furnace, and they cover this with a thin bed of broken China-ware, over which they place another row of the cups, and fo on to the top, where they lay on no covering: they never bake any thing elfe with thefe cups, when they are of this kind of twice-baked porcelain. Obfervat. fur les Coutumes de l'Afie, p. 321.

STAINING *of ftones*. The art of *ftaining* the gems and hard ftones, could it be brought to perfection, would be a very elegant and ufeful one; but it is loaded with fo many difficulties, that many, who have worked largely in the attempt, have given it up as impoffible to be carried to any degree of perfection. The heat, neceffary to be given to the ftones in the common way of attempting this operation, fpoils the ftone, in order to give it the colour. It is true, that fomething is to be done with folutions of filver, and the other metals, in acid menftrua without fire, and fomething may be done with a moderate heat alone, without the ufe of any thing elfe; but chance has difcovered another way, by which, without heat, it may be done in a very eafy manner. This was difcovered by Mr. Muller, who grinding fome aurum fulminans, made by diffolving gold in aqua regia, and precipitating it with falt of tartar, together with fome red glafs powdered, and a little water added, found that this mixture ftained the onyx, or chalcedony, of which the mortar was made. He was rubbing this mixture together to make an enamel colour, and leaving it three or four days in this little mortar, he found, that not only where it had been rubbed againft the bottom of the mortar, but where it had accidentally fplafhed againft the fides of it, and on the furface of the peftle, it had tinged them both very deeply to a fine red, leaving the intermediate parts of a true onyx, or chalcedony colour, wholly unaltered. The polifh of the ftone was not injured in the places where it was thus *ftained*, nor could any art get out the colour, though it was tried with alkalis, and other fharp liquors. This colour was not given to thefe parts of the ftone of the mortar in fimple blotches, but formed itfelf into regular lines, as we fee the natural colours of ftones do; but this not in the fame degree of colour, but fome of the lines were deeper, others paler.

This experiment was repeated in feveral other mortars of the fame ftone, but without fuccefs; on which the ftones, of which they were compofed, were examined with the help of glaffes, and it was found that this mortar chanced to be made of a more flaky chalcedony than any of the others, though it appeared equally folid and beautiful to the naked eye, and bore a polifh no way inferior to them. It may be worth while, on this occafion, ftrictly to examine ftones of this chalcedony kind, and on meeting with a plate of one of them of this flaky kind, to cover it with this mixture, and by that means give it a feries of lineations, which muft make it a very beautiful and valuable ftone. The polifh will not be injured by this, or if it fhould, the adding a new polifh will not at all affect the colours. In the fame manner the texture of ftones, intended for any other experiments in *ftaining*, fhould be confidered, and the choofing proper ones may make this procefs fucceed on them. Phil. Tranf. N° 179.

STAJOLUS, among the Romans, a meafure of length ufed in furveying land; it was equal to five palms and three fourths of a palm. *Pitifc.* in voc.

STAKE, the name of a fmall anvil ufed by fmiths; fometimes it ftands on a broad iron foot, on the work-bench, to be moved up and down occafionally; and fometimes it hath a ftrong iron fpike at the bottom, by which it is fixed to fome place on the work-bench. Its ufe is to fet fmall and cold work ftrait, by hammering it on the *ftake*, or to cut or punch upon with the cold chifel, or cold punch.

STAKE *of a plough*. The *ftake* is an upright piece of wood, paffing at its bottom through that link of the tow-chain which paffes through the box of the plough, and at its upper end receiving the end of what is called the *bridle-chain*, which ties it to the crow-ftaff, or if it be not long enough, a wyth, or cord, is ufed to tie it: it is alfo tied to it again, a little below the pillow of the plough, by another wyth or cord. *Tull's* Hufbandry. See the articles PLOUGH, PILLOW, CROWSTAVES, &c.

STAL-*boat*, a kind of fifhing-boat, mentioned 27 Eliz. c. 21. *Blount.*

STALACTAGNIA, in natural hiftory, the name of a genus of fpars. The word is derived from the Greek σταλακτὸς, ftillatitious, or formed by dropping, and ἁγνὸς, pure.

The bodies of this genus are formed by the dropping of water from the roofs of fubterranean caverns, and are the purer fort of what are called by authors *ftalactitæ*. They are cryftalline fparry bodies, formed into oblong conical figures, compofed of various crufts, and ufually found in form of icicles. Of this genus there are three known fpecies. 1. A hard and white one. This is a very beautiful body, and is found in many parts of England, as well as other countries. 2. A white fhattery one, found in the fame places. And 3. a yellow fhattery one, common with us in Yorkfhire, Devonfhire, and Derbyfhire; as alfo in many other parts of the world. *Hill's* Hift. of Foff. p. 363.

STALACTOCIBDELA, in natural hiftory, the name of a genus of fpars. The word is derived from the Greek σταλακτὸς, ftillatitious, or formed by the dropping of water, and κίβδηλος, impure.

The bodies of this genus are formed by the dropping of water from the roofs of fubterranean caverns, and are the coarfer kinds of what authors have called *ftalactitæ*. They are cryftallino-terrene fpars, formed into oblong bodies, and found hanging from the roofs of caverns and grottos.

Of this genus there are only two known fpecies. 1. A brownifh friable one, common in our fubterranean caverns, and even on the infides of new-built ftone arches, as thofe of the New Bridge at Weftminfter. And 2. a fnow-white friable one, found in fubterranean caverns in England and Germany,

Germany, and even on modern-built brick arches, as has of late been found on opening the vault under the terrace at Windsor. This, and the preceding instance, give us unquestionable evidence of the present, and daily formation of these bodies. *Hill's* Hist. of Foss. p. 367.

STALAGMITÆ. See the article STALAGMOSCIERIA.

STALAGMODIAUGIA, in natural history, the name of a genus of spars. The word is derived from the Greek σταλαγμὸς, a drop, and διαυγὴς, pellucid. The bodies of this genus are the purer kinds of what authors call *stalagmitæ*, or drop-stones.

They are spars found in form of small balls, each composed of numerous crusts, and considerably pellucid and crystalline. Of this genus there are three known species. 1. A white one with numerous thin crusts, and a smooth surface, found in many parts of Germany, and in England. 2. A greyish white one with thicker crusts, and a rougher surface. And 3. a yellow thin-crusted one with an echinated surface. These are both found in the subterranean caverns of England, and many other places, and the former of them is the *confetti di Tivoli* of the Italians. *Hill's* Hist. of Foss. p. 370.

STALAGMOS, a term used by authors to express a distillation of rheum from the head.

STALAGMOSCIERIA, in natural history, the name of a genus of spars. The word is derived from the Greek σταλαγμὸς, a drop, and σκιερὸς, opake, and expresses an opake spar, which has received its form from the dropping of water.

The bodies of this genus are the coarser kinds of what are called by authors *stalagmitæ*, and are small round masses, composed of numerous thin crusts, and of an opake and coarse structure.

Of this genus we have only two known species. 1. A small brownish white one with a smooth coat, found in Saxony, and some parts of England. And 2. a small brownish white one with thin crusts, and a large nucleus. This is found in small masses in Yorkshire, and is the substance of which the famous Ketton-stone of Rutland is composed. *Hill's* Hist. of Foss. p. 373.

Scotland affords a vast variety of the *stalagmitæ*. One cave, about eight miles distant from Aberdeen, on the sea-side, has its whole roof crusted over with *stalactitæ*, of a foot in length, hanging down like the fringe of a bed. The floor also is as deep covered with congeries of *stalagmitæ*. The upper coat, both of these and the *stalactites*, is of a sea-colour, but the inner parts are as white as sal prunellæ. The water which drops from these is of a very peculiar nature, for it is so acrimonious, that if it touch the skin but ever so slightly, it makes it smart. Near this cave there is another hollow rock, in which the *stalactitæ* make a very beautiful figure: they are all formed into long and thick columns, and stand perpendicularly, so that they represent the pipes of an organ; when broken, they are all found to be hollow within. The rock, and all the stone thereabouts, is of the limestone kind.

STALK, among botanists, that part of a plant which rises immediately from the root, and which usually supports the leaves, the flowers, and the fruit.

The term *stalk* is used on all occasions; but in speaking of the grasses, and gramineous plants, where the word *culm* is used in its place, to distinguish that peculiar kind of *stalk* which is general to all these plants, and is not found in any others. See the article PLANT.

The terms used in describing the *stalks* of plants, are; a *simple stalk*, one which runs up undivided from the root to the top.

Naked stalk, one that has no leaves.

Foliose stalk, one with leaves on it.

Ramose stalk, that which sends out branches.

Erect stalk, that which rises strait up.

Oblique stalk, that which is slanting.

Voluble stalk, that which twists round other things.

Flexuous stalk, that which bends.

Reclinate stalk, that which stoops towards the ground.

Procumbent stalk, that which lies on the ground.

Creeping, or *sarmentous stalk*, that which emits roots as it runs along.

If the *stalk* be rounded in shape, it is called *round*; if it make two angles, *ancipital*; if three, *trigonal*; if four, *square*; if more, *polygonal*.

If the *stalk* be lightly ridged and furrowed on the surface, it is said to be *striated*; if more deeply, *canaliculate*; if full of protuberances, *scabrous*; if lightly hairy, *villose*; if more roughly, *hispid*.

In the *branched stalk*, if the branches rise erect, it is expressed by *ascendant*; if they spread, by *diffuse*; if they are very large, it is called *branchiated*.

If the *stalk* divaricate, or, instead of sending out branches, it divide into them, it is called a *composite stalk*. If these divarications proceed by pairs, or if every branch be divided only into two others, it is called *dichotomous*; if it part into two series of branches, it is expressed by the term *distichous*; if it part into a multitude of ramifications, is called *subdivided*.

All these terms are used also in expressing the different states of the *culm*, which having no articulations, is called *equal*; when scaly, *squammose*.

STALK, or *stalking*, among the sportsmen, a term used to express the manner of making approaches to their game behind some animal, or the resemblance of some animal, or other object, which may be more familiar, or less terrible to the creature than the body of a man would be.

The best, of all methods for *stalking*, is by means of a real living horse, trained for the purpose. This horse should be chosen of the tallest and largest kind; no matter how old he is, but he must be well trained, and ready at command: And as there is much art required to the reclaiming a horse that is by nature wild, and apt to be frighted by noise and fire, as is the case when the gun is fired over him, the first attempt toward the training him must be the chaining up his head to a tree, and firing the gun several times very near him: at first he will be frighted, and kick and caper about, but after this has been practised many days together, he will by degrees become so tame, that a gun may be fired under his neck without starting, or taking any notice of it.

When he is thus taught to bear the noise of a gun, one great matter is obtained; what remains, is the teaching him to go in a proper manner, moving gently, and feeding as he goes, and to stand still and feed when the sportsman would have him: this is only to be done by much practice; and by his observing the motions and checks given him as signals on this occasion. The horse must be always naked for this sport, for the sight of a saddle and bridle on a horse give the birds an alarm, and they will rise and take wing, when they would otherwise have stood perfectly quiet: he must therefore only have a little slip tied about his lower chap, by means of which he may be guided as the sportsman sees occasion; and the person who uses him, must always take care to go just upon a level with his shoulders, and to guide his own feet by his. Some take their aim under the *stalking* horse's belly, but this exposes them too much to the sight of the birds, who often fly away before they can take aim; but the better way is to take the level before the creature's breast, where the whole body of the man remains as much concealed, as it was before the taking the aim.

The horse being properly trained, will walk slowly along in any sort of ground, as stubble-fields, moorish places, or the banks of rivers, and will always feed, or pretend to feed, as he is directed. The sportsman is to conceal himself and his gun behind the horse's fore shoulder, bending his body low by his side, and keeping the whole body of the horse always full between the fowl and himself. When by this means the sportsman is come so near to the birds, that the gun will reach them with strength to kill, he is never to attempt advancing any nearer, that they may not be disturbed. Some recommend the shooting over the horse's buttocks, and some over his neck, but the best way is under the neck, and before the breast; for by this means the body of the sportsman is covered by the shoulder, and his legs by the legs of the horse. It is proper also to take out a spaniel, but he must be one that is well trained to the sport, and that will lie still and close behind his master's heels, for if he is seen, the birds will immediately be gone. When the birds are shot, the dog will bring them to his master, and as they often fall in places where a man cannot come at them, this creature is of very necessary service.

This is the best of all methods of *stalking*, but as such a horse is difficult to train, and chargeable to keep, and is not always to be had, there are many other contrivances introduced to supply the place of it; among these the principal are the *stalking* wheelbarrow, the *stalking* bush, and the *stalking* hedge. The first of these is to be thus contrived: take a wheelbarrow, made on purpose of light fir, and set round about it boughs and bushes in such a manner, that you may sit in it, and not be discovered by the fowl, and drive it along without giving them disturbance. The sportsman is always to take a spaniel well trained to the sport along with him on this occasion, and when he knows the haunts of the birds, he is to level through the boughs that are placed about it, and send out his spaniel for the birds he kills.

The *stalking* bush is to be contrived of several bushes well platted together, with all their leaves on; it is to be fastened to a stake, which is to have an iron point at the end: the whole is to be of the height of a man, and thickset with boughs all the way, from top to bottom. When the sportsman sees his game before him, he is to advance slowly with this artificial bush between him and them; when he is come within a proper distance, he is to fix the bush into the ground, by running in the iron spike, and then to shoot through the boughs.

The *stalking* hedge is generally made about nine feet long, and a yard and half high: it is to be made of small wands, so woven together, as to give room for the placing of green boughs among them, that it may resemble a great growing hedge. This is to be carried before the sportsman, and, in the

the manner of the bush, it is to be fastened down, when near enough for the gun to kill from it.

As birds however are apt to have some apprehension of terror from seeing a tree or hedge move, these machines are to be carried on very slowly; and the resemblance of a real animal, as a horse or cow, are better for the purpose: these may be made of canvas, supported on a slight frame, and with tails of hair. For pheasants, woodcocks, and the like foolish birds, the common flat figure of a horse will do; but the water fowl are generally much more shy, and it is necessary, for the getting near them, to have the body made hollow, and stuffed with hay, or some other matter, to keep it out. The proper time to use these engines is either early in the morning, or late in the evening; for the sunshine in the middle of the day very soon discovers to the fowl the imperfection of the engine.

STALKER, in brick-making. See the article BRICK.

STALKERS, in our old writers, a kind of fishing-nets. Stat. 13 Rich. II. cap. 20. *Blount.*

STALLAGE, *stallagium*, in our old writers, the liberty, or right of pitching and erecting *stalls* in fairs or markets, or the money paid for the same. *Kenn.* Gloss. Terms of Law. *Blount, Cowel.*

STALLION, in the manege, in French *etalon*, a stone-horse kept to breed. See the articles HORSE and MARE.

STAMINA, (*Cycl.*) among botanists, the male organs of generation in flowers. They consist of two parts, a filament and anthera; though sometimes the latter stands alone. The filament is a slender body, supporting a tumid one, which is the anthera, on its head or top. The anthera is the great male organ of generation, is hollow, and contains in it a fine powder, called *farina fœcundans*. See GENERATION and FARINA.

STAMINEOUS, (*Cycl.*) in botany, a term used by authors for those flowers of plants which have no petals, or flower-leaves, but consist only of a number of *stamina* and pistils placed in a cup. This cup is sometimes mistaken for a flower, and its leaves thought to be true petals; but they remain when the *stamina* are fallen, and become the capsules containing the seed, which is the true character of a cup, not of a flower. *Tourn.* Inst. p. 501.

STAMNOS, an urn, or vessel, for holding water. Some authors have made it signify the bucket-head, as it is called, of those alembics which have no worm, but are cooled about the head by this means.

STAMPS, in metallurgy, a sort of large pestles lifted up by water-wheels, and serving to beat to powder the ores, and refuse of ores of metals. *Ray's* English Words, p. 116.

STANCH, or STAUNCH, a name given by the country people of Northamptonshire, and some other counties, to a species of fossil called *selenites*, from its supposed virtue in stopping fluxes of blood. *Hill's* Hist. of Foss. p. 129. See the article PACHODECARHOMBIS.

STANCHION (*Cycl.*)—STANCHIONS, in a ship, those pillars, which being set up pillarwise, do support and strengthen the waste trees.

STAND (*Cycl.*)—STAND, in commerce, a weight from two hundred and a half to three hundred of pitch. Merch. Dict.

STANDARD (*Cycl.*)—For the Roman *standards*, see the article SIGNA.

STANDEL, in our old writers, denotes a young store oak-tree, which in time may make timber; and twelve such young trees are to be left standing in every acre of wood, at the felling thereof. 35 Hen. VIII. cap. 17. 13 Eliz. cap. 25. *Blount.*

STANDING-*coin.* See the article COIN.

STANDING-*marriage*, in the law of Scotland, is used to express one actually subsisting, though perhaps reducible for adultery, or liable to be declared void for impotency, or constingency of blood; that is, consanguinity. *Bayne's* Crim. Law.

STANDING *part of the sheat*, in a ship, that part of it which is made fast to a ring at the ship's quarter. When they say *overhale the sheat*, they mean, *hale upon the standing part*; but when they say *hale the sheat* barely, they intend only of the running part.

STANDING *part of a tackle*, aboard a ship, is the end of the rope where the block is seized or fastened; as the other, which is haled, is called *fall.*

STANDING-*ropes*, in a ship, those ropes which do not run in any blocks, but are set taught, or let slack, as occasion serves; as the sheat-stays, back-stays, and the like.

STANNEL, in zoology, an English name of a species of hawk, more commonly known by the names of the *kestrel*, or the *windhover*; and called by Latin authors *tinnunculus* and *cenchris*. *Ray's* Ornitholog. p. 50. See the article TINNUNCULUS.

STANNUM, *tin.* See the article TIN.

STAPEDIUM, in anatomy, a name given by Albinus to the muscle of the stapes in the ear, called by others *stapidis musculus*, and *stapidanus musculus.*

STAPES (*Cycl.*)—This bone is very well denominated from its resemblance to a stirrup; it is divided by anatomists into its head, legs, and basis. The head is placed upon a short flatted neck, the top of it being sometimes flat, sometimes a little hollow. The two legs, taken together, form an arch like that of a stirrup, in the concave side of which is a groove, which runs through their whole length; one of the legs is longer, more bent, and a little broader than the other.

The basis resembles that of a stirrup, both in its oval shape, and union with the legs, except that it is not perforated, as the stirrups now are, but solid, like those of the antients. Round its circumference, next the legs, is a little border, which makes that side of the basis appear a little hollow; the other side is pretty smooth, and one half of the circumference is something more curve than the other. The subject being in an erect posture, the *stapes* is to be considered as lying on its side with the head turned downward, near the extremity of the leg of the incus; the basis inward being fixed in the fenestra ovalis, the longest leg backward, the shortest forward, and both in the same place. By this situation it is easy to know the *stapes* of each ear. *Winslow's* Anatomy, p. 49.

STAPHYLE, a word used by the old Greek writers, sometimes to express a grape; and sometimes a disorder of the uvula, which consists in an extenuation of its superior part, and a tumor of the inferior, whence it hangs down in the shape of a grape. The uvula, or gargareon, is also thus called by some writers.

STAPHYLEPARTES, the name of a chirurgical instrument, in use among the antients for elevating the uvula. It is mentioned by Paulus Ægineta.

STAPHYLINUS, in botany, a name given by some authors to the common *daucus sylvestris*, wild carrot, or bird's nest. *Dillen.* Cat. Giss. 150.

STAPHYLIS, a name given by some authors to a sort of cup or boat, made for feeding young children, and contrived with a spout in form of a grape or nipple.

STAPHYLODENDRON, the *bladder-nut*, in botany, the name of a genus of trees, the characters of which are these. The flower is of the rosaceous kind, being composed of a number of leaves disposed in a circular form. The cup is composed of one leaf, divided into many segments at the edge; and from this arises the pistil, which finally becomes a membranaceous fruit, inflated in the manner of a bladder, and containing hard seeds. See Tab. I. of Botany, Class 21. The species of *staphylodendron*, enumerated by Mr. Tournefort, are these. 1. The common *staphylodendron*, or *bladder-nut*. 2. The trifoliate Virginian *staphylodendron*, called by some the *wild pistacia*, or the *trefoil Virginian pistacia*. *Tourn.* Inst. p. 616.

STAPHYLOMA, in surgery, the name of a distemperature of the eye, which is of two kinds: in one the cornea is more than usually protuberant; and in the other the uvea breaks forth, and forms an unsightly tumor on the cornea, either from internal causes, or from some wounding instrument forced through the coat; in which last case, the sight of the eye is usually destroyed.

This is a very dangerous disorder, as it not only deforms the face, and destroys the sight of the eye, but very often it induces violent inflammations, headachs, restlesness, abscesses, and sometimes a cancer in these parts. In the cure of this disorder, the tumor and deformity are to be relieved by the application of compresses dipped in alum-water, together with a plate of lead and a bandage, or some proper instrument. If the uvea protrudes itself through a wound in the cornea, it should be returned with a probe, and the patient must be ordered to lie in a supine posture, and the wound must constantly be dressed with the white of an egg, and a mucilage of quince-seeds, till it is healed; and by this means the sight is often restored.

If this disorder is become inveterate and inflexible to all remedies, a needle, armed with a double thread, must be passed through the middle of the tumor, and the two ends of the thread are then to be tied on a knot, first on one side, and then on the other, by which means the tumor will gradually wither, and fall off along with the threads; but as this method occasions a continued pain, and from thence sometimes arise inflammations, it is better still to cut off the tumor with a scalpel, or scissors. *Heister's* Surgery, p. 423.

STAPIDACEUS *musculus*, in anatomy, a name given by Duverney, Douglass, and many others, to the muscle of the stapes of the ear, called by others *stapedis musculus*, and by Albinus *stapedium*. See the article EAR.

STAR (*Cycl.*)—Mr. Flamstead had observed different distances of the pole-*star* from the pole at different times of the year; and these observations were, through mistake, looked upon by some as a proof of the annual parallax of the fixed *stars*. On the whole, Mr. Flamstead concluded that the pole-*star* was 35″, 40″, or 45″ nearer the pole in December, than in May or July.

Dr. Hook had also communicated several observations on the apparent motions of the fixed *stars*; and as this was a matter of great importance in astronomy, several of the learned were desirous of verifying and confirming his observations. An instrument was accordingly contrived by Mr. George

George Graham, and executed with surprising exactness. With this instrument the *star* γ, in the constellation Draco, was frequently observed by Messrs. Molyneux, Bradley, and Graham, in the years 1725, 1726; and the observations were afterwards repeated by Mr. Bradley, with an instrument contrived by the same ingenious person, Mr. Graham, and so exact, that it might be depended on to half a second. The result of these observations was, that the *star* did not always appear in the same place, but that its distance from the zenith varied, and that the difference of the apparent places of Themis, the third satellite of Jupiter, amounted to 21 or 22 seconds. Similar observations were made on other *stars*, and a like apparent motion was found in them, proportional to the latitude of the *star*. This motion was by no means such as was to have been expected, as the effect of a parallax; and it was some time before any way could be found of accounting for this new phænomenon. At length Mr. Bradley resolved all its variety, in a satisfactory manner, by the motion of light and the motion of the earth compounded together. See Light.

Star, *starrum*, in our old writers. All the deeds, obligations, &c. of the Jews, were called *stars*, and writ for the most part in Hebrew alone, or in Hebrew and Latin; one of which yet remains in the Treasury of the Exchequer, written in Hebrew without points, the substance whereof is expressed in Latin just under it, like an English condition under a Latin obligation: this bears date in the reign of King John; and many *stars*, as well of grant and release, as obligatory, and by way of mortgage, are pleaded and recited at large in the Plea Rolls. Pasch. 9 Edw. I. *Blount.*

The word *star* is a contraction from the Hebrew *schetar*, a deed or contract.

Star *of the earth*, in botany, the name of a plant famous for its virtues in curing the bite of a mad-dog: but unhappily there has been a very great misunderstanding among authors about the plant properly signified by this name; some calling by it the *coronopus*, or buckshorn-plaintain, an herb common every where, and others a species of *lychnis*, or catch-fly, which is a very scarce plant. The original account of its nature and virtues seems to be this: King James sent to the Royal Society a dried specimen of a plant, which had been sent to him as the plant with which his dogs had been cured when bitten by a mad-dog, and the name, by which this was called, was *star of the earth.*

The plant was so ill dried, that it was not easily distinguished, but at length Mr. Ray found it to be the *sesamoides salamanticum magnum*. It does not seem, however, clear, that this was the plant vulgarly known by that name, but rather that it was gathered by some ignorant person; neither the name *star of the earth* at all agreeing with it, nor any account having been given before of its having such virtues. Dr. Grey, in his Compleat Farrier, greatly recommends the *star of the earth* in the cure of this bite, and the plant he means is plainly the *coronopus*, or buckshorn-plantane: and, upon the whole, it seems that this last mentioned is the plant properly called by this name, as its virtues have always been celebrated even in this case, and its leaves always are disposed on the earth in the form of the rays of a *star*. It is to be added to this, that the Countess of Suffolk's powder, so famous in many places for this terrible disease, and by which several persons have been known to be cured, is principally composed of this plant. Philos. Trans. N° 450. p. 455.

Star-*fish*. There are many species of the *star-fish*, and those extremely different one from another: they have different numbers of rays, but the most common kind has five. Their upper surface, or that to which the legs are not fastened, is covered with a firm and hard skin, which is full of little eminences of a harder matter, approaching to the nature of that of the shells of the echini marini, and the like. This skin is of different colours in the different species; most usually it is red, sometimes it is green, in some blue, and in others yellow, and of all the degrees of these colours, or the mixtures that may be produced from them. This colour does not extend to the under surface, that is covered all over with legs and with points, like the eminences of the upper side, only longer; these are all either whitish, or yellowish. In the center of the *fish* there may be seen a mouth or sucker, by means of which the creature draws its nourishment from the shell-fish, on which it feeds. There are five teeth placed round this sucker, or perhaps they may be more properly called *five bony forceps*; by means of which it seizes and holds fast the creature, while the sucker does its office, in draining out the juices; and probably it is by means of these that they open the bivalve shells, when they feed on the fish in them.

Every ray of the *star-fish* is furnished with so very large a number of legs, that they cover the whole surface: they are disposed in four ranges, each of which contains about 74; so that the whole ray contains 304, and consequently the *fish* has, upon all five of its rays, no less than 1520 legs. With all this numerous train of legs, however, the animal moves but very slowly; and indeed they are so soft and feeble, that they scarce deserve the name of legs, and, more properly speaking, they are only a sort of horns, like those of our garden-snails, but they serve the animal to walk with, and are therefore called legs. It is not only in their softness that they resemble the horns of snails, but their figure is also perfectly like them; so as that the comparison gives a sufficient description of them. They are capable of being contracted or shortened also, in the same manner with the horns of snails, and it is only in the time of the creature's moving that they are seen of their full length; at other times no part of them is seen but the extremity of each, which is formed like a sort of button, being somewhat larger than the rest of the horn. If one of the rays of this *fish* be turned the lower part upwards, and attentively viewed, the mechanism by which it extends its legs will be easily understood. If the ray be cut transversely in two, it is found composed of two bodies, divided from one another by a cartilaginous hard substance. This body seems composed of a vast number of vertebræ, and along it there run a great number of spherical, or oblong tubercles, very bright and transparent. There are four ranges of these, on each side two; they are formed of a fine thin transparent membrane, filled with a perfectly clear and pellucid fluid, like water. It is not difficult to conceive, that these little bladders serve to the lengthening and contracting of the legs of the animal; it is soon perceived that they are of the same number with the legs, and are ranged in the same order, so that each bladder corresponds to one leg: but the whole is perfectly explained, when on pressing one of these bladders the liquor is seen to flow out of it into the leg which it belongs to, and that the leg is extended and lengthened by this means; and that when this pressure is taken off, the fluid runs back again of itself from the leg to the bladder, and that on this the leg gradually shortens again: there is, therefore, nothing more necessary for the lengthening and contracting of the legs, than that the animal should have a power of pressing these bladders; that would always perform the first motion, and the mere ceasing to press them would perform the other.

When the under part of the rays is viewed, and the creature in motion, it is seen that the legs are elongated, and again contracted, merely by the ingress and egress of a fluid; and that the creature does not use all the legs of the same ray to walk with, but sometimes one part of them, and sometimes another, and this with great irregularity. They seize on any part of the rock, in the creature's moving, in an acute angle, and in consequence, when they set themselves strait upright again the body of the fish, must be so far pulled forward, as is the space of that angle from the perpendicular. They march with equal ease when thus inverted, and when in their natural position, and as well on sand as stones, and if in the dry, or if covered with water; but in all cases they move very slowly.

If a *star-fish* is taken up when full of water, it throws it out at different parts of its body by a vast number of little, and almost imperceptible apertures, in so many small streams or threads; and when it has discharged thus all that it will naturally, it may be made to throw out more by pressing or squeezing the rays, and by this means the pipe, by which it is thrown out, may be forced out of the body, and is then seen to be white, and of a triangular, not round figure. These are disposed in great numbers over the rays. Mem. Acad. Par. 1710.

The amazing property of reproducing the essential parts, when lost, is not confined to the polype, and some few others of the insect world, but is extended to the *star-fish*, and to the urticæ marinæ of various kinds, and probably to many others, in which we at present have no expectation of finding it. Mr. Reaumur, on the discovery of this property in the polype, observed these other animals, as they lay on the shores of Poictou, and other places, and often found that species of *star-fish*, which is very commonly known, and which has naturally five rays or arms, with only three or four, one or two being wanting; and on taking up and examining these mutilated ones, nature was always found reproducing the limb that was wanting; and on cutting and breaking other *star-fish* into several parts, it was but a very little while before the broken parts cicatrised, and every part remained alive; and by the appearances of things there remained no doubt, but that these living pieces will all, in time, reproduce their wanting parts.

Mr. Reaumur could not stay long enough on the spot to see this, but Mr. de Villars, on the coast of Rochelle, saw the whole process very frequently in the urticæ marinæ, which he cut to pieces on purpose for the experiment, and which always reproduced the parts he had cut off; and the common fishermen of the coasts, where Mr. Reaumur was in company with Mr. Jussieu, seeing them making their experiments on the *star-fishes*, appeared to be well acquainted with their nature, and told them that they might cut aod tear them as much as they pleased, but they would not be able to kill them: so familiarly was this piece of natural history known among these people, though unknown to those who had employed their lives in the searches after such things.

Mr.

Mr. Reaumur was very ſenſible of the advantages that water inſects, and animals, have over others, as to the healing of their wounds, but was reſolved to try the experiment on ſome land animals. The creature he firſt choſe for theſe experiments was the earth-worm; and on cutting theſe creatures aſunder, though many of the pieces dried, yet he had the pleaſure of ſeeing ſome ſucceed ſo perfectly, that the tail part, which wanted not only the head, but alſo the organs of generation of both ſexes (which in theſe animals are always both contained in the ſame individual) has been ſeen to reproduce both theſe organs and the head, and become as perfect a worm as the whole was. Philoſ. Tranſ. Nº 464. Append.

STAR-*gazer*, in ichthyology, the Engliſh name of the uranoſcopus. See the article URANOSCOPUS.

STAR-*ſhot*, the common name of a gelatinous ſubſtance often found lying on the ſurface of the earth, and called by ſome *ſtar-jelly*, and *ſtar-fallen*.

The vulgar have been always of opinion, that this was produced from that meteor which they call a *falling-ſtar*; others have imagined it a vegetable ſubſtance, and ſuppoſed it grew out of the earth: neither of theſe however appear, upon a cloſe examination, to be the caſe, but that it is really the half-digeſted food of herons, bitterns, crows, ſea-mews, and coddy-moddies, principally when they have fed upon frogs or earth-worms.

The heads of frogs have been found whole in maſſes of this matter, as have alſo parts of worms; and theſe birds, when ſhot, have been found, when dying, to diſgorge a ſubſtance of the ſame kind.

It is a gelatinous ſubſtance, reſembling a thick mucilage of gum tragacanth, and is cold to the touch. There are often yellow ſpecks, and ſmall clots, like grumous blood, in it. It ſtinks like putrid fleſh when kept, and is principally found in miſty mornings, and in wet weather in autumn, winter, and ſpring. *Moreton*'s Northampt. p. 353.

Mr. Boyle ſays, he has ſeen this jelly reſolved by digeſtion only into a permanent liquor; and that a phyſician of his acquaintance extolled it as a ſpecific, outwardly applied, to wens. Works Abr. Vol. 1. p. 310.

STAR-*ſtone*, *aſteria*, in natural hiſtory, the name of a kind of extraneous foſſil, of a very regular figure and ſtructure, and approaching very much to the nature of the entrochi, having the ſame ſubſtance and inner ſtructure, and being much of the ſame ſize, though different in form: and as thoſe foſſils have fragments of ſhelly bodies, to which they are ſometimes found affixed, and appendages like branches, or the rudiments of ſuch, growing from them, ſo theſe have both the one and the other; the firſt called *aſteropodia*, and the others the *appendiculæ*, or wires of the *aſteriæ*.

The *aſteropodia*, in ſubſtance and inner ſtructure, agree perfectly with the ſhells of the echinitæ, found in our chalk-pits, and with the *aſteriæ* and entrochi; theſe bodies being all compoſed of obliquely-arranged plates of a tabulated ſpar: they are uſually compoſed of ſeveral joints, but they are only very imperfect fragments of the body of the animal the *aſteriæ* have once been a part of; the ſeveral parts of which they are compoſed are all convex on one ſide, and concave on the other, but they are of very different ſhapes, being ſometimes roundiſh, ſometimes oblong, often quadrangular, and not unfrequently of different numbers of angles. They have frequently two, ſometimes more ridges running acroſs them, and ſometimes they have tubercles, or ſmall protuberances, ſtanding either on their upper or under ſide: they are ſometimes found ſingle, but more frequently compound, or arranged into ſmaller or larger parcels, being placed one over another in the manner of the tiles of a houſe, and ſeem truly to have been originally part of an imbricated ſhell, or cruſt of ſome yet unknown ſpecies of ſea-fiſh. They are in theſe compound maſſes even very evidently fragments, and are uſually of irregularly broken figures, though ſometimes they reſemble, in ſome degree, parts of the rays of one or other of the kinds of *ſtar*-fiſh. They are uſually found looſe from the *aſteriæ*, though lying among them; but ſometimes the *aſteriæ* are regularly fixed on them, juſt as the entrochi on the modioli, and are plainly ſeen to have originally grown out of them.

The *encrinos* of authors is one kind of *aſteropodium*, and has been affirmed by ſome perfectly to agree in figure with a ray of the magellanic *ſtar*-fiſh. This is, however, ſeldom found in ſuch a compound ſtate; it uſually is met with in ſingle joints, and then is what authors call the *aſteropodium minus*, or ſmall *aſteropodium*. *Hill*'s Hiſt. of Foſſ. p. 653.

Theſe bodies are uſually of a pale bluiſh grey, or aſh colour; ſometimes they are whitiſh, and ſometimes, though more rarely, yellowiſh, or reddiſh.

Having thus far deſcribed the *aſteropodia*, which ſeem properly the baſes of the *aſteriæ*, we ſhall be more intelligible in the account of the *aſteriæ* themſelves, which are to be treated of merely as branches of them; though, from their being much more frequent than theſe their baſes, they are much more familiarly known, and uſually more regarded. The *aſteriæ* are ſhort, and commonly ſomewhat crooked angular columns, compoſed of ſeveral joints, each reſembling the figure of a radiated *ſtar*, with a greater or ſmaller number of rays in the different ſpecies: they are uſually found of about an inch in length, and of the thickneſs of a gooſe-quill. Some of them have five angles, or rays, and others only four, and in ſome the angles are equi-diſtant, while in others they are irregularly ſo; in ſome alſo they are ſhort and blunt, while in others they are long, narrow, and pointed; and ſome have their angles ſo very ſhort and obtuſe, that at firſt ſight they might be taken for *entrocho-aſteriæ*. The ſeveral joints in the ſame ſpecimen are uſually all of the ſame thickneſs; this however is not always the caſe, but in ſome they are larger at one end, and in others at the middle, than in any other part of the body; and ſome ſpecies have one of the rays bifid, ſo as to emulate the appearance of a ſix-rayed kind.

All the *aſteriæ* are naturally ſulcated between the angles, but this in a very different degree; ſome are very little ſo, while others are cut ſo deeply, that the ſingle joints of them reſemble the rowels of a ſpur. One end of the column is frequently found finely engraved along the edges of the angles, or rays, while the other end is ſmooth, or nearly ſo; and the ſame is often the caſe alſo in the ſingle joints. Not unfrequently, alſo, one end of a column is indented, and the other has five ſtriæ, running from a hollow center to the ſulci between the rays.

They are found of various bigneſſes and colours; the longeſt ſeldom arrive, however, at two inches, and they are found of all the intermediate bigneſs from this down to the length of a barley-corn: they are not unfrequently found, alſo, compreſſed and flatted, as is common to the foſſils that have been formed in animal moulds.

They are uſually found bedded in the ſtrata of clay, though not unfrequently in thoſe of a lax ſort of quarry-ſtone, and ſometimes in a harder, but that leſs frequently. They uſually have ſea-ſhells, and other marine remains, lying about them; and ſometimes theſe ſhells adhere to the *aſteriæ*, and when ſeparated from them do no injury to the *aſteriæ*, but themſelves ſhew a mark of the figure of the body, or part of the column, when a part has been always wanting in the ſhell. Had theſe ſhells been ſtuck into the bodies of the *aſteriæ*, it would have been a proof that theſe ſhells were the bodies firſt formed, and that the matter of the *aſteriæ* had been formed, or had gathered about them afterwards; but as it is, we have by it abundant proof on the other ſide of the queſtion, and may plainly diſcover that theſe *aſteriæ* are really of marine origin; and that however they may be altered in their matter or ſtructure, ſince they were depoſited in the earth, yet that they were really exiſting in this their proper form in thoſe ſeas, when the ſhells that are found adhering to them acquired their growth.

From the columns of the *aſteriæ* there are ſometimes propagated certain ſmall branches, like thoſe of the entrochi; theſe are called by authors *appendiculæ aſteriarum*, or the wires of the *aſteriæ*.

They are compoſed of ſeveral ſhort cylindric joints, with obliquely-truncated ends, and each hollowed to the middle, where there ſtands a ſmall tubercle. Theſe branches are ſometimes two inches long, and the largeſt or thickeſt joint always adheres to the *aſteria*, all the ſucceeding ones growing ſmaller, and the branch taperer toward the end. In their natural ſituation on the *aſteria*, they ſtand in regular circles at different diſtances, one above another: there is always one wire in each of the ſulci, or channels of the body, and theſe ſtand evenly againſt one another.

Theſe wires, or *appendiculæ*, are very ſeldom, however, found in this their native ſtate, or fixed to the bodies of the *aſteriæ*; they are commonly found broken off, and lying looſe among them, and the rudiments only of them remaining on the *aſteriæ*, and very rarely even theſe. The wires themſelves are more frequently found wholly ſeparate from them, and either in fragments of different lengths, or in ſingle joints, immerſed in ſtone, or lying among the ſtrata of clay. *Hill*'s Hiſt. of Foſſ. p. 654.

The *aſteria* is alſo denominated *aſtrites*, *aſtroites*, *aſtrobolus*, and *aſteriſcus*; by Geſner *ſphragis aſteros*, *ſigillum ſtellæ*, in Engliſh the *ſtarry-ſtone*.

The *aſteriæ* may be reduced to two kinds; the firſt, thoſe whoſe whole bodies make the form of a *ſtar*; the ſecond, thoſe which in the whole are irregular, but which are adorned, as it were, with conſtellations in the parts.

Dr. Liſter, for diſtinction's ſake, only gives the name *aſteria* to the former ſort, diſtinguiſhing the latter by the appellation of *aſtroites*; the other naturaliſts generally uſe the two indiſcriminately [b]. The *aſteria*, ſpoken of by the antients, appears to be this latter kind [g].—[[b] *Plott*, Nat. Hiſt. Oxfordſh. cap. 5. ſect. 16. ſeq. [g] Mercat. Metalloth. arm. 9. cap. 10.]

Some antient writers indeed ſpeak of another more extraordinary ſpecies of *aſteria*, or *aſterites*, which the ſun's rays would ſet on fire, and which on that account came into uſe for the compoſition of philtres for kindling love. *Bail.* Dict. Crit. in voc. Eſope, n. (A).

The quality of moving in vinegar, as if animated, is ſcarce perceivable in the *aſtroites*, but is ſignal in the *aſteria*.

The former muſt be broken in ſmall pieces before it will move; but the latter will move, not only in a whole joint, but in two or three knit together. *Plott*, Nat. Hiſt. Oxfordſh. ſect. 26, ſeq.

STAR-*wort*, *aſter*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the radiated kind. Its diſk is compoſed of floſcules, and its border of ſemifloſcules: theſe all ſtand on the embryo ſeeds, and are contained in one common ſquammoſe cup. The embryos finally ripen into ſeeds, which are winged with down, and fixed to the thalamus of the flower.

The ſpecies of *aſter*, enumerated by Mr. Tournefort, are theſe. 1. The common blue Attic *ſtar-wort*. 2. The Attic *aſter* with white flowers. 3. The round-leaved hairy Auſtrian *ſtar-wort* with large blue flowers. 4. The long-leaved mountain *ſtar-wort* with large blue flowers. 5. The purple-flowered Alpine *aſter*. 6. The blue-flowered dwarf mountain *ſtar-wort*. 7. The blue-flowered Alpine Attic *ſtar-wort*. 8. The purple tripolium-flowered *aſter*. 9. The broader-leaved *aſter* with tripolium flowers. 10. The common acrid blue-flowered *aſter*, called the *blue fleabane*. 11. The great blue Attic *ſtar-wort*. 12. The leſſer blue Attic *ſtar-wort*, called the *blue Alpine fleabane*. 13. The blue-flowered willow-leaved ſea *ſtar-wort*, called *tripolium*. 14. The leſſer *tripolium*. 15. The ſmall white-flowered *tripolium*. 16. The early Pyrenean *aſter* with large blue flowers. 17. The autumnal Pyrenean *aſter* with ſmaller blue flowers. 18. The broad-leaved American *aſter* with pale blue umbellated flowers. 19. The tall hairy New England *aſter* with very large violet-purple flowers. 20. The late-flowering hairy willow-leaved American *aſter* with blue flowers. 21. The tall-branched, wild daiſy-leaved, late-flowering *aſter*. 22. The branched late-flowering purple *aſter*. 23. The broad-leaved paniculated *aſter* with deep violet-coloured flowers. 24. The blue-flowered hyſſop-leaved branched African *aſter*. 25. The white-flowered branched hyſſop-leaved African *aſter*. 26. The annual Canada branched *aſter*, called by ſome the *branched daiſy*. 27. The African *aſter* with helichryſum leaves. 28. The hairy yellow mountain *aſter atticus* with very large flowers. 29. The ſmooth mountain *aſter* with large yellow flowers. 30. The yellow-flowered *aſter* with ſweet-ſcented roots. 31. The fleabane-leaved autumnal meadow *aſter*, commonly called the *middle fleabane*. 32. The meadow Alpine *aſter* with gold-yellow flowers. 33. The yellow-flowered woolly Dutch *aſter*. 34. The very hairy and woolly Alpine *aſter*. 35. The hairy mullein-leaved *aſter*. 36. The rock *ſtar-wort* with viſcous, hairy, and ſtrong-ſcented leaves. 37. The long-leaved mountain yellow *aſter*. 38. The yellow marſh *aſter* with long woolly leaves. 39. The ſea *aſter* with a thick cylindric, and three-pointed leaf. 40. The yellow jagged-leaved marſh *aſter*, called the *jagged-leaved marſh fleabane*. 41. The marſh *aſter* with ſmall globoſe flowers. 42. The yellow-flowered tuberous-rooted ſea *aſter*, called *ſea-fleabane*. 43. The mountain willow-leaved *aſter* with yellow flowers. 44. The yellow ſweet-ſcented *fleabane* like *aſter*. 45. The fleabane-leaved yellow Alpine *aſter*. 46. The mullein-leaved *aſter* with yellow flowers. 47. The primroſe-leaved American *aſter* with yellow flowers, and a thick large cup. 48. The American primroſe-leaved *aſter* with a ſingle purple flower. 49. The ſhrubby yellow ſtœchas-leaved American *aſter* with umbellated yellow flowers. 50. The American *aſter* with large ragwort leaves, hairy underneath. 51. The yellow-flowered ſtœchas-leaved Æthiopian *aſter*. 52. The great *aſter*, commonly called *elecampane*. *Tourn.* Inſt. p. 481.

All the ſpecies of this plant are propagated by parting their roots early in ſpring, and they will grow in almoſt any ſoil or ſituation; and the larger ſorts encreaſe ſo faſt, that if not prevented, they will in a little time over-run a large ſpace of ground. They grow beſt in the ſhade. But the lower kinds do not run ſo much at the root, but ſhould be taken up and tranſplanted every other year, which will make them produce much fairer flowers. *Miller's* Gard. Dict.

Golden STAR-*wort*. See the article ASTER *Atticus*.

STAR *of Bethlehem*. See the article ORNITHOGALUM.

STARAPHAXAT, a name uſed by ſome of the old writers for any medicine that reſtrains fluxions upon the eyes, noſe, or fauces.

STARTING, in the manege. A horſe is ſaid to be *ſtarting*, ſkittiſh, or timorous, that takes every object he ſees to be otherwiſe than it is; upon which he ſtops, flies out, and ſtarts ſuddenly to one ſide, inſomuch that the rider can't make him come near the place where the object is. This fault is more common to geldings than ſtone-horſes. Such horſes alſo as have bad eyes are moſt ſubject to it, as well as thoſe that have been kept a long time in a ſtable without airing; but theſe laſt are eaſily cured of it. When you have a ſkittiſh horſe, never beat him in his conſternation, but make him advance gently, and with ſoft means, to the ſcarecrow that alarms him, till he recovers it, and gains aſſurance.

STARVING *to death*, a kind of puniſhment uſed by the people of Arragon ſome ages ago; and it is reported by Tavernier, that the chief ladies in the kingdom of Tunquin are at this day ſtarved to death for adultery.

STASIS, a word uſed by phyſicians to expreſs a ſtagnation of the humors.

STATELY, in the manege. A horſe is ſaid to be *ſtately*, that goes with a proud, ſtrutting gate.

STATER, the name of a weight among the antients, equal to four drachms.

STATHEUSIS, a word uſed by the old writers to expreſs the torrefaction, or roaſting of ſome medicines before a ſlow fire, as is done frequently at preſent with rhubarb, &c.

STATICAL, (*Cycl.*) is ſometimes applied in a peculiar ſenſe to the experiments made as to the quantity of perſpiration, and other excretions of the human body.

We have a very particular account of ſome experiments of this kind in the Philoſophical Tranſactions, N° 470, made by Dr. John Lining of Charles-Town, in South-Carolina.

STATICAL *hygroſcope*. See the article HYGROSCOPE.

STATICE, *thrift*, in botany, the name of a genus of plants, the characters of which are theſe. The flowers are collected into a head of a ſort of globular form, which is ſurrounded by a common ſcaly cup. The head is compoſed of a number of caryophylleous flowers, compoſed of ſeveral petals, and each ariſing from its own proper tubular cup. The piſtil ariſes alſo from the ſame cup, and finally becomes an oblong fruit, covered by the cup.

The ſpecies of *ſtatice*, enumerated by Mr. Tournefort, are theſe. 1. The larger *ſtatice*, *thrift*, or *ſea July flower*. 2. The ſmaller *ſtatice*. 3. The large white-flowered Alpine *ſtatice*. 4. The ſmalleſt mountain *ſtatice*. 5. The Portugal *ſtatice* with ſcorzonera leaves. 6. The large ſhrubby Portugal ſea *ſtatice* with great flowers. 7. The great Portugal *ſtatice* with capillaceous leaves. 8. The ſmalleſt Portugal *ſtatice* with capillaceous leaves. And 9. the low ſea *ſtatice* with rigid capillaceous leaves. *Tourn.* Inſt. p. 340, ſeq.

STATICULA, among the Romans, thoſe little figures with which it was uſual to adorn their drinking-cups, called *ſcyphi*. *Pitiſc.* in voc.

STATICULI, among the Romans, a kind of dancing pantomimes. *Pitiſc.* in voc. See PANTOMIME.

STATION (*Cycl.*)—We have a method of meaſuring diſtances at one *ſtation*, in the Philoſophical Tranſactions, N° 7, by means of a teleſcope. But the practice of this method does not anſwer to the theory.

STATION, *ſtatio*, στασις, in the antient muſic, was ſometimes uſed for any fixed pitch, or degree of ſound, whether produced by intention or remiſſion. Vid. *Wallis*, Append. ad Ptolem. Harmon. p. 154.

STATION-*line*, in ſurveying. See the articles LINE and SURVEYING, *Cycl.*

STATIONARY (*Cycl.*)—STATIONARY *fevers*, a term uſed by Sydenham to expreſs a peculiar kind of fever, adapted, and owing to ſome general conſtitution of the air and ſeaſons. There are certain general conſtitutions of years, which owe their origin neither to heat, cold, dryneſs, nor moiſture, but rather depend upon a certain ſecret, and inexplicable alteration in the bowels of the earth, whence the air becomes impregnated with ſuch kinds of effluvia, as ſubject the human body to peculiar diſtempers, ſo long as that kind of conſtitution prevails, which after a certain courſe of years declines, and gives way to another. Each of theſe general conſtitutions is attended with its own proper and peculiar kind of fever, which never appears in any other; and this is thence called a *ſtationary fever*.

STATIVA, among the Romans, a ſtanding camp kept for the defence of the frontiers of the empire. Theſe camps gave riſe to a great many towns, which took their names from the legion ſtationed there. *Pitiſc.* in voc.

STATORES, among the Romans, made a part of the emperor's life-guard. *Pitiſc.* in voc.

STATUARY (*Cycl.*)—STATUARY *marble*, among our artificers, the name of the ſofter white marble uſually wrought into *ſtatues*, the ſame with the Parian marble of the antients.

STATUTE (*Cycl.*)—The king's royal aſſent to a bill by his letters patent under his great ſeal, and ſigned with his hand, and declared and notified in his abſence to the lords ſpiritual and temporal, and to the commons, aſſembled together in the high houſe, is as effectual as if the king was preſent. Stat. 33 Hen. VIII. cap. 21.

Statutes were antiently proclaimed by the ſheriff, but upon the invention of printing, this method was diſcontinued. Every body is obliged to take notice of an Act of Parliament at his peril. 4 Inſt. 26.

STATUTE-*ſeſſions*, in law, a meeting in every hundred of conſtables and houſholders, by cuſtom, for the ordering of ſervants, and the debating of differences between the maſters and the ſervants, rating of ſervants wages, &c. 1 Eliz. cap. 4. *Cowel.*

STATUTO *mercatorio*, a writ for the impriſoning him that has forfeited a *ſtatute merchant* bond, until the debt is ſatisfied: and of theſe writs there is one againſt lay-perſons, and another againſt perſons eccleſiaſtical. Reg. Orig. 146, 148. *Cowel.*

STATUTO *ſtapulæ*, a writ that lies to take the body to priſon, and ſeize upon the lands and goods of one who hath forfeited the bond called *ſtatute ſtaple*. Reg. Orig. 151. *Blount*, *Cowel.*

STATUTUM *de laborariis*, an antient writ for the apprehending ſuch labourers as refuſe to work according to the *ſtatute*. Reg. Judic. 27. *Blount*, *Cowel.*

STAVESACRE, *ſtaphiſagria*, in botany. See the article STAPHISAGRIA.

Staveſacre grows in Provence, Languedoc, and many other parts of Europe. The leaves are large and finger'd, the flower blue, and ſomewhat like that of the larkſpur. The ſeed, which is the only part of the plant uſed in medicine, is of a duſky brown, and very rough on the outſide, and of a pale yellow within, and of a bitter, diſagreeable, and very acrid taſte. The ſeed ſhould be choſen new, clean, and plump. Taken inwardly they are a violent purge and vomit, in a very ſmall doſe, and are never preſcribed; but outwardly they have always been famous for deſtroying lice in children's heads. Some take it into their mouths alſo for the tooth-ach, and others have ventured to uſe gargariſms of it to cure phlegm, and as an errhine, ſnuffing it up the noſtrils. It is alſo commended for the cleanſing old ulcers. *Lemery's* Dict. de Drog.

The chief uſe of *ſtaveſacre*, as a medicine, is the deſtroying vermin in children's heads: to this end it is powdered and mixed with *cocculus indicus*, and ſeldom fails of ſucceſs. It is a violent purgative, and therefore ſeldom uſed at preſent.

STAUROPHORI, Σταυροφοροι, in church-hiſtory, certain eccleſiaſtics, whoſe buſineſs it was to carry the croſs in proceſſions. *Hofm.* Lex. in voc.

The word is compounded of σταυρος, a croſs, and φερω, I carry.

STAUROPHYLAX, Σταυροφυλαξ, in church-hiſtory, a dignified officer in the church of Conſtantinople, to whoſe care the keeping of the croſs, found by Helena, was committed. *Hofm.* Lex. univ. in voc.

The word is derived from σταυρος, a croſs, and φυλασσω, I keep.

STAXIS, a word uſed by the antient phyſicians to expreſs a diſtillation of blood in drops from the noſe.

A *ſtaxis*, in the doctrine of criſes, is juſtly condemned as indicating a weakneſs and decay of ſtrength in nature; whereas, on the contrary, free and copious diſcharges of blood from the noſe are eſteemed good indications, and often make happy criſes.

STAY (*Cycl.*)—STAY, in the manege. To *ſtay*, or ſuſtain your horſe, is to hold the bridle firm and high. We likewiſe *ſtay* or ſuſtain a horſe with the in-leg, or in-heel, when he makes his croupe go before his ſhoulders upon volts: as alſo when we hinder him to traverſe, and ride him equally, keeping him always ſubject, ſo that his croupe can't ſlip out, and he can't loſe either his cadence, or his ground, but marks all his times equal.

STEAMS. Subterranean *ſteams* often affect the ſurface of the earth in a very remarkable manner, and influence or prevent vegetation more than any thing elſe. The ſurface of ſome ground is ſo hollow and light, and ſo ſwoln by a warm and continually working ferment, that it muſt needs ſend up a warming *ſteam*; and that it does ſo, even in the coldeſt weather, is evident from the immediate melting of the ſnow that falls on it: nay, in many places, the effect of this *ſteam* is ſo great, that it melts the ſnow before it reaches the ground, ſo that it falls on it in form of rain.

Some ſtones alſo, and ſome waters, impregnate the earth by their innate warmth, ſending up a continual ſucceſſion of warm effluvia from all parts of their ſurfaces; and other ſtones have exactly a contrary effect, rendering the places where they lie barren and cold. Streams of water, which have in their ſubterranean courſe run through beds of limeſtone, marl, or chalk, are always enriched, and warmed by the *ſteams* iſſuing from thoſe ſubſtances, and mixing with them as they paſs, and conſequently theſe waters enrich the ground wherever they run; and, on the contrary, ſome waters are uliginous, or corroſive, from the *ſteams* they have received in their channels from the veins of pyrites, or beds of metalline ores. It is even reported, that the very ſubſtances of metals and minerals are thus raiſed in *ſteams*, and that the juices of plants are found loaded with them; thus we are told, that in Italy crude quickſilver is found in the juices, and at the roots of plants; and that in Moravia, Hungary, and Peru, the ſubſtances of the metals are found in the bodies of plants, particularly lead and ſilver. The Miſcellanea Curioſa of Leipſick ſpeak of wonderful appearances of gold in the form of plants, which, if true, muſt be owing to that metal's having been raiſed in *ſteams*, and carried into the veſſels of the plants in ſuch quantity, as in fine to deſtroy the vegetable appearance, and leave the figure of the plant in metal. Phil. Tranſ. N° 110.

STEATITES, in the hiſtory of foſſils, a name given by late authors to a ſubſtance called in Engliſh *ſoap-earth*, and which, though the authors on theſe ſubjects had not taken notice of that circumſtance, was the very ſubſtance called *Cimolia purpuraſcens*, or purple earth of Cimolus, by the antients. The later ages finding the purple Cimolian earth of the old writers to be wholly different from their white kind, have given that name (though it is not eaſy to gueſs why) to the common fuller's earth, which has no tinge of purple in its whole ſubſtance.

This earth however, called by us *ſoap-earth*, and *ſteatites*, is well worth enquiring after, as a ſubſtance for imitating the fine porcelain ware of China. Dr. Woodward much recommends it on this account, and repeated trials have been made of it ſince his time, and ſome of them very lately; in all which it has afforded the fineſt earthen-ware ever made with us, and promiſes fair, with good management, for the equaling any in the world.

It is dug in many parts of Devonſhire and Cornwall, and the neighbouring counties; the cliff of the Lizard point is almoſt wholly compoſed of it, and the adjacent little iſlands abound with it; and from all theſe places it might be brought, at ſmall expence, in any quantities. It is known from all other earths by theſe characters. It is compoſed of extremely fine particles, and is of a firm, equal, and regular texture, and great weight. It is very firm and hard as it lies in the earth, but when it has been ſome time expoſed to the air, it becomes almoſt of a ſtony hardneſs. It is of a perfectly fine, ſmooth, and gloſſy ſurface, ſofter to the touch than any other ſpecies of earth, and does not at all adhere to the tongue, or ſtain the fingers in handling; but drawn along a rough ſurface, as a piece of cloth, or the like, it marks it with a fine and even white line. In colour it is a clear white, veined and variegated very beautifully with purple of different degrees of deepneſs; and is of ſo fine a ſtructure of parts, that when cut into thin pieces it is in ſome degree tranſparent. It makes no efferveſcence with acids, and burns to a pure white, even in its purple parts. *Hill's* Hiſt. of Foſſ. p. 22. See TERRA *Cimolia*.

STEATOCELE, a term uſed by the antients to expreſs a ſort of rupture, occaſioned by a large quantity of fat or ſuety matter lodged in the ſcrotum.

STEEL (*Cycl.*)—The difference between *ſteel* and iron is, that *ſteel* being much the harder, will not yield to the hammer, but is brittle, inſtead of being ductile, and reſiſts the file. Malleable iron grows rigid by being ſimply extinguiſhed in cold water, but it yet retains a conſiderable degree of ductility in the cold, and may be extended in all dimenſions with the hammer.

Steel, however, if heated again, and cooled by ſlow degrees, may be filed, and extended more or leſs by the hammer. But there are many degrees in the hardening of *ſteel*; for if it has been made extremely red-hot, and is then quenched in cold water in motion, it becomes greatly harder than if it had been but moderately red-hot, and had been quenched in warm water.

Steel is alſo of a darker colour than iron, and the ſurface of it, when broken, appears to conſiſt of ſmaller granulated, or even ſtriated particles, than the iron it was made of. This appears moſt diſtinctly, when *ſteel* is welded to the ſame iron of which it was made, and the maſs made red-hot, and well incorporated by hammering. If then you harden it again, by extinguiſhing it in cold water, and poliſh it, the veins of iron are eaſily diſtinguiſhable from thoſe of the *ſteel*; the iron ones being whitiſh, and of a ſilver-like hue, the *ſteel* ones blackiſh, or like water; and when broken, the ſize of the particles is found extremely different. *Cramer's* Art of Aſſaying, p. 346.

The manner of making iron into *ſteel* had remained very long a ſecret, but many authors of late date have given the proceſs, though it does not appear the ſame in all, and in many is encumbered with circumſtances, intended only to diſguiſe it. Mr. Reaumur has taken greater pains, than almoſt any man, to come at the truth; but to be rightly informed of his reaſons, we ought to begin where he did, that is, at the origin of the iron in its pure metallic ſtate.

The ores of this metal are mixed bodies, compoſed of ſome particles truly metallic, and of others ſulphureous, ſaline, and terrene; this compound maſs is put in fuſion by the fire, and on this operation the metallic parts being heavieſt, ſubſide to the bottom of the veſſel, or furnace, and are then eaſily ſeparated from the lighter ſubſtances which float at the top. This ſeparation, however, is not ſuppoſed to be perfect, but the metal, after this its firſt fuſion, retains many heterogene particles, which prevent it from being malleable. It is after this to be refined, that is, to be melted again, and that ever ſo often performed, the metal becomes yet more and more pure and perfect, ſome heterogene matter being every time depoſited, or thrown off, and this is uſually much leſs after every fuſion.

The metal, when thus purified by melting, yet remains hard and brittle: theſe are two qualities which we do not want in iron, and this hardneſs and friability are no incompatible qualities, ſince their origin is this, that the iron in this ſtate is compoſed of a multitude of ſmall granules, every one of which is very firm and compact in its own texture, though they

they cohere but flightly one with another. The knife, or the file, cannot eafily cut any one of thefe granules, but a blow of a hammer eafily feparates large parcels of them from thofe to which they were joined : this caft iron is therefore ufed only for fuch purpofes as requires a fubftance poffeffed of thefe qualities; purpofes where hardnefs is required, and where no blows are to be met with. Thus backs of grates, iron pots, and the like, are made of it.

One of the general properties of metals is, that they are malleable ; that is, their feveral particles cohere fo well together, that they are ductile and extenfible under the hammer, and will fuffer the whole mafs to bend any way without breaking, that is, without their feparating from one another. In the words of the artizans, fuch fupplenefs and pliability is called *body* in a metal, and the caft iron, which wants this, is faid to have no body, and is what they call *no foft metal.* It is therefore no way fit for fuch works as require fafhioning by the hammer or the file, nor of fuch as are to ftand any violent blows ; but as it is eafily fufible, it ferves for caft works where there is no great delicacy in the figuring, fince it does not run fo thin as to adapt itfelf to every lineament of a fine figure, nor is qualified to be repaired by inftruments.

The ill qualities of caft iron are, in a great degree, remedied in the forged or wrought iron, taken from the fame quantity, and the fame fufion. The forging of iron is only the placing it over the fire till heated to a certain degree, and then beating it out with large hammers till it becomes foft. When it has been fufficiently forged, it becomes foft and malleable, even when cold, and when heated, is eafily wrought into any figures, which it retains always afterwards ; and it is eafily cut by the file when cold, and is not brittle on being ftruck, as is the caft iron.

While it gains thefe properties by the forging, it lofes, however, another by the fame means, which is its fufibility. It will no longer melt in the fire, but when the workmen give it the ftrongeft heat they can, it is only reduced to a fort of foft pafte, and *fweats* a little, as they exprefs it ; that is, fome few drops of truly melted iron fall from it.

It is very certain, that both the caft and the forged iron are mixtures of metalline, faline, and fulphureous particles ; and the different arrangement of thefe, in their mere fimple running together in the fufion, and their being driven intimately into, and among one another, by the hammering, makes the fufibility different in the two ftates.

If the forged iron differ greatly from the caft, there is however a third ftate into which it is reducible by art, which is yet different from both, this is what we call *fteel* ; and the quality of iron on receiving this change is not one of its leaft valuable ones, fince from this we have all our inftruments for cutting, fawing, boring, and the like purpofes, the value of which to us is almoft infinite. The German *fteel* has always been in great repute, and though feveral other nations have made it, yet the Germans have kept their method a facred myftery, to keep up their trade in it.

Steel is confiderably harder than forged iron, and fo it is neceffary that it fhould be, in order to many of the purpofes it is employed in. Shears of *fteel*, which are intended to cut iron, muft be harder than iron, otherwife their edge will turn, and they will not cut ; whereas, if the metal is too hard, then the granules will fly off, and the edge break away in fmall fragments. This is the cafe with all edged tools ; and hence it is that good *fteel* is fo nice and difficult a thing to make, fince there is required fuch a degree of hardnefs, and no more.

It is very well known, that *fteel* acquires its hardnefs from the plunging it into water ; it is to be heated to a certain degree, and then immediately plunged, while the fiery particles yet remain in it, into water perfectly cold ; it is then to be fpeedily drawn out of the water, and thus the whole operation is finifhed. It acquires its hardnefs in degrees, proportionate to its heat when plunged into the water ; and this hardnefs, or temper, remains with it only till it is heated as high again ; for after that, if it is left to cool leifurely, and not thrown into water, it is loft. All the maffes of *fteel* which are fold are thus tempered ; neverthelefs, when they are wrought into tools, their temper is loft, and is to be renewed by plunging them again into cold water, when they have been forged into the fhape of which they are to be.

Mr. Reaumur affirms, that *fteel* differs in nothing from forged iron, except that it contains more fulphurs, and more falts. Hence it follows, that caft iron fhould be *fteel*, fince it evidently differs from forged iron in the fame manner, and by the fame properties ; and in effect, caft iron is *fteel*, fuch as it is, efpecially the white fort, which is more pure, and more perfectly divefted of its earth, than the browner forts ; and this white kind may be accordingly brought to all the hardnefs of *fteel*, by repeated heating and quenching in cold water. It follows alfo, that in order to convert iron into *fteel*, we are to give it new falts, and new fulphurs. It may be afked, where is the neceffity of giving again that, which the mere caft iron poffeffes? To which the anfwer is, that *fteel* is required to be malleable in fome degree, which the mere caft iron is not ; and it is to be added to this, that it may be poffible for us to give to forged iron fuch falts and fulphurs as are more proper for the *fteel*, than thofe which the caft iron naturally poffeffes.

We have great variety of falts and fulphurs, out of which to chufe for this purpofe, and Mr. Reaumur made many trials to find which would fucceed beft ; and the refult of all was, that for fulphurs, powdered charcoal and common foot ; and for falts, fea-falt alone fucceeded beft, and that thefe were properly to be mixed with afhes, by way of an intermediate fubftance. Thefe fubftances muft alfo have their allotted dofe ; that is, there muft not only be a certain proportion of the feveral ingredients one to another, which however need not be very precife or exact, but there muft alfo be a proportional quantity of the whole employed to the quantity of iron that is to be wrought upon ; and in this alfo regard muft be had to the feveral forts of ores from which the iron was obtained, fince the iron of fome ores is much fooner convertible into *fteel* than that of others, and makes alfo a better *fteel*.

The manner of beft introducing thefe falts and fulphurs into the body of the iron, was found by this author a matter of great difficulty to determine. He foon perceived, that fire was the only agent that could convey thefe bodies into the metal ; and in contriving how this might be done moft eafily, and with leaft expence, he found out, after many trials, a new fort of furnace, which effected this purpofe with great eafe, and which was not fubject to the inconveniences of other furnaces.

As *fteel* is iron with an admixture of heterogene particles, it follows that it muft be lefs metallic, that is, lefs malleable, or more brittle ; and it is alfo neceffary that it muft be, in fome degree, malleable for the purpofes it is required for ; and it is eafy to conceive that thefe properties cannot be given it, in a proper degree, but by means of a very accurate operation ; and even when all the parts of the procefs are the fame, there is yet much depending on the iron itfelf, which can never be perfectly known but by trial. Something, however, may be judged of the iron by breaking bars of it : the feveral forts of iron, when broken, fhew fome of them only granules, others flakes, and others fibres ; fome alfo fhew all three of thefe moleculæ at once, and others two of them ; but it is eafy, in either of thefe cafes, to fee which fort is in the greateft number. The laminated and the fibrous iron are the two extremes ; the firft is very brittle, the latter very malleable. The laminated iron is ever the worft of all kinds for making into *fteel* ; and of this kind fuch pieces are worft of all, the laminæ of which are very white and fhining, and are large and irregularly difpofed, and arranged in different inclinations. Mr. Reaumur began to reckon from thefe an arrangement of all the kinds of iron, which coming, each by degrees, to have the laminæ ftill fmaller and fmaller, and at the fame time lefs glittering, and placed more evenly together, funk at laft into the irons of the granulated kind. It is eafy to conceive how many differences there muft be between thefe ; and from thefe the fibrofe ones may be deduced, owing their texture merely to the granulæ, which in thefe are difpofed into long ftrings or ftreaks. Tho' in this arrangement of the irons, the firft are, of all others, the leaft proper for making *fteel*, it does not follow that the laft are the moft fo : thefe indeed ufually make a very foft and pliant fort of *fteel*, which has what the workmen call the *greateft body* of all the kinds of *fteel*, and is therefore moft proper of all for certain purpofes, as the making watch-fprings, and the like ; but the want of hardnefs makes it very unfit for cutting tools of all kinds, from the razor to the ax. The granulated iron always makes the fineft and hardeft *fteel* ; and of thefe fuch fucceed beft, whofe granules are fmalleft.

One thing remarkable is, that all *fteel*, though made of iron of the granulated or ftriated kind, yet is, before it has been hammered, of a flaky, or a fort of laminated ftructure ; but this feems owing to the fire's having melted fome of the granules in the operation, and run feveral numbers of them together into thefe plates. The fmallnefs of thefe flakes in *fteel*, which has not been worked, are a proof of its being but of a bad kind.

A bar of iron, when converted into *fteel*, is not equally fo converted in all its parts ; the fire has always acted more ftrongly upon its furface than on its central parts, and it is therefore more perfect *fteel* there than in its inner parts ; but a perfection in the operation is not neceffary to the *fteel*'s being good and ufeful, and the whole bar is often very good *fteel*, as are alfo many bars made at the fame time, yet all perhaps fomewhat differently affected.

If the compofition, which is to convert the iron into *fteel*, be too ftrong, or if the fire be too violent, or the matter continued too long in it, in all thefe cafes the *fteel* will be over made ; that is, there will be an over proportion of faline and fulphureous parts added to the iron : thefe will therefore too far feparate the particles of the metal afunder, and the confequence will be, that the *fteel* will be too brittle to bear hammering, and will be of great lofs to the proprietor in the great quantities that will be broken, befide the lofs he

will suſtain from the abundance of ſcales which will fly off in the working. The way to meliorate ſuch *ſteel* as this, muſt be to diveſt it of part of its ſalts and its ſulphurs, but peculiarly of the laſt; and Mr. Reaumur found, that the burying the bars of ſuch *ſteel* in lime, or any other alkaline ſubſtance that would readily abſorb the ſulphurs, and placing it for a proper time in the fire, it would be in a manner decompoſed again, and come out a very good and perfect *ſteel*; and this is no trivial proof, that the account given of the manner of iron's becoming *ſteel* is the true one.

By this management *ſteel* may again be converted, or reduced to its primitive iron, and a body of any middle degree, between *ſteel* and iron, may be produced, by ſtopping this proceſs at different points of time, or continuing it till all the adventitious ſalts and ſulphurs are drawn off or abſorbed. Hardneſs and flexibility are the two great points in this operation, and what the metal gets of the one of theſe, it aſſuredly loſes of the other. The greater hardneſs is from the greater quantity of the adventitious ſalts and ſulphurs; and the greater flexibility, or, as the workmen call it, the *greater body*, is from the greater quantity of the metallic; and he who is able to calculate properly the quantities of his ſalt, charcoal, and ſoot, and to regulate exactly the degree of fire, is capable to make *ſteel* of what degree of temper or perfection he pleaſes.

Iron, impregnated with new ſalts and new ſulphurs, is not however perfectly reduced to the ſtate of what the workman expects in *ſteel*; there wants yet the quenching it while hot in cold water, to compleat the operation. The *ſteel* penetrated every way by the particles of fire, and at that inſtant plunged into water, is by that quenching ſtopt in the very ſtate in which it was, and is not ſuffered to exhale the igneous bodies, as it would otherwiſe have done. It was, while in the fire, rarified and dilated, and this quenching continues it in that ſtate, and it is found, on meaſuring, conſiderably thicker and larger than it was while unheated. It might be ſuppoſed from hence, that the particles of fire, which were lodged in the *ſteel* while red-hot, were thus detained and impriſoned in it, and ſo wrought the change, as they are known to remain in many calcined bodies, though they have not been ſo ſuddenly quenched; but if this were the caſe, the *ſteel* muſt be encreaſed in weight as well as bigneſs, as many calcined bodies are, but this is not found to be ſo in fact.

Recourſe muſt be had therefore to ſome other operation on the *ſteel*, and this appears, in reality, to be no other than the change of its texture, or internal ſtructure. If a body be naturally compoſed of a number of particles, which are in themſelves hard and compact, but between which there are certain ſpaces; if one take from thoſe hard and compact particles ſomewhat to fill up thoſe voids, it muſt appear very evidently, that though by this the proper particles are rendered leſs hard, yet the whole body muſt be made harder than it was before.

In the converting of iron into *ſteel*, Mr. Reaumur conceives that the particles of iron, being naturally very covetous of ſalts and ſulphurs, have imbibed great quantities of theſe adventitious bodies, while the ſpaces between them have been able to retain very few. This being then the firſt ſtate of the *ſteel*, when it is afterwards heated, in order to its being tempered by quenching, the fire drives theſe ſulphureous and ſaline particles, ſo abundant in the iron, out of its granules, and diſperſes them throughout the ſpaces between theſe granules; and that it is to this equal and regular diſtribution of theſe ſalts and ſulphurs, fixed in that ſtate by the immediate quenching, that the hardneſs, and other qualities of *ſteel* are owing.

To the advantage the metal gets by this means, there is however always joined a diſadvantage, which is, that its grain naturally and neceſſarily becomes coarſer by it, and the *ſteel* has the leſs body. The hardeſt *ſteel* always muſt neceſſarily have the leaſt body; but according to the rules laid down by Mr. Reaumur, one may diſpoſe the hardneſs in what degree one pleaſes, and conſequently all the other properties are in the direction of the ſame laws.

If the oppoſition of the qualities of *ſteel* be nicely conſidered, we ſhall find, that inſtead of being hurtful, they are truly what ſhould be moſt wiſhed for, and are productive of the moſt deſirable conſequences. It may appear ſomewhat ſtrange, that hardneſs and flexibility in *ſteel* ſhould be ſuch directly oppoſite and contradictory principles, and that the quenching, which makes *ſteel* more powerful to reſiſt preſſure or rubbing, ſhould at the ſame time make it more feeble in action; but this is plainly the caſe, and a piece of *ſteel* wire, which, before it is tempered by quenching, will, when hung vertically, ſuſpend a certain weight, will not ſuſtain the ſame weight when tempered, but will be broken even by a leſs; and that if the trial be made by tempering it up to one certain part, and no farther, the wire will aſſuredly break at that very part where the tempered and untempered portions meet. The encreaſe of ſize in every grain of *ſteel*, from the quenching, gives the plain ſolution of this phænomenon. The rupture of any body whatever, that is, the ſeparation of its parts, by whatever means it is done, muſt be more difficult, the more intimately thoſe parts touch, or the more points they touch in. The granules of *ſteel* are theſe touching parts, and it is very evident that theſe granules becoming larger on the quenching, muſt after this touch in fewer points, in the whole combination of the maſs; and on the other hand, as they are larger, they alſo muſt mutually touch each other in a larger ſpace. Here are two contrary principles, which conſtitute the facility and the difficulty of the rupture by different means; and it cannot be, but that the one of theſe conſtructions muſt give the greater force to reſiſt preſſure or friction, and the other to reſiſt drawing or traction.

It has been already obſerved that *ſteel* is the harder, according as it was more or leſs hot at the time when it was plunged into the water; and it muſt be added to this, that it alſo is the more ſo, the more cold the water is into which it is plunged. The degree of heat in the *ſteel* is eaſily known by its colour, and the diſtinctions in it are familiar to the workmen. Several perſons have thought there was great virtue to be communicated to the water by means of different ingredients; this Mr. Reaumur carefully tried, and the reſult was, that he found common cold water the beſt, and moſt uſeful of all liquors: it is true, that vinegar and verjuice harden the *ſteel* ſomewhat more, and aqua fortis greatly ſo, but the latter of theſe renders it too hard for ſervice; and repeated trials have evinced, that common water alone will give *ſteel* all the hardneſs it can be wiſhed to have, provided only that it be plunged into it at a time when it is ſufficiently hot.

If *ſteel*, after the tempering, be found too hard, there is a very familiar way of bringing it back to what ſtate one pleaſes, between that and iron, which is only the heating it in the fire; for it may be kept in the fire ſo long, as to be reduced wholly to iron again. It is eaſy to infer from hence, what was before obſerved, that caſt iron is *ſteel* of a peculiar kind; its properties plainly evince, that it is *ſteel* with an over proportion of all that makes it ſo, and conſequently of all its properties. It is not malleable, is very brittle, and too hard for the file, or any other tool, to cut. Theſe are the qualities of *ſteel* which is over tempered, or, as it may be called, too much *ſteel*: it owes theſe qualities to its being overcharged with thoſe ſulphurs and ſalts, which in a due proportion makes *ſteel* of iron. The method of reducing this to the ſtate of wrought iron, is the ſame with what we have before obſerved is to be uſed to untemper too high tempered *ſteel*, that is, keeping it in the fire till part of its ſalts and ſulphurs are driven off; and if the fire alone be thought too difficult, or too tedious a method, Mr. Reaumur has found that thoſe alkaline ſubſtances, which naturally abſorb ſulphurs, will aſſiſt the reducing this to the ſtate of wrought iron, as they do to the untempering of *ſteel*, and that the very ſame ſubſtances of this kind, which have been found beſt in the untempering *ſteel*, ſucceed beſt in the rendering this malleable; ſuch are lime, chalk, and the like.

Caſt iron may be taken for theſe operations in two ſtates; the one, that of ſimply melted iron in its firſt fuſion, the other that of the iron, which has been run into the mould. When a caſt piece of iron, in a certain form, is heated again with the calx of animal bones, which is one common way, this being a ſubſtance extremely diveſted of ſalts and ſulphurs, it abſorbs thoſe of the metal too greedily, and diveſts it of too great a quantity of them; ſo that when the piece comes afterwards to be filed, the fragments fly off in large ſcales, and the beauty of the caſt figure muſt be loſt: to remedy this difficulty, ſome powdered ſulphur is to be added in the heating; for this being a ſulphureous and ſaline body, checks and moderates the effects of the calx of bone.

Chalk in the ſame manner can only be employed with certain regulations; it ſucceeds very well, if the fire be not too violent, or too long continued, but if it be exceſſive in either of theſe particulars, the chalk throws into the body of the iron ſalts and ſulphurs of its own, which lay hid in its ſtructure, and which would not have been diſlodged by a ſmaller fire; but which being diſlodged, and thrown into the iron, act upon it, and render the ſucceſs of the operation quite different from what was intended, the iron becoming more hard and more brittle by it.

One great nicety in all theſe operations, is the underſtanding the ſigns by which it is known at what time caſt iron is ſufficiently ſoftened, or over tempered *ſteel* is ſufficiently reduced toward the ſtate of iron again; but this is only to be acquired by nice obſervation, and on this depends the whole certainty of the proceſſes, ſince every minute's continuance in the fire gives the operation a different turn in degree.

Mr. Reaumur, in one of his experiments in the ſoftening a piece of caſt iron of a beautiful figure, found, on taking it out, that it had loſt prodigiouſly of its weight, and coming to a nicer examination, he found that it was hollow; its outer cruſt having been ſooner converted into malleable, that is unfuſible, iron than the reſt, and the violence of the fire afterwards having melted away the inner part, which was not yet ſo changed. This accident led him to experiments, by which he found that he could, at any time, melt out

the central part of a thick ſquare bar of caſt iron, the outer part changing firſt into the condition of malleable iron, and ſerving as a crucible for the fuſion of the yet unaltered fuſible iron within. By a proper management of this diſcovery, it will be eaſy to take off the unwieldy weight of many works of caſt iron, which do not require ſo much ſtrength as that of the ſolid contained in their circumference. Mem. Acad. Scienc. Par. 1722.

Mr. Cramer obſerves, that the method of making *ſteel* out of iron, is either by fuſion, or by cementation. That by cementation may be performed in the following manner: chooſe ſome bars of pure iron, not too thick, prepare a cement of charcoal-duſt, moderately pulverized, one part, and wood-aſhes half a part; or of charcoal-duſt two parts, bones, horns, leather, or hair of animals, burnt to a blackneſs in a cloſe veſſel, and in a gentle fire, and afterwards reduced to powder, one part, wood-aſhes half a part; mix them together. Prepare a cylindrical earthen veſſel, two or three inches higher than the bars are long; put into the bottom of this veſſel the cement, prepared as before directed, ſo that being gently preſſed down, it may cover the bottom of the veſſel an inch and half deep; place then the iron bars perpendicularly, ſo that they may be every where an inch diſtant from the ſides of the veſſel, and from each other; fill the interſtices with the cement, and cover the bars with it, that the veſſel may be quite full, cover it with a tile, and ſtop the joints with a lute; put this veſſel into a furnace, and keep it moderately, but equally red-hot, for ſix or ten hours. When this is over, take the red-hot bars out, and dip them in cold water, they will then be brittle, and turned to *ſteel*. *Cramer*'s Art of Aſſaying, p. 344.

The method of making *ſteel* by fuſion is this: take of iron ore, or of unmalleable iron of the firſt fuſion, divide it into ſmall parcels, and put them into a bed made of charcoal-duſt in a ſmith's forge; let the quantity of the iron be but ſmall for the experiment; put to it, as a defenſitive menſtruum, ſome of the vitreſcent ſcoriæ of ſand, or ſtones of the ſame nature; then put upon them a quantity of charcoal, light this, and admit only a ſmall blaſt of the bellows, that the ſcoriæ and metal may both melt regularly: when this has been ſome time kept in fuſion, take it out, divide it into two parts, which make red-hot, and hammer into long bars; finally, heat them red-hot, and plunge them into cold water, and they will then be found to be *ſteel*, ſo very hard, as not to be filable, and ſo brittle, as to break aſunder when ſtruck with conſiderable force. *Cramer*'s Art of Aſſaying, p. 348.

Mr. Lemery ſhews a ſimple method of reducing *ſteel* to a very fine powder, without ruſting it: pour water on filings of *ſteel* in an earthen veſſel, till it is four inches above the filings; ſtir it well every day, ſupplying more water, as that in the veſſel ſubſides, ſo that the *ſteel* is always covered: continue this operation till the *ſteel* falls into an impalpable black powder, then dry it for uſe. Mem. de l'Acad. des Scienc. 1736.

Mr. Boyle tells us of his having opened the body of *ſteel*, by a highly rectified ſpirit of urine made *per ſe*, and poured upon new filings of the *ſteel*. This being put into a warm place, the menſtruum diſſolved a conſiderable part of the metal. See his Works Abr. Vol. I. p. 77.

Annealing, or *nealing of* STEEL, is by ſome uſed for the ſoftening it, in order to make it work eaſier; which is uſually done by giving it a blood-red heat in the fire, and then taking it out, and letting it cool of itſelf. *Mox.* Mechan. Exerc. p. 60.

Some have pretended to ſecrets in annealing, by which they could bring down iron or *ſteel* to the temper of lead: this was to be done by often heating the metal in melting lead, and letting it cool again out of the lead. But this method is found by Moxon to have no other effect than what is had from the former. *Hought.* Collect. N° 276.

Steel may indeed be made a little ſofter than in the common way, by covering it with coarſe powder of cow-horn, or hoofs; thus incloſing it in a loam, heating the whole in a wood fire till it be red-hot, and then leaving the fire to go out of itſelf, and then the *ſteel* to cool. *Mox.* loc. cit.

STEEL *glaſſes*, a name given by ſome authors to the metalline ſpheres uſed in optics. Theſe, according to Cardan, are made of three parts of braſs, one part of tin, and one of ſilver, with an eighteenth part of antimony; but moſt either totally leave out the ſilver, or add only a twenty-fourth part, to ſave the expence. There are many other methods, directed by ſeveral authors, but moſt uſe arſenic and tartar, mixed with the metals. Theſe are afterwards to be poliſhed with emery, rotten-ſtone, putty, and the like. *Merret*'s Notes on Neri, p. 342.

STEEL-*ore*, is uſed to ſignify a particular kind of lead-ore. See LEAD-*ore*.

STEEL-*waters*. See the article *Mineral* WATERS.

STEELING, in cutlery, the laying on a piece of *ſteel* upon a larger maſs of iron, to make that part which is to receive the edge harder than the reſt. The body of an ax may very well be of iron, as it never comes into uſe to cut with, and perhaps is ſtronger, and leſs liable to break, than if of *ſteel*; but it muſt have a quantity of *ſteel* at that part where the edge is to be made.

STEELYARD (*Cycl.*)—*Chineſe* STEELYARD. The people of China carry this ſtatera about them to weigh their gems, and other things of value. The beam, or *yard*, is made of wood, and is round, and a quarter of an inch over, and about a foot in length; upon this are three rules of meaſure, made of a fine ſilver-ſtudded work, as in a watch-caſe. One of theſe rules is divided into inches, and every inch into 25 parts; the other two are divided alſo into equal parts, but not into inches. They all begin from the end of the beam, whence the firſt is extended 8 inches, the ſecond 6 and $\frac{1}{2}$, the third 8 and $\frac{1}{2}$. The firſt is the European meaſure, the other two ſeem to be China meaſure, and that of ſome other nation trading with them. At the other end of the *yard* hangs a round ſcale, marked with China characters, and at three ſeveral diſtances from this end are faſtened ſo many ſlender ſtrings; the firſt diſtance makes $\frac{8}{5}$ of an inch, the ſecond is double to the firſt, and the third 4 inches and $\frac{4}{5}$. When they weigh any thing, they hold up the *yard* by ſome of theſe ſtrings, and hang a ſealed weight, of about an ounce and $\frac{1}{4}$ troy weight, upon ſome point of the rule, as the thing requires. *Grew*'s Muſeum, p. 369.

STEELYARD-*ſwing*. In the Philoſophical Tranſactions we have an account of a *ſteelyard-ſwing*, propoſed as a mechanical method for aſſiſting children labouring under deformities, owing to the contraction of the muſcles on one ſide of the body. The crooked perſon is ſuſpended with cords under his arm, and theſe are placed at equal diſtances from the center of the beam. It is ſuppoſed that the gravity of the body will affect the contracted ſide, ſo as to put the muſcles upon the ſtretch; and hence by degrees the defect may be remedied. See N° 462. ſect. 7.

STEEVE, aboard a ſhip. The ſeamen ſay that the bow-ſprit, or the beak-head of a ſhip *ſteeves*, when it ſtands too upright, and not ſtrait enough forwards.

STEEVING, in merchant ſhips, is uſed for the ſtowing of cotton, or wool, by means of ſcrews, to force it cloſe together.

STEINBIZA, in ichthyology, a name given by Hildegard, and ſome other writers, to that ſmall ſpecies of cobitis, called by others *cobitis aculeatus*, and *tænia cornuta*. It is the *cobitis* with a forked ſpine under each eye, deſcribed by Artedi. *Hildegard*, lib. 4. p. 1. See COBITIS.

STEINHUN, *ſtone-hen*, a name given by the Germans to a bird of the lagopus kind, more commonly known by the name of *otomo*, and in ſome places by that of *colmeſtre*.

It ſeems not to differ from the lagopus in any thing but colour, and that bird being known to change its colour in the ſummer months, it is probably no other *ſpecies*. *Ray*'s Ornitholog. p. 127. See the articles LAGOPUS and OTOMO.

STELE, Στηλη, in antiquity, a kind of puniſhment, being a pillar whereon a criminal was expoſed, and on which was engraven an account of his crime.

The perſons, thus expoſed to the laughter and reproaches of the people, were called *ſtelitæ*. *Potter*, Archæol. Græc. lib. 1. cap. 25. Tom. I. p. 130.

STELECHEIA, a word uſed by ſome authors to expreſs the vena portæ.

STELECHITES, in the materia medica, a name given by Dioſcorides, and ſome other of the Greek writers, to a peculiarly fine kind of ſtorax. It was the ſame with the calamite, only that this name was given to the larger, and the name *calamite* to the ſmaller or ſlenderer pieces. Pliny, Strabo, and many others, join in telling us, that the wood of the ſtorax-tree was the moſt ſubject to be eaten by worms, of that of any tree in the world.

The ſoftneſs, and ſweet taſte it had, probably rendered it liable to theſe injuries. When the worms attacked a branch, they generally eat away all the wood, and left an empty caſe of the bark, ſo that inſtead of a ſtick, there was a hollow tube like a reed: all the while that the worms were eating, the wounded veſſels poured out their balſam, and covered at length the whole ſurface with their fine pellucid yellowiſh balſam. This was doing without, while the vermin were at work within, and in conſequence, the whole ſtick, or twig, became a hollow tube, covered over with the moſt pure and fine ſtorax. This was eſteemed beyond any other ſtorax for medicinal uſes; and when in ſmall twigs, it was called *calamites*, or *calamita*, and when on larger ſticks, it was called *ſtelechites ſtorax*. When the worms attacked the body of the tree, the duſt they made by their eroſion formed a hillock or heap round the tree, or at its foot, and the extravaſated balſam running among this duſt, made a maſs that was called the *cymatius ſtorax* at that time, and was the ſame with the common ſtorax now in uſe.

STELECHITES *ſtibii facie*, in natural hiſtory, a very uncouth name given by Aldrovandus, and ſome others, to the entrochi. He gave them this name from the reſemblance of ſome of the longeſt pieces to fragments of the trunks of trees, the arms parting out from the ſides of theſe main branches, the rudiments of which are very frequent in many

of the entrochi, paffing for the remains of boughs, and the hollow in the middle, for the cavity where the pith of the tree was. The addition of *ftibii facie*, was only from the obferving that the top and bottom were radiated, or ftriated, from the central hole to the circumference, in the manner of antimony. Thefe are truly no vegetable remains, but parts of the arms of that ftrange fifh called *ftella arborefcens*.

They are all fragments, or fhort pieces, broken from larger; the longeft pieces we meet with feldom exceed two inches in length, and we find from thefe down to fingle joints, as thin as a fixpence: thefe fingle joints are diftinguifhed by authors from the compound bodies, or entrochi, by the name *trochitæ*. The largeft that we find meafure two inches in circumference, but we have from this fize to the thicknefs of the fineft pin; about a quarter of an inch in diameter is, however, the moft frequent fize. The longeft pieces confift of from twenty to thirty joints, and are very various in their thicknefs. Thefe bodies are found fometimes in clay, and fometimes in marble. The Derbyfhire marble, of late come fo much into efteem, owes all its beauty to the great quantity of them it contains; and they in fome places make up all the fubftance of the maffes of rock, only with a very flender portion of ftone to join them.

They are ufually found thrown in irregular directions, and often fhew that they have fuffered injuries by accident. In fome the joints they are compofed of are diflocated, and thruft out of their place; in others the whole fubftance is crufhed flat, as if a hollow cane were trod upon, and fqueezed to flatnefs; and in this cafe, the cracks occafioned by the injury are always manifeft. Thefe injuries muft have happened to the entrochi, while their matter was yet foft; for at this time they are fo brittle, that the force employed to diflocate, or crufh them, would only fhatter them to pieces, not take that regular effect. In fome the whole feries of joints are diflocated, and the entrochus refembles a pile of crown pieces placed on a table, and then pufhed afide, fo as not to break the pile, but force all the feveral crowns, or joints of it, to hang over one way. Some of them are found twifted like a cord, and fome have the taints evenly arranged, but ftuffed full of extraneous matter, as bricks are laid in mortar. The joints of the entrochi vary in thicknefs, from the thicknefs of a fixpence to a quarter of an inch; but this is not proportioned by their fize, for there are fome of them as fmall as pins, which yet confift of very thick joints.

The outermoft joint is in fome more deeply, and in others more flightly furrowed; and the outer circle of the points, though generally fmooth, is fometimes radiated. The rudiments of branches from the entrochi are fmall knobs, evidently broken off: they are always placed in the middle of a thick joint, between future and future, and fometimes are fingle; but fometimes there is a whole circle of them round the body of the entrochus in that joint; and fometimes, befide a regular circle of knots, there are other fmaller eminences, like warts, which ftand irregularly above and below them, and give the whole a very irregular figure. Sometimes the entrochi with thinner joints are found thus knotted, and thefe feem to have been all over covered with joints of fmaller branches; and in the living ftate of the animal, when they were perfect, muft have made a very remarkable figure. Some joints have three regular rows of knots on them, each perfectly encompaffing the entrochus; the middle row, or circle, confifts of large knots, and the upper and lower one of fmall ones. Some of the joints, inftead of having a circle of knots, rife up regularly into a circular fharp ridge between future and future; and in fome of thofe which have no rudiment of a knot on any part, the joints all rife thus regularly into fharp ridges in the middle, but that alternately, and in a very beautiful order; the one joint having a high and large ridge, and the other a fmall and low one all the way. In others there is the fame fort of difference in the joints alternately, but the one ridge is blunt, and the other fharp, and edged all the way: in thefe the joints alfo are alternately larger and fmaller, one than another. In fome the alternate edges are knotted, and in fome there is a double edge in the middle of every joint: thefe have the appearance of being compofed of a very great number of extremely thin joints, but this is not in reality the cafe. Some of thefe laft have the double edge in the center of the joint knotted at intervals, and have the appearance of ferrate edges.

Moft of the entrochi have had branches, in greater or fmaller number, iffuing from them; in all they are inferted deep into the ftem, and often, when they have been difplaced, leave deep holes in it. The ftriature of the branches runs tranfverfely to the ftriature of the main ftem: thefe branches are of various thickneffes, and fometimes very thin ones grow upon very thick ftems; but the more general rule is, that the thicker the ftem, the thicker are the branches from it. Some of the branches from the largeft ftems are found to be branched again, but this is very rare. The pieces of entrochus which we find, however large, are ufually of a cylindric figure, as thick at one end as at the other; but there are fome few found which fwell out in the middle, and grow gradually taper to each end. Thefe Agricola has defcribed, and efteems them a diftinct kind; but thefe never terminate regularly, in the manner of perfect bodies, at the ends, but are all fragments as the others are. Phil. Tranf. N° 100.

STELENCHIS, a ftrigil, or an inftrument ufed in the baths to rub off the fweat from the fkin.

STELITÆ, Στηλῖται, in antiquity, perfons who had undergone the punifhment called *ftele*. See STELE.

STELLA (*Cycl.*)—STELLA *crinita*, in natural hiftory, a name given by Linkius to a genus of *ftar-fifh*, the characters of which are thefe; that they have more than five rays, and from thefe have feveral other lateral proceffes, which are covered with a fine down or hair.

STELLA *lapis*, in the materia medica, the name of a ftone which has been very differently interpreted by different writers. Some have fuppofed it the *afteria* of Pliny, and fome the common *corolloide aftroites*; but Mefue explains it to be the *lapis lazuli*.

This ftone, and the fapphire, being both blue gems, have been very fubject to be confounded together; and the fapphire of the antients was indeed no other than a kind of lapis lazuli; but this author has always diftinguifhed between the modern fapphire and the lapis lazuli, by calling the latter *ftella lapis*, and the former *zemphyrus*. This word has been by fome written *zephyrus*, and its meaning much doubted of, but it is plainly the name of the fapphire; and this word is only formed on the Arabian name of the fame gem, which is *femphir*. See the articles ZEMPHYRUS and SEMPHIR.

STELLA *lumbricalis*, in natural hiftory, a name given by Linkius, and others, to a kind of *ftar-fifh* with an undivided body, and with five vermiform rays.

STELLA *marina*, in natural hiftory, a genus of animals, the characters of which are thefe. It is a foft animal divided into many parts, or compofed of many fegments, or lobes, running out from a central part, and refembling the radii of a circle, or the rays of a *ftar*, as it is vulgarly painted. The central part is the body, and has always a mouth in its lower fide; and the rays, commonly called *arms*, and by fome very improperly *legs*, all ftand at equal diftances from one another. The upper part of the central nucleus of this animal is called the back, and the lower the belly, but in both thefe the ftructure is very different in the feveral diftinct fpecies of the creature.

The fkeleton of the *ftar-fifh* examined, fhews the body to be made up of joints, very different in number and figure; and in fome, this articulated fubftance is made up of very fmall, and in others of very large pieces; in fome alfo it is covered with a very thick fkin, and in others with a very thin one; this however, in the firmeft ftate, never approaches to a fhelly hardnefs, and is rather callous than teftaceous, or cruftaceous, as fome have called it. The parts, of which all thefe fifh are invariably compofed, are the trunk or body, and the lobes: thefe are of no determinate figure, nor have any thing certain, but that there is a mouth, or aperture, for the taking of food, in fome part of the under plane of the trunk; and the only apparent fenfation the animal has, is that of touch or feeling. The common pofition of the mouth is in the center of the body, and the conformation of it is this: the under part of each lobe runs toward a point with the reft at the center of the body, and thefe feveral productions of the lobes make a fort of lips, the ends of each of which are armed with a number of fharp teeth, which ferve to take and convey the food into the body. From this mouth there goes a feparate canal to all, or many of the lobes, which runs through their whole length, and becomes gradually narrower, as it approaches the extremity: thefe things are conftant in all the fpecies, all their other properties differ in the different ones.

Some genera of the *ftellæ marinæ* have their body multifid, and have juft as many canals in their belly as there are lobes or arms, one conftantly and regularly running to each; while others have feveral cylindric rays or lobes, which are not perforated with any canal: hence the general number of them are divided into the whole, and the multifid kinds. In the multifid kinds the lobes, or rays, are ufually five in number, though fometimes they are more, fometimes fewer: hence authors have eftablifhed a triple diftinction of thefe creatures. 1. Thofe which have juft five rays. 2. Thofe which have more than five. And 3. thofe which have a fmaller number than that. The whole bodied ones are alfo arranged into their feveral genera in the fame manner.

The moft frequent kind of *ftar-fifh* is that which has five rays, which iffue in the manner of fo many vermiform, or worm-like proceffes: thefe therefore are called *ftellæ vermiformes*, or the worm-like *ftar-fifh*. Another kind, nearly approaching to the nature of thefe, has more than five rays, and from the fides of thefe other tranfverfe proceffes being produced, which are covered with an extremely fine kind of down, or hairynefs: thefe are called the *hairy ftar-fifh*. A third kind is called the *aftrophyta*, or plant-like *ftar-fifh*: this is compofed of a body from whence there arife a great

number of branches, which divaricating more and more, are at length encreafed, or divided into a prodigious number; and thefe being cylindric in figure, refemble very much the branches of plants.

This general diftinction being eftablifhed, the general and particular arrangements are naturally deduced from the fubordinate diftinctions: from the moft remarkable differences in each feries of *ftellæ* of every clafs are conftituted the genera; from the lefs remarkable difference among each genus, the fubordinate diftinctions, and from the minuter diftinctions among thefe, the fpecies are diftinctly feparated from one another. The accurate Linkius has hence eftablifhed a very regular method of thefe animals, calling them by names expreffive of their differences, as *oligactis*, for fuch of the firft general divifion as have lefs than five lobes, or rays, and the like. Several of the fpecies of the *ftar-fifh* are eatable, and fome of them afford a very good nourifhment. Some are prefcribed by phyficians as ingredients in plaifters.

The foffile world has been greatly enriched by the fragments and remains of the feveral kinds of *ftar-fifh* which have been converted into ftone, and have been varioufly gueffed at in that ftate, as to their origin. The afteriæ are by many affirmed to be the foffile radii of the *ftar-fifh* of the decempede, or ten-rayed kind; and others have thought it evident, that fome fpecies of them have been the remains of the common coriaceous kinds. The encrinos, or *lilium lapideum*, feems to be a part of one of the ten-rayed kinds; and the trochitæ, and entrochi, are plainly owing to the fragments of feveral of thefe kinds. *Linkius*, de Stellis Marin.

STELLA *arborefcens*. See ARBORESCENT and BASKET-*fifh*.

STELLA *occidens*, a word ufed by fome of the chemical writers to exprefs fal armoniac.

STELLA *fcolopendroides*, in natural hiftory, a name given by Linkius to a kind of *ftar-fifh* with an undivided body, and five rays, refembling the bodies of the fcolopendræ, as thofe of the more ufual kind, called *ftella lumbricalis*, do the bodies of common earth-worms. See the article STELLA *marina*, fupra.

STELLA *vermiformis*, in natural hiftory, a name given by Linkius, and other authors, to a common kind of *ftar-fifh*, which has five rays parting from the body, each fomewhat refembling the body of a large worm. See the article STELLA *marina*, fupra.

STELLARIA, in botany, a name ufed by fome authors for the *carduus ftellatus*, or *ftar*-thiftle. *Ger.* Emac. Ind. 2.

STELLARIS *lapis*, a name given by many authors to the various fpecies of *aftroites*. See the articles ASTROITES and STAR-*ftone*.

The near alliance between this name and the *afteria*, though they are the names of two foffils of an extremely different kind, has been the occafion of great errors. Authors, not converfant in foffils, have too haftily attributed to one of them the properties of the other.

Cambden tells us, that about Bevor-Caftle there are found *aftroitæ*, which he very well defcribes, as confifting of the reprefentation of feveral *ftars* fixed together by a flinty, or other extraneous matter.

STELLATE *leaf*, among botanifts. See LEAF.

STELLIO, in zoology, the name by which authors call the fwift, or fpotted lizard. The fpots which diftinguifh this kind are not, however, ftellated, as might be fuppofed from the name, but round; fome fmall, and fcattered irregularly all over the body; and others larger, and difpofed in thirteen zones, or femicircles. The fpots are much more diftinct and clear on the back than on the belly. It is common in Syria, and fome other places.

STELLIO *adufta*, an affected term ufed by fome chemical writers for cinnabar.

STELLITES, in natural hiftory, a name given by fome writers on foffils to a kind of white ftone found on Mount Libanus, and in fome other parts of Syria, containing the lineaments of the ftar-fifh compleat.

The fame ftones frequently contain the lineaments of other fifhes, principally of the bones, or fkeletons of them; and it is very certain, that the real bodies of thefe ftar-fifhes, and the bones of other fifh, after the flefh and fkin had been corrupted and worn off, have been received into this ftone while yet foft, and afterwards retained in it after its concretion: our own coal-flates fhew us innumerable inftances of leaves of plants; and the black flate of ifleb fhews us, fifhes thus preferved.

STEM (*Cycl.*)—*Falfe* STEM, in a fhip, that fixed before the right one. When a fhip's *ftem* is too flat, fo that fhe cannot keep a wind well, they ufe to put a *falfe ftem* above, which makes her rid more way, and bear a better fail.

STEMPHYLA, a word ufed by the antients to exprefs the hufks of grapes, or the remains of the preffings of wine. The fame word is alfo ufed by fome to exprefs the remaining mafs of the olives, after the oil is preffed out.

STEMPHYLITES, a name given by the antients to a fort of wine preffed hard from the hufks.

STEMPLES, in mining, crofs bars of wood in the fhafts which are funk to mines.

In many places the way is to fink a perpendicular hole, or fhaft, the fides of which they ftrengthen from top to bottom with wood-work, to prevent the earth from falling in: the tranfverfe pieces of wood, ufed to this purpofe, they call *ftemples*, and by means of thefe the miners in fome places defcend, without ufing any rope, catching hold of thefe with their hands and feet. *Ray*'s Engl. Words, p. 118.

STENO'*s duct*, a name given from its difcoverer to the fuperior falival duct. See SALIVAL, *Cycl.*

Several anatomifts, particularly Heifter and Palfyn, have difputed whether *Steno's duct* is pervious in recent fubjects, as well as in the fkeleton. Dr. Kulm affirms, he has demonftrated it to feveral to be pervious in deer, bears, wild goats, hares, calves, and in the human fubjects; and mentions the manner of tracing it. See Med. Eff. Edinb. Abridg. Vol. 2. p. 421.

STENOMARGA, in natural hiftory, a name ufed by fome authors for a light marly earth, more ufually called *agaricus mineralis*, and *lac lunæ* by the later writers, and *terra*, or *creta Seleneufiaca*, by Diofcorides and Galen. *Agricola*, de re Metal. p. 378.

STENTATO, in the Italian mufic, is ufed to fignify that the voice fhould be forced in fome part of a fong, or on fome particular found, to exprefs an extraordinary emotion.

STEP (*Cycl.*)—STEP, in a fhip, that piece of timber whereon the mafts or capftans do ftand at bottom, is called the *ftep* of the maft or capftan.

STEPHANITÆ, Στεφανῖται, in antiquity, an epithet given to games and exercifes, where the prize was only a garland. *Potter*, Archæolog. Græc. Tom. I. p. 451.

STEPHANOPHORUS, Στεφανοφόρος, in antiquity, the chief prieft of Pallas, who prefided over the reft. It was ufual for every God to have a chief prieft; that of Pallas was the *ftephanophorus*, juft mentioned, and that of Hercules was called *dadouchus*. *Potter*, Archæol. Græc. Tom. I. p. 206. See DADOUCHUS.

STEPHANOPHORUS was alfo a prieft that affifted the women in the celebration of the feftival Thefmophoria. Id. Tom. I. p. 403. See THESMOPHORIA.

STEPHENS'*s medicine for the ftone* (*Cycl.*)—Mrs. *Stephens* having fold medicines for the ftone in the bladder or kidneys, Dr. Hartley publifhed feveral cafes of their fuccefs; and fo much was faid of them, that the parliament appointed truftees to examine into the truth of what was alledged in their favour. The report of thefe truftees being favourable, fhe had five thoufand pounds fterling ordered her for publifhing the receipt. Dr. Hartley leaving out the fuperfluous part of Mrs. *Stephens*'s prefcription, reduces her receipt to a more fimple form; to wit, to two ounces and an half of foap, and feven fcruples and an half of egg-fhell powder, as the mean dofe of the medicines to be taken. Dr. Hales, after feveral trials on the different ingredients, found that the diffolving power of them lay in the lime, which Dr. Rutty confirmed; and Dr. Jurin having taken foap-lees, the ingredients of which are pot-afhes and lime, beginning with a few drops, and increafing the quantity till he took an ounce, or an ounce and an half every day, in a proper vehicle, was cured of bloody urine, pain, &c. and paffed feveral fmall ftones; after which he had no uneafinefs.

STERA, in anatomy, a word ufed by fome of the barbarous writers to exprefs the uterus. It feems to have been only a corruption of the word *hyftera*.

STERCORARIUS *pifcis*, the *dung-fifh*, the name of an Eaft-Indian fifh; fo called, from its frequenting neceffary-houfes which are over the water, and other places, where the like naftinefs is to be found. It is for this reafon fuppofed unwholefome by fome, but is really a very well-tafted fifh, and eaten by moft people where it is to be had. It is a broad and thin fifh, of about fix or feven inches long, and nearly as much in breadth. Its back is variegated with fpots of deep brown; its belly is bluifh. *Ray*'s Ichthyogr. Append. p. 2.

STERCUMEZEFF, an affected word ufed by fome of the chemical writers for litharge.

STEREO-*ftatics*, is ufed by fome for the *ftatics*, or fcience of the equilibrium of folid bodies. *Curtel.* Math. Univ. p. 79.

STERN (*Cycl.*)—STERN-*faft*, aboard a fhip, fome faftenings of ropes, &c. behind the *ftern* of a fhip, to which a cable or hawfer may be brought, or fixed, in order to hold her *ftern* to a wharf, &c.

STERN-*pofts*, in a fhip, a great timber let into the keel at the *ftern* of a fhip, fomewhat floping, into which are faftened the after-planks; and on this poft, by its pintle and gudgeons, hangs the rudder.

STERNA, in zoology, a name by which Turner, and fome others, have called a bird, known among authors by the name of the *hirundo marina*, or fea-fwallow.

It is of the fmaller kind of *lari*, or gulls, and has a forked tail. It is called the *fea-fwallow*, from its having very long wings, very fhort legs, and a forked tail, and its being almoft always on the wing. Its ufual weight is about five ounces. Its body is of a long and flender fhape, the upper part of its head is black, but it has a white line furrounding it; the belly, and under part of the wings, are white, the breaft

breaſt a little greyiſh; the rump is alſo white, but the back and wings of a blackiſh grey; its beak is ſomewhat long and ſtrait, and its legs are red. It is very common on our weſtern coaſts. It feeds on fiſh, and flies uſually in large flocks. *Ray's* Ornitholog. p. 269.

STERNOCOSTALES, commonly called the *muſculi triangulares ſterni*, are five pairs of fleſhy planes, diſpoſed more or leſs obliquely on each ſide the ſternum, on the inſides of the cartilages of the ſecond, third, fourth, fifth, and ſixth true ribs. They are inſerted by one extremity in the edges of the inſide of all the lower half of the ſternum; from thence the firſt muſcle on each ſide runs up obliquely, and is fixed in the cartilage of the ſecond rib. The ſecond runs leſs obliquely to its inſertion in the cartilage of the third rib; and the reſt are inſerted, in the ſame manner, in the cartilages of the following ribs; their obliquity decreaſing, and their length encreaſing, in proportion as they are ſituated lower down, ſo that the loweſt of all is almoſt tranſverſe. This laſt muſcle, which is fixed by one extremity in the cartilage of the ſixth true rib near the bone, ſeems to paſs the appendix enſiformis, immediately above the inſertion of the diaphragm in that appendix, and to join the muſcle on the other ſide. *Winſlow's* Anatomy, p. 233.

The *ſternocoſtalis* was called by ſome of the older anatomiſts *ſextus thoracis*; and by Riolanus, and ſome others of the later writers, *pectoralis internus*.

STERNODACTYLÆUS, in anatomy, a name given by Riolanus, and ſome others, to a muſcle of the foot, called by Albinus the *flexor brevis digitorum pedis*, and by others the *ſublimis flexor*, or *perforatus pedis*.

STERNOHYOIDÆUS, a long, thin, flat muſcle, called by ſome *ſterno-cleido-hyoidæus*.

It is broader at the lower than at the upper part, and is ſituated, together with its fellow, on the foreſide of the throat; from whence ſome have very improperly named it *muſculus bronchialis*. It is fixed by its lower extremity in the ſuperior and lateral part of the inner, or poſterior ſide of the ſternum, in the poſterior part of the ſternal extremity of the clavicula, in the tranſverſe ligament which connects thoſe two bones, and in the inner, or backſide of the cartilage of the firſt rib. All theſe other inſertions are more conſiderable than that in the ſternum, which is ſometimes ſcarce perceivable. From hence it runs up to the foreſide of the aſpera arteria, joined to its fellow by a membrane which forms a ſort of linea alba, and is inſerted laterally in the lower edge of the baſis of the os hyoides. There is ſometimes a tranſverſe tendinous line about the middle of the backſide of this muſcle. *Winſlow's* Anatomy, p. 256.

STERNOMANTIS, Στερνομάντις, in antiquity, a deſignation given to the delphian prieſteſs, more uſually called *pythia*. *Potter*, Archæol. Græc. Tom. I. p. 278. See the article Pythia, *Cycl.*

Sternomantis is alſo uſed for any one that had a propheſying demon within him. *Potter*, Archæol. Græc. Tom. I. p. 300, ſeq.

STERNOMASTOIDÆUS, a muſcle, called alſo ſimply *maſtoideus*, and *maſtoidæus anterior*, or *externus*. It is long and narrow, pretty thick, and moſtly fleſhy, and is ſituated obliquely between the back part of the ear, and the lower part of the throat. It is in a manner compoſed of two muſcles, united at the upper part through their whole breadth, and ſeparated at the lower. It has two inſertions below both of them, flat, and a little tendinous; the firſt is in the upper edge of the ſternum, near the articulation of the clavicula; and the other in the clavicula, at a ſmall diſtance from the ſternum. Theſe two portions run up obliquely, and unite together at about an inch above their lower inſertions, the triangular ſpace left between them being filled by a membrane. The ſternal portion riſes foremoſt, and covers the clavicular, both forming one body, or belly, which running in the ſame oblique direction to the apophyſis maſtoidæus, is inſerted in the upper and back part of that proceſs, over which it likewiſe ſends off a very broad aponeuroſis, which covers the ſplenius, and is inſerted in the os occipitis. The two anterior maſtoidæi repreſent a great Roman V, the angle being at the lower part of the throat, and the two crura running up behind the ears. *Winſlow's* Anatomy, p. 234.

STERNUM (*Cycl.*)—This is a long flat bone, not all of the ſame breadth, but repreſenting a kind of dagger. It is generally made up of three principal pieces; the firſt broad and ſhort, the ſecond longer and narrower, and the third a ſort of ſmall appendix, called by the Greeks *xyphoides*, from its reſemblance to the point of a broad ſword.

The firſt, or uppermoſt piece, is broad and thick at the top, but thinner and narrower below, being nearly of the figure of a triangle with the three angles cut off, or of a very irregular ſquare. The ſecond is much longer than the firſt, and is flat on both ſides, whereas the outſide of the upper is unequally convex, and the inner a little concave. This is broader alſo toward the lower, than toward the upper part, and has ſometimes ſeveral tranſverſe lines, eſpecially on its outſide, which point out the places where the pieces, of which it is made up in children, are joined together. The two lateral edges of this bone have each one cartilaginous half notch, and five cartilaginous whole notches; the half notches are at the upper part of the lateral edges, and the five entire notches come nearer to each other, in proportion as they are lower, and part of the laſt properly belongs to the third piece.

The third piece, commonly called *cartilago enſiformis*, and *xyphoides*, is entirely cartilaginous in infants, and young ſubjects, but in an advanced age it generally oſſifies, either wholly, or in part. This piece is joined to the lower extremity of the ſecond, between the cartilages of the laſt true ribs, and is often more or leſs notched on each ſide, to form part of the articular notches of the *ſternum*. Its figure and ſize vary, and in ſome ſubjects it is forked, and in others perforated. Sometimes alſo it is very large, and at others very ſmall, hardly exceeding in ſome ſubjects the third part of an inch. The inner ſubſtance of the *ſternum* is almoſt all cellulous, and very tender; it is covered with a thin, but compact lamina. The *ſternum* compleats the fore part of the cavity of the thorax, and ſuſtains the anterior extremities of the ribs; being ſufficiently fixed to reſiſt compreſſions, and other outward accidents, and yet moveable enough, by means of its articulation with the cartilages of the ribs, not to obſtruct the motions neceſſary to reſpiration. It ſerves alſo for the inſertion of ſeveral muſcles, and to ſupport the mediaſtinum. *Winſlow's* Anatomy, p. 67.

We owe to Mr. Hunauld a very judicious account of the perforation which is ſometimes found in the lower part of the *ſternum*.

This perforation is ſometimes larger, ſometimes ſmaller; and a certain German author has found a very ſingular uſe for it, ſuppoſing that it gives paſſage to the mamillary veins and arteries; but Mr. Hunauld, though he had often found the *ſternum* thus perforated, never could obſerve any veſſels paſſing it, but always found it filled up with a cartilaginous ſubſtance. The German author does not poſitively affirm that he ſaw the veſſels paſſing through this perforation, and Mr. Hunauld ſuppoſes it to have been but a conjecture, that this might be its uſe. Its origin and formation, however, may be more rationally accounted for on much ſounder principles.

The *ſternum* is in its firſt ſtate wholly cartilaginous, and the oſſification begins afterwards in ſeveral different parts of it: the number of theſe oſſifying ſpots is wholly uncertain, but as they encreaſe they unite, ſooner or later, into three pieces, and afterwards theſe three pieces unite themſelves, ſo as to form only one. If therefore, when theſe different oſſifications begin to unite, there be ſome place where the oſſification has been impeded, this place, or ſpot, muſt remain only of a cartilaginous ſubſtance, and in making the ſkeleton, this cartilage will be ſeparated from the bones, and will conſequently leave a perforation in the *ſternum*; and what makes this the more probable, is, that this perforation, which is ſo commonly ſeen in ſkeletons, is never found in diſſecting the recent body. It may alſo have happened, that the three pieces of bone, which conſtitute the *ſternum*, by uniting at their edges, may, in acquiring their growth and ſolidity, have naturally left a vacancy between them. We never find a perforation of this kind in the upper part of the *ſternum*, which is probably owing to that part of it being only one piece in the earlier times, and not oſſifying in different places and ſpots at the ſame time; as is always the caſe in regard to this lower part of the *ſternum*, where the perforation is always found. Mem. Acad. Par. 1740.

Cartilages of the Sternum. The *ſternum* of an adult ſubject has commonly ſixteen cartilages; fourteen of the number are articular, the other two are ſymphyſes. Of the former, two belong to the articulations of the clavicle, and twelve to thoſe of the true ribs, from the ſecond to the ſeventh incluſively; and the two ſymphyſes are both between the *ſternum*, and the firſt rib on each ſide. There is likewiſe another ſymphyſis, by which the upper portion of the *ſternum* is connected to the lower; but the cartilage of this is often obliterated in advanced age. The apophyſis enſiformis is often long toward the *ſternum*, and more or leſs cartilaginous toward the other end. This has, in very aged perſons, been ſometimes found entirely oſſified, and ſometimes wholly cartilaginous even in adults. *Winſlow's* Anatomy, p. 149.

Ligaments of the Sternum. The *ſternum* has ſeveral ligaments, by which it is connected to the clavicles and ribs. It is joined to the clavicles by ſtrong ſhort ligaments, fixed by one extremity round the edges of its two ſuperior notches, and by the other in the extremity of each clavicle, and by the middle to the inter-articular cartilages, ſurrounding the particular ligaments which go between the edges of theſe cartilages and the *ſternum*. *Winſlow's* Anatomy, p. 149.

Sternum *fractured*. The *ſternum* is equally ſubject to depreſſions and fractures, from falls and blows, with the reſt of the bones. When either of theſe accidents happen to it, the part is not only uneven and painful, but the ſubjacent arteries and veins are alſo contuſed and ruptured; whence ariſe pains in the breaſt, difficulty of breathing, violent coughs, ſpitting of blood, or elſe extravaſations of it in the

præcordia, or between the duplicatures of the mediaftinum, with many bad fymptoms of the like nature. The figns of a *fractured fternum* will therefore be very evident by thefe, and by its being moveable to the touch, efpecially when one part of it grates againft another, and when there is a cavity and inequality very remarkably vifible there.

In order to reduce a fracture of this bone, the patient muft be laid on his back on a bed, or hard even place, as a table, putting a hard pillow, a large parcel of cloth rolled up, or fome other fuch body, under his back, and preffing down his fhoulders, by which means the *fractured fternum* will be elevated and extended; and to facilitate the reduction, the furgeon muft prefs the bones of the *fternum* together, and fhake them very ftrongly. But when this method is impracticable, or not proper, the fkin muft be divided, and the depreffed part of the *fternum* lifted up into its place, by means of an elevator, or elfe of a fcrew gently wormed into the part, and afterwards pulled upwards; and when it has regained its natural fituation, it muft be kept in it by the proper bandages. If after the reduction violent pains continue under the *fternum*, and if blood fhould gather, and fuppurate internally, between the duplicature of the mediaftinum, the lower part of the *fternum* ought to be trepanned, as the cranium on the like occafions; and when the putrid matter is difcharged, and the wound cleanfed, it muft be healed with vulnerary balfams; and if any blood fhould be found difcharged into the cavity of the thorax, the cure muft entirely depend on the evacuating that by the paracentefis, in the manner of wounds of the thorax. *Heifter*, p. 122.

STHENIA, Σθενια, in antiquity, a feftival of Argos, fuppofed to be kept in honour of Minerva, furnamed Σθενιας from σθενος, ftrength. *Potter*, Archæol. Græc. Tom. I. p. 430.

STIÆ, a word ufed by fome of the old authors for pebbles found on the fea-fhore.

STIBIALIA, a term ufed by fome to exprefs the antimonial medicines.

STIBADIUM, among the Romans, a low kind of table-couch, or bed of a circular form, which fucceeded to the triclinia, and was of different fizes, according to the number of guefts they were defigned for. They were called *hexaclina*, *octaclina*, or *enneaclina*, according as they held fix, eight, or nine guefts, and fo of any other number.

STIBINUS *color*, a term ufed by St. Jerom, and others, to exprefs the falfe black colour which the antient Jews, and other Eaftern people, gave to their eye-brows with *ftibium*, or antimony.

STIBIUM, *antimonium*, antimony. See ANTIMONY, *Cycl.*

This is a mineral never found native in its perfect ftate, but always intimately mixed with, and penetrated by fulphur, and other extraneous matter, and by it reduced to the ftate of an ore. In this condition it is ever found in the earth, and according to the different proportions of fulphur, or other matter, it contains, it affumes very different appearances.

It is moft commonly found in form of a very hard and heavy lead-coloured fubftance, compofed of a number of extremely fmall granules, all very bright and fparkling, and giving it the appearance of a lump of the pureft fteel when frefh broken. This is what is commonly underftood by the name *antimony ore*, and is what is fold under that title in the German fhops.

Not unfrequently, however, it appears of a fomewhat more lax texture, lefs heavy, but much more bright, and compofed of fmall, but vifibly broad and flat particles, of a very pale whitifh lead colour, and glittering appearance, like that of many of the lead ores. This is called *broad-grained antimony ore*.

Sometimes alfo, but lefs frequently, *antimony* appears in form of bright maffes, made up of multitudes of parallel flender filaments, of a bright fteel colour, and more glittering hue than in either of the former ftates: thefe filaments are of different breadths and thickneffes in the feveral maffes. Thefe are generally known by the name of *ftriated*, or *plumofe antimony ore*.

Thefe are the moft natural and fimple appearances of this foffil, but befide thefe it is liable to a multitude of other very different ones, as it fometimes contains iron mixed among its own matter, and very frequently filver; thefe may naturally be fuppofed to give it fome differences in its appearance: but befide thefe it is fubject to much greater, from its admixtures with the common marcafites and pyritæ; thefe often tinge the whole body of the ore to a filvery white, or to a golden yellow.

Antimony ores are found in fiffures and veins at different depths, and often very near the furface, and is varioufly accompanied with fpars, cryftals, fulphurs, and other fubftances. Sometimes the veins of it are every way furrounded by a tolerably pure yellow native fulphur; fometimes with a more debafed matter, made of a mixture of fulphurs, earth and fpar, differing according to the different difpofition and admixture of thefe bodies.

Antimony is found in great abundance in England and Germany; we have feveral mines of it in Cornwall; and Germany, Hungary, and many other parts of the world, afford it in very great abundance.

To reduce it to a ftate fit for ufe, it is to be feparated from its ore by the force of fire, and by the affiftance of fuch ingredients as break the mutual connection between the fulphureous and the reguline part, which mutually diffolving each other, keep the concrete in the ftate of ore. The addition of iron is able to do this; and that of filver, copper, and other metals, has alfo the fame effect.

There have not been wanting perfons, who have pretended to extract a mere running mercury from *antimony*, and Mr. Boyle believed it might be done: but this is one of the many great things pretended to by chemiftry, of which we have yet no fufficient proof.

Antimony, when feparated from its ore, is very eafily fufible, and runs the thinneft of all the bodies of this kind. It greatly promotes the fufion of other foffils, but it makes every thing brittle that it is mixed with. It is of great ufe in medicine, chemiftry, and mechanics, and in its feveral preparations is diaphoretic, cathartic, and emetic. The chemifts ufe it greatly in their operations on other metals, and it is an ingredient in pewter, bell-metal, and the mixt metal, of which types are made for printing. *Hill's* Hift. of Foff. p. 623.

Mr. Geoffroy has been the inventor of a new method of treating this mineral, by which it yields much more regulus than according to thofe prefcribed by Kunkel and Stahl, and is purified without the addition of falts, and with very little lofs.

It is generally fuppofed, that the vapours of *antimony* are poifonous when raifed by fire, but it appears otherwife from the operations this gentleman made on it; the fame operator having once gone through fixty calcinations of twelve ounces of *antimony*, without receiving any harm from it: whence it is very evident, that the common opinion of the fumes of *antimony* containing an arfenical fulphur is an erroneous one; and it may be added, that one great mark of *antimony*'s being good, is, that it lofes a great deal of its weight in calcination. It has more fulphur in this cafe, which the fire raifes in a vapour, and lefs of the terreftrial matter or fpar, which are ufually very abundant in it. It has been proved by experiment, that the fulphur of *antimony* is a neceffary and effential part of its conftruction, fince without this it is no longer emetic; but this fulphur is only neceffary in a certain proportion; for it is found, that when it is more abundant in the *antimony*, the whole lofes in proportion of its emetic quality; and Mr. Geoffroy has found by repeated experiment, that to give this virtue in its greateft degree, the *antimony* is firft to be divefted of its native fulphur, much of which is of no ufe as to this intention, and is then to be melted with a gentle fire in a crucible with a quantity of foap, made from a ftrong lixivium of pot-afhes, quick-lime, and oil, united by boiling into a folid mafs.

The *antimony* melted with this, after a fufficient previous calcination, affords a fort of glaffy cruft of fcoriæ, which covers a quantity of compact regulus lying at the bottom of the crucible. Thefe fcoriæ are a fort of blackifh glafs, which melts in the flame of a candle, but does not run on being expofed to the air. This is plainly compofed of the burnt oil of the foap, united with the acid of fulphur of *antimony*, and a vitrification made with fome earthy particles, and the falts of the foap; this vitrification is what preferves the fatty matter from being liquified by the air. When thefe fcoriæ are feparated from the reguline matter, if that be again melted, with an addition of an alkali falt and of the powder of white cryftal glafs, there is produced a purer regulus than can be obtained by any other known method, and in a larger quantity, by two ounces from the pound, than ever Stahl, or Kunkel, were able to procure. Mr. Geoffroy, by thefe nice obfervations and experiments, difcovered that *antimony* contained much lefs common fulphur than had been generally fuppofed, fince it can be made to lofe, at the utmoft, only three ounces and five drachms in the pound in calcination. The emetic quality of the regulus proves, however, that it yet contains a very large fhare of fulphur, though of another kind: this Mr. Geoffroy diftinguifhes from the common fulphur, by the name of the *metallic fulphur*. Mem. Acad. Scienc. Par. 1736.

Acid of ANTIMONY. Mr. Charras was the firft author who gave the world a fuccinct method of drawing an acid liquor from *antimony*. He did it thus: he mixed crude *antimony* ore in powder with three times its weight of fand, this he diftilled in a large retort into a capacious receiver, filled half full of river water, and on rectifying this, the acid liquor was to be produced. Himfelf acknowledges, however, that this, though a fuccinct, is not always a certain method, for that fometimes the acid liquor was produced, and fometimes not: this, however, he attributes wholly to the management of the fire, which he fays will always afford the acid, if conducted regularly through its feveral degrees. But Mr. Homberg trying this experiment feveral times, and finding it fometimes fucceed, and at other times not, though the fame cautions were ufed, difcovered at length that this variation,

riation, in the ſucceſs of the proceſs, was not occaſioned by any difference in the fire, but by the different nature of the matter employed. The crude ore of *antimony* ſometimes being mixed with a white argillaceous earth, and ſometimes free from this admixture; he found, that when it had this white earth in any great proportion, it never failed to yield this acid liquor; and that when it had none of it, it never could be made to yield a drop of acid; and conſequently, that this was not an acid extracted from *antimony*, but merely from the earth, as common pipe-clay, or any of our argillaceous earths, will yield an acid by means of a ſtrong fire.

This liquor had therefore been very improperly called the *vinegar of antimony*; and it is evident, that whatever acid *antimony* contains, muſt be of the nature of ſpirit of ſulphur, ſince ſulphur ſo greatly abounds in the compoſition of that mineral, and its ſulphur is wholly the ſame with the common brimſtone. Whatever acid, therefore, of this kind could be produced, muſt be of the nature of that collected from the fumes of burning ſulphur; and, even though it were produced from *antimony*, could have nothing of the nature of *antimony* in it, ſince it would be wholly the produce of the common ſulphur in that mineral, and not of the reguline part, which alone is properly *antimony*. Experiment alſo proves the truth of this opinion, the *acid of antimony*, truly ſeparated from it, being no way different, in any particular, from that of crude ſulphur.

There are ſeveral ways by which it may be made, but the following ſeems the eaſieſt and moſt familiar. Powder crude *antimony* very fine, lay it in an earthen diſh not glazed, and of a conſiderable width at the top; cover this diſh with an earthen pot, with the bottom taken out, and fit to this three earthen aludels, and cover the mouth of the uppermoſt aludel with a large glaſs bell; the edges of which muſt be ſuſtained about a quarter of an inch above a veſſel of water, kept ſo hot, as to fumigate the inſide of the bell; the water that runs down from the bell, will be received again into the veſſel of water. In the middle of the earthen pot, which covers the diſh of *antimony*, there muſt be a hole, large enough to admit the handle of an iron ladle, or ſome ſuch other inſtrument, to ſtir about the *antimony*. The fire being made under the earthen diſh, and continued a proper time, there will be found the flowers of *antimony* in the aludels, a little acid liquor in the water of the veſſel kept under the bell, and the *antimony* will be found calcined in the diſh.

It is but little acid that can be obtained in this manner, but then it is aſſuredly the pure acid of the ſulphur of *antimony*. Sometimes this method furniſhes alſo little or no acid, but this depends on the care of the operator, and the temperature of the air; for the colder and moiſter the ſeaſon is, the more acid will be obtained, and the hotter and drier it is, the leſs. The operation, whenever ſo perfect, is however of little value, the acid being every way the ſame with that of common ſulphur. Mem. Acad. Par. 1700.

Infuſion of ANTIMONY. Mr. Homberg being well aſſured, that water was a menſtruum capable of diſſolving all the metals, if properly applied, uſed it, in ſeveral different manners, in his analyſis of *antimony*. He made an *infuſion of antimony* in water, putting into ſeveral glaſs veſſels crude *antimony*, coarſely powdered, five pounds into each veſſel, and to each of theſe quantities he added two pints of rain water; after the *antimony* had ſtood thus for ſix months, the ſeveral parcels were uſed on different occaſions, one only excepted, which had been forgotten, and had at length ſtood two winters and a ſummer: having at length found this veſſel, he obſerved that its inſide was every where coated over with configurations of leaves; he at firſt ſuppoſed this to be owing to ſome ſalts of the *antimony*, which had been diſſolved in the water, and had afterwards cryſtallized themſelves in this manner, as the butter of *antimony* is ſometimes known to do in ſublimation; but on rubbing the ſides of the veſſel with a finger, and afterwards ſcraping them with a knife, he found that they were covered with a yellowiſh pellicle, without the leaſt appearance of ſalt, and that the configurations of the leaves were not raiſed upon this pellicle, but ſunk, as if graved by a tool. The water taſted ſomewhat acid, and being tried on turnſol, and on different metallic ſolutions, it turned the turnſol to a light red, and turned a ſolution of ſilver white; whence it appeared to be an acid, and of the nature of that of ſea-ſalt. The ſunſhine had turned this water ſower, had made it act upon the *antimony*, and take up a part of its ſalt. This ſalt, in the winter, was probably afterwards concreted into the figures of leaves, formed upon the mud depoſited by the water on the ſides of the veſſel; and theſe ſalts being afterwards diſſolved again in ſome hotter weather, had eaten their way into this ſediment of mud, in the form of the leaves, &c. in which they had concreted. Mem. Acad. Par. 1693.

Texture of STIBIUM. Monſieur de Reaumur gives the following account of the contexture of *antimony*, or *ſtibium*.

Nothing is more common, than to obſerve on the ſurface of broken *antimony* long and ſhining needles, as it were; and that *antimony*, on which theſe are moſt diſtinct and viſible, is eſteemed the beſt. Sometimes theſe ſtreaks are ranged with ſo much order, and branch out ſo regularly in certain directions, that thoſe who are ever ſo converſant with it, cannot but admire its beauty. The figures of the conſtituent molecules of this mineral may poſſibly contribute ſomething to the formation of theſe needles, but the texture, and configuration of the conſtituent parts, will not alone account for the diſpoſition of theſe ſtreaks, and their arrangements, in regard to one another; ſince upon breaking different lumps of the ſame *antimony*, and thoſe of the ſame ſhape, we frequently obſerve quite different configurations of the needles. Let us take, for inſtance, equal maſſes of *antimony* of a regular conic figure, theſe being moſt frequent, from the ſhape of the veſſel they cool in, which reſembles a funnel, or inverted cone; let ſeveral of theſe conical maſſes be broken into different parts, and we ſhall ſee the needles in very different directions in theſe ſeveral parts.

In one of theſe maſſes, from a certain height, we may obſerve all theſe needles directed to the point of the cone; in a piece taken from a little higher, the needles ſhall be horizontal, or nearly perpendicular to the former; above theſe we ſhall find others, which ſometimes direct themſelves toward ſome point in the baſe of the cone, and ſometimes form themſelves into different cones with their ſeveral ſummits.

In another of theſe maſſes we ſhall not find the needles diſpoſed into a horizontal direction, but running into ſmall conical parcels, in directions quite reverſe one to another; that is, ſome of them ſhall have their ſummits toward the baſe of the cone, and others toward its apex. In ſome lumps alſo we ſhall diſcover needles every where, and in others no where at all; and often the needles are found in one part of the lump, with no appearance of them in the others. Sometimes alſo we ſhall find the inſide of a maſs regularly diſpoſed into cones, though the outſide is of no ſuch figure, for the internal cones have no dependance upon the external figure of the maſs; and ſometimes the needles are diſpoſed along the ſides of the cone, and their direction ſeems to follow the ſides of the veſſel in which they were fixed. Notwithſtanding, however, all theſe varieties in form, the cauſe of all the appearances is wholly the ſame, and is no other than that refrigeration, by which the maſs is changed from a fluid into a ſolid ſtate; and to the progreſs of this the needles plainly owe their different directions.

All melted metals cool firſt at the tops and ſides, and thence by degrees through the whole body of the maſs: the particles at the ſides and top, which firſt cool, becoming fixt to thoſe which are neareſt them, affix thoſe, and they are the next that cool, and ſo on, in ſucceſſive order; now moleculæ, of whatever ſhape, thus affixed ſucceſſively to each other, form a kind of threads or needles, the ſeveral directions of which ſhew the order in which the refrigeration has been carried on.

If the crucible, or other veſſel, in which the melted *antimony* is ſuffered to cool, were in the ſhape of a hollow bowl; if its ſides were every where equally thick, and equally warm, and acted equally upon by an air equally cold; and if the melted ſubſtance were of the ſame uniform nature, alſo, in all its parts, all the needles or fibres would be then ſo many rays, terminating in the center of the bowl; and if the ſubſtance were ſuch, that its fixed particles were naturally all of a length, we ſhould find ſo many concentrical beds of needles, formed by parcels of each ray, and lying at equal diſtances from the center.

But ſo many regular circumſtances do not concur in the cooling of melted *antimony*; and hence the beforementioned irregularities muſt neceſſarily ariſe. In melting *antimony* in conical crucibles, and ſuffering it to cool in them, the needles may be determined ſeveral ways, to any directions one may chooſe.

If, when the crucible is taken from the fire, it be ſet to cool upon ſome cold body, the conſequence is, that the bottom and top of the *antimony* muſt cool firſt, and the needles will be found diſpoſed into two cones, the one having its baſe at the apex, and the other at the baſe of the large, or general cone: but if the crucible be ſet on burning coals, and the ſurface of the *antimony* covered with more coals, then the ſides muſt cool firſt, and the needles will be found running horizontally, or forming themſelves into horizontal cones: the touching the ſides of the crucible alſo, at times, with a wet cloth, and by that means forcing the melted matter to cool firſt in ſuch particular places, will give cones of needles directed horizontally, and having their baſes at thoſe ſpots of the crucible ſo forcibly cooled.

Not unfrequently there is found a hollow in the midſt of a conical maſs of *antimony*, and in that caſe there are ever found needles proceeding in different directions from the ſides of that cavity inwards, as they, when cooled, became of the ſame nature with the ſides of the veſſel, and acted on the encloſed maſs in the very ſame manner.

To procure the needles perfect and fine, the *antimony* muſt be ſuffered to cool gradually, for if it cool too faſt, one molecula becomes fixed before it can be adapted to the end of another, and the whole is a confuſed maſs; and the ſame happens alſo if it cool too ſlowly; for then the particles of fire

fire get out ſo very regularly and inſenſibly, that the moleculæ cooling equally all together, form no arrangements. This is found by letting a crucible of melted *antimony* ſtand on ſome burning coals, and gradually cool as their heat burns away and decreaſes; in which caſe the maſs will have perhaps no needles at all, or if any, then but very few.

It may be objected to this, that if the refrigeration of the maſs is the only cauſe of the needles in *antimony*, all melted metals ought to afford the ſame appearance alſo, if cooled in the ſame manner: and poſſibly indeed all do ſo; we ſee them eaſily in *antimony*, becauſe it breaks with a ſlight blow, without diſordering the configuration of its parts, the combinations of its molecules into needles being more firm than that of the needles to one another; but in metals which require more force to break them, the needles may perhaps rather break than ſeparate, and by more force muſt be more diſordered; and all the parts may be as regularly arranged in a ductile maſs, as in a brittle one, though we are not able to diſcover that arrangement.

Lead, when hot to a proper degree, ceaſes to be ductile, and is brittle, and lead broken at this juncture is found to be granulated, appearing like broken ſteel; there is no reaſon to doubt but that this is alſo the caſe, when that metal is perfectly cold, but that the force required to ſeparate, or break it, deſtroys its proper ſtructure.

Mr. Reaumur melted lead in a conical crucible, and ſuffering it to cool to a certain degree only, he broke the maſs into ſeveral large lumps by a ſmart blow of a hammer, and in theſe found the ſame needles as in *antimony*, the granules having cohered in long trains, juſt as the moleculæ of the *antimony*; and the diſpoſitions of the ſeveral groupes of needles in the lead, in regard to the ſides and bottom of the crucible, were the very ſame with thoſe of *antimony*. But there is this manifeſt difference between the needles of lead, and thoſe of *antimony*, that whereas the latter are flat and extremely gloſſy, the former are viſibly round, and much leſs bright. Mem. Acad. Scienc. Par. 1724.

Ore of Antimony. The way of running down *antimony* out of its ore by the aſſayers, is as follows. Take a crucible that will hold ſome pounds of *antimony* ore, broken into pieces of the ſize of a hazel-nut, and bore at the bottom of it a few ſmall holes with a common gimblet; place this bottom in the mouth of another ſmaller crucible, put in the ore, and cover the orifice with a tile; then lute all the junctures, and place this on the pavement of the hearth, making a circle of ſtones all round it, at ſix inches diſtance; fill this intermediate ſpace with aſhes, ſo high, that the lower pot may be covered up to its rim, then put freſh burning coals upon the whole, and blow the fire ſtrongly with a pair of hand-bellows, to make the upper veſſel red-hot: when it has been ſo a quarter of an hour, take away the fire, and when the veſſels are cold, open them, and the *antimony* will be found in form of a regulus in the under veſſel. *Cramer's* Art of Aſſaying, p. 356.

The moſt ready method of fuſing *antimony*, yet known, is by means of that mineral ſubſtance called *cawk*. A lump of this, of the bigneſs of a wallnut, thrown red-hot into a pound of *antimony* in fuſion, converts almoſt the whole ſubſtance of it into glaſs, fifteen ounces of clean and fine glaſs being thus produced; and what is very remarkable, the cawk itſelf never melts in the metal.

The purification of gold, by means of *antimony*, is performed in this manner. Before you enter on the proceſs, it is neceſſary to gueſs, as nearly as may be, at the allay of the gold, by the touch-needles, or otherwiſe. If the quantity of gold in the maſs is not leſs than three quarters, that is, eighteen carats, the maſs muſt be melted in a wind-furnace, and the crucible muſt be covered, to prevent coals falling in; this done, put into it, at ſeveral times, double the quantity of crude *antimony* in fine powder, as ſoon as one portion of the *antimony* is melted, putting in another: let the whole continue in fuſion a few minutes, then pour it into a melting cone, warmed, and rubbed with tallow, and ſtrike with a hammer on the floor, near where the cone ſtands, that the heavier part may ſink to the bottom. When all is cold, invert the cone, and ſtrike it, and a maſs will fall out, having at bottom a regulus, more or leſs yellow, according to the quantity of the gold in the mixture; this may with a few blows be ſeparated from the ſulphureous cruſt, which is at top. Melt in a ſmaller fire this regulus, and when in fuſion add to it a double quantity of crude *antimony* in powder, and pour it out into the cone again a little after; ſeparate the regulus from the *antimony* at top, and then repeat this operation once more. When this is done, put the ſeparated regulus into a thick good teſt, place this in the furnace immediately before the bellows, put coals round it, and one or two pieces of wood upon them, and make a middling fire, ſuch as is ſufficient to melt the regulus, the reguline part of the *antimony* will vaniſh in a thick ſmoak; then encreaſe the fire, and keep it ſo, till the fumes are over, and the ſurface of the gold is of a fine green; and afterwards give the gold another fuſion with borax and nitre, and it will be perfectly pure.

When the gold to be purified by this proceſs is impure to an allay of eight carats, it is not proper to perform the precipitation by *antimony* alone, but there ſhould be added as many times two carats of common ſulphur, as the allay of the gold is ſo many carats leſs than eighteen. *Cramer's* Art of Aſſaying, p. 276.

Stibium, in medicine, &c. is not only given in ſubſtance, but many preparations of it are alſo uſed; which are either emetic, cathartic, diaphoretic, or ſudorific. Crude *antimony* in powder is found good for diſſolving viſcidities, in cutaneous diſeaſes, and, as ſome very confidently aſſert, in convulſions and epilepſies. Externally, in ointments, it is commended for drying up ulcers, curing the itch, and in plaiſters for reſolving of tumors.

There appears no reaſon for people's being afraid of giving crude *antimony* internally, experience ſhews it to be a ſafe medicine, unleſs by accident the acid of the ſtomach ſhould prove ſtrong enough to be a menſtruum to it.

The preparations of *antimony* are, 1. *ſulphur præcipitatum antimonii*. 2. *Crocus antimonii*, called alſo *crocus metallorum*. 3. *Crocus antimonii lotus*. 4. *Calx antimonii*, called *antimonium diaphoreticum*. 5. *Tartarum emeticum*. 6. *Cauſticum antimoniale*. 7. *Cinnabaris antimonii*. 8. *Regulus antimonii martialis*. 9. *Tinctura antimonii*. 10. The *Kermes* mineral, or Carthuſian powder. See the articles Sulphur, Crocus, Calx, &c. *Cycl.* and *Suppl.*

The virtues of *antimony*, in the diſeaſes of animals, are very great, and very evident on any trial. Pigs that have the meaſles are at all times recovered by it, which proves it a great purifier of the blood. Horſes who have running heels, that cannot be cured by the common methods uſed by the farriers, will generally be cured by this medicine in a little time. The manner of uſing it is this: mix one drachm with every feeding of oats which the horſe has in a morning; it is beſt put together in one place, buried under a few oats, and the horſe's head being with-held a little, and then let go juſt againſt that place, he will take it all in at a mouthful. Some horſes do not diſlike it, others obſtinately refuſe it, but to theſe it may eaſily be given in balls. The virtues of this drug, in fattening of cattle, has by many been thought imaginary, but experiment proves it to be a real truth. A horſe that is lean and ſcabby, and not to be fatted by any other means, will become fat on taking a doſe of *antimony* every morning, for two months together. A boar fed for brawn, and having an ounce of *antimony* given him every morning, will become fat a fortnight ſooner than others put into the ſtye at the ſame time, and fed in the ſame manner, but without the *antimony*. Philoſoph. Tranſ. Nº 39.

Crude *antimony* is recommended in palſies, pains, and numbneſs, which come on after a ſalivation, and is ſaid to have cured ſeveral who were paralytic from other cauſes. The method of giving it, is to begin with three grains, increaſing the doſe with three grains every day, to half a drachm; after which the doſe is diminiſhed three grains every day, till it comes down to the quantity of the firſt doſe. Commerc. Liter. Norimb. ap. Medic. Eſſ. Edinb.

Antimony, before the twelfth age, was of ſervice only in the compoſition of paint. Scripture deſcribes it to us as a ſort of paint, with which the women blackened their eyebrows. Jezabel underſtanding that Jehu was to enter Samaria, painted her eyes with *antimony*, or, according to the Hebrew, put her eyes in *antimony*.

As large black eyes were thought the fineſt, they of both ſexes, who were careful of their beauty, rubbed their eyes, eyelids, and round the eyes, with a needle dipped in a box of paint made of *antimony*, with a deſign of blackening them.

At this day the women of Syria, Arabia, and Babylonia, anoint and blacken themſelves about the eyes; and both men and women put black upon their eyes in the deſert, to preſerve them from the heat of the ſun, and the piercing of its rays. M. Darvieux tells us, that the Arabian women border their eyes with a black colour made of tutty, which the Arabians call *rebel*. They draw a line of this kind of blacking without the corner of their eyes, to make them appear larger. Iſaiah, in his enumeration of the ſeveral ornaments belonging to the daughters of Sion, has not forgot the needles which they made uſe of in painting their eyes and eyelids; nor has this practice eſcaped the laſh of Juvenal [b].

> *Ille ſupercilium madida fuligine tinctum*
> *Obliqua producit acu, pingitque trementes*
> *Attollens oculos.*

Ezekiel, diſcovering the irregularities of the Jewiſh nation under the idea of a debauched woman, ſays, that ſhe bathed, perfumed herſelf, and that ſhe anointed her eyes with *antimony*. Job ſhews ſufficiently how much *antimony* was in eſteem, by calling one of his daughters a veſſel of *antimony*, or a box to put paint in, *cornu ſtibii*. Tertullian and St. Cyprian have declaimed very warmly againſt this cuſtom of painting their eyes and eyebrows [c].—[[b] *Juv.* Sat. 2. [c] *Calmet's* Dictionary.]

STIBIUM *ceratum.* See the article VITRUM *antimonii ceratum.*

STICA, a name given by some authors to all external astringents used in hæmorrhages.

STICA, in our old writers, a brass Saxon coin, of the value of half a farthing, four of them making an helfing. *Blount.*

STICHOMANTIA, Στιχομαντεία, in antiquity, a sort of divination by verses, (commonly those of the Sibylline oracles) which being wrote on little pieces of paper, and thrown into a vessel, the first drawn out was supposed to contain the will of the Gods. *Potter*, Archæol. Græc. Tom. I. p. 333. See SORTES, *Cycl.*

STICHOS, a name given by the old writers to a pectoral confection, the principal ingredient of which was the herb *marrubium*, or hore-hound.

STICKLEBACK, in ichthyology, a name given by us to that small fish, called by authors by the several names of *spinachia, spinax*, and *pugnitius piscis*; as also *pisciculus asper, pisciculus aculeatus*, and the like; and finally, by Artedi, by the much more expressive name of *gasterosteus*, expressing that great singularity it has in the bony structure of its belly. The common *stickleback* is distinguished by Artedi by the name of the *gasterosteus* with three spines on the back; and by this character it differs from two other species, the one the *spinarella* of authors, a small species with ten prickles in the back; and the other a long sea kind with fifteen spines on its back, called by Willughby, and others, the *pugnitius marinus longus.* See the article GASTEROSTEUS.

As contemptible a fish as this may seem, its mischief in eating the young fry in ponds is not greater than its value. In a sort of manufacture carried on at Boston, and some other parts of Lincolnshire, they have fallen into a way of making oil of it, and have made annually a hundred tun, or more, to their very great advantage. All the waters thereabout swarm with this little fish, and doubtless a sufficient quantity might be found in other places for the same sort of use. They grow in the Boston river to an inch and half in length, and about half an inch in breadth, and are taken out at a bushel a draught. Eight chalder of them make a barrel of oil; their barrel is a hogshead; they are obliged to use them very fresh, else the oil runs from them to waste, and they usually boil every night what they have caught by day. It is a wonder that this quality of this little fish was not found out sooner, for in frying them in the common way for eating, they all run into an oil in the pan. Philos. Trans. N° 223.

STICKLER, in our old writers, an inferior officer, who cut wood within the king's parks of Clarendon. Rot. Parl. 1 Hen. VI. *Blount.*

STICKS *of eels*, a quantity, or measure of twenty five. A bind of eels contains ten *sticks*, and each *stick* twenty five eels. Stat. Weights and Measures. *Blount.*

STIFFLE, or GREAT *muscle*, in the manege, is the part of the hind leg of a horse which advances towards his belly. This is a most dangerous part to receive a blow upon.

STIGMA, among botanists. See the article PISTIL.

STIGMATA, in natural history, the apertures in different parts of the bodies of insects communicating with the tracheæ, or air vessels, and serving for the office of respiration. *Reaumur*, Hist. Insect. passim.

Nature has given to these minute animals a much larger number of tracheæ and bronchia, than to us. We have the ramifications of the trachea reaching no farther than into the breast, whereas, in the bodies of these insects, we find them extended through the whole, and finely and admirably interlaced one with another. We have but one mouth to respire by; and the organization of the parts, inservient to respiration, is very admirable in us; but in the insect class, the mouths, or openings to breathe at, are much more numerous, and the organization much more complex.

All the two-winged and four-winged flies, which have a single or undivided corcelet, to which their legs are all fixed, have also four *stigmata* in that corcelet, two on each side. They have them also on the rings of their body, but those on the corcelet are the most considerable.

Of the four on the corcelet, the two anterior ones are usually the largest. The best way to find them, in the generality of flies, is to examine them first in the larger species of the libellæ, where they are very distinct and plain, and after their situation is well known in that species, they will be much the more readily found in the rest.

These *stigmata* of the corcelet, as well the anterior as the posterior, are oblong, and placed obliquely to the length of the body; that end of them next the head is more elevated than the other, and their size is sufficiently large to render them visible, especially the first pair. Each of these seems not a little to resemble a sea-muscle with its shells a little open, or is somewhat like the opening of an eye. It is also surrounded by two eyelids, proportionably thick; and beside these, which make its outer circumference, one may discover two others within, which are bordered with hairs, and which, when closed, often quite shut up the opening.

The colour of the *stigmata* often is some help also to us for the discovering them; they are very frequently different in colour from the corcelet; some are yellowish, others of a coffee colour, or some degree of a fallow colour, in flies whose corcelet is brown, or black, or bluish.

Flies have, beside these, several *stigmata* also in the rings of their bodies, perhaps in every one of them, though commonly those in the two or three first are only to be distinguished: these are not like those of the corcelet, but are round, usually a little eminent above the rest of the surface, and resembling pin's heads; they are not easily discovered, because they are not only small, but usually hid by the folds, or commissures of the rings. They are usually two on each ring, placed on the two opposite sides, and partly under the belly. *Reaumur*, Hist. Ins. Vol. 4. p. 248.

STIGMATICI, among the Romans, were servants marked in the face for some crime. *Pitisc.* in voc.

STIGMATIZING, among the antients, was inflicted upon slaves as a punishment, but more frequently as a mark to know them by; in which case, it was done by applying a red-hot iron, marked with certain letters, to their foreheads, till a fair impression was made, and then pouring ink into the furrows, that the inscription might be the more conspicuous. *Potter*, Archæol. Græc. Tom. I. p. 64.

STIGMATIZING, among some nations, was looked upon as a distinguishing mark of honour and nobility. *Potter*, loc. cit. p. 65.

STIL *de grain*, in the colour trade, the name of a composition used for painting in oil or water, and is made of a decoction of the lycium, or Avignon berry, in alum-water, which is mixed with whiting into a paste, and formed into twisted sticks. It ought to be chosen of a fine gold yellow, very fine, tender, and friable, and free from dirt. *Pomet's* Hist. of Drugs, p. 14.

STILE (*Cycl.*)—In a philosophical *stile*, the only end is accurately to explain our thoughts to others; thence the particular rules to be observed by a philosopher, in delivering his doctrines, naturally follow: such as,

1°. Not to deviate from the received significations of terms.

2°. That the same terms be always taken in the same sense.

3°. To fix the meaning of such words as have only a vague sense.

4°. To signify objects, essentially different, by different names.

From these rules, the use and necessity of terms of art appear, and shews with how little reason they are vulgarly condemned.

5°. The philosopher ought always to make use of proper expressions, and use no more words than what are precisely necessary to establish the truth of his doctrines. *Wolf*, Disc. Prælim. Logic. cap. 5.

STILL-*bottoms*, in the distillery, a name given by the traders to what remains in the *still* after the working the wash into low wines.

These *bottoms* are procured in the greatest quantity from the malt wash, and are of so much value to the distiller in the fattening of hogs, &c. that he often finds them one of the most valuable articles of the business. They might also be put to other uses, such as the affording a large proportion of an acid spirit, an oil, a fuel, and a fixed salt; and with some address, and good management, a vinegar, and a tartar. Another very advantageous use of them, is the adding them to the next brewing of the malt for more spirit: the encrease of the produce from this, is more than could easily be conceived. It also more readily disposes the new wash to ferment, and gives the spirit a vinosity that it cannot have without it; the proportion, in this case, must never exceed that of a fifth, or sixth part of the whole quantity of liquor employed.

The liquor left behind in the *still*, after the rectifying the low wines into proof spirit, is also called by some by the name of *still-bottoms*; but this is little more than mere phlegm, or water impregnated with a few acid, and some oily parts, not worth separating, unless for curiosity. The liquor left in the *still*, after the rectifying the proof spirit into alcohol, is also of the same kind.

The *bottoms* of melasses spirits seem calculated for many uses. It is very probable that the vinegar-makers would find their account in the trying them, and the strong, and lasting yellow colour, with which they tinge the hands, may recommend them to the dyers. A small proportion of them added to the new treacle to be fermented, greatly promotes the operation, and encreases the quantity of spirit.

The *bottoms* of the wine spirit, that is the remainder, after distilling the spirituous part from damaged wines, or wine lees, may be brought to afford Mr. Boyle's acid spirit of wine, and that substance called by Becher the *media substantia vini.* A parcel of tartar may also be procured in very great perfection; and the last remainder may be converted into excellent and genuine salt of tartar. The liquor may otherwise be serviceable in making vinegar and white lead. *Shaw's* Essay on Distillery.

STILL-*house.* The Dutch have much the advantage of us in the structure of their *still-houses*, and have every thing in

great readineſs and neatneſs. The general rules, in building theſe *houſes*, ſhould be theſe.

The firſt caution is to lay the floor aſlope, not flat, where any wet work is to be performed; it ſhould alſo be well flagged with broad ſtones, ſo that no wet be detained in the crevices, but all may run off, and be let out at the drains made at the bottom and ſides.

The *ſtills* ſhould be placed abreaſt on that ſide of the *ſtill-houſe* to which the floor has its current. The largeſt *ſtills* in Holland, for their greateſt works, are never of that monſtrous ſize that we ſee them of in England, but much more manageable and handy, as ſeldom containing more than ſix or eight hogſheads; and with ſuch *ſtills*, a ſingle hand will perform much more buſineſs than with one of a much larger ſize. Fronting the *ſtills*, and adjoining to the back wall, ſhould be a ſtage for holding the fermenting backs, and theſe being placed at a proper height, may empty themſelves, by means of a cock and a canal, into the *ſtills*, which are thus charged with very little trouble.

Near this ſet of fermenting backs ſhould be placed a pump or two, that may readily ſupply them with water by means of a trunk, or canal, leading to each back. Under the pavement, adjoining to the *ſtills*, ſhould be a kind of cellar, wherein to lodge the receivers, each of which ſhould be furniſhed with its pump, to raiſe the low wines into the *ſtill* for rectification; and through this cellar the refuſe waſh, or *ſtill*-bottoms, ſhould be diſcharged by means of a hoſe, or other contrivance. Theſe are the principal things to be regarded in the erecting a *ſtill-houſe* for the original production of ſpirits, and if theſe rules are well obſerved, malt ſpirit will be made with little more trouble than melaſſes; for by this means the buſineſs of brewing and cooling the waſh, which, according to the method generally practiſed in England, takes up ſo much time and trouble, is entirely ſaved, fermentation is carried on to a much greater advantage, and the quantity of ſpirit encreaſed. *Shaw*'s Eſſay on Diſtillery.

STINT, in zoology, the name of a ſmall bird common about the ſea ſhores in many counties of England, and ſeeming to be the ſame with the *cinclus prior* of Aldrovand, and the *ſchœniclos*, or *junco* of Bellonius, called by the French *alouette de mer*, the *ſea-lark*.

It is ſomewhat ſmaller than the common lark, and in ſhape reſembles the ſmaller ſnipe. Its beak is black, ſlender, and ſtrait; its feet of a greeniſh, or browniſh black; its back is a grey, variegated with oblong black ſpots, and its wings ſomewhat of a reddiſh brown; its neck is grey, and its head variegated with black and a reddiſh brown; its wings are long, and when folded reach beyond the end of the tail; and its rump is ſomewhat reddiſh with black ſtreaks. *Ray*'s Ornitholog. p. 226.

STIP *viſch*, in zoology, a name given by the Dutch in the Eaſt-Indies to a fiſh of the claſs of our European ones which have two back fins, the anterior of which is prickly, the hinder not ſo. Its ſkin is ſpotted, and its fleſh very delicate, and well taſted. It is generally caught by hooks. *Ray*'s Ichthyogr. Append. p. 8.

STIRRUP, (*Cycl.*) in the manege. To looſe one's *ſtirrups*, is to ſuffer them to ſlip from the foot.

The *ſtirrup-foot* is the near, or left foot before.

Stirrup-leather is a thong of leather, deſcending from the ſaddle down by the horſe's ribs, upon which the *ſtirrups* hang.

Stirrup-bearer, called in French *porte etrier*, is an end of leather made faſt to the end of the ſaddle, to truſs up the *ſtirrup* when the rider is alighted, and the horſe ſent to the ſtable.

STIRRUP *of a ſhip*, a piece of timber put upon a ſhip's keel, when ſome of her keel happens to be beaten off, and they cannot come conveniently to put, or fit in a new piece; then they patch in a piece of timber, and bind it on with an iron, which goes under the ſhip's keel, and comes up on each ſide of the ſhip, where it is nailed ſtrongly with ſpikes; and this they call a *ſtirrup*.

STOÆ, Στοαι, in antiquity, the porticos at Athens. Theſe were full of exedræ, ἐξέδραι, and ſide-buildings, furniſhed with ſeats fit for ſtudy or diſcourſe. Here it is probable philoſophers, and their ſcholars, uſed to meet. *Potter*, Archæol. Græc. lib. I. cap. 8. Tom. I. p. 38. See the article EXEDRÆ, *Cycl.*

STOAKED, in a ſhip. When the water in the bottom cannot come to the well of the pump, they ſay, *the ſhip is a-ſtoak*, or *ſtoaked:* ſo they ſay alſo, *the limber holes are ſtoaked*, when the water cannot paſs through them; and that *the pump is ſtoaked*, when ſomething is got into it which choaks it up, ſo that it will not work.

STOAT, in zoology, the name uſed by many for the animal whoſe ſkin is the ermin. See the article ERMINEUM *animal.*

STOC *and ſtovel*, in our old writers, a forfeiture where any one is taken carrying *ſtipites* and *pabulum* out of the woods; for *ſtoc* ſignifies ſticks, and *ſtovel* pabulum. Antiq. Chart. ap. *Blount.*

STOCK *of an anchor.* See the article ANCHOR.

STOCK-*bricks.* See BRICK-*making.*

STOCK-*fiſh*, in the fiſh trade, a name given to the common cod-fiſh when cured in a particular manner, which makes it neceſſary to beat it with ſticks before it is fit for dreſſing. *Willughby*'s Hiſt. Piſc. p. 166. See COD-*fiſh.*

STOCK-*July-flower.* See the article LEUCOIUM.

STOCKER, in ichthyology, a name given by the Germans to the *ſaurus* of the antients, the *trachurus* of the later writers. It is a ſpecies of the *ſcomber*, known among us under the name of the *horſe-mackrel*; and is diſtinguiſhed from the reſt by Artedi, by the name of the *ſcomber* with the lateral line prickly, and with thirty rays in the pinna ani.

STOCKS (*Cycl.*)—STOCKS, among ſhip-carpenters, a frame of timber and great poſts, made aſhore to build pinnaces, ketches, boats, and ſuch ſmall craft, and ſometimes ſmall frigates. Hence we ſay, *a ſhip is on the ſtocks*, when ſhe is a building.

STOCKS, *cippus*, a wooden machine to put the legs of offenders in, for the ſecuring of diſorderly perſons, and by the way of puniſhment in divers caſes ordained by ſtatute, &c. And it is ſaid that every vill, within the precinct of a torn, is indictable for not having a pair of *ſtocks*, and ſhall forfeit 5 *l.* Kitch. 13.

STOMACACE, a word uſed by ſome authors to expreſs a ſymptom of the ſcurvy, which is a fœtor of the mouth, with a ſoreneſs and bleeding of the gums.

STOMACH (*Cycl.*)—In order to underſtand the action of the *ſtomach*, in turning the aliments into chyle, we are firſt to thoroughly conſider its form. It is eaſy to obſerve, that the two orifices of the *ſtomach*, the œſophagus, and pylorus, are not ſituated exactly over-againſt one another; but that if the *ſtomach* be regularly divided longitudinally into two halves, the œſophagus will be found wholly in the anterior half, and the pylorus, in great part, in the poſterior. Near the inſertion of the œſophagus there are two planes of muſcles, the one is placed near the bottom of the *ſtomach*, and encompaſſes all that part of the œſophagus that is neareſt that part. This muſcle throws off obliquely ſeveral bundles of fibres, which run to the middle, both of the anterior and poſterior ſides of the *ſtomach*, and many of theſe extending even to the lower part of it, make what are there called *the oblique fibres of the ſtomach.* The other muſcular plane encloſes, in the ſame manner, the other part of the mouth of the œſophagus, or that which lies toward the pylorus; this terminates on each ſide near the bottom of the *ſtomach.* Theſe two planes of fibres are, as it were, two fleſhy bands about the mouth of the œſophagus, which croſs one another both on the upper and under part of the *ſtomach.*

The longitudinal fibres are very ſlender, and appear about an inch from the pylorus, extending themſelves along both the anterior and the poſterior ſides of the *ſtomach*, quite to the orifice of the œſophagus; and finally, they are inſerted round about the pylorus by two ligamentary bands, which authors have generally paſſed over without obſerving. Theſe bands are much like thoſe of the colon, and occupy all the length of the neck, and may be eaſily diſtinguiſhed by the touch, and are not difficult to be ſeen on bending the part in an inflated *ſtomach.*

The fibres of the bottom of the *ſtomach*, when nicely examined, are found to be circular, all compoſing ſeveral ſmall concentric circles, each ſeries of which is independent of all the reſt. There is one of theſe circles placed juſt in the center of the bottom of the *ſtomach*, and from this the other circles ſpread, being of ſeveral different diameters, according to the places where they ſtand, and reaching to near the orifices where the fleſhy fibres take another courſe, as before obſerved. The bodies, called *circular fibres of the ſtomach*, and ſuppoſed to part from the upper part of the *ſtomach*, cloſe to one another, and taking the round of the *ſtomach* to return thither again, are truly a number of ſmall muſcles, or bundles of fibres, placed at ſmall diſtances from one another, no one of which ever reaches perfectly round the *ſtomach:* from theſe ſeveral ſmaller fibres are propagated in an irregular manner, which fill up the interſtices of the circular directions of theſe, and form a ſort of net-like plexus, between the fibres of which the nervous membrane of the *ſtomach* is eaſily ſeen. Theſe interſtices, in general, are of a ſort of lozenge ſhape, and the whole of theſe fibres may be ſaid to conſtitute a ſort of muſcular net, enveloping the whole *ſtomach.* All thoſe bundles of fibres, or ſmall muſcles, which are ſituated below the upper orifice of the *ſtomach*, or near about it, form together a plan, or ſeries, which runs in a ſtrait line from the upper to the lower extremity of the *ſtomach*; whereas, on the contrary, thoſe which are placed about the middle of the *ſtomach* ſeem to turn about, and form parts of circles, the convex part of all which ſtands toward the bottom of the *ſtomach:* and finally, thoſe which are placed about the neck of the *ſtomach* are much bent, and their bending is always the greater, as they approach nearer to the pylorus. This appears to be the true figure and arrangement of the fibres of the *ſtomach*; and as this is very different in many particulars, from the common accounts of anatomical authors, it was neceſſary to give this at large, in order to underſtand and explain the action of this part in the

the great work of digestion; and according to this account, the offices of every part will be very easily understood.

The circular bands of muscular fibres, placed round the orifice of the œsophagus, are designed to prevent the upper orifice of the *stomach* from being too much distended, whether by our carelessly swallowing too large morsels, or by the action of vomiting. The use of the muscular circles, at the bottom of the *stomach*, is as easily seen: the aliments received into this part of the *stomach*, were it not for these circular arrangements of fibres, would remain there, and have no tendency given them to go out of the *stomach*; but by this wonderful structure, the whole bottom of the *stomach* can at once be put into a safe and easy, though a powerful contraction, by means of which the aliments are naturally sent toward the pylorus for their discharge. These circles give the first principle of the peristaltic motion of the *stomach*, which is much the same with that of the intestines.

When the aliments have been thrown off from these circles, they are not immediately, however, discharged into the pylorus, but are thrown upon those bundles of fibres, or small muscles, which make what has been before called the *reticular coat of the stomach*. That part of this coat which immediately receives them, is that composed of segments of circles, the convex parts of which are all placed toward the bottom of the *stomach*; and as these afterwards form their contractions, their middle naturally elevates, and throws off the aliment still toward the pylorus, and this is done with the more force, as the action of these fibres is strengthened by the longitudinal ones; and, in fine, those longitudinal fibres, which are attached to the bands that surround the pylorus, when they act, contract, or pull the other parts of the *stomach* toward their insertions; so that every thing tends to help the throwing the food upon the pylorus.

The reticular coat of the *stomach* has also other great advantages; it is easily capable of extension, and consequently gives the *stomach* a capacity of enlarging, so as to hold a larger quantity of aliments than it otherwise could; and when they act, so as to be approaching toward their natural state again after such distention, this action, which is no other than their contraction, necessarily throws the aliments toward the pylorus: this contraction is always succeeded by a small dilatation again, and that by another contraction, and these alternately succeeding one another, so long as any of the aliments continue in the *stomach*, constitute what authors call its peristaltic motion. Although this motion is very slight, and only a kind of vermicular undulation, which is scarce sensible, yet there have not been wanting very great men, who have thought it sufficient for the great work of digestion. These authors set aside the use of any liquors, or juices of the *stomach*, mixing themselves with the aliments, and give the whole to this motion, which they call a kind of trituration, which they say breaks the aliments into small and fine parts, by rubbing them against one another, and that these fine broken particles make what is called chyle; but it is scarce consonant to reason, that so weak a cause should be productive of such great effects.

This motion is no stronger than the peristaltic motion of the intestines, and that is never supposed to have any such effects on their contents, but only to push them forward. The liquor prepared from the food is known also to be grey at its passing out of the *stomach*, and only to acquire its white colour in the duodenum; and how is this accountable for on the plan of trituration only? And finally, if that were all that was required to digestion, to what purpose did nature, which does nothing in vain, ordain such an abundance of fluids to be present in all places, where the aliments were destined to undergo any change? To know the abundant quantity of these, we need only follow the course of the food from the time of its being taken into the mouth to that of its being changed into chyle.

All the time that the teeth are chewing the food, the parotid glands afford a prodigious quantity of saliva, which runs into the mouth, mixes with it, and passes with it into the *stomach*; beside these, also, there are many other sources of the saliva, which all discharge it at the same time, but the quantity from these alone is not easily conceived. A soldier had, by a wound in the cheek, one of the parotids cut in two, and had the wound closed within, but not without; it was observed, that whenever he used his jaws in chewing, this one wounded gland alone discharged a quantity of lymph enough to wet several napkins; what then must be the quantity at every meal discharged from both, and from all the other sources together? Though this is all carried down into the *stomach*, yet there fresh juices are added to it. Wepfer discovered multitudes of glands in the human *stomach*, the orifices of which were very sensible; and beside these, Mr. Ruysch discovered several other eminences, which, by their resemblance to those in the second *stomach* of an ox, seem to be only cases enclosing clusters of minute glands, all destined, with the others, to pour out their contents on the mass of aliments. All these fluids, however, only change the food into a thick greyish liquor, which is too coarse to be received into the lacteals, and needs a farther elaboration. This elaboration changes it into a white liquor, which we call chyle; and this is only performed in the duodenum, where there can be no trituration, but where there is a very remarkable assemblage of different liquors to effect it: for beside the common ones, the liver and gall-bladder discharge into this intestine a great quantity of bile by the ductus choledocus; and the pancreas sends thither also a great deal of its lympth. Brunderus has observed also, in this intestine, a vast number of glands, which, according to him, make a sort of second pancreas: these all furnish, also, a great quantity of liquors to the duodenum, where this great change is made in the matter of the aliment; and it is very natural to conclude from the whole, that it is by means of these liquors that this change is effected; and if it appear, that the last change of the greyish liquor of the *stomach* into chyle be wrought by these fluids, why should it be doubted but that nature, which is alike in all its works, has used the same means in the first change, and by the liquors, mixt with the aliments in the *stomach*, has wrought them into that grey liquor they are found there changed into? Trituration does not at all seem the business of the *stomach*, nature we see has appointed another part, the mouth, for that office, and has furnished that with hard bodies, capable of tearing and grinding things to pieces. The most natural opinion, on the whole, seems therefore, that the office of the mouth was thus to rend and tear in pieces the aliments before their passage into the *stomach*, that there the juices might act more strongly upon them; in the same manner as the chemist beats and breaks to pieces the substances, which he is going to throw into proper liquors, to extract their tincture. Mem. Acad. Par. 1719.

The digestive power of the *stomach* of some fowls is vastly greater than that in men, or any other animals. Crystal bullets, some hollow, and others solid, have been crammed down the throats of hens, and have been found afterwards strangely eroded, and eaten by the juices there. Hollow bullets of glass have been also crammed down by the members of the Florentine Academy, and have been found afterwards not only eroded on their surface, but filled within with a whitish liquor like cream, which seemed to prey upon their substance. It is probable hence, that the strong digestion of these fowls may be in some measure owing to a powerful menstruum in their *stomach*; glass and crystal are two things wholly indissoluble by any menstruums we are acquainted with, and yet they are corroded here.

This menstruum in the *stomach* of these animals, assisted by what the gravel-stones, which they swallow, are able to do in the manner of teeth, may very well destroy, and reduce substances of such dense texture, as we scarce know how to manage. The glass drops with long tails, called *Prince Rupert's drops*, having been in the same manner forced down the throats of capons, were found entire in the *stomach* after many days, and burst as usual on breaking off the tail. These lost somewhat of their weight by remaining in the *stomach* some time, but the same sort of drops, when untempered by heating in the fire, lost a great deal in a very short time. One of them, with which Redi made his experiments, lost four grains of its weight in four days, and giving it to another fowl, it, in six days time, lost nine grains more. This is an argument, not only of the vast power of digestion in the *stomach* of these fowls, but of the great difference of hardness there is between the same glass when tempered, by being dropped hot into water, and when untempered again by fire.

Experiments were also made, by giving diamonds, topazes, leaden bullets, jaspers, and porphyry, to the same animals, and others of like kinds. The diamond lost nothing of its weight; the topaz almost nothing, the loss being scarce discernible with nice scales; other stones scarce lost any thing, but the leaden bullets lost considerably. Hence it is easy to conclude, that the small gravel-stones, which they pick up to serve for grinding the food in their *stomachs*, do their office without parting with almost any thing from themselves; these little stones, though less beautiful, yet approaching in their nature to the gems. There is great difference, however, between these and pearls; for it was found that four pearls given to a pigeon lost one third of their weight in twenty four hours, and eight small pearls given to another pigeon lost two thirds of their weight in two days. *Redi*, Esperienz.

STOMACH *of fishes*. The *stomach of fishes* is very different in the various kinds, in respect of size, thickness, and its several properties and qualities; but its situation is generally longitudinal, and it is single in all the known fishes, except in the *stromateus* of Rondeletius, in which it is said to be double.

The *stomach* in living fish is cold to the touch, but this is only a proof that it is less hot than our own flesh. That there is heat in it, is evident enough from the digestion which is so powerful in it, the *stomachs* of many fish digesting substances which ours could not at all effect; such are the shells of shell-fish. It is not easy to suppose this could be performed without some degree of heat in the part, but at the same time we are informed by this how small a degree

degree of heat is neceſſary for working theſe effects, and how much may be done by the continual attrition of the fibres, and by a proper fluid. *Artedi*, Ichthyolog.

STOMACH *of flies*. In examining with care the bodies of theſe little animals one may perceive, that when the paſſage of the aliments is got beyond the lungs, and below the place where they form a ſort of diaphragm, one finds the canal, that ſerved for this paſſage, forming a large, though ſhort body, the diameter of which three or four times exceeds that of the canal itſelf. This body is compoſed of three fleſhy lobes, and is unqueſtionably the *ſtomach* of the animal. The inteſtine goes out of it, very nearly from the ſame part where the other paſſage is admitted into it; the inteſtine then directs itſelf toward the anus, and afterwards runs upward again toward the diaphragm, or bottom of the lungs; and thence, after many convolutions, many times running backward and forward, it terminates in the anus.

In caterpillars and butterflies, the canal from the mouth to the anus is only one ſtrait inteſtine, but it is much otherwiſe in theſe creatures, the inteſtines, both in the fly, and in the worm it is produced from, always making a number of contortions and convolutions.

STOMACH-*bruſh*. See EXCUTIA *ventriculi*.

STOMACHICA *febris*, the *ſtomachic fever*, a name given by Heiſter, and ſome others, to a ſpecies of fever, called by others a *meſenteric fever*, and by our Sydenham *nova febris* in a peculiar treatiſe. See INTESTINAL *fever*.

STOMATICA, a term uſed by ſome for all medicines uſed in diſorders of the mouth.

STONE (*Cycl.*)—Some look upon *ſtones* as unorganized vegetables, and that they grow by the accretion of ſalts, which often ſhoot into angular and regular figures. This, it is ſaid, appears in the formation of cryſtals on the Alps; and that *ſtones* are formed by the ſimple attraction and accretion of ſalts, appears by the tartar on the inſide of a claret veſſel, and eſpecially by the formation of a *ſtone* in the human body. Dr. *Berkeley*, Biſhop of Cloyne, in Philoſ. Tranſ. N° 481. p. 326.

Stones are often corroded, and conſumed by the air. Ibid.

Naturaliſts vulgarly define *ſtone* a foſſil incapable of fuſion, yet *ſtone* has been known to be melted, and when cold to become *ſtone* again, Philoſ. Tranſ. N° 481. p. 327. See the article SCIARRI.

Hence it ſhould ſeem not impoſſible for *ſtone* to be caſt, or run into the ſhape of columns, vaſes, ſtatues, or relievos; which experiment may perhaps, ſome time or other, be attempted by the curious, who following where nature has ſhewn the way, may poſſibly, by the aid of certain ſalts and minerals, arrive at a method for melting and running *ſtone*, both to their own profit, and that of the public. Phil. Tranſ. N° cit. p. 328.

Formed STONES, among naturaliſts, mineral, or *ſtony* matter, caſt in the cavities of certain ſea-ſhells, or other parts of marine animals.

Of theſe ſome are found quite naked and bare; others have the remainder of the ſhell about them: and among theſe there are alſo found many real ſhells, ſcarce at all altered from their recent ſtate, buried at great depths in the earth, far from ſeas, and even on the tops of mountains.

This is by moſt ſuppoſed an effect of the general deluge, and by many is thought a convincing proof of the truth of that hiſtory; but there have been many who have aſſerted, that theſe bodies can convey no ſuch proof, ſince, as they affirm, they are not, nor ever were marine bodies, or owed their form to ſuch, but mere *luſus naturæ*, *ſtones* formed in the places where they are found, having no relation to animals of any kind, but only accidentally reſembling them. But the aſſertors of the former opinion have plainly the better ſide of the argument. See MARINE *remains*.

It ſeems indeed contrary to the great wiſdom of nature, which is found, in all its works and productions, to deſign every thing to ſome determinate end; that theſe bodies ſhould have been ſo nicely formed by a mere plaſtic virtue in the earth, or endued with all the characters and neceſſary parts of animal coverings, &c. for no other end but merely to exhibit ſuch a form, without having any relation to the uſes theſe particulars are appropriated to in the animal. See the article FIGURED *ſtones*.

But if the origin of the *ſtones*, found in the ſhape of ſhells, be doubtful, yet the real ſhells, found in the earth, ſurely cannot be ſuppoſed to have been formed there; yet theſe are found at as great diſtances from the ſea, and that not only in the lower grounds and hillocks, but in the higheſt parts of the loftieſt mountains, and that without the leaſt particle of *ſtony* matter about them; mere ſhells, unpetrified, and uncorrupted, and of the exact figure, ſtructure, and conſiſtence with the ſea-ſhells, which are now living, of the ſame ſpecies.

Mentzel ſays that the mount near Bologna, where the Bononian *ſtone* is found, abounds with theſe *formed ſtones*: they lie in beds with ſtrata of ſand, of a yard thick, between them, and are not lodged in *ſtone*, or any cementitious matter, as we often find them in England, but are all looſe and ſeparate: and Fabius Columna tells us, that the hills about Andria, in Apulia, abound with ſea-ſhells not at all petrified, but whole and uncorrupt; and ſeeming to have undergone no change. The mountains about Genoa have alſo been found full of them; and we have in our own kingdom numerous inſtances of them in all their ſtates, ſome ſeeming mere *ſtone*, and others perfect and unaltered ſhells; ſome looſe, and others bedded in marble, in *ſtone*, or in indurated earth.

That nature ſhould form real ſhells, without ever intending them for the covering of an animal, ſeems no way probable; and indeed, were it true, would give great ſtrength to the atheiſt's opinion, that all things exiſted by mere chance, and were intended for no end or uſe. Nor are the ſhells the only inſtances of theſe foſſile bodies perfectly reſembling animal ones, but we find with them other parts of animals, as the teeth of fiſhes and land animals; which, though met with buried in earth, or on the tops of mountains, are plainly the ſame with the ſubſtances produced by the fiſhes; &c. Of this kind are the teeth of the ſeveral ſpecies of ſharks, called *gloſſopetræ*; thoſe of the wolf-fiſh, called *bufonitæ*; the vertebræ of ſeveral fiſh, and the like.

The very inſpection is abundantly ſufficient to prove, that theſe were once parts of animals; but were that inſufficient, they have not, even in this their foſſile ſtate, ſo far diveſted themſelves of their animal nature, but that they carry proofs of it; and Columna has evidently proved their true origin from theſe. He obſerves, that all animal and vegetable ſubſtances, whether of a woody, bony, or fleſhy nature, by burning, are changed firſt into a coal, before they go into a calx or aſhes; whereas *ſtony* ſubſtances, on the contrary, do not burn into a coal, but are reduced at once into their calx or lime, or elſe into glaſs. But theſe teeth, ſuppoſed by ſome mere productions of the earth, all burn firſt to a coal, while the *ſtony* matter adhering to them does not; whence alone it is ſufficiently plain, that they and that ſubſtance are of very different kinds, and that they are truly of a bony, not a *ſtony* matter. It is alſo repugnant to that great maxim, that nature does nothing in vain, to ſuppoſe theſe teeth formed in the earth where they are now found, ſince they could there have no uſe as teeth, nor the vertebræ, or other bones, as bones. It is very certain, that nature never made teeth without a jaw, nor ſhells without an animal inhabitant, nor bones without the reſt of the body they belong to; theſe things are not made in this ſeparate and uſeleſs ſtate in the element to which they naturally belong, much leſs in a foreign one.

Their very ſubſtance and place alſo evince plainly, that they were not formed where they are now depoſited; for they are uſually lodged in *ſtone*, and *ſtones* contain not the matter of which they are made; and as to their place, they muſt be ſuppoſed to have been lodged there either when formed, which proves our aſſertion, or elſe they muſt have been at ſome time either generated all of a ſudden there, or have grown from a ſmall origin, encreaſing by little and little, as the animal ſubſtances which they imitate do. Now if the *ſtone*, in which they lie, was formed before them, and they were formed all of a ſudden in it, how came the cavity there juſt correſponding to their ſize? and if they grew by little and little, how could they force a cavity in the *ſtone*, without hurſting or cracking it?

Things that grow, expanding themſelves leiſurely and ſlowly, may indeed by degrees lift up great weights, and dilate the chinks or cracks of *ſtones*; but then they are ſubject to various contortions and alterations in their ſhape, as we daily ſee in the roots of trees, which make their way through the cracks of *ſtones*, and in common plants, whoſe roots meet with hard matter in their way, receding from the form they would have in a looſe open ſoil, and conforming to that of the body that ſtands in their way: thus, if foſſile ſhells and teeth were generated, and grew in *ſtone*, they muſt be liable to contortions and alterations in their ſhape and figure, from the ſhape of the cavities they found, or the hardneſs of the different matter they meet with in their progreſs; but nothing of this kind appears, and it is plain they were generated elſewhere, and then buried in the ſtrata of our fields, becauſe they are all of the ſame exact and regular ſhape, whether found looſe on the ploughed lands, buried in clay or marl, or lodged in beds of marble, or hard *ſtone*. All of the ſame ſpecies are, in theſe ſeveral matrixes, of the ſame exact form; whence it evidently appears, not only that they were not produced where they are now found, but even that the ſtrata were not hardened at the time when they received them.

It is alſo no ſmall proof of theſe teeth being of marine or animal origin; that they are not regularly ſhaped at the baſe, but are all broken, and that in various manners; which proves very plainly, that there has been no vegetation in the caſe, becauſe in all other figured foſſils it is obſerved, that they are never found mutilous, or imperfect. It cannot, with any ſhew of reaſon, be ſuppoſed, that theſe teeth were thus broken within the body of the *ſtone* where they now lie, but is plain that they were lodged in the *ſtone* at a time when it was ſoft, and were before that broken off from the jaw of the creature in this irregular manner.

It is likewife no weak argument, that thefe bodies are not formed at this time in the *ftone*, that they are all found perfectly alike; for were they continually encreafing, either in fize or number, it is probable that the new-formed ones would be fome way different from thofe which were of older date; nor can any thing be more abfurd, than to think that were they mere *ftones*, they would have been formed as we fee they are, not only with the external fhape and appearance, but with the whole inner ftructure of teeth; thefe foffile teeth being not like *ftones*, one homogeneous body, but compounded of various parts of a different conftitution, there muft, in the formation of it, have been made a various election of humors; one for the root, another for the inner part, and a third for the enamel, or fuperficial coat. The variety of fpecies in the gloffopetræ alone may evince, that they have belonged to the animal we attribute them to, fince they are of extremely different kinds; fome being ftrait, fome crooked, fome bent inwards, fome outwards, fome to one, and others to the other fide, fome plain, others ferrated at their edges, others undulated, and others befet all about with fmaller teeth, and fome ftrait and flatted, or cylindrical, others triangular, fome plain, and others tricufpidate, or having a fmall point on each fide the great one, or main body of the tooth; and all thefe varieties, and no more than thefe, are found in the teeth of fharks of various kinds, and at various ages, and in the different parts of the mouth. The firft row of teeth in thefe animals hanging out of the mouth, bend forward and downward, the fecond row are ftrait, efpecially towards the fides of the mouth, where they are triangular and broad, and the other rows bend downward toward the inner part of the mouth. *Columna*, de Gloffopetra.

If the *formed ftones* be original productions of nature, merely refembling thefe marine bodies in form, why are we to fuppofe that nature ftopt here, or confined her formations of this fort merely to the refemblance of fifhes, and parts of them? why might not other natural bodies as well be imitated, and *formed ftones* found in the fhape of the horns and hoofs of animals? for if we deny them their origin from animals, is it yet explained how, or in what manner they are formed? They cannot fhoot in the manner of falts, fince then the feveral fpecies, which are of the fame fubftance, ought to be alfo of the fame fhape, which is not found to be the cafe; but, on the contrary, we meet with the fame fpecies of fhell in feveral kinds of matter, and compofed of every various fpecies of *ftone*; nay, and of the pyrites, a falino-fulphureous matter, wholly different from common *ftone*, and which could not, by any principle in nature, be made to fhoot as a falt into the fame form with fo different a fubftance as limeftone; whereas, if, as we obferve, thefe bodies are really formed from fhells, &c. they muft retain the forms of thofe bodies, of whatever foffile matter they be compofed; neither could it be fuppofed, that if a falt fhould fhoot into the figure of a fhell, it fhould alfo fhoot into all the natural differences of the upper and under valve in bivalves, the one hollow, the other flat, as is neceffary in many fpecies, for the prefervation and well-being of the animal; and as thefe foffile bodies are found wholly correfponding to the moft minute particulars of the recent fhells of the fame fpecies, there feems no reafon to doubt their having been actually formed from them.

The perfection of the figures of thefe bodies is a farther proof of their origin from animals which they reprefent, fince in all cryftallizations there are many imperfect and mutilated figures, nay more than perfect ones. The hexaedral figure of common cryftal, the cubes of marcafites, and the cryftals of falts in chemical operations, are all much more regular and ordinate in themfelves, than the figures of fcallops, cockles, and other fea-fhells; yet in thefe fimple bodies we find great defects and imperfections; often the top is cut off, and fometimes one of the folid angles; and not unfrequently numbers of thefe concretions are found adhering one to another, and injuring one another's form: fometimes, alfo, their planes greatly differ from one another in fize and fituation, and often they differ, or recede other ways, from their natural and perfect figure. Since this is the cafe in the cryftallizations of bodies of fo fimple a figure as cubes and columns, terminated by pyramids, how much greater muft have naturally been the varieties and imperfections, in fuch varioufly figured bodies as the *formed ftones*, which refemble the fhells of fea-fifhes, had they been formed like thefe by mere cryftallization? but no fuch defects or irregularities appear in thefe.

As there are, therefore, none of thofe defects in thefe compound bodies, to which other much more fimple ones are found fubject, and that there are no irregularities obferved in them, the like of which are not alfo found in the living animals which they reprefent; and as in whatever country they are found, and in whatever matter they are lodged, and whatever fubftance they are compofed of, they are ever found alike among themfelves, and perfectly refembling the parts of animals, it is not to be conceived that they fhould have fhot into thefe forms merely in the manner of falts, but evident that they were parts of animals; the fimilitude of conformation in their pores, their ftriæ, hinges, teeth, prominences, &c. neceffarily inferring a fimilitude of original, and being a ftrong argument of the government of fome principle fuperior to matter figured and moved in their formations. Nor is it any fmall argument againft their arifing from the fhooting of falts, that in all the experiments made with the different falts and minerals by chemiftry, no one fimilar cryftallization, no refemblance indeed, even to the meaneft of them, was ever produced. *Steno*, de Solido intra Solidum.

To all this it may alfo be added, as an unanfwerable proof of the foffile fhells having been once marine, and having lived in the fea, that they are found with injuries which could have been no way elfe received. The purpura, and fome other fhell-fifhes, have bony tongues, with which they bore regular holes through the fhells of fhell-fifh of other kinds, in order to make their way in, and prey upon their flefh. Thefe holes are always eafily known by their regularity and fhape; and fhells bored through in this manner are not only frequent on our fhores, but there are fuch alfo found foffile, bedded in the ftrata of earth or *ftone*; and furely, if falts could be allowed to have fhot into the figures of fea-fhells, they could never be fuppofed able to fhoot into the figures of fuch wounds, as a few of thofe fhells have received in their recent ftate from other animals.

The general opinion is, that the deluge brought all thefe fhells into the places where we fee them; but this feems not eafily conceived; and as there is no argument fo good, but that being carried too far it will make againft its purpofe, fo the laying too much to the effects of the general deluge, has made many believe it has done nothing at all.

Thefe *formed ftones* and real fhells are both found in vaft ftrata on the tops of the higheft mountains, the Alps, Apennines, and others in different parts of the world. The deluge lafted only ten months, and probably the tops of mountains were not covered half that time; and thefe immenfe quantities of fhells cannot be fuppofed either to have bred there in that time, or to have been carried fo high in fuch prodigious numbers. It is more probable that thefe tops of mountains were once not fuch, but bottoms of the fea. The hiftory of the marine bodies they contain is then very plain, and earthquakes may have raifed them, or they may indeed not be fo high above the level of the fea, as we at firft fight fuppofe. If indeed we ftick to the letter of the text, in the fcripture hiftory of the creation, we can find no account for thefe bodies from that time; for if the creation of fifhes fucceeded the feparation of the land from the water in all parts of the globe, they could not be then depofited there; but it is poffible, that at the creation the whole earth was not all at once uncovered, but only thofe parts where Adam and the animals were created, and the reft gradually afterwards, perhaps not in many years, as there feems no neceffity of underftanding the account of the creation to have been in fix natural days. If we may thus underftand, and conjecture in this refpect, it is not difficult to conceive, that during the years in which the earth remained covered with fea-water, fhell-fifh might breed and multiply abundantly all over its bottom; and this bottom being afterwards elevated, deferted by the fea, and made dry land, thefe fhells muft be elevated with it, and retained in thofe ftrata, which afterwards hardened into the various kinds of earth and *ftone*: and fomething of this kind feems to have been the cafe, much rather than, according to Dr. Woodward, that all *ftony* matter fhould have been diffolved by the deluge, and afterwards have concreted again. *Ray's* Phyficotheological Difcourfes.

Solution and colours of STONES. The various beauties of the form and colour of the feveral more precious *ftones*, cannot but have been always the admiration of the curious part of the world, and the wits of the ableft chemifts have been tried, in attempting to counterfeit them; and much may be gathered even from their attempts, which have not fucceeded, toward the learning the true nature and hiftory of thefe beautiful bodies.

The beautiful figures of the Florentine marble, whofe veins reprefent trees, rivers, and ruins of buildings, are well known; as are alfo the delineations of trees and fhrubs in thofe fpecies of white agates, called *Mocoa ftones*. All the *ftones* of this kind are natural, for art has not yet been able to come up to any counterfeit of them; but it is not fo in regard to thofe agates which reprefent regular figures of beafts, &c. thefe are all affifted by art, and that by a very fimple and eafy procefs; and Mr. Du Fay, in the Memoirs of the Paris Academy, has given at one view the feveral ways, then known, to penetrate into the fubftance of agate, marble, &c. and to lodge figures in them.

The *ftones* fubject to be tinged he divides into two claffes, the harder and the fofter. Of the harder kind are thofe which refift the force of acids, even of the moft powerful kind; and of this clafs are agates, onyxes, and all that are vulgarly comprehended under the general name of the gems, or precious *ftones*, with cryftal, porphyry, granite. Thefe, and the like *ftones*, are not foluble in any of the known acids, yet thefe fame acids, impregnated with the folutions

of metals, are capable of penetrating very deeply into them, and tinging them with different colours. The simple agates and jaspers, and other *stones* of the like uniform structure, are easily coloured in an uniform manner; but those which are variegated with veins are composed of several different sorts of matter, and therefore are less easily, and less evenly stained. As the tinging matter does not penetrate the several beds, or veins, in the same manner, therefore all that can be done to these, is to add spots and veins to their natural ones, but they cannot be tinged throughout to one uniform colour, as the chalcedony, or white agate may.

If a small quantity of a solution of silver, in spirit of nitre, be poured upon one of these agates, and the *stone* exposed to the sun, it will in a few hours be tinged to a reddish brown colour; and if more of the same solution be added, and it be again exposed, the colour will become stronger, and will penetrate deeper into the body of the *stone*; and if the *stone* be not too thick, and the solution be rubbed on both sides, it will tinge it throughout. Nor is this all the effect, for it will give it several veins and lineations, which were not distinguishable in it before; the reason of which is, that in all these *stones* there are some parts harder than the rest, and consequently more difficultly coloured, and these remaining, therefore, paler than the rest of the mass, make the lines and veins in it.

If there be added to the solution of silver, used for this purpose, a fourth part of its quantity of soot, and as much salt of tartar, the colour becomes grey; and if, instead of this soot and tartar, the same quantity of plumose alum be used, the *stone* will be tinged to a deep violet colour, tending to black.

A solution of gold gives agate only a pale brown colour, and that penetrates but a little way into it; and a solution of bismuth gives a colour, which appears white when the light falls directly upon it, but brown when it is held against the sunshine, or a candle; and all the metallic and mineral solutions, employed in the same manner, affect the *stone* more or less in the same way.

The exposing the *stones* to the sun is a very necessary article in the process, since without that the tinge is but very faint, and penetrates but to a very little depth. To trace in the chalcedony, or white agate, figures of any determinate kind, the usual method is this: before the agate is polished, mark out the intended figure with the point of a fine needle, and afterwards with a brush, or a pen, follow those lines with a very strong solution of silver. One would imagine that the dendritæ, or delineations of trees in Mocoa *stones*, might be imitated in this manner; but it is difficult to give the due blackness of colour, and to mark the figures with a like precision and exactness. If any *stone* should, however, be suspected to be adulterated, or counterfeited in this manner, it is easily brought to the trial; for if it be thus made, a small heat over the fire will almost entirely divest it of its colour, and the rubbing a little spirit of nitre, or aqua fortis over it, will have the same effect. In both cases the *stone* may, however, be restored again to its beauty; in the first, by tinging it afresh with the same liquor, and in the last, by only exposing it for several days to the sun.

It is well known, that by means of fire alone the amethyst, the sapphire, and the other gems, may also be wholly divested of their beautiful colours. The method of doing this, is, to put the gems into a crucible, surrounding them with sand, or with steel filings; then putting them into the fire, they lose their colour as they become hot, and are taken out wholly colourless. If the white agate be calcined in this manner alone, it becomes of a cloudy or opake white; but if it has before been stained with the solution of silver, those spots or stains become of a yellow colour, which aqua fortis afterwards has no power to take away. If the agate be calcined first, and afterwards rubbed over with the solution of silver, it receives some spots and lines of brown. The cornelian loses a great part of its redness by calcination, and becomes of a dusky flesh-coloured white; and the Mocoa *stone*, treated in the same manner, loses all its colour, and the delineations of trees disappear.

There are many *stones* on which the solution of silver has no effect; of this number are all the gems, rock crystal, and the like. The dendrites of Catalonia is also of this kind; and of this *stone* the artificers relate an odd phænomenon, which is, that if it be sawn asunder there are very few delineations observed in it, but if it be split by a blow, it is usually found full of them. The reason of this is only that these delineations are so many flaws and cracks, and the *stone* breaks easiest in these places.

The effects of the solution of silver are different, as to degree of colour, on different *stones*. The Oriental agate receives from it a deeper and blacker tinge than the common chalcedony. Some agates, naturally distinguished by their yellow spots, receive a purple colour from it. The jade *stone*, used by the Turks, takes only a faint tinge of brown. The common prime emerald, or root of the emerald, becomes blackish with it. The Oriental granite is tinged in many places with a violet colour by it; this is principally effected in the white parts. The solution does not act much on the black ones, only that it takes some of them away. The serpentine marble receives an olive colour from it; but it is remarkable that the amianthuses, and the talcs, and other foliaceous *stones*, are wholly unaffected by it.

Marble being a substance greatly softer than agate, receives the colours with much greater ease, and the doing this in an accurate manner has been the subject of the attempts of many eminent men. Kircher has given some directions for the staining marble, which have been translated word for word into the Philosophical Transactions; but they are so indeterminate and uncertain, that nothing can in reality be learned from them. Many others have written also on the same subject, but Mr. Du Fay is the only one whose experiments are plainly and clearly laid down, and may be followed by any body.

This gentleman chose the common white marble without veins for making his experiments, for the same reason that he chose the plain agates, because in the veined ones there are several different sorts of matter, all of which are not to be penetrated with equal ease. The solution of silver penetrates into marble to the depth of an inch, or more, and gives a tinge, reddish or purple, at first, and afterwards brown, from which colour it never varies afterwards. It always takes off the polish of the marble, eating away a part of its surface. The solution of gold does not penetrate so deep into marble as that of silver, but it gives a beautiful violet colour. Both these operations are much assisted by exposing the marble to the sun. The liquors usually diffuse themselves, and spread every way in the marble, so that it is not easy to make any figure with them that shall keep its outline tolerably regular.

The solution of copper gives marble a beautiful green tinge; but it does not penetrate deep, and on the application of boiling water becomes black; when the surface is polished off afterwards, however, it becomes again of a beautiful green.

Beside the powerful acid menstruums, there are many other liquors which have a power of penetrating deep into marble. Of this nature are all the oily fluids; but the expressed oils have this disadvantage, that they leave a fattiness in the marble which will not suffer it afterwards to take a good polish. All substances which can penetrate marble, can carry colours into it; but such are most eligible, which having lodged the colours evaporate, and leave them there, without injuring the *stone*. Spirit of wine is of this number; it is excellently qualified for the extracting beautiful tinctures, and sinks them very deep. Oil of turpentine also has its value, but it does not take tinges so well as the spirit. Some have recommended lixiviums of the fixt alkaline salts, but they very rarely produce any beautiful colour. In the using these fluids the marble is to be gently heated, and the spirit is by that means evaporated before it is cooled, leaving its colour always behind. White wax penetrates very deep into hot marble, and conveys colours into it in a very beautiful and determinate manner. There are however but a few bodies, which will impart their colours to wax, and therefore this valuable means is of a very limited use.

Several of the gums alone are also able to tinge marble very strongly. Dragons blood, and gamboge, if rubbed on hot marble, penetrate it to the depth of about a twelfth of an inch: the gamboge requires the marble to be hotter than the other, and tinges it to a very beautiful yellow; the dragons blood tinges to a red in different degrees, according to the heat of the marble.

If these gums have been used to polished marble, there is no farther caution necessary, than the cleaning them off from the surface with a little spirit of wine: but the way to make them sink deeper into the *stone*, is to take off the polish by rubbing the surface with pumice, or the like, and then the gums sink much farther, and the colours appear very beautiful when the marble is polished again.

Though these gums act alone, yet they will succeed much better if dissolved in spirit of wine, and applied with a pencil; for by this means they sink deeper in, and the figures traced out will keep their determinate form and outlines, these solutions fixing immediately, without spreading any way. It is also remarkable, that the solution of dragons blood hardens the marble, and renders it less soluble in acids than before; so that if a piece, stained in part with this solution, be afterwards rubbed over with an acid dissolvent, and its surface eaten away to some depth, the parts which are coloured will all stand out above the rest.

A tincture of Brasil wood in spirit of wine tinges marble red, and if the heat given to the marble be greater, it becomes purple; but both these colours fade a little in keeping. A tincture of cochineal gives a purplish red, and the more the marble is heated, the farther the colour penetrates, and the deeper it is. In oil of turpentine the colour of cochineal penetrates much deeper into the marble, but it has a brownish cast. Alkanet root, by means of spirit of wine, gives also a red colour, which, if the heat be too great, changes to brown; and this, and most other of the like matters, tinge the marble, in tincture with spirit, to a slight depth; and in oil of turpentine they sink much deeper, but then the oil leaves a greasy look upon the marble.

If verdigreafe be boiled a confiderable time in white wax, it tinges marble, when rubbed hot upon it, to a beautiful green, little inferior to that of the coarfer emeralds, and the colour fpreads itfelf very equally, and penetrates to a third of an inch deep; if the marble be made too hot, the colour becomes that of the jade *ftone*. Alkanet boiled in white wax gives a flefh colour, which penetrates very deep; and the roucou boiled in wax makes a permanent yellow, which alfo finks very deep. The beft way of heating marble for this purpofe, is to lay the piece, intended to be ftained, upon a bed of fand, a fifth of an inch deep, upon an iron plate; this is to be fet over the fire, and when of a proper degree of heat, the colour is to be applied. The juft degree can only be found by experience, and it varies indeed in almoft every colour; but in general, the finer colours require the marble to be of fuch a heat, that the hand can juft bear to be laid upon it, and the others require a fomething greater degree than this.

Black is, of all colours, the moft difficult to give in this manner to marble; and perhaps indeed it is impoffible to give that colour in any degree of perfection, and that for this plain reafon, that all thefe colours only fill the interftices between the granules of the marble, thofe granules themfelves remaining unaltered: thus, in the other colours, the whitenefs of the granules is only a heightning to the tinge, making it brighter, and a little paler; but the whitenefs can never fail to appear diftinguifhably as fuch in black, and by that means deftroy that colour.

Next to black, blue feems the moft difficult, of all the colours, to give to marble. Mr. Du Fay, however, having found by Mr. Geoffroy's experiments, that oil of thyme, by long ftanding with fpirit of fal armoniac, acquired a blue colour, tried this mixture, and found it fucceed very beautifully. But this is one of thofe colours which require the marble to have but a very fmall degree of heat, fince a greater would evaporate them before the colour had time to penetrate. The colours of the gums may be laid on when the marble is cold, and on heating it afterwards they will fink into it.

There is another very elegant fort of workmanfhip to be employed on marble, that is, the tracing figures in relief in it; and this is done much more eafily than might be imagined, there being nothing more required to it, than the faving the parts which are to be left in relief, by covering them with a varnifh, and eating away the reft by means of an acid. For this purpofe let the defigned figures be traced in chalk upon the marble, and cover them with a bed of varnifh, made by diffolving a piece of common red fealing-wax in fpirit of wine; then pour on the marble a mixture of equal parts of fpirit of falt and diftilled vinegar, and this will eat down all the ground, and leave the figures ftanding, as if engraved with immenfe trouble. The adding the colours, before defcribed, to thefe marbles afterward, in a regular manner, will give them a furprifing beauty. Mem. Acad. Par. 1728.

Electrical attraction of Stones. Many *ftones* have been obferved by Dr. Lifter to have a fort of *electrical attraction* to vegetable refins.

This author obferves, that having placed fome foffils in a cabinet made of Barbadoes cedar, and examining them at fome diftance of time, he found them all covered with a liquid refin like Venice turpentine. Many of the *ftones* were wrapt up in papers, yet thefe, as well as the reft, were covered with this refin; though, upon the moft diligent fearch, there could not be found any exfudation on any part of the cabinet. The iron ores were moft of all covered with refin, all the kinds of the hæmatites being thick coated with it; and among the aftroitæ fome were thinly covered, and others perfectly free from it.

It was not owing to the texture and denfity of the *ftones*, that they either efcaped this, or had it, but thofe of the moft open grain, and thofe of the clofeft, were indifferently covered with it. It is certain from this fingular obfervation, that the whole body of the turpentine of the cedar wood was carried up into the air, and floating in it was again condenfed, on the coming into contact with certain *ftones*, tho' not with others.

There are feveral vegetable fubftances, which in this manner emit their whole body into the air: of the number of thefe is camphor; but the *ftone*, that will again condenfate this into camphor, is not known. Philofoph. Tranfact. N° 110.

Formation of Stones. See Lithogenesia.

Medical Stones, a term ufed by fome to exprefs thofe particular *ftones*, which for their real or imaginary virtues have, at one time or other, been made ingredients in medicinal preparations.

The opinions of the antients, in regard to the virtues of gems and precious *ftones*, were very whimfical; they fuppofed that they had certain fympathetic properties, and that the wearing them on the finger, or carrying them in the pocket, would cure difeafes, render the Gods propitious to their prayers, or fave them from thunder. Thefe have been defervedly laughed out of the world in our more enlightened times; but it has remained a queftion, and does fo even to this time, whether or not fome of the gems have real medical virtues, naturally refulting from their parts, and conftituent matter. It appears from the prefent ftate of the gems, that they were once fluid bodies, or, at leaft, made up in part of fuch fubftances as were once fluid; and as in this ftate they were capable of receiving metalline admixtures, it is poffible they may derive certain virtues from thofe admixtures; and fome concurrent circumftances in that mixture may have exalted the virtues of the bodies received, beyond what they could naturally and fingly have excited.

The diaphaneiety, the external figure, and the internal ftructure of gems, all argue ftrongly for their having once been in a fluid ftate; and their colours, which feem to be evidently adventitious, and imparted either by fome coloured mineral juice, or fome tinged exhalation, could have fo deeply affected the denfe texture of thefe *ftones*, as to pafs through all their parts in no other manner, than when that *ftone* was in *folutis principiis*, or in a fluid ftate.

There are fometimes found extraneous matters lodged in the bodies of the gems themfelves, which could only have been enveloped in them in this manner while they were foft; and even in moft of them, the art of the chemift is able to difcover real particles of metals, which muft have been mixed in their fubftance at fuch a time, and to which they may very probably be indebted for real virtues.

Rubies, when too fmall to be of value as gems, are in fome places, where they make a fort of fand in the rivers, worked to fome advantage as ores of gold. The amethyft evidently contains iron, and the emerald copper; why fhould it then be fuppofed impoffible, that the virtues of thefe metals may be found in the gems which contain themfelves, and that in fo pure and fine a ftate, as no chemical procefs can afford them in? The weight of many of the coloured gems is much greater than could be expected in *ftones* of that hardnefs and confiftence, and is plainly owing to the admixtures of the metalline particles of the various forts they contain.

Mr. Boyle's opinion of the origin of the real virtues of the gems, is, that while the petrefcent matter was yet in a fluid ftate, the mineral matter was received into, and intimately mixed with it, fo as that the whole became but one *ftone*; and that the virtues are always fuch, as may be derived from the impregnating metal or mineral, and are various in degree, according to the various ftates of the metal, and its quantity received into the compofition.

If this fyftem holds good as to the gems, it will be much more naturally applicable to the femipellucid *ftones*; many of which have gravities fo great, as plainly to denote the metalline or mineral matter that makes a part of them. The metalline fubftances, that may be feparated out of thefe *ftones*, give great proof of the truth of this fyftem: thus the hæmatites contain a very large quantity of iron, and the lapis lazuli, and turquoife *ftone*, contain very large quantities of copper; and many of the jafpers hold no inconfiderable portion of the fame metal. *Boyle* of the Origin and Virtues of Gems.

Stone *for building*. Care muft be taken to dig *ftone* at the proper feafon; for that *ftone* which, taken out of the quarry at one time, would foon moulder away, will at another feafon endure the weather for many years, if not ages. *Boyle*'s Works Abr. Vol. I. p. 111.

Bolonian Stone. See Lapis *Bononienfis*.

Chalk Stones. See Chalk.

Chick Stone. See Cicerum *lapis*.

Copperas Stone. See Lapis *atramentarius*.

Eft Stones. See Ept.

Figured Stones. See Figured *ftones*.

Flefh Stone. See Sarcites.

Free Stone. See Free *ftone*.

Gypfine Stone. See Gypsine.

Horn Stone. See Lapis *corneus*.

Moor Stone. See Moor.

Oil of Stones. See Oil *of ftones*.

Shoad Stones, among the miners of Cornwall. See the article Shoad *ftones*.

Staining of Stones. See Staining.

Stone, in commerce. The *ftone troy*, in Scotland, contains fixteen pounds, the pound being two marks, or fixteen ounces. Tr. Pract. Geom. p. 153. See Pound.

Stone-*brafh*, in agriculture, is a light lean foil, full of larger and fmaller maffes of rubble *ftones*.

Thefe are to be tilled according to the condition in which they are found, for if they are graffy they fallow them pretty late; but if they have no grafs upon them, they fold them in winter, when the fheep's dung, with the help of fome hay-feed, will furnifh them with grafs: or elfe, early in the fpring they lay upon them old thatch or ftraw, or the ftrawy part of old dunghills, earth out of ditches, or the like, which will all, more or lefs, help forward a coat of grafs upon the land; for it is a rule in regard to thefe lands, that they muft have a covering of grafs before they are fallowed, elfe they will yield but a poor crop. *Plot*'s Oxfordfhire, p. 247. See Stony *land*, infra.

STONE-*chatter*, in zoology, the name of a ſmall bird of the *œnanthe*, or fallow-finch kind, called by ſome authors *rubetra* and *muſcicapia*, and in ſome places the *ſtone-ſmich*, and the *moor-titling*.

It is about the ſize of the common linnet. Its beak is longiſh, ſtrait, and ſharp, and is black, as is alſo its mouth within. Its head is large, and in the male is black almoſt all over, as is alſo the upper part of the throat; but in the female theſe parts are variegated with black and brown. The neck is black, and marked on each ſide with a white ſpot, the two ſeen together looking ſomewhat like a white ring. The middle of its back is alſo black, but the extremities of the feathers are yellowiſh. It has a white ſpot juſt above the rump. Its breaſt is of a ſomewhat reddiſh yellow, and its belly white, with a faint caſt of red. In the female, the feathers of the back and neck are of a ſomewhat greeniſh tawny, with black middles; the upper part of the throat is grey, and the breaſt red. It is common on heaths, and makes a very loud, and often repeated noiſe. *Ray*'s Ornitholog. p. 169.

STONE-*curlew*, in zoology, the Engliſh name for the *œdicnemus*, a bird of the colour of the curlew. See the article ŒDICNEMUS.

STONE-*phoſphorus*. See LITHOPHOSPHORUS.

STONE-*plant*. See LITHOPHYTON.

STONE-*ſmich*, a common Engliſh name for that ſpecies of œnanthe, which we more frequently call the *ſtone-chatter*. See the article STONE-*chatter*.

STONE-*ſucker*, in zoology. See PETROMYZON.

STONY *land*. The farmers expreſs by this term two ſorts of land, the one full of large flints and pebbles, and the other full of fragments of free *ſtone*, or other coarſe *ſtones*.

Theſe lands in many places yield good crops, and the general rule is, that in ſtiff and cold lands the *ſtones* ſhould be as carefully picked out as may be, but in light and dry grounds they ſhould be left. In Oxfordſhire they have great quantities of a lean earth, and a ſmall rubble-*ſtone*, or a ſtower ſort of land mixed with it; this is ſometimes very full of weeds, and ſometimes very clear of them: if they are weedy they fallow them late, but if they be ſeary, as they expreſs it, that is, if they have no ſwerd upon them, they either fold them in winter, and add ſome hay-ſeed to the ſheep's dung, to bring up graſs, or elſe they lay old thatch or ſtraw, and dung upon it; for they reckon, that if theſe lands have no ſwerd upon them before they are fallowed, they will by no means be brought to bear a good crop, but a great deal of May-weed, and other unprofitable herbs. In September, November, and December, they fallow as the ſwerd directs them: if this is done in either of the two laſt months, they call it a winter-fallowing, and never ſtir it again till they plow it, and ſow it with barley; and theſe lands are reckoned to do better than if finely tilled. They will bear wheat and meſlin in a kindly year, and large crops of barley, if they are well managed, and kept in good heart.

They always fallow theſe lands every other year, unleſs they ſow peaſe upon them; ſometimes they ſow them with lentils; and when they are quite worn out, they lay them down for clover, or rey-graſs. *Mortimer*'s Huſbandry, p. 71.

STOOL (*Cycl.*)—STOOL, in mining, is uſed when the miners leave digging deeper, and work in the ends forward. The end before them is called the *ſtool*. *Houghton*'s Compl. Miner in the Explan. of the Terms.

Bloody STOOLS, in medicine. The ſpirit of vitriol, mixed with the patient's drink, has often been found beneficial in cures of *bloody ſtools*.

Retention of the firſt STOOLS, in infants. See INFANT.

STOP, in the manege, is a pauſe, or diſcontinuation of going. In order to *ſtop* a horſe, the rider ſhould, in the firſt place, bring to the calves of his legs, to animate the horſe, then bending his body backwards, raiſe the bridle-hand, without moving the elbow; then vigorouſly extend the hams, and reſt upon the ſtirrups, to make him form the times or motions of his *ſtop*, in falcading with his haunches three or four times. You ſhould not form the *ſtops* of your horſe ſhort and precipitate, leſt you ſpoil his hams and mouth. After *ſtopping*, a horſe ſhould be made to make two or three corvets.

The oppoſite term to *ſtop* is *parting*. In former times, the *ſtop* of a horſe was called *parade*. See the articles RAISE and NAILS.

Half a STOP, is a *ſtop* not finiſhed by a *peſate*; ſo that the horſe, after falcading three or four times upon the haunches, reſumes and continues his gallop, without making *peſates*, or *corvets*. See the articles PESATE, CORVET, &c.

STOP, at ſea, a word uſed by him that holds the half-minute glaſs, in heaving the log; for immediately when the glaſs is out, he calls *ſtop* to them that let run the line. See the article STOPPING.

STOPPAROLA, in zoology, the name of a bird of the lark kind, deſcribed by Aldrovandus, and ſuppoſed by Mr. Ray to be the ſame with the *ſpipoletta*, or the *tordino* of the Venetians. See the article SPIPOLETTA.

STOPPER, in a ſhip, a piece of rope having a wale-knot at one end, with a lannier ſpliced into it, and at the other end made faſt in the place where it is to be uſed. Its uſe is to ſtop the main-halliards, or the cable. The *ſtopper* for the halliards is faſtened at the main-knight, and it ſerves, when they are hoiſing the main-yard, to ſtop it, that it don't run out too faſt. They bind the wale-knot about the cable with the lanniers, and that ſtops it, ſo that it cannot ſlip away. This *ſtopper* is faſtened to the bottom of the bits by the deck. The word is, *lay on the ſtoppers*; and a ſhip is ſaid to ride by the *ſtoppers*, when the cable is faſtened, or tied only by them, and not bitted; but this is not ſafe riding in a ſtreſs of weather.

STOPPING (*Cycl.*)—STOPPING *a leak*, at ſea. See LEAK.

STOPPING *a ſhip*, at ſea. When a ſhip comes to an anchor, and the cable is veered out by degrees till the ſhip is found to ride well, and then ſtopped, it is called *ſtopping the ſhip*.

STORAX (*Cycl.*)—The writers of the middle ages have greatly perplexed the hiſtory of this drug in general.

The true ſtate of the caſe is this; all authors, of all times, have deſcribed at leaſt two kinds of *ſtorax*, a dry and a liquid kind. The Arabians and Greeks have both joined to call the dry kind *calamita*; but neither the origin of that epithet, nor its true ſignification, have been conſidered as they ought.

The *ſtorax ſicca*, or *calamita* of the Arabians, was the worſt of all the kinds of *ſtorax*; it was only the refuſe, after making the artificial liquid kind.

They ſometimes boiled the fruit of this tree, and ſometimes its bark, and out of both extracted a liquid *ſtorax*; and the remainder of both was ſaved under the name of *dry*, or *calamite ſtorax*. It is no wonder, therefore, that the *calamite ſtorax* of the Arabians was the worſt of all the kinds; and as ſuch the term is always to be underſtood, when met with in the works of the Arabians.

On the other hand, when the Greeks would expreſs the very beſt and fineſt *ſtorax*, they always do it by the term *calamite ſtorax*. The two kinds of *ſtorax* they mention, are the reddiſh and the black. The latter was foul, and much leſs in eſteem. The former was the fine pure *ſtorax*, naturally exſudating from the tree. This they ſometimes called *calamite*, becauſe in the form of pieces of reed.

The common opinion, in regard to this word, is, that it was an epithet given to the fineſt *ſtorax*, from its being put into reeds to be brought over with ſafety: but this was not the caſe. The fineſt of all *ſtorax*, was that which voluntarily exſudated from the tender twigs, and young ſhoots of the tree: this ſometimes coated over the whole twigs for an inch or two in length, and reſembled a reed, or other hollow cylindric body, drawn on over the twig. This was the origin of the name *calamite*, or reed-like *ſtorax*, given to this which was of the red *ſtorax* kind, but finer than that of the trunk or larger branches, and approaching to a yellowiſh hue.

Pliny gives even a ſtricter account of the name than this: he ſays, and that from the authority of authors of repute, that the *ſtorax*-tree being very ſweet taſted, and very ſoft in the young wood, worms were very apt to get into the ſhoots; and that when they did ſo, they would eat away all the woody matter, and leave only the bark. The *ſtorax*, extravaſated by theſe punctures, uſed to coat over theſe tubes, and they then exactly reſembled pieces of reed artificially covered with ſome gum.

According to this account, the name *calamita* was extremely appoſite to that *ſtorax*, and it had as much title to the epithet, in all appearance, as the *adarce calamites*, which always gathered about reeds, and was therefore ſometimes ſimply called *calamites*. See ADARCE.

STOREA, among the Romans, a kind of baſket made of ropes or ruſhes, for gathering flowers or garden-fruits. *Pitiſc.* Lex. Ant. in voc.

STOREA was likewiſe a kind of defence, made of large cables faſhioned into a ſort of nettings; which was ſo ſtrong, that no weapon, though thrown out of an engine, could penetrate it. See *Pitiſc.* in voc. and *Cæſ.* Bell. Civ. II. 9.

STORM-*fink*, in zoology, the name of a ſmall bird deſcribed by Hoier, and ſaid to be ſeen principally at ſea, where it is looked on as a foreteller of bad weather.

It is a little larger than the common ſparrow, and is all over of a greyiſh colour. It is very remarkable for its ſkimming very ſwiftly along the ſurface of the water. When large flocks of theſe appear, the mariners know they are to expect a *ſtorm*, and prepare for it. *Ray*'s Ornithol. p. 306.

STORYNE, the name of an inſtrument uſed by the antients for drawing blood from the noſe; but we are not perfectly informed of its ſhape or ſtructure.

STOVE (*Cycl.*)—STOVES, in gardening, are buildings erected for the preſervation of tender exotic plants, which, without that aſſiſtance, will not bear the cold of our winter, becauſe they require an artificial warmth.

Stoves are of two kinds, diſtinguiſhed by the names of the *dry*, and the *bark ſtove*.

The dry *ſtove* has the flues, in which the ſmoak is carried, either laid under the pavement of the floor, or erected in the back part of the houſe over each other, and returned ſix or eight

eight times all along the *ſtove*. In theſe *ſtoves* the plants are placed on ſcaffolds, and benches of boards, raiſed above one another; and the plants, principally preſerved in theſe, are the aloes, cereuſes, euphorbiums, tithymals, and other ſucculent plants, which are impatient of moiſture in winter, and therefore are not to be kept among trees, or herbaceous plants, which perſpire freely.

The bark *ſtoves* are made with a large pit, nearly of the length of the houſe, which is three feet deep, and ſix or ſeven feet wide. This pit is to be filled with freſh tanner's bark to make a hot-bed, and in this the pots, containing the tender plants, are to be plunged.

This invention of tanner's bark for hot-beds has been of prodigious ſervice to the curious in gardening, as many plants are, by this means, annually preſerved and raiſed, which no other method could have made endure our climate.

The dimenſions of theſe *ſtoves* muſt be wholly directed by the number of plants intended to be preſerved; and for the dry *ſtove*, the floor muſt be raiſed above the ſurface of the earth, more or leſs, according to the dryneſs or wetneſs of the ſoil. In the front there is to be a walk about twenty inches wide, for the convenience of walking. The fire-place may be made either in the middle, or at one end, and the furnace muſt be contrived according to the nature of the fuel which is to be burnt there. The beſt firing, when it can be had, is turf, for it burns longer, and more moderately, than any other fuel, as alſo more uniformly, and therefore requires leſs attendance.

The entrance into the bark *ſtove* ſhould always be either out of a green-houſe, or the dry *ſtove*, or elſe through the ſhed where the fire is made; becauſe in cold weather the front glaſſes muſt not, by any means, be opened, and the top ſhould be covered either with tarpaulins, or ſliding ſhutters, in bad weather.

The tender ſhrubs and exotic plants muſt be plunged in their pots into the bark beds; ſuch are the caſhew, cabbage-tree, cocoa-tree, dumb-cane, ſuſtick, logwood, mancinel, papaw-tree, four-ſop, and the like; and upon the top of the flues may be ſet the melon, thiſtle, the tender cereuſes, and the like.

The thermometer, by which the heat in the *ſtove* is regulated, muſt always be hung with its back to the ſun, and as far from the flues as may be. The proper ſtructure of theſe ſhelters, for the curious part of the vegetable creation, is to have a green-houſe in the middle, and two *ſtoves*, and a glaſs caſe, at each end. The particular rules for the ſtructure of all theſe, with plans of them, are accurately given by Mr. Miller in his Dictionary. *Miller's* Gardner's Dictionary.

STOWS, in mining, are ſeven pieces of wood, ſet upon the ſurface of the earth, faſtened together with pins of wood.

STOWING *the hold*. See the article HOLD.

STRAIGHT, (*Cycl.*) in geography. See the article FRETUM.

STRAIGHT, in the manege. To part, or go *ſtraight*, or right out, is to go upon a tread traced in a *ſtraight* line. When you would puſh your horſe forwards, make him part *ſtraight*, without traverſing, or bearing ſidewiſe.

STRAIGHT *membered*, called in French *droit ſur les jambes*. See the article LEG.

STRAIKS, in the military art, are ſtrong plates of iron, ſix in number, fixed with large nails, called *ſtraik-nails*, on the circumference of a cannon wheel, over the joints of the fellows, both to ſtrengthen the wheel, and to ſave the fellows from wearing on hard ways or ſtreets.

STRAKE, in the ſea phraſe, a ſeam between two planks; as the *garboard-ſtrake* is the firſt ſeam next the keel. They ſay alſo a ſhip *heels a ſtrake*; that is, hangs or inclines to one ſide the quantity of a whole plank's breadth.

STRAMONIUM, *thorn-apple*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the infundibuliform kind, and conſiſting of one leaf, and divided into ſeveral ſegments at the edge. The piſtil ariſes from the cup, and is fixed, in the manner of a nail, to the hinder part of the flower. This afterwards becomes a fruit of a roundiſh figure, echinated in moſt of the ſpecies, and divided into four cells, containing ſeveral large ſeeds, uſually of a kidney ſhape. The ſeptum, which divides the head or fruit, is of a cruciform ſhape, and has four placentæ, to which the ſeeds adhere.

The ſpecies of *ſtramonium*, enumerated by Mr. Tournefort, are theſe. 1. The round thorny-fruited *ſtramonium* with ſingle white flowers. 2. The round thorny-fruited *ſtramonium* with double white flowers. 3. The round thorny-fruited *ſtramonium* with ſingle violet-coloured flowers. 4. The round thorny-fruited *ſtramonium* with double violet-coloured flowers. 5. The Ægyptian *ſtramonium* with double flowers, white within, and of a violet colour on the outſide. 6. The white-flowered *ſtramonium* with an oblong prickly fruit. 7. The purple-flowered *ſtramonium* with oblong prickly fruit. 8. The violet-flowered *ſtramonium* with oblong prickly fruit. 9. The ſharp long-thorned *ſtramonium*, called by authors *ſtramonium ferox*. 10. The ſmaller American *ſtramonium* with leaves like thoſe of alkekengi. 11. The ſmooth-fruited *ſtramonium* of Malabar with ſingle violet-coloured flowers. 12. The ſmooth-fruited *ſtramonium* of Malabar with double flowers. *Tourn.* Inſt. p. 118.

STRANGALIDES, a word uſed by authors to expreſs hard tumors in women's breaſts, ariſing from coagulations of obſtructed milk after child-birth.

STRANGLES, in the manege, is a collection of foul humors formed in the body of a young colt; which are voided by the noſtrils, or by a ſuppuration of ſome glands or knots, that lie between the bones of the lower jaw, and are crowded with impurities.

The *falſe ſtrangles* happen in old horſes, that have not well caſt the *ſtrangles*.

STRANGULATIO, a word uſed to expreſs that kind of ſuffocation which is common to women in hyſteric diſorders; and for the ſtraitning the inteſtines in hernias.

STRANGULATORIA, in the materia medica, a name by which Avicenna, and ſome other authors, have called the *doronicum*, or leopard's bane. *Ger.* Emac. Ind. 2.

STRANGURY (*Cycl.*)—The vulgar generally underſtand by this word the three ſeveral complaints, called by phyſicians *ſtrangury*, *dyſury*, and *iſchury*; the differences of which are theſe.

The *ſtrangury* is properly and diſtinctly a difficult excretion of urine, which comes away by drops, with a ſenſation of a ſpaſmodic pain about the ſphincter and neck of the bladder.

The *dyſury* is a difficulty of making water, attended with a violent attempt and preſſure of the parts. This ſometimes has its origin from the kidneys, ſometimes from the bladder.

The *iſchury* is a total ſuppreſſion of urine for ſome days, without the leaſt drop being voided, or the patient's feeling the leaſt ſtimulus toward attempting to void it.

Theſe three diſtemperatures of the urinary organs, though very properly diſtinguiſhed by their ſeveral names, are, however, in reality all the ſame in their origin, and differ only in degree.

In the *ſtrangury*, the difficulty of voiding the urine is ſomewhat tolerable, and is not attended with any ſenſation of heat, but rather with a coldneſs; and though the urine is voided only by drops, yet, as this is continual, there is more in quantity voided in this, than in the ſame time in a *dyſury*. The *ſtrangury* ſeems a ſort of middle complaint, combined of the two others, the *diſury* and *iſchury*; and it differs in point of duration, being ſometimes only a complaint of a few hours, and ſometimes fixing itſelf upon the patient for a long time. Sometimes alſo it is idiopathic, and is properly a diſeaſe in itſelf; but ſometimes it is ſymptomatic, attending nephritic complaints of ſeveral kinds.

Phyſicians alſo diſtinguiſh the *iſchury* into the proper, and improper: the firſt is the denomination they give to this diſeaſe, when the bladder is full of urine all the time, and is ſo diſtended, that it brings on ſpaſmodic affections, which prevent the natural efforts for the excretion of it. The improper *iſchury* is that in which there is no ſuch fullneſs of urine, but this fluid is, by ſome means, prevented from flowing as it ought into this receptacle. We muſt be careful not to confound with theſe diſtempers the natural imminution of urine, which happens after copious ſweats, or diarrhœas, in which a great quantity of wet ſtools have been voided: this is diſtinguiſhed from theſe morbid affections, by its being attended with no pain, and always going off of itſelf.

Symptoms of a STRANGURY. Theſe are of frequent irritations to make water, which are ſucceeded either by a few drops, or a ſomewhat larger quantity, according to the nature and violence of the caſe; there is always a ſenſation of coldneſs while the urine is coming away, and a heat afterwards; and the whole body is very frequently affected with ſhiverings and ſudden coldneſs.

In a *dyſury*, the difficulty of voiding the urine is great, and the pain violent; but in this caſe it does not go off as ſoon as the urine is voided, but continues afterwards.

In the *iſchury*, while there is for ſeveral days together no attempt to the voiding any urine, if the complaint is in the bladder, the patient feels a weight and preſſure upon the os pubis; but when the kidneys and ureters are in fault, the pain is felt in the loins; and ſometimes this is attended with heart-burnings, iſchiatic pains, and even with diſorders of the ſtomach, and actual vomiting; and if the cauſe is ſome inflammable tumor, which is not unfrequently the caſe, then the pains are very violent, and the body is all over preternaturally hot.

The *dyſury* more frequently attacks thoſe who are ſubject to the ſtone in the kidneys or bladder, or to other nephritic complaints, and ſuch as have taken cantharides internally, and by that means brought on an eroſion of the neck of the bladder; ſometimes, alſo, this becomes a ſymptom in hyſteric complaints.

The *iſchury* principally attacks young men, and moſtly thoſe of plethoric habits; and thoſe who have been too free with hot medicines, ſtrong liquors, and powerful diuretics.

Causes. The cause of a *strangury* is a spasmodic contraction of the sphincter, and neck of the bladder, attempting to throw off something that is troublesome; and the fermentative state of the urine, accused by many as the cause of this disease, has indeed no share in the occasioning it. The *dysury* sometimes has its cause and origin in the kidneys, sometimes in the bladder, and when in the last place, a spasmodic constriction of the sphincter is often the case, and this is not unfrequently brought on by a high diet, the feeding on very salt foods, or using too much spices. The *ischury* is often occasioned by accidents; such as a stone, gravel, a worm, a grume of blood, or a collection of purulent matter stopping up the passage in the neck of the bladder; sometimes it is occasioned by a venereal caruncle, or inflammatory tumor; sometimes by the weight of the uterus in women with child, when near the time of their delivery; sometimes by external violence; and sometimes by the sitting a long time drinking, without going to make water; but this last more rarely happens. *Junker's* Consp. Med. p. 533.

Prognostics in these cases. A simple and idiopathic *strangury* is rather a painful, than a dangerous disease; but if it often recurs upon the person, it bespeaks a calculous nephritic complaint for its cause: and, in general, it is a worse complaint in old people, than in the young or middle aged. The *dysury* is of the same nature with the *strangury* in its event, but the longer it continues, the greater danger there is of its bringing on spasms and fevers. But though these two cases are not attended with any very imminent danger, the *ischury* is, especially when it is of some days standing; for if it is not cured before the seventh day, an inflammatory fever comes on, which is usually followed by a speedy mortification, and by the death of the patient with hiccups and violent convulsions. People subject to *ischuries* are also in danger of dropsies; and dropsical people are more subject to this complaint than any others, especially when the disease is increased to a considerable height.

Method of cure. The *strangury* and *dysury* are to be treated in the same manner. The acrimony of the fermentitious matter in the blood, which might be apt to occasion new congestions, is to be obtunded, and the spastic motions taken off: both these purposes are excellently answered by nitre, whether given alone, or mixed with some abstersive salt, or with an absorbent, mixed with a small quantity of an acid to saturate it, and with a little cinnabar. A compound powder may be prepared of these ingredients, and a scruple of it given four times a day, will usually soon take off the complaint. The cooling emulsions, made with barley-water and almonds, and with the cold seeds, are also of great service; and when there is farther occasion for medicines, gum arabic, and pills of boiled turpentine, are found very good ones; and decoctions of liquorice-root in barley-water, with syrup of marsh mallows, may be drank in large draughts. Many people are also fond of external remedies, and recommend onions, roasted and buttered, to be applied to the pubes, and goat's suet to be rubbed warm about the navel.

In cases of the *ischury* there is occasion for greater medicines, and the method must necessarily be varied, according to the state of the patient, and the cause of the disease. The first thing to be done, is the injecting an emollient clyster to loosen the bowels, for when these are emptied, the other complaint will be much more easily removed: after the clyster, powders composed of cinnabar, nitre, and diaphoretic antimony, are to be given, to prevent an inflammation in the abdomen, and to attemperate the offending matter. When these things are done, the peculiar causes of the disease are to be examined. If a plethora and violent emotion of the blood be in fault, making a congestion of it at the kidneys; in this case, if the beforementioned methods do not take effect, bleeding in the foot will be of service, and an external use of camphorated ointments probably will compleat the cure. When the cause is a spastic constriction of the ureters and kidneys, then the relaxing medicines are to be given, and gentle purges of senna, manna, and the like, will be of great use. Externally warm baths, oily liniments and ointments, and emollient cataplasms, are also great assistants to the internal medicines.

If a small stone, or a grume of blood, or mucous matter, or a worm, have stopped up the passage, and prevented the urine from passing after the clyster, and the powders are found not to have the desired effect, the catheter is to be introduced; or if the stone be lodged in the urethra, the injecting a little oil may be of use to lubricate the passage, and ease its way out. When a genuine nephritis is in the cause, this is first of all to be regarded, and treated in the common way. See NEPHRITIS.

If a venereal caruncle be in the way, it must be taken down by the surgeon with the septics usually employed on those occasions; and if the case be violent, and of this kind, the cure must be perfected, by treating the patient in the usual method in venereal cases.

If an inflammatory tumor stops the neck of the bladder, this is to be discussed by resolvents internally taken, and externally applied to the pubes; and if there is an erosion, or ulceration, balsamics are to be given, and particularly the pills of boiled turpentine. *Ischuries* in infants are cured by giving crabs eyes, and the like powders, with the usual catarrhal medicines to the nurse who gives them suck. Finally, in cases of grown people, as soon as the urine comes away at all, the common diuretics are to be given, as the daucus seeds, and the like, with gentle purges at the intermediate times; but it is a very dangerous practice to give diuretics, before the cause of the obstruction is removed, and since they always add greatly to the pain and misery of the patient.

There is no medicine so useful in these cases as nitre, and it is better given in substance than any other way; for its dulcified spirit, though well known as a diuretic, is less safe than the salt itself. Many people have a great opinion of specifics in these cases, and golden-rod, and mouse-ear, and ground ivy, are accounted of that number, as also violet seeds, and powder of egg-shells; but it is a very dangerous thing, in cases of so great importance, to rely upon uncertain remedies. A common *strangury* often is carried off by mere diluters, such as tea, barley-water, or any other watery liquor, drank in large quantities till a sweat comes on; and in the gentler cases, where these alone are not quite effectual, there is no better addition to them than a little nitre. Bleeding in time often prevents great mischiefs from these disorders; and in cases of a *dysury*, brought on by the taking cantharides, there is no remedy so powerful as warm milk alone, drank in large quantities. The great Mr. Boyle has also said much in the favour of Venice soap on this occasion. *Junker's* Consp. Med. p. 534, 535.

STRAP (*Cycl.*)—STRAP, in a ship, the rope which is spliced about any block, and made with an eye to fasten it any where on occasion.

STRAPS, in the manege. The *straps* of a saddle are small leather *straps*, nailed to the bows of the saddle, with which we make the girths fast to the saddle.

STRAPAZINO, in zoology, the name of a bird of the wheat-ear kind with a white rump and tail, and of a brownish yellow on the head and back. Its wings are variegated with black and yellow, and its beak is longer, and of a brownish colour. Its throat, breast and belly, of a yellowish white. It is common in Italy, and is frequently brought to market among the small birds. *Bellonius*, de Avibus.

STRASITES, STASITES, or STAXITES, a stone described by the writers of the middle ages, and famed for its imaginary virtue of promoting venery, assisting digestion, and the like, and that whether taken inwardly, or outwardly applied. It is not easy, from the accounts they have left us, to guess what stone they mean.

STRATA, (*Cycl.*) the beds of different kinds of matter, of which the crust of the earth is composed.

The most frequent opportunities we have of observing these in England, is in the coal mines in coal countries. Here we find them lying in a regular manner, on what appears to us a plane, as we see any small part of it; but when we consider the same *strata*, according to the globular figure of the earth, and suppose the mass of the earth to consist of the foregoing, and perhaps in different parts, and at different depths of *strata*, of ten thousand other kinds, all originally, while in a soft and fluid state, tending toward the center, we shall find that it must mechanically, and almost necessarily follow, by the continual revolution of the crude mass from west to east, like the winding up of a jack, or the rolling up of the leaves of a paper-book, that every one of these *strata*, though they each reach the center, must, in some place or other, appear to the day, or on the surface. In which case, there needs no specific gravitation to cause the lightest to be uppermost; and were it practicable to sink to the center of the earth, all the *strata* that are would be found in every part, and, according to the poet, *ponderibus librata suis*. Add to this, that, according to an observation of Dr. Stukely, the precipices of all hills are to the westward, whereas the ascent to the east is more gradual. Philos. Trans. N° 391. p. 396.

STRATEGUS (*Cycl.*)—Towards the declension of the Roman greatness, the chief magistrate of Athens was called by the name of Στρατηγος, *dux*. Constantine the great, besides many other privileges granted to that city, honoured him with the title of Μεγας Στρατηγος, *magnus dux*. *Potter*, Archæol. Græc. lib. I. cap. 7.

STRATOR, among the Romans, an officer who took care of the horses, furnished by the provincials for the public service. *Pitisc.* in voc.

STRATOR is also used for an officer in the army, whose business it was to take care there was nothing in the roads to hinder or incommode the army in its march. For which purpose he ordered banks and steep eminences to be levelled; laid bridges, cut down woods, and assisted the quarter-master to find out places proper for transporting the army over rivers. *Pitisc.* in voc.

STRATOR is also used for an equerry, who held the bridle of the prince's horse, and assisted him in mounting. This officer was by the Greeks called *anaboleus*. *Pitisc.* in voc. See the article ANABOLEUS.

STRATOR likewife denotes a furveyor of the high-ways. *Pitifc.* loc. cit.

STRAWBERRY, *fragaria*, in botany. See FRAGARIA.

The common *ftrawberry* is frequent in the woods of England, and is thence tranfplanted into gardens. The beft feafon for this is in September, that the plants may be rooted before the frofts. They may alfo be tranfplanted in February; but then, if the fpring fhould prove dry, they will require a great deal of watering to keep them alive.

The proper foil for *ftrawberries* is a light hazely loam, not over rich; the ground muft be well dug, and very carefully cleared of all noxious weeds; and when it is levelled even, it fhould be marked out into beds about three feet and a half wide, leaving a pathway between each bed of two feet broad. In each of thefe beds fhould be planted four rows of plants, fo that they may ftand about a foot diftant from each other in the rows, and they fhould be planted at about eight inches plant from plant in each. This is the proper diftance for the wood *ftrawberry*, which is of the leaft growth of any; but the fcarlet *ftrawberry* muft be planted at a foot diftance every way, and the heautboy fixteen inches; and finally, the large Chili *ftrawberry*, which is the largeft grower of all, muft be fet at twenty two inches diftance plant from plant.

In the fpring, when the *ftrawberries* begin to flower, if the feafon is dry, they muft be very plentifully watered, and they muft be kept very carefully cleared from weeds. At Michaelmas the beds fhould be dreffed, the weeds all very carefully taken up, all the ftrings or runners muft be taken from the roots, and the weak plants, which ftand too clofe, muft be pulled up; throwing a little fine earth, at the fame time, over the plants, alfo greatly ftrengthens their roots. Thefe beds, however well managed, will not continue good above three years; and the beds of the firft year bearing but few fruit, it is neceffary to new-plant fome frefh ground every third year, and deftroy the old beds; but the new ones muft be firft of one year's growth.

Different palates prefer different fpecies of *ftrawberry*, but the white-fruited one is, of all others, the beft flavoured; though it is but a very bad bearer. The great Chili *ftrawberry* is cultivated in the fields in that country; it is a much ftronger and larger plant than any of our kinds, and its fruit is as large as a wallnut, but not fo well tafted as our own *ftrawberries*. Mr. Frezier brought them fome years ago to Paris, and fince that they have been fpread over the feveral parts of Europe. They grow beft in a loamy foil, under the fhade of trees. *Miller's* Gard. Dict.

STRAWBERRY-*tree*. See the article ARBUTUS.

STREAK-*fallowing*, in hufbandry, a particular fort of tillage. The way of doing it, is to plow one furrow, and leave one, fo that but half the land is plowed, each furrow that is fo lying on that which is not: when this is ftirred, it is then clean plowed, and laid fo fmooth, that it will come, at fowing time, to be as plain as before. This is done, when lean and poor lands are not fwardy enough to bear clean tillage, nor light enough to lie to get fward. The intent of this tillage is to keep the fun from fcorching them too much; but in many places they think this wears their land too faft, and therefore are not fond of having recourfe to it. *Plot's* Oxfordfh. p. 248.

STREAMERS, in a fhip, the fame with *pendants*. See the article PENDANT, *Cycl.*

STRENGTH (*Cycl.*)—STRENGTH *of fpirits*, among diftillers, that quality by which they become inflammable, and which they have in greater or leffer proportion, as they are more or lefs debafed by an addition of water.

Dr. Shaw has very well recommended to the world the method of felling and buying fpirits in their moft highly-rectified ftate, that is, when they are totally inflammable. By this means, as the burning a fpoonful of the goods would always be a proof of their quality, there could be no room for thofe cheats, which are now too common between the feller and buyer. As this, however, is not likely to be brought into practice, it may be of great ufe to thofe, who traffic in fpirits, to have fome more certain way of judging of their *ftrength* than that by the bubble proof, or crown of fpume arifing on fhaking; which being wholly owing to a mixture of the effential oil of the ingredient from which the fpirit is made, with the fpirit, may be fophifticated by the addition of other oils, or faponaceous fubftances, or by any thing that can give a greater vifcofity to the fpirit than it had before.

The fureft method of judging of the *ftrength of fpirits* is by the hygrometer, water-poife, or balance; or 2. by diftillation; or finally, by deflagration. The fpecific gravity of totally inflammable fpirit is fo much lefs than that of phlegm, or common water, that it is eafily fenfible upon the balance; whence an exact hygrometer, well balanced and graduated, and furnifhed with a proper fcale and weights, may be of great ufe to affign the proportions in which pure fpirit and water are mixed in any given liquor. Though perhaps a readier way than this may be that of Mr. Homberg's, mentioned in the Memoirs of the Paris Academy 1718, for determining the different gravities of different fluids, by means of a bottle with a very long and flender neck; which being filled to a certain height with any mixture of fpirit, is weighed againft the fame bottle filled with pure water.

The moft exact, of all methods of determining the *ftrength* of any fpirit, is by diftillation, rectifying it up to an alcohol, or totally inflammable fpirit; but this, though liable to no error, is too tedious to come into common ufe. And, upon the whole, the beft method, of all others, feems to be that of deflagration, which Mr. Geoffroy has been at much pains to adjuft and improve. *Shaw's* Effay on Diftillery. See the article SPIRITS.

STRENGTHNERS (*Cycl.*)—An artificial method of procuring a powerful, fafe, and innocent *ftrengthner*, is the following. Put half a pound of fine Peruvian bark, reduced to a fubtile powder, into a long or tall glafs body, and pour upon it two quarts of fpirit of wine; fhake them well together, and fet them in a fand-heat two or three days, or till the fpirit of wine is of a fine purple colour; pour off this tincture, and prefs the fæces very ftrongly, to get it all away; then return the powder into the fame veffel, and pour upon it two quarts of ftrong white wine; fet this in fand for two or three days, then pour off this tincture; mix it with the former, and putting the whole into a glafs body, diftill off a great part of the fpirit of wine; then put the remainder into a glazed earthen pan, and evaporate it to the form of an extract, adding, toward the end, three ounces of fyrup of orange peel.

This is the invention of Charas, and feems the beft preparation of bark known. Befide all the common cafes in which the bark is given, this preparation may be tried in other weakening diftempers, as well as intermitting fevers, as the inconveniencies attending the taking the bark in fubftance are obviated by this preparation, which is equally powerful and innocent. It may be aromatized at pleafure with any of the effential oils. *Shaw's* Lectures, p. 232.

STREPITOSUS, the name of a diftemper common to the inhabitants of fome parts of the Alps, in which the face, neck and arms, are fo diftended with flatulencies, as to make a noife, when ftruck, like a dry bladder half diftended with wind.

STREPSICHEROS *ovis*, in natural hiftory, the name of a fpecies of fheep defcribed by Bellonius, and found in the ifland of Crete in great flocks. They are of the fize of our common fheep, but their horns are erect, and twirled into a fpiral line, and beautifully furrowed on their outfide. *Bellon.* Obferv. lib. 1. cap. 14.

STRETTO, in the Italian mufic, is fometimes ufed to fignify that the meafure is to be fhort and concife, and confequently quick. In this fenfe it ftands oppofed to *largo*. See the article LARGO.

STRETWARD, in our old writers, an officer whofe bufinefs it was to take care of the ftreets, like our furveyor of the high-ways, or rather fcavenger. *Blount.*

STREVER, in zoology, a name given by many to the fifh called by authors *afper pifciculus*.

It in fome degree refembles in figure the *lucioperca*, or pikepearch, but is more flender than that fifh toward the tail. Its back has a hollow on its anterior part near the head, and its fides are marked with feveral obliquely tranfverfe lines, like thofe of the pearch. Its back is fcaly, its breaft braked. It has two back fins, a fhort and prickly one before, and a longer behind; and the bony coverings of its gills terminate each in a fharp fpine. *Gefner*, de Aquat. p. 478.

Gefner, in particular, calls this fifh *gobius afper*. It is a genuine fpecies of pearch, and is diftinguifhed by Artedi by the name of the *pearch* variegated with eight or nine tranfverfe black lines on a fide.

STRIATA *corpora*, a term ufed by anatomifts to exprefs two protuberances of the brain, upon the crura of the medulla oblonga. See CEREBRUM.

STRIATED *leaf*, among botanifts. See LEAF.

STRIATED *ftalk*. See the article STALK.

STRIATULA, in natural hiftory, a name given by Mr. Lhuyd to a fpecies of foffile plants of the fern kind, remarkable for their *ftriated* appearance. See the article *Foffile* PLANTS

STRIBILIGO, a name given by fome authors to any fort of cutaneous efflorefcence.

STRIGA, among the Romans, a fpace or interval in a camp, 120 feet long, and 60 feet broad, ufed for currying and rubbing down the horfes. *Pitifc.* in voc.

STRIGA is alfo ufed for a furrow drawn out at length, for a long row, or feries of any thing, and by furveyors for a long meafure. *Pitifc.* in voc.

STRIGIL, an inftrument ufed among the antients in their baths, and at fome of their gymnaftic exercifes.

It ferved to abfterge the fweat, or other fordes from the body. Perfons who intended to bathe, or to ufe any of thefe exercifes, when they entered the gymnafium, put off their clothes in the apodyterium; after which, fuch of them as intended to box, wreftle, or ufe any of the more violent exercifes, went into the alipterium, where they were anointed, and thence returning into the place where the duft was, they were fprinkled with this as they paffed along, and then entred

entred upon their feveral exercifes; after this they returned to the alipterium, where they had the fweat and fordes wiped off from their bodies by the alipta with an iron *ftrigil.*

The fordes taken off from the body, and confifting of oil, duft, and fweat, were preferved for medicinal purpofes, and we find them ufed among the old phyficians.

The *ftrigils* were of the fhape of a gardner's knife; they were made of different materials, as ivory, horn, gold, filver, iron, brafs, and the like; but in fome after times the word was only ufed to fignify a linnen cloth, or a piece of fpunge, which every one carried about him for his own ufe. The fordes, faved for medicinal purpofes, were called *ftrigmenta.* See the next article.

STRIGMENTUM, the filth, dirt, or fordes, abfterged from the fkins of thofe that bathed in the baths and places of public exercife among the antients, or from the walls of bathing places, or ftatues fet up in them.

Thefe were all referved for medicinal purpofes, and were properly of three kinds. The firft, or bath *ftrigments*, confifted of the fweat, oil and fordes, collected in thofe places. The fecond kind was the *ftrigments* of the palæftra, confifting of the fame things, with the addition of duft, which was thrown upon the bodies of the perfons before they entred on thofe exercifes. The third kind was that collected from the walls of the gymnafia, and from the ftatues, of whatever materials they were made, which were placed there. Hence the nature of the firft and fecond kind might always be afcertained, but that of the third was very different; for as it was often collected from brafs and copper ftatues, it partook of the nature of the ruft, or ærugo of thofe metals which was collected from them with it.

Thefe *ftrigments* were fuppofed to be of a heating, drying quality, and difcutient; they were, therefore, ufed for difcuffing the parotides, and for condylomata of the anus. Thofe of the palæftræ were ufed to difcufs collections of matter about the joints; and applied in the manner of a cataplafm, were faid to be of great ufe in the fciatica: and thofe collected from the walls and ftatues were ufed to cleanfe old ulcers.

STRIGONIENSIS *terra*, earth of *Strigonium*, in the materia medica, a red earth of the bole kind, found about the gold mines at *Strigonium* in Hungary, and ufed in fome places as an aftringent and fudorific.

The characters by which it is known from the other earths, are thefe. It is but of a coarfe and impure texture, and lighter than moft of the boles; in colour it is of a ftrong, but dull red, and is of a tolerably fmooth furface. It is apt to crumble to pieces between the fingers, and ftains the fkin in handling. It melts freely in the mouth, and has a remarkable fmoothnefs, but very little aftringency in its tafte, and leaves a fenfible grittynefs between the teeth. It is fometimes veined and fpotted with fmall moleculæ of an earth, like the whitifh variegations of the red French bole. It makes a flight effervefcence with aqua fortis, or any other acid menftruum, and fuffers no change of colour by burning. *Hill*'s Hift. of Foff. p. 11.

STRIGOSULA, in natural hiftory, a name given by Mr. Lhuyd to a fpecies of foffile oifter-fhell. See the article *Foffile* SHELLS.

STRIKE (*Cycl.*)—STRIKE *a nail*, in the manege, is to drive through the horfe's fhoe, and the horn or hoof of his foot, and to rivet it for holding on the fhoe.

STRIKE *a vein*, in the manege. See BAR, *Append.*

STRIKING (*Cycl.*)—STRIKING-*wheel*, in a clock, the fame with that which by fome is called the *pin-wheel*, becaufe of the pins which are placed on the round or rim (which in number are the quotient of the pinion divided by the pinion of the detent-wheel.) In fixteen days clocks, the firft, or great wheel, is ufually the pin-wheel; but in fuch as go eight days, the fecond wheel is the pin-wheel, or *ftriking-wheel.* See PIN-*wheel*, *Cycl.*

STRILLOZZO, in zoology, a name by which fome authors have called the emberiza alba, or bunting, or perhaps a bird fomewhat different from our bunting, and common in Italy: for it is not yet afcertained, whether the *ftrillozzo* fpecifically differs from the bunting, or only by fome accidental variegations.

STRING (*Cycl.*)—STRINGS *of metal*, a term ufed by our miners to exprefs thofe thin and fmall veins of ore, into which the beds or veins degenerate toward their terminations. Thefe are from an inch to a tenth part of that in thicknefs, and run through the folid rocks to a great diftance. The ore in them is ufually very pure and rich, and as they lie in the rocks, communicating with the larger veins of ore, they refemble the feveral fmall brooks and rivulets in a hilly country, which by degrees uniting all their ftreams, form the rivers. See the articles LOAD and VEIN.

STRINSIA, in ichthyology, a name given by authors to that fpecies of the gadus, which is called by fome *lota*, and by others *muftela fluviatilis*; by us in Englifh the *eel-pout.* Olaus Magnus calls it the *borbocha*; and Artedi, who refers it to the genus of the gadi, diftinguifhes it by the name of the *gadus* with two fins on the back; with even jaws, and beards at the mouth. See the article GADUS.

STRIP, at fea. A chafe is faid to *ftrip* himfelf into fhort or fighting fails, when he puts out his colours in the poop; his flag on the main-top; his ftreamers or pendants at the end of his yard-arm; furls his fprit-fail; peeks his mifen; and flings his main-yard. In which cafe the chafer muft prepare himfelf for fight.

STRIVALE, in zoology, the name ufed by many for the fifh more ufually known by the name of *aper*, the boar-fifh. It is a fmall fifh, of the fhape of the doree, caught in the Mediterranean. *Aldrovand.* de Pifc. p. 270. See Tab. of Fifhes, N° 19. See the article APER.

STRIX, the *owl.* In the Linnæan fyftem of zoology, this makes a diftinct genus of birds of the hawk kind, the diftinguifhing characters of which are, that the feet have three toes before, and only one behind, none of which are moveable backwards. *Linnæi* Syft. Nat. p. 44.

STRIX is more particularly made the name of the common *brown owl*, or *ivy owl.* This is diftinguifhed from the other fpecies of the *owl* kind by thefe characters.

Its beak is of a pale horn colour, and but fhort, yet the opening of its mouth is very wide. Its eyes are remarkably large and protuberant, and the apertures of its ears very large; and covered with a membrane; and its eyes are nearer to its ears, than in any other animal. Its face is furrounded with a double circle of feathers, and its back is mottled with brown and black, and its belly of the fame colour, but fomething paler, as if it had a mixture of whitifhnefs. The legs are feathered almoft down to the toes, and the outer feather of its wing is much fhorter than the reft, by which it is diftinguifhed from the aluco without any farther mark. *Ray*'s Ornitholog. p. 66.

STROBILE, a word ufed by chirurgical writers to exprefs a pledget of a twifted form.

STROBILUS, among botanifts, a kind of pericarpium, formed of a number of vaginæ with contorted points applied clofe to one another. See PERICARPIUM.

STROBULUS, among the antients, a kind of mitre, which rofe to a height by many windings and turnings, and ufed by the barbarians; inftead of which the Romans wore the *apex*, which had a high, but ftreight top. *Pitifc.* in voc. See the article APEX.

STROCAL, in glafs making, a long iron Inftrument like a fire-fhovel, ufed to empty the metal out of a broken pot into a whole one. *Neri*'s Art of Glafs Append.

STROMATEUS, in ichthyology, a genus of fifhes of the malacopterygious, or foft-finned kind, the characters of which are thefe. The body is very much compreffed, and very broad and thin; it has no belly fins, and has only one back fin, which is extended over the whole back. The only known fpecies of this genus is the *callichthys* of authors, a fifh called the *fiatola* at Rome. The tail is very forked; the mouth is very fmall; the teeth are placed in the jaws and palate; and the tongue is fmooth and broad. The body is ftriped crofsways. *Artedi*, Gen. Pifc. p. 15.

The *ftromateus* is a broad, flat, and fhort fea-fifh, fomething refembling the turbot in figure, and thin both on the back and belly, but fwimming erect, not flatwife.

Its common fize is of about a pound and half weight; its colour on the back a pale bluifh, and on the fides and belly a filvery white; and on its back, and upper part of its fides, it is very beautifully variegated with yellow lines and fpots, and towards its belly with others of a paler tinge of the fame colour. There are two longitudinal lines on the fides, the one ftrait, the other arched and bent. Its fkin is extremely thin and tender, and is covered with fcales. The tail is forked, the end of the fnout obtufe, and the mouth very fmall. It has only one row of teeth in each jaw, but it has, befide thefe, two bony fubftances in its mouth, all over covered with fmall teeth. It has no belly fins, but has two fmall ones at the gills, and one long one running down the back, and another fingle long one anfwering it near the tail. It is caught in the Mediterranean, and brought to market at Rome under the name of the *lampuga*, and is a very delicate fifh. *Ray*'s Ichthyography, p. 156.

STROMBUS, in conchyliology, the name of a genus of fhells, nearly allied to the buccinums, and called by the generality of authors *turbo.* See the article TURBO.

STROMLINGUS, in ichthyology, a name given by fome writers to the *aras* of the Greeks, which is no other than the common herring. See the article HALEC.

There is no other difference between the *ftromling* and herring, but that the former is fmaller.

STROPHIARIUS, among the Romans, a perfon who prepared and made the *ftrophia.* See STROPHIUM.

STROPHIUM, among the Romans, a fhort fwath or band, wherewith the young women kept down the fwelling of their breafts. *Pitifc.* Lex. Ant. in voc.

STROPHIUM was likewife a bandage for the head, made of two or three garlands of flowers tied together. *Pitifc.* loc. cit.

STROPPUS, among the Romans, the thong with which the oars were tied to the *ſcalmus*. *Pitiſc.* Lex. Ant. in voc. See the article SCALMUS.

STRUFERTARII, among the Romans, perſons hired to perform ſome kind of ſacrifices near the trees that had been thunder-ſtruck. *Pitiſc.* in voc.

STRUMARIA, a name by which Galen has called the little burdock. *Ger.* Emac. Ind. 2.

STRUMUS, in botany, a name given by ſome of the old Roman authors to the *cucubalus*, or berry-bearing chick-weed.

It had this name from its being found of ſervice in *ſtrumous* and ſcrophulous ſwellings, when externally applied. The name *cucubalus* ſeems to have been derived from the word *halicacabum*, or the winter cherry, for the antients eſteemed both theſe plants ſpecies of nightſhade; and ſome of them have plainly deſcribed the *cucubalus* under the name of *ſolanum hortenſe*.

STRUPPI, among the Romans, garlands or wreaths of vervain, wherewith the ſtatues of the Gods were crowned. *Pitiſc.* in voc.

STRUT, a term uſed by ſome builders for that brace which is framed into the king-piece and the principal rafters. See BRACE, *Cycl.*

STRUTHIO, in zoology, the name of the oſtrich in the Linnæan ſyſtem. Others uſually call it the *ſtruthio camelus*. According to the ſyſtem of that author, this makes a diſtinct genus of birds, the characters of which are, that it has only two fore toes on each foot, and no hinder ones. See Tab. of Birds, N° 19. *Linnæi* Syſt. Nat. p. 47.

STRUTHIOMELA, a word uſed by Pliny and the antients to expreſs a ſort of quinces, which were ſmaller than the common kind, and of a ſweeter juice and leſs aſtringent.

STRUTHIOPTERI, in natural hiſtory, a name given to a ſeries of flies, of the claſs of thoſe which do not feed on fleſh: theſe have remarkable ſhort wings, and are always found on flowers and leaves of plants. There are ſeveral ſpecies of theſe. The moſt frequent among us are a white-bodied one with black wings, which cover but a very ſmall part of the back, and with feathered wings; and two others with long bodies, of a duſky grey, ſtreaked with white. Theſe are all early flies, being found in the ſpring in hedges and buſhes.

STRUTHIOPTERIS, in botany, a name by which Tragus, and ſome other authors, have called the *lonchitis*, or ſpleenwort. *Ger.* Emac. Ind. 2.

STRUTHIUM, in natural hiſtory, a name given by the Greeks to a plant called by the Latins *lanaria herba*, from its uſe in the manufacture of their wool. Many have ſuppoſed the *chaſcuſa* of the antients to be the ſame with this plant, but that is an error, for the *chaſcuſa* of the Greeks is the *antirrhinum* of the Latins, as is plain from Pliny; and the ſame author tells us, that it has leaves like thoſe of flax, ſmall, narrow, and ſmooth. All the account we have of the *ſtruthium* is from Dioſcorides, who ſays, that it was a kind of thiſtle, ſomewhat reſembling the ſcolymus, and having a large root, long, and of the thickneſs of two or three fingers, and very ſharp prickles on the leaves. This ſhort account, though not enough perhaps certainly to inform us what the plant was, is yet abundantly ſufficient to prove, that it was not the chaſcuſa, or antirrhinum.

Many have ſuppoſed that the *candes*, or *candiſi* of the Arabian writers, is the ſame plant with the *ſtruthium* of the Greeks, and the old interpreters of the works of Avicenna and Serapion tell us that it is ſo; nay, Avicenna himſelf gives us the deſcription of the *ſtruthium*, as it ſtands in Dioſcorides, under his name *candiſi*, and Serapio under his title of *candes*: but all that we may learn from this, is, that the Arabians were as liable to errors about the Greek Phyſicians works as ourſelves, and that the *ſtruthium* of the antients was as much unknown in their days as in ours. Alphagus gives us a genuine deſcription of the candes, or candiſi, out of the writings of Ebenbita *de Simplicibus*, who ſays, that it was common in Syria; and expreſly adds, that neither Dioſcorides, nor Galen, were at all acquainted with it, nor had any where mentioned it under any name.

It may ſeem ſtrange to ſome, that Serapio and Avicenna ſhould miſtake the plants of Dioſcorides, and their other Greek predeceſſors; but we find, by Avicenna's character of the artanita, which is not the *artanita*, but the *leontopetalon* of Dioſcorides, that the Greek phyſicians works were at that time tranſlated into the Arabic language; and theſe Arabians uſed that tranſlation in their own tongue, never troubling themſelves to refer to the original. Now though it is probable, that neither Serapio nor Avicenna would have erred about the plants of Dioſcorides, had they read the works of that author in the original, yet is very eaſy to ſuppoſe that a common tranſlator might make blunders about ſuch nice ſubjects as the ſynonyms of plants; and theſe muſt all be tranſplanted into the works of the Arabian writers, who, according to their own accounts, made uſe of theſe tranſlations, inſtead of the originals; and on this foundation we may ſafely affirm, that the *artanita* of the Arabians is the *leontopetalon*, not the *artanita* of the modern times, and that the *candes*, or *candiſi* of the Arabians, though we do not know what it is, yet evidently is not the *ſtruthium* of the Greeks.

We find the *ſtruthium* celebrated among the Romans for its virtues; but all the account we have of it from them, is, that it was a prickly plant, and was very common in the Grecian iſlands. This however is ſufficient to convince us of the great error of thoſe who make this plant, and the *oſtrucium* of the later writers, to be the ſame plant. The oſtrucium is the Smyrnium, or Alexanders, and can by no means be ſuppoſed the ſame with this prickly plant; yet Macer has made them the ſame, and has attributed to the Smyrnium, or Alexanders, the virtues which Theophraſtus gives to the ſtruthion.

STRUTHIUM, in the materia medica, is uſed by modern authors as the name of the *luteola*, or dyers weed, a common wild plant with narrow leaves and yellow flowers. *Dale's* Pharm. p. 248.

STRUTHIUM is alſo uſed by ſome for the *ſaponaria*, or ſoapwort. *Ger.* Emac. Ind. 2.

STRYCHNUS, a name given by the antients to the plant we call *ſolanum*, or nightſhade. Some of the old authors have alſo called this *tithymal*; and in the times of Theophraſtus, we find that tithymal and nightſhade were ſynonymous terms.

The oldeſt authors [b] mention only three kinds of *ſtrychnus*, or nightſhade; the one they call the *ſleepy nightſhade*, the other the *mad nightſhade*; theſe two being poiſonous, and exerting their bad effects, by making people ſleepy or mad; and the third they called the *eſculent nightſhade*. This ſeems to have been the ſame with our *pomum amoris*, or love apples; which, though not much eſteemed in England, yet in Spain, and many other parts of the world, are univerſally eaten in ſoups, &c.—[b *Theophraſtus*, lib. 9. cap. 11.]

Pliny [c], in his account of the ſolanum, ſeems to intend the ſame thing as Theophraſtus; but having collected the accounts of different authors, and put them together in a confuſed manner, it is not eaſy to comprehend what he means; and to add to the perplexity, this is one of the parts of that author where the copies are very faulty.—[c Lib. 21. cap. 31.]

STUB, in the manege, is uſed for a ſplinter of freſh-cut under-wood, that goes into a horſe's foot as he runs; and piercing the ſole through to the quick, becomes more or leſs dangerous, according as it ſinks more or leſs into the foot.

STUD, in the manege. See BREED.

STUDDING-*ſail*, in a ſhip, the ſame with what is called a *gooſe-wing*. See the article GOOSE-*wing*.

Studding-ſails, are bolts of canvas, or any cloth that will hold wind, extended in a fair gale of wind along the ſide of the main-ſail, and boomed out with a boom. They are ſometimes alſo uſed to the clew of the main-ſail, fore-ſail, and ſprit-ſail, when the ſhip goes either before the wind, or quartering.

STUFFING, or CONGESTION, in medicine, the name of a diſtempered ſtate of the body, in which there is a ſpecial and peculiar direction of the blood, in larger quantities than ordinary, to ſome particular places, in order to its there making its way out by an hæmorrhage, and relieving nature from an over-abundant quantity of it, that the reſt may circulate the more freely and eaſily.

Congeſtions differ in regard to the places where they appear; ſome are made in the head, others in the breaſt; ſome in the hypocondria, and ſome in the kidneys; and others in the hæmorrhoidal veſſels. In this alſo there is ſome regularity in regard to the age and conſtitution of the patient; for in young perſons *congeſtions* are uſually made in the head, in middle-aged people in the breaſt, and in thoſe ſomewhat farther advanced in years toward the abdomen.

Medical writers diſtinguiſh *congeſtions* into two kinds, the *complete*, and the *incomplete*. The complete *congeſtions*, are thoſe in which the blood is directed to ſuch a part where it is natural and eaſy for it to be diſcharged by an hæmorrhage; ſuch are the head, the lungs, the uterus, and inteſtinum rectum; and in which it is carried in large quantities to the very parts.

The incomplete *congeſtions*, are thoſe in which the blood is indeed directed toward theſe, or the like parts, from whence it ought to be diſcharged, but never is carried to them, or indeed near them, but collecting itſelf at a diſtance from them, can never come to a diſcharge by a hæmorrhage. Something of this kind is obſerved in the rheumatiſm, gout, and what are called the *cold catarrhs*.

Congeſtions are alſo divided into two kinds, from the matter they are occaſioned by: the one are called *ſanguineous*; in theſe the blood is always ready to appear in its own form in an hæmorrhage. The other are ſtiled *bechic*; theſe extend themſelves farther than the ſanguineous, and theſe have their origin from the blood: but when a paſſage is by any means denied to the whole ſubſtance of the blood, its ſerous parts only form the *congeſtions*; and theſe, as they are become either mucidoſeroſe, or ſeroſoſaline, are the occaſion of coryzæ, gravedines, moiſt coughs and aſthmas, cold œdematous, ſcirrhous, and glandulous tumors.

Authors diftinguifh *congeftions* from ftafes fanguinis, by this, that in thefe the quality and progreffive motion of the humors are greatly altered, in the others, as fuch, they are not altered at all.

The figns of *congeftions* are deduced from their effects, and are thefe. In the parts affected there is a diftenfion of the veffels, fo that the very fmall ones, which fcarce appear at another time, are now found turgid, with heavy and tenfive pains, and often, as it were, with a fenfation of pricking; if the *congeftion* be carried farther, there fucceeds to thefe rednefs, and preternatural heat in the part: when upon this there appears an hæmorrhage, all the fymptoms vanifh; but if this difcharge does not happen, there are frequently formed tumors, and running ulcers, with violent pain and inflammation. Thefe are the fymptoms in the affected parts; in the more remote ones, there is a conftriction of the veffels, fo that they appear lefs than natural, and a fenfation of coldnefs in the flefh.

The perfons moft fubject to *congeftions* are thofe of a plethoric habit, and fuch as live fedentary lives, and eat and drink high; and to thefe are to be added, fuch as have been ufed to fome habitual difcharge of blood, whether natural, or by regularly bleeding in the arm at ftated times of the year, and afterwards live wholly without thefe; and fuch as have had iffues, blifters, or old natural ulcers dried up, without ufing the neceffary precautions on fuch occafions. *Junker*'s Confp. Med. p. 90.

Caufes of Congestions. Thefe are principally a plethoric habit of body, and an effort of nature to relieve herfelf from the load, by difcharging part of it at fome proper outlet. To thefe are to be added many external and occafional ones; fuch are a moift and cold air, and fometimes a moift and hot one; a refrigeration of the remoter parts, or of thofe oppofite to fuch as are proper for the *congeftion*.

The effects of *congeftions* are generally ftagnations; and from thefe ftafes and corruptions of the blood and humors, too frequently arife. When *congeftions* are become habitual to a perfon, they very rarely yield to the effects of medicines, even though the material caufe is removed, but often after this renew their fymptoms in fome different way. When *congeftions* are ill treated, efpecially when narcotics are given, or hot medicines, or a warm diet are indulged, they always return the more frequently upon the patient, or bring on a feries of other diforders; and *congeftions* in themfelves are not without danger, when they affect perfons at a certain time of life. Finally, *congeftions* in the breaft are always of more unhappy confequence than thofe of the head and abdomen, becaufe the evacuation of the blood, which is what nature aims at in a *congeftion*, is not to be effected any way happily in the breaft.

Method of treating them. In the time of the paroxyfm, the bowels, which are ufually bound in this cafe, are to be loofened by a gentle emollient clyfter, or by fome of the gentle purges; and the too great expanfion of the blood, and ftricture of the fibres, is to be prevented by abforbents, and nitrous medicines, with the addition of cinnabar, and of the common diaphoretics: to this purpofe powders are to be given three or four times a day, compofed of crabs eyes, nitre, antimonium diaphoreticum, and cinnabar, either native, or that of antimony; and if the pains are violent, a gentle opiate may be added to the powder to be taken at night. To thefe things are to be added the temperate alexipharmics, and the mild and diluent diaphoretics; fuch as tea made of the flowers of lavender, of fage, and the like: and when the blood begins to ftagnate in the place of the *congeftion*, topics may be ufed; fuch as camphorated fpirit of wine, or a cataplafm of caraway feeds, juniper berries, falt, and crumb of bread: and in fome cafes repellents may be fafely ufed; fuch as the vinegar of rofes, and mixtures with nitre, and with faccharum faturni. *Junker*'s Confp. Med. p. 92.

Stuffings *of the breafts*, in infants. See Infant.

STUM, (*Cycl.*) in the wine trade, a term for the unfermented juice of the grape, when it has been feveral times racked off, and feparated from its fediment. The cafks are for this purpofe well matched, or fumigated with brimftone every time, to prevent the liquor from fermenting, as it would otherwife readily do, and become wine.

It is this fume of the fulphur from the match that prevents, in this cafe, all tendency to fermentation, and continues the natural juice of the grape in a fweet ftate, fit to be readily mixed with wines inftead of fugar; for which purpofe it is very much ufed in Holland, and fome other countries, as alfo for giving a new fret, or brifknefs, to decayed wines. So that very large quantities of this *ftum* are annually imported to all parts along with the foreign wines; and after the fame manner a *ftum* is prepared in England from the juice of apples, which ferves the ordinary purpofes of the wine-cooper. In the preferving this liquor in this ftate, we fee the vaft ufe of brimftone, for it could never be done otherwife, than by the matching the cafks. *Shaw*'s Lectures, p. 192. See the article Matching.

Artificial Stum. An artificial muft, or *ftum*, as good as the natural, and as fit for the re-fermenting, fretting, improving, or making of wines, vinegars, and fpirits, may be prepared in the following manner.

Take three pound of fine lump fugar, or fuch as has been well refined from its treacle, melt it in three quarts of water, and add in the boiling of Rhenifh tartar, finely powdered, half an ounce; this diffolves with a remarkable ebullition, and gives a grateful acidity to the liquor; take the veffel from the fire, and fuffer it to cool, and you have an artificial muft, which in all refpects refembles the natural tafte and fweet juice of a white flavourlefs grape, when well purified, and racked off from its fediment, in order to make *ftum*. If this artifical muft be ftummed, that is, well fumigated with burning brimftone, it becomes a perfect *ftum*, and may be made of any flavour, at the difcretion of the artift. *Shaw*'s Lectures, p. 202.

STUPHA, a name given by fome writers to a balneum vaporis.

STUPIO, a name given by fome of the writers in chemiftry to tin. See Tin.

STURDY, in cattle, a kind of diftemper, otherwife called the *turning-evil*. See Turning-*evil*.

STURIO, the *fturgeon*, a very well known, large, and fine-tafted fifh, caught in many places, and fometimes in the river Thames, being one of thofe fifhes called *anadromi* by authors, which fpend a part of their time in the fea, and a part in rivers.

It never goes into the fea to any great diftance, and never is caught there of any very great fize. The fea ferves for its production, but it is only in large rivers that it grows to its ufual fize. *Ray*'s Ichthyogr. p. 248.

STURNUS, the *ftarling*, a bird very well known, and of the thrufh, or turdus kind.

There is, befide the common fpecies, a very beautiful one, defcribed by Bontius under the name of the *Indian ftarling*, or *fturnus Indicus*. This is of the fize and fhape of our common *ftarling*, but is variegated with a deep blue, a lead colour, and a pale grey, and has on its head a very beautiful yellow creft. It learns to imitate the human voice, and talks much better than the parrot, but is troublefome in being over noify. *Ray*'s Ornitholog. p. 145.

Linnæus makes the *fturnus* a diftinct genus of birds, of the order of the *pafferes*; the diftinguifhing characters of which are, that the tongue is membranaceous, fharp, and edged with a rim, or margin; the beak is of a fomewhat cylindric form, and is pointed and crooked. *Linnæi* Syftem. Naturæ, p. 49.

STYE, or Stithe, the Englifh name for a diforder on the eyelids, called by the phyficians *hordeolum*, and by fome *crithe*, *chalazium*, or *grando*.

It is a fmall encyfted tumor, ufually of about the bignefs of a barley-corn, which fometimes degenerates into matter, and occafions great pain and uneafinefs.

The tendernefs of the organ of fight makes it neceffary to be careful about thefe tumors, which, if fituated in any other part of the body, would hardly deferve much attention. Some authors commend cataplafms, and the like applications, to thefe, but the eye is often hurt by thofe applications; and it is obferved befides, that thefe tubercles feldom give way to topical applications of any kind.

When they are fmall, it is beft to let them take their own courfe; but if fo large as to occafion deformity, or danger of hurting the fight, the way to extirpate them, is to make a longitudinal incifion on the part, and carefully take them out whole; or if it cannot be thus got out clean, it muft be cut out, as far as may be, with fciffors, and dreffed with Ægyptian ointment, and a little red precipitate, or touched at times with the common cauftic, till eaten thoroughly away, and then the wound dreffed and healed in the common manner.

This is the method by which the flat and broad-bottomed tumors of this kind are to be extirpated; and in this great care muft be taken that none of the fharp applications touch the eye, as they might injure the fight. It is common, however, with thefe tumors to hang by a fort of fmall root, and then they are much more eafily managed, there being no more neceffary than the cutting them clofe off with a pair of fciffors, or the tying them firmly round with a piece of filk, or horfe-hair. They are fometimes, if taken in time, difperfed by rubbing them with fafting fpittle, or with applying the pulp of a roafted apple mixed with fome faffron and camphor. *Heifter*'s Surgery, p. 365.

STYGIA *aqua*, a term ufed fometimes to exprefs aqua regia; fometimes for the other ftrong acid fpirits.

STYLE, among botanifts. See Pistil.

STYLOBATON, or Stylobata, in architecture, the fame with the pedeftal of a column. It is fometimes taken for the trunk of the pedeftal, between the cornice and the bafe, and then called *truncus*. It is alfo called by the name of *abacus*.

STYLOCERATOIDES, in anatomy, a name given by Riolanus, and fome others, to a mufcle, more generally known by the name of *ftylohyoidæus*. See the next article.

STYLOHYOIDÆUS, a small fleshy muscle, lying obliquely between the apophysis styloides, and os hyoides.

It is fixed laterally by one extremity to the root, or basis of the apophysis styloides, and by the other to the os hyoides, at the place where the basis and cornu unite, and likewise to the cornu itself, from whence it has been called *stylo-cerato-hyoidæus.* The fleshy fibres of this extremity are often parted, and inclose the middle tendon of the digastricus. *Winslow's* Anatomy, p. 255.

STYLOHYOIDÆUS *novus*, a name given by Santorini to a small muscle of the os hyoides, called by Albinus *stylohyoidæus alter*, and by Douglass *stylochondrohyoidæus.* See the articles MOUTH and Os *hyoides.*

STYMMATA, a word used by some authors to express the stiff ointments. The antients used the word both for their more solid and stiff ointments, and for the ingredients which gave those ointments that consistence: they also called by the same name the several sweet ingredients which they put into their ointments, to give them a fragrancy, and preserve them from corruption; such were the powders of spikenard, mint, amomum, and the several spices.

STYMPHALIA, Στυμφαλια, in antiquity, a festival at Stymphalus in Arcadia, in honour of Diana, called from that place *Stymphalia. Potter*, Archæol. Græc. Tom. I. p. 431.

STYMPHALIDES *aves*, in fabulous antiquity, birds of an extraordinary size, which in their flight are said to obscure the sun. They fed only on human flesh; but Hercules, by the help of Minerva, drove them out of Arcadia by the noise of cymbals. *Danet.* in voc.

STYPTIC (*Cycl.*)—STYPTIC *powder of Helvetius*, in pharmacy, a composition of alum and dragon's blood. In the Edinburgh dispensatory, two parts of alum are directed to be made into powder with one of the dragon's blood: others use equal parts of both. See Med. Eff. Edinb. Vol. 4. Art. 7.

This medicine is said to be extremely serviceable in uterine hæmorrhages, either to correct the too frequent return of the menses, or their too great abundance; also to stop the flooding, to which women with child are subject, and to moderate the flow of the lochia. It has also been found to have surprising good effects in the fluor albus.

In violent bleedings it may be given in the quantity of half a drachm every half hour, and it seldom fails of stopping the bleeding before three drachms, or half an ounce has been taken. See Medic. Eff. ibid.

Heister also, in his Compendium Medicinæ Practicæ, p. 143, recommends this powder, or alum alone, with a decoction of lin-seed, from Helvetius Traité des pertes de sang.

Eaton's STYPTIC, a medicine famous for curing fresh wounds in a very small time, and immediately stopping their bleeding.

The method of curing fresh wounds in a few days without suppuration, where neither nerves, large vessels, bones, nor any of the viscera are concerned, has been a practice long ago used.

Purman, a famous surgeon of Breslaw, in his Chirurgia Curiosa, tells us of a mountebank who gave himself thirteen wounds by incision in the upper part of his left arm, and applying his nostrum with a common roller, the wounds were all well in two days: and both this author, and Blegny, mention what they call a *martial styptic*, which cures wounds in two days, especially if the patient take also a few drops of it inwardly.

The French were a long time very fond of a *styptic* ball made of filings of iron and tartar, mixed to a consistence with French brandy, which was afterwards published by Helvetius, and from him has been generally known by the name of *Helvetius's styptic.* This was extolled with us as one of the greatest medicines in the world for the cure of wounds, bruises, and external injuries of all sorts: but the author never said so much about it; he only modestly introduced it into the world as an useful thing for a first dressing of fresh wounds with people who lived too far off for the immediate assistance of a surgeon: and he mentions several cases, in which it ought not to be used. In fine, he published it as a good medicine under proper restrictions; but we made it an universal one. The only universal remedy of this kind, that we have had recommended by the author as such, is the famous *styptic* of Dr. Eaton, which the inventor says is good to stop all manner of bleeding both without and within, without any manner of exception.

Sir Richard Blackmore, soon after the publication of this great secret, wrote a treatise on consumptions, in which he highly extols this *styptic* of Dr. Eaton, declaring positively, that it will be of more service to the world than all the discoveries that had been made before it. On this Dr. Sprengel, who had before examined *Eaton's styptic*, and judged it to be no other than that of Helvetius; which, after having been tried and discarded in France, Germany, and Holland, had been set on foot as an universal medicine here, thought it worthy a more strict and public examination, and ordering an apothecary of credit to prepare him some of Helvetius's *styptic* in the common way, he produced before a judicious audience a bottle of that, and another of *Eaton's styptic*; and giving them both the same trial, they both answered in the same manner, and proved, beyond all possibility of doubt, that they were in effect the same medicine.

The same trials were made by several other chemists, physicians, and apothecaries; and the event proving the same in all, it appeared wonderful that a man, who had a mind to sell a known medicine under the notion of a secret, should not have had the caution to alter or disguise it either in taste, smell, or colour; which he might very easily have done, without at all impairing its virtues as a medicine.

The usual method of trying a *styptic* is upon the crural artery of a dog cut open for that purpose. In this manner the *styptic* of Helvetius and Eaton were both tried, and both answered very well; and plain French brandy being also tried, had the same success; whence it appeared, that there was no very great virtue in either, more than the heat of the spirit, which forcibly constringed the fibres: and when we consider the smallness of the crural artery in a dog, we shall not wonder that a trifle stops the bleeding of it, since, with a bit of dry lint, or even with no application at all, the bleeding will stop of itself, without any hurt to the animal. By this, and by the common experiments made upon this *styptic* on other occasions, its external virtues appear to be very trifling. Internally, however, it is a much worse medicine. It is too often given in natural hæmorrhages; and in all these cases, as there is a stimulation and feverish disposition, which gives occasion to the bleeding, it is certain that any thing, of the nature of brandy and a chalybeate, must add to it, instead of curing it. Upon the whole, the virtues of these *styptics* externally are too trifling to be trusted to; and internally too precarious to meddle with, without the greatest caution. Philos. Trans. N° 383. p. 110.

STYRAX (*Cycl.*)—STYRAX, the *storax-tree*, in botany, the name of a genus of trees, the characters of which are these. The flower consists of one leaf, and is of the funnel-fashioned kind, and divided into many segments at the edges. The pistil arises from the cup, and is fixed, in the manner of a nail, into the hinder part of the flower: this finally becomes a roundish, or fleshy fruit, containing one or two kernels, in which are soft seeds.

There is only one known species of this tree, which is the common, or quince-leaved *storax-tree. Tourn.* Inst. p. 598. See the article STORAX.

SUBARMALE, among the Romans, a coarse and thick kind of cassock worn by the soldiers under their arms, in order to keep them from being hurt with their weight. *Pitisc.* Lex. Ant. in voc.

SUBBUTEO, in zoology, the name of a bird of the hawk kind, called in English the *ringtail*; the male of which is called the *hen-harrier.* Some authors give it the name of *pygargus accipiter. Ray's* Ornithol. p. 40. See the articles RINGTAIL and HEN-HARRIER.

SUBCLAVIUS, a small oblong muscle, lying between the clavicle and first rib. It is fixed by one end in all the middle lower portion of the clavicle, at the distance of about an inch from each extremity; and by the other in the cartilage, and a small part of the bone of the first rib. It seems likewise to adhere to the extremity of the clavicle, next the sternum, by a kind of broad thin ligament. *Winslow's* Anatomy, p. 177.

SUBCOSTALES. These muscles are fleshy planes of different breadths, and very thin, situated more or less obliquely on the inside of the ribs near their bony angles, and running in the same direction with the external intercostals. They are fixed by other extremities in the ribs, the inferior extremity being always at a greater distance from the vertebræ than the superior, and several ribs lying between the two insertions. These muscles are more sensible in the lower ribs than in the upper, and they adhere closely to the ribs that lie between their insertions. *Winslow's* Anatomy, p. 233.

SUBDUPLICATE *ratio* of any two quantities, is the ratio of their square roots. See RATIO.

SUBER, the *cork-tree*, in botany, the name of a genus of trees, the characters of which are these. The fruit and flowers are the same with those of the ilex, but the bark of the tree is thick, fungous, and light.

There are two species of this tree. 1. The ever-green broad-leaved *cork-tree.* 2. The *cork-tree* with narrow, and not serrated leaves. *Tourn.* Inst. p. 584.

SUBETH, the word used by the Arabian writers to express a carus.

SUBETH *sahala*, a term used by the Arabian writers to express a coma vigil.

SUBFRONTALIS *sutura*, a name given by some anatomical writers to the suture, by which the os frontis is connected with the bones of the superior jaw.

SUBJECT (*Cycl.*)—SUBJECT, in the manege. To keep a horse *subject*, is an expression relating to volts; signifying, to keep the croupe of the horse in the round, so that it may not slip out; that he may not traverse; and that he may work

work in the manege, croupe in, marking his equal times, without lofing his ground.

SUBJECT, in mufic. See SOGGETTO.

SUBJECTION, *fubjectio*, in rhetoric, is ufed for a brief anfwer to a preceding interrogation: thus Cicero, *Quid ergo? audaciſſimus ego ex omnibus? minimè.* *Voff.* Rhet. lib. 5. p. 416.

SUBINTRANTES *febres*, a term ufed by fome medical writers to exprefs thofe fevers in which one fit begins before the other is perfectly worn off.

SUBITO, in the Italian mufic, is ufed to fignify that a thing is to be performed quickly and haftily: thus we meet with *volti fubito*, turn over the leaf quickly.

SUBLIMABLE *bodies*, a term ufed by fome of our chemical writers to exprefs fuch fubftances as are capable of *fublimation* in a dry form.

They fay that only thofe things are *fublimable*, which contain a dry exhalable matter in their original conftruction; and among thefe they find a great variety, which require various methods and means to execute that effect. Among the minerals, fulphur, antimony, and orpiment, are named as the principal among *fublimable* bodies: thefe are of a very lax compage, or ftructure, and are eafily raifed by fire in fmall particles, which concrete again on being ftopt from flying off by the cover of the veffel; while, on the contrary, iron, filver, and the other metals, being of a clofer ftructure, remain fixed in the greateft heat, and never afcend, unlefs mixed with fome volatile fubftance that is itfelf capable of rifing, and of taking up fome of them with it.

Thus copper and iron will be raifed in *fublimation* by means of fal armoniac mixed with them; and even gold itfelf is faid to be fubject to the fame law, Mr. Boyle affuring us, that he had a fecret method of preparing a certain faline fubftance, by means of a very fmall admixture of which, the gold would be made to rife in *fublimation*, and form fine purple cryftals.

Fire is the great agent in *fublimation*; and according as thefe bodies are more or lefs denfe and compact, this is to be made more or lefs ftrong, and continued a longer or a fhorter time. Very often the internal heat alone, occafioned in vegetable or animal fubftances by fermentation, is fufficient to *fublime* certain of their principles, as is evident in Wedelius's inftance of a ball of woad, or glaftum.

Many fubftances of a loofer texture are to be *fublimed* alone, and many others are to have other things mixed with them, as before obferved, in order to make them fubject to this operation of the fire. The admixtures, which are to make bodies *fublimable* which are not fo in themfelves, are to be of various kinds, according to the nature of the body to be *fublimed*; and the attempt of this procefs upon any particular body is never to be given over on the firft effay, but the whole round of thofe things, which render *unfublimable* bodies *fublimable*, are to be tried firft, that what one does not effect, another may have its chance of doing.

Among thefe bodies, ufed as mixtures in *fublimation*, fome act by rendering the body more eafily fufible, and difuniting thofe particles more readily which the fire is expected to carry up; others act only by preventing the cohefions of the particles of the fubftance to be *fublimed*, which heat would otherwife occafion; and finally, others by entering the body of the fixed fubftance they are mixed with, and giving wings, as it were, to its fubtle particles, fo that they may afcend with its eafily *fublimable* matter, and join with it in the formation of one mixed fubftance in the top of the veffel, by partaking of the nature of both. Others act potentially in the fame way, but by different means, themfelves not being capable of *fublimation*, but acting on the fubftance to be *fublimed*, by enervating, weakening, or abforbing thofe fubftances, or parts of the mixed body, which would have otherwife prevented the afcent of the reft; and finally, fome act as diffolvents only, and by that means render things eafy of *fublimation*, which would have been very difficultly fo, while their parts were in a more ftrict continuity. The ufe of this management of *fublimable* bodies is to prepare the flowers, the fulphurs, or the volatile falts of thofe bodies, pure and feparate from their terreftrial fæces, from phlegm, from impure oils, and from acids; and the mixing together the *fublimable* bodies of two or more kinds into one fubftance, proper for the ufes of medicine, painting, *&c.* as in the combination of mercury with fulphur into cinnabar; a noble medicine, and a very valuable paint; or with corrofive falts into the common drugs, called, by way of pre-eminence to all others, *fublimate*. *Hoffman's* Acta Laborat. Chem.

SUBLIMATE (*Cycl.*)—*Corrofive* SUBLIMATE. In making *fublimate*, the quickfilver is extinguifhed by trituration in calcined vitriol. But Monfieur Lemery obferves, that bole armeniac and potters clay are cheaper, and extinguifh the mercury fooner.

It has been faid, that to try whether *fublimate* has been fophifticated with arfenic or not, it was to be rubbed with falt, or oil of tartar; and that if fophifticated, it would turn black. But Mr. Lemery agrees with Barchufen and Boulduc, that this is no trial; for the falt of tartar has the fame effect on the good and the bad *fublimate*. See Mem. de l'Acad. des Scien. 1734.

Dr. Kirften affirms that *fublimate*, rightly prepared, becomes firft faffron coloured, and then red, when oil of tartar is dropped on it: whereas, if it is adulterated with arfenic, it becomes firft near the colour of brimftone, then red, afterwards afh coloured, and laftly black. He is pofitive in this, notwithftanding what Barchufen and Boulduc have faid to the contrary. Commerc. Norimb. 1738. Hebd. 12. §. 2.

An anonymous chemift affirms, that *fublimate* prepared with arfenic becomes at laft white, inftead of black, when touched with oil of tartar. He fays, that in the *fublimation* of fweet mercury, where the *corrofive fublimate* has been adulterated, the upper part is of an orange colour, and a white earth remains in the bottom, and the belly of the glafs becomes dark coloured, or fmoaky; whereas, when the corrofive mercury is genuine, the upper part is white, the powder in the bottom is red, and the middle is not fmoaky coloured. But the fweet mercury, prepared with genuine or adulterated corrofive, appears on every trial the fame.

Dr. Kramer relates the hiftory of a lad who fwallowed half an ounce of *corrofive fublimate*; foon after which his mouth and ftomach were fo eroded, that he voided large quantities of blood, both upwards and downwards, with violent gripes, coldnefs of the extremities, ftartings of the tendons, and racking pain. A vomit was foon given; notwithftanding which the fymptoms continuing, Dr. Kramer ordered mild drink, with large quantities of oil of tartar *per deliquium* in it, by which the fymptoms foon were mitigated, and the cure was compleated by giving theriaca andromachi, with terra figillata, and putting him into a warm bath. Commerc. Norimb.

Blue SUBLIMATE, a preparation of mercury with fome other ingredients, yielding a fine blue for painting. The method of making it is this: take quickfilver two parts, flower of brimftone three parts, fal ammoniac eight parts; grind thefe upon a porphyry, and with the quickfilver put them into a long-necked glafs veffel luted at bottom; place it in a fand-heat, and when the moifture is afcended, you will have a fine *blue fublimate* for painting. *Neri's* Art of Glafs, p. 164.

SUBLIMIS, in anatomy, a name given by Albinus, Hunaud, and others, to the mufcle of the wrift, called by others the *perforatus*. See the article PERFORATUS.

Thefe authors call the perforans the *profundus*. See the article PERFORANS, *Cycl.*

SUBLINGUALIA, a term ufed by fome authors to exprefs fuch medicines as were intended to be laid under the tongue, and gradually diffolving there.

Thefe have been principally intended either to cure coughs, or give a fweet fcent to the breath.

SUB-MARSHAL, an officer in the Marfhalfea, who is deputy to the chief marfhal of the king's houfe, commonly called the *knight marfhal*, and hath the cuftody of the prifoners there. He is otherwife termed *under marfhal*. Crompt. Jurif. 104. *Blount*, *Cowel.*

SUBMARINE *navigation*. See the article *Submarine* NAVIGATION.

SUBMERSION, *fubmerfio*. See DROWNING.

SUBMISSIO, a word ufed by medical writers to exprefs a remiffion.

Sometimes it imports the fame as *fyftole* with refpect to the arteries, that is, their contraction.

SUBPRINCIPALIS, in fome Latin writers of mufic, is ufed for the note or chord called by the Greeks παρυπατη, *parhypate*.

SUBPURGATION, *fubpurgatio*, a word ufed by fome writers to exprefs a gentle purgation.

SUBROTUND *leaf*, among botanifts. See LEAF.

SUBSCAPULARIS, (*Cycl.*) a mufcle of the fame breadth and length with the fcapula, of which it occupies all the inner or concave fide; and having its name from its fituation.

It is thick, and made up of feveral penniform portions, nearly in the fame manner with the deltoides. It is fixed in the internal labium of the whole bafis, and in almoft the whole internal furface of the fcapula; its flefhy portions lying in the intervals between the bony lines, when thefe are formed. Near the neck they leave the bone, and form a very broad tendon, which is inferted in the furface of the fmall tuberofity of the head of the os humeri, clofe by the bony channel. The lower edge of this tendon probably fends off the ligamentary frænum, mentioned in the defcriptions of the latiffimus dorfi, teres major, and coracobrachialis. This mufcle covers immediately the ferratus major, being in a manner inclofed between it and the fcapula: the upper edge of its tendon is joined to the lower edge of that of the fupra fpinatus, except at the upper part of the bony channel, where they give paffage to one tendon of the biceps. It likewife adheres to the capfular ligament. The tendons of the fupra fpinatus, infra fpinatus, teres minor, and *fubfcapularis*, being all joined by their edges, form a fort of cap, which covers the upper part of the head of the os humeri. *Winflow's* Anatomy, p. 184.

SUBSISTENCE, in the military art, is the money paid to the soldiers weekly, not amounting to their full pay, becaufe their clothes, accoutrements, tents, bread, &c. are to be paid; it is likewife the money paid the officers upon accompt, till their accompts be made up, which is generally once a year, and then they are paid their arrears.

SUBTERRANEAN (*Cycl.*)—SUBTERRANEAN *fires*. Among the many places where thefe *fires* are found, England is not wholly without them; though with us they appear only in the coal countries, and plainly feed on nothing but the upper ftratum of the coal, called by the miners *day coal*, unlefs where they have by accidents been kindled by actual fires at great depths, or fired downward, by being pent in for room. See VOLCANO.

They have, in many places, been known to burft out fpontaneoufly from the furface, and make their courfe both ways from the place along the ftratum. There is no actual native fulphur found there, but there are plenty of the marcafites, to which the *fire* is probably originally owing; as we know that thefe ftones, piled up in a heap in the air, will often take fire of themfelves.

If at any time a fmall quantity of melted fulphur fhould be found in the earth, it is not to be fuppofed to be native there; for the *fire* acting on the other marcafites it meets with, may very well melt and feparate the fulphur from them, as is done at Goffelaer, and in fome other places, where the fulphur we commonly ufe is made in that manner by art. It has been faid, that crude fal armoniac is found in the earth in thefe places; but it is only met with at the mouths of the *fire*. Where the fmoak afcends in thefe places, there continually arife vaft quantities of the vapours of fulphur, as well as fal armoniac; and crufts of the flowers of fulphur, and of fublimed fal armoniac, are found together around thefe openings. The brimftone generally arifes firft, and forms a cruft, under which there is a cruft of fal armoniac. It is remarkable, that in the places where thefe *fires* have burnt, there are often found cavities in the rocks, containing a white milky liquor of a ftyptic tafte: this is a fort of liquid alum, and yields generally about one half of that falt.

The fal armoniac is found in confiderable quantities in fome of thefe places, yet its origin is not eafily accounted for on the common principles; for neither nitre, nor common falt, are found in the earth thereabouts. The fprings alfo, which arife in the neighbourhood of the places where the *fire* is, have been diligently examined, and no fufpicion of the leaft admixture of fal armoniac appears in them. The water that runs through the ftrata of coal in all thefe countries is vitriolic, and turns black with a decoction of galls. There needs no more than burning pit coal to produce fal armoniac; for it has been found produced in brick-kilns, where nothing but coals and clay have been laid together: and here it muft be afcribed to the coal alone, no one ever having found it in clay. Phil. Tranf. N° 130. See FIRE.

We have an account, in the Philofophical Tranfactions, of a *fubterranean* town found at Portici, near Naples, in which many antique ftatues, paintings, and other curiofities, have been found.

This *fubterranean* town is probably the antient city of Herculaneum, which was fwallowed up by an earthquake. See Phil. Tranf. N° 458. fect. 4, 5, and 6.

It is remarkable, that fome of the antique paintings found there are as frefh and perfect, as if lately painted. Ibid. fect. 6.

SUBTRACTION. See the article SUBSTRACTION, *Cycl.*

SUBVERSIO *ftomachi*, a term ufed by fome authors to exprefs a violent vomiting, when what fhould pafs through the inteftines is voided conftantly by the mouth.

SUBULARE *folium*, among botanifts. See LEAF.

SUBULATED *leaf*, among botanifts. See LEAF.

SUBULO, a term ufed by Pliny for deer two years old. See the article FERULÆ.

SUBULO, in natural hiftory, a word ufed by the antients to exprefs a deer, or ftag, at that time of its life when the horns firft begin to appear.

Others have underftood it as the name of the oryx, whofe horn was narrow at the fummit, and thence gradually larger toward the bafe, fo that it refembled the figure of the fubula. This is the fabulous creature called the *unicorn*, and defcribed as a nimble and terrible animal. But it is certain that no fuch animal ever exifted, as is called by this name, and thus defcribed: the only one-horned animal in the world is the rhinoceros, and this is an unwieldy heavy animal, not at all refembling the characters or figures we have of the *fubulo*, or oryx.

It is to be obferved, that the *fubula* of the moft antient writers was an inftrument of iron, fharp at the point, ufed in the ftone-quarries to break way through large maffes.

SUCCENTURIATI (*Cycl.*)—It is the opinion of Dr. Kerkring, and of many fince his time, that thefe are cafes in which there is elaborated a bilious juice, which afterwards, either by the emulgent vein, or, as often is the cafe, immediately paffes to the cava, and being thence conveyed to the heart, raifes there that effervefcence, which Sylvius contends to be excited in that part by the mixture of a faltifh liquor with an acid: for although experience contradicts the conveyance of the juice out of the liver through the cava, yet that effervefcence in the heart, upon which the whole fyftem of Sylvius is grounded, may ftill hold, if this opinion about the ufe of the *fuccenturiati* be true. As there needs but very little leaven to ferment a large mafs, which is in a proper ftate and condition to be fermented, a very minute quantity of falt of tartar, mixed with a very large portion of oil of vitriol, will occafion not only a very confiderable, but a very lafting fermentation; though a very confiderable quantity of the latter, poured on a quantity of the former, caufes but a languid and fhort effervefcence. This account of an opinion, though not now received, may be worthy the confideration of thofe who remember how cautioufly both fides of a queftion ought to be heard, before any thing is determined in regard to it. *Kerkring*, Spicileg. Anat.

SUCCIFERA *vafa*, in natural hiftory, a name given by thofe who have written of the anatomy of plants, to thofe veffels which contain the juices, by way of diftinction from thofe which only give paffage to the air, and are called *tracheæ*. Lewenhoek tells us, that the microfcope difcovers the *fucciferous* veffels of plants to be, in all refpects, analogous to thofe of animals, and that they are of two kinds, veins and arteries: the latter receiving the juices from the root, and carrying them all over the plant; and the others receiving the juice from their extremities, and carrying it back again to the root, where it is again delivered to the arteries.

SUCCINUM, *amber* (*Cycl.*)—The origin of *amber* has been much difputed among the naturalifts, and many erroneous, and fome even abfurd, conjectures made about it. There feems however, from experiment and a clofer obfervation, to be no doubt but that it is wholly of mineral origin, and is a bitumen which was once liquid, and of the naphtha, or petroleum kind, hardened and brought into its prefent ftate by a mineral acid, of the nature of fpirit of fulphur, or oil of vitriol; both thefe fubftances abounding in the earth, and an artificial mixture of them producing a body much refembling *amber*, and affording all its principles on a chemical analyfis.

Flies, and other fmall infects, found bedded in *amber*, have by fome been fuppofed mere *lufus naturæ*, and never to have been real animals; but this needs only the eye to difcover its abfurdity: and with others, who allow them to be real, they are ufed as proofs that *amber* is of vegetable origin, and was once foft and fluid. That they do prove the laft is certain, but by no means the firft. To judge properly of this, we fhould confider the true ftate of the cafe, which is this: that more than a thoufand pieces of *amber* are found without infects, for one that has any; and that moft of the pieces which have them, have not been dug out of the earth, but found on the fea fhores. The fides of hills we well know are continually trickling down the liquid bitumens; and there is no abfurdity in fuppofing, that fmall quantities of this might, in its paffage, be detained in little cavities of rocks, &c. and there fuffer leifurely its change into *amber*, from the matter of its natural acid being near. And it can be no wonder that flies, &c. fhould be drowned in fuch a mafs of matter, which being afterwards hardened, might be found on the furface of the earth, or wafhed down to the fea, in the form of common *amber*. Nor is there any thing impoffible in the maffes, thus formed on the furface, being afterwards buried in the earth, by the various changes we know the furface of the earth at times is fubject to.

Befide the places whence *amber* is ufually brought, which are Pruffia, Pomerania, &c. we have it on our own fhores, and even in our clay-pits; the pits dug for tile clay, between Tyburn and Kenfington Gravel-pits, have afforded many fpecimens; and that behind St. George's Hofpital, at Hydepark Corner, has afforded fine fpecimens, one of which has been wrought into a beautiful cane-head of three inches long. *Hill's* Hift. of Foff. p. 409.

If the people, who collect *amber* on the fhores of the Baltic, were more curious and particular in their obfervations of the maffes they find, we fhould doubtlefs have much more lights into its true hiftory and nature. There is no queftion, but that fome pieces of it are toffed up there fo imperfectly formed, that the procefs of nature may be feen in their different ftages. Pieces have been fometimes found fo foft, as to receive the impreffion of a feal: thefe are always not only perfect *amber* in other refpects, but they are obferved to have a fmell ftronger than the common *amber* has. Thefe pieces fometimes harden immediately, on being expofed to the air, but fometimes they retain this foftnefs many months. We have an account of fuch a piece in the Philofophical Tranfactions, which had retained this foftnefs a whole year, in which time it had lain among other pieces of *amber*; and of another mafs very foft on one fide, and hard on the other, and containing in the foft part a fly buried. Phil. Tranf. N° 57.

This foffil has been of great repute in the world from the very earlieft times we have any knowledge of, many years before

before Chriſt it was in eſteem as a medicine; and Plato, Ariſtotle, and Herodotus, and among the poets Æſchylus, and others, have commended its virtues. In the times of the Romans it became in high eſteem as a gem; and in the luxurious reign of Nero immenſe quantities of it were brought to Rome, and uſed for ornamenting works of various kinds. Long after this Theodoric, king of the Goths, ſhewed a high eſteem for it. However well known, and however highly eſteemed this ſubſtance was in theſe ages, its nature and origin yet remained unknown through a long ſeries of time, and various conjectures were made about it in the different places where people were poſſeſſed of it among their gems; ſome ſuppoſed it the product of Africa, others of Aſia, and others of America; and the gardens of the Heſperides, Ægypt, Æthiopia, and Numidia, were ſuppoſed, in the firſt mentioned part of the world, to give it birth. Thoſe who made it the produce of Aſia, gave Arabia, and ſome parts of the Eaſt-Indies, as the places of its production; and thoſe who ſuppoſed it brought from Europe, gave Italy, the river Eridanus, and the borders of the Adriatic, as the only parts whence it came: but the Romans, when they ſpread the terror of their arms through Germany, found it on the ſhores of the German ocean and the Baltic, and Spain, and afterwards Britain, were added to the liſt of places where it was found.

The antients, who had leſs traffic, and leſs knowledge of the world than we have, are the more pardonable in allotting ſo great a number of places, and many of them falſe ones, for the production of *amber*, and for not diſcovering the true place where it has been at all times found in the greateſt plenty, and whence moſt parts of the world have long been, and are to this day ſupplied; but the moderns are much more unpardonable, who in their accounts give us Aſia, Africa, and America, as the places where *amber* is found, as if it were to be had no where elſe; and ſome of them diſtinguiſh the finer pieces under the name of *Oriental amber*.

The generality of theſe falſe accounts of *amber*, have been owing to the ignorance of the perſons who have taken upon them to give the hiſtory of it: they have, in general, taken upon hearſay what they have related, or borrowed it from books they were not able to underſtand. Thus we find the many places in Aſia and Africa celebrated for producing large ſtores of *amber*, are taken upon credit from the old authors, who have mentioned ambra as being found there. Theſe copiers not diſtinguiſhing, that ambra in theſe places is not given as the name of *ſuccinum*, or *amber*, but as that of the rich perfume called *ambergris*, which is found there, though the real *amber* never was.

The name of *Oriental amber*, ſo common with ſome, ſeems to have been owing alſo to a miſtake, but of another kind; the gum copal, brought from the Eaſt-Indies, is very like *amber*, and ſome of the fantaſtic writers in chemiſtry have called this by the forced name of *Oriental amber*. Hence thoſe who read their works, without perfectly underſtanding them, have ſuppoſed that *amber* was common in the Eaſt-Indies; and as all the gums of that part of the world are ſuperior to thoſe of other places, they began to call all the fine pieces of this foſſil by the pompous name of *Oriental amber*.

We are not to limit the operations of nature ſo far, as to ſay that ſhe does not, or cannot produce *amber* in Aſia, Africa, or America; but it is certain, that we have no authentic account of its ever having been found in any of thoſe regions, and there is the greateſt reaſon in the world to believe that it is peculiar to Europe. This we are very well aſſured of, that the Chineſe, who are as cunning a people as any in the world, expend annually with us vaſt ſums of money in buying European *amber*, and have done ſo at all times ſince we have trafficked with them; and it is by no means to be ſuppoſed that they would purchaſe it of us, if they had it nearer home. All the intelligent perſons, who have reſided in the Eaſt-Indies, ſay, that they never ſaw or heard of *amber* being found there. And, upon the whole, it ſeems very rational to conclude, that *Oriental amber* never exiſted, otherwiſe than in the error beforementioned, of calling copal by that name.

Europe ſeems the only region of the world where *amber* is produced: it ſeems alſo to be produced almoſt all over Europe, but not in equal plenty, nor perfection; the German dominions, and the country about the Baltic, claim the prerogative above all other places. Hartman, who has given the abovementioned account of the errors of the antients, &c. in regard to the places of its origin, has been too free in cenſuring the moderns for giving it to ſome parts even of Europe: he ſcruples to believe that Italy, Spain, and even England, produce *amber*; but in this he errs: he ſuppoſes that jet, which is called by ſome *black amber*, being found in theſe places, has impoſed upon the authors of theſe accounts, and made them ſay *amber* was found there; but nothing is more certain, than that *amber*, and that of the fineſt kind in the world, is found in England, at leaſt, if not in the other places where he doubts of its production. *Amber* is at this time thrown on the ſhores of Yorkſhire, and many other places, and found at great depths under the earth, in ſtrata of clay, as well about London, as in more inland places; and if we mention Dr. Woodward, and the other authors, who have themſelves taken it up, we ſhall have no room to doubt its being real *amber*, not jet, as Hartman ſuppoſes.

Poland, Sileſia, and Bohemia, are famous for the *amber* dug up there at this time. Germany affords great quantities of *amber*, as well dug up from the bowels of the earth, as toſſed about on the ſhores of the ſea and rivers there. Saxony, Miſnia, and Sweden, and many other places in this tract of Europe, abound with it. Denmark has afforded, at different times, ſeveral quantities of foſſile *amber*; and the ſhores of the Baltic abound with it. But the countries lying on the Baltic afford it in greateſt abundance of all; and of theſe the moſt plentiful country is Pruſſia, and the next is Pomerania. Pruſſia was, as early as the times of Theodoric the Goth, famous for *amber*; for this ſubſtance coming into great repute with this prince, ſome natives of Pruſſia, who were about his court, offered their ſervice to go to their own country, where that ſubſtance, they ſaid, was produced, and bring back great ſtores of it. The offer was accepted, the journey ſucceſsful, and from this time Pruſſia had the honour to be called *The Country of Amber*, inſtead of Italy, which had before undeſervedly that title.

The *amber* of Pruſſia is not only found on the ſea coaſts, but in digging; and though that of Pomerania is generally brought from the ſhores, yet people, who dig on different occaſions in the very heart of the country, at times find *amber*. Philoſ. Tranſ. Nº 248. p. 5, ſeq.

In Pruſſia the cliffs are very high and abrupt, and are all of naked earth, except a few rocks; the ſhore is very even, and the ſea ſhallow for a long way; after this there is a conſiderable depth for ſome furlongs, and behind this the ſhallows riſe again, and continue a great way. The ſtormy ſeas, and high tides, waſhing againſt theſe cliffs, break down vaſt maſſes of them from time to time; in the matter of theſe maſſes of earth lie great quantities of *amber*; this mixture falling upon the flat ſhore, is daily waſhed by the waves, and the earth waſhed, and broken to pieces in a little time, and carried back by the waves into the ſea; while the lumps of *amber*, being too hard to break, and too large to be carried away ſo eaſily as the diſunited particles of earth are, remain naked on the ſhore, or in the ſhallower water. If they are any of them waſhed away, they are only carried into the firſt deep water, and by its riſe and fall in the tides they are thrown up, either on one ſide or the other, and lodged on the ſhallows, from whence the people, employed to gather them, eaſily obtain them.

The whole country about theſe cliffs abounds in *amber*, but it is impoſſible to get at it by digging, becauſe of the nature of the ſoil, which is boggy, and full of water, riſing in ſome places up into ſprings, and in others making the ground ſo ſoft, that there are a ſort of bogs and quickſands, which ſwallow up cattle, and ſometimes men and their horſes. A little higher up in the country, where digging is practicable, the earth is found of the ſame nature as in the face of the cliffs, and abounds with minerals of various kinds. The pyritæ, and vitriols of many ſorts, are found there, and ſtrata of a ſort of black earth, with white veins, in great abundance. Under theſe ſtrata there is found a great quantity of a cortical ſubſtance, reſembling the barks of trees, among, or under which the *amber* is uſually found. The whole face of the country is very barren; in this part tracks of ſand often cover vaſt ſpaces, and ſometimes a few weeds of the hardieſt kinds appear; ſometimes a buſh, but rarely, and ſcarce any ſuch thing as a tree is to be ſeen. The *amber* in theſe places, when dug up, is uſually foul, and covered with a rough opake coat, which muſt be taken off, or broke through, in order to the ſeeing its beauty; but that on the ſhores is uſually found clear and fine, this outer cruſt having been worn off by the waſhing of the waves. This *amber* on the ſhores is ſometimes found buried in the ſand, ſometimes naked on the ſurface of it, and ſometimes covered over with large bundles of the ſea-wrack, and other weeds. The vulgar have thought, from this laſt accident, that the *amber* was a gum flowing out of the leaves of thoſe plants, but that is a very abſurd opinion.

Sand, vitriol, and ochre, with a blue clay, are the ſubſtances which make up the principal part of the ſtrata in the cliffs; and the vitriol, in particular, ſeems to have ſome conſiderable ſhare in the formation of the *amber*, becauſe *amber* is ſcarce any where found foſſile, where there is not alſo vitriol: but neither of theſe ſubſtances can be properly called the matrix of the *amber*, ſince it is ſeldom found bedded in them; and when it is, only in ſmall quantities. The blue clay contains more *amber* than either of the other of theſe ſubſtances, but the true matrix of it is the wood, or cortical ſubſtance, which is found among theſe ſtrata, and of which alone there are immenſe hills in ſome places. Phil. Tranſ. Nº 248. p. 12. See the article MATRIX *ſuccini*.

The bodies of inſects, found buried in *amber*, are viewed with admiration by all the world; but of the moſt remarkable of theſe, many are to be ſuſpected as counterfeit, the great price, beautiful ſpecimens of this kind fell at, having tempted

tempted ingenious cheats to introduce animal bodies in ſuch artful manners into ſeemingly whole pieces of *amber*, that it is not eaſy to detect the fraud. The antients have deſcribed globes of *amber* with bees immerſed in them, and the cabinets of the modern virtuoſi afford many ſuch pieces; but Sendelius, after accurately examining many of theſe ſpecimens, ſuſpects them all to be ſophiſticated. Many ſpecies of the fly kind, however, are obviouſly and indiſputably lodged by nature there: among this tribe of animals, the ſeveral ſpecies of the ichneumon fly are found the moſt numerous; the common houſe and fleſh flies are alſo frequently found thus preſerved; and it is remarkable, that of theſe ſome have preſerved, and others have wholly loſt their natural colours. Theſe are ſometimes found in cloudy pieces of *amber*, but much more frequently in the perfectly clear and fine ones; and in theſe many are ſeen plainly to be encruſted with a thin coat of the matter of the *amber*, ſeparate from the maſs. Beſide the animals already named, the cabinets of the curious afford us numerous inſtances of the ſmall ſpecies of butterflies, the cricket, the graſhopper, beetles of various kinds, but theſe only ſmall ones, the larger and ſtronger being able to force their way out of the once viſcid maſs, and therefore never remaining entangled in it. Some of theſe, which are incloſed in it, are plainly ſeen to have ſtruggled hard for their liberty, and even to have left their limbs behind them in the attempt; it being no unuſual thing to ſee, in a maſs of *amber* that contains a ſtout beetle, the animal wanting one, or perhaps two of its legs; and thoſe legs left in different places, nearer that part of the maſs from which it has travelled. This alſo may account for the common accident of finding legs, or wings of flies, without the reſt of their bodies, in pieces of *amber*; the inſects, to which theſe have belonged, having, when entangled in the yet ſoft and viſcid matter of the *amber*, eſcaped, at the expence of leaving theſe limbs behind them. Drops of clear water are ſometimes alſo preſerved in *amber*. Theſe have doubtleſs been received into it while ſoft, and preſerved by its hardening round them. They are uſually contained in cavities too large for them, though ſometimes the holes are filled up. In ſome ſpecimens, the holes alone remain without any moiſture. Naturaliſts, who have been ſo curious as to examine this liquor contained in the *amber*, have found it to be of an auſtere taſte, like that in which vitriol had been diſſolved: others mention the having met with it wholly inſipid, and ſome taſting of ſea ſalt. It is eaſy to account for a drop of water, of any of the three kinds, being found in *amber*, but the vitriolic water is the moſt natural there, as there is always great plenty of vitriol where the *amber* is found. Some people, who have been poſſeſſed of pieces of *amber* thus containing water, have thought that the quantity was continually increaſing and decreaſing, according to the increaſe and decreaſe of the moon; but this is not countenanced by any certain obſervation. *Hartman*, Hiſt. Succin.

Amber, though fuſible with a ſmall fire, and concreting again when cold, yet differs from the metals, and other fuſible bodies of that kind, in this, that as ſoon as cold they are the ſame as before melting; but *amber*, when it has once been melted, is no longer *amber*, it loſes its beauty and hardneſs: and the true reaſon of this is, that being compoſed of bitumen and ſalt, the ſalt flies off in the heating, and leaves the remainder little better than the ſimple reſiduum of an evaporated petroleum, or any other liquid bitumen. There have been people, at different times, who have pretended to have an art of melting ſmall pieces of *amber* into a maſs, and conſtituting large ones of them; but this ſeems ſuch another undertaking as the making of gold, all the trials, that have yet been made by the moſt curious experimenters, proving, that the heat which is neceſſary to melt *amber*, is ſufficient to deſtroy it. Phil. Tranſ. N° 248. p. 25.

Hartman indeed mentions an accident, which ſhews a poſſibility of many pieces of *amber* being combined into one by an operation of nature, though it never could be effected by art. A ſheep was once killed in Pruſſia, in whoſe ſtomach a large piece of *amber* was found, which was compoſed of ſeveral other ſmaller pieces, the joinings of all which might be ſeen, though as firm as the pieces themſelves. This is a proof that the creature had ſwallowed the whole in ſmall pieces with its food, and that nature, by the heat and juices of its ſtomach, had ſoftened thoſe pieces without melting them, ſo as to make them unite firmly, though not be thoroughly blended with each other. Could art arrive at this, which it is not probable it ever will, even this is far ſhort of what is pretended of melting *amber*, and caſting it into what form is deſired. The factitious curioſities in *amber*, which are pretended to be pieces of this foſſil, with inſects embedded in it, are uſually no other than a hardened varniſh, not having the hardneſs, or other qualities of *amber*. Some few of them are *amber* melted, into which the inſects have been put in that ſtate, but theſe are very coarſe and brittle. Theſe two kinds of cheat are eaſily diſcovered by their want of hardneſs, and the other by obſerving the ſides of the piece, to find the joining where it has been ſplit.

Among the numbers of inſects thus preſerved, as ſome are covered within the maſs with a thin coat, or cruſt of pure *amber*; ſo others are covered with a cruſt of a white matter of a like thickneſs, but ſeeming different from the nature of the *amber*. The true cantharides are ſometimes alſo included in *amber*, and preſerving all the beauty of their colours there, they make a very ſplendid appearance. The ant is moſt frequently met with in pieces of *amber*; and the earwig is ſometimes found very perfect and beautiful in it. The ſpider kind afford very numerous ſpecies. The millepedes are not unfrequently met with. The ſcolopendræ appear in great beauty, when their bodies are twiſted and contorted, as not unfrequently happens in the large globes of *amber* where they lie. Caterpillars are alſo ſometimes found, but the ſoftneſs of their bodies has made them ſubject to great injuries, and they are often ſqueezed, compreſſed, and injured, ſo as ſcarce to be known.

Theſe are the ſpecies of land animals moſt frequently found in *amber*; to theſe ſome add the louſe and flea: and though theſe have brought great diſcredit upon all the inſects incloſed in *amber*, in the judgment of many, as ſeeming certainly counterfeit, yet Sendelius, who had carefully examined ſeveral of the maſſes in which they were found, and could find no trace of fraud in any of them, attempts to account for ſuch animals being naturally included in the ſubſtance of the *amber*, while yet ſoft, in the manner of the other inſects.

To theſe animals thus impriſoned, many authors add accounts of ſmall fiſh, young water newts, and other aquatic animals, but theſe ſeem in general to have been ſophiſticated maſſes; and indeed it is obſerved, that even the moſt common water inſects are very rare in *amber*. The way in which all the inſects, that are truly found lodged by nature in *amber*, were placed there, is not hard to gueſs, when we are ſo far acquainted with the nature of *amber*, as to be aſſured from experience, that it is at firſt a fluid, and by degrees becomes viſcid and thick like turpentine, from which ſtate it gradually hardens into the ſolid form we find it in; and this is ſufficiently proved; ſince there have been at times found quantities of true *amber* yet in its fluid ſtate; and the ſtructure of ſome globes of *amber* abundantly ſhew, that they have hardened from a fluid ſtate, ſome being plainly compoſed of ſeveral plates, and ſome containing a maſs of *amber* in another larger maſs; the internal maſs having undoubtedly hardened firſt, and the external, while yet in a fluid ſtate, gathered and concreted round it.

This being the manner of the including of the inſect tribe in *amber*, it ſeems that inſects alone ſhould not be ſubject to that fate, but that other matters, which fall in the way of the *amber* while yet ſoft and viſcid, ſhould ſhare the ſame fate. The locomotive power of the animal kingdom gives its creatures opportunities of falling into theſe maſſes, while vegetables and minerals have not; yet as theſe cannot but ſometimes fall in the way of the hardening matter of *amber*, they are ſometimes found immerſed in it. Beautiful leaves of a pinnated ſtructure, reſembling ſome of the ferns, or maiden-hairs, have been found in ſome pieces; but theſe are rare, and the ſpecimens of great value. Other leſs beautiful vegetable ſubſtances are more frequently found than theſe, though all of this tribe are ſcarce in compariſon to the animals. Small pieces of heath, and fragments of the alga, and ſome other plants, common about the ſea ſhores, are ſometimes found; as alſo ſmall fragments of wood, the ſeeds of ſome plants, and pieces of the ſtalks of others. Theſe are ſometimes found alſo, but a little way, buried in the *amber*, and at other times are only faſtened to its ſurface; the ſmall ſpecific gravity of theſe bodies, too little to immerſe them into the fluid, and the different conſiſtence of that hardening fluid, may have been the occaſion of theſe bodies having made their way into the maſſes but to ſmall depths: and indeed, if we conſider the whole proceſs, many happy accidents muſt concur to the perfect and beautiful immerſion of a foreign body in this bitumen.

Mineral ſubſtances are alſo found at times lodged in maſſes of *amber*: ſome of the pompous collections of the German princes boaſt of ſpecimens of native gold and ſilver in maſſes of *amber*; but as there are many ſubſtances of the marcaſite, and other kinds, that have all the glittering appearance of gold and ſilver, it is not to be too haſtily concluded, that theſe metals are really lodged in theſe beds of *amber*. Iron is found in various ſhapes immerſed in *amber*, and as it is often ſeen eroded, and ſometimes in the ſtate of vitriol, it is not impoſſible but that copper, and the other metals, may be alſo ſometimes immerſed in it in the ſame ſtrata; and that the bluiſh and greeniſh colours, ſometimes found in the recent pieces of *amber*, may be owing, like the particles of the gem colours, to thoſe metals; but as the gems, by their denſe texture, always retain their colours, this lighter, and more lax bitumen uſually loſes what it gets of this kind, by keeping ſome time. Small pebbles, grains of ſand, and fragments of other ſtones, are not unfrequently alſo found immerſed in *amber*. Theſe, it is very plain, have fallen into the maſs while not yet quite hardened; though things of this ſpecific gravity, when found lodged deep in it, muſt have fallen

fallen in when it was almoſt hard, otherwiſe they would have ſunk through. The pieces of *amber* including other pieces are alſo of this origin; and when it has happened that the included piece, and the ſurrounding maſs, have been of different degrees of colour, the inner piece is obvious, and the effect plain; but when theſe have been both of the ſame colour, which probably moſt frequently has been the caſe, we have no traces of the accident; and probably this, though by accident concealed, is a much more frequent caſe than is commonly imagined.

To all theſe accidental beauties in *amber* it is to be alſo added, that as in the Mocoa ſtones, and many other foſſils, ſo alſo in this there are ſometimes found beautiful delineations of trees, ſhrubs, and the like. The natural beauties of theſe pieces have tempted the cunning artificers ſometimes to counterfeit them; but in theſe, as well as in the ſophiſticated maſſes with inſects, the fraud may always be diſcovered by a curious and attentive inſpection. *Sendelius*'s Hiſt. of Amber.

On opening the ditches for the fortifications of Copenhagen, it is ſaid that ſeveral large maſſes of *amber* were found, all of them adhering to the ſides of large bodies of trees, which were black as ebony. The pieces are preſerved in the cabinet of the king of Denmark in that place, and ſome of them weigh forty or fifty ounces. This is an additional circumſtance to the common obſervation of ſomething, reſembling wood, being always found where *amber* is, and deſerves to be conſidered, as it tends to overthrow the preſent received ſyſtem, of *amber* being originally a mineral production.

Amber is the baſis of all varniſhes. For the method of diſſolving this ſubſtance into varniſh, ſee the article VARNISH. But if *amber* could be diſſolved without impairing its tranſparency, or one large maſs be made of it by uniting ſeveral ſmall ones, it is eaſy to ſee what would be the advantages of ſuch a proceſs. The art of embalming might poſſibly be alſo carried to a great height by this, if we could preſerve the human corps in a tranſparent caſe of *amber*, as the bodies of flies, ſpiders, graſhoppers, *&c.* are to a great perfection. Something of a ſubſtitute of this kind we have in fine roſin, boiled to a great hardneſs, and perfect tranſparence; this being diſſolved by heat, and the bodies of ſmall animals ſeveral times dipped in it, they are thus coated with colophony, that in ſome degree reſembles *amber*; but this muſt be kept from duſt. *Shaw*'s Lectures, p. 425.

Amber, in medicine, is given in its crude ſtate, only reduced to powder, as an aſtringent and balſamic. It is preſcribed in the fluor albus, in convulſions, and in all diſorders of the nerves. It is alſo given in coughs, and diſeaſes of the lungs; and is by ſome greatly recommended in inveterate head-achs. Its doſe is from one ſcruple to two.

Its preparations are, 1. *ſal ſuccini*, or ſalt of *amber*. 2. *Oleum ſuccini*, or oil of *amber*. 3. *Tinctura ſuccini*, or tincture of *amber*.

Oleum SUCCINI, or *oil of amber*. To purify the dark muddy *oil of amber* drawn *per ſe*, take two pounds of good brandy, one of ſea ſalt, half a pound of the oil; mix them, and diſtil them together, and a large proportion will come over very tranſparent, and finely coloured. *Boyle*'s Works, Vol. 1. p. 329.

Plants in SUCCINUM, or *amber*. See PLANTS.

SUCCURY, or SUCCORY, *cichorium*, in botany. See the article CICHORIUM.

The common blue-flowered *ſuccory*, or cichorium, is celebrated among ſome of the botanical writers for a property in its flowers, ſuppoſed to be peculiar to it, and eſteemed very ſingular; this is, that though naturally of a fine bright blue, they become red as blood on being a little time buried in an anthill. By what accident this property was diſcovered we do not know, but probably only by the falling of ſome of the flowers off from the plant into a neſt of theſe little animals. Langham, in his Garden of Health, has related this, but it is no diſcovery of his; for Tragus, long before his time, tells us, ſpeaking of this plant, that nature affords a miraculous phænomenon in its flowers, which is, that if put amongſt living ants in their hill, it changes from blue to red, as if bluſhing with ſhame and fear of ſuch numerous and ſmall enemies; and John Bauhine records the ſame thing from Otho Brunfelſius. It would have been well, if all who have related this wonderful change of colour, would have varied the experiment with the violet, and other blue flowers; they would then have found, that it was not the property of the plant, but of the animal, that was the true object of wonder. All blue flowers of plants will turn red on the rubbing them over with acids, and the wonder is, to find that the ants have a natural animal acid about them, capable of making ſuch a change; not that the flowers of the *ſuccory* are ſuſceptible of ſuch a change with acids. *Tragus* in Stirp. *John Bauhine*, Hiſt. Plant.

The method of making the experiment is this: lay bare the top of an anthill with a ſtick, and then throw ſome of the flowers of *ſuccory* on the place; the ants will immediately be ſeen to creep over them, and as they move along, they may be obſerved frequently to let fall a drop of clear water from the lower part of their bodies; wherever this falls upon the flower, it makes a large red ſtain; by degrees they let fall more of theſe drops, and every one making its own particular ſtain, the whole flower becomes at length coloured. Sometimes they make this change very quickly in the flower, and ſometimes they are a great while about it; but the body of the ant, bruiſed upon a leaf of the flower, will immediately ſtain the whole, ſo far as it reaches. It deſerves inquiry, whether the ants ſimply depoſit this liquor on the flower, or whether they make a wound or puncture on the ſurface of the flower firſt. The laſt is moſt probably true; becauſe this flower is covered with ſo thick an external membrane, that the acid ſpirits of vitriol, ſalt, or the like, being barely touched upon it, do not inſtantly change its colour; but if it be picked or bruiſed, ſo as to let in the liquor, the change of colour is then inſtantly produced. If the flowers of this plant be ſteeped in the ſtrongeſt vinegar for a long time together, they will not change colour while the menſtruum remains cold; but if it be heated a little, it is by that means put in motion, and rendered capable of entering the pores, and then the colour is inſtantly changed. It is not obſerved that the ant makes any puncture, and if it does not, it is evident, from the immediate change in the flower, where the ſtrong mineral has no ſuch effect, that the acid in this little animal is of a very peculiar nature.

It has been ſuppoſed by ſome, that the tingling felt in the ſkin, and the bumps raiſed on it by ants, are owing to the falling of this penetrating acid liquor, as the creature moves along. The venomous effect of the ſting of the bee and waſp, is ſaid by authors to be owing to the introducing into the wound a ſharp liquor, lodged by nature in this animal at the root of the ſting. It would deſerve a trial, whether the liquor of theſe creatures be of the ſame penetrating acid nature with that of the ant, which might be eaſily diſcovered, by forcing out the ſting of one of theſe animals by preſſure, and making it enter into the petal of the flower of a violet, bugloſs, *ſuccory*, or any other of the like plants. This liquor of the ants may eaſily be procured in ſome quantity from them. If their neſts be diſturbed with a ſtick, thruſt in among them, they will crawl about the ſtick, and leave a great number of the drops of their acid upon it, and theſe, if immediately ſmelt to, will twinge the noſe like newly diſtilled ſpirit of vitriol. The larger kind of ants, called by the country people *horſe-ants*, afford this liquor ſtronger, and in greater quantity, than the ſmaller, or common ants; and, on trials, it proves nearly allied to the mineral acids in its properties.

The ants, diſtilled either by themſelves, or with water, yield an acid ſpirit like that of vinegar, or of verdigreaſe, which is more pungent and penetrating. Lead put into this ſpirit affords a good ſaccharum ſaturni; and the ſame ſalt is produced from that metal, if only put into fair water with a large parcel of living ants in it, they ſoon parting with enough of their acid to make the water a menſtruum ſharp enough for diſſolving that metal. There is alſo ſomething very ſingular in this acid, which is, that it will preſerve itſelf, and be regained from the metalline admixture in its own nature. The common ſaccharum ſaturni being diſtilled, does not yield back the acid employed in making it, but only an inflammable oil and water; but the ſaccharum ſaturni, made by the animal acid of the ant when diſtilled, returns back that acid in the ſame quantity and ſtrength, and no way altered. The vinegar diſtilled from verdigreaſe, and called *ſpirit of verdigreaſe*, is an acid very like this, but ſtronger, and more penetrating. Phil. Tranſ. Nº 68.

SUCK-*fiſh*, in ichthyology, an Engliſh name for the *remora*, or *echeneis* of Artedi. See REMORA.

SUCKING (*Cycl.*)—Though there are very few inſtances of children which are born with an inability of *ſucking*, yet the writings of phyſicians have recorded ſuch caſes; and one, which happened ſome years ago in France, gave occaſion to the members of the Academy to examine ſtrictly into the cauſe of it. Mr. Maloet, who examined the child, found that it wanted the whole palate of the mouth, and that in looking up to the top of the cavity of the mouth, the inner part of the noſe was ſeen; the child not only wanted the bony parts which form this arch, but alſo the inveſtient membrane they are naturally covered by. Mr. Maloet conceived that he had now found out the reaſon of the child's not having the power to *ſuck*, which he explained in this manner.

In the action of *ſucking*, while the infant has in its mouth the nipple of the nurſe, the air about it is diſperſed, and there is made a little void all about it in the cavity of the mouth. At this time the whole breaſt is preſſed upon as uſual by the external air, though the nipple is not, or at leaſt is much leſs ſo, and hence the mouth performing the office of a pump, the milk contained in the breaſt cannot but diſcharge itſelf by degrees through the apertures in the nipple. In order to this, however, it is evidently neceſſary that the communication between the mouth and the noſe ſhould be ſtopped by the proper organs; ſince, if this were open, the air, which continually paſſes through the noſe in

refpiration, getting into the child's mouth, would equally prefs the nipple with the other parts of the breaft, and confequently the caufe of the iffuing out of the milk would no longer fubfift; the mouth being no longer capable of performing the office of a pump, than while it is empty. Hence, according to Mr. Maloet's account, the child born without a palate could not fuck, becaufe the nofe and mouth had, by the abfence of this organ, a conftant and uninterrupted communication.

This account however did not feem right to Mr. Petit, for thefe reafons: a void in the mouth is not at all effential, or neceffary to *fucking*, as appears every day by women's milking their cows; when, without any fuch void, and by the mere preffure of their hands, they get out the milk. All the mechanifm ufed here, is a continual fucceffion of ftroaking down the teat, one hand fupplying the place of another, and here is milk extracted without either a void, or a pump; and if the action of *fucking* be nicely obferved in an infant, it will be found to amount only to the fame thing. It feizes the nipple, and makes with its lips a fort of flefhy canal, which receives, and continues gently to prefs it. The lips are found by anatomy to be compofed of partly longitudinal, and partly tranfverfe fibres; in the action of feizing the nipple, the firft of thefe are extended as far as they are capable, and afterwards their natural contraction fqueezes the nipple, and does what the hands of the milker do on the cow's teat, preffing out the milk in the very fame manner. The fhape of the nipple being larger at its origin, than at the end, makes it eafily flide out of the child's mouth, and this gives the infant conftant occafion of laying hold of it higher up, and then if it flip a little, that is only a motion which, as the child's lips inclofe it round, will the more facilitate the flowing out of the milk, which is thus forced from above downwards. The lips of the infant, though they are thus affiftant, are not however the only organs employed in *fucking*, the jaws are of great ufe, by their force and power of compreffion, and the tongue is a very ferviceable affiftant.

The tongue in infants is extremely thin, tender, and flexile: this is applied clofely to the under part of the nipple, and when it afterwards is drawn down toward the bottom of the mouth, there is then indeed formed in that place a fort of void, which determines the milk to flow readily in there, efpecially as the tongue itfelf has before given the principle of fuch a motion. Nor is this all the ufe that Mr. Petit allows the tongue in *fucking*; he obferves, that the root of it may be as ferviceable to the child in the fwallowing the milk, as the tip of it was in getting it out of the nipple; for when the milk has been conveyed along it to the lower part of the palate, in the manner of a gutter, the root at that time preffing againft the œfophagus, compels the milk to run down it, and then the tip is again employed to the *fucking* out more milk; and the action of *fucking* is thus alternately relieved by fwallowing, and both greatly affifted by the tongue. It is very poffible, from the different ftructure of the parts, that in the infant firft mentioned, the root of the tongue might be incapable of its office of affifting in fwallowing, while the tip of it readily performed its office of *fucking*; and this Mr. Petit takes to have been the occafion of its death, for the child lived only five hours.

From this theory of *fucking* it is plain, that a child born without a palate may yet be able to *fuck* by means of its tongue. Mem. Acad. Scienc. Par. 1735.

We are told of a man's giving *fuck* to a child, and thereby rearing it; but we do not find any other evidence of the truth of the ftory, than the word of the man, or pretended man, who was a beggar. See Philof. Tranfact. N° 461. p. 813.

In the Philofophical Tranfactions we have an account of a woman, of fixty eight years of age, giving *fuck* to her grandchildren. This woman had not borne a child for twenty years, or upwards. It would feem, as if the *fucking* of the child had brought milk into the breafts. See N° 453. fect. 10.

SUCKING *fifh*, in ichthyology. See the article REMORA.

SUCU, in botany, a fpecies of apple-tree, faid to be frequent in the province of Canton in China. The fruit is dried like figs to be kept all the year, and is brought into Europe. It is fomewhat larger than our apple, almoft round, and of a reddifh colour, or fometimes green. When it is dry, it has a cruft refembling honey or fugar. *Hofm.* Lex. Univ. in voc.

SUDARIUM, in ecclefiaftical writers, the fame with *brandeum*. See the article BRANDEUM.

SUDIS, in zoology, a name ufed by moft authors for the fea pike, a fifh called by others *lucius marinus*, and *fphyræna*. See Tab. of Fifhes, N° 44.

It in fome degree refembles the common river pike, but is thinner in proportion to its length, and in fome degree approaches to the *acus*, or tobacco-pipe-fifh, in that particular. Its fcales are fmall, and its nofe long, and of a conic form, the under jaw running out a good way beyond the upper, and ending in a fharp point. Its mouth is very wide, and yellow within; its tongue large and narrow, and armed all along with fharp and fmall teeth. The jaws are furnifhed each with a fingle row of large and fharp teeth, fet at fome diftance one from another; and in the middle of the lower jaw is one tooth longer than the reft, which has a hollow in the upper jaw made to receive it. It has two fins on the back, which are both, but efpecially the fore one, very prickly; and the tail is very deeply forked. It is caught in the Mediterranean, and ufually fwims in fhoals together. Its ufual length is ten or twelve inches; and it is efteemed a very well tafted fifh. *Ray's* Ichthyogr. p. 273.

SUDORIFIC (*Cycl.*)—A fafe, eafy, and effectual *fudorific* may be prepared in the following manner. Take an ounce of refined camphor, beat it in a marble mortar with two ounces of blanched almonds, till it be reduced to a fmooth and even pafte. This may be formed into pills, or bolufes, and given, according to the ftrength of the patient, and other confiderations, from three grains to forty.

Sudorific, perfpirative, and alexipharmic medicines, make a large part of the common difpenfatories. A few medicines, well chofen, might fupply the place of all thefe; and of thefe one principal one would prove to be camphor, which trial will always fhew to be greatly fuperior to bezoar, Gafcoign's powder, lapis contrayerva, and the like. *Shaw's* Lectures, p. 227.

SVEGLIATO, in the Italian mufic, is ufed for a brifk, lively, gay manner of finging or playing. Thus they fay *maniera fvegliata*.

SUETA, in ichthyology, a name given by Bellonius, and fome other writers, to the *nafus*, a fpecies of cyprinus, according to the Artedian fyftem, and diftinguifhed by that author by the name of the *cyprinus* with the fnout ftanding prominent, in form of a nofe, and with forty rays in the pinna ani. See the articles CYPRINUS and NASUS.

SUFFIBULUM, among the Romans, a name given to the *prætexta* of the pontiffs, and *palla* of the Veftal virgins. *Pitifc.* Lex. Antiq. in voc.

SUFFIMENTA, *fumigations*, in pharmacy. The *fumigations* prefcribed by difpenfatory writers are reduced to two kinds; the one conducive to health, the other only to pleafure; and of each kind fome are of moift, or liquid ingredients, others of dry ones.

The *fumigations* for pleafure are compofed of fragrant and fweet-fcented fubftances, and are ufed in form of powders, troches, or medicated candles. The firft are ufually prepared of ftorax, benjamin, lignum aloes, cinnamon, camphor, mufk, ambergris, and civet, mixed in due quantities, and all reduced together to a powder. The fecond kind, or troches, are compofed of the fame kind of powdered ingredients, and are made into a pafte with a mucilage of gum tragacanth, and then cut into form. And the laft kind, or candle *fumigations*, are prepared of the melted fweet gums, with labdanum, made up into the form of large candles, with as much of the beforementioned fweet ingredients as can be received into the mafs. Thefe, though only meant for luxury and pleafure, yet have medicinal virtues; and as they abound in cordial fubftances, cannot but revive the fpirits, and refift contagion. The moift *fumigations* of this kind confift of the powders before named, blended among a large quantity of rofe and orange-flower water, and of folutions of ftorax, and other of the fweet gums in fpirit of wine.

The *fumigations* ufed to reftore health are of feveral kinds. Some are meant only as corroboratives, and thefe are compofed of much the fame ingredients with thofe ufed for pleafure; others are ufed to dry up abundant humors, to purge the lungs, or to promote the menfes. In all diforders of the uterus, there fhould be added to thefe *fumigations*, galbanum, caftor, and affa fœtida. A common *fumigation* is alfo ufed, by throwing tobacco on coals, and receiving the fmoak through a funnel; and to this are fometimes added colt's foot leaves, with other pectoral herbs, and a little fulphur. Thefe are very ufeful for drying up ulcerations of the lungs, and other diforders of the breaft.

The moift *fumigations*, for the fake of health, confift either of fome fimple liquor, fuch as vinegar, wine, aqua vitæ, or rofe water; and in fome cafes, as for the difcuffing hard tumors, a red-hot brick, or ftone, is thrown into vinegar, and the fteam is received on the part. This is alfo a *fumigation* often ufed in times of peftilential contagion, and that with great fuccefs. Decoctions of uterine herbs are alfo frequently ufed for *fumigations* in feveral diforders of the womb.

Olibanum, amber, ftorax, and balfam of Tolu, make a fine dry *fumigation* for a catarrh: and in hyfteric cafes, great benefit is often found from holding the head, with the mouth open, over a hot folution of an ounce of affa fœtida in a pint of ftrong wine vinegar.

SUFFITION, *fuffitio*, among the Romans, a kind of luftration, practifed by perfons who had attended a funeral; it was performed by walking over fire, and being fprinkled with water. *Pitifc.* in voc.

SUFFOCATIVE *catarrh*, in medicine, the name of a diſeaſe, which conſiſts in a copious eruption of a ſerous and mucous humor into the veſicles of the lungs; which takes its origin from a ſudden congeſtion of humors about the breaſt, and a flaccid and weak ſtate of the breaſt and lungs.

This diſeaſe is not to be confounded with the ſpaſtic aſthma; nor with a moiſt cough, treated injudiciouſly with expectorants and opiates; nor with that ſudden oppreſſion of the breaſt, which is brought on by the ſtriking back of rheumatic humors, or cutaneous exanthemata; or the ſtopping the diſcharges of old ulcers: all theſe, though they have ſomething of the general appearance of the *ſuffocative catarrh*, and are therefore miſtaken for it by the leſs judicious, yet differ greatly and eſſentially from it in ſeveral points; of which hereafter.

Another diſtemper, with which it is alſo confounded, and from which it no leſs differs, is that aſthmatic anxiety which attends young and plethoric perſons, who are unhappily labouring under a latent ſcirrhus, or vomica of the lungs. The *ſuffocative catarrh* differs as widely from this, as from any of the others; but as the cauſe of this is ſeldom gueſſed at firſt, it is liable to miſconſtructions. Others have confounded this diſeaſe with a convulſive aſthma. Theſe diſtempers are in a great meaſure to be diſtinguiſhed by the habit of body of the perſons afflicted with them; plethoric perſons, who abound in rich blood, being very ſeldom ſubject to this diſeaſe, though frequently to the convulſive aſthma. They are alſo diſtinguiſhed from the abundant afflux of matter in the *ſuffocative catarrh*, and by there being none in a convulſive aſthma. In the catarrh of this kind there is a relaxation of the tone of the muſcles of the breaſt; but, on the contrary, in this kind of aſthma they are continually contracted into convulſions; and hence there is, in this caſe, rather an actual preſſure and cohibition of reſpiration, than an impotence of it, which is truly the caſe in a *ſuffocative catarrh*. In this caſe alſo there is a remarkable loſs of the ſtrength, whereas, in the convulſive aſthma, there are violent efforts, and ſtrong palpitations of the heart. Some have alſo buſied themſelves in determining the differences between a ſerous apoplexy, and a *ſuffocative catarrh*; but this is not neceſſary, ſince they very often concur, and make but one diſeaſe: but when the ſerous apoplexy comes alone, it is known by having been preſaged by diſorders of the head, redneſs and lippitude of the eyes, a dull and heavy cephalæa, and a foaming, or voiding of frothy matter by the mouth. *Junker*'s Conſp. Med. p. 507.

Signs of a ſuffocative catarrh. This diſeaſe always ſeizes the patient at once, without any previous notice; his breath becomes extremely difficult, and the fullneſs of the breaſt is eaſily diſtinguiſhed by a ſound of rattling of a frothy matter at the time of drawing in the breath. There is an immediate debility and loſs of ſtrength and ſpirits, as the patient calls it, but there is in reality a ſpaſmodic tenſion; there follows this a reſtleſsneſs, ſo that the patient cannot ſuffer his limbs to lie a minute in the ſame poſture or place; and there is always a deſpondency in the mind, and the patient thinks he is certainly going to die. There is uſually either no cough at all, or, at utmoſt, only a very ſlight and inſufficient one, and the very ſtrength to cough is wanting. The breaſt, and even the ribs, are ſenſibly affected by this diſeaſe, and the eyes always look red and tumid.

Perſons ſubject to it. Scarce any one is ever ſeized with this diſeaſe, except ſuch as are, according to the common acceptation of the word, troubled with habitual catarrhs, or have for many years been ſubject to defluxions from the head upon the fauces and lungs; and the perſons moſt of all ſubject to it, are old men of a phlegmatic and plethoric habit, and are of that kind of temperament which ſubjects people, at other times, to palſies and apoplexies. Lean perſons are ſcarce ever afflicted with this diſorder, unleſs they have long laboured under a violent cough, or have ulcerous diſorders of the lungs. Young people are alſo very little ſubject to this diſeaſe, excepting only ſuch as are very corpulent and phlegmatic, and already habituated to large defluxions of this kind. Infants alſo, which are very fat, and have had a ſudden ſuppreſſion of their natural ſweats, ſometimes fall into this diſeaſe, but with them it is not ſo violent.

Cauſes of it. The occaſional cauſes of this diſeaſe are ſeen in what has been already obſerved, but its true origin is to be ſought for in the head, not in the breaſt or lungs; yet, though it is eaſy to ſee what may occaſion a congeſtion of ſuch ſerous humors in the upper parts, it is difficult to ſay how the lungs become rendered fit to receive it all at once in this dangerous manner. It is accidentally brought on in children, as well by the repulſion of their cutaneous eruptions, as by the ſtopping their ſweats; and in grown people, from the omiſſion of habitual bleedings, from coldneſs and dampneſs in the air, from frequent drunkenneſs, and from an injudicious treatment of cutaneous humors, and particularly from drying up runnings of the eyes. *Junker*'s Conſp. Med. p. 509.

Prognoſtics in it. It is a very terrible diſeaſe, and very ſpeedily proves fatal, for the patient, if not relieved, uſually dies in twenty four hours. Sometimes it degenerates into a fever; and the patient ſeems cured by the change; but the remedy in this caſe proves as bad as the diſeaſe; for the fever proves incurable, and becomes a ſettled hectic, attended with terrible difficulty of breathing, and finally carries off the patient, after making him endure, for ſome time, a life of terrible pain. Sometimes it goes off into an aſthmatic laxity of the breaſt, attended with a cough, and a continual diſcharge of large quantities of mucous matter by ſpitting; and ſometimes into an abſolutely cachectic flaccidity of the body: and in general, if not carefully treated from the beginning, it either entails ſome of theſe diſorders upon the patient, or leaves him ſo poor and weak a conſtitution, that he becomes eaſily liable to all the diſeaſes of this kind from the ſlighteſt occaſions.

Grown perſons are ſooner taken off by this diſeaſe than young children, with whom it ſometimes continues above a week or a fortnight. In old people, the fatal event of the diſeaſe is ſo ſudden, that it is often dubious whether it were this diſorder, or an apoplexy; and in general it ſeems probable, that many of the perſons, ſaid to die of apoplexies, die, in reality, of the violent attacks of this terrible diſeaſe.

Method of cure. In the time of the fit a ſtimulating clyſter muſt be given, made of a decoction of marjoram, and other warm herbs, with colocynth, and a few grains of euphorbium, in order to abate the infarction of the breaſt, and give a new courſe to the matter that might add to it; and when there appears to be a plethora beſides, a vein muſt be immediately opened after the clyſter. After this, if the ſtomach be nauſeating and uneaſy, let a ſcruple of ſalt of vitriol be given as a vomit, with a large quantity of warm water; and if the patient is of a very phlegmatic habit, a few grains of gamboge may be added to this, to carry the humor off downward; or, if the caſe be very preſſing, a draught of a decoction of aſarum, or of tobacco, may be taken, the bad effects of which laſt are taken off by a draught of wine with the ſpices; and all this time there may be frictions and ſinapiſms applied to the lower extremities: and finally, to attenuate and diſcuſs the mucous ſtaſis, gentle alexipharmics and ſudorifics may be given, ſuch as the eſſence of amber, tincture of ſalt of tartar, and tartariſed tincture of antimony; and all nitrous medicines are alſo of the greateſt uſe, as they partly mitigate the cauſes, and partly prepare the humors for evacuation; and after all theſe, the cortex elutheriæ is of great uſe in diſcuſſing and mitigating the pain.

As ſoon as the fit is over, the corroborating medicines are to be given, and all things that can reſtore the parts to their due tone: of this number are the milder chalybeates, and the like; and with theſe analeptics are to be given, to recruit the fleſh and ſtrength, ſuch as emulſions, and a proper diet; and in ſuch as are uſed to wine, the richeſt wines, in moderate quantities, and the higheſt foods, will be of ſervice. If there be perceived a fever after the other ſymptoms are gone off, this muſt be cured by the gentle alexipharmics, and by powders of nitre, and the abſorbents; and if a chronic indiſpoſition ſeems left behind, then the gums, which act as diſcutients, are to be given for ſome time, ſuch as the ammoniacum and ſagapenum, and a warm regimen is to be recommended. And finally, to prevent a return of the diſeaſe, bleeding is very proper in the ſpring and autumn, and purging medicines taken in the intermediate time; the patient muſt alſo avoid all violent paſſions of the mind, and muſt never ſleep in a damp air. We are not to fear bleeding in the time of the fit, becauſe of the patient's complaining of want of ſtrength; for as the danger of *ſuffocation* is ſudden and imminent, it muſt be ſuddenly removed, and when that is done, the patient's ſtrength will return in good time: the ſame is alſo to be alledged in favour of the violent vomits. In people of a very phlegmatic habit, bleeding is not neceſſary nor proper; but in theſe caſes a vomit is ſafe and right, and uſually gives great relief, eſpecially if the patient have eaten heartily ſome little time before. *Junker*'s Conſp. Med. p. 513.

SUFFOLK *powder*, the name of a medicinal powder, good for the bite of a mad dog. It had its name from a Counteſs of *Suffolk*, who uſed to give it with great ſucceſs. It is ſtill kept as a ſecret in ſome private families, but ſeems to be only the ſtar of the earth, or the common buckſhorn plantain dried and powdered, or this powder with ſome very trifling addition. This plant has been famous for its virtues in this caſe a great while among us, and De Grey, in his Complete Farrier, gives the method by which he had cured dogs by it with great ſucceſs. See Phil. Tranſ. N°450. p. 455.

SUGAR (*Cycl.*)—The curious in the whole art of *ſugar*-making, or the reducing vegetable juices to what we call *ſugar*, by expreſſion, decoction, clarification, graining, claying, and cryſtallization, will find farther accounts and directions, in the ſeveral proceſſes of this art, in Piſo's Hiſt. Ind. in Angelus Sala's Saccharologia, in Dr. Slare's Treatiſe on *Sugars*, and in Sir Hans Sloane's Hiſtory of Jamaica. There are alſo ſeveral valuable papers on theſe ſubjects in the Philoſophical Tranſactions.

Sugar has been said to be a specific against the famous Indian poison mentioned by Mr. de la Condamine; but this seems a mistake. See the article POISON.

Coarse *sugar*, in which there is more oil than in refined *sugar*, is recommended as a good medicine in Collyria for discharging ulcers of the cornea, in which astringents are hurtful. *Demour's* Diff. sur les Malad. des yeux.

Labourers in *sugar*-houses are very subject to dysenteries. The *vitrum antimonii ceratum* is an effectual remedy in these cases. See VITRUM *antimonii ceratum*.

Maple SUGAR. See MAPLE.

SUGAR *of milk*. See MILK.

SUGAR *spirit*, a name given by our distillers to a spirit made in England, Holland, and other places, from the washings, scummings, dross, and waste of a *sugar*-baker's refining-house. The manner of preparing it is the same with that used for the malt and melasses spirits. The refuse of the *sugar* is fermented with water in the usual manner, then distilled into what is called *low wines*, and afterwards rectified, without any addition, into proof spirit.

When the operation is well performed, and no foul fœtid, or foreign matter, has got in among the wash, this is a tolerably clean spirit. We usually make it such, but in Holland it is usually made very nauseous and disagreeable; though capable, by an easy rectification familiar with us, though not much known abroad, of being brought to a fine and clean spirit. With us this *sugar* spirit is used to mix with, and adulterate brandy, rum, and arrack, which will receive a large dose of it without its being at all discoverable; but the Dutch, who have it very coarse, can only adulterate rum with it, and even that will bear but a small proportion, without being betrayed by its nauseousness.

This *sugar spirit* reduced to alcohol makes one of the purest spirits we are acquainted with, much superior to that of melasses, and much more to that of malt. *Shaw's* Essay on Distillery.

We have, in the Philosophical Transactions, an account of a volatile and pungent spirit of sugar, which was made from what the *sugar*-bakers call *sugar-water*, which is no other than the water in which the aprons, moulds, and other utensils, employed in the refining of *sugar*, are washed. This was so extremely pungent, that a man could not smell to a large quantity of it without danger of suffocation; and so volatile, that no stopping it up could preserve its spirit for any length of time. Phil. Transf. Nº 130.

SUGGESTUS, among the Romans, a place in the *campus martius* raised higher than the rest, where every magistrate, according to his rank, was allowed to harrangue the people; but private persons could not, unless they first obtained leave from some magistrate to do it. *Pitisc.* in voc.

SUGGRUNDARIUM, among the Romans, a place where infants, not exceeding forty days old, were buried; it being unlawful to burn them. *Pitisc.* in voc. See the articles BURNING and BURIAL.

SUGITIVA, a term used by some authors to express medicines, which suck up and absorb the serosities in dropsical persons.

SUIT (*Cycl.*)—SUIT-*silver*, in our old writers, a small rent, or sum of money, paid in some manors to excuse the appearance of freeholders at the courts of their lords. *Blount*.

SUKOTYRO, in natural history, the Chinese name of a very large and remarkable horned animal, which seems to be the same with the carnivorous bull of Pliny and the antients.

It is of the size of a large ox; its head is shaped like that of a hog; its ears are long and hairy; and its tail is bushy. On each side of the head, near the eyes, there stands a large horn, resembling the ivory tusk of the elephant, but not altogether so thick. Nieuhoff, who gives this account, adds, that it is very rarely caught, and that it feeds on grass; but this last observation may possibly have been spoken of course, without any one's having certainly known it. All that we have ever seen of this animal, is a pair of horns of an enormous size, now in the possession of Sir Hans Sloane, and of which he has given an account to the Academy of Sciences at Paris.

These were found in some part of Wapping, by Mr. Doyly, the inventor of the English stuff of that name, in a cellar he had hired; they were much injured by time, and in many places rotten, and worm eaten. No one could remember any account of the place whence they came, or how they were brought to that place.

They are strait for some distance from the base, but higher up they begin to bend, and go on crooked to a point. They have much more of the external appearance of the horns of the goat, than the ox kind, being not round, but flatted, and variously undulated with high transverse ridges and furrows. They are not both exact in length, but the longest measures six feet, six inches and a half in length. The diameter at the base is seven inches, and the circumference there a foot and a half. The weight of the largest is nearly two and twenty pounds, and it will hold in its cavity a gallon and a pint of water; and would hold much more, were it not for the worm-holes near the base.

The captain of an East-Indian ship, on seeing these horns, assured Sir Hans that they belonged to a large species of bull in the East, which he had seen, and which, by his account, seemed to be the same with the creature before mentioned, as described by the antients; though none of the modern naturalists having seen it, it has been left out of their accounts. Agatharcides, who lived about a hundred and twenty four years before Christ, has well described this animal; and whatever has been occasionally spoken of it by any others, is all transcribed from his writings. The creature seems to be a native only of Ethiopia, some few parts of the East-Indies, and some inland countries in Africa, never visited by our travellers. From all the accounts we have, its size appears to be, at least, twice that of our ordinary oxen, and with horns proportionably large. The pair here mentioned seem not to be the only ones preserved in Europe, for Gesner tells us of one of an enormous size, which is still hung up in the cathedral church of Strasburg. Mem. Acad. Par. 1727.

SULA, in zoology, a name given by Hoier, and some others, to a bird, described as a distinct species of the webfooted water-fowl, but seeming to be no other than the *anser bassanus*, or soland goose. *Ray's* Ornitholog. p. 249.

SULCATED *leaf*, among botanists. See LEAF.

SULMO, in ichthyology, a name given by Bellonius, and some others, to the salmon.

SULPHUR, (*Cycl.*) in natural history. *Sulphurs* are defined to be dry, solid, but friable fossile bodies, melting with a small heat, when fired in the open air, burning almost wholly away with a blue flame and noxious vapour, indued with an electric power, and not dissoluble in acids.

Some have used the word *sulphur* as a name for the whole series of inflammable bodies, but as we have also been used to distinguish those of a particular kind by the same name, it seems much more eligible to restrain that name to those bodies, and to give some other for the more general classes.

The word *sulphur*, in this acceptation, becomes the name of a regular genus of fossils, of which there are four known species. 1. The yellow native *sulphur*, which in its purest state is of a pale straw colour, and as pellucid as the finest amber; but is more frequently found coarser, and more opake. It is found in the gold mines of Peru, in Hungary, and in some other places. 2. The green native *sulphur*. This is harder than the other, and is usually found in small masses composed of several crusts. It is found, so far as is yet known, only about mount Vesuvius. 3. The grey native *sulphur*, which is common in Iceland, and many other places, and is the coarsest and worst of all the kinds. And 4. the most rare and beautiful of all the kinds, the red native *sulphur*. This is of a fine glowing red, like cinnabar, and very bright and transparent, and is found, so far as is yet known, only in the gold mines of Peru. *Hill's* Hist. of Foss. p. 402.

Mr. Homberg having given the original composition of *sulphur*, in his accurate analysis of that mineral, Mr. Geoffroy attempted to bring that analysis to the nicest test, by composing *sulphur* out of such substances as appeared to be its constituent principles.

It appeared from Mr. Homberg's analysis, that what passed in the earth for the production of *sulphur*, was, that the vitriolic acid, and the common mineral bitumen; both which are always found in great abundance in all places where native *sulphur* is produced, being joined by a long digestion under ground, and mixt with some of the native alkalis of the earth, by an intimate union of all three together, formed one mineral *sulphur*. The best way of trying the justness of this hypothesis, was by attempting to make *sulphur* with the same substances by a chemical digestion. With this view Mr. Geoffroy mixed the perfectly deflegmated spirit of *sulphur* with an equal quantity of Mr. Homberg's balsam of *sulphur*, carefully prepared; after digesting these alone for some time, he added some oil of tartar by way of alkali, and then gave the whole a new digestion. After this the whole being distilled by the retort with a brisk fire, there came over into the receiver some phlegm, and a little oil; and when the vessels were cooled, there was found in the retort a saline matter, yellow in some parts, and red in others, and every where smelling very strongly of *sulphur*. He made a lixivium of this substance, filtered the clear liquor, and adding distilled vinegar to it, the liquor became turbid, and smelt strongly of *sulphur*, and, in fine, precipitated a white powder, which was true *sulphur*, and would burn wholly away.

This was the first experiment: the next was to try whether other substances, of the nature of those separated from *sulphur*, would produce a true *sulphur* in the same manner. For this purpose the substances fixed upon were oil of vitriol for the acid, and oil of turpentine for the bitumen; equal quantities of these being mixed together, the whole became very hot, and after standing some time it became red, and had an agreeable smell, like the citron: this however, in longer standing, became stronger, and less agreeable. The mixture having stood till it was considerably thick, there was added to it a quantity of oil of tartar; the whole then fermented together for a long time, but not with any great violence,

violence, after which it became a thick soapy liquor. Part of this was distilled, and yielded by the retort a yellow transparent oil, of a strong smell, and an acrid taste, and a phlegm of a like acrid taste: after these there came over a thick brown oil, sweet to the taste, and smelling like the oil of wax; and after this there followed a substance, wholly resembling the butter of wax. At the bottom of the retort there remained a saline matter of a very strong *sulphureous* smell, resembling also the stink of rotten eggs: this matter being dissolved in water, and distilled vinegar poured on the solution, the whole became turbid, and, in fine, precipitated a grey powder, which proved true sulphur.

Thus was the process of nature fairly imitated, and a mineral substance produced by a mixture of bodies not drawn from that mineral. The author, after this, was desirous to shorten the operation, dried the remainder of the first mixture over an open fire; then putting it into a red-hot crucible it flamed, and emitted a smell wholly resembling that of olibanum when burnt; and after that a very penetrating smell of *sulphur* issued from it. The whole being then taken from the fire, part of it was yellow, and part red, but all had the smell of *sulphur* very strong.

The vitriolic acid is not peculiarly necessary in the making of *sulphur*, for the spirit of alum was found to finish the process in the same manner.

As it appeared, that in the course of this process there had been made a tartarum vitriolatum, by the mixture of the oil of tartar with the acid spirits, Mr. Geoffroy was induced to try whether the common tartar vitriolate would not answer the purpose, and the event proved, that this salt, mixt with any of the inflammable oils, would yield a burning and true *sulphur*; and not only this salt, but many others of a like kind, answered the same purpose. The salt, produced by mixing oil of tartar and spirit of *sulphur*; colcothar, or fixed salt of vitriol; Glauber's salt, which is a composition of the acid of vitriol, fixed by the alkali of sea salt; and burnt alum, which is the vitriolic acid, mixed with a large portion of earth, all made genuine *sulphur*, on being properly mixed with the inflammable oils. Another way of making this mineral is thus.

Mix together one ounce of the salt of colcothar with two drachms of salt of tartar; melt them together over a fierce fire, and as they begin to fuse, throw in, at several times, an ounce of rectified spirit of wine. When the whole ceases to fume, it will yield a very penetrating smell of *sulphur*; take it from the fire, and the flame will appear bluish. When it is cold, the matter will appear yellow in some places, and red in others, as in the former processes, and will smell very strongly of *sulphur*, or of rotten eggs. Make a lixivium of this matter, and pour distilled vinegar into it, and a true inflammable *sulphur* will be produced, in form of a precipitate, at the bottom of the vessel.

The salt of tartar, in this mixture, serves only to assist the fusion of the colcothar, and to render the mixture of the spirit with it more exact; but it appears very wonderful, that so volatile a *sulphur*, as that of spirit of wine, should be able at once to unite and fix itself in mixture with a fixed salt in fusion. Nor is spirit of wine any more essential in this process, than any peculiar acid in the former, since petroleum, oil of amber, oil of turpentine, or any of the fetid oils of animals, in the same manner produce *sulphur* with these salts. Nay, any inflammable matter mixt with these salts, whether charcoal, common pit coal, or whatever else of the same kind, will produce *sulphur* in the same manner, though in different proportions.

Decrepitated sea salt and fixt nitre were tried in the manner of the former salts, but they would not yield any *sulphur* on a like process. These several experiments all join in proving the truth of Mr. Homberg's observation, that *sulphur* is composed in the earth by a mixture of an acid spirit, a bituminous oil, and an alkaline earth; and do great honour to that elaborate analysis by which he discovered it.

Mr. Geoffroy, though he carried the art of making artificial *sulphur* to these great lengths, is not however the first author who attempted it, Mr. Boyle and Glauber both did it before him, but on different plans; Mr. Boyle by a mixture of oil of vitriol and oil of turpentine, and Glauber by a mixture of his own salt and powder of charcoal; but though both succeeded in some degree, neither process could be compared with these, nor the *sulphur* be made near so pure. Mem. Acad. Par. 1704.

Stahl's method of producing *sulphur* is very easy, and is thus performed. Mix with tartar vitriolate, in order to facilitate the melting of that refractory salt, an equal quantity of potash, and add to this an eighth part of soft powdered charcoal; put this mixture, at several times, into a red-hot crucible, and cover it with a tile, lest a great quantity of the phlogiston should be dissipated by the fire; the mixture will soon melt, and there will be produced a true *hepar sulphuris*, or liver of *sulphur*. When this is dissolved in cold water, true *lac sulphuris* may be precipitated from it; and this may be sublimed into true and perfect flower of brimstone. *Cramer's* Art of Assaying, p. 390.

The purest gold, when melted with common *sulphur*, remains perfectly the same as before; it lets the *sulphur* burn freely away, remaining itself entire, and in a mass. Silver, when it begins to grow red-hot in a crucible, melts immediately on adding common *sulphur*; and when poured out, it proves a mass that cuts very easily, is very malleable, and is of the colour and consistence of lead: this mass, however, being a second time exposed to a very strong fire for a considerable time, is freed from its *sulphur*, which becomes dissipated, and the silver germinates into a kind of woolly substance, if the fire be slackened toward the end of the operation.

Tin, granulated and stratified with an equal, or double quantity of *sulphur*, deflagrates in the fire as if nitre had been added, and leaves the fluid, which becomes solid and consistent while it is yet red in the fire; whence it is plain, that the fusion of tin is retarded by *sulphur*. The remaining regulus is very brittle under the hammer, much like a semi-metal, and is of the colour of lead; but the part of the tin, thus turned into scoriæ, looks like ashes and dust upon the surface, but is darker coloured, and cleaner within. The whole quantity of the tin will be converted into these scoriæ, by repeating the burning with fresh quantities of brimstone.

Lead melted with brimstone, after the deflagration, is reduced to a mass which is hardly fusible by a great fire, but forms a friable mass, consisting of very bright and glittering particles.

Copper stratified with *sulphur* melts immediately in the fire, and turns to a black brittle mass. The same thing also happens, if *sulphur* be put upon copper when red-hot. Iron being taken red-hot out of the fire, and rubbed with *sulphur*, melts into a spungy dross; it afterwards quits this *sulphur* with difficulty, but melts very easily with it. There is no metal, or semi-metal, that seems so nearly allied to iron, as *sulphur*, or that melts so easily, and remains so intimately mixed with it. Regulus of antimony being well powdered, and mixed with *sulphur*, and stirred with an iron while in fusion, returns into crude antimony again. The fusion of crude antimony is also greatly promoted and assisted by common *sulphur*; but it does not mix so readily with the *sulphur* as the regulus.

Bismuth melted with common *sulphur* runs into a mass resembling antimony, of a faint grey colour, consisting of minute and very bright needles, each cutting the others across: this mass is extremely brittle.

Zink melted with *sulphur* does not readily mix with it, but if it be kept a long time in a moderate fire, and *sulphur* be many times poured over it, so as to cover the whole surface, and it be continually stirred together, it at last produces a very brittle dark-coloured shining substance.

From these experiments with *sulphur* on the metals it appears, 1. that iron being very greedy of *sulphur*, all the other metals, and semi-metals, may be freed from *sulphur*, by adding iron to them. 2. That a very small quantity of iron, a greater quantity of copper, and a much larger of lead, or tin, are necessary to absorb the same proportion of *sulphur*. *Cramer's* Art of Assaying, p. 43.

Dr. Lister has given it as his opinion, that there is no such thing as pure mineral *sulphur* found native, or in its original state, in the earth. He supposes all the pyrites to contain a vast quantity of *sulphur*, as indeed experience proves; and is of opinion, that as we by art can, by means of fire, melt and separate pure *sulphur* from the pyrites, so nature, acting by subterranean fires, can do, and frequently does the same; and that the *sulphur*, found pure about the burning mountains, and in mines, is all of this kind. He supposes, also, that thunder, lightning, and earthquakes are all owing to this matter; and that it is owing to the exhalations of the pyrites, which are in effect the pyrites itself. Philos. Trans. N° 156.

It is evident, from numerous experiments, that vitriol and *sulphur* are things very nearly allied to one another. The vitriolate salt, in common *sulphur*, differs scarce at all from common vitriol, and the acid liquors obtained from both, under the different names of *spirit of sulphur*, and *oil of vitriol*, are the same, except in degree of strength.

The effects of these two acids in the body, and also on metals, *&c.* are exactly the same. It is observed, that the *sulphur* yields but a very small quantity of this acid, in comparison of the vitriol; but the reason of this is, that in the operation the rapid motion of the flame sublimes the far greater part of the substance, unseparated in the form of flowers.

There are ways however of remedying this, and by some such means it was that the famous Drebbel obtained, at the rate of eight, and sometimes ten ounces of spirit, from a pound of *sulphur*; whereas, in the common process, one ounce is a considerable quantity to obtain. Possibly the grand secret, Mr. Ward possesses at present, of making oil of vitriol, as he calls it, cheaper than others, may depend on this sort of contrivance. The vessels he uses are vast spheres of glass, of three feet in dameter, which must serve as well, at least, if not much better, than bells; and oil of *sulphur*, and oil of vitriol, are so much the same, that there is no deceit in selling the one for the other.

In

In all the operations for the making oil of *ſulphur*, the weather is a material thing to be regarded; for when the operation is performed in moiſt weather, there is always a greater quantity of ſpirit or oil prepared, than when in dry; and Drebbel acknowledged, that he could obtain one fourth more in theſe, than in other ſeaſons. This great chemiſt tells us, that he was convinced the contrivance he uſed was capable of very great improvements, and that he made no doubt of carrying it ſo far, at length, as to obtain an equal weight of acid ſpirit to that of the *ſulphur* uſed in the experiment; the humidity of the air, at leaſt, adding as much as the quantity of the *ſulphur* loſt in the operation. There are ſeveral common menſtrua, by means of which *ſulphur* may be reduced into the form of a highly-rectified acid, and corroſive liquor; and even ſpirit of nitre, or aqua fortis, well rectified, being digeſted upon the flowers of brimſtone, and then diſtilled in aſhes, and the proceſs repeated five or ſix times after the laſt operation, there will remain with the flowers nearly an equal weight of an acid ſpirit, in all things reſembling that made by the bell, the ſpirit of nitre being ſcarce at all changed from what it was before the operation: and it ſeems, from experiment, that if the proceſs were frequently reiterated, and the ſpirit of nitre changed, the whole may be thus tranſmuted into an acid ſpirit, abating only for ſome ſmall proportion of earthy, or metalline particles. Phil. Tranſ. N° 104.

There is a preparation of common *ſulphur*, ſtrongly recommended by Mortimer for preſerving timber from being worm eaten, as it is very ſubject to be when felled before the ſap is wholly at reſt. A quantity of common yellow brimſtone is to be put into a common retort of glaſs, and covered three fingers deep with aqua fortis; this is to be diſtilled off to a dryneſs, and the ſame repeated three times. The *ſulphur* then is to be taken out, and laid on a marble, or put into an open flat glaſs veſſel, where it will ſoon run into an oil by deliquium. This oil is to be rubbed on any curious piece of wood that is in danger of worms: it will deſtroy them if they have begun to breed in it, and wholly prevent them if not yet begun. It alſo gives the wood an agreeable tinge or colour, which no art can ever rob it of afterwards. It is alſo a great preſervative of wood that is to be ſet in the earth, or under water; and may be uſed with ſucceſs to rub over the cables in ſhipping, or any other ropes that are indangered by lying much in the water. *Mortimer*'s Huſbandry, Vol. 2. p. 104.

SULPHUR, in medicine, is given in its crude ſtate with great ſucceſs in diſeaſes of the lungs: it ſtrengthens and cleanſes them, by promoting expectoration. It has always been famous for its virtues in cutaneous diſeaſes, and in hæmorrhoidal complaints. It generally proves a little looſening to the bowels, and increaſes the diſcharges by perſpiration: it even communicates its ſmell to the perſpired matter for a conſiderable time after taking it, and will often blacken gold or ſilver that is worn by people who take any conſiderable quantity of it.

The preparations of *ſulphur* are, 1. *flores ſulphuris*, flowers of *ſulphur*. 2. *Sulphur precipitatum*, commonly called *lac ſulphuris*. 3. *Balſamum ſulphuris*. 4. *Aqua ſulphurata*. 5. *Spiritus ſulphuris*, the oil, or ſpirit of *ſulphur*.

SULPHUR *of antimony*. The method of Angelus Sala for preparing the *ſulphur of antimony* ſeems, according to Dr. Plummer, preferable to the common way. The curious may find the deſcription of Sala's in the Medic. Eſſ. Edinb. Vol. 1. Art. 6. The doctor thinks, that in the common preparation much of the true *ſulphur* is conſumed by the deflagration, and the precipitated powder conſiſts of many of the groſs earthy parts of the ſalts in antimony. However, the *ſulphur of antimony*, uſed by the doctor in the preparation of his *æthiops*, was made in the common way. See PLUMMER's *æthiops*.

SULPHUR *auratum*, a name given by ſome chemiſts to a preparation of *ſulphur* and arſenic, called by others *rubinus arſenicalis*. See RUBINUS.

Balſam of SULPHUR. See BALSAM, *Cycl.*

Embryonatum SULPHUR. See EMBRYONATUM.

Fixed SULPHUR. *Fixed ſulphur* is uſed by the enamellers, and is prepared in the following manner. Boil flower of brimſtone in common oil for an hour; take the matter off the fire, and pour on it a quantity of very ſtrong vinegar, the flower of brimſtone will on this ſink to the bottom; pour off the liquors, and repeat the operation to the third time, and the powder then ſeparated is the *fixed ſulphur*. *Neri*'s Art of Glaſs, p. 188.

Spirit of SULPHUR. The uſual methods of preparing the acid *ſpirit of ſulphur*, or oil of *ſulphur*, by the bell, are ſo tedious and expenſive, that few are at the pains to make it. Both the methods, deſcribed by Mr. Charras in the Pharmacop. Royale, p. 883, are liable to many uncertainties and inconveniencies, as well as that recommended by Mr. Homberg in the Memoirs de l'Acad. des Sciences, anno 1703. In the Medical Eſſays of Edinburgh, Vol. 5. Art 14. we have an eſſay on extracting the acid of *ſulphur* in an eaſy manner, by placing a crucible with about three ounces of flower of *ſulphur* in it under a retort. The *ſulphur* being fired by throwing a lighted coal into it, the crucible is then gradually raiſed till it be juſt received within an orifice cut in the bottom of the bole of the retort, to which a large receiver with a ſpout is adapted. When the *ſulphur* is conſumed, the ſame quantity of new lighted *ſulphur* is to be put into another crucible; and thus the proceſs may be continued, till as much acid is obtained as is required. See the book loc. cit. or the Abridgment, Vol. 1. p. 160, ſeq. for the details of practice.

This method is indeed an improvement on the common one; but there are two other more elegant and eaſy ways of extracting the acid from *ſulphur*. The firſt is by Stahl, who directs woollen cloths to be moiſtened in a ſolution of fixed alkaline ſalt, and then dried. Theſe are to be ſuſpended over the fume of burning *ſulphur*, which will be imbibed and locked up in the ſalt, from whence it may be eaſily ſeparated by the addition of oil of vitriol, and the aſſiſtance of common glaſs diſtilling veſſels.

The ſecond is by Mr. Seehl, who pours oil of vitriol on a *hepar ſulphuris* placed in a glaſs retort, to which he adapts a receiver, and by a ſmall heat draws off the acid liquor. See Improvement on making Volatile *Spirit of Sulphur*, by Ephr. Rinh. Seehl, Lond. 1744. and Medic. Eſſ. Abridg. Vol. 1. p. 164. Not.

A pound of flowers of *ſulphur* may be burnt in about ſeven or eight hours, and will yield about ſeven drachms, or an ounce of pure acid. But it is obſervable, that the quantity of acid liquor varies greatly with the weather, being, as before mentioned, conſiderably more when the air is moiſt, than when it is dry.

It is ſaid that *ſulphur* may be made by contriving a fat, oily, or bituminous ſubſtance, with any mineral acid ſalt; but, in reality, the difficulty of making *ſulphur* with every acid is very great, if not impoſſible. With the vitriolic acid, indeed, the inflammable part of bodies eaſily combines into a true *ſulphur*; but it does not appear that any way has yet been found, by which the marine or nitrous acid may directly be combined into ſuch a ſubſtance. Stahl is expreſsly of this opinion in his Opuſcul. Phyſ. Medic. 4to. See Medic. Eſſ. Abrig. p. 163. Not.

Oil of SULPHUR. Some think there is an eſſential difference between the acid of *ſulphur* and its ſuccedaneum, the oil of vitriol; but a late author aſſerts, notwithſtanding the experiments brought to ſupport this opinion, that if the two acid liquors be reduced to the ſame ſtrength, and perfectly freed from all heterogeneous ſubſtances, they will be perfectly ſimilar, and not to be diſtinguiſhed. See Eſſay for Reforming of the London Pharmacopœia, London, 1744. p. 64.

SULPHUR *præcipitatum*, a name given in the London Pharmacopœia to the medicine called by other authors *lac ſulphuris*, or milk of *ſulphur*. It is by ſome directed to be made with the addition of an alkaline ſalt, but according to the method now in uſe, is thus prepared. Boil flowers of *ſulphur* in water, with three times their weight of quick lime, till they are thoroughly diſſolved; filtre the ſolution through paper, and pour on it weak ſpirit of vitriol, till a precipitation is procured; ſeparate the precipitated matter, by pouring off the water, and waſh it with freſh water, till it is become quite inſipid. *Pemberton*'s Lond. Diſp. p. 210.

Purified SULPHUR, is uſed in the making of gunpowder, and other occaſions. The method of preparing it at the powder-mills is this: they diſſolve the *ſulphur* by a very gentle heat, and then ſkum it, and paſs it through a ſtrainer. If the brimſtone ſhould happen to take fire in the melting, they have an iron cover that fits on cloſe to the melting veſſel, and damps the flame. The brimſtone is judged to be ſufficiently refined, if it will melt without yielding any fetid odour between two hot iron plates, and be changed into a kind of red ſubſtance. *Shaw*'s Lectures, p. 389.

SULPHUR *rapax*, in chemiſtry, a name given to arſenic, from its carrying off a great quantity of many metals in the fire, which it carries up with it, and ſublimes in form of flowers, called by ſome *cadmia fornacum*.

Volatile acid of SULPHUR. The *volatile acid of ſulphur*, according to ſome, contains not only the oil of *ſulphur*, but, at the ſame time, the pure native *gas*, or highly volatile ſpirit of the *ſulphur*. Mr. Seehl has given us an eaſy method of procuring this *volatile acid of ſulphur*, which he thinks of ſuperior virtue, both as a menſtruum and as a medicine, to the oil of *ſulphur* by the bell. For this purpoſe he gives us two proceſſes; one with an alkaline ſalt *per ſe*, mentioned above; and the other, which he prefers, by means of the ſame ſalt, with the addition of quick lime. See Phil. Tranſ. N° 472. The ſpirit, obtained thus by quick lime, is ſtronger, more acid, and more volatile, although ſpecifically heavier than the former.

The caput mortuum, remaining after diſtillation, makes an excellent tartar of vitriol, by ſolution, filtration, and cryſtallization. Ibid.

SULPHUR-*water*. See AQUA *ſulphurata*.

SUMA, a name given by ſome of the chemical writers to tartar.

SUMAGE, SUMAGIUM, or SUMMAGIUM, in our old writers, toll for carriage on horseback. *Pro uno equo portante summagium per dimidium ann. obolum. Chart. de Foreſt.* cap. 14. *Crompt.* Juriſ. 191. Terms of Law. *Blount, Cowel.*

SUMEN, a word uſed by ſome anatomical writers to expreſs the hypogaſtrium.

SUMMER (*Cycl.*)—It is ſaid, that a froſty winter produces a dry *ſummer*; and a mild winter a wet *ſummer*. It often happens ſo, in fact; but why it ſhould be ſo, is perhaps a queſtion difficult to determine. The curious may, on this ſubject, conſult the Philoſophical Tranſactions, N° 458. ſect. 10.

SUMMER *teale*, in zoology, the name of a bird, the ſmalleſt of all the duck kind, called by Geſner the *anas circias*. See the article CIRCIAS.

SUMP, in metallurgy, a round pit of ſtone lined with clay within, for the receiving the metal on its firſt fuſion from the ore. *Ray*'s Words, p. 114.

SUMP, in the Engliſh ſalt works, where ſea water is boiled into ſalt, is uſed as the name of a ſort of pond, which they make at ſome ſmall diſtance from the ſaltern on the ſea ſhore, between full ſea and low water mark. From this pond they lay a pipe, through which, when the ſea is in, the water runs into a well adjoining to the ſaltern; and from this well they pump it into troughs, through which it is carried to their ciſterns, in order to be ready to ſupply the pans. See the article SALT.

SUN (*Cycl.*)—SUN-*fiſh*, *mola*, in ichthyology. See Tab. of Fiſhes, N° 27. and the article MOLA.

One of theſe fiſhes, of five hundred weight, was taken ſome years ago near Plymouth, and on boiling a piece of the fleſh, to try how it would taſte, (as ſome authors have deſcribed it as a fine fiſh for the table) it was found, inſtead of a firm maſs, to be all converted, in a few minutes, into a perfect jelly, ſo that it could not be taken out otherwiſe than with a ſpoon. In colour and conſiſtence this jelly reſembled boiled ſtarch when cold, and had little or nothing of a fiſhy flavour, but a very agreeable taſte; it ſtuck firmly to the lips, however, and to the fingers, appearing very remarkably glutinous: and as the antients had no other glue than one made of fiſh, this jelly was tried, as to its ſticking quality, on leather, and on paper, and was found to anſwer as well as common paſte; but by ſome accident it was not tried upon wood.

It will be extremely worth while, on ſome other opportunity, to try whether a true ichthyocolla may not be prepared, by boiling down this jelly. Philoſ. Tranſ. N° 456. p. 220.

SUN-*flower*, *corona ſolis*, in botany, the name of a genus of plants, the characters of which are theſe. The flower is of the radiated kind; its diſk is made up of floſcules, and its outer edge of ſemifloſcules; theſe ſtand upon the embryo ſeeds, and are ſeparated from one another by little leaves of an imbricated figure, and contained in a ſcaly huſk, or cup: the embryos finally ripen into ſeeds, furniſhed with two little leaves.

The ſpecies of *ſun-flower*, enumerated by Mr. Tournefort, are theſe. 1. The common great *ſun-flower*. 2. The great branched *ſun-flower*. 3. The great *ſun-flower* with greyiſh white ſtriated ſeeds. 4. The perennial *ſun-flower* with large flowers and large ſeeds. 5. The leſſer, or female *ſun-flower*. 6. The ſmall-flowered *ſun-flower* with tuberous roots. 7. The ſmall-flowered *ſun-flower* with long roots. 8. The talleſt broad-leaved *ſun-flower*. 9. The tall *ſun-flower* with alated ſtalks. 10. The rapunculus-rooted *corona ſolis*. 11. The ſmall-flowered large-leaved *corona ſolis*. 12. The throat-wort-leaved *ſun-flower* with creeping roots. 13. The golden-rod-leaved very tall *ſun-flower*. 14. The creeping narrow-leaved *ſun-flower* with pale yellow flowers. 15. The willow-leaved *ſun-flower* with alated ſtalks. 16. The ſhrubby American *ſun-flower* with lychnis leaves, and yellow flowers. 17. The ſhrubby American *ſun-flower* with ſpurge-laurel leaves, and yellow flowers. 18. The dwarf ſea American *ſun-flower* with fleſhy three-pointed leaves, and yellow flowers. 19. The ſmall *ſun-flower* with deeply jagged leaves. 20. The *ſun-flower* with large jagged leaves. 21. The narrow-leaved *ſun-flower* with jagged leaves. 22. The New England *ſun-flower* with very large trifid leaves. *Tourn.* Inſt. p. 489.

There are ſeveral different ſpecies of this flower, all which are very beautiful in large gardens. They are moſt of them annual plants, and are to be ſown every ſpring in a bed of good light earth. When the ſhoots are about three inches high, they muſt be tranſplanted into nurſery beds, and ſet at eight inches diſtance every way; they ſhould remain here till they are a foot high, and then be carefully taken up with a ball of earth at their roots, and planted in large borders, or intermixed in the boſquets of large growing plants; they muſt be frequently watered till they have taken root, and after that will require no farther care. In July the flowers appear, and ſtand a conſiderable time: the largeſt of theſe ſhould be left to ſtand for ſeed. The birds are very apt to devour this ſeed, but it ſhould be carefully guarded from them, and the head left on the plant till October, at which time it ſhould be cut off, and hung up to dry in an airy place, and in a month more the ſeeds will be perfectly hardened.

Several ſpecies of this plant alſo are perennial, and increaſe greatly by the root. Among theſe the common ſmaller-flowered one is a very valuable plant in gardens, as it requires no culture, will grow in all ſoils and ſituations, and is a very ornamental flower, continuing in bloom from June to October. *Miller*'s Gard. Dict.

Small SUN-*flower*. See HELIANTHEMUM.

SUN-*dew*. See ROS *ſolis*.

SUN-*ſcorched*, a term uſed by our gardeners in ſome parts of England to expreſs a diſtemperature of fruit trees, owing to the *ſun*'s affecting them too forcibly and too ſuddenly; the conſequence of which is the loſs and withering of the fruit. Such trees only are ſubject to this, as are planted in places ſheltered from the ſpring *ſun*, and only open to the ſummer's; and it may be always cured by proper waterings.

Mr. Merret gives us an account of three cherry-trees, of that kind we call *May-dukes*, which he cured in this manner. Theſe trees were planted in a very rich mould, which lay to a ſouth wall, ſhaded four months of the winter from the *ſun* by a high building, ſo that the *ſun* never came upon them till the latter end of March; when being high, and ſhining ſomewhat fiercely upon them, from that time the fruit had been always uſed to wither. In a very hot ſummer, when theſe trees ſeemed going into a worſe way than ordinary, the roots of one of them was bared, and a hole being made about it, a gallon of water was poured into it every morning and evening for about a fortnight before the cherries came to a redneſs.

The effect of this was, that the fruit was full and good, while the two trees that ſtood next it had their fruit withered and ſcorched up. One of theſe was taken into conſideration more late, and being watered from time to time, thoſe fruits which were moſt withered on it fell off, and the reſt grew ripe of themſelves, and proved very good ones. The third tree, which was left to itſelf, produced not one ripe good cherry. Phil. Tranſ. N° 23.

SUNCOPULLY, in natural hiſtory, a name given by the people of the Eaſt-Indies to a kind of ſparry ſubſtance of a whitiſh colour, which they calcine, and afterwards give in agues, and other intermittent caſes.

It is erroneouſly by ſome ſuppoſed to be a ſpecies of arſenic; for it has none of its qualities.

SUONATA, in muſic. See SONATA, *Cycl.*

SUONATINA, or SONATINA, in the Italian muſic, a little, ſhort, eaſy *ſonata*. See SONATA, *Cycl.*

SUPERBUS *muſculus*, a name given by ſome to the elevator oculi, or the muſcle whoſe office is to raiſe and lift up the eye; that motion giving a haughty look.

The *ſuperbus muſculus* is one of the muſcles called by Albinus the *quatuor recti oculi*. See ATOLLENS.

SUPERFICIAL (*Cycl.*)—SUPERFICIAL *fourneau*, in fortification, the ſame with *caiſſon*, which is a wooden cheſt, or box, with three, four, five, or ſix bombs in it. Sometimes it is filled only with powder, and uſed in ſieges, by being buried under ground, with a train to it, to blow up any lodgment that the enemy may make.

SUPERFICIALIS *ſphincter*, in anatomy, a name given by Riolanus, and ſome others, to the muſcle of the anus, called by Winſlow and Albinus *ſphincter internus ani*. This author, and ſome others, call it alſo *ſphincter cutaneus*.

SUPERFICIES (*Cycl.*)—*Internal* SUPERFICIES *of the earth*, a term uſed by Tull, and others, to expreſs that part of the earth which affords the pabulum, or what is called the *paſture of plants*.

Plants themſelves are the paſture of animals; but it is from this *internal ſuperficies of the earth* that vegetables firſt receive the nouriſhment which they afterwards give to animals. This inner *ſuperficies of the earth* is the *ſuperficies* of the pores, cavities, and interſtices of the divided parts of the earth; and theſe are of two kinds, natural and artificial. Tull is the firſt who has uſed this term, and he juſtifies himſelf from the imputation of having uſed an abſurd phraſe, as it might at firſt ſeem, the adjective expreſſing ſomething within, and the ſubſtantive ſomething without, by obſerving, that though the vegetable paſture is within the earth, yet it is alſo on the outſides of the divided parts of the earth.

Of the natural and artificial paſture of plants, or the natural and artificial cavities, pores, and interſtices of the earth, the natural alone will ſuffice to furniſh a country with vegetables for the maintenance of a few inhabitants: but if the artificial, that is, if agriculture, the ſole buſineſs of which is the making this artificial paſture for plants, were aboliſhed out of the world, it is much to be feared, that the people of all populous countries, eſpecially of thoſe toward the borders of the frigid zones, (for there the trees often fail of producing fruit) would be reduced to the utmoſt neceſſities for want of this proper kind of food.

The artificial paſture of plants is that inner *ſuperficies* of the earth, which is made by dividing the ſoil by art. This, on all parts of the globe where it is uſed, maintains many more people

people than the natural one; in the colder countries it maintains ten times as many as the natural one, and when the art of agriculture is more advanced to perfection, it will maintain twice as many as it does at present; and this improvement is eaſy, and to be done by ſimple means.

The natural paſture is not only leſs than the artificial, in an equal quantity of ground; but the little there is of it conſiſting alſo of the *ſuperficies* of pores and cavities not having a free communication with one another, they are leſs pervious to the fine roots of all vegetables, which require a greater force to break through their partitions; and by that means roots, eſpecially of weak plants, are excluded from many of thoſe cavities; ſo that the benefit of a great part of the paſture that really is there, is loſt to the huſbandman.

The artificial paſture, on the other hand, conſiſts in *ſuperficies* of cavities that are pervious to all roots, and give them free paſſage throughout the whole extent of the cultivated place; and conſequently, the fine horizontal roots of plants, which run much farther than is generally ſuppoſed, (thoſe of a turnep, for inſtance, running ſix feet diſtant from the main root every way; ſee ROOT) will find an eaſy paſſage in every part to the utmoſt extent to which nature allows them to run.

The *internal ſuperficies of the earth*, which is the paſture of plants, is not like the external ſurface, which is the paſture of animals, in that it cannot be inlarged without the addition of more ſurface taken from land adjoining to it, by inlarging its bounds or limits: but the *internal ſuperficies*, or artificial paſture of land, may be inlarged without addition, or more land, only by diviſion of the ſame earth: and this artificial paſture may be increaſed in proportion to the diviſion of the parts of the earth, whereof it is the *ſuperficies*.

A cube of earth of one foot has but ſix ſquare feet of *ſuperficies*; but divide this cube into cubical inches, and then its *ſuperficies* will be increaſed twelve times, that is, it will be ſeventy two *ſuperficial* feet. Divide theſe cubes again into ſuch others, as bear the ſame proportion to an inch that an inch does to a foot, and then the ſame quantity of earth, which had at firſt only ſix feet *ſuperficies*, will have a *ſuperficies* of eight hundred and ſixty four feet of natural paſture: and in the ſame manner is the ſoil diviſible, and conſequently this paſture increaſable *ad infinitum*.

Poor land does not afford an *internal ſuperficies* ſo well ſtocked with theſe fruitful particles as rich land does, but this we may compenſate by dividing it more, and then what it wants in quality may be made up in quantity.

The common method of dividing the ſoil is by dung, or by tillage, or by both; and none of the natural paſture is ever loſt, or injured by the uſe of the artificial means, but, on the contrary, it is mended by ſuch means, a free communication being made by them between pore and pore. *Tull's* Horſehoeing Huſbandry, p. 18.

SUPERFLUOUS *interval*, in muſic, is one that exceeds a true diatonic interval by a ſemitone minor. Thus the

SUPERFLUOUS *ſecond*, or *tone*, contains a ſemitone minor more than a tone, or greater ſecond; and will therefore be expreſſed by $\frac{125}{108}$, or by $\frac{75}{64}$. The firſt of theſe expreſſions is a tone minor, and a ſemitone minor; ſince $\frac{10}{9} \times \frac{25}{24} = \frac{125}{108}$: and the other is a tone major, and ſemitone minor; for $\frac{9}{8} \times \frac{25}{24} = \frac{75}{64}$. This laſt occurs in practice, and is one of the intervals of the chromaticum toniæum. See the article CHROMATIC.

In temperate ſcales theſe two *ſuperfluous* tones coincide. Thus from B b to C ſharp, or from F to G ſharp, are *ſuperfluous* tones.

SUPERFLUOUS *third* is greater than the third major by a ſemitone minor, and will therefore be expreſſed by $\frac{125}{96} = \frac{5}{4} \times \frac{25}{24}$. It is not in uſe. It ſeems a fourth on our harpſichords. Thus from B b to D ſharp is, properly ſpeaking, a *ſuperfluous third*; but D ſharp and E b being confounded, it paſſes for a fourth.

SUPERFLUOUS *fourth*. This interval is expreſſed by $\frac{25}{18} = \frac{4}{3} \times \frac{25}{24}$. It is by practitioners, and in temperate ſcales, confounded with the tritonus. See INTERVAL.

SUPERFLUOUS *fifth* is expreſſed by $\frac{25}{16} = \frac{3}{2} \times \frac{25}{24}$. This is equal to two thirds major, for $\frac{5}{4} \times \frac{5}{4} = \frac{25}{16}$. The *ſuperfluous fifth* occurs in practice, as from C to G ſharp.

SUPERFLUOUS *ſixth*. This interval is of two kinds; being the reſpective complements of the two diminiſhed thirds to the octave. One only, ſtrictly ſpeaking, anſwers to the general definition of a *ſuperfluous* interval, which is that interval which exceeds the ſixth major by a ſemitone minor, and is therefore expreſſed by $\frac{125}{72} = \frac{5}{3} \times \frac{25}{24}$. But the other interval, which is a comma more than the former, and is two ſemitones major leſs than the octave, is chiefly uſed in harmony, as between B b and *a* ſharp, where it has a fine effect. It is expreſſed by $\frac{225}{128} = \frac{2}{1} : \frac{16}{15} : \frac{16}{15} = \frac{2}{1} : \frac{256}{225}$. See the articles INTERVAL and DIMINISHED *third*.

SUPERFLUOUS *ſeventh* is expreſſed by $\frac{15}{8} \times \frac{25}{24} = \frac{125}{64}$. This is a dieſis leſs than the octave. See INTERVAL.

SUPERFLUOUS *octave* is a ſemitone minor more than the octave, as from C to *c* ſharp. It ſometimes occurs in the baſſes of inſtrumental pieces.

SUPERGEMINANS, a name given by ſome anatomical writers to the epididymis.

SUPERGENUALIS, a name given by ſome authors to the patella, or knee pan. See PATELLA.

SUPERIOR (*Cycl.*)—SUPERIOR *auriculæ muſculus*, in anatomy, a name given by Santorini, and by Winſlow, to one of the muſcles of the ear, called by Albinus and Cowper the *attollens auriculam*, and by many *auriculæ primus*.

SUPERIOR *courts of record*. See the article COURT.

SUPERNUMERARII, in the later times of the Roman empire, ſoldiers added to the legion after it was completed. They were the ſame with thoſe in former times, called *accenſi*. *Pitiſc.* in voc. See ACCENSI, *Cycl.* and *Suppl.*

SUPERNUMERARY (*Cycl.*)—SUPERNUMERARY *bones of the head*. Anatomiſts diſtinguiſh by this appellation ſeveral bony pieces found in ſome ſkulls, chiefly between the parietal and occipital bones. They form breaks in the lambdoidal ſuture, and are joined by true ſutures to the bones already mentioned.

Their figure, number, and ſize vary extremely; ſometimes they are triangular, or approaching to that form, but oftener they are of no determinate figure: in ſome ſubjects they incroach on the occipital bone, and in others on the parietal bones; and ſometimes they extend themſelves every way. They are commonly indented, and broader on the outſide of the ſkull than on the inſide, in which they have no viſible indentations; and ſometimes, when they are ſmall on the outſide, are hardly at all to be ſeen within. They have by ſome been termed keys, a name uſed by joiners for the pieces which ſerve to ſtrengthen the joints of boards; but this can agree to them only in reſpect to their ſituation, not in reſpect to their uſes with regard to the other bones of the head. Some ſuch bones have alſo been found in the joints, between the bones of the head and face; and between thoſe of the bones of the face with each other. *Winſlow's* Anatomy, p. 53.

SUPERONERATIONE *paſturæ*, a judicial writ, that lies againſt him who is impleaded in the county court for the ſurcharging, or overburthening a common with his cattle, in a caſe where he was formerly impleaded for it in the ſame court, and the cauſe is removed into one of the courts at Weſtminſter. Reg. Judic. *Blount*, *Cowel*.

SUPERPARTICULAR (*Cycl.*)—SUPERPARTICULAR *ratio*. Ptolemy, in his Harmonics, ſeems to lay a great ſtreſs on *ſuperparticular ratios* [c], beyond the ſuperpartient in muſic. He does not call the intervals which may be expreſſed by the former ratios, excepting 2 : 3 and 3 : 4, diſſonants, as the Pythagoreans did, but concinnous, as if they were of a middle nature between conſonant and diſſonant. But all this doctrine of *ſuperparticular ratios* is a precarious hypotheſis. The two thirds, major and minor, expreſſed by 5 : 4 and 6 : 5, are *ſuperparticular*, and concords. Their octaves, 5 : 2 and 12 : 5, are *ſuperparticular*, and concords alſo. Ptolemy himſelf refutes the Pythagoreans for excluding the diapaſon diateſſaron, expreſſed by 8 : 3, from the number of concords, becauſe its proportions were ſuperpartient; yet his own doctrine is equally precarious [d].—[[c] See RATIO, *Cycl.* [d] Vid. *Euler*, Tentam. Nov. Theor. Muſic. p. 63, 64.]

SUPER-PRÆROGATIVA *regis*, a writ which formerly lay againſt the king's widow for marrying without the ſucceſſor's licence. F. N. B. 173. *Blount*, *Cowel*.

SUPER-STATUTO *de articulis cleri cap.* 6. a writ lying againſt the ſheriff, or other officer, that diſtrains in the king's highway, or in the lands antiently belonging to the church. F. N. B. 173. *Blount*, *Cowel*.

SUPER-STATUTO *facto pour ſeneſchal & marſhal de roy, &c.* a writ that lies againſt the ſteward or marſhal for holding plea in his court, or for treſpaſs or contracts not made, and ariſing within the king's houſhold. F. N. B. 141. *Blount*, *Cowel*.

SUPER-STATUTO *verſus ſervantes & laboratores*, a writ which lies againſt him who keeps any ſervants departed out of the ſervice of another contrary to law. F. N. B. 167. *Blount*, *Cowel*.

SUPINATOR (*Cycl.*)—SUPINATOR *brevis*, in anatomy. This is a ſmall thin fleſhy muſcle, ſurrounding a great portion of the upper part of the radius.

It is fixed by one end to the lower part of the external condyle of the os humeri, to the external lateral ligament of the joint, to the annular ligament of the radius, and to part of the lateral eminence in the head of the ulna; from thence it paſſes obliquely over the head of the radius, covering ſome part of it, and running down upon, and in ſome meaſure ſurrounding the neck, it turns in under the occipital tuberoſity, and is inſerted by the ſide of the interoſſeous ligament, in the inſide of the ſuperior quarter of the bone, and even a little lower. In ſome ſubjects we may obſerve the marks of the paſſage of this muſcle over the outſide of the bone. It makes an angle with the pronator teres, reſembling the Roman V. *Winſlow's* Anatomy, p. 190.

SUPINATOR

SUPINATOR *longus*, a long flat muscle, lying on the external condyle of the os humeri, and on the convex side of the radius, from one end to the other.

It is fixed by fleshy fibres to the external intermuscular ligament, and to the crista of the external condyle of the os humeri, for five or six fingers breadth above the condyle, between the brachiæus, and anconæus externus; from thence it runs along the whole convex side of the radius, and is inserted by a flat narrow tendon, a little above the styloide apophysis, in the angle between the concave and flat sides of the extremity of this bone. *Winslow*'s Anatomy, p. 189.

SUPPLE. To *supple* a horse, in the manege, is to make him bend his neck, shoulders, and sides, and to render all the parts of his body more pliable.

SUPPOPLITÆUS, in anatomy, a name given by Spigelius, and some others, to the muscle more generally known by the name of the *poplitæus*. See POPLITÆUS.

SUPPRESSION (*Cycl.*)—SUPPRESSION *of urine*. There are commemorated, in the Philosophical Transactions, three cases of an actual and total *suppression of urine*, supposed to proceed from a stone lodged in the neck of the bladder; but in all which, on introducing the catheter, it was found that there was no stone there, nor any urine in the bladder. In all these cases the same remedy was used; that is, a great quantity of acids diluted largely with water, and in consequence of this the urinary secretion was immediately restored, and the patient soon voided it in a proper manner, and was restored to health without any further use of medicines. Philos. Trans. N° 253.

A *suppression of urine* sometimes happens to women with child, by the womb falling down, and pressing on the urethra. See Act. Acad. Nat. Curios. Not. 4. Obs. 113.

SUPPRESSIONIS *ignis*, a *fire of suppression*, a term used in chemistry to express such an application of fire to any subject, that it shall at once act upon it above and below in the same manner. The usual way of giving this heat, is by covering the vessel, in which the ingredients are put, with sand, and then laying hot coals upon that, so that they may heat through the sand downwards.

SUPPURATION (*Cycl.*)—When in tumors and phlegmons nature shews a tendency to *suppuration*, or ripening, all the resolving, or dispersing medicines must be laid aside, and great care must be taken to forward the maturity of the inflammation, that is, to convert the stagnating blood into laudable matter; then to give a discharge, or vent, to this *suppurated* matter, afterwards to cleanse the part, and finally to incarn, and heal it.

The first of these intentions, the ripening the swelling, is to be promoted by such of the emollient medicines as obstruct the pores of the skin, as fats, oils, and glutinous medicines; as also the sharp, pungent, and, in some degree, caustic medicines, which may be used in form of cataplasms, or plasters. Of the first kind are mallows, marshmallows, figs, linseed, honey, crumb of bread, the various animal fats, and the oils of lillies, chamæmile, &c. and of the latter, or the sharp and pungent ripeners, are garlic, onions, saffron, turpentine, and many of the gums, as galbanum and ammoniacum; and lastly, sour leven of bread.

Medicines compounded of these are to be applied hot to the part, and the application frequently repeated, till the matter within is found to be sufficiently ripened, by the softness and whiteness of the tumor. But when the abscess is small, it is more convenient, and sufficient, to apply some of the ripening plasters, as diachylon, with the gums, or the like, till the *suppuration* is perfected.

Nor are internal remedies wholly to be neglected in cases of this kind, especially where the tumors are large, or of consequence. In these cases, when the blood moves too slowly, which may be known by the pulse, the patient must be allowed to eat meat, and must take such medicines as are warm and stimulating; by means of which, and by the increased motion of the blood, the inspissated particles contained in the smaller vessels will be the more easily converted into matter.

Strong broths are very proper for this purpose, as also the use of wine, or ale, in moderation; and Venice treacle, diascordium, and the confection of alkermes, are to be the medicines taken three or four times a day, and medicated teas, made of sanders-wood, sassafras, or cinnamon. But, on the contrary, when the motion of the blood is too violent, and the heat too great, cooling medicines are to be given, such as the thin and watery drinks, the subacid medicines, and nitre: bleeding, in a small quantity, is also often necessary in this case. But when the constitution is sound, and the blood's motion regular, the use of internal medicines, to promote *suppuration*, is trifling, and may be altogether rejected. When by these means the matter is perfectly formed, the abscess is to be carefully opened by the surgeon, and the matter discharged, after which the wound is to be cleansed and healed in the common way. *Heister*'s Surgery, p. 183.

SUPRACOSTALES, muscles irregularly triangular, and situated on the back part of the ribs, near the vertebræ, commonly called *levatores costarum*.

Each of these is fixed by one tendinous extremity in the transverse apophysis, which lies above the articulation of each rib, and to the neighbouring ligament; the first being inserted in the transverse apophysis of the last vertebra of the neck, and the last in that of the eleventh vertebra of the back. From thence the fleshy fibres run down obliquely, increasing in breadth as they descend, and are inserted in the back part of the outside of the following rib; some of the fibres often pass beyond that rib, and are fixed in one or more of the ribs below it by several digitations, which lie at a greater distance from the vertebræ, in proportion as they run lower. In the inferior ribs these digitations are more considerable than in the superior. *Winslow*'s Anatomy, p. 232.

SUPRACOSTALES *longi*, in anatomy, a name given by Verheyen to those muscles of the loins, which Albinus has described under the names of the *levatores longi costarum*. See the article LEVATORES.

SUPRASPINATUS, in anatomy, is a thick narrow muscle, in some measure penniform, filling all the *supra-spinal* cavity of the scapula.

It is fixed to all the posterior half of the *supra-spinal* fossa, and sometimes its insertion reaches near the neck of the bone. Then the fibres leave the surface of the bone, and being, as it were, supported by the fat, or cellulous substance, pass between the acromium, and neck of the scapula, under the arch formed by the acromium and extremity of the clavicle, and under the ligament between the acromium and apophysis coracoides; being afterwards inserted in the superior surface of the great tuberosity of the head of the os humeri, very near the bony channel. This muscle is covered by the trapezius. *Winslow*'s Anatomy, p. 184.

SUPREME *pear*, a name given by the gardners to a small pear, called also by some the *little musk pear*. It is of a roundish shape, and is usually produced in clusters. The stalk is short, and when it is ripe, the skin is yellow. The juice is somewhat musky. If it be not suffered to hang till too ripe, it is an excellent pear. It ripens in the beginning of July, and continues good but a few days. The French call it *le petit muscat*. *Miller*'s Gard. Dict.

SURA, (*Cycl.*) the name of a drink used in the East-Indies, and made of the juice that flows from the cocoa-tree. *Boyle*'s Works Abr. p. 51.

This juice being evaporated, and exposed to the sun, forms a sugar, but it is little esteemed. *Boyle*, ibid. p. 53.

SUR CUI *in vita*, in law, a writ that lies for the heir of a woman, whose husband aliened her land in fee, and she neglected to bring the writ *cui in vita* for recovery thereof, her heir may bring this writ against the tenant after her decease. F. N. B. 193. Terms of Law. *Blount*, *Cowel*.

SURCULUS, in the anatomy of plants, a word used to express that part of the branching of the ribs of a leaf which is of a middle kind, between the great middle rib and the smallest reticular ramifications. The middle rib is, by the writers on these subjects, called *petiolum*.

The first divisions, that go off laterally from these, are called *rami*, or branches; the next division of these, into more minute ones, are called *surculi*; and the final divarications of these into the reticular work, that spreads itself over the whole leaf, are called *capillamenta*.

Many, however, confound these two last divisions, and call all beyond the second division, or lateral branches of the middle rib, by this name of *surculi*. Act. Erudit. 1722. See PETIOLUM and RAMUS.

SURD (*Cycl.*)—Simple *surds* are commensurable in power, and by being multiplied into themselves give, at length, rational quantities. But compound *surds*, multiplied into themselves, commonly give irrational products. Yet in this case, when any compound *surd* is proposed, there is another compound *surd*, which multiplied into it, gives a rational product. Thus if $\sqrt[3]{a}-\sqrt[3]{b}$ were proposed, multiplying it by $\sqrt[3]{a^2}+\sqrt[3]{ab}+\sqrt[3]{b^2}$, the product will be $a-b$.

The investigation of that *surd*, which multiplied into the proposed *surd*, gives a rational product, is made easy by three theorems, delivered by Mr. Maclaurin, in his Algebra, p. 109, seq. to which we refer the curious.

This operation is of use in reducing *surd* expressions to more simple forms. Thus suppose a binomial *surd* divided by another, as $\sqrt{20}+\sqrt{12}$ by $\sqrt{5}-\sqrt{3}$, the quotient might be expressed by $\frac{\sqrt{20}+\sqrt{12}}{\sqrt{5}-\sqrt{3}}$. But this might be expressed in a more simple form, by multiplying both numerator and denominator by that *surd*, which multiplied into the denominator, gives a rational product: thus,

$$\frac{\sqrt{20}+\sqrt{12}}{\sqrt{5}-\sqrt{3}}=\frac{\sqrt{20}+\sqrt{12}}{\sqrt{5}-\sqrt{3}}\times\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}}=\frac{\sqrt{100}+2\sqrt{60}+6}{5-3}=\frac{16+2\sqrt{60}}{2}=8+2\sqrt{15}.$$

To do this generally, see Mac Laurin, lib. cit. p. 113.

When the ſquare root of a *ſurd* is required, it may be found, nearly, by extracting the root of a rational quantity that approximates to its value. Thus, to find the ſquare root of $\surd\overline{3+2\surd 2}$, firſt calculate $\surd 2 = 1,41421$. Hence, $3+2\surd 2 = 5,82842$, the root of which is found to be nearly 2,41421.

In like manner we may proceed with any other propoſed root. And if the index of the root, propoſed to be extracted, be great, a table of logarithms may be uſed.

Thus $\sqrt[7]{5+\sqrt[13]{17}}$ may be moſt conveniently found by logarithms.

Take the logarithm of 17, divide it by 13; find the number correſponding to the quotient; add this number to 5; find the logarithm of the ſum, and divide it by 7, and the number correſponding to this quotient will be nearly equal to $\sqrt[7]{5+\sqrt[13]{17}}$.

But it is ſometimes requiſite to expreſs the roots of *ſurds* exactly by other *ſurds*. Thus, in the firſt example, the ſquare root of $3+2\surd 2$ is $1+\surd 2$: for $\overline{1+\surd 2} \times \overline{1+\surd 2} = 1+2\surd 2+2 = 3+2\surd 2$.

For the method of performing this, the curious may conſult Mr. Mac Laurin's Algebra, p. 115, ſeq. where alſo rules for trinomials, &c. may be found.

For extracting the higher roots of a binomial, whoſe two members being ſquared are commenſurable numbers, we have a rule in Sir Iſaac Newton's *Arithmetica Univerſalis*, p. 59, but without demonſtration. This is ſupplied by Mr. Mac Laurin, in his Algebra, p. 120, ſeq. as alſo by 'sGraveſande, in his *Matheſeos Univerſalis Element.* p. 211, ſeq.

It ſometimes happens, in the reſolution of cubic equations, that binomials of this form $a \pm b\surd -9$ occur, the cube roots of which muſt be found. To theſe Sir Iſaac's rule cannot always be applied, becauſe of the imaginary, or impoſſible factor $\surd -9$; yet, if the root be expreſſible in rational numbers, the rule will often lead to it in a ſhort way, not merely tentative, the trials being confined to known limits. See *Mac Laur.* loc. cit. p. 127, ſeq.

It may be farther obſerved, that ſuch roots, whether expreſſible in rational numbers, or not, may be found by evolving the binomial $a+b\surd -9$ by the Newtonian theorem, and ſumming up the alternate terms. *Mac Laur.* loc. cit. p. 130.

Thoſe who are deſirous of a general and elegant ſolution of the problem, *to extract any root of an impoſſible binomial* $a+\surd -b$, *or of a poſſible binomial* $a+\surd b$, may have recourſe to Mr. De Moivre's Letter to Dr. Saunderſon, inſerted by way of Appendix to his Algebra, p. 744, ſeq. and to the Philoſophical Tranſactions, N° 451. or to Dr. Martyn's Abridgment, Vol. 8. p. 1, ſeq.

SURFACE (*Cycl.*)—A *ſurface* is not a body of the leaſt ſenſible magnitude, as ſome have imagined, but it is the termination, or boundary of a body; neither is a line to be conſidered as a *ſurface* of the leaſt ſenſible breadth, but as a termination, or limit of a *ſurface*: nor is a point to be conſidered as the leaſt ſenſible line, but as the termination of a line; and in this ſenſe it is plain that a point cannot be conceived to have parts, or magnitude. See MAGNITUDE. See alſo *Mac Laurin*'s Fluxions, Vol. 1. p. 245. and Mr. *John Bernoulli*'s Letter to Monſieur Crouzas, concerning his Comment on the Analyſe des Infiniment petits. *Jo. Bernoul.* Oper. Vol. 4. p. 160, ſeq.

SURF *of the ſea*, the great breakings, or rolling of the ſea againſt ſome ſhores; making it dangerous to land in ſuch places.

SURMULLET, in zoology, a name uſed, both by the French and Engliſh, for the *mullus major*, a fiſh of the cuculus kind, in many things reſembling the mullus barbatus, but differing from it in that it is twice as big, being often caught of twelve or fourteen inches in length. Its fins alſo are yellowiſh, and have a ſlight bluſh of red mixed with that colour. Its ſcales are large and broad, and thick, and are more firmly joined to the fleſh. It has alſo three or four ſtrait yellow lines, running parallel with one another down its ſides. It is caught in the Mediterranean, and in the Britiſh ſeas, eſpecially on the coaſt of Cornwall, and is every where eſteemed a very delicate fiſh. *Ray*'s Ichthyography, p. 285.

SURO, in zoology, a name given by ſome to a fiſh of the cuculus kind, much reſembling the mackrel in taſte and in ſhape, and more uſually known by the name of the *trachurus*. *Willughby*'s Hiſt. Piſc. p. 290. See TRACHURUS.

SURRECTORIUM, the name of a chirurgical inſtrument, mentioned by Ambroſe Parè, and intended to keep the arm in an erect ſituation when required.

SURVEYING (*Cycl.*)—A *ſurveyor* ought to be provided with an off-ſet ſtaff, equal in length to ten links of the chain [b], and divided into ten equal parts. He ought likewiſe to have ten arrows, or ſmall ſtrait ſticks, near two feet long, ſhod with iron ferrils. When the chain is firſt opened, it ought to be examined by the off-ſet ſtaff. In meaſuring any line, the leader of the chain is to have ten arrows at firſt ſetting out. When the chain is ſtretched in the line, and the near end touches the place from which you meaſure, the leader ſticks one of the ten arrows in the ground at the far end of the chain. Then the leader leaving the arrow, proceeds with the chain another length; and the chain being ſtretched in the line, ſo that the near end touches the firſt arrow, the leader ſticks down another arrow at his end of the chain. The line is preſerved ſtrait, if the arrows be always ſet ſo, as to be in a right line with the place you meaſure from, and that to which you are going. In this manner they proceed till the leader have no more arrows. At the eleventh chain the arrows are to be carried to him again, and he is to ſtick one of them in the ground, at the end of the chain: and the ſame is to be done at the 21, 31, 41, &c. chains, if there are ſo many in the right line to be meaſured. In this manner an error can hardly be committed in numbring the chains, unleſs of ten chains at once [c].—[[b] See CHAIN. [c] Treat. Pract. Geom. p. 72, 73.]—See farther under FIELD-*book*, OFF-SETT, STAFF, and THEODOLITE.

If the lands to be plotted are hilly, and not in any one plane, the lines meaſured cannot be truly laid down on paper, without being reduced to one plane, which muſt be the horizontal, becauſe angles are taken in that plane.

In viewing objects, if they have much altitude or depreſſion, either write down the degree and decimal, ſhewn on the double ſextant, or the links ſhewn on the back ſide, which laſt ſubtracted from every chain in the ſtation line, leaves the length in the horizontal plane; but if the degree is taken, the following table will ſhew the quantity.

A TABLE *of the links to be ſubtracted out of every chain in hypothenuſal lines of ſeveral degrees altitude, or depreſſion, for reducing them to horizontal.*

degrees.	links.	degrees.	links.	degrees.	links.
4.05	$\frac{1}{4}$	14.07	3	23.074	8
5.73	$\frac{1}{2}$	16.26	4	24.495	9
7.02	$\frac{3}{4}$	18.195	5	25.84	10
8.11	1	19.95	6	27.13	11
11.48	2	21.565	7	28.36	12

Let the firſt ſtation line really meaſure 1107 links, and the angle of altitude, or depreſſion, be 19° 93′; looking in the table, I find 19° 95′ is 6 links; now 6 times 11 is 66, which ſubtracted from 1107 leaves 1041, the true length to be laid down.

It is uſeful in *ſurveying* to take the angles which the bounding lines form with the magnetic needle, in order to check the angles of the figure, and to plot them conveniently afterwards.

Large maps, repreſenting conſiderable extents of ground, are ſubject to a good many inconveniencies, eſpecially if carried into the fields, to be compared with them; ſuch maps become very troubleſome in the wind, and it is difficult to find out the part you want. To remedy this, a general and ſmall map of the manor, or county, &c. ſhould be firſt made on one ſheet of paper, the ſeveral parts may be ſet off on other ſeparate ſheets, and the general map being divided into as many ſquares as there are of theſe particular ſheets, the relation of the whole to the ſeveral parts is eaſily ſeen; and all theſe maps may then be bound up in a book. See Mr. *Baighton*'s Deſcription and Uſe of his New Plotting Table, in Phil. Tranſ. N° 461. ſect. 1.

SURVEYING-*ſcale*, the ſame with *reducing-ſcale*.

SURVEYOR (*Cycl.*)—*Surveyor* of the king's Exchange, an antient officer, mentioned in the Statute 9 Hen. V. Stat. 2. cap. 4. But what his office was is uncertain. *Cowel.*

SUS, the *hog*, in the Linnæan ſyſtem of zoology, a diſtinct genus of animals, the characters of which are; that they have uſually ten paps, ſituated along their belly; their dentes inciſores are four each way; and in the males, the canine, or dog-teeth, are extremely long. Of this genus are the *hog* kind, the Mexican muſk-boar, and the babyrouſſa. *Linnæi* Syſtem. Nat. p. 41.

SUS *piſcis*, in ichthyology, a name given by Ovid, and ſome other of the antient writers, to the fiſh called alſo *us* and *mus*, and by the later writers *capriſcus*. See the article CAPRISCUS.

SUS *agreſtis*, the *wild boar*. This creature differs from the common domeſtic *hog*, in that the grown animal is not different in colour in the different individuals of the ſame ſpecies, but is always of a ruſty iron grey. His ſnout is much longer alſo than that of the other; his ears ſhorter and rounder; and both theſe, and his tail and feet, are always black. It differs alſo, in that it is covered with two ſorts of hairs, the one kind long, the other ſhort: theſe laſt ſerve the creature to the ſame purpoſes, as the downy fur which the bever and otter have under their long hair. It is very common wild in Italy, and its fleſh frequently brought to market. *Ray*'s Syn. Quad. p. 96.

SUSCEPTOR, among the Romans, a citizen choſen by the decuriones to collect the debts belonging to the public. *Pitiſc.* in voc.

SUSCEPTOR is alſo a term uſed by eccleſiaſtical writers for *ſponſor*. See SPONSOR, *Cycl.*

SUSCEPTOR *aurarius*, in middle age writers. See the article AURARIA.

SUSPENSORIUS, in anatomy, a muſcle of the eye. It is ſo called, from its uſe in ſuch animals as go much with their head hanging down. Veſalius has deſcribed it as belonging to man, in whom it is never found. Fiſhes and fowls are commonly without it, as well as man; but oxen, and, ſo far as has been obſerved, all quadrupeds, are provided therewith; though it is not of the ſame ſtructure in all. Dr. *Porterfield*, in Med. Eſſ. Edinb. Vol. 3. Art. 12.

The doctor thinks, that the uſe of this muſcle is not only to ſuſpend the eye, and preſerve the optic nerve from being too much ſtretched, but principally to aſſiſt the ſtreight muſcles in moving the eye, according as its different fibres act.

SUSSEX *marble*, a name given by many to a peculiar ſpecies of marble found in the county, the name of which it bears, and formerly much uſed in the pillars of churches, and other buildings, but now leſs regarded. The ground of this *marble* is grey, with a faint caſt of green, and it is very thick ſet in all parts with ſhells; theſe are chiefly of the turbinated kind, and they are generally filled with a white ſpar, which adds very greatly to the beauty of the ſtone.

It is plain, from conſidering the whole maſs of this *marble*, that this ſpar was received into the ſhells before they were depoſited in the *marble*. This is about the hardneſs of the common white Genoeſe marble, if any thing, ſomewhat more hard. The ſlender round ſcapi of the pillars in Weſtminſter-Abbey, and in many other of our old Gothic buildings, are made of this kind of *marble*. Some people have thought that the ſcapi of pillars of this kind, which occur in moſt of our Gothic buildings, are artificial, and that they are a kind of fuſile marble caſt in cylindric moulds. But any one who will compare the marble, of which thoſe pillars are made, with its ſhells, and the ſpar they are filled with, with the marble of the *Suſſex* quarries, will find both to be the ſame in every particular. *Woodward*'s Cat. of Foſſ. p. 20.

SUTORIUS, in anatomy, a name given by Riolanus to a muſcle of the leg, called by Cowper, Albinus, and others, the *ſartorius*. The French authors call it the *couturier*; Veſalius, and others of the more early anatomical writers, have called it the *primus tibiam moventium*.

SUTURE (*Cycl.*)—All wounds are not to be united by the needle, but thoſe only that are oblique, tranſverſe, or angular, and at the ſame time very large and deep; or in caſes where a part is very nearly cut off; or if a wound is ſo circumſtanced, that it cannot be kept in a proper ſituation by plaſters and bandages. Wounds that are to be ſtitched, ſhould be in their recent ſtate, and muſt be firſt well cleanſed from extravaſated blood, and all extraneous bodies; there ſhould alſo be no loſs of ſubſtance, except in thoſe fleſhy parts that are eaſily elongated; and no contuſion, nor any ſign of inflammation.

Dry SUTURE. This is to be uſed in ſlight wounds, and eſpecially when they happen in the face; and indeed, wherever it may appear of force enough to keep the lips of the wound together; and as it gives no freſh pain, and occaſions no ſcar, it is much fitter for wounds of the face than the needle. The plaſters, which are to form the *dry ſuture*, ſhould be of a ſufficient length, and ſhaped like the part to which they are to be applied, ſo as to ſurround the greateſt part of it, but not the whole, leſt they ſhould retard the circulation of the blood, and bring on tumors, and miſchiefs of that kind: they muſt alſo be ſuch as will ſtick very faſt, the diachylon, if good, or the common ſticking plaſter, are fitteſt for this purpoſe. The hæmorrhage being well ſtopt, and the wound well cleanſed, ſome vulnerary balſam of the gummy kind, as the balſam of Peru, or the like, is to be applied; and over all a ſticking plaſter is to be laid, adapted to the ſize of the part. Two or more of theſe may be applied, as occaſion ſhall require, leaving a ſpace between, and they are to be ſecured in their place by the application of proper bolſters and bandages.

Petit's method of making the *ſuture* of this kind, is by letting the plaſters have one, two, or more openings in the middle, through which the ſurgeon may diſcover, as by the ſpaces left between in the former method, whether the lips of the wound are properly united or not; and may alſo be able to apply proper remedies to the part, without removing the plaſters. Theſe plaſters are applied in the ſame manner as the former, and left on till the work is compleated.

But there is alſo yet another manner of performing the *dry ſuture*, to wit; ſpread two plaſters upon ſtrong cloth, anſwering in ſize to the wound; to the ſides or margins of theſe faſten three or four tape ſtrings, according to the length of the wound, and then, after warming the plaſters, apply them on each ſide of the wound, at about a finger's breadth from it; after this bring the lips of the wound together, dreſs it as in the former method, and while an aſſiſtant keeps the lips of the wound together in a proper ſituation, tie the ends of the tapes, firſt in a ſingle, and afterwards in a ſlip knot, to keep the part in contact; over each of theſe ſhould be laid an oblong compreſs, and over all a large ſquare one, and the whole kept on by a proper bandage. The day following the wound is to be again examined, and if the tapes are looſened, they muſt be drawn tighter again; but if they are not looſened, let them remain untouched, and only moiſten the parts with a few drops of balſam, and cover them up again with the compreſſes and bandages, as before. Some, inſtead of the tape, uſe claſps of braſs, or ſteel; but this method is much leſs convenient than the former, and therefore is little uſed. *Heiſter*'s Surgery, p. 37.

Bloody SUTURE. In large wounds, eſpecially tranſverſe ones, as their lips cannot be kept in their ſituation by means of the dry *ſuture*, which is frequently the caſe in wounds of the thigh, or in the abdomen, nates, or arms; or when pieces hang from the wounded part, as often happens in wounds of the forehead, cheeks, noſe, or ears; or when wounds are large, and made in an angular, or cruciform manner, the needle muſt be uſed to bring their lips together; and this is called the *bloody*, or the *true ſuture*. This operation is alſo diſtinguiſhed into two kinds, the ſimple, and compound.

The ſimple *ſuture* is that which is performed only by the aſſiſtance of the needle and thread: to this claſs belong the interrupted *ſuture*, the glover's *ſuture*, and the twiſted *ſuture*; the laſt of theſe is ſeldom uſed but in caſes of the hare-lip, and the ſecond only in wounds of the inteſtines; but the firſt is in common uſe for all wounds which require the true, or *bloody ſuture*.

The beſt method of making the common, or interrupted *ſuture*, is this. Take a double thread, well waxed, paſs it through a ſtrong crooked needle; when the lips of the wound are brought together, and held firmly in their proper ſituation by an aſſiſtant, with one ſtroke pierce through them both, paſſing the needle through the lower lip from without inwards almoſt to the bottom, and ſo on from within outwards, obſerving to make the punctures at a finger's breadth diſtance from the wound, which in this caſe we will ſuppoſe to be in length two fingers, varying this diſtance according to the ſize of the wound. After taking off the needle, tie the ends of the thread firſt in a ſingle knot, and then in a ſlip knot, covering all with the ſame dreſſings, as are uſed in the dry *ſuture*. But if the wound be ſo large, that one ſtitch will not be ſufficient, then two or more are to be made, according to the length of it, at about a finger's breadth diſtance one from the other. To prevent the knots from bringing on any miſchief, lay a ſmall linnen compreſs over the ſingle knot, and make the ſlip knot over that; which, if any pain or inflammation ſhould ſucceed, may be afterwards eaſily looſened at pleaſure.

This is the method to be obſerved in ſtrait, oblique, or tranſverſe wounds; but where there are angles, as in a triangular wound, you are to proceed in the ſame manner, but obſerve to let the *ſuture* begin at the angle, and the other ſtitches be taken about the middle, both ways; but if the wound be quadrangular, or have two angles, like the Greek letter Π, which ſometimes happens in the face, then the *ſutures* muſt be made in both the angles; and when the wound is ſo large, that theſe are not ſufficient, then as many more, as are neceſſary, muſt be made in the midway between them. When you meet with a cruciform wound, and the lips of it cannot be kept together by the uſe of plaſters, the *bloody ſuture* muſt be made, by paſſing the needle through the lips, near the end of each extremity of the wound; and when the ſtitches are all thus made, the threads muſt be tied as in the other caſes. *Heiſter*'s Surgery, p. 38.

Compound SUTURE. Some of the ſurgeons among the antients uſed a *compound ſuture* for large wounds, inſtead of the interrupted *ſuture*, now generally practiſed: they preferred this method, becauſe it prevented the lips of the wound from being lacerated, which ſometimes happened when the other method was uſed, and not only prevented the wound from uniting, but frequently brought on other grievous diſorders; and though this method has of late years been rejected, and particularly by Dionis, in his Surgery, yet many ſtill prefer it, in ſeveral caſes, to the common interrupted *ſuture*: but inſtead of the pieces of wood uſed by the antients, thoſe, who now practiſe it, uſe pieces of plaſter rolled up in a cylindrical form, of the length of the wound, and of about the ſize of a gooſe-quill, from whence it is called by ſome the *quilled ſuture*. This method prevents tumors, pain, and inflammations, which might be brought on by the hardneſs and preſſure of wood.

Palfynus performs this operation, in deep wounds of the muſcular parts, with a large and ſtrong crooked needle, furniſhed with a double thread well waxed, which has alſo a bow at one end. The needle thus fitted being paſſed thro' both lips of the wound, in the ſame manner as in the other operations of the true *ſuture*, and afterwards a ſecond, and a third, paſſed in the ſame manner, a roll of plaſter is to be introduced into the bow ends of the thread, which are left hanging out; then when the needle is taken out at the other ſide, another roll of plaſter is to be placed between the ends of the thread; and the lips of the wound being brough

brought together, these ends are to be gently tied over the roll, first in a single, and then in a slip knot. If there are three of these threads, you are to tie the middle one first, and afterwards the rest in the same manner. On the first days after the operation of the *suture* is performed, in whatever method that be done, the bandage and compress are to be gently removed, and the state of the wound examined: if every thing now looks well, and there is little or no pain, or inflammation, the *sutures* are to be left alone for six or seven days, or longer, and the wound dressed till there appears a strict union in the lips. If, in any of these examinations, the stitches of the *suture* are seen to be too loose, they must be tightened, if too tight, loosened. When the lips of the wound appear to be inlarged, or bruised, they must be dressed with a digestive ointment, the continuance of which usually soon takes off those symptoms; but if the wound be attended with great inflammation and a fever, the stitches must be loosened, and the patient blooded, and kept on a thin diet: if this method remove the symptoms, the stitches must be tighted again, and the wound dressed and managed as before; but if this method proves fruitless, and the symptoms continue and increase, the stitches must then be cut, and the wound treated as if there were a loss of substance.

If the wound heals by the assistance of the *suture*, the threads of it are to be cut with scissors, near the knots, and the lower lip of the wound to be suspended with one hand, while the threads are gently drawn out with the other. The punctures that are left from them will easily heal, by injecting the arquebusade water, or spirit of wine, or lime-water, and laying on compresses dipt in the same liquors. *Heister*'s Surgery, p. 39.

SUVERNA *guirecom*, in natural history, a name given by the people of the East-Indies to a kind of fossile, which they esteem greatly for certain imaginary virtues. It is a kind of fine and glossy foliaceous talc. Their manner of preparing it is this: they beat it to pieces in a mortar, and then boil, or rather fry it a long time in butter, and afterwards straining off the butter, they eat it to make them fat.

SWALLOW, in ornithology. See HIRUNDO.

SWALLOW-*fish*. See HIRUNDO *piscis*.

SWALLOW-*fly*, in natural history, the name of the chelidonius, a fly very remarkable for its swift and long flight. See CHELIDONIUS and the next article.

SWALLOW-*stone*, *chelidonius lapis*, in natural history, the name of a stone which Pliny, and many other authors affirm to be found in the stomachs of young *swallows*. It is always described to be small, roundish, convex on the outside, and concave on the other, and of a brownish, yellowish, or blackish colour: this, and the figures given of it, plainly shew that it is either a small species of the lycodontes, or bufonitæ, or else a detached piece of one of the compound ichthyperia, or, as they are vulgarly called, *siliquastra*. These are the bony palates of certain species of fish, and are composed of several parts, the middle ones longish, and resembling the pods of a lupine, and those toward the edges roundish and small, convex on the outside, and concave within, but more hollowed, and consequently thinner than the lycodontes, to which otherwise they are very like in shape. The whole palates, or the long parts, when loose, are called *siliquastra* by authors; but the round pieces have been usually confounded with the bufonitæ, and mistaken for them, whenever they have been found loose. These, as they are thinner and hollower than the lycodontes, agree better than any species of those bodies with the figures and descriptions of the *chelidonii* in the more accurate writers, who make them small, thin, and tender; but the generality confound these fragments of palates, as well under the name of *chelidonii*, as of the bufonitæ, never guessing at their true origin. They are rarely larger than the eighth of an inch in diameter. The common report is, that when two of these *stones* are found in the stomach of one *swallow*, the one is more yellow, the other more red; but that when there is only one, it possesses the virtues of both. De Boot tells us, that he cut up several young *swallows*, but never found any such stones in them; and indeed it is no wonder, since they are not to be looked for there, but in the jaws of the wolf-fish, or in the palates of some of the less known kinds.

SWALLOW-*wort*. See the articles ASCLEPIUS and VINCETOXICUM.

Difficulty of SWALLOWING, in infants. See the article INFANT.

SWAN, *cygnus*, in zoology. See the article CYGNUS.

By the law of England, to take *swans* eggs is penal, in the same manner as taking hawk's eggs, that is, by fine and imprisonment. See HAWK.

SWAN-*shell*. See the article CIGNE.

SWARDY, in agriculture, a term used by the farmers for a soil well covered with grass. *Plot*'s Oxfordsh. p. 247.

SWARM. The signal of the going out of a *swarm* from a hive is sometimes only a humming noise made by one single bee, but that a very particularly acute, and clear sound: this seems to be the voice of the new queen, or female bee, calling together the *swarm* that is to follow her out, and animating them with a sort of martial music for the great adventure they are going to engage in.

Some who have pretended to be extremely well versed in the language of bees, as Butler, and others, say, that this is a voice of intreaty, by which the young queen begs permission of the old queen, or parent of the hive, to take out a *swarm* with her to some other place: they say this noise of intreaty usually lasts about two days, and that at the end of that time, if the parent grants the request, she is heard to answer with a louder and clearer voice of the same kind. These noises are not to be heard, unless the ear be applied close to the place; and they say, that when this last found is made, the new *swarm* may be expected certainly to go out the next day, if the weather be proper.

But he seems to have taken great pains to distinguish these sounds; he gives all the modulations of the voice of the young female, and every note that she runs into; and observes, that all these are notes of supplication, and that the sounds issued by the parent, or reigning queen of the hive, have an air of majesty, and are greatly different; and adds, that if the young female attempts to make the sounds of the reigning bee, it is looked upon as a rebellion in the hive: and he pretends to be acquainted with the proceedings against her in these cases; he says she loses her head, and that several of the bees that followed her are treated in the same manner for having been seduced to a rebellion. *Reaumur*'s Hist. Insect. Vol. 10. p. 290.

All these different modulations of sounds, made by the bees, are the effect of the different vibrations of their wings in the air. It has been supposed by Swammerdam, that the air issuing from the stigmata of the body was very instrumental to the making of this sound; but this is proved to be an erroneous conjecture, by the easy experiment of cutting off a bee's wings, which always renders the creature perfectly mute; though this could not be the case, if the voice proceeded from other parts. It is evident, therefore, that all the sounds of the bee are made by the striking of its wings against the air; and it seems very easy to imagine, that when the motion of the wings can make a sound, the more quick or slow motion of them can modulate it in a different manner, and the moving them in several different directions, may also add greatly to the variety.

The hours of going out of *swarms* are always between eleven in the morning, and three in the afternoon: the air is at this time very hot, and the sun often shines brightly on the surface of the hive; the effect of this, in causing them to go out, is easily conceived. The few who are nearest the mouth of the hive, and are ready to follow their queen, soon find that this is a pleasant season for their expedition, and the numbers of others, which remained irresolute in the inner parts of the hive, now find the natural heat of the place increased to so great a degree by the action of the external warmth, that it is very natural for them to resolve at once to depart with those which are going off, in order to find a place where they may be more at ease, or less crowded and heated in their habitation. People, who have the care of bees, should attend to their *swarming*, or going out on these occasions; and if they are not at leisure to watch them in the hours before mentioned, should defend the hives, during that part of the day, from the heat of the sun, that they may not go off and be lost.

Immediately before the going out of a *swarm* there is heard a prodigious humming in the hive, much greater than what is heard at any other hive, and immediately after this, the openings of the hive are crowded with bees, in a violent hurry to get out; those which first come out immediately take flight, and if the female, or queen, be among these, vast numbers immediately follow, and the air is seen as full of them, as it is of flakes of snow in a winter storm; and, in fine, it is not a minute before all the bees, that are to make the new *swarm*, are out of the hive: when the body is thus joined, they rise and fall in the air, and seem very curious in choosing a place where to fix themselves. It does not appear that the female bee chooses the place for them, but they all seem to be assistant in it; and as soon as they have fixed upon a proper branch of a tree, or the like, they all fly towards it, and begin to form a cluster in one part of it. The female does not place herself at the head of this cluster, but sits on the branch near it, to see how she approves the management; as soon as the cluster is of a proper size, she adds herself to it, and from that instant it thickens in a surprising manner, all trying first to fix themselves to the rest, so that in a quarter of an hour they are all collected together into a vast mass, hanging to one another by the legs. In this condition they remain absolutely quiet, though exposed to the open air, and there are no more of them seen flying loose about, than there are about the hives in a summer's day. *Reaumur*'s Hist. Inf. Vol. 10. p. 293.

The hives of bees are commonly placed in gardens, that the bees may have some flowers at least in their own neighbourhood, and not be compelled to go far in search of food; and the *swarms* from these hives always succeed best, when there

there are fome bufhes, as of filberts, barberries, or the like, in the garden, as well as high trees; for when the bees take a high flight, they often take a very long one before they fettle, and fometimes go fo far, that the eye cannot trace them to the place of their fettling; in which cafe, all attempts to fearch for them are ufually vain, and they are loft entirely. The low bufhes in view ufually determine them to low flights, and if they are feen to be afcending too high, the cuftom is to throw handfuls of duft and fand upon them; this ufually brings them down, as they probably miftake the particles for drops of rain.

Another very antient cuftom, and which is continued to this day, is the beating on inftruments of brafs, and the like, to make a great noife, while they are gathered in the air: it is pretended, that this difpofes them to fix themfelves the fooner. The origin of this cuftom has been an obfervation, that thunder always fends thofe bees, which are abroad, from the flowers back to the hive, and it is fuppofed that this artificial noife may have the fame effect; but in all probability, the bees are better acquainted with thunder than to be thus deceived: there is indeed much more probability of their miftaking the particles of duft, falling upon their backs, for drops of rain, than taking fo unlike a found for thunder; for it is found by experience, that the making all the noife that can be conceived, this way, never was able to drive one bee from a flower where it was bufy, or to fend one ftraggler home.

When the time of a *fwarm*'s going out of the hive is expected, the people, who have the care of them, fhould always be prepared with a hive to receive them; and when the *fwarm* fettles upon fome branch of a bufh, or low tree, the hiving of them is an eafier matter than could be imagined. See Hiving.

The nature of the annual new *fwarms* of bees, which we fee depart from old hives, are not to be truly underftood, otherwife than by knowing the hiftory of the propagation of the fpecies among thefe animals, for which fee the articles Bee, and Queen *bee*.

The queen, or mother bee, which is the general parent of the hive of bees, continues laying eggs, in greater or leffer number, during the whole fummer months, but in the winter months fhe defifts; and many bees perifh in the end of the autumn, and during the courfe of the winter, without the hive's having any fupply from the female: by this means there are but a fmall number of bees left, when there is but a fmall provifion in ftore for them, as they are to live on their labours of the former fummer. As foon as the fpring comes on, and there appear flowers, out of which honey may be obtained, the parent bee begins to lay again; and by the vaft number of eggs fhe lays every day, foon provides a fupply to repair the lofs. All thefe eggs are hatched, in two or three days after they are laid, into worms; and, in fine, they appear under the form of bees, and are fit for working, in about three weeks time.

All the eggs that the female lays, during the firft week or two, are for the production of the common, or working bees, as they are the more neceffary at that time: after this fhe begins to lay eggs which are to produce drones, whofe whole period of life is to be only of a few months, and who are never to work, but to feed on the labour of the others; they being the males of the hive, and all their bufinefs being to impregnate the eggs of the females for future fupplies of young; and this office they are to perform, as well to this their parent, as to their fifter female, that is to be hatched from an egg laid afterwards in a peculiar cell. According to this rule we fee, about the month of May, a great number of drones in a hive, where, before that time, there was not one, and foon after the appearance of thefe we find a new female, hatched out of an egg laid on purpofe at a proper time; and fometimes the fame hive affords two or three of thefe females. *Reaumur*, Hift. Infect. Vol. 10. p. 285.

All the time that this female, and thefe males, or drones, are hatching, the number of common, or working bees, is alfo increafing very faft, by a numerous progeny hatching every day from the eggs of the parent; and the confequence of this is, that the number becomes too great to be contained in the hive. It is neceffary then, that a certain number fhould go off in form of a colony, and fettle themfelves in fome other place; this is foon refolved, and the number thus detached from the reft is what we call a *fwarm*. This however they would never do, had they not a chief to lead them, and promife a future progeny for the object of their cares and labours; but as with them, when they become numerous, there is always hatched at leaft one female, fhe places herfelf at their head, and leads them out to feek a new abode. If by any accident fhe is killed, they will never enter a hive at all, but fly feparated during the whole fummer, and take no care but of the feeding themfelves. This alfo is carried fo far among them, that if the hive be never fo full, and there be no young female among them, none of the bees will ftir, but they will hang in clufters out at the mouth of the hive; and, on the contrary, if a hive be but half peopled at the time that a young female is produced, as foon as fhe is able to go away, and to lay her eggs, the half, or at leaft fome confiderable part of thefe few bees, will leave the hive, though they have plentiful room in it, and form a new *fwarm*: fo that though the overfulnefs of the hives be, in general cafes, one great reafon of the departing of a colony, in form of a *fwarm*, yet it is not the only reafon.

The departure of the *fwarm* ufually happens almoft immediately upon the birth of the young female, or queen. This creature feems to be fœcundated, and ready to lay her eggs almoft as foon as fhe is out of the nymph ftate, and very often actually places herfelf at the head of a company, and goes off within four or five days of her birth in the winged ftate. It may happen, however, that the time of the departure of the *fwarm* may be retarded by accidents, fuch as very rainy, or ftormy weather; for as fuch a feafon would render the *fwarming* abroad very uncomfortable, they ufually ftay in the hive till fuch weather is over, though perfectly ready to go. It is very certain, that though the female is ready to go, fo foon after her birth, to form a new *fwarm*, that her eggs are at that time fœcundated, and ready to produce the young ones; for there often go no drones, or male bees, with the new *fwarm*, and it feems accident, rather than the intent of nature, if any go out with them, as the female is plainly already impregnated, and needs no new impregnation, till fome of her own offspring are able to ferve her. The time of the going out of the *fwarm* is different in different countries, and even in the fame country varies very much, on occafion of the feafon of the year, and the ftate of the hive. *Reaumur*'s Hift. Infect. Vol. 10. p. 288.

If a hive has been very well peopled during the winter, the young progeny go out early in the fpring; and if it have been very thinly peopled, it is fometimes as late as the middle of June before they go out, even without any accidental delay from the want of a queen.

The people who manage bees, are informed of the time when they are going to fend out new *fwarms* by feveral figns. One is, when the hive is fo peopled, that many of the bees cannot find room within, but ftand in clufters on the outfide of the hive; another, is the appearance of a large number of drones, or male bees: thefe, however, are not certain figns, nor do they point out the very day of the *fwarming*; but there is one which declares it very punctually, which is the obferving, that though the hive be very full, and the day very fine, yet very few bees go out in fearch of honey; in this cafe it is a certainty that they are affembling themfelves in the hive, and preparing to be gone in a very little time. If a perfon go near the hives, that are ready to fend out *fwarms*, in the evening, or even in the night, he will hear a fort of humming noife in them, which is not to be heard at fuch times on any other occafion: in fhort, the whole is in agitation on the occafion, and the tumult never ceafes till the new colony goes out.

Swarms *of infects*. We have an account [1] of an extraordinary *fwarm of infects* in New-England, that deftroyed all the trees in the country for the fpace of two hundred miles. It is faid there were found a great number of holes in the ground, out of which thefe creatures broke forth in the form of maggots, which became flies with a kind of tail or fting, which they ftuck into the tree, and thereby envenomed and killed it.—[[1] Philof. Tranf. N° 8. p. 137.]

SWEAT (*Cycl.*)—Many diftemperatures of the body have their rife, as well as their cure, by means of the differences of this evacuation.

The faults of our *fweats*, in regard to the general health of the body, are reducible principally to three kinds. 1. They are too exceffive: thefe ufually happen early in the morning, as foon after three o'clock, and are in fome degree periodical; but in others they are rather continual, or have very few intermiffions. 2. The ufual and habitual fecretions by *fweat* are fubject to be impeded, or retarded, and hence many diftempers take their rife. And 3. there is in fome particular people a remarkable difficulty of being brought to *fweat* at all.

The perfons principally fubject to too profufe *fweats*, are men of a plethoric and fanguineo-phlegmatic temperament; thefe, on the flighteft motion of the body, are ufually thrown into profufe *fweats*; and the fame perfons are ufually fubject to violent nocturnal *fweats* in the fpring and autumn feafons. Perfons in hectics alfo, when near the time of their death, ufually fall into profufe nocturnal *fweats*, which are always a fatal prognoftic.

The perfons principally fubject to a natural difficulty of *fweating*, are thofe who have a mucous and thick dyfcrafy of the humors; and fometimes perfons of very tender and delicate conftitutions, who are fubject to emotions of the blood, and are continually thin in flefh.

Prognoftics in fweats. A profufe *fweat*, though it confiderably waftes the flefh and ftrength, yet is lefs dangerous when left to itfelf, than when rafhly fuppreffed. The confequences of habitual *fweats* being fuppreffed, are ufually according to the habit and difpofition of the patient, either cutaneous eruptions, as the itch, and the like; or catarrhs, coryzas, and

and gravedos; and fometimes they bring on congeftions, inflammations, and convulfions.

Method of treatment. So long as *fweats* bring on no bad fymptoms in illneffes, they are to be rather promoted than checked, even though they may feem profufe in quantity; and in this cafe, the proper regimen is a moderate warmth, a quiet ftate of the body, and frequent draughts of warm liquors; but when the ftrength is found to be too much exhaufted by thefe *fweats*, fmall dofes of nitre are found of great fervice.

When different diforders arife from the fuppreffion of *fweats*, nothing is of greater fervice than the compound powder of antimonium diaphoreticum, crabs eyes, and nitre, given in fmall dofes every three hours; and a quiet pofture of the body is to be ordered, which greatly tends to promote *fweating*; and frequent draughts of warm and weak liquors are to be taken, and the bowels are to be relaxed with a clyfter, or a gentle purge, if there be no fymptom neceffarily forbidding it. In regard to thofe perfons, who are naturally very difficult to be *fweated*, a draught made of frefh arum-root and wine, or vinegar, ufually brings on profufe *fweating*, if they are put to bed, and warm liquors drank afterwards. It is a very good general caution, that profufe *fweats*, if they have continued ever fo many months, are never to be repreffed by aftringents; for in that cafe they are ufually attended with fymptoms much worfe than the original complaint. The common method of forcing out fuppreffed *fweats* by the hot alexipharmics, and volatile falts, is by no means advifeable in any cafe. Bleeding, judicioufly timed, is often of very great fervice in promoting *fweats*. When the natural *fweats* of children are repelled, they become fuddenly feverifh and ill, and nothing relieves them till the *fweats* are recalled. This may be done fimply, by keeping them warmer than before, in moft cafes; but when that fails, the gentle abforbents are to be prefcribed, and if they fuck, the nurfe may take the common alexipharmic medicines: crabs eyes are as proper as any thing for the child in this cafe, and for the nurfe the lapis contrayerva. The convulfions of children very often arife from the fuppreffion of their *fweats*, and are always then taken off by making them *fweat* again. *Junker's* Confp. Med. p. 530.

SWEATING-*houfe*. The natives of North-America, when we firft fettled among them, had a great many houfes to *fweat* in, it being their general remedy for difeafes of whatever kind; but at prefent they are lefs ufed among them.

The cave, or *fweating-houfe*, was ufually eight feet in diameter, and four feet high, the roof being fupported by fticks, or boards. They ufually dug thefe caves in the fide of a hill, and as near as could be to fome river, or pond. The entrance into the cave was fmall, and when any perfon was *fweating* in it, the door was covered with a blanket, or fkin. Near the cave they ufed to make a large fire, and heat in this a quantity of ftones, perhaps five hundred weight; thefe they rolled into the cave, and piled up in a heap in the middle. When this is done the Indians go in naked, as many as pleafe, and fit around the heap of ftones; and as foon as they begin to grow faint, which is ufually in a quarter of an hour, they come out, and plunge themfelves all over in the water, remaining in it a minute or two; and repeating this a fecond time, they drefs themfelves, and go about their bufinefs.

This has been for many ages ufed among them with fuccefs, in cafes of colds, furfeits, fciaticas, and pains fixed in their limbs, and the Englifh have often ufed the fame means, and found relief by it. It is practifed equally at all times of the year, and the Indians do it not only in fickneffes, but by way of refrefhment after long journies, and other fatigues, and to ftrengthen themfelves for any expeditions. Philof. Tranf. N° 384. p. 131.

Turf SWEATING. See TURF-*fweating*.

SWEATING-*iron*, in the manege, is a piece of a fcythe about a foot long, and of the breadth of about three or four fingers, very thin, and fuch as cuts only with one fide. When a horfe is very hot, and the grooms have a mind to leffen the *fweat*, or make it glide off, they take this knife or iron in their two hands, and gently run the cutting edge along the horfe's fkin, commonly with the grain, or as the hair lies, and but feldom againft it; with intent to fcrape off the *fweat*, and dry the horfe.

SWEATING-*room*. See an account of the remains of a Roman *fweating-room* in the Philofophical Tranfactions, N° 461. fect. 29.

SWEATING-*ficknefs*. See SUDOR *Anglicanus*, *Cycl.* and *Suppl.*

SWEET (*Cycl.*)—By a *fweet* is underftood any vegetable juice, whether obtained by means of fugar, raifins, or other foreign or domeftic fruit, which is added to wines, with a defign to improve them. It is plain, from the making of artificial muft, or ftum, by means of fine fugar, with a fmall addition of tartar, that the art of *fweet*-making might receive a high degree of improvement, by the ufing pure fugar, as one general wholefome *fweet*, inftead of thofe infinite mixtures of honey, raifins, fyrups, treacle, ftum, cyder, &c. wherewith the *fweet*-makers fupply the wine-coopers to lengthen out, or amend their wines: for pure fugar being added to any poor wine, will ferment therewith, and improve it, and bring it to a proper degree of ftrength and vinofity. If the wine that is to be amended is tart of itfelf, no tartar fhould be added to the fugar, but if it be too *fweet* or lufcious, then the addition of tartar is neceffary. *Shaw's* Lectures, p. 203. See the article *Artificial* STUM.

SWEET *fublimate of mercury*. See MERCURIUS *dulcis*.

SWEET *corn*, a term ufed by the Indians to exprefs a fort of corn they are very fond of, and generally keep in their houfes.

While the ear of the maiz, or Indian corn, is yet green, but full, they gather it, and firft boil, and afterwards dry it, and lay it up for ufe in bags, or bafkets. When they eat it, they boil it again, either whole, or grofsly beaten in a mortar; they then mix it with fifh, or with venifon, or beaver flefh, and account it a very fine difh. The green ears, or frefh *fweet corn*, they alfo fometimes eat, as foon as it is gathered, roafting it before the fire, and then picking out the grains. This is a new fupply of food for them many times, when their winter, or laft harveft-ftore is exhaufted. Their foldiers alfo commonly go out to war againft their enemies about this time of the year, and find this fupply in their enemies fields. See GUINEA *corn*.

SWEET-*Williams*, the Englifh name of feveral fpecies of *cariophyllus*, or pink. See the article PINK.

There is a great variety of fpecies, and very elegant diverfities of colouring in thefe flowers; the principal difference, however, is between the fingle and double kinds.

The fingle kinds are to be propagated by fowing their feeds in March on a bed of light earth; in May they will be ready to plant out, and muft then be fet at fix inches diftance in beds of the fame kind of earth. In thefe beds they fhould remain till Michaelmas, and then be tranfplanted to the places where they are to remain. They will flower the next year in May, and ripen their feeds in Auguft, when that of the beft flowers fhould be faved.

The double kinds are propagated by layers in the fame manner with the carnations, they love a middling foil, neither too light, nor too ftiff; they continue flowering a long time, and are very beautiful, efpecially the mule-kind, which produces yearly two full blooms of flowers, the one in May, the other in July. *Miller's* Gardner's Dictionary.

SWELLING (*Cycl.*)—*Swellings* in the face and falivary glands, without any fever, or rednefs of the fkin, fometimes happen in fummer months, and often give way to a gentle purge or two. See Medic. Eff. Edinb. Abridg. Vol. 1. p. 65.

Thefe *fwellings* are fometimes erifipelatous, and fall chiefly on the forehead and eyelids, and yield to purges and blifters. Ibid.

SWIFT, in zoology, a name given by many to the common newt, or eft. See the article EFT.

SWIFTERS, in a fhip, ropes belonging to the main-mafts and fore-mafts, which help to fuccour or ftrengthen the fhrowds, and to keep the mafts ftiff: they have pendants faftened under the fhrowds, at the head of the mafts, with a double block, through which the *fwifter* is reeved; which at the ftanding part has a fingle block with a hook, hitched into a ring at the chain-wale, and fo the fall being haled up, helps to ftrengthen the maft; yet it is belayed about the timber heads of the lower rails aloft.

SWIFTING *of a boat*, is compaffing her gun-wale round with a good rope, to ftrengthen her in ftrefs of weather, that fhe be not fhattered by the violence of the fea.

SWIFTING *the capftan-bars*, aboard a fhip, is ftraining a rope all round the outer ends of the capftan-bars, in order to ftrengthen them, and make them bear all alike, and together, when the men heave or work there.

SWIFTING *of a fhip*, is either bringing her aground, or upon a careen; for then they ufe to *fwift* the mafts, to eafe and ftrengthen them, that all the weight may not hang by the head; which is done by laying faft all the pendants of the *fwifters* and tackles with a rope clofe to the maft, and as near to the blocks as can be; and then to carry forward the tackles, and there to bowfe, or hale them down as hard and taught as poffible. The word of command here, is, *Ho! bowfe men!* All this is done alfo to keep the maft from rifing out of the ftep.

SWIGGING, a particular way of caftrating rams.

The operation is performed by throwing the creature on his back, in which pofture he is held; then a ftring is drawn about his tefticles as tight as poffible, and fixing it there, the part is anointed with frefh butter. The beaft is then left to feed, and in two or three days the tefticles grow fo rotten, as to fall off with the ftring, or may be plucked away with a fmall force. *Boyle's* Works Abr. Vol. 1. p. 87.

SWIMMING *of fifhes*. See NATATIO, and AIR-*bladder*.

SWINE, *fus*. See the article SUS.

Swine are very profitable creatures to the owner, being kept at fmall expence, feeding on things that would be otherwife thrown away, and producing a very large increafe. They are apt to dig up the ground, and to break fences; but this may be prevented, by putting rings in their nofes, and yoaks about their necks. Leicefterfhire, Northamptonfhire,

ſhire, and Hampſhire, are famous for theſe animals, which ſeems owing to their being clayey countries, and that more beans and peaſe are ſown there, than in other places. The wild kind never grow ſo large as the tame, but they are much better taſted. The keepers of hogs ſhould always chooſe ſuch boars to breed out of as are long bodied, and have deep bellies and ſides, ſhort noſes, thick thighs, ſhort legs, high claws, a thick neck, and a thick chine, well ſet with large briſtles.

It is not proper to keep too many breeding *ſows*; for they will produce ſo many young at a time, and this three times a year, that they will not find food enough. They uſually bring thirteen or fourteen young ones in a litter, ſometimes more, but they can bring up no more than they have teats to ſuckle; and they bring forth three times in a year. Young ſhoots, as they are called, that is, *ſwine* of three quarters of a year old, are beſt for pork, and thoſe of a year and half, for bacon. Moiſt and ſedgy grounds are good for *ſwine*, for they eat the roots of many of the plants that grow there; and the fruit of the beech, cheſnut, and hedge buſhes, fatten them well, and make their fleſh much better taſted, than when bred intirely in the ſtye. *Mortimer's* Huſbandry, p. 253.

SWINE-*pipe*, in ornithology, a name uſed in many parts of England for the red-wing.

SWING-*wheel*, in a royal pendulum, that wheel which drives the pendulum. In a watch, or balance clock, it is called the *crown-wheel*.

SWINGING was preſcribed by antient phyſicians, as a good exerciſe in ſome caſes. See AGITATION.

SWINGLE, in the wire works in England, the wooden ſpoke which is fixed to the barrel that draws the wire, and which, by its being forced back by the cogs of the wheel, is the occaſion of the force with which the barrel is pulled. *Ray's* Engliſh Words, p. 133.

SWINGLING. See the article BRAKE.

SWIT, in natural hiſtory, a name given by the people of the Philippine iſlands to a very ſmall bird of the humming bird kind, frequent in that part of the world. It is beautifully coloured, and lives on the honey of flowers.

SWORD (*Cycl.*)—SWORD-*hand*, in the manege, is the horſeman's right hand, as *bridle-hand* is uſed to denote his left hand.

Pleas of the SWORD. See PLEA, *Cycl.* and JUS *gladii*, *Suppl.*

SYCABIS, in zoology, a name by which ſome authors have called the *atricapilla*, or black-cap, a ſmall bird well known in England. See ATRICAPILLA.

SYCAMINOS, a word uſed by ſome for the mulberry fruit, and by ſome for the tree.

SYCAMORE-*tree*, a name improperly given by us to the *acer majus*. See the article MAPLE.

SYCAMORE-*moth*, in natural hiſtory, the name of a peculiarly large and beautiful moth, or night butterfly, ſo called, from its caterpillar feeding on the leaves of the *ſycamore*.

This caterpillar is remarkably large, very often growing to three inches and an half long, and three quarters of an inch in diameter. The head is ſmall, and the body conſiſts of twelve rings, each of which has five or ſix large and ſtiff hairs on it, each having at its extremity a ſmall, but hard globule of a blue colour, from which there often ariſe alſo ſeveral other hairs, ſmaller and ſhorter than the others, and having one in the middle a little longer than the reſt; on nine of the rings alſo there is above each foot a white oval mark, ſurrounded by a black line; theſe Malpighi diſcovered in the ſilkworm to be the organs of reſpiration.

This caterpillar has ſixteen feet, diſpoſed in three ſeries, or ranges; ſix are placed near the head, theſe ſtanding very cloſe together, eight more ſtand in the middle of the body, and the other two near the tail: the ſix that are placed near the head, are the only true feet, for the reſt ſerve as well to fix the creatures to any particular place, as to aſſiſt them in their motions. The ſkin is yellow and ſmooth, without a ſingle hair, except thoſe particularly before mentioned. Theſe caterpillars being put into a box, each ſpun itſelf a ſtrong and firm caſe, which it faſtened to the ſide of the box, and in it waited the time of its laſt transformation: in each of theſe ſhells there was left a ſmall aperture, by means of which the creature was to get out when in its butterfly ſtate, and the head of this animal was placed exactly againſt this aperture. In this ſtate they lie all the autumn, winter, and ſpring, and in the beginning of ſummer come out in the ſhape of a very elegant moth. The wings, when expanded, meaſure more than five inches, and each has an eye, like that on the peacock's tail, near the extremity. The horns are of the feathered kind, and are very large and elegant; and the body and origins of the wings are covered with very long hairs. Mem. Acad. Par. 1692.

SYCION, a word uſed by ſome authors to expreſs a decoction of dried figs.

SYCITES, the *fig-ſtone*, an idle name given by ſome authors to ſuch natural nodules of flint or pebbles, as happen to approach to a fig in ſhape.

SYCITES *vinum*, a term uſed by the antients to expreſs a wine impregnated with figs.

SYCOMANTIA, Συκομαντεια, in antiquity, a ſpecies of divination performed with fig-leaves; for which ſee *Potter*, Archæol. Græc. lib. 2. cap. 18. Tom. I. p. 353.

SYCOSIS, a term uſed by ſome authors to expreſs a tumor of the anus, differing only in bigneſs from the thymus. It had this name from the reſemblance of the fleſh about its edges to a ripe fig. The antients underſtood two ſorts of ulcerated tumors by this name, tho' both attending the ſame part; the one was hard and round, the other ſofter, and of an irregular figure: from the firſt there was diſcharged only a ſmall quantity of matter, from the latter a very large quantity, and that of a very ill ſmell. Some other of the antient phyſicians make the ſame word alſo expreſs two ſorts of ulcerated tumors of the head, or beard, which they diſtinguiſh by the ſame characters into a hard and a ſoft one.

SYCOTA, a word uſed by ſome of the antients to expreſs a ſort of food prepared of figs.

SYCOTON, a name given by the antients to the liver of a pig fed with figs. This was eſteemed a very elegant diſh among the old Greeks.

SYDEROPŒCILUS, in natural hiſtory, the name of a ſtone mentioned by the antients. It was found in Arabia, and ſeems to have obtained this name from its being ſpotted with a ferrugineous colour. The deſcriptions of the antients are, however, in this, as in many other inſtances, too ſhort to ſuffer us to gueſs what ſtone they meant. This might poſſibly be a granite with ſpots of this peculiar colour.

SYENITES, in the natural hiſtory of the antients, a name given by many to the granite, the ſame with the oriental granite of the moderns. It had this name from its country; but our artificers have of late learned to call a very different ſubſtance by a name that ſounds very like this, the beautiful purple and yellow marble, ſo frequent with us now in tables, *&c.* being called among them *Sienna marble*. *Hill's* Hiſt. of Foſſ. p. 500.

SYLVA (*Cycl.*)—SYLVA, among the Romans, a ludicrous kind of hunting exhibited in the circus; ſo called, becauſe the circus was really planted with trees, which had been dug up with the roots by the ſoldiers and brought thither, and fixed to large beams, after which earth being thrown upon their roots, the circus actually reſembled a wood; then being filled with all ſorts of herbivorous animals, the people were let looſe upon them, and carried all clear off. *Pitiſc.* Lex. Ant. in voc.

SYLURUS, in ichthyology, a name given by Geſner to the *ſilurus* of Willughby, and others, which we call in Engliſh the *ſheat-fiſh*.

The names of fiſh are in general ſo arbitrary, that it is not eaſy to determine what is meant by them in the different authors who uſe them: but Artedi has very well diſtinguiſhed this by the name of the *ſilurus* with four cirri, or beards, at the mouth; by which it evidently is diſtinguiſhed from the fiſh called the *lake*, which, though a true *ſilurus*, has only one beard.

SYMBACCHI, Συμβακχοι, in antiquity, a deſignation given to the two men, who purified the city of Athens at the feſtival *Thargelia*. See THARGELIA.

SYMBOLISM, a word uſed by ſome of the chemical writers to expreſs a conſent of parts.

SYMBOLOGICE is uſed by ſome for that part of the ſcience of medicine, which treats of the ſymptoms of diſeaſes.

SYMPARATAXIS, a word uſed by Hippocrates to expreſs the conflict between nature and a diſeaſe, and the aliments or medicines given in it.

SYMPASMA, a word uſed by many authors to ſignify a cataplaſm.

SYMPATHETIC *inks*. See *Sympathetic* INKS.

SYMPATHETIC *powder*. The compoſition of the *famous ſympathetic powder*, uſed at Goſſelaer by the miners in all their wounds, is this. Take of green vitriol eight ounces, of gum tragacanth, reduced to an impalpable powder, one ounce; mix theſe together, and let a ſmall quantity of the powder be ſprinkled on the wound, and it immediately ſtops the bleeding. The vitriol is to be calcined to whiteneſs in the ſun, before it is mixed with the gum.

SYMPATHY, (*Cycl.*) in medicine. A part is ſaid to ſuffer by *ſympathy*, or conſent, when it is yet whole and ſound, and is only affected by the fault of ſome other part. Medic. Eſſ. Edinb. Abridg. Vol. 1. p. 449.

We have ſome practical remarks on the *ſympathy* of the parts of the body, in the Medical Eſſays of Edinburgh, Vol. 5. Art. 45.

SYMPESIS, a word uſed by the old Greek writers to ſignify concoction, or digeſtion.

SYMPHONIACA, in botany, a name given by ſome authors to the common *hyoſciamus*, or henbane. *Ger.* Emac. Ind. 2.

SYMPHONIALE, in the Italian muſic, is ſometimes prefixed to a canon, or fugue, to ſhew that it is at uniſon, *i. e.* that the ſecond part is to follow, or imitate the firſt in the ſame intervals, ſounds, notes, *&c.* the third to obſerve the ſame with regard to the ſecond, and ſo on.

SYMPHYTUM, *comfrey*, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe. The cup is an erect, acute, pentagonal perianthium, divided

divided into five segments at the rim, and remaining when the flower is fallen. The flower consists of one petal, formed into a very short tube, with a bellied tubular end, somewhat thicker than the tube, the extremity of which is divided into five segments. The opening of the flower has five tapering rays, shorter than the rim of the flower, and converging, so as to form a sort of cone. The stamina are five tapering filaments, placed alternately with the rays of the mouth of the flower; the antheræ are acute, upright, and covered. The pistillum has four germina. The style is slender, and of the same length with the flower. The stigma is simple. The cup becomes inlarged, and supplies the place of a fruit, containing four pointed gibbous seeds, with their tops converging one towards another. *Linnæi* Gen. Plant. p. 38.

The characters of *symphytum*, according to Tournefort, are these. The flower consists of one leaf, and is funnel-fashioned, but somewhat resembling the bell-shaped ones. The cup is divided into segments, even to the base, and from this there arises a pistil, which is fixed in the manner of a nail to the hinder part of the flower, and is surrounded with four embryos, which afterwards ripen into so many seeds: these are of the shape of a viper's head, and are contained in the cup, which becomes inlarged for their reception.

The species of *comfrey*, enumerated by Mr. Tournefort, are these. 1. The great purple-flowered *comfrey*. 2. The great bluish purple-flowered *comfrey*. 3. The white or yellowish-flowered great *comfrey*. 4. The deep yellow-flowered great *comfrey*. 5. The great *comfrey*, with variegated flowers. 6. The tuberose-rooted larger *comfrey*. 7. The smaller tuberose-rooted *comfrey*. 8. The large echium-leaved *comfrey*, with red roots, and yellow flowers. 9. The large echium-leaved *comfrey*, with red roots, and white flowers. 10. The narrow-leaved *comfrey*, with red roots, and yellow flowers.

Authors have been used to reckon another species of this plant, the little borage-like *comfrey*; but this is properly a species of omphaloides. *Tourn.* Inst. p. 138.

The roots of the common *comfrey* are very powerful agglutinants. The common people use them with success in fresh wounds, and a conserve of them is found of excellent use in hæmorrhages of all kinds. They have been also recommended in the gout and sciatica, as of great virtues in mitigating the pain, and shortening the paroxysms.

Symphytum was a name given among the antients to several different plants, which had the common virtues of agglutinators. We have appropriated the word to *comfrey*; but Dioscorides plainly uses it sometimes as the name of elecampane, and sometimes as that of the common horse-tail. He even seems to have led himself into an error in the use of these synonyms, in this very article, having prescribed the horse-tail, under the name of *symphytum*, for a shortness of breath. It is very evident, from the tenor of his other works, that he meant to prescribe the helenium, or elecampane, that having the qualities necessary in such a case; and neither this author, nor any other, ever having recommended the horse-tail on any occasion of this kind. Pliny has collected the virtues and characters of the *symphytum* from all the authors he had, in whom the word occurred, and therefore he has given a list of virtues that belong to no one plant.

SYMPLEXIUM, in natural history, the name of a genus of fossils, of the class of the selenitæ, but not of the determinate and regular figure of most of the genera of those bodies, but composed of various irregular connections of differently shaped, and usually imperfect bodies.

The word is derived from the Greek, συμπλεκω, to connect, or compound a mixt mass of different things.

The bodies of this genus are of an irregular figure, and are variously notched, divided, and indented at their edges: they are composed of a number of other imperfect selenitæ, principally of the rhomboidal kind, though not unfrequently with the columnar, and usually with parts of tabular masses among them. The different bodies that form this kind are seldom quite perfect, having usually fallen together before they were wholly hardened; but generally, whether they form a larger or a smaller mass, they together affect the external figure of a flat hexaedral column, though variously notched at the sides, and truncated at the ends. *Hill's* Hist. of Foss. p. 124.

SYMPLOCE, Συμπλοκη, in rhetoric, a figure, where the same word is repeated several times in the beginning or end of a sentence: thus, *Quis legem tulit? Rullus. Quis majorem populi partem suffragiis privavit? Rullus. Quis comitiis præfuit? Idem Rullus. Voss.* Rhet. lib. 5. p. 289.

SYMPOSIARCH, Συμποσιαρχος, in antiquity, the director, or manager of an entertainment. This office was sometimes performed by the person at whose charge the entertainment was provided; sometimes by another named by him; and at other times, especially in entertainments provided at the common expence, he was elected by lot, or by the suffrages of the guests. He was otherwise called *basileus*, *rex*, and *modimperator*, &c. and determined the laws of good fellowship, observed whether every man drank his proportion, whence he was called *ophthalmus*, *oculus*, the *eye*. The guests were in all things obliged to obey his commands; on which account Cicero upbraids a certain person, that *qui nunquam populi Romani legibus paruisset, iis legibus, quæ in poculis ponebantur, obtemperabat*: he, who had never submitted to the laws of the Roman people, yielded obedience to those of drinking.

Arian reports, that the king being elected by lots commanded in this manner, *do you drink*, *do you fill the glass*, *do you go*, *do you come*, &c. The chief magistrates were not exempted from yielding obedience, if the lots gave another the preeminence. Plutarch relates, that Agesilaus, king of Lacedæmon, being chosen *symposiarch*, gave the following command to the cup-bearer, who asked him how much wine every guest should drink, *viz. If there is plenty of wine, let every man have what he calls for*; *if not, let every man have an equal share.*

SYMPTOSIS, a word used by the antients to express a contraction, or subsidence of the vessels, such as happens under evacuations. It also is sometimes used to express a remission in a disease, and the falling away in flesh of people in sickness.

SYNAGELASTIC, an epithet used to express the fishes of the gregarious kind, or which swim together in large shoals, in opposition to the solitary kinds.

SYNAGRIS, in zoology, a fish caught in the Archipelago, and some other seas, and much resembling the *dentex*. Some have used it as a synonym for that fish, and others accounted it only a name applied to the *dentex* while young, but it is properly a distinct species. It is considerably shorter and thicker than the *dentex*, and much resembles the carp in figure. Its head is yellow, and its sides are variegated with bluish, and other coloured lines, laid in an oblique direction; but the longitudinal side lines are black. Its scales are remarkably round in figure, and its tail very forked. *Bellonius* de Pisc.

Aristotle, Athenæus, and others, apply the name *synagris* to the fish generally called the *dentex*, or *synodon*, the *dentale* of the Italians.

According to Artedi, it is a species of the sparus, and is distinguished by him by the name of the variegated *sparus* with a sharp back, and with four large teeth.

SYNARTHROSIS (*Cycl.*)—The articulation of bones, so joined together as to remain fixed in their situation, is of two kinds; one is made by ingrailing, and the other in the same manner, in which a nail, or pin, is fixed in wood. The first of these may be again subdivided into the deeper, and the more superficial kind.

The deep kind is observable in the articulation of the broad bones; the antients term this a suture, from the resemblance it bears to a coarse seam, as is seen in the upper bones of the skull. It is made by jags, notches, and holes, in each of the articulated bones, by which they are mutually indented, much after the same manner as what is called *dove-tailing* among the joiners. By the antients this was called also *unguis*, probably because the indented pieces are rounded like nails. Sutures have been divided also into the true and the false. See SKULL.

The other kind is that which is observed in bones joined together by more extended surfaces, in which no indentation appears outwardly. This kind of articulation the antients termed *harmony*; and the articulation of some of the bones of the upper jaw were given as examples of it. But though they describe this as running in a single line, they did not mean this in a strict sense, but only that the joint was like that of two rough boards without grooves; for they have expresly told us, that some small inequalities might be observed in these joints, and some of them have used the terms *suture* and *harmony* indifferently. The other kind of *synarthrosis*, an example of which we have in the teeth, is called *gomphosis*, a Greek term, still retained. *Winslow's* Anatomy, p. 15.

SYNATHROISMUS, Συναθροισμος, in rhetoric, a figure which, in order to magnify a thing, whether good or bad, enumerates a great many different persons, actions, *&c.* to which it relates: thus Cicero, *qui mihi fratrem optatissimum, me fratri amantissimo, liberis nostris parentes, nobis liberos; qui dignitatem, qui ordinem, qui fortunas, qui amplissimam rempublicam, qui patriam, quâ nihil potest esse jucundius; qui denique nosmet ipsos nobis reddidistis.* See *Voss.* Rhet. lib. 5. p. 372.

SYNCAMPE, a word used by the old writers to express the joint, or flexure, where the upper part of the arm is joined to the lower.

SYNCAUSIS, a word used by some medical writers to express the drying, and, as it were, burning up of the excrements within the body, by a febrile heat.

SYNCHISIS, a word used by the old medical writers to express a confusion and perturbation of all the humors in concoction, from the imbecillity of the stomach. It is also used to express a disease of the eye, which consists in a confusion of the humors: this generally proceeds from a violent blow; sometimes from an inflammation of the uvea, occasioning a rupture of the vessels, and an effusion of the humors.

SYNCHORESIS, Συγχωρησις, in rhethoric, the same with *permission*. See PERMISSION.

SYNCHYSIS, Συγχυσις, in rhetoric, a confused manner of expression, where the natural order of the words is perverted. Horace affects it much: thus lib. 1. sat. 5.

Pæne macros arsit dum turdos versat in igne.

SYNCOMISTERIA, Συγκομιστηρια, in antiquity, the same with *thalysia*. See THALYSIA.

SYNCOMISTON, a name given by Athenæus, and some other authors, to the coarser sort of bread eaten by the poor in many countries, and made of unsifted meal, the bran being mixed up among the rest. This is a very nourishing food, and for laborious people, or those who use much exercise, is highly preferable to all other sorts of bread.

SYNCRISIS, a word used by the chemical writers to express a concretion, or coagulation of any thing, effected by a spontaneous, or violent reduction of a liquid substance to a solid one, by a privation of the humid.

SYNCRISMATA, a sort of ointment, of the nature of the acopa, in use among the antients.

SYNCRITICA, a name given by some writers to such medicines as are of a coercive and astringent quality, whether used externally, or given internally.

SYNDESIS, a word used by the antient physicians to express a binding, or straitening.

SYNDESMOSIS, in anatomy, a connection of the bones, called also *synneurosis*.

SYNDESMUS, in anatomy, a word used by some for a ligament. See LIGAMENT.

SYNECHES, in medicine, is the name of a fever of the next degree to the intermittent: it also seems to be something of kin to those, and is called the *continent*, or *remitting fever*. It is a continual fever in regard to duration, though not in degree, continuing many days together without intermission: but then it has its diminutions and augmentations; sometimes regular, sometimes irregular, though no true intermissions. *Allen's* Synopsis, p. 3.

SYNECTICON, a word used by the old writers to express the proximate cause of a disease; called also the *causa continens*, and always remaining closely united with the disease.

SYNERGASMA, a word used by Libavius, and some other authors, to express any operation in chemistry. The operations are by this author divided into two classes, the energetic, and preparatory: the first producing such bodies as are of power to act on others as menstruums, to cure diseases, and the like; and the others producing no such things, but being necessary preparatives to them.

SYNESTIC is sometimes applied by physicians to express the stools when firm, and of a consistence; such as to make them remain in their shape, in opposition to liquid ones.

SYNGENESIA, in botany, a class of plants with hermaphrodite flowers, whose stamina are naturally formed into a single regular congeries.

The word is formed of the Greek συν, together, and γένεσις, formation. The plants comprehended under it are those whose stamina, by the junction of their apices, are formed into a single regular cylindric body; and among these are the lettuce, succory, hawkweed, &c.

The *syngenesia* expresses the same class of plants with the compound flowered plants of Ray, and others. The general characters of the class are these.

The cup is the crown of the seed, and stands on the summit of the germen. The flower consists of one petal, and has a very narrow and long tube placed upon the germen: this is either tubular, ligulated, or naked.

The tubular flower of the *syngenesia* has, at the summit of the tube, a wide campanulated mouth, divided into five segments, which are expanded, and somewhat bent backward. The ligulated flower is that which has a plain and strait edge turning outwards, with a truncated apex undivided, but furnished with three or four teeth. The naked flowers are those which have no mouth at all; and often in these, even the tube is also wanting. The stamina are five very short and slender filaments, inserted into the tube of the flower. The antheræ are of the same number with the stamina: they are slender, erect, and grow together at their sides, so as to form a tubular cylindric body of the length of the mouth of the flower, and divided into five segments at the edge. The germen of the pistil is oblong, and placed under the receptacle of the flower. The style is capillary, erect, and of the length of the stamina, and goes through the cylinder formed by the antheræ. The stigma is divided into two parts, which stand open, and bend backwards. These plants have properly no pericarpium, though in some few species there is a coriaceous crust placed about the seed. The seed is single and oblong, often of a quadrangular figure, and sometimes narrower at the base than in any other part. *Linnæi* Gen. Plant. p. 370.

The seeds are, in the different genera of this class, of a very different appearance at the ends. Some are crowned with a downy matter, composed of a great number of single short filaments, placed circularly, or otherwise, on the head of the seed. In some the downy matter is radiated; in others it is ramose, or branched; and in some it is supported on a pedicle, while in others it stands immediately on the seed. In some genera the seeds have no down at all, but have a small corona, formed of what was originally the cup of the flower: this is permanent, and divided usually into five segments. In some genera the seed is wholly naked, having neither any down, nor this crown of a cup.

The sexes of the plants of this class are very variously disposed, and it is owing to this that there are among them several different kinds of flowers. The tubulated flower is called an hermaphrodite flower, when it contains both the stamina and pistil. It is called a male flower, when it contains only stamina without any stigmata. It is called a female flower, when it contains a stigma and no stamina. And there is still another sort of flower, called neutral, among this class of plants; these have neither stamina, pistil, nor stigma, nor indeed any other part of fructification. These several kinds of flowers are, in the descriptions of the genera, called ligulated, campanulated, &c. from their shape.

A flower composed of a great number of these small flowers is called floscular, or flosculose flower; each of these, from their being small, and only making up a part of a general flower, being called a floscule. The common receptacle of the fructification in the flosculous flowers contains always several floscules; and in the various genera the disk, on which these are received, is either concave, convex, plain, globose, or, finally, pyramidal. This receptacle is called by some *thalamus*.

The superficies of this receptacle is called by authors, in some genera, naked, in others paleaceous. In the naked kinds, it is either absolutely bare, or else covered with a number of small tubercles, or with short and erect hairs. The paleaceous receptacles are covered on the surface with narrow, subulated, and painted paleæ, or chaffy substances. These stand erect, and are placed between the floscules.

The common cup, or perianthium, in these plants, contains, or incloses both this receptacle, and all the floscules: this is contracted together at the top when the plant is in flower, but it expands itself when the floscules are fallen, and the seeds are to ripen. This general cup is, in its different appearances in the several genera, distinguished by authors by the epithet *simplex*, *imbricatus*, and *auctus*. The perianthium simplex, or simple cup, is that which consists of only one simple series of leaves, which surround the flower. The imbricated cup is that which is composed of a vast number of short squammæ, or scales, the exterior ones being gradually shorter than the inner ones, which they lie upon. The calyx auctus is that, in which while one series of long and equal segments surrounds the floscules, another small series surrounds only the base of the inner, simple, and larger cup. The compound flowers are very variously composed, in regard to the nature of the floscules. *Linnæi* Gen. Plant. p. 371.

1. Some are composed of tubulose hermaphrodite flowers in the disk, and of the same sort of tubulous hermaphrodite flowers in the radius. 2. Others are composed of tubulose hermaphrodite flowers in the disk, and of tubulous female flowers in the radius. 3. Some are composed of tubulous hermaphrodite flowers in the disk, and of tubulose neutral flowers in the radius. 4. Some have tubulose hermaphrodite flowers in the disk, and ligulated hermaphrodite flowers in the radius. 5. Some are composed of tubulous hermaphrodite flowers in the disk, and of ligulated female flowers in the radius. 6. Some are composed of tubulous hermaphrodite flowers in the disk, and ligulated neutral flowers in the radius. 7. Some are composed of tubulous hermaphrodite flowers in the disk, and of naked and neutral flowers in the radius. 8. Some are composed of tubulose male flowers in the disk, and of naked female flowers in the radius. And 9. some are composed of ligulated female flowers in the disk, and ligulated hermaphrodite flowers in the radius.

The essential character of a flosculous flower consists in its antheræ growing together into a cylindric body, and producing a single seed, which stands under the receptacle of the separate floscule. Id. p. 372.

The common cup is usual in most genera of this plant, but it is no universal character, for it is wanting in the echinopus. Nor is this the only variation they are subject to, for the common receptacle, which might seem a very essential part of the plant, is wanting in the milleria. It is evident from this, how very uncertain characters the common cup, and common receptacle of the seeds, are in this class of plants; for though they have been judged essential, and unerring marks, yet we find the two plants above named want them severally; and we also find that some plants are possessed of them, which have not the other characters of the class. Thus scabious has a common cup, and dipsacus a common receptacle, yet neither scabious, nor dipsacus, are flosculous, or, as they may much more properly be called, *syngenesious* plants.

It is very remarkable that Plumier has no genus of compound flowers. Tournefort, though he had not the assistances of the later observations on the stamina and antheræ to guide him, yet has fixed very natural genera in the class of the *syngenesious*, or compound flowered plants.

Vaillant made more observations on the nature of the flowers of these plants, than any one who went before him, and the only

only error he run into, was the making too many genera. Pontedera has rendered the method of this clafs very eafy and clear, though he found it very confufed. *Linnæi* Gen. Plant. p. 373.

SYNGNATHUS, in ichthyology, the name of a genus of fifhes, the characters of which are thefe. The coverings of the gills are on each fide compofed of a thin and fingle bony lamella; the head is oblong and compreffed; the jaws are clofed up at the fides; and the mouth is only capable of opening at the extremity of the fnout. The body is long and very flender; the fhape is fometimes roundifh, but more ufually angular. The fins are in moft fpecies four in number, but in fome only one.

The fpecies of this genus, enumerated by Artedi, are four. 1. The fquare-bodied *fyngnathus*, having no fin at the tail. This is the creature called the *hippocampus* by authors. 2. The cylindric *fyngnathus* without any breaft, or tail fins. This is the *acus lumbriciformis* of Mr. Ray. 3. The *fyngnathus* with the middle of the body heptagonal, and with a pinnated tail. This is the *acus Ariftotelis fpecies altera major* of Willughby. 4. The *fyngnathus* with the middle of the body hexangular, and a pinnated tail. This is the common *acus Ariftotelis*. In the diftinguifhing this genus, the number of the incifures, in the body of the feveral fpecies, is to be carefully attended to. *Artedi*, Gen. Pifc.

The name *fyngnathus* is of Grecian origin, and is formed of the word *συν*, which in compofition fignifies the fame as the Latin *con*, together, and *γναθος*, a jaw. It is given to this fifh from that remarkable ftructure of its mouth, by which the jaws are made to grow together, and the very end of the mouth only opens.

SYNGNOME, Συγνωμη, in rhetoric, the fame with *conceffion*. See CONCESSION, *Cycl.*

SYNNAS, or SYNNADIUM *marmor*, in the writings of the antients, the name of a fpecies of marble ufed in the larger buildings of the Romans. It is by fome confounded with the docimenum marmor, with which the temple of Jupiter, erected by Adrian, was built; but this is erroneous, fince that elegant marble was always characterized as perfectly white, without blemifh; and this was always fpotted, and clouded with black, infomuch that fome writers have called it by an epithet, expreffing thofe variegations, *maculofa fynnas*.

SYNNEUROSIS, in anatomy, a kind of articulation of the bones, performed by the intervention of ligaments.

SYNOCHA, (*Cycl.*) in medicine, the name of a fpecies of fever, of which authors diftinguifh two kinds, the fimple, and the compound. The fimple *fynocha* is very rare in our parts of the world. The compound one is a mixed difeafe of the *fynochal* and ordinary continued fever, and has been called by fome the *putrid fever*, and *fynocha putrida* by the antient medical writers.

Signs of it. The *fynocha* always feizes people at once with a violent heat, without thofe fhiverings which frequently attend the firft attacks of other fevers. It is attended with a violent thirft, an univerfal languor, and laffitude of the limbs; and often with anxieties, fighings, and fuffocative difficulties of breathing. Acute and violent pains are felt in the head, with a tumid rednefs of the face and eyes, noifes in the ears, vertigos, and eternal reftlefsnefs and toffing about in the bed, with wildneffes in the thoughts. The urine from the firft is red and pellucid; it rarely admits of any breaking, or depofits any fediment before the fourth day, then it frequently precipitates a reddifh matter. There is generally an obftinate coftivenefs, and fpafmodic tenfions of the back and limbs are ufually very painfully felt during the whole time of the difeafe. The feventh day generally brings on a crifis in this difeafe, which in young people is ufually by an hæmorrhage of the nofe, in older by profufe fweats. The perfons moft fubject to this difeafe are thofe of a plethoric habit, who eat high-feafoned foods, and ufe little exercife; and efpecially fuch as have had any habitual evacuation of blood ftopt upon them. It is more frequent in the fpring and autumn, than at other feafons. *Junker's* Confp. Med. p. 267.

Caufes of it. Thefe are principally violent and unaccuftomed exercife, drinking large quantities of fpirituous liquors, long watchings, immoderate paffions, violent fweatings from hot medicines, and fudden cooling the body when very hot, by drinking large draughts of cold water, or other weak liquors. All thefe occafion the fever, by affecting the plethoric habit of the perfon; but this, which is the general and original bafis of the diftemper, is ufually brought on by omiffion of ufual bleedings at fpring and autumn, and other feafons, by fuppreffions of accuftomed hæmorrhages by the nofe, and by ftoppages of the menftrual, or hæmorrhoidal evacuations.

Prognoftics in it. The *fynochal* fever, in itfelf, is feldom attended with any great danger; and when the crifis happens by profufe fweats, or by an hæmorrhage, on the feventh day, there is no fear of any ill accidents: but if this time pafs without a crifis, and the congeftions remain, young perfons are ufually thrown into a violent phrenitis, and older ones into foporous affections; and even in fome cafes, where the crifis comes regularly on by hæmorrhages, there is danger from its being too great in quantity, and too much impairing the ftrength of the patient. There muft be great caution, however, ufed in affwaging this hæmorrhage, if that be found neceffary, fince, when it is imprudently done, it often brings on terrible obftructions in the vifcera, and hectics, dropfies, and cachectic complaints, that are very difficult to get rid of. The critical hæmorrhage is known to be coming on by a ftricture and itching of the nofe, an intenfe pain in the head, a rednefs of the eyes and face, and a ringing in the ears. Very frequently, alfo, the crifis is predicted by a remarkable perturbation of mind, but this is not the peculiar fymptom of the hæmorrhage, but happens as often, when it is by fweat. Often there is a dripping of blood from the nofe on the fourth day; and in this cafe, if nature be not difturbed, there will certainly be a farther bleeding on the feventh day. Complaints of an anxiety and uneafinefs about the breaft prefage an unhappy event. Other very bad fymptoms, alfo, are involuntary tears, great reftlefsnefs, no relief from fleep, and the appearance of livid, or brown fpots. The thick ftate of the blood, in this fever, makes it very eafily pafs into flow continued fevers and hectics; and fometimes, when the crifis does not come on at the feventh day, and there appear clouds in the urine, it appears afterwards on the fourteenth day.

Method of cure. Bleeding is always neceffary in the firft ftages of this fever, before the figns of coction appear in the urine; after this the violent emotions of the blood are to be quelled by nitrous and acid medicines, as the juice of lemons: to thefe muft be added reft, and a frequent drinking of warm and weak liquors. The bowels, if much bound, muft be gently loofened by an emollient clyfter; and after the crifis, fome gentle purgatives muft be given to clear the primæ viæ. Bleeding is not to be ordered after the figns of coction appear in the urine, for it often prevents the critical hæmorrhage, and renders the patient foporous, or delirious; and in the compound, or putrid *fynochal* fever, the patient is not to be blooded at all. Volatile falts are given by fome in this cafe, but very improperly, for they always are attended with mifchief, and often occafion cachectic tumors. Symptomatic quinfeys often attend this difeafe, and are to be relieved by gargarifms, rendered aftringent by an admixture of terra Japonica, or the like medicines; and in this particular cafe, wine is to be more cautioufly forbid than at other times. *Junker's* Confp. Med. p. 266.

SYNODON, in zoology, a name given by feveral authors to a fifh caught in the Mediterranean, and more commonly known by the name of *dentex*. *Aldrovand.* de Pifc. lib. 1. cap. 12. See DENTEX.

SYNODONTIDES, in natural hiftory, the name of a ftone defcribed by the antients, and faid to be taken out of the head of the fifh, called by them *fynodontes*, the *dentex* of the moderns. See DENTEX.

SYNONYMA. The perplexity in the writings of the antients, arifing from the ufe of *fynonymous*, as well as homonymous terms, is very great, when they ufe the fame word as the name of two different things. The whole value of the accounts they have left us is loft, by our not being able to diftinguifh which of the two they mean.

The great fource of this confufion has been in the love of fecrets in medicine, which prevailed as ftrongly among the antients, as it does among the moderns. In order to conceal the remedies they ufed, they often gave them new names, and often (which was worfe) ufed for them the names of other things.

Thus they called the pine-tree *itea*, the univerfally received name of the willow, and fo in many other inftances; from which we have, at this time, the fame word in ufe in different authors, as the name of different things.

Galen gives a prefcription for baldnefs, in which almoft all the ingredients are called by names wholly different from thofe that the reft of the world knew them by at that time, and by that means paffed upon the vulgar for new-difcovered medicines. The bay-tree is there called *ladonis*. The bear *amorphon brephos*, from the ftory of its young cubs being fhapelefs till licked into form by the mother bear. The ladanum, or labdanum, is called *apotragopogon*, becaufe of its being gathered from the beards of goats. And the adarce is called *pericalamitis*, from its being found concreted about a reed.

The compofition of Philo, called *cholice*, given in the fame author, is thus given in the ænigmatical manner by the fame means. The more learned and ingenuous people of thefe ages detefted this idle practice, and gave all things their common names; but as the abfurdities of one man will generally find followers in others of the fame ftamp, though the phyficians difcarded the practice, the fucceeding race of chemifts, famous for their love of fecrets, continued and improved it to fo great a degree, that were there writings of any value, it would be wholly impoffible, in many of them, ever to arrive at the author's meaning. See SYNONYMOUS, *Cycl.*

The Arabian writers have fallen more into the ufe of *fynonyms*, and that in a more erroneous manner than any other authors. If two things have happened to be called by the fame

fame name, be they ever fo different, they always defcribe them together, and attribute their virtues to one, as well as to the other; nay, they too often tranfcribe from other authors the virtues belonging to the one, and adding them to the account of the other, leave no room to trace out the truth, but by referring to the originals if they are in being. Thus thefe authors found the word *zarnich*, ufed by fome as the name of orpiment, and by others as the name of the lapis armenus, a blue colour, ufed in painting. Aëtius, and fome other authors, tell us, that the Syrians always ufed the word in this latter fenfe, though all other people ufed it in the former. Avifenna on this makes thefe two different fubftances, orpiment, and armenian zarnich, the fame; and having feen no lapis armenus, but what was of a greenifh blue, (as much of it was) he gives a chapter on zarnich, in which he tells us that it was of three kinds, yellow, red, and green: thus confounding the true fpecies of orpiment, the red and yellow, with a blue green colour, wholly different from them in its nature and qualities. In the fame manner the various fubjects of the vegetable world, that happen to have been at fome time called by the fame name by others, are always confounded by thefe writers. The chamælea, and chamæleon, two very different plants, both in figure and qualities, and which are not indeed wholly *fynonymous*, yet are confounded together, both by Serapio and Avifenna; and the nature and qualities of both defcribed fo conjunctly in one chapter, that they muft pafs for the fame plant with all, but thofe who have before made themfelves mafters of the hiftory of the materia medica of the earlier times, and are able to diftinguifh which of the characters and virtues belong to the one, and which to the other. The two ephemerons are in the fame manner confounded together by Avifenna, and blended in one chapter: and what is ftill more foreign than all thefe, the Ægyptian *lotus*, becaufe it happens to be called by the fame name with the *lotus* of the Greeks, which is a trifoliate plant, is defcribed together with it in the fame chapter, though nature can fcarce afford two plants more various, either in form, or qualities. And thus in numerous other inftances.

SYNONYMISTS, among the botanical writers, fuch as have employed their care in the collecting the different names, or *fynonyma*, ufed by different authors, and reducing them to one another.

SYNTENOSIS, a word ufed by anatomifts to exprefs an articulation of the bones when they are connected, as the offa fefamoidea of the toes, only by a tendon.

SYNTHENA, a term ufed by Paracelfus to exprefs an apoplectic, or epileptic diforder, attended with violent griping pains in the bowels. This is generally mortal.

SYNTHETIC, or SYNTHETICAL, (*Cycl.*) a term given to that part of chemiftry, which, after the analytical chemiftry has taken bodies to pieces, or reduced them to their principles, can, from thefe feparated principles, either recompound the fame body again, or, from the mixtures of the principles of one or more bodies in various manners, form a large fet of new productions, which would have been unknown to the world but for this art: fuch productions are brandy, foap, glafs, and the like.

Synthetical chemiftry, taken in the ftrict fenfe for the recompofition of bodies from their own principles, is rather of philofophical, than of ordinary ufe. This however is not eafy, except in a few cafes, nor are we to imagine, becaufe it may be done in fome, that nature has taken this way to compofe them; her method of compofition of bodies are a new fubject, and worthy a diligent inquiry. *Shaw's* Lectures, p. 169.

SYNTHETISMUS, a word ufed in chirurgical writings to exprefs the four operations neceffary to the reftitution of fractures, which are extenfion, coaptation, repofition, and deligation, or the bufinefs of bandage.

SYNTONUM *diatonum*, in mufic. See GENUS.

SYNTROPHIC, an epithet ufed to certain difeafes, which grow up with the patient. Of this kind is the epilepfy, which often firft feizes the perfon in infancy, and continues growing up with him, and increafing in ftrength as he does.

SYNULOTIC, a word ufed by fome writers in the fame fenfe as epulotic.

SYNYMENSIS, a word ufed by fome chirurgical writers to exprefs a conjunction of two bones by means of a membrane, as the bones of the finciput are connected to thofe of the forehead in young children.

SYPHAR, a word ufed by fome naturalifts in the fame fenfe as exuviæ, to exprefs the fkins which many reptiles caft off at certain times. Thus the fnake, the water newt, and all the caterpillar tribe, part with their fkins during the time they remain in that ftate.

SYRIACUS *lapis*, in natural hiftory, a name given by Aëtius, and many other authors, to the petrified fpines of the *echini ovarii*, called by us the *Jew ftones*, and *petrified olives*, from their likenefs to an olive in fhape, and called by the antients *tecolithus*.

It has been a common opinion, that this *ftone* was good againft the gravel and ftone; but Aëtius limits its efficacy to a particular cafe, which is that where the ftony matter is lodged in the kidneys and ureters; but he frankly confeffes, it is of no power to diffolve or break the ftone in the bladder.

This is contrary to the doctrine of Diofcorides, and the other old Greeks; but more confonant to reafon and experience. Some have carried its virtue fo far, as to pretend, that when rubbed to powder, and mixed in water, and that mixture rubbed on the groin and perinæum, it will break the ftones concreted within, and bring them away in pieces by urine. This, though too grofs for belief, is yet given us by Pliny. In moft of the common editions the words ftand thus, *lingentium frangit calculos*; but all the beft copies have it *ungentium*; and the word *lingentium* is only made by dividing the two perpendicular lines in the letter U.

SYRICON, a word ufed by fome authors in the fame fenfe as fandyx. Pliny makes it a compofition of equal parts of finopis and fandyx; and Aëtius gives it as the name of a collyrium, ufed in many diforders of the eyes.

SYRINGA, the *pipe-tree*, in botany, the name of a genus of trees, the characters of which are thefe. The flower is of the rofaceous kind, being compofed of feveral petals arranged in a circular form. The piftil arifes from the cup, and finally becomes a fruit adhering to the cup, of a turbinated form, and divided into four cells, which contain fmall feeds.

There is no other known fpecies of the *fyringa* befide the common one, and its variety, with double flowers. *Tourn.* Inft. Bot. p. 617.

Many fpecies of this flowering fhrub, common in gardens, are called *lilacs*. See LILAC.

In the Linnæan fyftem of botany, *fyringa* is the name of a feparate genus of plants, the characters of which are, that the flower cup is a perianthium formed of only one leaf, which is fmall, tubulated, and erect, and has four notches at its extremity. The flower is a fingle petal, formed into a very long and flender tube, divided at the extremity into four fegments, which are fpread open and bent; the feveral jags, or fegments, being ftrait, hollowed, and obtufe. The ftamina are two very fhort filaments, terminated by fmall antheræ, hid within the tube of the flower. The piftillum is compofed of an oblong germen, a thready ftylus of the length of the ftamina, and a thick and bifid ftigma. The fruit is an oblong, compreffed, and pointed capfule, containing two cells, and made up of two halves, containing each a fingle, oblong, and compreffed feed; pointed at each end, and furrounded with a membranaceous rim. *Linnæi* Gen. Plant. p. 3.

The feveral fpecies of this beautiful and fweet flowering fhrub are eafily propagated, by taking off their fuckers in autumn, of which they always produce great plenty. Thefe fhould be tranfplanted intu the nurfery, where, after they have remained two years, they will be fit to be removed to the places where they are to remain. They are very hardy, and may be planted in almoft any foil or fituation; and require no farther culture, but to take away the fuckers, and cut out the dead wood every year, and now and then to dig up the earth about their roots. They flower in May and June. *Miller's* Gardner's Dictionary.

SYRINGITES, a ftone mentioned by Pliny, and defcribed as being always full of cavities. Some have fuppofed this author meant the ofteocolla by this name; but it is more probable, that he meant the ftone we now call *fyringoides*, or the pipe-ftone.

SYRINGOIDES *lapis*, the *pipe-ftone*, in natural hiftory, the name of a very beautiful foffile fubftance, of which there are feveral different kinds. The *tubuli marini*, or cafes of fea worms, lodged in any folid fubftance of the foffile kind, conftitute what is called the *lapis fyringoides*.

The moft frequent kind is made of the common matter of the ludus helmontii, or feptaria, with tubuli of different kinds and dimenfions in it; but the moft beautiful fort is that made of the bottoms of fhips, old boards, or piles of wood; which having been long in the fea, have been pierced by the fea worms, which have made their feveral burrows, and left their fhells behind in them: the whole of thefe fubftances becoming afterwards petrified, is found in form of wood, with all the knots, veins, and other characters, but wholly of the hardnefs of ftone. This is ufually of a blackifh colour, and the pipes being of a pale yellow, the whole makes a very elegant appearance.

Our clay-pits about London afford alfo a *fyringoides* of this kind, but the earth there abounding with the matter of the common vitriolic pyrites, that fubftance by degrees gets into the pores of the wood, and the whole feems a mafs of pyrites with thefe pipes lodged in it in different directions. This has been called by authors *pyrites fyringoides*. *Hill's* Hift. of Foff. p. 64.

SYRINGOTON, in furgery, an inftrument to lay open fiftulæ. We have a propofal of a *fyringoton*, of a new form, for laying open fiftulæ in ano, by Mr. Freke. See Appendix to *Barroughby's* Tranflation of *Aftruc* on the Fiftula in ano.

SYRINGOTOMY, in surgery, a term used for the cutting for a fistula.

SYRITES, in natural history, a name used by some for the sapphire, but by Pliny for a stone, which he says was generated in the bladder of a wolf.

SYRIUS, a word used by some authors for a very strong purge, a preparation of scammony, being no other than a resin, or magistery of that drug.

SYRMA, among the Romans, a long garment, common to both sexes, that reached to the ground. It was used in tragedies, that the persons of the heroes and heroines might appear the taller. *Pitisc.* in voc.

SYRMÆA, a name given by the antients in general to a certain root, said to be of the radish kind, and to be frequently used to provoke vomiting.

Some have made it also the name of a sort of viand, prepared of honey, the fine fat of animals, and other ingredients, which was the prize bestowed at one of the Spartan games: others have used it to express a purging potion made only of salt and water, or plain brine. The Ægyptians frequently purged themselves with this radish juice and salt, which operated gently both upwards and downwards, and these potions were called by the same name *syrmæa*.

SYRMÆA, Συρμαια, in antiquity, was used as a designation of the games at Sparta, the prize in which was συρμαια, or a mixture of fat and honey. *Potter*, Archæol. Græc. Tom. I. p. 431.

SYRMÆSMUS, a word used by the antient medical writers to express a gentle purging of the stomach or bowels, either by stool or vomit. It had its name from *syrmæa*, a word expressing a medicine that acted in this gentle manner.

SYRTITES, in natural history, is used by some authors as the name of a gem of a very beautiful appearance, in the substance of which are interspersed faint stars of a saffron colour. *Hofm.* Lex. Univ. in voc.

SYRUPS (*Cycl.*)—There seems to be no part of pharmacy, in which the writers of dispensatories have more erred, than in their directions about the making of *syrups*; which seems the more strange, because this part is particularly easy. The misfortune is, that great men cannot stoop to consider common and ordinary things; whence, however, the credit of a physician may sink in the esteem of those, who by their employments are led to a knowledge of these ordinary things.

The whole of the business of *syrup*-making may be, however, reduced to a few short and easy rules. As first, it is matter of experience that aqueous infusions, decoctions, or other aqueous liquors, require twice their own weight of dry sugar-candy to make them into a *syrup* of a just consistence, for keeping without candying or fermenting.

This rule, by directing the use of sugar-candy, fixes the consistence of *syrups* in an exacter manner than any way else, because all salts require a determinate proportion of water in crystallizing; so that sugar, in the form of candy, contains always one certain proportion of water, while different kinds of sugar may hold more or less aqueous matter, according to their different manner of refining, the accidents of the weather, &c. Hence, therefore, all such infusions for *syrups* as are of a delicate, or destructible colour, which is impaired by boiling, such as violets, clove July flowers, &c. and all such infusions as contain any volatile parts, which would evaporate by a boiling heat, as those of cinnamon, orange peel, &c. should have twice their own weight of sugar added to them, and be kept close covered in the gentle heat of a balneum mariæ, till the sugar is dissolved; which, to hasten the solution, should be reduced to powder.

Secondly, the decoctions of all such vegetable substances, as lose no valuable parts by boiling, may be boiled down to the proper consistence with their own weight of sugar, the two being first clarified together with the whites of eggs in the usual way: but if the ingredients here contain any unctuous, or balsamic parts, whereon their medicinal virtues depend, let the sugar be added from the very first, and boiled along with the ingredients; afterwards straining and clarifying it, before it be of near the consistence of a *syrup*. This rule is founded on the property in sugar of dissolving resins and oils, so as to make them intimately mix with water.

Thirdly, all vegetable juices are to be thoroughly purified, before they are boiled into *syrups*. Thus the juices of lemons, oranges, &c. are first to be filtered, and then made into *syrups* without boiling, according to the first rule: but the juices of mulberries, and the like, will not clarify without a beginning fermentation; wherefore they must first stand a day or two, and then they will pass through a flannel; after which these are to be made into *syrup* with an eighth part less than twice the quantity of sugar; that is, with one pound twelve ounces of sugar to a pint of the juice, on account of their being somewhat saccharine themselves. And wines, and vinegars, must be made into *syrups* with the same quantity. *Shaw's* Lectures, p. 205.

Pectoral SYRUPS, *syrupus pectoralis*, a new form of medicine prescribed in the late London Pharmacopœia, and intended to stand in the place of the *syrup* of maiden-hair, and some others of that kind. It is to be made thus: take leaves of English maiden-hair dried five ounces, liquorice four ounces, boiling water five pints; steep the ingredients for some hours, and afterwards strain off the liquor; and when it is made clear by settling, add to it the necessary quantity of sugar to make it a *syrup* in the common way. *Pemberton's* Lond. Disp. p. 299.

SYRUP *of saffron.* See SAFFRON.

SYRUS *lapis*, a name given by the writers of the middle ages to a fossil, seeming to be the same with the *thyrreus* of Pliny; of which name this indeed seems only a corruption, according to the barbarous manners of those times. There are many remarkable qualities recorded of this, one of which is, that it would swim on water. Hence it seems to have been a species of bitumen; but we want a fuller description.

SYSSARCOSIS (*Cycl.*)—Besides the use of this word to signify a kind of articulation of the bones, by means of flesh, when the muscles are extended from one bone to another; it is also used by some chirurgical writers to express a method of curing wounds of the head when the cranium is laid bare, and the interstice between the lips of the wound too wide for a contraction, by means of promoting the granulation, as it is called, or growth of new flesh. Paulus Ægineta uses it also to express a preternatural generation of flesh about the vessels and coats of the testes, which is sometimes the case in a sarcocele.

SYSTASIS properly only denotes the consistence of any thing, as of a syrup or ointment, but authors have used it also in a different sense. Hippocrates understands by it a collection of humors about the palate; and sometimes expresses by it a contraction of any part of the body from an uneasiness, or sensation of pain.

SYSTEMATICAL *qualities*, a term used by Mr. Boyle to express such qualities as are also called *cosmical*, and do not depend on the nature and constitution of the body itself, but on its being a member of this general system of the universe, in which capacity it is acted upon by agents unperceived by us, which occasions great changes in it.

SYSTEMATISTS, in botany, those authors, whose works in this science are principally employed about the arranging plants into certain orders, classes, or genera. *Linnæi* Fund. Bot. p. 2.

SYSIMBRIUM, *water-mint*, in botany, a name given by some to a species of mint. See MENTHA.

SYSTREMMA, a word used by Hippocrates to express a collection of humors forming a hard tumor, or tubercle, in any part of the body; called also sometimes *systrophe*.

SYSTYLE, in architecture, that manner of placing columns where the space between the two fusts consists of two diameters, or four modules.

T.

T, in the Italian muſic, ſtands for *Tutti*, all or altogether. See the article TUTTI.

It is alſo uſed to mark the tenor, and has the words *primo*, *ſecundo*, or the figures 1°. 2°. added, to ſignify the firſt or ſecond tenor.

The letters T, *t*, or *tr*, are often uſed likewiſe to ſignify a ſhake or trillo, to be made on any ſound, and are placed over the note on which the ſhake is to be made; thus  or  being an abbreviation of the word *Trillo*. See the article TRILLO.

TABACUM, in botany, a name by which John Bauhine, and ſome others have called the tobacco-plant, more uſually known among authors by the name *nicotiana*. See the article NICOTIANA.

TABARZET, a word uſed by ſome writers to expreſs highly refined ſugar.

TABAXIR, and *Arundo* TABAXIFERA, names by which ſome authors call the Bamboo cane. *C. Bauhin.* Pin. p. 18.

TABERNA *Meritoria*, among the Romans, Mars's hoſpital, or a place where diſabled ſoldiers were maintained at the charge of the government. *Danet.* in voc.

TABES *Dorſalis* (*Cycl.*)—This diſtemper, according to a late author, is a particular ſpecies of conſumption, the proximate cauſe of which is a general debility of the nerves.

Of the ſeveral kinds of conſumptions incident to human bodies the *Tabes dorſalis* is the ſloweſt in its progreſs, but the moſt melancholy in its circumſtances; and, unleſs timely obviated, for the moſt part fatal.

This diſeaſe is incident only to young men of ſalacious diſpoſitions; and proceeds from too early venery, an immoderate uſe of it, or pollutions.

It ſeems therefore to derive its origin from too frequent venereal ſpaſms. And the immoderate loſs of the ſeminal fluid, has alſo a conſiderable ſhare in producing the effect.

The ſymptoms of the *Tabes dorſalis* are involuntary, nocturnal ſeminal emiſſions, a pain in the back, and often in the head; formication in the ſpine, an aching pain, rolling, and hanging down of the teſticles, a weakneſs of memory and ſight, and a mucous diſcharge from the urethra, eſpecially after ſtraining at the diſcharge of the excrements. The mucous diſcharge here mentioned, is called by Hippocrates *liquidum ſemen*; but it is no more than the mucus of the proſtate gland. This diſeaſe is farther attended with great melancholy and dejection of mind; and a gutta ſerena often follows. The eyes grow hollow, the viſage meagre and thin; the body emaciated and weak, a palpitation of the heart, and ſhortneſs of breath ſucceed; with a concourſe of hectical complaints, ending in death.

For the cure of this diſtemper, a regularity of the non-naturals is of the utmoſt importance. Good air, rather cool than hot, is of great uſe. As to diet, high-ſeaſon'd meats, ſpirituous and fermented liquors, ſhould be avoided. No food is ſo beneficial as milk: Chocolate alſo is eſteemed, in ſuch quantities as to ſit eaſy on the ſtomach. Animal food of eaſy digeſtion at dinner, does no harm. Suppers ſhould be avoided, at leaſt milk only ſhould be then taken, about two hours before going to bed. Sleep muſt be little, and in due ſeaſon; that is, the patient ſhould go to bed and riſe early. Indulgence in bed in a morning is hurtful. The general rule ſhould be, to riſe immediately upon waking; which, though irkſome at firſt, will by cuſtom be made familiar and agreeable. Moderate exerciſe, or ſo much as the patient's ſtrength will admit of without wearineſs, ought to be uſed. Some recommend riding, eſpecially a long journey, by ſuch daily portions as to avoid extraordinary fatigue. The ſecretions of the body, if out of order, ſhould be regulated: And the patient ſhould be entertained with chearful company. As to medicines, the claſſes of balſamics and aſtringents are chiefly uſeful. Among the latter, the Peruvian bark, either in ſubſtance, extract, or tincture, the acid elixir of vitriol, and the *tinctura ſaturnina* or *antiphthyſica*, are the moſt efficacious. Strengthening plaſters may alſo be laid on the loins; and, chief of all, the cold bath ſhould be uſed. See Pract. Eſſay on the *Tabes dorſalis*, Lond. 1748.

TABON, in natural hiſtory, a name given by the people of the Philippine iſlands to a bird called in other places *daie*, and remarkable for the largeneſs of its eggs; though ſome accounts of theſe are certainly fabulous. See the article DAIE.

TABULARIUM, among the Romans, the name of that part of the treaſury where the Elephantine books were kept. See the article ELEPHANTINE, *Cycl.*

TABUM, a word uſed by medical writers, to expreſs a thin ſanious and putrid humour, flowing from old ulcers, or from mortified parts, in caſes where the vital powers are not ſufficient for the generation of a perfect or concocted matter.

TACET, in the Italian muſic, is often uſed to denote a long reſt, or pauſe. It uſually ſignifies that a whole part is to lie ſtill: thus, *Chriſte Tacet*, *depoſuit Tacet*, intimates that while one or more parts are performing the *Chriſte*, or the verſe *depoſuit*, &c. the part marked *Tacet* ſhould be ſilent. *Broſſ.*

TAC-*Free*, in old charters, an exemption from payments. *Blount.* Law Dict. in voc.

TACHAS, in ichthyology, a name given by ſome authors to the manati, or ſea-cow. See the article MANATI.

TACIT *Decree*, in Roman antiquity, ſecret deliberations, to which none but old ſenators were ſummoned.

J. Capitolinus mentions a decree of this ſecret kind, which he calls *S. C. tacitum*, and ſays, that the uſe of them among the antients was derived from the neceſſities of the public, when upon ſome imminent danger from enemies, the ſenate was either driven to ſome low and mean expedients, or to ſuch meaſures, as were proper to be executed before they were publiſhed, or ſuch as they had a mind to keep ſecret even from friends; on which occaſions they commonly recurred to a *Tacit decree*, from which they excluded their clerks and ſervants, performing that part themſelves, leſt any thing ſhould get abroad. *Capitol.* de Gordian. c. 12.

In the early times of the republic there are ſeveral inſtances mentioned by hiſtorians, of ſuch private meetings of the ſenate, ſummoned by the conſuls to their own houſes; to which none but the old or proper ſenators were admitted, and of which the tribunes uſually complained. Vid. *Dion. Halic.* L. x. 40. L. xi. 55, 57. *Middlet.* of Rom. Sen. p. 90.

TACK, in a ſhip, a great rope having a wale-knot at one end, which is ſeized or faſtened into the clew of the ſail; ſo is reefed firſt through the cheſſe-trees, and then is brought through a hole in the ſhip's ſide. Its uſe is to carry forward the clew of the ſail, and to make it ſtand cloſe by a wind: And whenever the ſails are thus trimmed, the main-*Tack*, the fore-*Tack*, and miſen-*Tack*, are brought cloſe by the board, and haled as much forward on as they can be.

The bowlings alſo, are ſo on the weather-ſide; the lee-ſheets are haled cloſe aft, and the lee-braces of all the ſails are likewiſe braced aft. Hence they ſay, a ſhip ſails or ſtands cloſe upon a *Tack*, i. e. cloſe by the wind. The words of command are, *Hale aboard the Tacks*, i. e. bring the *Tack* down cloſe to the cheſs-trees. *Eaſe the Tack*, i. e. ſlacken it, or let it go, or run out. *Let riſe the Tack.* i. e. let all go out.

The *Tacks* of a ſhip are uſually belayed to the bitts, or elſe there is a chevil on purpoſe to faſten them.

TACKLE (*Cycl.*)—*Burton*-TACKLE, in a ſhip. See the article BURTON.

Gunners-TACKLE, in a ſhip, that which ſerves to hale the ordnance in or out.

Winding-TACKLE, in a ſhip, a *Tackle* that ſerves as a pennant, with a great double block and three ſhivers in each, ſeized faſt to the end of a ſmall cable about the head of the maſt; it has a guy brought to it from the fore-maſt. Into this block is reeved a hawſer, which is alſo reeved through another double block, having a ſtrap at its end; which being put through the eye of the ſlings, is locked into it with a fidd, in order to hoiſt in goods.

The fall of this *Tackle* is reeved into a ſnatch-block, and ſo is brought to the capſtan, whereby the goods are heaved.

TACOMAR-*Tree*, a name by which ſome authors call the fugar-cane. *Marggrave*, p. 829.

TADPOLE. The animal called by this name is no other than the frog in its firſt ſtate from the ſpawn; and this creature furniſhes the curious in microſcopic obſervations with a beautiful view of the circulation of the blood, eſpecially when young. See Tab. of Microſcopical Objects, Claſs 1.

The method of procuring them for this purpoſe in the greateſt perfection, is this: Let a ſmall quantity of frog's ſpawn be kept for ſome days in water, and from this will be produced a vaſt number of young *Tadpoles*; theſe, while very young, are perfectly tranſparent, and when placed before the double microſcope, the heart may be eaſily ſeen, and its pulſation regularly obſerved; and the blood protruded thence may be beautifully ſeen circulating through the whole body; but particularly in the tail, where tho' ſo very minute, more than fifty veſſels may be ſeen at one view. The young brood grow more and more opake every hour, and in a day or two the circulation of the blood can only be ſeen in their tail, or in the fins near the head. *Baker*'s Microſcope, p. 126.

TADOMA, in zoology, a name given by many authors to a ſpecies of duck, called by others *vulpanſer*, and in Engliſh the *ſhell-drake*, or *burrow-duck*; and by ſome the *bergander*.

It is of a middle size between the duck and goose; its beak is broad, short, and red; and at the origin of the upper chap there is a large red tubercle of flesh. The head and upper part of the neck are of a mixed blackish and greenish colour, very glossy and shining; the rest of the neck is white; the breast and shoulders are of an orange-colour, which makes a sort of ring surrounding the whole anterior part of the body. The lower part of the breast and belly have a black broad line reaching to the anus; the rest of the breast and belly are white; as are also the under sides of the wings, but just below the tail there is a faint cast of the orange colour. The middle of its back is white. The shoulder-feathers falling on each sides of the back are black, and the wings are almost wholly white, only some of the longer feathers are black. The tips of most of the tail-feathers are also black. Its legs and feet are of a pale red, and their investient skin so thin, that the veins may be seen under it. They are common on the coasts of Lancashire, and build in deserted rabbit-holes; but their flesh is not well tasted. *Ray*'s Ornithol. p. 279.

TÆDA, in pharmacy, a term used by some authors to express certain compositions made up in form of troches. These are sometimes meant as pessaries to be introduced into the vagina, and therefore made into this form; sometimes they are compositions of fragrant or other ingredients for fumigations.

TÆDA, in botany, a name given by some authors to the pinaster or common wild pine or mountain pine. *J. Bauhin*, Vol. I. p. 253.

TAEL, an East-Indian weight, being the sixteenth part of a *cati*, See the article BAHAR.

TÆNARIA, Ταιναρια, in antiquity, a festival in honour of Neptune, surnamed *Tænarius*, from *Tænarus* a promontory in Laconia, where he had a temple. *Potter*, Archæol. Græc. T. I. p. 432.

TÆNARIUM *Marmor*, the name of a marble used by the antient architects and statuaries. There were two kinds of it, very different in colour, but perfectly agreeing in hardness, and in the high polish they were capable of. The first or most frequent kind was black, and was dug from the promontory called *Tænarus*, in the Lacedæmonian state; the other, which was more scarce, and much more beautiful, was of a green colour with a cast of yellow; this was dug in the Tagetan quarries, and was called by some *marmor herbosum*, and *xanthon*. *Strabo*.

TÆNIA, (*Cycl.*) in ichthyography, the name of a fish of the anguilliform, or eel-shaped kind, common in the Mediterranean sea, and brought to market in Italy, and elsewhere.

It is a very remarkable little fish, being of a pale flesh colour with a slight admixture of blue, and is free from scales; and its flesh so transparent, that the vertebræ of the back may be easily counted through it. Its body terminates in a long and very slender tail. The mouth is small, and has one row of sharp teeth in each jaw, and is very singular in that the belly-fin is twice as wide as the back one; and runs so far up to the head, that the anus which is situated at its termination, is very near the angle of the under jaw. The intestines are all covered with a silvery peritonæum, which is seen also plainly through the flesh. It is commonly of a foot long, and not more than a finger's breadth. *Willughby*'s Hist. Pisc. p. 116.

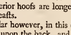
There are two other species of this fish. See the articles FALX, and CAVIRAGO.

TÆNIA *Cornuta*, the *horned Tænia*, in ichthyology, a name given by many authors, to the species of cobitis, named by Artedi, the cobitis with a forked prickle placed under each eye. This fish is properly a species of the cobitis. *Schonfeldt* Hist. Pisc. See the article COBITIS.

TAGETES, *African Marygold*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the radiated kind: Its disk is composed of floscules divided into several segments, and its outer edge of semifloscules; all standing on embryo seeds, and contained in a one-leaved cup of a tabulated form. The embryos finally become seeds of an angular form, furnished with a foliaceous head, and affixed to the thalamus of the flower. There are also some species in which the flower is wholly composed of semi-floscules.

The species of *Tagetes*, enumerated by Mr. Tournefort, are these: 1. The great upright *Tagetes*, with single pale yellow flowers. 2. The great upright *Tagetes*, with very large double flowers. 3. The smaller Indian *Tagetes*, with a single flower, commonly called the single African, or French marygold. 4. The smaller Indian *Tagetes*, with double flowers. 5. The small Indian *Tagetes*, with a double reddish yellow flower. 6. The middle-sized Indian *Tagetes*, with a double yellow flower. 7. The Indian *Tagetes*, with a single fistulous flower. 8. The Indian *Tagetes*, with a double fistulous flower. 9. The least Indian *Tagetes*, with a velvety flower. 10. The *Tagetes*, with extremely finely divided leaves. *Tourn.* Inst. p. 488.

We have a great many species of this plant annually raised in our gardens, for the beauty of their flowers. They are propagated by sowing the seeds in spring, on a moderately hot bed; when the young plants come up, they must have air allowed them; and when three inches high, they should be removed to another hot bed, which should be arched over with hoops that it may be sheltered with mats. They are to be planted here at about eight inches distance, and when they are grown stronger, as about the beginning of May, they are to be taken up with a ball of earth about their roots, and placed where they are to remain; or else at eighteen inches distance in a nursery, where when they flower the finest sorts may be marked and removed, with a large ball of earth to their roots, either into pots, or into the borders of the flower-garden. They are very beautiful; but their smell is very offensive. *Miller*'s Gardener's Dict.

TAGLIATO, in the Italian music, is used for a measure called by the French *Barré*; that is, when the character of common time is thus marked  with a perpendicular line drawn down through its middle. It signifies a pretty quick motion, and contains a breve, or its quantity in smaller notes, in each bar. Hence it is called *Alla breve*.

TAJACU, in zoology, the name of an animal common in some parts of America, and called by many authors *aper moschiferus*, or the musk-boar.

It is of the shape of our hog, but much smaller, and has no tail, and its head is broader, and the snout much less pointed than in our hog; the neck is short and thick, and the whole body of a grisly colour or mixture of black and grey. Its body is covered with hairs, much thicker and stronger than our hogs bristles, something like the bristles of the hedgehog, and like them also variegated with circles of black and white; these are four or five fingers breadth long on the back, and gradually diminish to the sides; on the middle of its head between the ears it has a sort of crest, made up of black bristles; its ears are small and erect. and its eyes small; its snout, feet and hoofs, are just like those of the European hog; but the two posterior or exterior hoofs are longer than in any other of the cloven-footed beasts.

What is most singular however, in this creature, is a certain gland which he has upon the back, and which has given occasion to some to say its navel was placed there. This gland is situated on the very ridge of the back near the rump, and is so closely covered with long bristles, that till they are removed by blowing, and keeping them back with the hand, the gland is not to be seen; when these are removed there is seen a spot almost naked, in the middle of which the top of the gland is seen; the lips of this gland usually stand a little way above the flesh, and its aperture easily admits a large stylus; and this gland, when lightly pressed, spews out a liquid substance of a brownish yellow colour, and very sweet scent, something like that of musk or civet. The gland itself is placed between the skin and flesh, and is not wholly covered by its constringing muscle, but only surrounded by it at its bottom. *Ray*'s Syn. Quad. p. 120.

TAIIBI, in zoology, the name of an American animal, described by Marggrave and other authors, and supposed by some to be only the male of the Opossum. The Portuguese in America call it the *Cachorro de mato*, and by the Dutch it is called *Boschratte*.

Its body is long, its head shaped like that of a fox, its nose sharp, and it has whiskers like those of a cat; its eyes are black and prominent, and its ears roundish, soft, tender, and white. The tail near its insertion has white hairs, and toward the extremity black ones, and near the end is naked of hair, having a skin like that of a snake over it. *Ray*'s Syn. Quad. p. 183.

TAIL (*Cycl.*)—TAILS *of Fishes*. This part in the fish kind is the subject of very great distinctions, among the characters of the several genera. It differs in the several kinds of fish in a very obvious manner, in number, situation, and figure.

In regard to the first difference, the *acus lumbriciformis*, and one of the kinds of the *serpens marinus*, have no *Tail* at all; in all other fishes there is a *Tail*, and it is never more than one on each fish.

In regard to situation, there is this great difference, that in some it is placed perpendicularly, in others horizontally. In almost all the known fishes it is placed perpendicularly, except in the dolphin, the phocæna, the orca, the manati, and all the whale kinds; for in all these it is placed horizontally, when the body is laid in its natural posture.

In figure it has many very remarkable differences, which are of great use in ichthyological distinctions. 1. In some fish it is rounded at the end; as in the cottus, and some others. 2. In some it is cut off even as it were at the end, so that the whole *Tail* is a sort of parallelogram; as in the tench, and some of the salmons. 3. In some fishes it is cuspidated at the end, as is the case in the conger, the eel, and the petromyzon. 4. In others it has as it were a small segment of a circle cut out at the end, and so is slightly hollowed out; this is the case in the carassius, and some of the salmons. 5. In many fish it is forked or opened into two points, making an acute angle; this is the figure of the *Tail* in the pearches, the cyprini of many kinds, &c. 6. Finally, the *Tail* is falcated in many fish, that is, it is of the shape of a crescent; as in the sword-fish, the tunny, mackrell, and the like. *Artedi*, Ichthyolog.

TAIL, in the manege. Many affirm that the dock of a horse's *Tail* serves to point out his sixth or seventh year; saying, that about the time that the black speck, or eye of the bean begins to disappear, and the cavity to be filled, the dock of the tail becomes longer, by reason that the vigour of the young years begins to abate; and nature has not strength enough to nourish and keep up the joints or knots that form the dock; so that when the horse is six years old, one of these joints slackens, and begins to fall down; and a year after, another descends in like manner. But this relaxation or down-falling happens sooner in some than in others, according as they have been well or ill kept, with reference to feeding, housing, and working. Accordingly we find the marks of a horse's age, taken from his *Tail*, are so erroneous, that we see a great many jockies maintain, that the first joint descends when he is nine, and the second when he is ten years old.

TAILS *of Comets*. We have an enquiry into the cause of the *Tails* of comets by Mr. Euler in the Mem. de l'Acad de Berlin, Tom. 2. p. 117. seq. He thinks there is a great Affinity between these *Tails*, the zodiacal light, and the aurora borealis; and that the common cause of them all is the action of the sun's light, on the atmospheres of the comets, of the sun, and of the earth. He supposes that the impulse of the rays of light on the atmosphere of comets, may drive some of the finer particles of that atmosphere far beyond its limits; and that this force of impulse combined with that of gravity towards the comet, would produce a *Tail*, which would always be in opposition to the sun, if the comet did not move. But the motion of the comet in its orbit, and about an axis, must vary the position and figure of the *Tail*, giving it a curvature, and deviation from a line drawn from the center of the sun to that of the comet; and that this deviation will be greater, as the orbit of the comet has the greater curvature, and that the motion of the comet is more rapid. It may even happen, that the velocity of the comet, in its perihelion, may be so great, that the force of the sun's rays may produce a new *Tail*, before the old one can follow; in which case the comet might have two or more *Tails*. The possibility of this is confirmed by the comet of 1744, which was observed to have several *Tails* while it was in its perihelion. See the article ZODIACAL *Light*, and AURORA *Borealis*.

TAIPARA, in zoology, the name of a Brasilian species of perroquette. It is of the size of a lark, and of a pale green colour over its whole body; its tail is short, not reaching beyond the tips of the wings when closed. Its beak is red, and its legs are grey. Near the origin of the beak it has a semilunar red spot on the head, and a yellow spot in the middle of each wing. It builds in the deserted abodes of ants on trees. *Marggrave's* Hist. Bras.

TAINHA, in zoology, a name given by some to a species of mullet caught in the American seas, and more usually called the *curema*. *Willughby*, Hist. Pisc. p. 277. See the article CUREMA.

TAL, a name used by some writers on the materia medica to express the dung of peacocks; and by some of the chemical writers, for any alkali salt.

TALA, in botany, a name by which some authors call the plant whose seed is the sesamum or oily purging grain of the shops. *Herm.* Mus. Zeyl. p. 58.

TALABONG, in natural history, a name given by the inhabitants of the Philippine Islands to a species of heron, common among them; which is much smaller than our heron, and perfectly white all over.

TALÆDITES, Ταλαιδιτης, in antiquity, gymnical exercises in honour of Jupiter ταλαιος. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 432.

TALARIUS *Ludus*, among the Romans, a game somewhat resembling our dice-playing, and performed with a kind of gold or ivory dice, which they shook as we do in a box, before they threw them. There was this difference, however, between their game and ours, that our dice have six sides, because they are cubical; but theirs had but four, and were conically shaped. They made use of them for divination, as well as playing; and they concluded upon a good or evil augury, according to what came up. As they usually threw four of them at a time, the best chance was when four different sides came up. The sides were called by the name of some animal, as the dog, vulture, basilisk, *&c.* Or of some deity, as Venus, Hercules, *&c.* Some authors have been of opinion, that they were marked with the forms of animals, or images of Gods, and not with numbers or dots, as our dice are. *Danet*. in voc.

TALASSIO, among the Romans, an acclamation used at marriages; for the origin of which see *Pitisc.* and *Danet* in voc. and *Livy* 1. 9.

TALC, (*Cycl.*) in natural history, the name of a large class of fossile bodies. See Tab. of Fossils, Class. 1.

The *Talcs* in general are defined to be fossils, composed of broad, flat, and smooth laminæ or plates, laid evenly and regularly on one another; easily fissile, according to the site of these plates, but not all so in any other direction; flexile and elastic; bright, shining, and transparent; not giving fire with steel, nor fermenting with acid menstrua, and sustaining the force of a violent fire without calcining.

By these characters, the *Talcs* may be distinguished from all other bodies which resemble them; and, according to their several natural and essential differences among one another, they are themselves divided into two separate orders, and under those into four genera.

The *Talcs* of the first order are those composed of plates of great extent, each making singly the whole horizontal surface of the mass.

Those of the second order are those composed of small plates, in form of spangles, irregularly disposed, and usually many of them concurring in different directions, to the formation of one of the surfaces of the mass. *Hill's* Hist. of Foss. p. 71.

The genera of the first order are two: The first is of those composed of visibly separate plates of extreme thinness, and each fissile again into a number of others yet finer. The *Talcs* of this genus are called *speculares*.

The second genus is of those which are composed of separate plates of considerable thickness, and those not fissile into any thinner. The *Talcs* of this genus are called *hyalinæ*.

The genera of the second order are also two. The first is of those composed of small plates, in form of spangles, each fissile into many yet finer and thinner ones. The *Talcs* of this genus are called *bractearia*.

The second genus is of those composed of small plates in form of spangles, which are moderately thick, and are either not fissile at all, or are only so to a certain degree, or into a small number of others yet thick ones, and those no farther fissile. The *Talcs* of this last genus are called *elasmides*.

Authors have hitherto been used to call also another set of bodies by the name of *Talcs*, with the addition of the adjective *fibrose*; but as these are found not at all of the nature of the true *Talcs*, they are now distinguished by the name *fibrariæ*. See the article FIBRARIÆ.

Authors are divided as to the origin of the word *Talc*. Lemery derives it from the High-Dutch *Talch*, tallow, because it feels greasy. But this is improbable; since Avisenna, who had no commerce with the Germans, uses the word, and tell us, that the aster of Lemnos is *Tallz*, which cannot be calcined but with the most intense fire, and which is dangerous when taken inwardly. Its origin therefore, according to Mr. Pott, seems rather *Arabic*. Cæsalpinus tells us, that *Talc*, among the Moors, signifies *star*, and that they understand thereby the *stella famia*. Johnson also says the word is Arabic, signifying small shining stars. This term does not occur among the antients, as Theophrastus, Dioscorides, or Pliny; tho' some critics pretend that Dioscorides designed it by *stella terræ*. Cæsalpinus and Salmasius endeavour to prove that *Talc* is the *aphroselene* or *selenites* of Dioscorides. Those authors also pretend that Pliny meant the same thing by *schistus*. Cæsalpinus refers *Talc* to the *galeucos argyrodamanti similis*; and Bœtius to the *argyrodamas* itself. Some think that a passage in Pliny, Lib. xxxvi. c. 22. may be understood of *Talc*. Avisenna call it *lapis lunæ*; and Albertus Magnus, *aphroselene*. The most common species in Germany is called *katzen-silver*, or *katzen-glimmer*. It is also named from a particular place where it is found, *Kiphauser-glantz*. When it is of a yellow colour, they call it *katzen-gold*, and in Latin, *mica*, and *chærile nitidum*. In some places it is also called *sper-glass*. *Pott*. in Mem. de l'Acad. de Berlin.

Talc is often confounded with similar concretions, as with the *schistus* or *lapis fossilis*, with the *spathum* or *spatum*, and *gypsum*, Muscovy-glass, or *glacies-Mariæ*, and the *lapis specularis*. Boyle takes it for an alkaline spathum, and others for other substances, from which nevertheless it differs. See *Pott*. in Mem. de l'Acad. de Berlin, 1746.

The repeated experiments of the chemists, who expect great things from an oil of *Talc*, have abundantly proved that this substance is indissoluble both in acids and alkalies in a liquid, form; and the most violent corrosive mineral acids, such as spirit of nitre and aqua-fortis, and the like, make no change in it. Mr. Du Hammel, in his *topiarium hermeticum*, indeed speaks very largely of a solution of *Talc* made by means of a long trituration in water alone: This, he says, in six hours will reduce *Talc* into an unctuous or oily fluid. And in the Commercium Literarium for the year 1732, there is a paper in which it is affirmed, that *Talc* may be in part dissolved by the mineral acids, particularly by spirit of salt; and that the dissolved *Talc* may be afterwards precipitated from the menstruum; but, in reality, neither the fuming spirit of salt, nor the purer acid of salt, dried by a repeated solution and sublimation, with sublimate Mercury, exerts the least effect upon this refractory substance. It has been also said, in the Memoirs of the Paris Academy, that *Talc* and oil of vitriol produce alum; but neither is this found true on experiment; much less is any solution of *Talc* to be expected from the volatile spirit of vitriol, the spirit of naphtha, or oil of wine, so much recommended by some of the chemists for this purpose. The greater part of these pretences are absolute frauds, intended only to impose on credulous persons, who expect great matters from an oil of *Talc*; the others are probably owing to the error of taking other foliated bodies for *Talc*, such as the plated spars, which easily split into flakes like *Talc*, and are soluble in any acid.

The burning *Talc* and sulphur together does not advance any thing

thing farther toward a folution of the *Talc*: Even after repeated trials of this, the *Talc* is only changed to a fort of afh-colour, which is owing to the impurity of the earth contained in the fulphur. This is to be underftood of the pure and genuine *Talc*, fuch as that of Mufcovy, commonly called ifinglafs; for the black and yellow kinds of *Talc*, after repeated calcinations, will be finally diffolv'd in concentrated aqua-regalis, or in very ftrong fpirit of falt, into a yellow liquor refembling the folutions of gold. This colour, in the folution, has given fome perfons idle notions of its containing gold or folar fulphurs, as they exprefs themfelves; but an accurate examination fhews, that this colour is only owing to fome attenuated particles of iron; and upon evaporation of the folution, there remains a mere crocus martis. If frefh aqua regalis be continued to be poured on this yellow *Talc*, it will draw ftill more of a yellow tincture from it, till the remaining matter be perfectly white, retaining no remains of its golden appearance.

Common fire has very little efficacy upon *Talc*, it neither making it crepitate, nor melt, nor reducing it to the condition of gypfum or lime: All the change it can make in it, is the rendering it in fine fomewhat more brittle, and in part deftroying its foliated ftructure. It fuffers no diminution all this time in weight, and is as bright and lucid, and as unctuous to the touch afterwards as before. Angelus Sala had *Talc* kept forty days in a glafs-houfe fire, and at the end of that time took it out unaltered: But according to the experiments of Neuman and Hoffman, the folar fire, concentrated by powerful burning-glaffes, melts this ftubborn fubftance into a greyifh kind of glafs. Thus we may eafily conclude, that when Morhoff and the great Boyle talk of reducing *Talc* into a kind of gypfum in a common fire, in the fpace of an hour, they deceived themfelves, and ufed fome other fubftance which had the appearance of *Talc*, but was not fo; fuch is the plated felenites, which cannot be diftinguifhed from the pureft ifinglafs, till it is tried, by bending its feparated plates, thefe being not at all elaftic, as thofe of *Talc* are.

The action of falts rendered fluid by fire is much more powerful upon *Talc* than any of thefe before-mentioned fubftances; but to this purpofe the fire muft be very violent, the common fire of fufion producing nothing; hence it is, that authors in general have not found the effect of this procefs; for they affirm that *Talc*, in a ftrong fire, mixed with three times its own quantity of a fufile falt, fuffers nothing, but renders the fame appearances afterwards as before. Neuman alfo affirms, that he had ufed nitre, borax, and the corrofive falts in the fame manner, without the leaft fuccefs: But Mr. Pott gives a different account of fuch proceffes, which he tried not with the common fire of fufion, but with the higheft degree he was able to give.

In his trials with this violent heat, *Talc*, fated with a folution of a cauftic alkali, run into a lax and fpungy mafs. Mixed with half its quantity of a purified alkaline falt, it run into an opake and blackifh mafs. *Talc* calcined in a common furnace, and then mixed with half its weight of an alkali, melted and run into a hard and ftony mafs of a brownifh black, which was capable of the fine polifh of an agate; and on repeating the fame experiment afterwards, the mafs produced by it was of the fame hardnefs and denfity, but perfectly white as alabafter; the colour was in many other trials found to be in great meafure owing to the cleannefs of the crucible, and to its containing no ferrugineous or other metalline or mineral matter. Kunkell has before obferved, that *Talc* mixed with falt of tartar, and with fritt, and put into the fire, eafily runs into glafs with the fritt, without any greater degree of fire than what is always ufed on this occafion: But Mr. Pott obferves that *Talc*, with an equal quantity of hepar fulphuris, does not run into a compact mafs, but rifes in foam and fpume to the top of the crucible, and acquires a yellow colour, and the mixture afterwards fuffers the greateft fire that common *Talc* can bear, unhurt. *Talc* does not detonate with nitre, becaufe it contains no fulphur, but they afterwards vitrify together in a violent fire; and this has been before obferved in the German ephemerides. *Talc*, mixed with an equal portion of fixed arfenic, runs into a white hard mafs; and with double its quantity of Glauber's falt, it does not diffolve, but only becomes a white friable mafs, yellowifh on the furface. *Talc*, with equal parts of borax, runs in a violent fire into a tranfparent mafs, refembling the gem called the *aqua marina*; and melted with different mixtures of borax, nitre, and arfenic, it runs into vitreous maffes, of many different degrees of colour.

Talc is ufed with great fuccefs in the diftillation of acid fpirits; that of falt is always naturally impure, and can fcarce be rendered pure but by an admixture of a *talcy* earth in the retort.

The mixture of *Talc* with different kinds and quantities of glafs, may be fuccefsfully performed with a violent fire, but not with a fmaller degree: Thus three parts of *Talc* with one part of cryftalline glafs, make only a fpongy and friable mafs in a common fire; but in a more violent one they become a firm and folid mafs of a brown colour. Minium, or glafs of lead, mixed in equal quantities with *Talc*, and fet in a violent fire, run into a yellowifh glafs refembling the opake pieces of amber; and two parts of minium to one of *Talc*, produce a clear and tranfparent yellow glafs, which is of a hardnefs capable of giving fire with fteel. The alkaline earths, mixed with *Talc*, produce a mafs fcarce vitrifiable by any fire: Hence appears the reafon why copels made of lime and *Talc* are fo very hard to vitrify. Minium added to thefe mixtures makes them combine into a firm mafs, but without perfect fufion; but borax added to them melts them readily into a true glafs. The gypfous earths mixed with *Talc*, will not unite into a mafs in any degree of fire; but if borax be added, the *Talc* readily melts. Thus two parts of *Talc*, two parts of that fpar or gypfous matter called *glacies mariæ*, or the common plated fpar, with one part of borax, run into a yellow mafs refembling a topaz.

The argillaceous earths do not vitrify with *Talc*, but they run into a mafs of great hardnefs, which will give fire with fteel, and is very ferviceable to make crucibles of, thefe veffels not fuffering the glafs of lead to run thro' them. *Talc*, joined with the vitrifiable ftones, forms no remarkable body, but the mafs remains friable; but from thefe maffes, by the addition of proper matters to render them fluid, great variety of elegant compounds may be made. Thus *Talc* mixed in equal quantities with powder of flints, on adding to the whole a fourth part of cryftal glafs, the whole unites into an opake but folid white mafs. Alkali falt added in equal quantity to *Talc* and flint, gives a tranfparent yellow glafs; and white fand, *Talc*, and a fixed alkali, in equal quantities, afford a green glafs; with other mixtures of this kind, in different quantities, the refemblances of many beautiful ftones are produced; and what is very remarkable, fome grains of metalline matter are often found on the furface of the maffes.

Cæfalpinus, Aldrovand, and fome others affirm, that *Talc* melted with copper, or added to copper, while in fufion, gave it a white colour; this being taken for granted, authors have hence agreed that *Talc* contains an arfenical earth. But experiment fhews this to have been a falfe affertion, in regard to *Talc*; and probably it only owes its origin to the cant language of fome of the alchemifts, who have called the flowers of zink, *Talc*; tho' thefe alone muft render copper yellow, not white. Antimony and *Talc*, firft calcined with nitre, run in a violent fire into a fort of flint, which will give fire with fteel. With regulus of antimony and the black flux, it runs into a black mafs; and with bifmuth it calcines into a grey powder. So little is there in the propofals of the chemifts for the metallization of *Talc* by antimony and bifmuth. Mem. de l'Acad. de Berlin, Ann. 1746.

In what part of Mr. Boyle's works the learned author from whom the foregoing extract was taken, has found that *Talc* may be reduced by common fire to a gypfum in an hour, we know not; but we find that Mr. Boyle fays, that the calcination of *Talc* is fo very difficult, that eminent chemifts have looked upon calxes of *Talc* as counterfeits. Works abr. vol. 1. p. 160.

Mr. Boyle mentions the extracting of gold from *Talc*, as having fometimes fucceeded. See Works abr. vol. 1. p. 160. but *vide fupra*.

The mountains in Hungary and Germany many of them abound in the Mufcovy *Talc*, not inferior to the *Talc* of that country from whence it has its name. The mountain of Cliffuro, which is a part of mount Hæmus, as alfo mount Pyrlipe, fhine like filver in all parts both day and night, provided there be any moon.

The *Talc* in thefe hills is the only occafion of this. There are alfo *Talc* rocks near Spittal in Upper Carinthia; and many other hills are faid alfo to contain great quantities of it; but there is a fort of felenites fo very like this *Talc*, that people are eafily deceived by its appearance. This felenites fplits into flakes like the *Talc*, but they are brittle. *Brown*'s Travels.

Mexico TALC. There is a famous cave fome leagues from Mexico, on the north-weft fide of the city, beyond the lake, the top and fides of which are faid to be lined with leaf gold; but that of fuch a kind, that the common methods of fluxing the ores have no effect upon it. The Spaniards, after many trials, have given it over, but are ftill perfuaded by the Indians that it is gold, and that the famous Montezuma obtained a great part of his treafures from this cave. The leaves, as they are called, are no more than fpangles of the fize of a man's nail; and the account we have of it in the Philofophical Tranfactions, and the various methods attempted in vain to reduce it to metal, abundantly prove that it is only a yellow *Talc*. Vid. Phil. Tranf. N°. 39.

Mufcovy TALC, a kind of foliaceous body, well known by the Englifh name of ifinglafs. See the article SPECULARIS *Lapis*.

Philofophic TALC, a name given by fome of the chemical writers to the flowers of zink.

This fubftance, diffolved in vinegar, affords what they have in their unintelligible language called, oil of *Talc*, and extolled as a thing of vaft power in the fixing of Mercury, and many other imaginary operations; and befide this, they call it a fovereign remedy for all difeafes.

The chemifts of after ages, feeing fuch prodigious effects afcribed to oil of *Talc*, and not conceiving that *Talc* was a mere

mere cant word in this place, have been at infinite pains, by means of a thousand differently varied menstruums, to obtain an oil from the common Venetian *Talc*, a dry stone which in a very remarkable manner resists the force of all menstrua, and of fire; and from which therefore no oil can be obtained. In the various operations used to this purpose, some have really hit upon liquors of a considerable power; but that power has been wholly owing to the menstruums they employed, not to the stone; and even if it were, could have none of the effects of the oil of *Talc*, mentioned by these dark writers, who meant by it so very different a substance as a solution of these flowers, which are only, that till of late little understood metal, zink, in another form. See *Oil of* TALC, infra.

Venetian TALC, in the materia medica, the name of a fossile substance famous among the chemists for the great things they have expected from the oil of it, if that could ever have been obtained; and among the ladies of Italy, and the neighbouring nations, as a cosmetic, when reduced to an impalpable powder after repeated calcinations, by levigating on a porphiry.

It is of an extremely irregular, though in some degree plated or foliaceous texture, and is remarkably smooth and soft to the touch, of a lax and somewhat crumbly texture; the several moleculæ it is composed of cohering but slightly, either in themselves, or with one another. It is of several sizes, from one inch to five or six in diameter; and in colour, of a pale silvery grey, with a large admixture of green. In many of the coarser parts of this substance, it may be observed to have a great analogy with the common French chalk, or morochthus. It is dug in several parts of Italy, and is brought to us principally from Venice, whence it has its name. *Hill*'s Hist. of Foss. p. 76.

Oil of TALC, the name of a substance, which has given great trouble to the chemists of later ages.

It had been recorded by some old writers, that oil of *Talc* had the power of fixing silver, that is, giving it the weight and tenacity of gold, so that it should no longer be distinguishable as silver, nor soluble in aqua fortis, but only in aqua regia, as gold. This was all idle and imaginary, no known substance having any such power. Our chemists of later times, supposing this oil was to be obtained from Venetian *Talc*, a common flaky stone, have tortured it a thousand ways to extract this divine liquor from it, but in vain; for unhappily this is a stone remarkable beyond almost all other bodies, for suffering almost nothing by any menstruum, nor even by fire itself. Some have however compounded liquors with the pompous names of oil of *Talc*, from their preparations of this stone; but these have owed all their qualities to the menstruums employed in making them, not at all to the stone; nor indeed had they owed them to that, would they have had any relation to the oil of *Talc* they were seeking after. The inventors of that barbarous term having never thought of Venetian *Talc*, or any other stone under the name of *Talc*; but given that name to the fibrose and cottony flowers of Zink, which in some degree resemble the disunited filaments of the fribrariæ, or, as they are called by the vulgar, fibrose *Talc*.

When zink is dissolved in distilled vinegar, and the solution distilled again in a cucurbit, there is first drawn over an insipid phlegm; after this there arise some fibrose white flowers; and finally these melt down into a sulphureous liquor, which is inflammable like spirit of wine. This being poured into a phial of water mixes with it, only leaving a few drops of a fragrant and aromatic oil swimming on the surface; this floating liquid is the so famed oil of *Talc*; but this is properly no preparation of zink, or its flowers, but merely the essential oil of the vinegar employed in the solution; and it is easy to conclude from this, that this so famed liquor can possibly have no title to any of the wondrous qualities ascribed to it. Mem. Acad. Scienc. Par.

TALED, in the Jewish antiquities, a sort of habit that the Jews wore, chiefly when they repeated their prayers in the synagogue. *Numbers* xv. 38. *Deuteronomy* xxii. 12.

It served instead of that square garment they wore heretofore, to which Moses had appointed that they should fasten borders of blue to the four quarters, and fringes or ribbands all along the borders. But at present, that they may not be exposed to the laughter of the people for the too great singularity of their dress, they content themselves with wearing a square piece of cloth underneath, with four tufts at the four corners, and when they meet in the synagogue to say their prayers, they cover their heads with a square woollen veil, which has four tufts at its four corners. It is this they call *Thaled*, or *Taled*. *Calmet* Dict. & *Leo of Modena*, Ceremonies of the Jews, P. I. ch. 5, II.

TALLY (*Cycl.*)—TALLY *the Sheets*, at sea, a word of command, when the sheets of a main-sail, or fore-sail are to be haled aft. See the article SHEETS.

TALPA, (*Cycl.*) the *Mole*, in the Linnæan system of zoology, makes a distinct genus of animals; the characters of which are, that they have feet with five claws on each, as well on those behind as on those before; and have their fore-feet made like hands, and fitted for digging. *Linnæi* Syst. Nat. p. 37.

This, though a very common animal, is very little observed by the generality of the world. Its fur is very short, soft and thick. Its nose is like that of a hog; and its teeth like those of the *mus araneus*, being single and eminent on the sides of the upper jaw, and those farther within the mouth armed with many points. It has scarce any neck, its head seeming set between its shoulders. Its legs are very short, its claws very sharp, and its toes five in number on each foot; the inner part or sole of the fore-feet is very broad, and much resembles the palm of the human hand. Its claws on these are more robust and strong, than in any other animal of its size: The whole feet and toes are not placed downward but sideways, for the sake of the creature's continual employment in digging, it being properly a subterranean animal. Its tail is short, and hairy.

It has been supposed by many, that the *Mole* had no eyes; and others have affirmed, that it had eyes, but that they were covered with a membrane; but neither of these assertions are true. The eyes are small, and have apertures in the skin, through which they may easily be discerned by a curious observer; and are very black, about the size of a millet-seed, and fastened to a nerve.

The reason they have not been observed by the common people, is, that they are hid by the fur; but, on blowing that away, they always shew themselves. It has no ears.

Its skin is extremely firm and tough, so that it requires a sharp knife to pierce it.

This seems the care of nature to defend the creature from the cold; and the fineness of the fur, that is, the smallness of every hair, seems proportioned to the small pores they had to grow out of. *Ray*'s Syn. Quad. p. 234.

TALPA, in surgery, a name given by some authors to an encysted tumor, situated under the scalp. *Heister*'s Surgery, p. 324.

TALWOOD, *Taliatura*, in our old writers, fire-wood cut and cleft into billets of a certain length: It is otherwise written *Talghwood*, and *Talshide*. Stat. 34 & 35 Hen. VIII. c. 3. 7 Edw. VI. c. 7. 43 Eliz. c. 14. *Cowel.*

TAMALAPATRA, in the materia medica, a name by which some authors have called the *folium Indum*, or Indian leaf, used in medicine. *C. Bauhin*, Pinax. p. 409.

The tree which produces this leaf is one of the *Enneandria monogynia* of Linnæus; and of the *arbores fructu calyculato*, of Mr. Ray. It is a large and lofty tree, the flowers and fruit of which resemble the cinnamon-tree. Its leaves, when full grown, are ten inches or more in length; and six or eight, in breadth. The flowers stand in clusters, in the manner of umbels on the tops of the branches, and are of a greenish white colour. The fruit is of the bigness of our currant.

The antients recommended *Indian-leaf*, as stomachic, sudorific, and cephalic. At present, it is utterly disregarded, being only kept in the shops as an ingredient in several compositions. Vid. *Hill*, Hist. Mat. Med. p. 419. seq.

TAMANDUA, in natural history, a creature called in English the ant-bear; and by the Brasilians *Tamandua-guacu*.

This animal has its English name from its feeding on ants, and having its hinder feet like a bear's. It has a very long and sharp snout, and its tongue is slender, and extensible to a very great length; and it has a long and brushy tail. *De Laët*, Ind. Occ. L. 16. c. 15.

The principal food of the *Tamandua* is ants, which he catches by scratching open their subterranean hives, and thrusting his long tongue into them; when the ants are gathered in great numbers upon this, he draws it back and eats them; and this he repeats till he is satisfied.

His tail serves him for a sort of cover; and he can, upon occasion, spread it almost over his whole body. *Barlæus* de Reb. Bras. p. 223.

TAMARIND, *Tamarindus*, in botany, the name of a genus of trees; the characters of which are these: The flower is of the rosaceous kind, and is composed of several petals, arranged in a circular form. The cup consists of one leaf, divided into many segments at the edge; and from this arises a pistil, which finally becomes a flat pod, containing in it another, in which are several flatted and angular-shaped seeds. The interstice between the two pods is filled up with a soft pulpy substance.

The only known species of this tree is that which produces the common *Tamarind*, the pulp of which is used in medicine. *Tourn.* Inst. p. 660.

The characters of this genus of plants, according to Linnæus, are, that the calyx is a plain four-leaved perianthium, the leaves of an oval figure, and equal in size. The flower is composed of three petals, which are of an oval figure, somewhat plane and flat, but folded and gaping open; these are smaller than the leaves of the cup, and are inserted in them, leaving a vacant space at the bottom of the cup. The stamina are three filaments, which have their origin together in the cavity in the cup, and are pointed, and bent toward the petala of the flower. The antheræ are single: The pistil has an oval germen. The style is pointed, and bent toward the stamina; and its stigma is single. The fruit is a long pod, of a compressed shape, and covered with a double skin between

between which is the pulp; it consists of only one cell. The seeds are angular, and of a flatted figure; and are three in each pod. *Linnæi* Gen. Plant. p. 9.

We owe the knowledge of the use of *Tamarinds*, in medicine, to the Arabians. The antient Greeks knew nothing of them; and Serapion, Mesue, and Avicenna, are the first authors who prescribe them.

The fruit of the *Tamarind* which is what we use, is only the pistil of the flower swelled into a pod; this is greenish at first, but grows brownish or reddish, as it ripens; its common size is four inches in length, and one in breadth; and it is undulated on the back, and deeply notched in three or four places at the front, which is terminated by a large rib, which runs from the pedicle on which it grows, to the end of the pod, and there frequently terminates in a sort of hook.

This fruit is, properly speaking, composed of two pods, the one inclosed within the other; the outer pod is fleshy, and of the twelfth of an inch in thickness when fresh, and the inner one is thin as a fine piece of parchment; between these two there is an intermediate space of about a quarter of an inch all the way; and this space is filled up with a very soft and pulpy substance, of a tart but very agreeable taste, which is what we use in medicine. This is blackish and of a viscous texture, and is traversed by three large vessels, or rather bundles of vessels, one of which runs all along the back of the pod, and the two others are placed on the opposite side, and often there are several ramifications of vessels, which run off different ways from these. These vessels carry the vinous juice, which afterwards hardens into the viscous matter of the pulp; but this is not all their office, for they also convey nourishment to the seeds in the inner pod.

We use the *Tamarinds* only in medicine; but the Africans, and the People of many of the Oriental nations, where they are common, make them into a sort of confect with sugar, which they eat as a delicacy, and which cools them in the violent heats of their climates; and at the same time keeps their bowels in a proper state of laxity. The four taste of this fruit proves, that acid particles abound greatly in it, and a chemical analysis of it gives farther proof of this. There is indeed no alkali to be obtained fom *Tamarinds*, otherwise than by distilling them in a retort with quick-lime. A simple analysis of them yields no other principles but acid and sulphur. Six pounds of *Tamarinds* mixed with six pints of water, will yield six drams of essential salt; this however requires a long time to crystallize, not fixing itself to the sides of the vessels under two months standing; in all this time however the liquor never grows mouldy, as such liquors usually do; and it in this somewhat resembles tartar, or the essential salt of grapes, which never separates itself from their juice under a very long time. Indeed, to be assured of gaining all the essential salt of any plant, the liquor ought to be covered half an inch deep with oil, to prevent its spoiling, and suffered to stand a whole year unmoved in the same vessel. The salt of *Tamarinds* in all things resembles cream of tartar; it is sharp to the taste, and will not dissolve in cold water. It does not detonate on the fire, nor yield any vinous smell, when moistened with oil of tartar. *Tamarinds* dissolved also in common water, and set in digestion for several months, yield on distillation only an acid spirit, like that from vinegar.

It is not uncommon in those places where *Tamarinds* are frequent, to find an essential salt crystallized on the branches of the tree, this greatly resembles cream of tartar in all respects, and is no other than the genuine salt of the plant formed by the sun's drying up the accidentally extravasated juices; nor is this peculiar to this tree alone, but many others are at times found with their juices thus extravasated, and their salts thus crystallized by the heat. The leaves of that large species of maple, which we vulgarly but improperly called the sycamore, are often in hot seasons found thus covered with crystals of their essential salt which is sweet, and very much of the nature of sugar; and the lime-trees have their leaves often covered with a like saccharine matter, which being washed off from them and the liquor given any person to drink, is found to have the taste and the purgative virtue of manna. Mem. Acad. Par. 1699. See the article TAMARINDS, *Cycl.*

TAMARISCUS, the *Tamarisk-tree*, in botany, the name of a genus of trees; the characters of which are these. The flower is of the rosaceous kind, being composed of a number of petals, arranged in a circular form; the pistil arises from the cup, and finally becomes a capsule, resembling that of the willow of a long figure and membranaceous structure, and containing seeds winged with down. *Tourn.* Inst. p. 661.

The species of *Tamarisk*, enumerated by Mr. Tournefort, are these: 1. The shrubby thick-leaved *Tamarisk*, called the German *Tamarisk*. And, 2. The tall arborescent fine-leaved *Tamarisk*, called the French *Tamarisk*.

It is a very remarkable property of this tree, that its salt made in the way of other lixivial salts is no alkali, but a mere sal salsus. The salt of guaiacum also approaches to the nature of this.

TAMATIA, in zoology, the name of a very strange bird of the Brasils. It is of the *Gallinula*, or moor-hen kind, but very different from the European birds of that genus. Its head is very large, its eyes large and black, its beak is two fingers breadth long, and one broad, shaped somewhat like a duck's, but pointed at the end; its upper chap is black, its under one yellow; its legs are long, and the thighs in great part naked; its toes are long; its tail is very short. Its head is black, and its back and wings of a plain dusky brown. Its belly is of the same brown, variegated with white. See Tab. of Birds, N°. 44. *Marggrave*'s Hist. Brasil.

TAMBOS, in Peruvian antiquity, buildings placed at certain distances for the lodging of the princes of that country, in their travels through their dominions. See Mr. de la Condamine, in Mem. de l'Acad. de Berlin, Tom. 2. p. 435. who tells us (p. 438.) that he saw several remains of these *Tambos*, in his journey from Quito to Lima.

TAMNUS, in botany, the name of a genus of plants, called by the old writers *Bryonia nigra*, and from them in English black bryony.

The characters of this genus are these: The flower consists of one leaf fashioned like a bell, open at the mouth, and divided into several segments. Some of these are steril, or male flowers, having no embryo; and others fruitful or female flowers, having in their center an embryo, which afterwards becomes a berry, usually of an oval figure, and covered with a sort of hood of a membranaceous structure; this berry is full of roundish seeds. This is a climbing plant, as well as the white bryony, but it has none of the tendrills which that has.

The species of this genus, enumerated by Mr. Tournefort, are these: 1. The clustery *black bryony*, with small yellowish green flowers. 2. The *black bryony*, with a larger white flower. 3. The American *black bryony*, with leaves like those of the citrul. *Tournefort*, Inst. Bot. p. 102.

TAMOATA, in zoology, the name of an American fresh-water fish, called by the Portuguese *Soldido*.

It is a small oblong fish, with a flat head, somewhat like that of a frog Its mouth is small, and from each angle of it there hangs a long single filament, by way of a beard. It has no teeth, and its eyes are extremely small. It has eight fins; two at the gills of one finger in length, and hard and firm like horns; two on the belly, of a softer substance; and one on the middle of the back, another near the tail, and another small one opposite to it on the belly: Its tail is the eighth. Its whole head is covered above with a hard coat like a shell; and its body with a sort of coat of mail made up of oblong hard squamose bodies, dented at their edges. Its colour is a sort of rusty iron colour. It is accounted a very well-tasted fish. It lives only in fresh-water rivers; and it is said, when the water where it is dries up, it will crawl out upon the land, and go in search of more. See Tab. of Fishes, N°. 34. *Marggrave*'s Hist. Brasil.

TAMPOE, in natural history, the name of an East-Indian fruit, approaching to the figure of the Mangoustan, but not near so agreeable to the taste. This fruit is very much of the size, shape, and colour of some of our common summer apples; but its skin is very thick and tough, and it has no crown. The Indians eat it in places where better fruits are scarce, and in some places call it the Mangoustan.

TAN (*Cycl.*)—*Flowers of* TAN. Flower of *Tan* is a name given by the people employed in the tanning-trade, to a yellow substance, often found upon old *Tan*, or oak bark broken to pieces, which has been used as *Tan*, and is of no farther service.

The name, however, is very improper; and though every body conversant in *Tan*-yards must have seen the thing, yet it has always passed as an efflorescence of the bark, till the curious Mr. Marchand enquired more accurately into its nature, and found it to be a plant of itself, wholly different from the matter of the *Tan*; and to which the bark which had been often wetted and dried again, served as a proper matrix. He found it to be more nearly allied to the spunge, than to any other genus of plants, and therefore named it *spongia fugax mollis flava & amæna in pulvure coriario nascens*, soft, beautiful, yellow fading spunge, growing on *Tanners* bark.

It makes its appearance most frequently in the summer months, and is then seen in small tufts of a beautiful yellow colour, on different parts of the old heaps of bark. It appears at first in form of a thin yellow scum, and is of a sort of jelly-like structure; but it every day grows larger and thicker, till it stands above half an inch out from the surface of the bark. As it grows, its surface becomes more and more cavernous and spungy, the pores or holes being of different diameters, and the interstitial matter forming a sort of net-work more or less regular, and often interrupted by irregular prominences in several parts; and, in fine, when the growth is compleat, the whole more resembles a spunge, than any other vegetable substance, and is of a deep yellow colour, and considerably thick and tough consistence; there are no roots to be discovered issuing from it; its smell is like that of rotten wood, and its taste is somewhat styptic. It always appears in the warm months, and always upon such old *Tan* as has begun to ferment, and is in the state in which our gardeners use it for hot-beds. If it happens to stand exposed to the south sun, it is but of short duration; but if it be in a sheltered place, it will last a considerable time, and often spread itself to a great

extent, and make a very beautiful figure for many weeks. Mem. Acad. Par. 1727.

TANACETUM, *Tanzy*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, conſiſting of numerous ſmall floſcules, which are divided into many ſegments at the ends, are placed on the embryo ſeeds, and are contained in a ſort of ſcaly cup, of a ſemi-orbicular figure. The embryos ripen into ſeeds, which have no down adhering to them. To this it is to be added, that the flowers are collected into large cluſters.

The ſpecies of *Tanzy*, enumerated by Mr. Tournefort, are theſe: 1. The common yellow-flowered garden *Tanzy*. 2. The garden *Tanzy* with curled leaves. 3. The garden *Tanzy*, with the leaves and the ſmell of mint, called by authors, *corymbiferous mint*, and *coſtmary*. *Tourn.* Inſt. p. 461.

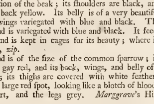
The leaves of the common *Tanzy*, either dried and given in decoction, or the expreſſed juice of them taken, are excellent in nephritic and hyſteric caſes. The good women in the country give the juice with great ſucceſs againſt worms, and in the colic. The infuſion of the dried plant is a remedy againſt flatulencies and colics, and is given in dropſies, and in ſuppreſſions of the menſes, and of the urine. It is pretended by ſome, that the diſtilled water deſtroys worms; but this is leſs probable.

TANGARA, in zoology, the name of a Braſilian Bird, of which there are two ſpecies: The firſt is of the ſize of the green-finch, and is of a fine ſhining ſea-green on its head and neck; and has a black ſpot on the front of the head, juſt above the inſertion of the beak; its ſhoulders are black, and the reſt of the back yellow. Its belly is of a very beautiful blue, and the wings variegated with blue and black. The tail is broad, and is variegated with blue and black. It feeds on vegetables, and is kept in cages for its beauty; where its only note is *zip*, *zip*.

The ſecond kind is of the ſize of the common ſparrow; its head is of a fine gay red, and its back, wings, and belly of a fine deep black; its thighs are covered with white feathers, and have each a large red ſpot, looking like a blotch of blood; the tail is ſhort, and the legs grey. *Marggrave*'s Hiſt. Braſil.

TANGARAC, a poiſonous Braſilian plant; but the root, ſays Piſo, is an antidote to the leaves, flowers, and fruit. *Boyle*, Works abr. vol. 1. p. 14.

TANGENT (*Cycl.*)—The definition of a *Tangent*, commonly given, is mentioned by Mr. Chambers; but it does not extend beyond the conic ſections; for in curves of higher orders a line may both touch and cut. A general definition is therefore neceſſary. As a right line is the *Tangent* of a circle, when it touches the circle ſo cloſely, that no right line can be



drawn through the point of contact between it and the arch, or within the angle of contact that is formed by them; ſo, in general, when a right line ET touches any arch of a curve, as EH in E, in ſuch a manner that no right line can be drawn through E, betwixt the right line ET and the arch EH, or within the angle of contact HET, that is formed by them, then is ET the tangent of the curve at E. *Maclaurin*'s Fluxions, Art. 181.

The *Tangent* of an arch is the right line that limits the poſition of all the ſecants that can paſs through the point of contact, though, ſtrictly ſpeaking, it is no ſecant. Ibid. Art. 505.

As to the methods of inveſtigating *Tangents* by Fluxions, ſee the ſaid treatiſe, book I. c. 7. where it is demonſtrated independently of infiniteſimals.

To determine the *Tangents* of curves, ſuppoſed to be deſcribed by the interſections of right lines revolving abour given poles. See Mr. *Maclaurin*'s Fluxions, Art. 210. ſeq.

In finding the tangents of curves by the method of infiniteſimal differences, it has been objected, that the concluſion is found by a double error. 1°. By taking the curve for a polygon of an infinite number of ſides. 2°. By the falſe rule for taking the differential of a power. But there is no need of ſuch ſuppoſitions in the method of fluxions, for it may be geometrically demonſtrated, that the fluxions of the baſe, ordinate, and curve, are in the ſame proportion to each other, as the ſides of a triangle reſpectively parallel to the baſe, ordinate, and *Tangent*. When the baſe is ſuppoſed to flow uniformly, if the curve be convex towards the baſe, the ordinate and curve increaſe with accelerated motions; but their fluxions at any term are the ſame as if the point which deſcribes the curve had proceeded uniformly from that term in the *Tangent*. Any farther increment which the ordinate or curve acquires, is to be imputed to the acceleration of the motions with which they flow. See *Maclaurin*'s Fluxions, Book. 1. chap. 7 and 8.

Any two arches of curve lines touch together, when the ſame right line is the *Tangent* of both at the ſame point. But when they are applied to each other in this manner, they never perfectly coincide, unleſs they be ſimilar arches of ſimilar and equal figures.

TANNERS *Bark*. This is a ſubſtance of prodigious uſe in gardening; and is the bark of the oak-tree chopped and ground into a ſort of coarſe powder, for the dreſſing of ſkins, after which uſe it becomes of ſervice to the gardener. Its fermentation is very laſting and very equal; hence it is the moſt valuable of all things for the making of hot-beds; and when it has ſerved to this uſe, and is thoroughly rotted, it makes a very valuable manure for land, one load of it doing as much ſervice as four loads of dung.

It has not been of very long uſe in England, and was brought to us from Holland in the reign of King William, and then uſed for the raiſing of orange-trees; but after this period it became diſuſed; and it is of a much later date that it has been brought into uſe again for the raiſing the pine-apple, ſince which time it is become generally uſed, wherever it is to be had, for all the purpoſes of the hot-bed, in raiſing tender plants.

There are ſeveral ſizes of this *tan*, and they heat in a different manner in proportion to their ſize, the ſmalleſt heating much quicker, and cooling again in a ſmaller time; and the largeſt acquiring its heat more gradually, but keeping it much longer. The ſkilful gardener therefore muſt uſe one or the other of theſe, or a mixture of both, according to the ſeveral occaſions he wants them for.

It ſhould always be taken within a fortnight after it comes out of the pit, and laid up in a round heap for a week, to drain out the moiſture; after which it ſhould be formed into a bed, and ſhould be laid at leaſt three feet thick. A hot-bed, properly prepared, of this ſubſtance, will retain a moderate heat ſix months. *Miller*'s Gardener's Dict.

TANNING (*Cycl.*)—The operation of *Tanning* is performed, on leather, better in the Weſt Indies than in England. They uſe three ſorts of bark, the mangrave bark, the olive bark, and another; and the whole buſineſs is ſo ſoon done, that a hide delivered to them is in ſix weeks ready to be worked into ſhoes, though they beſtow leſs labour than we do. Phil. Tranſ. N°. 36.

Every part of the oak-tree, of what age or growth ſoever, is fit for the tanners uſe, and all oaken coppice-wood, of any age or ſize, being cut and procured in barking-time, will tan all ſorts of leather, at leaſt as well as the bark alone. When this material is got at the proper ſeaſon, it muſt be very well dried in the ſun, more than the bark alone; thence it is to be cut up, and preſerved in a covered place for uſe.

When it is to be uſed, the greater wood muſt be firſt cleft ſmall, to fit it for the beating and cutting engine; and the ſmaller muſt be put into the engine as it is. Which done, it muſt be again dried upon a kiln, and after that ground in the ſame manner that the tanners grind their bark. Such wood as is to be uſed preſently after 'tis gotten, will require the better and the more drying upon the kiln; and if this is omitted, it will blacken and ſpoil all the leather it is uſed about. Where oak is ſcarce, black-thorn will tolerably well ſupply its place; and where that is not to be had in ſufficient plenty, the white thorn will do. Phil. Tranſ. N°. 108.

Birch alſo, being ordered in the ſame manner with oak, is fit for ſome uſes in *tanning*, particularly it does very well for *tanning* of ſhoe-ſoal leather. All theſe ingredients will *tan* much better than bark alone, and that with much leſs charge; ſo that this diſcovery may very well ſave the felling of trees when the bark is wanted, at a ſeaſon when the ſap is up, which, when 'tis done, cauſes the outſides of the trees to rot and grow worm-eaten; whereas if the trees had been felled in winter, when the ſap is down, they would have been almoſt all heart, as the people expreſs it, and not ſubject to worms. This manner of uſing the wood with the bark, in *tanning*, will alſo increaſe the value of underwoods very conſiderably. Phil. Tranſ. N°. 105.

The engine neceſſary for cutting the wood conſiſts of a long ſquare wooden block, and ſome pieces of iron to be faſtened on, and uſed about it, *viz.* a hammer, an anvil, an iron holding the wood to be bruiſed and cut, and a knife to cut it. The whole is a very ſimple and cheap machine, and is deſcribed at large, and figured in the above-mentioned number of the Philoſophical Tranſactions.

By Mr. de Buffon's experiments upon different ſkins, it was found that a decoction of young oak wood ſucceeded perfectly well in *tanning* ſheep and calves ſkins, but did not do equally well for ox, and the other harder ſkins. This, however, he imagines might be only for want of knowing the beſt method of uſing the wood. And certainly theſe trials deſerve to be farther proſecuted; ſince the ſmall branches of the oak, which are of little value, might be thus made to ſupply the place of a much dearer commodity, the bark; and as in many trees the bark of the young branches is found to be of greatly more virtue than that of the larger branches, or the trunk, the uſe of theſe ſmall boughs, bark and all, might very probably be found to anſwer to all the effects of the bark, of the larger kind alone. Memoirs Acad. Scien. Par. 1736. See the Phil. Tranſ. above cited.

TANT,

TANT, in natural hiſtory, an Engliſh name for a ſmall ſpider of the opilio kind, having only two eyes, and eight very long legs, and commonly ſuppoſed to be very poiſonous.

It is all over of an elegant ſcarlet colour, reſembling that of the flowers of the red poppy when full blown, except that the belly has a whitiſh caſt. Four of its legs are inſerted in the upper part of the breaſt, and the other four near the belly; and near the origin of each leg there is a ſmall black ſpot. Its body is round and full, and it is all over covered with a fine ſhort velvety down. It is not unfrequent in dry paſtures in the ſpring ſeaſon. It is terribly dreaded by our farmers, who ſuppoſe that an ox will die who chances to ſwallow it. *Ray's* Hiſt. Inſect. p. 44.

TANTALUS, one of the many names given by the chemiſts to mercury.

TANZY, *Tanacetum*, in botany, *&c.* See the article TANACETUM.

TAOS *Lapis*, the *Peacock Stone*, a name given by ſome of the antient writers to a very beautifully variegated agate, reſembling, in ſome degree, the great variety of colours in the peacock's tail.

TAP *Root*, in trees, that part of the root that deſcends ſtrait down.

In removing or tranſplanting young oaks, great care ſhould be taken not to wound this root, much leſs to cut it off; but it muſt be dug up to the bottom, and the hole prepared deep enough to ſet it; otherwiſe the tree either dies, or if not, yet it is always greatly ſtinted and impeded in its growth. *Ray's* Engliſh Words, p. 129.

TAPAYAXIN, in zoology, the name of a very remarkable ſpecies of lizard, called by Hernandez the *lacertus orbicularis*. It is not of the long and ſlender ſhape of the common lizards, but as broad as it is long, and much reſembling the wray-fiſh in ſhape, though ſeldom exceeding four inches in length or breadth. It is a cartilaginous lizard, of a very beautiful variety of colours, always very cold to the touch, and ſo ſluggiſh a creature, that it often will not move out of its place even on touching it. Its head is extremely hard and elate, and has a ſort of crown of prickles for its defence; yet it is a perfectly harmleſs animal, and ſo far from having the fear of man, and ſhyneſs that other beaſts have, that it loves to be taken up and played with, and will ſtand perfectly ſtill, and ſeem very happy while handled. There is alſo another thing very ſingular in it, that if hurt about the head or eyes, or handled too roughly, it will throw out drops of blood from its eyes to three or four foot diſtance. *Ray's* Syn. Quad. p. 263. *Hernandez*, l. 9. c. 16.

TAPE-*Worm*, a ſpecies of worm breeding in the human bowels, and called by authors, *tænia*, and *lumbricus latus*, or the broad worm.

The Greek and Roman phyſicians, as well as thoſe of our own time, have deſcribed three ſorts of worms to which the human bowels are ſubject. The common long worms, which reſemble earth-worms; the aſcarides, or ſmall worms; and this *Tape worm*, which they have alſo called *vermis cucurbitinus*, or the gourd worm, from its ſeveral joints reſembling, in ſome degree, the ſeeds of that fruit.

The interpreters of ſome of the Greek phyſicians have however been guilty of a great error, in confounding the gourd worms and the aſcarides together, tho' nothing can be more unlike. The antients ſeem to have had a very juſt opinion of this animal, in calling it *vermis cucurbitinus*, ſince it is plain by this, that they underſtood every joint, as we call them, of this creature, to be a diſtinct worm; and what we call the ſingle worm, to be a long ſeries of theſe worms joined together end to end.

Petrus de Abano was one of the firſt whom we find deſcribing the ſeries of theſe creatures forming a chain of this kind, and repreſenting a ſingle and very long animal. Arnoldus de Villa Nova mentions two kinds of theſe worms; but he gives no farther deſcriptions of them than ſaying, that one kind is broad and long, the other broad and ſhort. After theſe, he mentions the long and round worm, which is the common kind; and fourthly, the ſmall worm, or aſcarides. To theſe he adds a fifth, which he calls ſolium, from its being found ſingle in the bowels. This he alſo calls *cingulum*; and obſerves, that it is very long and large, and that only one can live in the bowels at the ſame time.

It has been ſuppoſed by ſome, that what this author deſcribes as a ſeparate ſpecies of worm, under the name of *ſolium*, was no other than a kind of ſacculus or bag incloſing a long ſeries of theſe *Tape-worms*.

The writers that ſucceeded ran into great errors about theſe worms: Some declared them a mere figment of the Arabian phyſicians, affirming that no ſuch animals ever exiſted in nature. Others who believed in general that there was ſuch a ſpecies of worm, yet diſcountenanced all the ſtories related concerning it; and many who wrote on theſe ſubjects, mentioned two kinds of the lumbricus latus, or broad worm, but knew nothing of what was the difference between them.

Another ſet of writers, of whom Platerus is the head, diſtinguiſh, by certain characters, two ſpecies of broad worms; the one, they ſay, is long and broad, and not jointed; the other jointed, or formed like a chain; this is the common *Tape-worm*, which they ſuppoſe to conſiſt ſingly of a number of joints, contrary to the opinion of Petrus de Abano; and they ſay, that the vermis cucurbitinus of the Arabian writers, is only one of the joints, or a fragment of the jointed tænia, ſometimes voided in this manner in ſeparate pieces. Finally, others confounding the cucurbitini with the aſcarides, if ever they chanced to ſee a real *Tape-worm*, looked on it as ſome monſtrous production; nothing that had any name. *Clerici* Hiſt. Nat. Lumbr. Lat.

In later times this animal has been better known, and Tyſon, Lewenhoeck, Andry, and others, have treated very carefully of it, and all have referred it to the ſecond kind of tæniæ, mentioned by Platerus, which was of the ſhape of a chain, or compoſed of ſeveral joints, like ſo many links faſtened end by end to one another. Yet theſe have fallen into errors; and whent hey have found ſeveral of theſe tæniæ conjoined and encloſed in a ſacculus, they have taken the whole for one worm, whoſe head and tail they have deſcribed, but that in an inaccurate manner.

The true hiſtory of this animal is, that it is ſhort and broad. What is called a link of the long worm is really a diſtinct worm; and when one of theſe mutiplies in the bowels, its young adhere to it, and to each other endwiſe, ſo as to form a ſort of chain, which lengthens as they continue to increaſe, and in fine becomes immoderately long. Hence it is that the breaking, as it is called, of this worm, does not deſtroy it, and that the voiding large pieces of it is no cure, ſince it ſtill recovers that length again by new young ones. Every ſeparate link of ſuch a chain, if examined, is found to be entire, lively and briſk, and not at all injured by the ſeparation.

Authors who have treated of theſe worms as a diſeaſe, have given a canine appetite, or unnatural appetite to food, as one of the ſymptoms; but this is wrong, for it has never been found, in reality, that theſe worms, even where moſt numerous, have at all increaſed the natural appetite; and indeed it is very difficult to judge of their being in the body by ſymptoms, ſince they occaſion none which are not alſo common in many other diſeaſes. Many people have had them a long courſe of time, without being ſenſibly hurt by them; and there has never been a known inſtance of their occaſioning any one's death; or indeed any conſiderable diſorder. See the article WORMS.

TAPECON, in ichthyology, a name given by ſome to the fiſh generally called the *uranoſcopus*, or ſtar-gazer. It is properly a ſpecies of the trachinus, and is diſtinguiſhed by Artedi by the name of the *trachinus* with ſeveral beards at the lower jaw. *Aldrovand.* de Piſc. p. 258.

TAPERA, in zoology, the name of a Braſilian ſwallow, called by the Portugueſe there, *andorintra*. It is of the ſize and ſhape of our ſwallow, and it flies about in the ſame manner. The head, back, neck, wings and tail, are all of a greyiſh brown; and its throat and breaſt of a greyiſh white. *Marggrave's* Hiſt. Braſ.

TAPETI, in zoology, the name of an animal common in the Weſt Indies, and called by ſome, *cuniculus Americanus*, the American rabbit.

It is exactly of the ſhape of our common rabbit, and is of about double the ſize of the dormouſe. Its hair in length and colour is like that of the hare, and its ears long and erect, in the manner of our rabbits. It has a little reddiſhneſs on the forehead, and is ſomewhat whitiſh under the throat. It has uſually alſo a ſort of white circle or collar round the neck; but ſome of this ſpecies want that, and have their whiteneſs only under the throat, breaſt, and belly. It has no tail; its eyes are black, and its mouth bearded in the manner of our rabbits. The Indians eat the fleſh of it. *Ray's* Syn. Quad. p. 205.

TAPHICESIUS *Lapis*, a name given by Pliny and the antients to a ſpecies of ætites, or eagle-ſtone, found in a place of that name near Leucadia.

TAPHNEUS, a word uſed by ſome writers to expreſs any thing when depurated or purified to the greateſt degree, as the ſalts by repeated ſolutions and cryſtallizations, and the like. Paracelſus uſes it for a ſpecies of earth, the things produced from which, he ſays, never alter their nature by calcination or reverberation, or the like operations.

TAPIA, in botany, a name given by Plumier to a genus of plants called afterwards by Linnæus, *crateva*. *Plum.* Gen. 21. See the article CRATEVA.

TAPIJERETE, in natural hiſtory, the name of an animal found in ſome parts of America, and called by the Portugueſe, *anta*. It is of the ſize of a young calf, and in ſhape ſomewhat approaching to the figure of the hog. Its head is thicker than a hog's, and ends in a ſharp ridge at top; and has a ſnout hanging over the opening of the mouth, in which he has a very ſtrong muſcle, ſerving to retract it at pleaſure. The dentes inciſores are ten in each jaw; from the end of theſe the jaw ſeems toothleſs for a little ſpace. The grinders are large, and are placed five on each ſide; ſo that, on the whole, the creature has twenty of each ſort of teeth. Its eyes are ſmall, and very like thoſe of the hog; its ears roundiſh; and theſe he can draw forward at pleaſure. Its legs are thick, and not longer than thoſe of our hogs. Its hoofs are divided into four portions. It has no tail; the ſkin is hard and ſolid; and the hair ſhort, and of a pale brown, variegated with white ſpots. It lives in the thick woods, and ſleeps all day; but at night, or early in the morning, goes out for its prey. It feeds on

vegetables, and is particularly fond of the stalks of the sugar-cane; it often takes the water, and swims excellently. The natives, in places where it is common, eat its flesh; which is but very coarse and ill tasted. *Ray's* Syn. Quad. p. 140.

TAPINOSIS, Ταπείνωσις, in rhetoric, the same with *diminution*. See the article DIMINUTION, *Cycl.*

TAPLINGS, in the English salt-works, the name given to certain bars of iron which support the bottom of the pan in which the brine is boiled.

These pans are very large, and cover a wide furnace; but as their width would make them apt to bend in the middle, which would spoil the working the salt, there is a sort of wall of brick carried along the middle of the furnace; and on the top of this are placed these *Taplings*: They are about eight inches high, and from four to six in thickness, being smallest at the top. These are placed at about three foot distance one from another, and the wall which supports them, and which is called the *midfeather*, is broad at the base, and so narrow at the top, as barely to give room for the bases of the *Taplings*.

TAPPING (*Cycl.*)—In *tapping* for the dropsy, surgeons were formerly very careful to draw off only a small quantity of water at one time, and therefore repeated it often, till the whole was evacuated. The reason of this was to avoid the syncope, which usually attended the operation when all the water was evacuated at once. But Dr. Mead having discovered the true cause of this syncope to be owing to the removal of the pressure from the descending aorta, it was soon found, that the bad consequences might be prevented by emptying the belly at one operation, and preserving a proper pressure at the same time, which should be done equally and gradually, as the water runs out. Bandages have been contrived for this purpose in England and in France; but, according to Mr. Monro, they are not sufficient; and he therefore invented a belt made of fine flannel, and strong linnen, which will better answer the purpose. For the draught and description of this belt, we refer to the Medic. Ess. Edinb. vol. 1. art. 18. or its abridgment, vol. 2. p. 102. where the curious may find several practical observations about this operation.

Tapping has seldom proved more than a palliative remedy in dropsies. The chief improvements in the operation are owing to Mr. Monro, Monsieur Garengeot, and Mr. Warwick.

Mr. Monro has substituted a belt instead of the ordinary long bandage for compressing the abdomen; and has also ascertained the proper place of puncture. Garengeot makes the evacuation at once, cleans the emptied cavity, to remove the feculent part of the waters which subsides therein, and is apt, by its acrimony, to occasion mortifications.

Mr. Warwick tells us, however, that notwithstanding these improvements, an ascites shews, that the use of *Tapping* is but precarious, by returning as constantly as ever this method alone is put in practice to remove it. He has therefore endeavoured at a farther improvement, whereby the *Tapping*, instead of being a bare temporary relief of symptoms, becomes an absolute cure. This method is, after evacuating the waters, to make an injection of equal parts of cahors, wine, or claret, and Bristol water, blood-warm, into the emptied cavity. He mentions a cure he performed in this manner. See Phil. Transf. N°. 472. Sect. 3.

Dr. Hales has given us, in the same transaction, sect. 4. a method of conveying liquors into the abdomen during the operation of *tapping*, by means of two trocars fixed at the same time one on each side of the belly, one of them having a communication with a vessel full of the medicinal liquor, by means of a small leather pipe. This vessel might be raised high enough above the abdomen to force the liquor in by the laws of hydrostatics. The advantage proposed by this method, is to prevent a syncope from inanition. See a farther account of the success of injecting medicated liquors into the abdomen, in the case of an ascites, in Phil. Transf. N°. 473. Sect. 4.

TAR (*Cycl.*)—The antients esteemed *Tar* good against poisons, ulcers, the bites of venomous creatures; also for pthisical, scrophulous, paralytic and asthmatic persons. But the method of rendering it an inoffensive medicine, and agreeable to the stomach, by extracting its virtues in cold water, was unknown to them. Siris, Sect. 9. See the article TAR-*Water*, infra.

According to Pliny, liquid pitch, as he calls it, or *Tar*, was obtained by setting fire to billets of old fat pines or firs. The first running was *Tar*, the latter, or thicker running, was pitch. Theophrastus is more particular; he tells us, that the Macedonians made huge heaps of the cloven trunks of those trees, wherein the billets were placed erect beside each other. That such heaps or piles of wood were sometimes an hundred and eighty cubits round, and sixty, or even an hundred high; and that, having covered them with sods of earth, to prevent the flame from bursting forth (in which case the *Tar* was lost) they set on fire those huge heaps of pine or fir, letting the *Tar* and pitch run out in a channel made for that purpose. Siris, Sect. 13.

Some modern writers inform us, that *Tar* flows from the trunks of pines and firs, when they are very old, through incisions made in the bark near the root; that pitch is only *Tar* inspissated, and both are the oil of the tree grown thick and black with age and the sun. The trees, like old men, being unable to perspire, and their secretory ducts obstructed, they are, as one may say, choaked and stuffed with their own juice [a]. But the method used by our colonies in America for making *Tar* and pitch, is, in effect, the same with that of the antient Macedonians; as appears from the account given in the Philosophical Transactions. And the relation of Leo Africanus, who describes, as an eye-witness, the making of *Tar* on mount Atlas, agrees in substance with the methods used by the Macedonians of old, and the people of New England of this day [b].—[[a] Siris, Sect. 16. [b] Id. Sect. 17.]

According to Theophrastus, not only the turpentine-trees, the pines, and the firs, yield resin or *Tar*, but also the cedars and palm-trees; and the words *pix* and *resin* are taken by Pliny in so large a sense, as to include the weepings of the lentiscus and cypress, and the balms of Arabia and Judæa; all which perhaps are near of kin, and in their most useful qualities concur with common tar, especially the Norwegian, which is the most liquid and best for medicinal uses. Those trees that grow on mountains, exposed to the sun or north wind, are reckoned to produce the best and purest *Tar*; and the Idæan pines were distinguished from those growing on the plane, as yielding a thinner, sweeter, and better scented *Tar*. Id. Sect. 28.

Tar in substance, mixed with honey, has been found an excellent medicine for coughs. Id. Sect. 21.

TAR-*Water*. As the cold infusion of *Tar* has been lately much in vogue, and has been recommended by one of the most learned and ingenious writers of the age, it may not be improper to give some account of its virtues from the bishop of Cloyne's *Siris*, or Chain of Reflections concerning the Virtues of *Tar-water*.

In some parts of America, *Tar-water* is made by putting a quart of cold water to a quart of *Tar*, and stirring them well together in a vessel, which is left standing till the *Tar* sinks to the bottom. A glass of clear water being poured off for a draught, is replaced by the same quantity of fresh water, the vessel being shaken, and left to stand as before. And this is repeated for every glass, so long as the *Tar* continues to impregnate the water sufficiently, which will appear by the smell and taste.

But as this method produces *Tar-water* of different degrees of strength, the author says, he chuses to make it in the following manner: Pour a gallon of cold water on a quart of *Tar*, and stir and mix them thoroughly with a ladle or flat stick, for the space of three or four minutes; after which the vessel must stand eight and forty hours, that the *Tar* may have time to subside; when the clear water is to be poured off, and kept for use, no more being made from the same *Tar*, which may still serve for common purposes.

This cold infusion of *Tar* hath been used in some of our colonies as a preservative or preparative against the small pox, which foreign practice induced the bishop to try it in his own neighbourhood, when the small pox raged with great violence. He says, the trial fully answered his expectation; all those within his knowledge, who took the *Tar-water*, having either escaped that distemper, or had it very favourably. Several were preserved from taking the small-pox, by the use of this liquor; others had it in the mildest manner; and others, that they might be able to take the infection, were obliged to intermit drinking *Tar-water*. He says, he has found it may be drank with great safety and success for any length of time, and this not only before, but also during the aforesaid distemper.

The general rule for taking it, is about half a pint night and morning, on an empty stomach, which quantity may be varied according to the case and age of the patient, provided it be always taken on an empty stomach, and about two hours before or after a meal.

It has been found, that several persons infected with cutaneous eruptions and ulcers, were immediately relieved, and soon after cured, by the use of this medicine. It is said, that even in the foulest distempers, it proved much more successful than salivations and wood-drinks had done. It also succeeded beyond expectation, in a tedious and painful ulceration of the bowels, in a consumptive cough, and (as appeared by expectorated pus) an ulcer in the lungs, in a pleurisy and peripneumony. And when a person who had been for some years subject to erysipelatous fevers, perceived the usual forerunning symptoms to come on, the drinking of *Tar-water* prevented the erysipelas.

Tar-water cures indigestion, and gives a good appetite. It is an excellent medicine in an asthma; it imparts a kindly warmth, and quick circulation to the juices, without heating, and is therefore useful, not only as a pectoral and balsamic, but also as a powerful and safe deobstruent in cachectic and hysteric cases. As it is both healing and diuretic, it is very good for the gravel. The bishop says, he believes it to be of great use in a dropsy, having known it cure a very bad anasarca in a person whose thirst, though very extraordinary, was in a short time removed by the drinking of *Tar-water*. It may likewise be safely used in inflammatory cases; and, in fact, hath been found an admirable febrifuge, at once the safest cooler and cordial.

The salts, and more active spirits of *Tar* are got by infusion in cold water; but the resinous part is not to be dissolved thereby.

thereby. Hence the prejudice which ſome, perhaps, may entertain againſt *Tar-water*, the uſe whereof might inflame the blood, by its ſulphur and reſin,as a medicine, appears to be not well grounded. It is obſerved by chemiſts, that all ſorts of balſamic wood afford an acid ſpirit, which is the volatile oily ſalt of the vegetable. Herein is chiefly contained their medicinal virtues; and this author affirms, that by the trials he has made, it appears, that the acid ſpirit in *Tar-water* poſſeſſes the virtues, in an eminent degree, of that of guaiacum, and other medicinal woods.

It is certain *Tar-water* warms, and therefore ſome may perhaps ſtill think it cannot cool. The more effectually to remove this prejudice, let it be farther conſidered, that, as on one hand, oppoſite cauſes do ſometimes produce the ſame effect; for inſtance, heat by rarefaction, and cold by condenſation, do both increaſe the air's elaſticity; ſo, on the other hand, the ſame cauſe ſhall ſometimes produce oppoſite effects. Heat, for inſtance, in one degree thins, in another coagulates the blood. It is not therefore ſtrange, that *Tar-water* ſhould warm one habit, and cool another; have one good effect on a cold conſtitution, and another good effect on an inflamed one; nor, if this be ſo, that it ſhould cure oppoſite diſorders. All which juſtifies to reaſon, what has often been found true in fact. The ſalts, the ſpirits, the heat of *Tar-water*, are of a temperature congenial to the conſtitution of a man, which receives from it a kindly warmth, but no inflaming heat. It is of admirable uſe in fevers, being at the ſame time the ſureſt, ſafeſt, and moſt effectual both paregoric and cordial; for the truth of which the biſhop appeals to any man's experience, who ſhall take a large draught of it milk warm, in the paroxiſm of a fever, even when plain water and herb teas ſhall be found to have little or no effect. To him it ſeems, that its ſingular and ſurprizing uſe in fevers of all kinds, were there nothing elſe, would be alone ſufficient to recommend it to the public. As *Tar-water* poſſeſſes the virtues of fortifying the ſtomach, as well as purifying and invigorating the blood, it may be preſumed of great and general efficacy in all thoſe numerous illneſſes, which take their riſe from foul or vapid blood, or from a bad digeſtion. The animal ſpirits are elaborated from the blood; ſuch therefore as the blood is, ſuch will be the animal ſpirits, more or leſs, weaker or ſtronger. This ſhews the uſefulneſs of *Tar-water* in all hyſteric and hypochondriac caſes; which, together with the maladies from indigeſtion, comprize almoſt the whole tribe of chronical diſeaſes. In very dangerous and acute caſes, much may be taken, and often, as far as the ſtomach can bear. But in chronical caſes, about half a pint, night and morning, may ſuffice. A medicine of ſo great virtue in ſo many different diſorders, and eſpecially in that grand enemy the fever, muſt needs be a benefit to mankind in general. There are nevertheleſs three ſorts of people to whom the biſhop ſays he would peculiarly recommend it; ſea faring perſons, ladies, and men of ſtudious and ſedentary lives.

To ſailors, and all ſea-faring perſons, who are ſubject to ſcorbutic diſorders, and putrid fevers, eſpecially in long ſouthern voyages, he is perſuaded this *Tar-water* would be very beneficial. And this may deſerve particular notice, when ſo many of our countrymen have periſhed by ſuch diſtempers, contracted at ſea, and in foreign climates, which, it is probable, might have been prevented by the copious uſe of *Tar-water*.

This ſame water will alſo give charitable relief to the ladies, who often want it more than the pariſh poor; being many of them never able to make a good meal, and ſitting pale, puny, and forbidden like ghoſts, at their own table, victims of vapours and indigeſtion. Studious perſons alſo pent up in narrow holes, breathing bad air, and ſtooping over their books, are much to be pitied; as they are debarred the free uſe of air and exercife; this, he ſays, he will venture to recommend as the beſt ſuccedaneum to both. Though it were to be wiſhed, that modern ſcholars would, like the antients, meditate and converſe more in walks and gardens, and open air; which, upon the whole, would perhaps be no hindrance to their ſtudies.

It has been inſinuated, that *Tar-water*, made in the common way, as here deſcribed, contains noxious oils or particles of *Tar*, which renders it dangerous to thoſe who drink it. But the biſhop ſays, this is contrary to all his experience, and that *Tar-water* is ſo far from doing hurt by any cauſtic or fiery quality, that it is, on the contrary, a moſt potent medicine for the allaying of heat, and curing of all inflammatory diſtempers.

It has alſo been publickly aſſerted, that the acid juice of *Tar*, freed from the volatile oil, is much more ſafe and efficacious than *Tar-water*. But the above-mentioned author is of opinion, that if *Tar-water* be robbed of its fine volatile oil (which neither ſinks to the bottom, nor floats at the top, but is intimately united with it, and appears to the eye only in the colour of *Tar-water*) it can be no cordial, he having obſerved, that the moſt acid water is the leaſt cordial; ſo far is he from imputing the whole virtue to the acid, as ſome have thought. See *Two Letters from the Biſhop of Cloyne*, &c. publiſhed 1747.

The ſame author obſerves, that the uſe of *Tar-water*, made a ſecond time from the ſame *Tar*, is not at all noxious, or of a fiery cauſtic nature, only it is not ſo ſtrong as that firſt made. If it be aſked, what preciſe quantity or degree of ſtrength is requir'd in *Tar-water*? it is anſwered, that the palate, the ſtomach, the particular caſe and conſtitution of the patient, the very ſeaſon of the year will diſpoſe and require him to drink more or leſs in quantity, ſtronger or weaker in degree. Preciſely to meaſure its ſtrength by a ſcrupulous exactneſs, is by no means neceſſary.

It is to be obſerved, that *Tar-water* ſhould not be made in unglazed earthen veſſels, theſe being apt to communicate a nauſeous ſweetneſs to the water.

The ſame ingenious author recommends *Tar-water* in the plague, and for the diſtemper among the horned cattle now raging; with what ſucceſs muſt be left to experience.

TARABE, in zoology, the name of a Braſilian parrot, larger than the common green parrot. Its general colour is green; but its head, breaſt, and the origin of its wings, are red. Its beak and legs are of a duſky grey. *Marggrave's* Hiſt. Braſ.

TARAE *Lapis*, the name given by the writers of the middle ages to a ſtone which they ſay had the power of ſtopping all ſorts of fluxes. They have left us no deſcription of it, and it ſeems to have been loſt even in their times; for they obſerve that the phyſicians uſed the ſanguis draconis, or dragon's-blood, in its place.

TARAGUICO *Aycuraba*, in zoology, the Braſilian name for a ſpecies of lizard, much approaching to the nature of the taraguira; but its tail is covered from its beginning with ſmall triangular ſcales, and very regularly marked with four brown ſpots. The back alſo, particularly that part which is next the head, is variegated with undulated brown lines. *Ray's* Syn. Quad.. p. 266.

TARAGUIRA, in zoology, the name of an American lizard. It grows to about a foot long; its body is rounded, and every where covered with ſmall triangular duſky grey ſcales. Its back is ſmooth, and it has not that falſe gullet under the throat which the iguana has.

This is the ſpecies of lizard of which it is reported, that it will wake a ſleeping perſon, if it ſee him in danger of being bitten by a ſerpent. It is very common about houſes and gardens in South America, and runs very ſwiftly, but with a waddling motion; and when it ſees any thing at a diſtance, has an odd way of nodding its head very ſwiftly. *Ray's* Syn. Quad. p. 266.

TARANDUS, in zoology, a name given by Agricola, and ſome other authors, to the rein deer. See the article RANGIFER.

TARANIOLO, in zoology, a name by which the whimbrel, or ſmall curlew, called the *arquata minor* by authors, is known in the markets of Italy. *Ray's* Ornithology. p. 217.

TARANTULA, (*Cycl.*) in zoology, a name given by the Italians to a peculiar ſpecies of lizard, called by Aldrovand and ſome others, *lacertus facetanus*. See Tab. of Quadrupeds and Serpents, N°. 36.

It is of a grey colour; its ſkin is extremely rough; and it is thicker and rounder bodied than the other lizards. It is found like our common eft, under old walls, and among the ruins of buildings, particularly in the neighbourhood of Rome, in great plenty; its colour looks dead and ghaſtly, and it is as odious to the ſight among the Italians, as the toad is with us, being never ſeen without a ſort of natural horror. It is eſteemed alſo a poiſonous creature, as the toad is with us, tho' it is not eaſy to find well-atteſted ſtories of any bodies ever having been hurt either by the one or the other of theſe creatures. *Ray's* Syn. Quad. p. 264.

TARBASON, a word uſed by ſome chemical writers as a name for antimony.

TARCONANTHUS, in botany, the name of a plant deſcribed by Vaillant, the characters of which are the ſame with thoſe of the parthenium. *Vaillant*, A. G. 1719. See the article PARTHENIUM.

TARDA *Avis*, in zoology, a name given by many to the buſtard, more commonly known among authors by the name *otis*. *Ray's* Ornithology, p. 129. See the article OTIS.

TARDO, in the Italian muſic, is uſed to denote a ſlow movement, being much the ſame as *largo*. See the article LARGO.

TAREIBOIA, in zoology, the name of a ſpecies of ſerpent found in America, and called alſo *cacaboia*; though, according to ſome authors, the *Tareiboia* and *cacaboia* are two different ſpecies.

They are both of the amphibious kind, and live in lakes and waters, as well as on land; but they are not very poiſonous. They are ſmall ſnakes, and all over black; when offended, they will bite; but the wound is eaſily curable. Authors have written differently of theſe ſerpents, ſome making the latter very different from the former, and of a yellow colour. *Ray's* Syn. Anim. p. 329.

TAREIRA, in ichthyology, the name of a fiſh caught in the American ſeas, and eaten; but of no fine flavour.

It is of an oblong and thick body, gradually tapering toward the tail. Its head reſembles that of a ſnake, and is raiſed into two tubercles over the eyes: Its eyes are yellow, with a black pupil; its noſe pointed, and its mouth large and yellow within. It has extremely ſharp teeth in both its jaws, and on its tongue. It has eight fins, the tail being accounted one, and this is forked; but this, as well as the reſt, is of the conſiſtence of a poppy leaf, tender, thin, and ſoft, and ſuſtained by ſoft rays. Its ſcales are ſo nicely laid on one another, that it ſeems ſmooth to the touch. Its belly is white, and its back and ſides are variegated with longitudinal green and yellow lines. *Marggrave's* Hiſt. Braſ.

TARGAR, a name given by fome of the chemical writers to oil of juniper.

TARIERA, in ichthyology, the name of a river-fifh caught in many parts of America.

It is an oblong fifh, with a ftrait back, and a belly fomewhat hanging down. Its under jaw is longer than its upper, and its teeth are extremely fharp. Among thefe there are two longer than the reft in the middle of the under jaw, and four fuch in the upper. Its fcales are large, and its back brown, and its belly and fides whitifh. It is a well tafted fifh, but full of bones. *Marggrave's* Hift. Braf.

TARIFILON, in botany, a name by which Avicenna, and fome other authors, have called the *trifolium bituminofum*, or ftinking trefoil. *Ger. Emac.* Ind. 2.

TARIN, in ornithology, a name given by the French, and from them by many others to the *Citrinella*; a bird common in Italy, and kept in cages for its beauty and fine notes. *Ray's* Ornithol. p. 93. See the article CITRINELLA.

TARINGTING, in natural hiftory, a name given by the people of the Philippine iflands to a fpecies of lapwing which is common on the fea-fhores, and runs remarkably fwift.

TARITH, one of the many names given by the chemifts to mercury. See the article MERCURY.

TARRAGON, in botany. See the article DRACUNCULUS.

TARROCK, in zoology, the name of a fea-fowl of the larus or gull-kind, and diftinguifhed by authors by the name of the *larus cinereus Bellonii*.

It is of the fize of the common pigeon, and is not much unlike it in fhape, except that the head is larger and thicker. Its tail is not forked; and its throat, breaft and belly, are fnow-white. Its head and the outer part of its neck are alfo white; but there is on each fide of the head a black fpot. The lower part of the neck is black; and the middle of the back and the fhoulders are grey. Its long wing feathers are black and white. Its great diftinction, however, from all the other birds of the gull kind, is, that it has no hinder toe. It is very common on the coafts of Cornwal, and fome other of the Englifh fhores. *Ray's* Ornithol. p. 264.

TARSI, in the materia medica, a name by which fome authors have called the root of the *cyperus efculentus*, or fweet cyperus of the fhops; and by which it is in fome places ufually called by the druggifts. *Dale's* Pharm. p. 257.

TARSO, in the glafs-trade, a fort of white ftone found in many rivers of Italy, and other places; and ufed inftead of fand for the fineft cryftal glafs, being firft burnt, and calcined with the falt of the polverine into frit. *Neri's* Art of Glafs, p. 7.

Neri calls this ftone a kind of white marble; and adds a general rule, that all ftones that will ftrike fire with fteel, are fit to vitrify; and thofe that will not ftrike fire with fteel, will never vitrify.

The criteria or determinate characters of foffils were not at all fixed in this author's time, otherwife he had not called this ftone a kind of marble; fince his own general rule of trying ftones by fteel, is, though liable to a few exceptions, a very good one; and, according to that, this *Tarfo* could be of no affinity to marble; for marble will not ftrike fire with fteel, nor ever be converted into glafs.

The great difference of ftones is this; fome are compofed of cryftal, varioufly debafed by adventitious matter; others of fpar, debafed in the fame manner. All cryftal will give fire with fteel; all fpar will refufe this. Flints, fand, and the harder ftones, are compofed of cryftal; and will therefore give fire with fteel, and vitrify or make glafs with the addition of falts. Marble, and other foft ftones, are compofed of fpar; and can neither give fire with fteel, nor make glafs, but readily calcine in the fire.

The *Tarfo* therefore, of this and other authors, could be nothing of the marble kind; but is truly a cryftalline matter debafed by an admixture of white earth, and found in form of fmall pebbles of a whitifh, yellowifh, or pale reddifh colour; and this is common in all the gravel-pits of England, and in the beds of fome of our rivers; and might be ufed with great advantage by our glafs-makers, if they knew it was fo eafily to be had.

On comparing thefe ftones of ours, with the cuogolo or *Tarfo* of the foreign glafs-makers, there is no difference diftinguifhable to the eye, nor will the niceft experiments by the fire, acid menftrua, *&c.* fhew the leaft diftinction between them. We are not to wonder however, that the glafs-makers did not hitherto diftinguifh this to be the true cuogolo or *Tarfo*, fince the characters of foffils have been hitherto fo little afcertained, that the beft and lateft author on thefe fubjects, Dr. Woodward, fo far miftook the ftructure of this ftone, as to call it a fparry pebble. It is certain that fpar could never have any thing to do with glafs-making; but this ftone has no fpar in its compofition.

TARSUS (*Cycl.*)—*Bones of the* TARSUS *luxated*. If any of the fmall bones in the foot, the *tarfus* or *metatarfus* happen to be luxated by fome external violence, the ligaments with the adjacent nerves and tendons, are generally fo affected as to excite not only the moft acute pains, but alfo violent inflammations and convulfions, and even death itfelf has been known to be the confequence of accidents of this kind, unlefs the bones be fpeedily replaced. The foot is for this purpofe to be extended on an even table, and the furgeon is to replace the diflocated bones with the preffure of the palms of his hands, adjufting them alfo with his fingers, where need requires. Compreffes dipped in warm fpirit of wine are then to be laid on the part, and both thefe and the reduced bones fecured in their places, by means of the proper bandages; the patient is then to be enjoined to remain in bed till the new fet bones have acquired a fufficient ftrength. *Heifter's* Surg. pag. 174.

TARTAR (*Cycl.*)—The fweet wines afford always lefs *Tartar* than the fharp ones, and it is alfo lefs valuable. The *Tartar* of Rhenifh wine, is better than that of any other; and in general, thofe wines which have the moft acid in them, afford the greateft quantity of *Tartar*, and that in the largeft cryftals. It is objected by fome to this fyftem, that vinegar affords no *Tartar*; but this is eafily anfwered, by obferving, that the wine from which vinegar is made, has before depofited its *Tartar*. This falt of wine may be by chemiftry reduced to elementary water, in this manner: let it be burnt to a fixed falt, and let this fixed falt of *Tartar* be diffolved by ftanding in a damp place into an oil *per deliquium*; let this oil be diftilled in an alembic, and a phlegm only comes over: by repeating this procefs, the whole will be reduced into perfect fimple and infipid phlegm, excepting a fmall remainder of equally infipid earth. *Portzius* de Vin. Rhen.

Befide the ufual way in which *Tartar* is produced, there is a very remarkable account in the Memoirs of the Academy of Sciences at Paris, of its having been found in a more than ordinary beautiful ftate on a human fkull; the difcovery was owing to accident, and was in this manner:

Mr. Morand wanting a human fkull cleanfed from its foft parts, put into a dunghill of horfe-dung a whole human head; after it had lain there eight days, the flefhy parts eafily feparated, being as it were boiled to pieces; after this the fkull was carefully wafhed, and then laid to foak for ten days in a large veffel of water; after this it was drenched three or four times in frefh water, and finally, without wiping, was fet out in the air to dry. As it dried it became covered with little cryftals, compofed of feveral planes or traces, but moftly of a cubic form, very bright and glittering; and when expofed to the light, of an extremely brilliant water. There were none of them on the bafis of the cranium, which was full of irregularities; but they all arranged themfelves on the upper part above the orbitary hollows; to the jaw-bones there were alfo many faftened, as alfo to the teeth; thefe laft were yellow, but they were not lefs bright and brilliant than the reft.

On examining thefe cryftals they were found to be *Tartar*, but in a purer ftate than *Tartar* is ever ufed to appear in; and as it was foon judged that though thefe cryftals owed their prefent form and extreme beauty to the fkull, yet they could not be wholly produced from it, the whole matter was carefully examined, and it was found that there had been lees of wine in the veffel in which the fkull had been laid ten days in foak. Mem. Acad. Par. Ann. 1737.

The formation of the cryftals of this *Tartar* on the fkull, while the fides of the veffel had none concreted on them, fhews that the fkull had a difpofition for receiving the cryftals more than any other body; and their peculiar brightnefs proves, that it had fome fhare in their formation.

The ufual method of refining *Tartar* is this: Take two pounds of common white *Tartar* reduced to powder, and put it into five gallons of fair water; put it over the fire to boil, and in the mean time beat up the whites of two or three eggs, mix thefe among the liquor, and fkim it as it heats; finally ftrain it and fet it in a cool place for two days, at the end of which time a quantity of whitifh cryftals will be found fticking to the fides of the veffel.

This is a very troublefome and inconvenient procefs, the *Tartar* requiring fo very large a quantity of water to diffolve it; and the operation muft alfo be repeated more than once, to make the cryftals fine. Veffels of metal cannot be employed, becaufe the *Tartar* would corrode them; and earthen ones of fize to make large quantities, are not eafily procured. In many arts the crude *Tartar* does as well as the refined; but in many other occafions none but the refined can be ufed. It were therefore much to be wifhed, that we could get into a method of refining it here, as they do in France. *Shaw's* Lectures, p. 158.

A great affiftance in the diffolving of *Tartar* is had from adding lime-water, pot-afhes, or falt of *Tartar*; and if the alkali be here too great, it may be taken off by a proper quantity of oil of vitriol. But where a very pure *Tartar* is required, the beft method of obtaining it is to diffolve the common cryftals or cream of *Tartar* in water, made highly acid with oil of vitriol. For this folution, after a proper evaporation, will afford perfectly fine cryftals of *Tartar*, no way participating of the oil of vitriol.

The glafs-men are very fond of a preparation, which they call burnt *Tartar*. This is no more than the larger lumps of red *Tartar*, burnt or calcined in earthen pans in an open fire till they have done fmoaking, and is of a blackifh purple colour. *Neri's* Art of Glafs, p. 69.

Soluble

Soluble TARTAR. The process for making *soluble Tartar*, is this: Take of an alkaline fixed salt a pound, of water a gallon; and having dissolved the salt in this water boiling, throw in crystals of *Tartar* in powder as long as any fermentation is raised, which usually ceases before thrice the weight of the alkali is thrown in. Then strain the liquor through paper; and after due evaporation set it by for the salt to crystallize, or else evaporate the liquor wholly away, that the salt may be left dry.

This salt by the action of the alkali on the acid of *Tartar*, being freed from those gross terrestrious parts, with which the crystals of *Tartar*, how pure soever, remain still charged; it dissolves readily, and keeps suspended in cold water. *Pemberton's* London Dispensatory, p. 181. seq.

The several alkaline salts, that of *Tartar* itself, the common pot-ashes, borax, &c. all make a very good *soluble Tartar*; and not only these but the common terrestrial alkali's, whether of the mineral kingdom as chalk or lime, or of the vegetable, as the ashes of plants after elixiviation; or of the animal, as oyster-shells calcined or not calcined, and hartshorn; all these give a better or worse *soluble Tartar*; but of these none succeeds so well as the oyster-shell, after it has been calcined; the *soluble Tartar* prepared with this, costs also greatly less, than when prepared with salt of *Tartar*.

In wood-ashes there is always a part, which when mixed with water swims, and is suspended in it a long time, and at length subsides into a kind of soft and impalpable matter; and another part, which subsides readily to the bottom, and feels rough and harsh. It is the first of these substances alone, which being mixed with cream of *Tartar*, renders it soluble: The other part will not mix with the cream of *Tartar*, or produce any such effect, unless reduced to the nature of the first, by repeated and violent calcinations, and then only a part becomes so altered, the whole never is so. It appears that the first portion has been wholly divested of its acid by the fire, and thence is become susceptible of the impression of the weakest acid, such as is that of the cream of *Tartar*; but in the second, or coarser part, the acid it naturally contained remains fixed and concentrated, so that it is not susceptible of any impression from the weak acid of the cream of *Tartar*. Mem. Acad. Par. 1733.

The different kinds of *soluble Tartar* have also their different degrees of solubility, or different readiness to run into a liquor *per deliquium*. The most easily soluble of all others are those made with chalk, with lime, and with wood-ashes; and that which is most differently so, is the kind made with borax; it will at length run however, and is truly *soluble Tartar*.

Regenerated TARTAR. When cream of *Tartar* has been made soluble by any alkaline substance whatever, it may be revived or regenerated into cream of *Tartar* again; its acid in this state has dissolved the alkaline matter presented to it, and that has been itself attenuated in such a manner as to render it capable of insinuating itself between the molecules or integrant parts of the constituent matter of the cream of *Tartar*; on this only depends the solubility of this preparation: and to render the whole of its primitive nature again, there requires no more than the addition of a new acid, which shall free the *Tartar* from this alkali; but this must necessarily be stronger than that naturally in the *Tartar*. Thus spirit of nitre, or oil of vitriol, regenerate the *soluble Tartar* in a moment, as being more powerful acids than that in the cream of *Tartar* and therefore taking from it all its alkali's.

It might be supposed also, that these being mineral acids, and that of the *Tartar* a vegetable one, they might therefore be the more proper to take up its alkali's; but this is found not to be the case, for the acid of distilled vinegar, which is not only a vegetable acid, but is also the very same acid with that of *Tartar*, is also able to regenerate the soluble *Tartars*. It might seem wonderful that this should be able to effect this change without any superiority of force; but it is to be observed, that in the cream of *Tartar* the acid has a terrestrial and alkaline basis, which is natural to it in that form; but in the state of *soluble Tartar* it takes a new alkaline basis, which is not natural to it, but is such as the artist gives it; and when we view the process in this light, it does not appear wonderful that an acid of its own kind should be able to take away from it this artificial alkaline basis, though it was not able to take from it the natural one. Mem. Acad. Par. 1733.

This second or artificial basis is different, according to the different alkali's which have been employed to render the *Tartar* soluble, and consequently the same acid may attach itself more to one than to another of those alkali's, and quit them the more or less easily. There is one kind of *soluble Tartar* however, which is not to be regenerated at all; this is that, which is made with borax.

Dr. Huxham says, he as often experienced the good effects of *regenerated Tartar* in the cure of obstructions of the bowels, and for sluggish humours. See the article OBSTRUCTIONS *of the Bowels*.

TARTARI *Lixivium*. See the article LIXIVIUM *Tartari*.

TARTARON, a sort of fine cloth or silk, mentioned in the stat. 4 Hen. VIII. c. 6. *Blount*, *Cowel*.

TARTARUM *Tartarisatum*, *Tartaris'd Tartar*, in chemistry, the name of a preparation of *Tartar*; the manner of doing which is given by Boerhaave, and is as follows: Reduce some of the purest white *Tartar* to powder, and boil this powder in ten times its weight of water in a large copper vessel, till it appears perfectly dissolved; let it after this continue boiling till the liquor become tolerably transparent, and of an acid taste; then drop into it from on high oil of *Tartar per deliquium*, the liquor being still kept boiling; upon the falling in of each drop there arises a great ebullition, occasioned by the meeting of the acid and alkali. Large bubbles appear on this, and in these the chemists have imagined they found the figures of clusters of grapes.

The operation is to be patiently continued till there is no more effervescence made by the falling in of the drops of the oil. The acidity of the *Tartar* will be then so perfectly saturated with its own alkali, that it will appear neither acid nor alkaline, but a third salt; great caution however must be used in observing the true point of saturation, otherwise the salt will be when finished either a little acid, or a little alkaline, as the one or the other exceeds.

The liquor is then to be strained several times through a flannel, till perfectly clear; it is of a deep brownish colour, and brackish saline taste, but has no scent. If this be evaporated to a pellicle, and set to crystallize, it forms a salt which is a *Tartar*, easily soluble in water, even when cold; and is very properly to be called soluble *Tartar*. *Boerhaav.* Chem. Part 2. p. 161.

Vitriolated TARTAR, *Tartarum Vitriolatum*. The chemists have sometimes boasted of great virtues, in what they call the magistery of this salt; this is the earth precipitated in the making of it. It is the opinion of some ingenious authors, that all fixed salts are produced by a blending together of the acid and alkaline salts, which the plants they are obtained from originally contained, with some earth. The making of this preparation of *Tartar* and vitriol, gives great strength to his opinion by means of this magistery; which shews, that an earth necessary to the cementing a mixture of an acid and an alkali into a neutral salt, may exist even in one of the principles themselves, though unseen by us; and that, as in the present instance, in so large a quantity, as not only to be sufficient for the combining the two volatile substances into a fixed one, but even to leave a remainder of it that was not necessary.

While the acid of vitriol is poured upon the dissolved salt of *Tartar*, or its oil *per deliquium*, for the making of this salt, during the great effervescence between the acid and the alkali, there is a precipitation made of an earth, for the separation of all which great care is to be had to the degree of saturation of the alkali with the acid. This earth afterwards may be severed by filtration. This earth is precipitated not out of the spirit of vitriol, but out of the salt of *Tartar*; and this experiment shews, that this fixed salt did originally contain that earth, which, according to the system of the formation of fixed salts out of volatile ones originally residing in plants, must necessarily be mixed with them, and which not being able to mix with the acid, is separated and thrown off in the conflict, in which the acid mixes itself with the rest.

This earth is what is pompously called the magistery of vitriolated *Tartar*; but it is very wrong to give that name to an earth, which has none of the properties of that or any other salt; and they greatly deceive themselves and their patients, who prescribe it instead of the salt itself. Its saline taste probably has induced them to think, that it possessed great virtues; but this is not innate, but adventitious, and the effect only of the fluid in which it was precipitated: It cannot but have some of the salts of that fluid hanging about it, when first made; but these may, by repeated washings, be carried wholly off, and the magistery will then remain a pure simple earth, and shew itself to be no other than that earth which may be properly called the earth of all fixed salts; and which, though necessary to give the salt of *Tartar* its form as a lixivial salt, yet being not necessary to it in its new form of a neutral salt, is deposited in the making it into that form.

It yet remains to be proved by more numerous experiments, that the fixed salts of plants owe that form only to a fixing earth, combining their two original volatile principles into a fixed mass; for if this be truly the case, there then needs no more to the volatilizing them again, but the divesting them of this earth. Phil. Trans. N°. 92.

TARTARHAN, a word used by some authors to express spirit of tartar.

TARTARUGA, in zoology, a name by which the Portuguese in America call a species of tortoise, known among authors by its Brasilian name *jurucua*. See the articles JURUCUA and TESTUDO.

TARTI *Lapis*, a stone mentioned by Ludovicus Dulcis, and some other authors, and said to be very beautiful, having all the colours of the tail of a peacock, and to have many medicinal virtues. It was probably some species of agate; but the short account given of it will not enable us to guess what particular kind.

TARTON *Raire*, in botany, a name used by some authors for the heath spurge, or that species of the thymelæa which is called *Sannamunda* in the catalogues of the materia medica. *Park.* Theat. p. 199.

TARUM, in botany, a name given by Pliny to the *agallochum sylvestre*, a species of aromatic plants. *Hofm.* Lex. in voc. See the article AGALLOCHUM.

TASIS, Τασις, in rhetoric, is used for the continuation of a period longer than the breath can hear. *Voss.* Ret. l. 4. p. 66.

TASCHENMUL, in zoology, a name given by authors to the *anas clypeata*, a species of duck, remarkable for the breadth of the end of its beak, and called in English, the *shoveler*. *Aldrovand.* de Avib. T. 3. p. 224. See the article SHOVELER.

TASTATURA, in the Italian music, the whole range of keys of organs, harpsichords, &c. See the articles ORGAN and HARPSICHORD, *Cycl.*

TASTE (*Cycl.*)—This is one of the most obvious characters of bodies, and much is to be judged from it of the nature of many things. Dr. Abercromby, in a treatise partly written on this subject, has carried his observations so far, as to lay down a set of rules for the judging of any plant, or other body, without knowing what it is, merely from its *Taste*, in regard to its virtues in medicine.

In order to judge of what he expressly means by the names of the several *Tastes*, it is proper to add the list of them, with some of the things to which they are applied.

Plants, fruits, &c. are either sour as the common sorrel, harsh as the medlar, austere or rough as the quince, sweet as the fresh juice of ripe grapes, fat and oily as the sesamum, bitter as gentian, or the wild cucumber, salt as common sea-salt, tart as garlick, or lastly, insipid as the gourd, or of some mixed *Tastes*, made of two or more of these.

The harsh or acerb things are cold, repelling and binding, hardly concocted, and they may all be known upon the tongue by their contracting or drying it. The austere or rough things differ from these only in degree, as being somewhat milder in *Taste*, and weaker in virtues.

The sour or acid things are always cooling; but this never to excess, by reason of their penetrating parts; this *Taste* is known by a biting on the tongue, but without any heat.

Sweet things are all nutritive; and, taking the word in its proper sense, it is they only that are so. Their sweetness arises from their neither being too hot nor too cold upon the tongue.

Fat things are moderately hot, and, on this account they all, in some degree, moisten and relax; but they also obstruct: they are known from the sweet things by filling and, as it were, anointing the tongue, without giving that sense of pleasure that the others do.

Salt things are astringent and detersive; the one quality they have from their earthy part, the other from their watery.

Bitter things may be very beneficial to the stomach; but, in improper cases, they may also do hurt. The pungent bitters, such as the elaterium, or wild cucumber, are all hurtful, unless rendered safe by other means.

Tart things are hot, and often bad for the head; but good in heavy and phlegmatic constitutions; they are known by their heat in the mouth.

Lastly; insipid things in general have no peculiar quality, but are cold and watery; they are generally hurtful to the stomach, unless mixed with hotter and spicy things. *Abercromb.* Nov. Medic. Clavis.

It is observed by Sir John Floyer, that the *Taste* is so good a judge for us, that all the chemical principles in plants may be discovered by it, before their distillation. All watery plants shew their phlegm, as well to the *Taste*, as by distilling; and in all dry woods, the *Taste* discovers the earth they contain, as well as a chemical analysis; by the mucilaginous and gummy *Taste*, and by the manifest oilyness in some plants, we distinguish their abounding in oil, as well as by the retort. The smell also helps us greatly in an extemporary judging of plants, and we are able to declare upon the spot, that all the aromatic plants, and all the fœtid ones, contain a large quantity of a volatile oil and salt. By the acrimony and pungency, we are well assured, that there is a volatile salt in plants; and, by the burning taste of others, we find that there is a corrosive salt in them. By a crude rough acidity, we distinguish the tartar or essential salt of plants to be in large quantity; but if the acidity be of a vinous smell, we observe that it is of a middle state of digestion, and may be called a vinous tartar, and distinguished from the first; but if the tartar have a pungent smell, then it is evidently a volatile tartar, or an acid acrid tartar.

The sweet *Tastes* are more numerous in plants, and more varied among themselves than any other kind. These, in general, shew their oil by thin slimy smoothness, and their tartar is evident in their extracts, as is very plain in the common liquorice juice.

The grass sweets, as the common dogs grass, and the like, have much essential salt, and a moderate portion of oil; and the rush, reed, horse-tail, and cats-tail, are all sweet and rough; some of these have more oil, and others more acid; and the most crude among them have more oil than tartar. The corn sweets, as barley, rye, wheat, oats, millet, and rice, have much oil and essential salt, and a little volatile; so bread, prepared of any of these, yields on analysis oil, and essential and volatile salt.

It is to be observed here, that fermentation and fire severally produce a volatile salt, where it was not before, by subtilizing and volatilizing the essential salt; and the slimy mealiness in corn supplies the oil. The goats beard and scorzonera kind, have the same principles as the grasses, much oil and essential salt. The sub-acrid sweets, as rampions, campanulas, trachelia, and the like, contain much oil and essential salt; but the acrimony in these plants shews that they have also a volatile salt, and that in no small quantity; though Lemery and the other chemical writers have not observed this.

The ferns, polypodys, and all that class of plants, contain much oil and essential salt; but the chemists in general have omitted to mention an acrid principle in all these, which bespeaks a volatile salt; and fragrancy is observed in some of the harts-tongues, which bespeaks a volatile salt also, and volatile oil, though hitherto unobserved.

All the leguminous slimy sweets have more oil than tartar; but all of them have a large quantity of both. Beans, Peas, and lentils, have also a volatile salt, as has also that strange fruit, eaten in Russia, and some other places, and called *lenticula aquatica* by some; but by the botanical writers, *tribulus aquaticus*; the other name belonging to the common duck-weed. The aromatic legumens, such as melilot, have an exalted oil, and volatile salt. The honeysuckle is said by Lemery, and the other chemists, only to have an essential salt and oil; but as there is a highly aromatic flavour, and great acrimony, there must be also a volatile salt.

These are some few instances, out of a vast number recited by the author, for the rest of which we refer to the paper itself in N°. 280 of the Transactions. Philos. Trans. N°. 299, p. 1160.

TASTO, in the Italian music, the touch or part of any instrument, whereon, or by means of which its notes are made to sound, be it on the neck, as lutes, viols, &c. which are called fixed and immoveable; or the front of organs, spinnets, or harpsichords, where the keys are disposed to raise the jacks, called moveable touches; and is properly no more than the finger-board of each.

Tasto Solo is often found in thorough basses, where it shews that the instruments accompanying, as the lute, organ, &c. are only to strike a single sound, from that place, till they find cyphers, or the words *accordo* or *accompanimento* placed in their part. These intimate, that the acc[illegible] are to begin again in this place.

TATA-*Youba*, in botany, a name used by some for the tree which yields what the dyers call the fustic, or yellow wood used in dying. *De Laet.* Ind. Occident. p. 603.

TATU, in zoology, the Brazilian name for the armadillo, or shell hedge-hog. *Grew*'s Muf. Reg. Societ. p. 17. See the article ARMADILLO.

We have several species of this creature described to us; but the most usual, is of the figure of a hog, and of the size of a large pig, and has a bony covering, which extends over the whole body, the head and the tail. This is composed of a number of very elegant scales, which have two junctures near the hinder part of the head, by means of which the creature is able to move its neck. On the back there are seven divisions, with a thick membrane between; and in all other parts of the body the shell is whole. The legs, so far as they come in sight, are in the same manner defended by a bony covering, in form of a shell, but thinner than that of the back; the belly has nothing of this covering, but is beset with a few whitish hairs, which grow out of very observable and eminent pores. The junctures of the head and back have also the same sort of hairs; the head is like that of a hog, the nose sharp, the eyes small, and set deep; the ears short, naked, and brown; the teeth are but small, and are in number eighteen in each jaw. The feet are made like hands; each has five toes, and the nails are round. Its colour is a sort of reddish tawny. It digs up the ground with its nose, in the manner of a hog, but much more nimbly; the tail is thick at the insertion, and tapers to the extremity. The creature feeds on roots and fruits, as potatoes, melons, and the like; but will eat meat also if it comes in its way. It is usually found in dry places; but sometimes in watery ones. *Ray*'s Syn. Quad. p. 233.

TATU-*Apara*, in zoology, the name of a creature of the armadillo kind; but differing from the others in many particulars: Its head is oblong, and of a pyramidal figure; its ears are small, short, and roundish; and its feet, as well the fore ones as the hinder ones, have each five toes. The fore legs are about three fingers long, the hinder ones five; the tail of a pyramidal figure, and little more than two fingers breadth long. It is covered with a shelly coat of a foot long, and eight fingers wide; it is smaller at both ends than in the middle; and is convex on the outside, and concave within. In the middle, or a little toward the fore end, it has four junctures, which are placed transversely, and by means of which it can, at pleasure, either expand its shell, or contract it together into a round figure. The whole crust is composed of pentangular pieces, very nicely fitted to one another, and the series of these between the commissures are parallellograms. The whole is composed of yellowish scales joined by an extremely tough skin.

When the creature would sleep, or when it is afraid of being taken up, it contracts its crust into a round figure; and hiding its

whole body within, it might sooner be taken for a sea-shell than a land animal. Its flesh is eatable, like the rest of this kind; and its food is the same as theirs. *Ray's* Syn. Quad. p. 234. See Tab. of Quadrupeds, N°. 21.

TATU-*Mustelinus*, the *weasel-headed armadillo*, in zoology, the name of a small animal of the armadillo kind; its head is about three inches and an half long; his forehead two inches and a half broad, and very flat; the end of his nose half an inch; his eyes small; his ears very distant from one another; his body eleven inches long, and about six broad; and his tail five inches long, and not tapering to so extreme a thinness at the point as that of the common armadillo, but a fifth of an inch over. His fore leg two inches and a half long, and three quarters of an inch broad, with five toes; his hinder foot something larger, and with the same number of toes. His head, back, sides, and tail, all covered with a shelly armour. His breast, belly, and ears, all naked. *Grew's* Musæum Reg. Societ. p. 19.

TATU-*Porcinus*, in zoology, the name of the pig-headed armadillo, a creature of about twelve or fourteen inches long.

Its nose is shaped like that of a pig, with four toes on its fore feet, and the hinder foot thicker, and having five toes; his tail eleven inches long, and extremely small at the extremity. Its head, legs, back, and tail, are all covered with a shelly armour. The fore part of his tail covered with eleven shelly rings; his thighs, breast, belly, and ears, all naked; his eyes black, round, and very small. His teeth are twelve in each chap, and no thicker than large needles. *Grew's* Musæum Reg. Societ. p. 18.

TATUETE, in zoology, the name of a species of *Tatu*, or armadillo, smaller than the common one, and differing also in many other respects.

Its head is small and sharp; its ears long and erect; its tail about three fingers long; and its legs much longer than in the common larger kind; but its most signal difference is, that it has only four toes on the fore feet, and five on the hinder ones; the two middle ones are the longest on the fore feet, and the three middle ones on the hinder; its whole length is about seven fingers breadth; its forehead and whole body are covered with a coat of armour, which stands out at the sides so far, that the creature can, at pleasure, draw in its head and legs under it; the armour of the back consists of nine pieces nicely joined to one another; the tail is coated in the same manner, and has likewise nine junctures, and ends in a point. It is of an iron colour on the back, and whitish at the sides; its belly also is whitish and naked, except for a few hairs.

The flesh of this is accounted more delicious than that of any other creature of this kind, though they may all be eaten. *Ray's* Syn. Quad. p. 234.

TATULA, in botany, a name used by Clusius, and some other authors, for the stramonium, or thorn-apple. *Ger.* Emac. Ind. 2.

TAVACCARÆ, in the materia medica, the name by which many authors call the *coccus maldiviæ*, or maldive nut. *Piso*, p. 203.

TAULACUM, in natural history, a name given by the people of the East Indies to a species of orpiment which is very common with them.

It is of a dirty yellow colour, and is composed partly of an irregular mass, partly of fine flakes, like scales of fishes. These are of the best colour. The whole mass, on being exposed to the fire, burns, and emits copious fumes; but it does not melt readily. After it has been several times calcined, the Indians give it internally in intermittent fevers, with safety and success. *Woodw.* Catal. Foss. vol. 1. p. 24.

TAUREA, among the Romans, a punishment inflicted by whipping with scourges made of bulls hides. *Pitisc.* in voc.

TAURIA, Ταυρια, in antiquity, a festival in honour of Neptune. *Pott.* Archæol. T. 1. p. 432.

TAURILIA, among the Romans, games in honour of the infernal gods. They were otherwise called *ludi taurii*. See *Pitisc.* in voc. *Ludi*.

TAUROBOLIUM, or TAUROBOLION, among the antients, sacrifices of bulls, which were offered to Cybele, the mother of the gods, to render thanks to the goddess of the earth, for her teaching men the art to tame those animals, and fit them for labour. See *Pitisc.* in voc.

TAUROCOLLA, *Bull-glue*, a sort of glue much used among the antients in works that required strength, being accounted far stronger than any other kind. It was made by boiling down the ears and genital parts of a bull in water.

TAURUS, (*Cycl.*) *Bull*, in zoology, the male of the ox-kind. See the articles BULL and BOS.

TAURUS, in ornithology, a name given by the antients to the bittern, or butterbump, from its imitating the roaring of a bull in its noise.

TAURUS *Æthiopicus*, the *Æthiopian Bull*, an animal described in a very remarkable manner by Pliny.

He indeed calls it the Indian *Bull*, and has led Solinus into the same error; but all the authors whom he quotes, and from whom he has transcribed his account, calling it the *Æthiopian Bull*, we may be assured that was its proper country. Agatharcides is the oldest author who has described these animals; he says, they lived only in Æthiopia, and that they were greatly larger than our oxen, and of a yellowish or tawny colour, and were swifter of foot than almost any other animal. Strabo, and all the other authors of credit, also mention this animal; but the descriptions they give of it are, in some particulars, carried too far into the marvellous.

They tell us, that all its hair stands the wrong way, and makes it the roughest animal, to appearance, in the world; and that its head is, as it were, all mouth, the opening of the mouth reaching from ear to ear. The horns, they say also, were very strong and sharp, and were moveable, so that the creature could turn them in any direction, at pleasure, to take aim at the proper part of the creature he would gore; but that as soon as he had placed them in this direction, they became firm and unalterable in it by any force, till he chose to alter the position himself. They, add, that its back, or hide in general, was of the hardness of flint, and turned away all sorts of darts. This creature hunted and fed upon all other animals, according to the accounts of the same authors, and could itself never be taken but by pitfalls; and that when it was thus trapped, and let down into a hole or pit, out of which it was impossible to get out, its fury generally killed it in a few minutes, without any wound. These are the wonderful things related by the antients of this animal; but they are so contrary to the course of nature in the ox kind, that we may very justly rank them among the other miraculous animals, such as the mantichora; and the vermis cæruleus, of sixty or seventy foot long. See the articles MANTICHORA.

TAXUS, the *Yew*, in botany, the name of a genus of trees, the characters of which are these: The flower is of the amentaceous kind, and is composed of a number of apices, usually shaped like mushrooms; these are the male flowers; the embryo fruit appears in different parts of the tree, and finally becomes a red berry, of a hollowed or cup-like shape, juicy, and containing a seed. There are also sometimes, on the same trees with these, dry fruits, in shape of acorns; the seed being enclosed at its bottom, not by a juicy berry, but by a dry cup.

There is no other known species of the *Yew*, beside the common kind; but that is sometimes found with variegated leaves. *Tourn.* Inst. p. 589.

TAXUS, in zoology, the name of the *Badger*, called in some parts of England, the *brock*, the *gray*, and the *pate*. The Greeks had no name for this animal, unless their *hyæna* was the same creature. See the article HYÆNA.

Authors who have described this animal, have all made two kinds; the *Taxus-Caninus* and *Taxus-Porcinus*, the dog and the hog-*Badger*. The last of these is our common kind; and 'tis indeed doubted whether there be any such animal as the authors describe under the other name.

The body of the *Badger* is short and thick; its neck very short, and its hairs long, and very rigid, and stiff like hog's bristles. Those on the back are of a pale yellow near the root; brown or black in the middle, and at the extremities yellowish again; so that the creature appears, upon the whole, of a mixt colour, or what we call grey, on the back. The sides and belly are covered with hairs, which are all over of a pale yellowish hue; and the legs and shoulders, as also the belly, are wholly black. It has a broad white line from the top of the head to the nose; and on each side of this a very regular pyramidal black mark reaching up to the ears; and below these the jaws are whitish, that the creature's face looks very oddly variegated. Its eyes are small; and its snout wholly like a dog's. The teeth are like those of a dog also; and the legs short; its fore feet have sharp claws, with which it digs itself burrows in the earth. Its face is very like that of the fox, being broad at the top of the forehead, and sharpening to a point at the nose, so as to appear triangular in shape; and its cheeks are tumid, and furnished with strong muscles, whence it bites very hard. It feeds on insects and small animals, and on the roots of vegetables. We have them in many parts of England, particularly in the counties of Essex, Sussex, and Warwickshire. *Ray's* Syn. Quad. p. 185.

The *Badger's* skin is of some use in commerce. Their fat is sold by the druggists, as a remedy against disorders of the kidneys, and the sciatica; and their hair for the making pencils for painters and gilders. *Savar.* Dict. de Comm. p. 354.

TEA (*Cycl.*)—*Tea* is extolled by the orientals as the greatest of all medicines; moderately and properly taken, it acts as a gentle astringent and corroborative; it strengthens the stomach and bowels, and is good against nauseas, indigestions, and diarrhœas. It acts also as a diuretic and diaphoretic. The immoderate use of it, however, has been very prejudicial to many, who have been thereby thrown into the diabetes.

TEALE. *Summer* TEALE, in zoology. See the article CIRCIAS.

TEARS (*Cycl.*)—Dr. Vaterus is of opinion, that the *Tears* come from the white lines seen on the inside of the palpebræ, described by Meibomius. He observed two small ducts, besides the common nasal duct, from the lacrymal sac into the nose; one of them opened into the upper part of the nose; the other opened into the *antrum maxillare*. Miscel. Berol. Tom. 4. par. 3. §. 5.

TEASEL,

TEASEL, *Dipsacus*, in botany. See the article DIPSACUS.

Beside the common wild species of this plant, there is a large kind of it, the heads of which are of singular use in raising the nap upon woollen cloth, for which it is propagated in great quantities in many parts in the West of England. It is to be sown in March, on a dry soil; a peck of the seeds are sufficient to sow an acre: The plants being come up, must be houghed up first to six inches, and some time after to a foot asunder every way; and for the first summer the ground must be kept carefully cleared from weeds. The second year after sowing, the plants shoot up to heads, which are fit to cut in August, and tied up in bundles, and dried. The common produce of an acre of land is about a hundred and sixty bundles, which are sold at about a shilling a bundle. Some people sow carraway among their *Teasels*, but it only damages both. *Miller's* Gardener's Dict.

TEBET, or THEVET, the fourth month of the civil year of the Hebrews, and the tenth of their ecclesiastical year. It answered to our moon of December, and has but 29 days. The second day of this Month is the last of the octave of the dedication of the temple, after it was purified by Judas Maccabeus. V. 1 Macc. iv. 59. John x. 22. *Calmet*, Diction. Bibl. in voc.

TECHNICAL *Chemistry*. See CHEMISTRY.

TECOLITTROS, in natural history, the name of a gem, otherwise called *Syriacus lapis*, and *Judaicus lapis*, good for dissolving the human *calculus*. See the articles SYRIACUS and JUDAICUS.

It has this name from τηκω, I dissolve, and λιθος, a stone; because it dissolves stones. *Hofm.* Lex. univ. in voc.

TEE, in the manege. See the article BREAST-*Plate*.

TEETH (*Cycl.*)—When the *Teeth* are subject to be overspread with a black or yellow crust, it is a very good method to rub them well every day with a mixture of tincture of gum lac, honey of roses, and spirit of vitriol, which will not only whiten the *Teeth*, but render the gums more firm.

The world is fond of tooth powders, and a moderate use of them may do service; but the daily rubbing with them does more harm to the *Teeth* than wholly neglecting them. Powders of this kind may be prudently used once in six or seven days, and will render the *Teeth* white and splendid. The common powders, prepared for this purpose, are too hard, and wear away the gums; softer substances should be employed, and when the gums are f d, a few drops of some acid spirit be added to the powder. The following is a very efficacious and safe powder: Take chalk in powder, myrrh, burnt hartshorn levigated, and Florentine rice root, of each two drams. Spirit of salt, six drops; mix all into a powder. *Heister's* Surgery, p. 457.

The common trick of mountebanks, and other such practisers, is to use various washes for the *Teeth*, the sudden effects of which, in cleaning and whitening the *Teeth*, surprize and please people; but the effects are very pernicious. All the strong acid spirits will do this. As good a mixture as any thing can be, on this occasion, is the following: Take plantane water an ounce, honey of roses two drams, spirit of salt ten drops; mix the whole together, and rub the *Teeth* with a piece of linnen rag dipped in this, every day, till they are whitened. The mouth ought to be well washed with cold water, after the use of this or any other acid liquor; and indeed the best of all *Teeth*-washes is cold water, with or without a little salt; the constant use of this will keep them clean and white, and prevent them from aching. *Heister's* Surg. p. 457.

Animalcules in the TEETH. No animalcules are to be found in any of the juices of the body, except the semen of male animals; and consequently the saliva affords none: yet great numbers, and those of different kinds, may be discovered in the white matter sticking between the *Teeth*, if it be picked out with a pin or needle, and mixed with a little rain water, or spittle, without bubbles, and applied before the microscope; and sometimes they are so incredibly numerous, and full of motion, that the whole mass seems alive. The largest sort are of an oblong oval figure, and pointed at one end; these move along very swiftly; but of these there are but few. There is another sort like these, in figure, but much shorter and smaller; these have a peculiar motion, being always running in an undulated or spiral line. A third sort are roundish, and so minute, that a grain of coarse sand is equal to a million of them in bigness: These move so very nimbly, that their shape is not easily distinguished; yet they appear like large swarms of gnats.

Some, or all of these three kinds, may be found between the *Teeth* of persons of all ages and sexes, especially between the grinders, and that though the mouth be washed ever so constantly. But from the *Teeth* of people who are more careless, there may usually be taken another sort of animal, in the shape of an eel or worm; these move backwards and forwards with great agility, and force their way through the clusters of smaller animalcules with great impetuosity; they move their bodies also into several bendings in their progressions. Beside these, there are also several other species of animalcules, whose motion is so slow and languid, that it requires great attention to be sure that they have life. They all die if a little vinegar be put to them; whence it seems a very proper method, to wash the mouth with vinegar, in order to destroy them. *Baker's* Microscope, p. 167.

Clenched TEETH. The *Teeth* are in some cases found so closely and firmly shut, that they cannot be opened sufficiently to give the person liberty to eat or speak. This generally arises from a spasm or cramp of the elevating muscles of the lower jaw. The cause of this spasm is various; sometimes it arises from a wound or blow, even from injuries of the nerves and tendons in different parts of the body; as after an amputation of an arm or a leg. Sometimes also, it is owing to an inflammation of the fauces themselves.

When this disorder arises from a wound, the first thing to be done is to search whether there be not some extraneous body left in it, which excites these spasms; if this be found to be the case, they always cease immediately, upon the pulling out such offending matters. If there be no such bodies in the wound, and medicines give no relief to the convulsions, you may be sure that some nerve is wounded; and the method then is to cut the nerve in two, if that may be done, and immediately the spasms will cease. Sometimes however, the nerve lies inaccessible, or cannot be divided without danger of the patient's life; which is a very deplorable case, and generally brings on a necessity of amputating the limb. These spasms when from amputations are less to be dreaded, since they generally go off on untying the ligatures about the vessels, and taking away the vitriol or other caustic applied to restrain the hæmorrhage.

When an inflammation of the tonsils or jaw excites this spasm, these are to be treated in the common method; and the cause being removed, as in the other cases, the effect will cease. But if this disorder be of so long continuance as to threaten the patient with starving, he is to be supplied with broths and other liquid food, which may be sucked through the *Teeth*.

The surgeons have an instrument, which they call *speculum oris*, made to force open the mouth on these occasions, and some advise the breaking out a *Tooth*, to give room for food and medicines; but both these practices are wholly to be rejected, as making the spasms more violent and obstinate. *Heister's* Surg. p. 455.

Hollow TEETH. The *Teeth* which are hollow and decayed are usually carious, and admit some parts of the food into their cavities, which by degrees putrifies, becomes acrimonious, and not only farther destroys the *Teeth* themselves, but irritates the internal periosteum and nerves of the *Teeth*, so as often to cause intolerable pain. Many methods have been contrived for relief in these cases: One is to clean the cavity, and then fill it up with mastick as often as there is occasion; and another is the filling up the cavity with a piece of lead or gold. The cavity may also be filled at times with oil of cloves, and the like, or cauterized with a red hot iron; this generally proves a lasting remedy, and is attended with very little additional pain, if carefully performed, and no part of the mouth burnt. If all these methods fail, the last relief is the taking out the *Tooth*, and afterwards replacing it again. *Heister's* Surg. p. 458. See the article TOOTH-*Drawing*.

Supernumerary TEETH. These are sometimes the cause of great disorders, and may, without careful examination, be mistaken for exostoses or schirruses of the palate. See Med. Ess. *Edinb.* Vol. 5. art. 16.

Mark of TEETH, in the manege. See the articles MARK and EYE *of a Bean*.

TEETH *of Fish*, *Dentes Piscium*. The *Teeth* in the fish kind are so very various in their shape, and also so variously disposed, that they make a very notable mark of distinction among the several genera.

As to situation, they are, 1. sometimes placed only in the fauces and orifice of the stomach, the rest of the mouth being entirely smooth: We have examples of this in the cyprini, and the ammodytæ or sand-eels, and many other fish. 2. In some the *Teeth* are placed only in the jaws; the tongue, the palate, and the inner part of the mouth being smooth. 3. In some they are placed in the jaws, and on the tongue, the rest of the mouth being smooth. 4. In some the tongue, the palate, and the jaws have *Teeth*, but the back part of the mouth is smooth; the herring has them disposed in this manner. 5. Some have the fauces, tongue, palate, and jaws all beset with *Teeth*, as the salmons, &c. 6. Some have them in the fauces and jaws only, the tongue and the palate being smooth: This we have instances of in the pleuronecti. And finally, 7. Some fishes have *Teeth* in the jaws, fauces and palate, and the tongue only remains smooth: This we see in the mackrel, &c. And all these are very essential marks and distinctions never varying in the same fish, and may serve as characters much better than the colours and other such more obvious, but less essential things, remarked by the old authors.

The differences in the shape of the *Teeth*, are as many as those in their situation, and may serve to as much purpose in their distinctions. 1. They are in some acute and sharp at the ends; this is the case in most fish. 2. In some they are obtuse, and as it were flatted at the end, as in the cyprini. 3. In some fish they are of a conic shape, as those in the

the upper jaw of the thymallus. 4. They are in fome compreffed or flatted at the fides, as in the gadi and eloces. 5. They are fmooth and even at the fides, as in the greater part of fifhes: Or, 6. They are ferrated or notched at the fides, as in the fhark kind, and fome others. 7. They are in fome ftrait, as in the common acus or needle-fifh, of Oppian And, 8. They are fometimes crooked inwards, as in the ofmeri, *&c.* Finally, they are fometimes convex on one fide, and flat on the other, as in the caprifcus.

The *Teeth* of fifh differ in proportion alfo. 1. In fome they are all of the fame fize in the fame fifh, as in the cottus, *&c.* 2. In fome they are of very different fizes in the fame mouth; we have inftances of this in the pike, the lucioperca, and many of the gadi. 3. They differ alfo in number and arrangement, for in fome fifh they are placed only in fingle rows in the jaws, and other places allotted for them; but in others they are aggregated into feveral rows; the firft is the cafe in the falmons, *&c.* the other in the cotti, and other fifh. *Artedi* Ichthyolog.

Mammoth's TEETH. See the article MAMMOTH's *Teeth.*

TEFTERDAR, the name of an office of dignity in the Eaftern nations. In Ægypt he is the lord high-treafurer of the tribute paid out of the lands to the Grand Seignior. He is named for a year by the Porte; but is generally continued in his office many years. This office is fometimes given to one of the poorer Beys, to help him to fupport his dignity; and frequently to a quiet one, who is not likely to enter into intrigues. For one party never cares that a ftirring man of the oppofite party fhould be invefted with an office of this dignity. *Pocock's* Egypt. p. 165.

TEGS, a term ufed in fome part of the kingdom by the farmers, to exprefs lambs of a year old.

When a flock of ewes and lambs are turned into a turnepfield, the young lambs of three weeks old will immediately fall to eating the turneps, and fcoop them very prettily; but thefe *Tegs* will not touch them for feveral days. They ufually ftay till almoft ftarved to death before they begin, but when they have begun they foon grow fat.

TEGULA *Hybernica*, Irifh *Slate*; a ftone of the flate kind, fo ftrongly impregnated with alum, as to deferve the name of an alum ore. It is often likewife found to contain a large portion of vitriol.

It is found in great abundance in many parts of Ireland, as alfo in feveral of our own counties. Many prefcribe it in powder as a ftyptic, in hæmorrhages of all kinds, with fuccefs; but, perhaps, it would be full as prudent for the perfon who knows to what falt or falts it owes this virtue, to give thofe falts alone, in a dofe that he can depend upon, and without the load of earthy matter, which is always to be found in this powder. Vid. *Hill*, Hift. Mat. Med. p. 257. feq.

This fubftance beaten to powder and infufed twelve hours in water, will impart fo much of the vitriolic falt it contains to the water, that being mixed with an infufion of galls the liquor will become reddifh, in the fame manner that the medicinal waters of many parts of this kingdom do, which not containing vitriol enough to make ink with, the infufion of galls yet turn reddifh with it. It is hence not improbable, that many of thefe waters owe their virtues to this very fubftance. This kind of flate being very frequent in many parts of the kingdom, at different depths under the furface; and it being not hard to conceive, that a bed of water paffing through a large ftratum of it, may acquire thofe virtues in its paffage that we find common water, in our own experiments, becomes poffeffed of by a few hours cold infufion.

This on being calcined, in order to try whether it be an iron ore, does not after burning, anfwer to the magnet; fo that it feems to contain no iron at all in the ftate of metal. But this is obfervable, that it calcines to a fort of ochre, becoming of a yellow colour, and marking as ochres will do. The yellow of this flate being burnt too far becomes of an orange-colour, exactly like the fediment of yellow matter, which we find about the ferruginous waters; and this fediment is hence efteemed by fome to be the remains of this flate diffolved by the water, rather than iron ore. It is even doubted by fome, whether the yellow ochres are indeed iron ores, or not; for many of them will not anfwer to the magnet, even after feveral days and nights continued calcination. It is indeed very certain, that all the naturally red ochres do contain iron, all of them having particles that anfwer to the magnet after a much flighter calcination than this given in vain to the yellow kinds. Phil. Tranf. N°. 243. p. 272.

TEICHOPŒUS, τειχοποιος, among the Athenians, an officer who had the care of the city walls; their number was the fame with that of the tribes, every tribe having the choice of one. *Potter*, Archæol. Græc. T. 1. p. 84.

TEITEI, in zoology, the name of a Brafilian bird called alfo *guiranheemegeta*, and *guroundi.*

It is of the fize of our red-breaft. Its beak is black, thick, and fhort; its head, the upper part of its neck, its wings, its back, and its tail, are of a bluifh black, fhining like the fineft high-polifhed fteel. Its throat, the lower part of its neck, its breaft, and its belly, are yellowifh. Its legs and feet are brown. The female is of the fame fize with the male, but differs in colour, being variegated with green, yellow, and grey. It fings very fweetly, and is kept in cages, five or fix together in the fame cage. *Marggrave's* Hift. Brafil.

TEJUGUACU, in zoology, the name of a fpecies of lizard, common in the Brazils, and called alfo *Temapara.*

It much refembles the iguana, in its general figure, but differs from it in that its whole body is black, only variegated with fome white fpots; its tail is thicker at its origin, it has not the feries of ferrated fpines, which the iguana has running all down its back. In the hinder feet the outer toe is alfo more remote from the reft, and fhorter; and it has a long red bifid tongue; and the animal can vibrate it an inch or more out of its mouth, in the manner of fnakes; but it makes no hiffing. It lives principally on the fucking of eggs, but it is capable of bearing hunger a long time; Marggrave having kept one alive feven months without eating. This fpecies afforded alfo a certain teftimony to that author, of the reproduction of the tail when cut off. *Ray's* Syn. Quad. p. 265.

TEIUNHANA, in zoology, the name of a fmall American lizard. It is about the thicknefs of one's little finger, and has a fharp nofe. Its tail is very flender, fix fingers breadth long, and terminates in a point almoft as fharp as a needle. Its head is covered with fcales; its back, fides, and legs, with a tender fkin as foft as fattin to the touch; and its tail is covered with extremely minute fcales, of a fquare figure. The throat and belly are covered alfo with fcales of the fame fhape, but larger. Its head is wholly brown; its back and fides are variegated with ftreaks of brown and green, and with feveral beautiful longitudinal feries of green and black fpots. The throat and belly are white; but they are beautifully variegated with fpots of a fine deep blood-red. The tail is of a dufky yellow or wax colour on the upper part, and of a pale and beautiful flefh colour underneath. *Ray's* Syn. Quad. p. 267.

TELAMONES, among the Romans, figures of men fupporting the out-jetting of cornifhes in architecture. The word, according to fome, is derived from the Greek τιλαμων, from τιλαω, or τλαω, I bear.

Among the Greeks they were called *Atlantes*, Ατλαντες, which comes from the fame word ταλαω, or τλαω, by the figure metathefis. *Pitifc.* in voc.

TELAMONES, is alfo ufed by the chirurgical writers fometimes for lint, and fometimes for the fillets or bandages, which they apply over their dreffings.

TELE, Τελη, among the Athenians, thofe revenues that were brought in by lands, mines, woods, and other public poffeffions, fet apart for the ufe of the common-wealth; as alfo tributes paid by fojourners and freed-fervants, and the cuftoms laid upon certain trades and goods. See *Potter* Archæol. Græc. T. 1. p. 80.

TELEOLOGY, the fcience of the final caufes of things. This is an ample and curious field of enquiry, though pretty much neglected by philofophers. *Wolf.* Difc. Prælim. Logic. §. 85.

TELEPHIUM *Orpine*, in botany, the name of a genus of plants; the characters of which are thefe: The flower is of the rofaceous kind, confifting of feveral petals, arranged in a circular form, and contained in a cup, confifting alfo of many leaves. The piftil arifes from the cup, and is finally converted into a triangular fhaped unicapfular fruit, containing a number of fmall and roundifh feeds. To thefe marks it may be added, that the leaves ftand alternately on the ftalks.

The fpecies of *Telephium*, enumerated by Mr. Tournefort, are thefe: 1. The common wild *Orpine*. 2. The American *Orpine*, with purflain leaves. 3. The red-flowered houfeleek-leaved fea *Orpine*. And, 4. The white-flowered houfeleek-leaved fea *Orpine*. *Tourn.* Inft. p. 248.

TELESCOPE (*Cycl.*)—Mr. Caleb Smith thinks that catadioptical *Telefcopes* might be formed with fpeculums of glafs, inftead of metal; and makes feveral obfervations as to remedying the diforders caufed by the different refrangibility of the rays of light. See Phil. Tranf. N°. 456. fect. 8.

TELETÆ, among the antients, were folemn rites performed in honour of Ifis. *Pitifc.* in voc.

TELICARDIOS, in natural hiftory, the name given by fome authors to a ftone found in the fhape of a heart. It owes this figure to its having been found in the fhell of fome large bivalve of the cockle kind; and is more ufually known among authors under the name of *Bucardites*. See the article BUCARDITES.

TELIPHANO, in botany, a name ufed by fome authors for the doronicum, or leopard's bane. *Ger. Emac.* Ind. 2.

TELLA *Sagrum*, in natural hiftory, a name given by the natives of the Eaft-Indies, to a kind of earth which they ufe externally to dry up ulcers, and internally in cafes of coughs and colds. It is of the nature of the finer clays, and is found at the bottoms of fome of their rivers.

TELLA *Pafhnum*, in natural hiftory, a name given by the people of the Eaft-Indies to a kind of white arfenic, or rats-bane, found native among them.

It is well known to be a fatal poifon, and ufed to deftroy vermine. It lies in the cliffs of rivers among ftrata of ftone in

in large white irregular lumps, when held to the fire it emits copious fumes smelling strongly of garlick and sulphur, but it does not readily melt or run.

TELLINA, in natural history, a sea-shell, by the latest writers on these subjects, referred to the genus of muscles. See the article MYTULUS.

These shell-fish do not naturally live on the surface of the bottom of the sea, but bury themselves in the mud or sand, in the manner of the chamæ, keeping a communication with the water above by means of the same sort of tubes or pipes as those fish are possessed of; but as the tubes of the *Tellinæ* are very short, the fish can only bear to be buried to a small depth.

When the water covers the bottom where they lie, they remain always buried in the sand; but when the sea in its ebb leaves the place dry, they very often come out of their holes, and are seen lying flat upon their sides on the sand; whether this be to take in fresh air, or, which seems more probable, to seek after the water which has abandoned them. They seem also to go far in search of it, for it is common to see them at a foot distance from their hole, with the furrow marked by their progression all the way behind them, from the aperture of their cell to the place where they are found. They perform this motion by means of a sort of foot, such as the chamæ, the sourdon, and many other bivalve shells have; but the leg to which this foot is fastened, is in this species very short, and not capable of any great extension. Mem. Acad. Par. 1710.

TELON, a name given by the chemists to fire.

TELONÆ, τελωναι, among the Athenians, farmers of the public revenues; for the severity with which they were handled, in case they failed, see *Potter* Archæol. Græc. l. 1. c. 14. T. 1. p. 81.

TELINO, a name given to the *Urogallus*, or great cock of the mountain. See Tab. of Birds, N°. 25. and the article UROGALLUS.

TELONIUM, among the Romans, is used to denote a customhouse, or place where the toll was collected. See *Pitisc.* in voc. and THELONIUM, *Cycl.*

TEM, or *brown* TEM, in zoology, the name of a water-fowl of the larus or gull-kind, called by Aldrovand *Larus cinereus minor*.

It is but a small species. Its back and wings are of a pale grey, with some faint admixture of bluish; and the longer feathers of the wings are black within. The beak is very small, somewhat crooked, and black. The back part of its head also is black. All other parts of the body are of a fine white. The feet are webbed, and the legs are yellow. *Ray's* Ornithol. p. 268.

TEMACHIS, in natural history, the name of a genus of fossils, of the class of the gypsums; the characters of which are these. It is of a softer substance than many of the other genera, and of a very bright and glittering hue.

The name is derived from the Greek τεμαχιον, *frustulum*, a small irregular fragment; the bodies of this genus being compofed of an assemblage of multitudes of irregular flaky fragments, as are all the gypsums; but no genus of them so visibly so as these.

There are but three known species of this genus: 1. A soft shining green one. 2. A soft white one, of a marbly appearance. And, 3. A pale brown glossy one. The first is found in great plenty on the shores of rivers in the East-Indies; and though not known as a substance that would make a plaster by burning, is given internally in nephritic cases, being powdered without calcination. The second is found in many parts of Derbyshire, and is used for burning into plaster for stuccoing of rooms, and casting statues, &c. And the third is found in Germany; and, beside its common uses in stuccoing and casting, is in great esteem among the metallurgists and assayers, for the making either singly or in mixture with bone-ashes, their tests. See the article TEST.

We have not this species in England so far as is yet known. *Hill's* Hist. of Foss. p. 113, 114, 115, 116.

TEMAPARA, in zoology, the name of a peculiar species of lizard, called also *Tejuguacu*.

It approaches much to the nature of the *Iguana*, but is black spotted with white. See the articles IGUANA, and TEJUGUACU.

TEMBUL, in botany, a name used by some authors, for the plant called *betle*, an herb the people of the East-Indies are fond of chewing. *C. Bauhin.* pin. p. 410. See the article BETLE.

TEMELO, in zoology, a name used by some for the fish called in English the *greyling*, and in some places the *umber*.

It is a truttaceous species, known among the writers in ichthyography under the name of *Thymallus*. *Willughby's* Hist. Pisc. p. 187. See the article THYMALLUS.

TEMPATLAHOAC, in zoology, the name of a broad-billed bird, of the West-Indies, described by Nieremberg; and by him esteemed a species of duck.

It is of the size of the common duck. Its head and neck are green, black and purple, and very bright and shining like the neck of the peacock. The body is of a brownish yellow, and it has two large spots of white on each side near the tail. The tail is white all round the edges, and is of the same marks and colours with the peacock's, but black underneath. It is common on the lakes of Mexico, and is a good eatable bird. *Ray's* Ornithol. p. 299.

TEMPERAMENT, or TEMPERATURE, (*Cycl.*) in music. Mr. Chambers, under this head, informs us, that the *Temperament*, or *Temperature*, denotes a rectifying or mending false and imperfect concords, by transferring to them part of the beauty of the perfect ones. This he took from Mr. de Fontenelles, in the Hist. de l'Acad. des sciences, 1701.

But this requires a fuller explanation; for though it be true, considered in one light, that a *Temperature* corrects some false concords; yet it is no less true, that, in other respects, it spoils and falsifies both perfect and imperfect concords, and renders discords more harsh than they would otherwise be, if the intervals were justly taken. To explain this, we must consider that all the intervals are founded on the primary proportions arising from the numbers 2, 3 and 5, that is, if we do not exceed the compass of an octave, $\frac{2}{1}$, $\frac{3}{2}$ and $\frac{5}{4}$. See the article INTERVAL.

The nearer we come in practice to the true intervals, the more perfect the melody and harmony will be; and it is certain, that the human voice, and some instruments, as violins, &c. which have no stops nor frets, will execute music to a great degree of exactness; but the case is not the same with fixed or fretted instruments, as harpsichords, organs, lutes, viols, &c. Accuracy is here impossible, unless we would content ourselves with always playing in the same key, without any transition or transposition whatsoever. In this case, indeed, the harpsichord or organ might vie with the accuracy of the voice or violin. For instance; if we were to compose or play in the key of C, then we might make the several intervals of that key, to be in the following true proportions, $1 \cdot \frac{9}{8} \cdot \frac{10}{9} \cdot \frac{16}{15} \cdot \frac{9}{8} \cdot \frac{10}{9} \cdot \frac{9}{8} \cdot \frac{16}{15}$. that is in whole numbers

C.	D.	E.	F.	G.	A.	B	C.
24	27	30	32	36	40	45	48.

and the instrument, tuned in this manner, would perform any piece of music in C, justly composed, with great beauty and exactness, I here take for granted, that every key, fundamental note, or sound, ought to have its true fifth and fourth, and that these ought also to have their true fifths and thirds.

Now this being premised, it will presently appear, that in making any transposition or transition from C, we shall find some false concord. Thus, for instance, if we proceed to G, and consider it as a key, or fundamental sound, we shall have the following series of numbers for the octave of G, *viz.*

G	A	B	C	D	E	F	g
36	40	45	48	54	60	64	72.

But here the interval between 40 and 54 is false, being a comma too much, for the second of a key must make a true fifth with the fifth of the same key. In like manner, if we were to proceed from C to A, as a new key, we should find the following series for the octave of A,

A	B	C	D	E	F	G	a
40	45	48	54	60	64	72	80,

where the interval between A 40 and its fourth D 54 is false, being too great by a comma. If any other transition were examined, we shall always find some note false; as in F, the sixth would be redundant by a comma. And in D the fifth would be deficient by a comma. All which shews the impossibility of truth and exactness of music on fixed instruments. Yet as these instruments have their use and convenience in some respects, it was proper to endeavour to find out a method of making them tolerable.

It has been observed under the head INTERVAL, that the tone major exceeds the tone minor by a comma. Their difference is necessary for the truth and perfection of music; but yet if these tones were rendered equal, the ear would not be offended. And this has suggested the means of tempering fixed instruments. If we were to make all tones equal to the tone major, as some imagine the antients did, then we should find the ditonus or third, exceeding a true third major by one comma, which would be intolerable. In like manner, if all tones were to be minor, we should have thirds major defective by a comma, which would also be intolerable, not to mention other false intervals that must necessarily arise from such a supposition.

Supposing then one tone increased, and the others diminished by half a comma, we should have our thirds major remain perfect. But still it would be necessary to examine what fifths this supposition would give. Now it is evident that a tone major added to an octave, makes just too fifths, thus $\frac{2}{1} \times \frac{9}{8} = \frac{9}{4} = \frac{3}{2} \times \frac{3}{2}$. But the tone here added is a tone major, and the tone we have assumed is a temperate tone, deficient from the tone major by half a comma; hence the sum of the two fifths, on this supposition, will fall short of the truth by $\frac{1}{2}$ of a comma, and consequently one fifth will be deficient by $\frac{1}{4}$ of a comma. Which difference, although it be sensible, yet experience shews, that fifths so diminished are tolerable.

This *Temperature* is what is called the common or vulgar *Temperature*, and consists, as has been said, in diminishing the fifth by $\frac{1}{4}$ of a comma, in preserving the third major perfect, and dividing it into two equal tones. Which being supposed, it follows that the fourth must exceed the truth by $\frac{1}{4}$ of a comma;

ma; that the third minor will be deficient by the fame quantity; that the fixth minor will be perfect, and the fixth major redundant by $\frac{1}{4}$ of a comma; and laftly, that the femitone major will exceed the truth by $\frac{1}{4}$ of a comma. If we introduce chromatic notes, or flats and fharps, the femitone minor will alfo exceed the truth by $\frac{1}{4}$ of a comma, and confequently the difference between the two femitones, or the diefis enharmonica, will be preferved.

If then we had a harpfichord or organ, with each feint or half note divided, we fhould have the following notes or founds, *viz.* C . C♯ . D^b . D . D♯ . E^b . E . F . F♯ . G^b . G . G♯ . A^b . A . A♯ . B^b . B . c. in the compafs of an octave. Yet this fyftem of notes, numerous as they feem, would not be fufficient for all tranfitions and tranfpofitions. For tho' a piece of mufic, tranfpofed to any of the natural keys C . D . E . F . G . A . B. and to the flats, as E^b and B^b, and fome others, would do well; yet in tranfpofing to fharps, as to C♯. we fhould not find a true third major, unlefs we introduced E♯. and even in flats, as A^b and E^b we fhould not find a true third major in defcending, or a fixth minor in afcending, unlefs we introduced F^b and C^b. and in like manner tranfpofitions to G♯ and E^b would oblige us to introduce B♯ and C^b. Nor would even this fuffice; for if neceffity required a tranfpofition from the key of C to that of D♯, we fhould not find a true third major without introducing F♯♯ and *c*. So that at laft we fhould come to a temperate fyftem, where, in afcending, the notes C, D, F, G, A would each have its fharp and double fharp, and the notes B and E each a fingle fharp. In defcending, the notes E, D, B, A, G would each have their flat and double flat, and the notes F and C each a fingle flat. And thus the octave would be divided into 31 intervals, whofe defignations are C . D^{bb} . C♯ . D^b .

1 . 2 . 3 . 4

C♯♯ . D . E^{bb} . D♯ . E^b . D♯♯ . E . F^b . E♯ . F . G^{bb} . F♯ .

5 . 6 . 7 . 8 9 . 10 . 11 . 12 . 13 . 14 . 15 . 16

G^b . F♯♯ . G . A^{bb} . G♯ . A^b . G♯♯ . A . B^{bb} . A♯ . B^b

17 . 18 . 19 . 20 . 21 . 22 . 23 . 24 . 25 . 26 .

. A♯♯ . B . C^b . B♯ . C. Where the letters C . D . E .

27 . 28 . 29 . 30 . 31.

F . G . A . B. fignify the common diatonic notes; thofe marked with a fingle ♯ or b are the chromatic, and thofe marked with a double ♯♯ or bb are enharmonic notes; fo called, becaufe the interval between them and the next diatonic note is an enharmonic diefis; for which reafon the notes E♯ . F^b. and B♯ . C^b. are alfo enharmonic.

But even in this divifion of the octave, all the notes would not have a third major in afcending and defcending; thus, for inftance, D♯♯ has no third major; for this would be F♯♯♯, which is not in the fcale, nor can any number of additional notes fuffice in all cafes. But this inconvenience is eafily remedied, and the fyftem confiderably improved by making all the 31 intervals equal. We have already obferved, that in the common temperature the femitones major and minor exceed the truth by $\frac{1}{4}$ of a comma, and that the enharmonic diefis is preferved true. Hence it follows, that the hyperoche, or difference between the chromatic and enharmonic diefis; for example, the interval between F^b and E♯ or D^{bb} and C♯, *&c.* will alfo exceed the truth by $\frac{1}{4}$ comma. Now the hyperoche, by our table, under INTERVAL, is equal to 1 . 37695, to which adding $\frac{1}{4}$ comma = 0 . 25000, we have 1 . 62695, which differs from the enharmonic diefis 1 . 90917 only by 0 . 28222, or about $\frac{2}{7}$ of a comma. Neglecting this fmall difference, let us fuppofe all the 31 intervals of the octave equal, it will follow that tranfpofitions to all the notes of the fyftem, whether diatonic, chromatic or enharmonic, will be equally good, and differ only in pitch or tone, as they ought, but not in accuracy, which muft next be examined.

The divifion of the octave into 31 parts may be conveniently done by logarithms. Under the head INTERVAL I find the logarithm of the octave = 55 . 79763 commas, confequently each diefis, or divifion of the octave = 1 . 79992 commas; hence the fifth, being 18 diefis, will be 32 . 399 commas. Now the true fifth is 32 . 640, the fifth confequently in this *Temperature* is deficient by 0 . 241 parts of a comma, which is lefs than $\frac{1}{4}$ of a comma by $\frac{1}{110}$ part; and therefore this fifth will, ftrictly fpeaking, be better than that of the vulgar *Temperature* by $\frac{1}{110}$ of a comma; but this is infenfible. Next, proceeding to examine the third, we fhall find it equal to 10 diefis or divifions, that is 17 . 999 commas, and the true third major being 17 . 963 commas, the difference is 0 . 036, that is about $\frac{1}{28}$ of a comma. Now as the ear can bear a fifth, altered by $\frac{1}{4}$ of a comma, it will much more eafily bear the alteration of $\frac{1}{28}$ of a comma in a third major. Again, in this *Temperature*, the third minor is indeed, ftrictly fpeaking, worfe than in the vulgar, which differs from the truth but by $\frac{1}{4}$ comma, whereas here it differs by about $\frac{1}{17}$ of a comma more; but then this difference is infenfible.

Thus we have been led from the confideration of the vulgar *Temperature*, to the invention of the *Temperature* which divides the octave into 31 equal intervals, commonly called, *Huygens's Temperature*. This great mathematician was indeed the firft who gave a diftinct account of it, and fhewed its ufe and accuracy. But here, as in many other inventions, we find the hint of the thing much older than the true knowledge of it. See *Hugenii* Opera Omnia, vol. 1. p. 748, 749. Edit. 1. Lugd. Batav. 1724.

The divifion of the octave into 31 parts, was invented in Italy about 200 years ago, by Don Nicola Vincentino. The title of his book is *L'Antica Mufica ridotta alla moderna prattica*, &c. Roma, 1555. Fol. and an inftrument called *archicembalo* was made upon this fcheme, as Salinas informs us, who at the fame time condemns it as very difagreeable in practice. But this could be owing to nothing but its not being tuned according to the intention of the inventor. For if all the thirds major of this inftrument were made perfect, and the fifths diminifhed by $\frac{1}{4}$ of a comma, it is evident that the inftrument would be equally exact with any tuned according to the vulgar *Temperature*, and would fuffice for tranfpofitions to any diatonic or chromatic notes, though not to all the enharmonic, as D♯♯, *&c.* becaufe we fhould not find its third major. And if the inftrument were tuned according to Mr. Huygens's fcheme, of making all the divifions equal, it would then have all the 31 keys equally good, and very near the truth. See *Salinas*, lib. 3. The title of his work is *Francifci Salinæ Burgenfis de Mufica Libri Septem, Salmanticæ*, 1577. Folio. *Merfennus*'s Work is entitled *Harmonicorum*, Libri XII. *authore* F. M. Merfenuo *Minimo, Lutetiæ Parifiorum*, 1648. Fol. He publifhed another book before this, the title of which is, *Harmonie Univerfelle, contenant la Theorie & la Pratique de la Mufique. Paris*, 1636. Fol. 2 vol.

Hence it is plain, Salinas and Merfennus had not fufficiently examined this matter.

The ufe of this *Temperature* of Mr. Huygens deferves to be introduced into the practice of mufic, as it will facilitate the execution of all the genera of mufic, whether diatonic, chromatic, or enharmonic; nor does the multiplicity of its parts render it impracticable, the author affuring us, that he had harpfichord made at Paris with fuch divifions, which was approved of, and imitated by fome able muficians. Merfennus alfo gives a fcheme for this purpofe; and Salinas fays, he faw and played upon fuch an inftrument. See alfo Don *Vincentino* before cited, lib. 5. p. 99, *&c.*

Mr. Huygens, to facilitate the tuning of inftruments with fuch divifions, has given us a table of the parts of an octave, according to his fyftem, together with their logarithms. The table is as follows:

The divifion of the octave into 31 equal parts.					The divifion of the octave according to the common *Temperament*.
I.	II.	III.	IV.	V.	VI.
N. 97106450					
4,6989700043	50000	Ut^2	C^2	50000	4,6989700043
4,7086806493	51131				
4,7183912943	52278				
4,7281019393	53469	Si	B^x	53499	4,7283474859
4,7378125843	54678				
4,7475232293	55914	Sa	B	55902	4,7474250108
4,7572338743	57179	*	*	57243	4,7577249674
4,7669445193	58471				
4,7766551643	59794	La	A	59814	4,7768024924
4,7863658093	61146				
4,7960764543	62528	*	*	62500	4,7958800173
4,8057870993	63942	Sol^x	G^x	64000	4,8061799740
4,8154977443	65388				
4,8252083893	66866	Sol	G	66874	4,8252574989
4,8349190343	68378				
4,8446296793	69924				
4,8543403243	71506	Fa^x	F^x	71554	4,8546349804
4,8640509693	73122				
4,8737616143	74776	Fa	F	74767	4,8737125054
4,8834722593	76467				
4,8931829043	78196				
4,9028935493	79964	Mi	E	80000	4,9030899870
4,9126041943	81772				
4,9223148393	83621	Ma	E^b	83592	4,9221675119
4,9320254843	85512	*	*	85599	4,9324674685
4,9417361293	87445				
4,9514467743	89422	Re	D	89443	4,9515449935
4,9611574193	91444				
4,9708680643	93512	*	*	93459	4,9706225184
4,9805787093	95627	Ut^x	C^x	95702	4,9809224750
4,9902893543	97789				
4,9999999993	100000	Ut	C	100000	5,0000000000

The fecond column of this table contains the numbers expreffing the lengths of chords making 31 equal divifions, the longeft anfwering to C, being fuppofed to be divided into 100,000 parts.

In the third column are the fyllables by which the notes are ufually named in France; and the afterifc * fhews fome enharmonic notes, of which that near *Sol* is moft neceffary.

In the fourth column are the letters commonly ufed to denote the founds of the octave.

The numbers of the fecond column were found by means of thofe in the firft, which are their refpective logarithms; and thefe were found by dividing 0.30102999566 the logarithm of

of 2 by 31. The quotient 97106450 is marked N. and being continually added to the logarithm of 50000 that is to 4.6989700043 gives all the logarithms of the first column to the greatest 4.9999999993, which being extremely near to 5.0000000000 the logarithm of 100000, shews the operation to have been rightly performed.

The fifth column shews the lengths of the chords in the common *Temperament*: And the sixth column contains their respective logarithms. V. *Huygenii* Opera, vol. 1. p. 752, 753. The learned author of this *Temperature* has not given the notes answering to all the divisions of the octave; but that may easily be supplied from what has been said above, when we derived this *Temperature*, from the consideration of the common.

We have already mentioned the advantages of Mr. Huygens's system; but its excellency will better appear by comparing it with the schemes of others. We may distinguish and name the different *Temperatures* by the number of equal parts, into which the octave is supposed to be divided. The *Temperatures* that occur in books, are *Temperatures* of 12, 19, 31, 43, 50, 53 and 55 parts, of which in order.

The *Temperature* of 12 parts is founded on the supposition that the semitones major and minor may be made equal. Hence the octave will be divided into 12 equal semitones, 7 of which will make the fifth, 4 the third, and 3 the third minor.

The *Temperature* of 19 parts goes upon the supposition that the semitone major is the double of the semitone minor. Hence the tone will be 3, and the third major 6. The diesis enharmonica will be 1, and consequently the octave being 3 thirds, and a diesis, will be 19. The fifth contains 11 parts. The harpsichord in this scheme will have every feint cut in two, one for the sharp of the lower note, and the other for the flat of the higher. Between B and C, and between E and F, will be interposed keys, which must serve for the sharps of B and E, and the flats of C and F respectively.

The *Temperature* of 31 parts is Mr. Huygens's already described; here the semitones are as 3 to 2. The third major is 10, and the fifth 18.

The *Temperature* of 43 is Mr. Sauveur's, and by him very fully described in the memoirs of the Royal Academy of Sciences, An. 1701, 1702. He supposes the proportion of the semitones to be as 4 to 3. Hence his tone is 7. The third major 14, the fifth is 25, and the octave 43. What musical foundation this learned gentleman went upon in the investigation of this *Temperature*, I know not: But it seems liable to insuperable difficulties; for here the diesis enharmonica is but the half of the difference between it and the chromatic diesis; whereas, in truth, this difference, instead of being double of, is really less than the enharmonic diesis, as was long ago objected to him by Mr. Hensling, and appears from the table under the head INTERVAL. Miscel. Berolin. Tom. 1. p. 285, 286.

Besides, his enharmonic diesis falls greatly short of the truth, being but 1.27 of a comma, which is an error of 0.64 or near $\frac{2}{3}$ of a comma. Whereas in Mr. Huygens's *Temperature*, the error of the diesis is almost insensible, being but $\frac{1}{10}$ of a comma. Nor are the practical advantages of Mr. Sauveur's system any way comparable to Huygen's. His fifth is indeed, strictly speaking, better; but so little, that the difference is not sensible, not being $\frac{1}{20}$ of a comma. On the other hand, his thirds are sensibly worse, the major being $\frac{1}{5}$ and the minor $\frac{2}{5}$ of a comma false. Whereas Huygens's third major does not differ sensibly from the truth, and the minor has no sensible difference from the third minor deficient by $\frac{1}{4}$ comma of the common *Temperature*, which ought to be deemed the limit of the diminution of concords. If we add to this, that the much greater number of parts in Mr. Sauveur's octave, makes it vastly more intricate than Mr. Huygens's, and that these parts would be false or useless, even supposing the enharmonic genus restored, I believe no musician will long hesitate which he ought to prefer.

The *Temperature* of 50 parts is proposed by Mr. Hensling in the Miscellan. Berolin. above cited; he takes the proportion of the semitones as 5 to 3; hence his tone is 8, the third major 16, the fifth 29, and the octave 50. The third major and fifth in this system will be worse than Huygens's, though the third minor be a little better. The third major is here less than the true, and the fifth deficient by more than $\frac{1}{4}$ comma, which is a fault, not to mention the inconveniency arising from dividing the octave into 50 parts; besides 5 : 3 the proportion of the semitones here assumed, although expressed in greater numbers, is not so near the truth as Mr. Huygens's of 3 : 2. We have given the proof of this under the head RATIO.

The *Temperature* of 53 parts is mentioned by Mersennus. Here the tones will be unequal, 9 being the tone major, and 8 the minor. Hence the third major will be 17, and the fifth 31, which last does not differ from the truth by above $\frac{1}{333}$ part of a comma. The third minor is also more perfect than in Mr. Huygen's system: But the multiplicity of parts in the octave of this system, render it too intricate; and the distinction of tones major and minor upon fixed instruments, is, I doubt, impracticable.

The last *Temperature* we have mentioned is that of 55 parts, which Mr. Sauveur calls the *Temperature* of practical musicians. Its foundation lies in assuming the proportion of the semi-tones, as 5 to 4, so the tone will be 9, the third 18, and the fifth 32. The fifth in this system, as in that which makes the semitones equal, is nearer the truth than Mr. Huygens's, but this advantage is not $\frac{1}{15}$ of a comma; and on the other hand, the thirds both major and minor are here greatly mis-tuned, as will appear by the annexed Table, exhibiting the thirds and fifths of these several *Temperatures*, as also the thirds and fifths of the common *Temperature*, and two mentioned by Salinas, marked 1st. Salin. 2d. Salin. The letter V. stands for the fifth; III. for the third major, and 3. for the third minor. The fifths are all deficient, but the thirds are sometimes greater and sometimes less than the true; the first are marked +, the others —.

Temperatures	V. Commas.	Error.	III. Commas.	Error.	3. Commas.	Error.
of 12 parts.	32.549	0.091	18.599	0.636 +	13.950	0.727 —
19.	32.304	0.336	17.620	0.343 —	14.684	0.007 +
31.	32.399	0.241	17.999	0.036 +	14.400	0.277 —
43.	32.440	0.200	18.167	0.204 +	14.273	0.404 —
50.	32.363	0.277	17.855	0.108 —	14.508	0.169 —
53.	32.637	0.003	17.897	0.066 —	14.740	0.063 +
55.	32.464	0.176	18.261	0.298 +	14.203	0.474 —
Com. Temp.	32.390	0.250	17.963	0.000	14.427	0.250 —
1st. Salin.	32.307	0.333	17.630	0.333 —	14.677	0.000
2d. Salin.	32.354	0.286	17.520	0.143 —	14.434	0.143 —
True Scale.	32.640	0.000	17.963	0.000	14.677	0.000

Temperatures formed by the division of the octave into equal parts, may be called geometrical *Temperatures*. The common and the two mentioned by Salinas, do not proceed upon this foundation. The intention of the first inventors not having been to make transpositions to every note of the system equally good; but only to make the most usual transitions in the course of a piece of music tolerable. Hence the parts of the octave, in their suppositions, were not all equal.

The common *Temperature*, as we have said, preserves the third major perfect. The first of Salinas, preserves the third minor perfect. In the second of Salinas, the semitone minor is perfect. The foundation of his first *Temperature* is making the temperate tone equal to the tone-minor and $\frac{1}{3}$ of a comma, or to the tone-major less $\frac{2}{3}$ of a comma. Hence his fifth and third major will be deficient by $\frac{1}{3}$ of a comma; and the third minor consequently, will be true. The ground of his second scheme is, to add $\frac{3}{7}$ of a comma to the tone-minor, or take $\frac{4}{7}$ from the tone-major, for his temperate tone. Hence the fifth will be deficient by $\frac{2}{7}$ of a comma, and the thirds major and minor each deficient by $\frac{1}{7}$ of a comma. Consequently the semi-tone, being their difference, will be preserved.

As to Mr. Salmon's scale, in the Philosophical Transactions, there is nothing true in it, but the diatonic scale of C. His scale for A is false, the fourth being erroneous by a comma; most of his semi-tones are likewise false. In short, it can neither be considered as a true scale, nor as a *Temperature*.

Before we close this article, it may be proper to add a few words about the method of invention of the foregoing geometrical *Temperatures*. Mr. Huygens having had the hint of a division of the octave into 31 parts, had nothing farther to do but to examine it by logarithms. But, supposing no such hint had been given, he might have investigated it directly by the method laid down by himself, and also by Dr. Wallis, and Mr. Cotes, for approximating to the value of given ratio's, in smaller numbers. We have given Mr. Cotes's method, under the head RATIO. The application of that method to the present purpose, is thus: The ratio of the octave to the third major is 55.79763 to 17.96282, and the approximating ratios will be

1°. greater than the true 28 : 9, 87 : 28, &c.

2°. less than the true 3 : 1, 31 : 10, 59 : 19, 205 : 66, &c.

The ratios greater than the true, must all be rejected; because they give the third major less than true, and consequently the tone, (its half) deficient by above $\frac{1}{2}$ comma; which gives the fifth deficient above $\frac{1}{4}$ of a comma; but this ought not to be. The first of the ratios less than true, is 3 : 1, or 12 : 4, which is the *Temperature* of 12 parts before described, and too inaccurate. The next is 31 : 10, or Mr. Huygens's. The rest divide the octave into too many parts.

The

The fame may be alfo found thus; the ratio of the octave to the common temperate fifth, deficient by $\frac{1}{4}$ of a comma, is 55.79763 to 32.38952. The approximating ratios to which are,

1°. greater than the true 2 : 1, 7 : 4, 19 : 11, 50 : 29, &c.
2°. lefs than the true 1 : 1, 3 : 2, 5 : 3, 12 : 7, 31 : 18, 205 : 119. Where we have the *Temperatures* of, 12, 19, 31, and 50 parts, before examined.

And here all ratios greater than the true, ought to be rejected; becaufe they give the fifth lefs than true, that is, in this cafe deficient by more than $\frac{1}{4}$ of a comma.

If we inveftigate the approximating ratios to the ratio of the femi-tones major and minor, or 5.19529 to 3.28612, we fhall have the ratios 1 : 1, 2 : 1, 3 : 2, 5 : 3, which refpectively give the *Temperatures* of 12, 19, 31 and 50 parts, before defcribed.

Again, inveftigating the approximating ratios of the fifth to the third major, we fhall find 7 : 4, 9 : 5, 11 : 6, 29 : 16, which will alfo give the *Temperatures* 12, 19, 31, 50, as before.

Laftly, the approximated ratios of the octave to the true fifth, are 12 : 7 and 53 : 31 greater than the true. The others being of no ufe, fince the fifth muft neceffarily be diminifhed. Here we find the *Temperature* of 53 parts. As to the *Temperatures* of 43 and 55, being deftitute of any mufical foundation, it is no wonder they do not appear by this method of inveftigation.

Mr. Huygens, in his Cofmotheoros, fays, that the tone or pitch of the voice cannot be preferved, unlefs the confonants be tempered, fo as to deviate a little from the higheft perfection. For the proof of this affertion, he brings a melody confifting of the following founds, C, F, D, G, C; where, if the intervals were to be fung perfect, by taking the interval from C to F a true fourth afcending, from F to D a third minor defcending, from D to G a true fourth afcending, and laftly, from G to C a true fifth defcending; we fhould fall a comma below the C from whence we began. Therefore, if we were to repeat this feries of notes nine times, we fhould at laft fall near a tone major below our firft found.

Mr. Huygens's folution of this difficulty is, that we remember the note from whence we fet out, and return to it by a fecret *Temperature*, thereby finging the intervals a little imperfect; which, he fays, will be found neceffary in almoft all fongs or melodies.

A like difficulty is mentioned in the Memoirs of the Royal Academy of Sciences; and is there urged for the neceffity of a *Temperature*, even for finging in the fame key. And Mr. Huygens's folution of the difficulty is there approved of. An. 1707. p. 264.

But the folution of thefe learned gentlemen is, as yet, far from being decifive. No experiment has yet been brought to fhew that the human voice fings tempered notes; not even when accompanied by tempered inftruments. It feems to us, on the contrary, that an exercifed voice guided by a good ear, fings true, even though accompanied by a mif-tuned inftrument, as harpfichords moft frequently are, efpecially in tranfpofed keys. And were thefe inftruments always as well tuned as art could make them, yet their tones would be equal; and it feems evident to the ear, that the human voice finging naturally two tones in fucceffion, as C, D, E, never makes them equal; and cannot, without great difficulty, and by means of a variation of harmony, be brought to make them equal.

Another folution, therefore, of Mr. Huygens's difficulty, muft be fought for. The truth feems to be, that the fecond of the key muft be the true tone-major above the key, and therefore the third between the fecond and fourth of the key muft be fung deficient by a comma. Thus in the key of C, from C to D will be a tone-major $= \frac{9}{8}$, and from D to F will be a deficient third $= \frac{32}{27}$. See the article INTERVAL.

Mr. Huygens's melody therefore, will ftand thus:

C, F, D, G, C.

$\frac{4}{3} \times \frac{27}{32} \times \frac{4}{3} \times \frac{2}{3} = 1$. And the voice would fing the interval F, D, juft as if the note E had been interpofed; in which cafe the notes would be C, F, E, D, G, C.

$$\frac{4}{3} \times \frac{15}{16} \times \frac{9}{10} \times \frac{4}{3} \times \frac{2}{3} = 1.$$

Thefe notes all come within the diatonic fcale of C; and the voice naturally falls upon the note from whence it fet out. The fame anfwer will hold in the example, mentioned in the Memoirs of the Academy of Sciences; where the intervals ♭B, G, E, C, occur. And here the interval from ♭B to G fhould be taken $= \frac{27}{32} = \frac{15}{16} \times \frac{9}{10}$, as in the former example; and for the fame reafon, the key being F.

There feems therefore no repugnancy between the practice and theory of mufic, while the melody is confined to one key; but it muft be owned, that in tranfitions from key to key, efpecially where feveral parts are to make harmony with each other, there ftill remain difficulties, not mentioned by Mr. Huygens, or any other writer we know of, which might deferve a farther examination.

We muft not omit mentioning, that the learned Dr. Smith, in his Harmonics, has not only carried the theory of *Temperaments*, or *Temperatures*, far beyond all the authors that preceded him; but has fhewn how to tune an inftrument, according to any propofed *Temperament*, by the ear only, which is certainly a moft ingenious difcovery.

This learned author[a] prefers what he calls the *Temperament* of equal harmony, which differs infenfibly from the divifion of the octave into 50 parts, to all others; and infifts, that it labours under the feweft defects, and is of all others the moft agreeable in practice. In the fyftem of equal harmony the *Temperaments* of the fifth, third major and third minor, are refpectively, $\frac{5}{18}$ and $\frac{2}{18}$ and $\frac{3}{18}$ of a comma lefs than the truth[b]. It would be impoffible here to do juftice to the learned author's reafonings on this fubject; we fhall only add, that he eftablifhes, contrary to the common opinion, that the lefs fimple confonances, generally fpeaking, will not bear fo great *Temperaments* as the fimpler confonances[c].—[[a] *Smith*'s Harmonics, p. 172, 188. [b] Ibid. p. 172. [c] Ibid. p. 146.]

Dr. Smith mentions a *Temperament* communicated to him by the ingenious Mr. Harrifon, which confifts in making the proportion between the octave and third major equal to that of the circumference of a circle to its diameter. In this *Temperament* the third major is diminifhed by $\frac{1}{5}$ of a comma, but the third minor is very near the truth, and extremely beautiful. *Smith.* pref. p. xi

A late author[a] feems to think the divifion of the octave into 31 parts, not to be of modern invention, but neceffarily implied in the doctrine of the antients. At firft fight it would feem, as if the antients made but 24 diefis or divifions in the octave, *viz.* ten to each fourth, and four to the tone; which (the octave being equal to two fourths and a tone) gives twenty-four diefes to the octave. But the author juft quoted contends, that this divifion is to be underftood only in one tenfion, that is either afcending or defcending; but that accurately fpeaking, if we confider all the diefes or divifions of the fourth, both afcending and defcending, we fhall find thirteen; five to each tone, and three to the femi-tone major; and confequently thirty-one divifions in the octave. Thefe indeed are not all naturally equal; but if we make them fo, we fhall have a *Temperature* known by the moderns under the name of Huygens's *Temperature*[b].—[[a] Dr. *Pepufch*, in Phil. Tranf. N°. 481. p. 273. [b] Phil. Tranf. ibid.] See the article DIESIS.

TEMPERATURE, or CLIMATE for plants. The difference of *Climate*, or *Temperature* of the air has a very great effect on plants. The different degree of heat is the great caufe of thefe changes, and the different degree of moifture fomewhat affifts in it. The American and Afian plants, famous in medicine when of the growth of their native foils, yet when removed into our *Climate*, though they grow and even produce their flowers and ripen their feeds, which feems the laft perfection of a plant, when put to the trial, have been always found to want their proper medicinal virtues.

Many of thofe plants and trees, which though natives of another *Climate*, will endure the open air with us, and grow in our gardens; yet lofe much of their ftrength, and become dwarfs, in proportion to what they were when in their proper *Climate*. But much lefs violent changes than thefe are able to produce the like effects, at leaft in fome degree. The feveral parts of Europe are able to alter the quality of the fame plant, even while it grows naturally in them. Thus the blue aconite or napellus, the root of which is a terrible poifon in the fouth of France; yet in Britany, a northern province of the fame kingdom, the root of the fame plant, though it feems to grow with equal vigour there, and is equally large and fucculent, has no bad effects; but has been eaten by old people and by children, without any injury.

In general, the farther north we go the lefs and lefs hurtful this plant becomes. It is common to almoft all Europe, and we find the inhabitants of fome places dreading it, and that with great juftice, as a fatal poifon; while thofe of others eat the leaves in their fallads, and even efteem them good to reftore the appetite.

The common woad which fucceeds well in many parts of England, is not fo certain in France; but the different *Climates* in different parts of that great kingdom, make ftrange alterations in its juices. In Upper Languedoc they raife great quantities of it, and it makes an extremely fine blue dye for ftuffs of all kinds; but in Britany, though the plant grows as high, and feems to flourifh as well, yet the leaves never are fo fucculent, and the colour obtained from them is not of fo fine a blue, but is dufky and brownifh.

This effect of the different *Climates*, in changing the nature of things produced in them, is not confined to plants; but the animal kingdom fhares in it. The whole ferpent kind are in general larger and more venomous, as we approach the hotter *Climates*. The tarantula, fo poifonous in the hot countries, is found greatly lefs fo as it is found in more cold regions; and the fcorpion, whofe fting is fatal in fome parts of Africa, is little more mifchievous than the wafp or hornet in fome of the coldeft places where it lives. Nay, the Philofophical Tranfactions inform us, that the bite of the tarantula, even in thofe very places where moft mifchievous, does not exert its power in cold weather; but that a perfon bitten at fuch a time feels not the effect of the bite till the next fultry hot day, though that may not happen till after two or three weeks.

The differences made by variety of *Climates* upon plants, are not limited to diftance of place, but even in the fame province the *Climate* differs greatly in different years, by means of accidents, and more or lefs heat; and more or lefs moifture will do as much violence to plants fometimes, as change of place, which only operates by means of the fame agents. Our farmers complain of great mifchiefs, from long droughts; and the French hufbandmen, in many of the provinces, always find, that when there has fallen very much rain, or thick fogs have been very frequent, all the bread-corn of every kind degenerates; the wheat and barley are poor and thin in the ear, and the grain fmall; but the rye becomes fo altered, that it is pernicious to ufe it in making of bread; and the poor, who are obliged to eat the bread made with it, are fubjected to many difeafes by it. They call the rye thus vitiated *Ergot*, and *blé cornu*. *Defland's* Trait. Phyf.

TEMPERING *of Bricks*. See the article BRICK-*making*.

TEMPLE (*Cycl.*)—*Temples* were originally all open, and hence received their name. See Phil. Tranf. N°. 471. fect. 5. where we have an account of an antient *Temple* in Ireland of the fame fort as our famous Stonehenge.

The word *Templum*, in its primary fenfe among the old Romans, fignified nothing more than a place fet apart, and confecrated by the Augurs; whether inclofed, or open; in the city, or in the fields. *Middlet.* of Rom. Sen. p. 135.

TEMPLUM *Softrati*, the name of a kind of chirurgical bandage, defcribed by Galen. He alfo defcribes another under the name of *Templum parvum Apollonii Tyrii*.

TEMPO *di Gavotta*, in mufic. See the article *Tempo di* GAVOTTA.

TEMPORALIS, (*Cycl.*) a broad flat mufcle, refembling the quadrant of a circle, and occupying all the femi-circular or femi-oval plane of the lateral region of the cranium, the *Temporal* foffæ, and part of the zygomatic. Through all the circumference of this femi-circular plane, the pericranium is divided into two laminæ. The internal lamina, which is fometimes taken for a particular periofteum, covers immediately all the bony parts of this region; the external lamina feparated from the other, is fpread out like an aponeurotic, or ligamentary tent, by means of its adhefions to the external angular apophyfis of the *os frontis*, to the pofterior edge of the fuperior apophyfis of the *os malæ*, and to the upper edge of all the zygomatic arch all the way to the root of the maftoide apophyfis.

This mufcle is compofed of two planes of flefhy fibres fixed to the two fides of a tendinous plane, nearly of the fame breadth with them by which they are feparated; it being fpread quite through the mufcle, like a concealed middle tendon; and the body of the mufcle thus formed, is inclofed between the two aponeurotic or ligamentary laminæ in the following manner:

The internal flefhy plane is fixed by a broad radiated infertion to all the femicircular plane of the cranium by the intervention of the internal lamina of the periofteum. Thus it is fixed to the lateral and external part of the *os frontis*, and to its external angular apophyfis, to the lower part of the *os parietale* to the fquammous portion of the *os temporis*, to the great ala or temporal apophyfis of the fphenoidal bone by which the temporal foffa is formed, and a little to the backfide of the internal orbitary apophyfis of the *os malæ*, which forms part of the zygomatic foffa.

The external flefhy plane is fixed in the fame radiated manner to the infide of the external lamina of the pericranium, from the great femi-circular circumference, all the way to a fmall portion of this lamina, more or lefs femi-circular above its infertion in the zygomatic arch; here the flefhy fibres leave the external lamina, and the void fpace is commonly filled with fat. The middle tendinous plane continues to contract by degrees, and ends at length in a very confiderable tendon, the extremity of which, which is in a manner double, encloses the coronoide apophyfis of the lower jaw. There is another fmall plane, reckoned by fome to be a portion of this mufcle, but in reality is no other than the third portion of the mafleter. *Winflow's* Anat. p. 251.

When the *Temporal* mufcles are wounded, at the fame time that there is a contufion of the cranium, which is frequently the cafe, the patient will be attended with great diforders; not only as thefe mufcles are neceffary for the offices of dividing the food, and for forming of fpeech, but becaufe they are furnifhed with nerves, tendons and arteries, all very confiderable, which will partake of the injury. Where there is no violent fymptom attending wounds on the external parts of the head, they are eafily cured by the common method ufed to frefh wounds, and there will be no occafion for futures, for fticking plafters will always anfwer the purpofe; but the dreffings muft always be finifhed with all poffible expedition; the medicines muft be always applied warm, and the air kept in a moderate heat with hot coals.

If there be any great degree of hæmorrhage from the wounded veffels, dry lint, or the ftyptic powders are to be ufed, and the whole kept on by compreffes and a proper bandage; and after the hæmorrhage is ftopped, the wound muft be dreffed with *mel rofarum*, or fome digeftive medicines, till fufficiently detorged, and then with a vulnerary balfam, or dry lint till it is healed. *Heifter's* Surg. p. 83.

TEMPOREGIATO, in the Italian mufic, fometimes fignifies, that the muficians who accompany the voice, or the perfon who beats time, fhould prolong fome particular part thereof, to give the actor or finger room to exprefs the paffion he is to reprefent, or to introduce fome graces by way of ornament to the piece.

TEMPOREGIATO is alfo ufed in a different fenfe, for *à Tempo*, or *à tempo giufto*.

TEMPORUM *Offa*. Thefe are two in number, fituated in the lower and lateral part of the fkull; the figure of each is partly femi-circular, refembling the fcale of a fifh, partly like a fhapelefs rock ending in feveral points.

Each of them is divided into two portions, one fuperior termed fquammous, from its figure; the other inferior, called *apophyfis petrofa*, or the rocky apophyfis; but that more from its hardnefs, than from the irregularity of its figure. This portion is eafily feparable from the former in children; and fome marks of this divifion are ufually found ftill remaining in adults.

They are alfo divided into two fides, one external and convex, the other internal and concave. Their external eminences are, the maftoide apophyfis in the lower and pofterior part of the bone; the zygomatic apophyfis in the anterior part; the ftyloide apophyfis under the bone, which feems originally to have been an epiphyfis; the capfular apophyfis, in which the bony ftilet feems as it were to be fet; the articular eminence of the zygomatic apophyfis, the lambdoidal angle, and the lower fide of the apophyfis petrofa.

Its external cavities are, the articular one immediately behind the eminence, called by the fame name; and which, with that, ferves for the articulation of the lower jaw. The crack in the articular cavities; the maftoide notch, in which the digaftric mufcle is inferted; the opening of the external *meatus auditorius*; the anterior indented border of that opening; the ftylomaftoide, or anterior maftoide hole, which is the orifice of the paffage of the *portio dura* of the auditory nerve, called from its form the aqueduct; the orifice or inferior hole of the carotide canal in the apophyfis petrofa, which alters its direction upward and forward, and ends at the point of the rock near the *fella fphenoidalis*; a portion of the jugular foffa, and a portion of the *foramen lacerum*.

Among the external cavities we are likewife to reckon a portion of the *ductus palatinus* of the ear, commonly called the Euftachian tube, and by fome the aqueduct; but by no means to be confounded with the other aqueduct, or ftylomaftoide; the zygomatic notch; the parietal notch; the fpheroidal notch; one or more little tubes, which receive the ramifications of the temporal artery; the groove in the apophyfis petrofa; by which it is connected to the great apophyfis of the *os occipitis*; the pofterior maftoide hole; but this hole is fometimes formed between this bone and the *os occipitis*, and is fometimes entirely wanting in one of the bones, and fometimes in both; and there is befide thefe, in fome fubjects, a fmall maftoide hole, which lofes itfelf in the fubftance of the bone.

In examining the internal eminences and cavities, we muft diftinguifh the fquammous portion from the apophyfis petrofa. In the former we fee the radiated indentations of the femicircular edge, which with the parietal bone forms the fquammous future; a portion of the middle foffa of the bafis cranii on the fame fide, and feveral inequalities on the fame fide.

The apophyfis petrofa, or rock, is a fort of pyramidal body, with three fides fituated obliquely, fo that its bafis is turned backward and outward, and its apex forward and inward toward the *fella turcica*: Of the three fides, one is fuperior and inclined a little forwards, the fecond pofterior, and the third inferior: This laft belongs to the outfide of the whole bone. The upper fide affifts in forming the middle foffa of the bafis cranii; and we obferve here a fmall irregular hole appearing to be double, and partly covered by a fmall bony plate; this is a kind of break or interruption in the duct, through which the *portio dura* of the auditory nerve paffes

In the back fide of the rock we fee the internal auditory hole, and a portion of the foffa for the cerebellum: fmall, indeterminate, and pretty deep depreffions are fometimes feen in it in children; but thefe are gradually obliterated as they grow up. At the bafis of this apophyfis we fee a portion of a groove in the lateral finus, formed partly in this bafis, partly in the lambdoidal angle; as alfo a portion of the *foramen lacerum*, and a fmall point which as it were divides this hole in two, and diftinguifhes the paffage of the jugular vein, from that of the eighth pair of nerves.

As this apophyfis has three fides, three angles are to be obferved in it; the firft fuperior between the upper and back fides, the fecond pofterior between the back and lower fides, and the third anterior between the lower and fore fide. The fuperior angle, which is the moft apparent, has a groove for the fmall finus of the *dura mater*. The pofterior angle is in a manner interrupted near the middle by the *foramen lacerum*, and from it proceeds the little bony point, which divides this hole; at the end of it is a grove by which it is connected with the

the great apophysis of the *os occipitis*. Between the apex of the apophysis petrosa, and the superior opening of the carotid canal, we sometimes meet with a small bone also of the sesamoide kind, mentioned long since by Riolan. Almost the whole substance of the *ossa temporum* is compact; the squamous portion is thin and transparent; the mastoide apophysis is hollowed by considerable cells; the apophysis petrosa is very hard and solid, with several internal cavities for the organ of hearing contained in it. *Winslow*'s Anatomy, p. 30. See the article TEMPORIS *Os*, *Cycl.*

TENACIOUS *Bodies*. See the article TENACITY.

TENACITY, in natural philosophy, that quality of bodies by which they sustain a considerable pressure or force without breaking. Mem. Acad. Berlin. 1745. p. 47.

Tenacity is the opposite quality to fragility or brittleness. See the article BRITTLENESS.

Tenacious bodies support the effort of percussion, or pressure, without receiving any damage: But here, and in many other cases, as when we use the words *hard*, *soft*, *flexible*, &c. we must be understood in a sense relative to the ordinary degrees of human strength; otherwise it would be difficult to say, what is *tenacious*, brittle, hard, soft, *&c.* Ibid.

TENCH, the English name of the *tinca* of the modern authors, the *fullo* and *gnapheus* of the antients.

It is, according to the Artedian system, a species of the cyprinus, and is distinguished by that author by the name of the blackish, mucous, or slimy cyprinus, with the end of the tail even. See the articles TINCA and CYPRINUS.

This is a delicately tasted fish, though it lives in foul water, and seems to feed very coarsely. It is always found in the muddiest parts of ponds, and where there are most weeds.

The slime of the skin of this fish is said to be of a healing nature, and to cure all fresh wounds; and it is pretended that the other fish know this property in it, and always apply to the *Tench* when wounded. Whether their opinion be true or false, the *Tench* has obtained by it the name of the *fishes physician*. The pike is said to pay such respect to this fish, on this account, that he never seizes him. But these are things easier to be fancied and said than proved; and if it should prove that the pike does not eat the *Tench*, it may be resolved into a much more natural cause, by supposing the slime of the *Tench* too disagreeable in his stomach to suffer it.

The season for angling for *Tench* is in June, July, and August. The time of their biting is early in the morning, or late in the evening, and in hot weather, all night long. The favourite bait for the *Tench* is a large red worm, and they will take this much more greedily if it be dipped in tar, after it is put on the hook. There are several sorts of paste also that he bites very well at, particularly one made of brown bread and honey, with an admixture of tar. All pastes that have any of the strong-scented oils in them, are also good baits. Other baits are the cad-worm, lob-worm, flag-worm, green gentle, marsh-worm, or soft boiled bread corn. All these will do very well at a proper season.

When a number of *Tench* are to be taken out of a muddy pond, where they will not bite freely at the hook, the method is to take a very good and large casting-net, well leaded, and with the meshes from the crown to a full yard and half, not too small, for then, if the pond be deep, the fish will strike away before the net gets to the bottom. The place where the net is intended to be thrown, must be made clean from bushes and large weeds, with a rake. When the place is thus cleared of any obstacles to the even descent of the net, a bait is to be prepared to draw the fish together, where the net is to be thrown. This bait is to be thus made: Put a quarter of a peck of wheat into three quarts of water, send it to an oven, and let it be well soaked, then add to it five pints of blood, and as much bran as is necessary to give it the consistence of a paste. Mix some clay with it, that it may the better hold together; and finally add a quart of lobworms chopped to pieces. Let the whole be wrought up into a stiff paste, and rolled into balls of the size of a hen's egg; and let these be thrown into the pond, in the place where the net is to be thrown. At times these, and at times some grains are to be thrown in; and the place in this manner thoroughly baited for several days. When the fish may be supposed to be very well acquainted with the spot, let a very good baiting be given in the morning, and in the close of the evening let the casting-net be carefully thrown in. When the net is sunk, the mud all about is to be stirred up with a long pole, with a fork at the end; the net is to lie half an hour, and the mud to be thus stirred all the time; by this means the *Tench* will be raised, and will be taken in the pulling out the net; but if the net were to be thrown in and taken out in the common way, there would hardly be one fish taken; for the custom of both *Tench* and carp, when they are frighted, is to plunge their heads up to the eyes in the mud, and thus placed, with their tails erect, any net in the world must draw over them, without a possibility of its entangling them.

TEND, in our old writers, seems to signify as much as *Tender* or offer; as to *tend* a traverse, an averment, *&c.* Briton, c. 76. Staundf. Prærog. 16. *Blount*, *Cowel.*

TENDO *Achillis*, in anatomy, is sometimes more peculiarly denominated *Chorda Achillis*, and *Chorda Magna*, or the great *Tendon*.

'Tis on the distance of the *Chorda Achillis* from the point of support, that the strength of the foot depends. The further this tendon is from the articulation, the stronger the part is found. Hence it is observed, that animals which run, or leap with the greatest ease, are those in which this *Tendon* is farthest removed. And men with long heels are better able to walk than others; and still the longer the foot, the more necessary is the length of heel. Petit. in Mem. de l'Acad. R. des Scienc. 1722. p. 75.

Anatomists are divided about the rupture of the *Tendon* of Achillis. Some hold this *Tendon* impossible to be broken by any effort whatever, and in proof hereof alledge its situation, which seems to secure it from such an accident. Others insist, that considering the great force which draws this *Tendon* downward, when in a leap or fall, the whole weight of the body bears on the top of the foot, or on the heel; 'tis easy to conceive, that a single effort may break it. Accordingly Pareus affirms, he has known it broken, on a slight occasion; as by a false step, a slip in mounting on horseback; and this without any visible injury, or solution of continuity of the part.

M. Petit, the surgeon, produces two other instances of his own knowledge: The first, of a posture-master named Clochoix, who, at the fair of S. Germains, endeavouring to jump, with his feet close together, upon a table 3 foot high, broke both the *Tendons of Achillis*, yet without any external wound [a]: The second, of a woman who broke the *Tendon of Achillis* of the right foot, by a fall in a boat, from a bench 6 foot high [b].—[[a] Mem. de l'Acad. R. des Scienc. 1722. p. 68. seq. [b] Traite des Malad. des Os. Jour des Scav. T. 74. p. 328.]

The phænomena ensuing on the rupture of the *Chorda Achillis*, in the first instance, were, that the patient could still contract or stretch his feet; that he could not stand upright; and that he felt no pain, either at the time of the rupture, or during the cure.

Notwithstanding this, several persons persist in the belief of the thing's being impossible; and contest both these instances, as not real ruptures of the *Tendon of Achillis*. A warm dispute has ensued between the author and Mr. Andry, and others, the particulars whereof are related by the Paris journalists. V. Jour. des Scav. T. 74. p. 328. seq. Id. T. 75. p. 483. seq. Id. T. 78, p. 230.—

Mr. *Petit* observes, that the *Tendons* are a sort of cords, which at one end part from a muscle, and at the other are joined to a bone, so that when the muscle contracts itself in its action, the *Tendon* draws toward it the bone to which it is infixed, and makes it perform such motions as it is capable of. The *Tendons* are substances not capable of extension; so that when a muscle acts, if the bone which it should, by that action, draw to a certain place, does not follow, either the bone must break, or the *Tendon* must be torn asunder; provided that the action of the muscle be of a proper strength.

We are next to consider, that in certain motions, such as that of the dancer, who is going to rise up from the ground, all the weight of his body is sustained by, and even overpowered by a certain number of muscles, which, having been thrown into a strong contraction, violently expand themselves again in a moment, and by that means cause the leap. If at the instant, when these muscles have stretched their *Tendons* to the utmost violence, there happens some accident by which these *Tendons* are again pulled downward by the whole weight of the body, it cannot be wondered at, that, strong as they are, they cannot resist so violent a force; and it was in this very manner that the dancer, cured by Mr. Petit, broke the *Tendons*. He was about to leap upon a table placed three foot above him; the *Tendon* could not but be extended to its full power in the attempt; and in trying, he sunk directly down again; by which means the weight of his whole body was added to the former force; and that force was yet increased by the acceleration of a fall from the height of three foot.

The *Tendo Achillis* is formed by an intimate union of the *Tendons* of two muscles; now if these two *Tendons* are both broken, the rupture of the *Tendon* is judged compleat; if one only is torn, and the other remains whole, the case is then called an imperfect or incompleat rupture of that *Tendon*.

There is a great difference between the compleat and the incompleat ruptures of this *Tendon*. The pain in the incompleat rupture is exceedingly great; whereas in the perfect one there is scarce any pain at all. When a *Tendon* is wholly divided, the two ends draw back different ways, like the string of a bow when cut, and this produces no pain, or any farther bad symptom, than the loss of the *Tendon*; which is so true, that, in order to take off the pain and other bad symptoms which attend the wounding, or imperfectly dividing a *Tendon*, the best means is to cut it wholly asunder.

The *Tendo Achillis* is placed in a sort of socket, where it plays freely every way, and has no connection or adherence with the adjacent parts; and hence a compleat rupture of it is without pain. This, however, is not the case, when only one of the two *Tendons* which compose it is divided, for then the separated ends of this retiring back as far as possible, cannot but violently affect the remaining entire *Tendon*, which with

them

them formed the *Tendo Achillis*; and as the union of these two is very strict, the pain succeeding the separation of one, and the retraction of its ends, cannot but be proportionably violent and great.

The pain felt in the division of one of these *Tendons*, or the imperfect rupture of the *Tendo Achillis*, is only perceived upwards or above the wound, not below it; the reason of which is, that the upper part of the divided *Tendon* is forcibly drawn up by the muscle by which it is contracted, while it is also drawn downward at the same time by the *Tendon* to which it is intimately and firmly united, and which yet remains whole; and this contrary force must produce the most exquisite pain in the fibres which resist; while the inferior portion, having no force applied to it but what tends to draw it downwards, easily yields to that, and is in no condition to suffer a like pain. This difference between the sensation of the two extremities is, however, only to be felt at first; since, after some time, the inflammation spreading, affects the neighbouring parts, and the lower extremity must feel its share; though even then the pain is much less acute in that portion than in the upper.

In case of a compleat rupture of this *Tendon*, the foot may be bent without causing any pain to the patient; the only effect is the encreasing the space which is between the divided ends of the *Tendon*: But the case is far otherwise in an imperfect rupture of this *Tendon*; the foot then cannot be bent without the utmost pain and agony, because the space between the divided ends of the *Tendon*, which must be enlarged by this bending, cannot be enlarged without a tearing, and violently forcing the imperfectly divided parts.

In the imperfect rupture of this *Tendon*, the patient may walk, though it is with very violent pain; but in the perfect rupture, the person cannot walk, though he suffers no pain at all. In walking, at every step that we take, the whole weight of the body is sustained by the hinder foot; now the *Tendo Achillis* is the only support, by means of which the foot can sustain that weight, or regulate its pressure; and therefore when that *Tendon* can no more perform its office, we can no more walk. These are the several symptoms by which the imperfect ruptures of this *Tendon* may be known from the compleat ones; a knowledge highly necessary to all who are to undertake their cure. Memoirs Acad. Par. 1728.

There have been instances of the *Tendo Achillis* having been cut through, and cured without stitching. See Commerc. Norimb. 1740. hebd. 46.

When a *Tendon* is wounded or divided, the part to which it belongs loses its motion; but if it is divided only in part, the symptoms it produces are much the same with those arising from a nerve wounded in the same manner. *Heister's* Surg. p. 28.

TENDON, in the manege, a sort of gristle that surrounds one part of a horse's foot, and is seated between the hoof and the coffin-bone, near the cronet. When a horse has a quitter-bone, the matter that gathers between the coffin-bone and the hoof, spoils the *Tendon*, and makes it black; and the cure of such a quitter-bone consists in cutting and extirpating the *Tendon*.

TENESMUS, (*Cycl.*) a name given by medical writers to a complaint, which is a continual desire of going to stool, but usually without any stool being ready to be voided. This is usually attended with some tumour, sometimes with a very considerable one in the part. This is properly no primary disease, but merely a symptomatic one, and differs in degree according to the disease on which it is an attendant.

Signs of it. These are a titillation and itching about the anus, attended with a violent burning pain, and a desire of compressing and voiding something, and this attended usually either with no excrement, or only a pulpous and mucous matter, and very often a procidentia ani, or falling down of the rectum.

Persons subject to it. This disease very often happens to people labouring under hæmorrhoidal disorders, especially when the discharges attending them do not succeed regularly, though nature gives all the necessary motions for their excretion. It happens also to people who are subject to void an acrid and bilious matter by stool, and not unfrequently to those who have a stone in the bladder. Women in the latter part of their time, in going with child, have also very often terrible fits of it, attended with considerable swelling; this happens to them from the pressure of the uterus, with its burden, upon the rectum and hæmorrhoidal veins. The procidentia ani happens also to all these subjects, and, beside these, is very familiar to infants, from their voiding an acrid matter by stool, and to all persons who are subject to great costiveness, and void their stools with great difficulty and pain; and finally, people who have paralytic weaknesses of the sphincter of the anus, incur this troublesome disorder after a time.

Causes of it. The causes of a *Tenesmus*, beside those already mentioned, of suppressions of the hæmorrhoidal discharges, and voiding acrid matter by stool, are the ascarides, a small sort of worms which usually infest the rectum, and occasion a continual iching and tickling there; the abuse of resinous purging medicines; and, among these, the resinous parts of aloes, and black hellebore, are, above all, most subject to remain in the rectum, and bring on this complaint: Much riding will also sometimes occasion it; and many people have been thrown into it by wiping their backside with paper in which pepper, ginger, or other hot and acrid things have been kept. The procidentia ani is owing usually to the same general causes, as also to the relaxation of the nervous and glandulous coat of the rectum, occasioned by long continued diarrhœas.

Prognostics in a TENESMUS. When a hiccough comes on upon a person in a *Tenesmus*, it is usually a bad omen; a violent *Tenesmus* coming upon women with child, sometimes occasions them to miscarry. In the mildest symptoms of the falling down of the anus, which is a frequent attendant on a *Tenesmus*, it is a very troublesome and painful disorder, especially when it continues some time, as it often does: And when there happens a tumour, and coldness in the part that is fallen, it very often becomes dangerous, threatening inflammation and mortification. In common cases, and where the distemperature has not before been frequent, the reducing the intestine to its place is usually an easy thing; but when there is any thing paralytic in the origin, it is more difficult both to restore it, and to prevent relapses.

Method of Cure. As the *Tenesmus* is merely a symptomatic disease, the primary disorder is to be examined, and treated, in order to a cure. Thus, when it is occasioned by ascarides, worm-medicines are to be given, and clysters of a proper kind injected, such as decoctions of tanzy, wormwood, and myrrh: When the worms are by this means destroyed, the *Tenesmus*, which was no more than a symptom, naturally ceases. In cases where it is caused by a flux of bilious matter by stool, or by a retention of the hæmorrhoidal discharges, it will be proper to give medicines to obtund the acrimony of the humours, and take off the spastic motions occasioned by them. To this purpose powders of nitre, crabs-eyes, and cinnabar, are to be given, and jellies of hartshorn, and the like, with gum-arabic, tragacanth, and such other agglutinants. The vapours of turpentine, and of the carminative seeds, received on the part, are also of great benefit; and hot fomentations of decoctions of the herbs of marshmallows and pellitory, and chamomile flowers. These ingredients may also be applied as a cataplasm; for beyond all things, external heat is of the most immediate service. The sitting over the steam of hot water is a very good thing, and the rubbing the part with an ointment made of mucilage of quince seeds, with oil of mullin, and the yolk of an egg. In cases where there is a procidentia ani, the gut is to be replaced as soon as possible; the person is, to this end, to be laid upon his belly, and a moderate force to be used in putting it back, the fingers being first rubbed over with oil of sweet almonds, before they touch the gut. If this is not to be done at the first attempts, the patient must be suffered to lie down again in a natural posture, and spunges, wetted with astringent decoctions, are to be applied to the part; powders of mastic, with a very small quantity of alum among it, also is useful to be sprinkled on the gut on this occasion. The sitting upon a bag of oatmeal, boiled to the consistence of pap, and sprinkled over with a small quantity of allum, is also a very good method. And so long as the intestine remains out of its place, it must be carefully kept warm, for fear of a mortification. If there is an inflammation attending it, this must be first carefully discussed by epithems of scordium, sage, chamomile, and rose and elder flowers; and, after this, the usual methods of attempting a reduction are to be employed. And finally, when the sphincter has a paralytic weakness, the ordinary methods are to be assisted by bandages, to prevent its return; but in a case of this kind, all that is to be done, is simply palliative, since the cure is not to be hoped. In cases where the *Tenesmus* is owing to bilious stools, or to the suppressions of the hæmorrhoidal discharges, the patients are carefully to abstain from all medicines in which aloes is an ingredient, as the elixir proprietatis, and the like.

In cases of the *Tenesmus* from the pressure of the womb in women with child, there is no cure but delivery; but the methods before proposed will palliate and give ease. When milk is given in clysters, in these cases there must be great care taken that it is perfectly fresh, not the least turned sour. If there be a colic attendant on the *Tenesmus*, provided that it be not a bilious one, it is always proper to inject clysters with a small quantity of common salt, to absterge the mucous humours; and when powders of the astringent kind are used, they must always be extremely fine, lest their particles, sticking to the inner coats of the intestine, should increase, instead of mitigating the disease. Alum must be added, but in very small quantities, to these powders, lest it astringe too violently, and by that means prevent instead of forwarding the reducing the part. Hartman commends the beetles found in horse-dung, dried and powdered, as a very powerful remedy in all cases of this kind. *Junk.* Consp. Med. p. 583. seq.

TENGA, in botany, a name by which some authors have called the coco-nut-tree, or *Palma Indica nucifera* of other writers. Hort. Malab. vol. 1. p. 1.

TENSION, (*Cycl.*) *Tensio*, Τάσις, in the antient music, was used to signify any pitch of sound, whether produced by intention or remission. Vid. *Aristoxen.* p. 10——13. Edit. Meibom.

Aristoxenus observes, there are five things to be considered about sounds, τασις, tention; ἐπίτασις, intention; ἄνεσις, remission; ὀξύτης, acumen; and βαρύτης, gravitas. Ibid. See these Terms in their proper Places.

TENSOR (*Cycl.*) — TENSOR *Tympani*, in anatomy, a name given by Albinus to one of the muscles of the ear, called by Cowper, *internus auris*, and by others, *internus mallei*.

TENT, (*Cycl.*) a small bundle of scraped lint, used in dressing some wounds, worked into the shape of a nail, with a broad flat head. They differ in thickness and length, according to the size of the wound for which they are intended.

They are chiefly used in deep wounds and ulcers, and are of service to convey medicines to the most inner recesses and sinuses of the wound. 2. To prevent the lips of the wound from uniting before it is healed at the bottom. And 3. By their assistance grumous blood, fordes, and other foulnesses, are readily evacuated.

They are to be made extremely soft, that the cure of the wound may not be retarded, by the pain they would otherwise bring on; but, that the wound may not be kept open too long, it is advisable, as soon as the part is sufficiently cleansed, and the sinuses are found to heal up, to lessen the sizes of the *Tents* by degrees, and as soon as safely and conveniently may be, to leave them entirely off.

Many surgeons, of great note, have entirely forbid the use of *Tents*, from the frequent observation of the ill effects arising from the surgeon's neglecting, or not knowing these necessary cautions.

There are, however, beside these *Tents* of scraped lint, another kind, made of linnen rags not scraped, worked up into a conical form, to the basis of which is fastened a strong thread; the apex of it must be a little unravelled, to make it softer, that it may not become painful. The thread is fastened to the basis, that it may be recovered with the greater ease, if by any accident it should be forced into the cavity of the thorax or abdomen, for these sort of *Tents* are chiefly used to keep open wounds that penetrate into the thorax or abdomen; in order to make way for the proper discharge of blood, matter, *&c.* by the mouth of the wounds.

A third sort of *Tents* there remains yet to be described, whose office is not only to keep open, but to enlarge, by degrees, the mouth of any wound, or ulcer, which shall be thought too strait, by which means a freer passage may be procured for the blood or matter that was confined; and that the proper medicines may find a more ready admittance.

These *Tents* are usually called *sponge Tents*, and are made either of sponge, or of the roots of gentian, calamus aromaticus, *&c.* for these kind of things imbibe the matter that flows to them, and being enlarged, by that means dilate the lips of the wound. *Heister*'s Surg. p. 17.

TENTHREDO, in natural history, the name of a fly of the stinging kind. It is of the size and shape of the bee, but of the colour of the wasp. It loves to be among meat, as in kitchens and larders; it is a very gregarious animal, but makes no honey, though whole swarms live together.

TENTORES, among the Romans, were persons appointed to hold the cloaths of the charioteers that contended in the circus. *Pitisc.* Lex. Antiq. in voc.

TENUIROSTRÆ, in zoology, the name of a genus of small birds, which feed on insects, and have slender and sharp beaks; of this genus are the lark, swallow, red breast, and a number of others. *Ray*'s Ornithology, p. 148.

TEPETOTOTL, in zoology, the name of a Brasilian bird, of the gallinaceous kind, more usually called *mituporanga*. See the article MITUPORANGA.

TEPHRIA, in the natural history of the antients, a name given to the grey ophites. See the article OPHITES.

TEPHROMANTIA, Τεφρομαντεία, in antiquity, a species of divination, performed with ashes; for which see *Potter*, Archæol. Græc. T. 1. p. 353.

TEPID, in natural history, a term used by writers on mineral waters, to express such of them as have a less sensible cold than common water.

They distinguish all the medicinal springs into three kinds; the hot, the *tepid*, and the cold; but the middle term might easily be misunderstood to mean a great deal more than they express by it; all that have what can be called the least sensible warmth, are called hot; and the *tepid* are distinguished from the absolutely cold, only by their being less cold.

Some of this class of mineral waters, and some few also of the cold ones, have a sharpish vinous taste, which is never observed in any of the hot ones. This taste is lost on the giving the waters the slightest heat, and is therefore very difficult to be guessed at as to its origin. It is not only found in the aluminous and vitriolate waters, but also in those which are manifestly nitrous, and which abound in sulphureous salts, quite different in their nature from acids. 'Tis therefore an additional somewhat, quite distinct from the saline properties of the fluid, and as easily connected with one kind of that as with the others.

The causes of heat in the mineral waters remains yet wholly unknown, notwithstanding all that has been written concerning it. It is hard to believe, that there are continual subterranean fires near enough the surface, to give a heat that preserves itself in so great a degree to the very place of their eruptions; and it is equally hard to conceive, that there can be beds of fermenting mineral matters, sufficient in quantity and force to have given the same degree of heat to waters for so many ages, as some of our hot springs are known to have subsisted. *Duclos*'s Exam. des Eaux. Miner.

TEPIDARIUM, among the Romans, a *Tepid*, or blood-warm bath, which was joined to the cold and hot baths, and was a medium between the two; so that if any person wanted to go from the hot to the cold bath, or *vice versa*, he always took the *Tepid* bath in his way. *Pitisc.* in voc.

TERBEDH, in the materia medica, a name given by Avisenna to the *Turbith*, a purging-drug, mentioned by all the authors of his time; but in general, in a very confused manner.

The *Turbith* of Serapion is the *Tripolium* of the Greeks. The *Turbith* of other authors is the *pityusa* or the *alypum*-root; all these are things greatly differing from one another, and from the true *Turbith* of our shops described by Garcias.

The greatest critics have been perplexed what to determine as to the *Turbith* of Avisenna; it seems plainly different from all these; and though Scaliger, and others, make it also different from the *Turbith* of our times, and of Garcias; yet there is some reason to suspect that they err in this, and that the drug is the same.

This author says, that the *Turbith* of his time was a woody substance, brought from the East-Indies. This cannot belong to any of the other plants, as they are natives of Greece, not brought from the Indies, and as they were not woody, but herbaceous plants; but the *Turbith*, which we at this time receive from the Indies, is a woody stalk, and the virtues of it agree well with those ascribed by Avisenna to his *Turbith*.

Garcias tells us, that the Indians use it to purge phlegm, and that they add ginger to it by way of corrective; and Avisenna says the same thing, of its use in his time.

TERDINA, in the materia medica, a name by which Paracelsus, and some other authors, have called the great garden Valerian. *Ger. Emac.* Ind. 2.

TEREBINTHUS, the *Turpentine-tree*, in botany, the name of a genus of plants; the characters of which are these. The flower is of the apetalous kind, being composed of several stamina, furnished with their apices; these are however barren, and the embryo-fruits are produced on other plants of the same species, which produce no flowers. These finally become a capsule, composed of one or two cells, and containing oblong seeds. See Tab. 1. of Botany, Class 18.

To this it is to be added, that the leaves are pinnated, growing several over-against one another on a middle rib, which is terminated by an odd leaf.

The species of *Turpentine*, enumerated by Mr. Tournefort, are these: 1. The common *Turpentine*-tree. 2. The *Turpentine*-tree, with a larger eatable fruit, like the pistachia nut. 3. The *Turpentine*-tree, with small blue eatable fruit. 4. The Indian *Turpentine*-tree of Theophrastus, the pistachia of Dioscorides. 5. The trifoliate pistachia, or *Turpentine*-tree. 6. The *Turpentine*-tree of Cappadocia. 7. The American *Turpentine*-tree, with fruit like the pistachia, but not eatable. *Tourn.* Inst. p. 579.

TEREBOTIN, a word used by Paracelsus, for the common turpentine.

TEREBRA, (*Cycl.*) the name of a chirurgical instrument, used for the perforation of bones, or for the extracting of bullets, or other the like extraneous bodies, out of wounds.

TEREBRATULA, in natural history, a name given by Mr. Lhuyd to some species of the smooth conchæ anomiæ, which have near the head of the shell a small hole, which looks as if bored by art. See the article CONCHÆ *Anomiæ*.

TEREDO, a name given by naturalists, to a species of sea-worm, which eats its way into the bottoms of ships, lining the hole it makes with a kind of shelly matter.

The head of this creature is well prepared by nature for the hard offices it is to undergo, being coated with a strong armour, and furnished with a mouth like that of the leech; by which it pierces wood, as that animal does the skin. A little above this it has two horns which seem a kind of continuation of the shell. The neck is as strongly provided for the service of the creature as the head, being furnished with several strong muscles. The rest of the body is only covered by a very thin and transparent skin, through which the motion of the intestines is plainly seen by the naked eye; and by means of the microscope, several other very remarkable particulars become visible there.

At that part where the intestines end, the tail begins; this is longer than all the rest of the body; it is depressed in the middle, and puffed out on each side, and is joined to the callous part of the lower end of the body, in an irregular manner, so that there is an indeterminate void space left between; this occupies the middle part between what the natural historians call two foleæ-form fins. This creature is wonderfully minute, when newly excluded from the egg, and at its utmost bigness is a foot long; three or four inches is however its more frequent length.

The skin of this little animal being stripped off, the heart, stomach, and intestines come plainly in view, as also the callous muscles of the neck, and two white ovaries; the heart is composed of two pyramidal vessels.

 The

The increafe of this pernicious infect is by eggs, and is fo very great, that Sellius, who has written a whole folio of its hiftory, computes there are in one parent more young at a time, than there are men in the eight largeft cities of Europe; fo that it is no wonder that fo many of thefe creatures are found in the bottom of a fhip, when they have once feized upon it; the only wonder is, that there are not many more. When the bottom of a veffel, or any other piece of wood conftantly under water, is inhabited and injured by ever fo great a number of thefe worms, there is no fign of the damage to be perceived on the furface, nor are the creatures vifible till the outer part of the wood is cut or broken away, then their fhelly habitations come in fight; thefe lie fo near the furface, however, as to have an eafy communication with the water, and there are a multitude of little perforations in the very furface through which the inhabitant infects throw out the extremities of their little fhelly horns. Thefe are of a reddifh colour, and may be diftinguifhed by an accurate obferver in form of fo many red prominent points; they all are retracted on the leaft touch, and are thrown out again as foon as all is quiet. From thefe points, or the fmall apertures which give them a way out, are the cells of the *Teredines* to be traced. They are compofed of a pearly or fhelly matter, which forms a long tube with various windings and turnings, which marks the abode of the creature; but which ufually neither adheres to the body of the animal, nor to the wood. Thefe cafes or tubes are always more or lefs loofe in the wood, and there is ever a large fpace within them, for the body of the animal to be furrounded every way with water. They are very fmooth on the inner furface, and fomewhat rougher without; and are much harder and firmer in the cells of the older and larger animals, than in thofe of the young ones.

Thefe fhelly tubes are compofed of feveral rings, or annular parts; but thefe differ greatly in their length.

There is an evident care in thefe creatures, as they are a republic, never to hurt or injure one another's habitations; and by this means each tubule or cafe is preferved entire, and in fuch pieces of wood as have been found eaten by them into a fort of honeycomb, there never is feen a paffage or communication between any two of the tubules, though the woody matter between them often is not thicker than a piece of writing-paper.

The creature depofits its eggs on the outfide of the bottom of a fhip, or any other piece of wood; the young worm hatched from this egg immediately eats its way into the wood, entering thus by a very minute hole, which is the reafon why the furface of wood ever fo much infefted with them fhews no fign of them; when they have made their way into the fubftance, they work forward in different directions, and when they find they approach one another, they turn fhort off, and direct their future courfe another way; and to this feems owing the twifted fhape of the tubules; neither are thefe every where of the fame dimenfions, but are always wider where the head and the foleæ-form fins are placed, than elfewhere; a free motion of both thefe parts being extremely neceffary to the well being of the animal.

The kind of wood in which thefe worms are lodged, makes a great difference in the appearance of their cells, as they work much more fpeedily and fuccefsfully in fome kinds, than in others. The fir and alder are the two kinds they feem to eat with the greateft eafe, and in which they grow to the greateft fize. In the oak they feem to make but a very flow progrefs, and ufually appear very fmall and poorly nourifhed. The colour of their fhelly tubules is often brown in this wood; which feems plainly owing to the effect of its juices.

Although the head of this creature feems extremely well formed for the eating into any fubftance, yet the hardnefs of oak, and of fome other fpecies of wood in which thefe animals are found, is fo great, that it feems fcarce credible that they could fairly have eat their way into it. Reaumur has proved that fome kinds of fhell-fifh have in part of their bodies a corrofive liquor; and many have fuppofed the *Teredo* to have fuch a liquor, and by that means to deftroy the wood. But there are many reafons againft this, as the exact and regular figure of the hole, the difficulty of corroding wood, *&c.* Sellius refolves the whole into the mere repeated action of water. He fuppofes the whole body of the *Teredo* to be an hydraulic engine, which, as it is always furrounded with fea-water in its cells, takes in and throws out part of this as it pleafes; and by continually difcharging water with fome violence againft that part of the wood into which it would make its way, it is fuppofed by degrees either wholly to wear it away, or at leaft to foften it in fuch a manner, as that it may be eafily gnawed away.

By this means alfo the tracheæ of the wood and other veffels, which in its growing ftate had ferved for its nutrition, are opened and enlarged, and make the way for wider holes much eafier than it would appear to any one who confidered the wood as one folid mafs.

When there comes an iron fpike, or other extraneous hard body in the way of one of thefe creatures in its courfe, it firft trys if it can eafily go round it, but if there appears any difficulty in that, it continues its battery of water againft it, and either by continued induftry makes its way through it, or perifhes in the attempt. The young ones when even but juft hatched from the egg, have this art of darting forth water, and by that means make their way, as well as by erofion into the wood.

One thing very remarkable is, that the body of the *Teredo* when grown to a moderate fize becomes the habitation at pleafure of a vaft multitude of fmall fea-water infects, which enter with the water into the cavity of the tubules, and are with it received into the body of the animal, and again thrown out againft the wood. In this, doubtlefs, many of them perifh; but millions at a time are alfo to be feen, living perfectly at eafe in the belly of the creature.

The vaft increafe of thefe animals, and their fhelly tubules, naturally leads to a confideration of the manner of their generation; and when we confider that each of thefe creatures is, from the time when it is produced from the egg, immediately lodged in a cell, in which it lives without the leaft poffibility of getting into that of another animal of its own kind, or receiving one of them into its own; it is not eafy to account for the propagation of the fpecies in the common way. This, however, is folved by an accurate anatomical obfervation of the animals themfelves; fince in every individual the parts of generation of both fexes, and both the femen and ovula are found. Each individual therefore evidently ferves by itfelf for the propagation of the fpecies; and this is probably very often the cafe in earthworms, and other of the hermaphrodite animals. All the yet known kinds of thefe being foft-bodied; and probably, though they often meet one another, and copulate in pairs, yet when they have not that opportunity, the parts copulate in the individual.

The eggs are found in great plenty in the bodies of thofe animals in June, and are after this difcharged with the water into the fea, where the far greater part of them, doubtlefs, become food for other fmall animals; and the few that come to good affix themfelves to any piece of wood they are wafhed againft, and there hatch and get into its fubftance in the manner of their parents.

Many other animals are great deftroyers of the eggs of the *Teredo* while they are fixed to the furface of the wood. The fcolopendræ marinæ eat them in great abundance; the fhrimps alfo, and the pulmo marinus devour them.

Poifonous ointments are alfo found to be of fome ufe in deftroying them, on rubbing over the wood; fome have thought that burning the furface was an effectual way of preferving them, but this has been found to be otherwife. The fureft method of avoiding them in particular works, is the ufing bitter or very folid woods; the firft kind they are found never to touch, and in the other they make but flow progrefs. Mixtures of lime, fulphur, and collocynth, with pitch, for covering over the furfaces of boards, *&c.* have been found of fome ufe.

It feems very evident, that boards and other pieces of wood have been fubject to be eaten by thefe animals, from all times that we have any knowledge of; for the ftone called *lapis fyringoides* is evidently no other than wood thus eaten, petrified by long lying in the earth, together with the tubules of the worms. The maffes of this with the grain of wood yet plain in them, are common in many places among fea-fhells, and other marine remains at great depths, and have evidently been brought thither in very diftant times, and before changes were made in the furface of the earth of which we have no accounts in our earlieft hiftories. *Sellii* Hift. Natur. Teredinis.

TERENJABIN, in the materia medica of the antient Arabians, a word ufed to exprefs a kind of manna called by fome *manna maftichina*, from its round globules refembling the drops of maftic, and by the phyficians of many parts of the world at prefent *manna perficum.* See the article MANNA *Perficum.*

Geoffroy indeed makes the *Terniabin*, or *Terenjabin* to be a kind of liquid manna; but this is an error into which he has been led by Bellonius, who, though a very cautious obferver in moft particulars, was evidently deceived in this, by the accounts of the monks of mount Sinai. Bellonius fays, that thefe monks collect a kind of liquid manna, which is called *Tereniabin*, and fold in the fhops at Cairo under that name; and adds, that this is the *mel rofcidum* of Galen, and *mel cedrinum* of Hippocrates; but it is very evident from the general confent of authors that this was not the fubftance called *Tereniabin* by the Arabians, and now *manna perficum.*

It feems indeed very probable, that this liquid manna collected by thefe monks, is the fame fubftance called *drofomeli*, and *aëromeli* by Galen, and *mel cedrinum* by Hippocrates (if there be no error in the text) though not the *Tereniabin.*

The defcription which Galen has left us of the *mel rofcidum*, and of the manner of collecting it on mount Sinai in his time, agrees very well with what Bellonius fays of it; and thefe circumftances feem to be agreed upon by all authors in regard to it, but it does not appear that its ufe as a medicine was known any thing near fo early as in the days of Hippocrates and Galen; the Arabian phyficians feeming to have been the firft who brought it into general ufe as a purge. Galen takes notice of the *mel rofcidum*, or liquid manna, more as

as a curiosity than as a medicine, no where mentioning its qualities as such, or saying any thing about its use. He says, that it was rarely met with in his country, but that it was gathered annually in considerable quantities on mount Sinai. And indeed from the manner in which it is spoken of by the old Greek writer cited by Athenæus, as mentioned by Salmasius, it should seem that it was only used for pleasure, as an agreeable sweet. What he says of it, being that it was sweeter and more agreeable to the taste than honey itself. Mesue tells us, that Galen mixed manna with scammony.

In the spurious piece *de dynamiis*, ascribed to Galen, scammony is indeed ordered to be mixed with honey, but he never once mentions manna in any of his writings on any such occasion. As Galen is known to be very minute and particular in his account of the materia medica at that time in use, his silence is a strong argument that even the mel roscidum was not in use as a medicine, much less any other species of manna. Phil. Transf. N°. 472. p. 90.

TERES (*Cycl.*)—TERES *Folium*, among botanists. See the article LEAF.

TERETRON, the name of a chirurgical instrument, more usually called *Terebra*.

TERFEZ, in natural history, the name given by the Africans to the truffles found in the desarts of Numidia, and other places in that part of the world in great abundance.

These are much more delicately tasted than the European truffles, and are white on the outside. They are called by some of the Africans *kema*, and by the Arabian writers *cantha*, and *camahe*.

TERM (*Cycl.*)—The use of *Terms* is necessary in order to render our abstractions clear and distinct, as also to retain them.

TERMOR, *Tenens ex termino*, in law, he that holds lands or tenements for a term of years, or life. *Litt.* 100. *Blount.*

TERNA, a word used by some authors, to express an impetigo. See the article IMPETIGO.

TERNA *Folia*, among botanists. See the article LEAF.

TERNARY *Number*, in antiquity, was esteemed a symbol of perfection, and held in great veneration among the antient mythologists. Whence Virgil,

——— *Numero Deus impare gaudet.* Ecl. 8. v. 75.

Servius on this place remarks, that the Pythagoræans ascribed the *Ternary* number to the supreme God, as being the beginning, middle, and end of all things. All the heathen gods had a threefold power attributed to them, as the *tria virginis ora Dianæ*, the three-forked thunderbolt of Jupiter, the trident of Neptune, the three-headed dog of Pluto. Again, the parcæ were three, the furies three, Hercules was three nights in begetting, the muses were antiently three, the graces three, &c. *Hofm.* Lex. univ. in voc.

This number was likewise used in most religious ceremonies, but especially in lustrations; whence Virgil, Æn. l. 11. v. 188.

Ter circum accensos, cincti fulgentibus armis
Decurrere rogos.————

TERPENTARIA, in botany, a name used by some authors for the *betonica aquatica*, or great water figwort, called waterbetony. *Ger. Emac.* Ind. 2.

TERRA, *Earth*, (*Cycl.*) in natural history, &c. see the article EARTH.

TERRA *de Baira*, in natural history, the name given by some to an earth of a white colour, found about Baira, not far from Palermo.

It is esteemed a very great medicine in the cure of malignant fevers, and in the stopping hæmorrhages of all kinds. The powder of it is commonly sold in Italy under the name of Claremont powder; a name it obtained from a person who first found out its virtues, and communicated them to the world in a treatise expresly written on the subject. *Boccone* Muf. de Fisic. See the article CLAREMONT *Powder*.

Chia TERRA, in the materia medica of the antients, an earth of the marle kind, found in the island of Chio, and given internally as an astringent; but its chief use among them was as a cosmetic, the ladies esteeming it the finest of all things for cleansing the skin, and defacing wrinkles.

What title it has to these qualities, the world has not of late ages inquired into; but the substance is still in being, and to be had in any quantities from the same place. And the descriptions Dioscorides and Galen have left us of it are so accurate, that there is not the least room to doubt but that the earth now found there was the very kind they used. It is a dense compacted earth, yet very soft and of a texture easily disunited and broken by water.

While in the stratum it is of a dusky greyish or bluish white, very dry, and of a shattery structure; when thrown upon the surface of the earth and left to the weather, it soon breaks into an impalpable powder, or melts into a substance like butter, and sinks into the earth again; but if taken up and dried, it becomes of a pale greyish white, and is seen to be laminated in its structure, or composed of a great number of plates or thin crusts. It is remarkably fine and soft to the touch; it adheres firmly to the tongue, is very easily broken and crumbled to pieces between the fingers, and a little stains the hands. Thrown into water it makes a slight bubbling and hissing noise, and afterwards swells and gradually melts into a substance like a thick cream. It ferments violently with acids, and suffers no change in a moderate fire, except that it becomes a little whiter; and by these characters may be distinguished from all the other white earths. *Hill*'s Hist. of Foss. p. 46.

TERRA *cimolia purpurascens*. See the article STEATITES.

TERRA *Foliata Tartari*. This saponaceous salt, which is a fixed alkali, saturated with distilled vinegar, is an excellent alterative and diuretic, when taken in the quantity of half a dram to two drams. If taken in the dose of three to six drams, it is a mild cathartic which never sinks the spirits, or occasions any violent disorder. It has been found of service in dropsies. Med. Eff. Edinb. abr. Vol. I. p. 166.

TERRA *Goltbergensis*. See the article GOLTBERGENSIS *Terra*.

TERRA *Hydata*, in our old writers, land subject to the payment of *Hydage*. *Selden. Blount.*

TERRA *Lignicensis*. See the article LIGNICENSIS *Terra*.

TERRA *Livonica*. See the article LIVONICA *Terra*.

TERRA *Melia*. See the article MELIA *Terra*.

TERRA *Melitensis*. See the article MELITENSIS *Terra*.

TERRA *Merita*, in the materia medica, a name given by some authors to the curcuma or turmeric root.

It is from a false pronunciation of this name *Terr merit*, that the English turmeric has its origin. *J. Baubin.* V. 2. p. 146.

Persica TERRA. See the article PERSICA *Terra*.

TERRA *Sigillata Magni Ducis*. See the article ETRUSCA *Terra*.

TERRA *Sigillata fusca*, a bole of a beautiful brown colour, found in Germany, England and America.

It is of a dense texture, makes no fermentation with the strongest acids, and if thrown into water, it soon separates into a number of thin flakes.

The Germans give it in fluxes and malignant fevers, being an excellent astringent, and worthy to be introduced into our shops.

Silesiaca TERRA, *Silesian Earth*, in the materia medica, a fine astringent bole, called by some authors *axungia solis*.

It is very heavy, of a firm compact texture, and in colour of a brownish yellow. It breaks easily between the fingers, and does not stain the hands, is naturally of a smooth surface, and is readily diffusible in water, and melts freely into a butter-like substance in the mouth. It leaves no grittiness between the teeth, and does not ferment with acid menstrua. These are the characters by which it is known from all other earths of a like colour. It is found in the perpendicular fissures of rocks near the gold mines at Strigonium in Hungary, and is supposed to be impregnated with the sulphur of that metal. It is, however that be, a good astringent, and better than most of the boles in use. *Hill*'s Hist. of Foss. p. 9.

The *Terra Silesiaca* is also called *Terra sigillata strigoniensis*. *Boyle*'s Works, Vol. I. p. 500, 501.

Montanus gives us a high character of its virtues, and says, it is gold transmuted by nature into an admirable medicine. Sennertus commends it as excellent against malignant fevers, diarrhœas, &c. *Boyle*, ibid.

Agricola tells us, that the spirit of this earth dissolves gold, as well as aqua regia, though more slowly, into a red solution; which, in a few days precipitates the gold in fine powder. He also mentions another earth found at Westerwald, preferable to this Silesian earth. *Boyle*, ibid. See the article WESTERWALD *Earth*.

Sinopica TERRA. See the article SINOPICA *Terra*.

TERRA *Solis*, in natural history, a name given by the German naturalists to a kind of black spungy earth, somewhat approaching to the nature of that English black earth, which we call *kellow*, but containing gold. It is not properly an ore of gold, but is an earth into which some small particles of gold have been washed from some other place, and there detained. A good microscope will discover these particles in the richer pieces of the earth, and they are bright and pure, though very small. The earth is found in fissures of the other strata, not in any beds or strata of itself. It is not to be had in any great quantity, nor does it contain any large portion of gold.

TERRA *Strigonensis*. See the article STRIGONENSIS *Terra*.

Turcica TERRA. See the article TURCICA *Terra*.

TERRA *Virgine aurea*, in natural history, the name of a medicinal earth, mentioned by Boccone.

It is found at a place called Sancto Paolo, in the state of Modena; and is thence sent to Venice, and many other places, where it is esteemed a very famous medicine.

Its great use is in hæmorrhages of all kinds; but it is also given with success in malignant fevers. *Boccone*, Muf. de Fisic.

TERRÆJENBIN, in the materia medica of the antient Arabians, a word used as the name of a kind of manna; it is evidently only a corruption of the word *Tereniabin*, which is plainly that kind of manna now known under the name of *manna persicum*. See the articles MANNA *Persicum*, and TERENJABIN.

TER-

TERRAIGNOL, in the manege, a horſe that cleaves to the ground, that cannot be made light upon the hand, that cannot be put upon his haunches, that raiſes his fore-quarters with difficulty, that is charged with ſhoulders, and, in general, one whoſe motions are all ſhort, and too near the ground.

TERRAIN, in the manege, is the manege ground, upon which the horſe makes his piſte, or tread.

TERRE *Tenant*, *Terræ Tenens*, in law, he who hath the actual poſſeſſion of the land. For example: A lord of a manor has a freeholder, who letteth out his freehold to another, to be poſſeſſed and occupied by him, this third perſon is called the *tertenant*. *Weſt*. Symb. par. 2. *Blount*, *Cowel*.

TERRE *Verte*, in the colour trade, the name of a green earth much uſed by painters, both ſingly for a good ſtanding green, and in mixture with other colours.

The name is French, and ſignifies green earth.

It is an indurated clay, of a deep bluiſh green colour, and is found in the earth not in continued ſtrata or beds, as moſt of the other earths are; but in large flat maſſes of four or five feet in diameter; theſe break irregularly in the cutting, and the earth is generally brought out of the pit in lumps of different ſizes. It is of a fine regular and even ſtructure, and very hard. It is of an even and gloſſy ſurface, very ſmooth to the touch, and in ſome degree reſembling the morochthus, or French chalk, but adhering firmly to the tongue. It does not ſtain the hands in touching it; but, being drawn along a rough ſurface, it leaves an even white line, with a greeniſh caſt. It does not ferment with acids, and it burns to a duſky brown colour.

It is dug in the iſland of Cyprus, and in many parts of France and Italy. That from the neighbourhood of Verona has been uſed to be eſteemed the beſt in the world; but of late there has been ſome dug in France that equals it. There is alſo an earth dug on Mendip Hills, in the ſinking for coal, which, tho' wholly unobſerved, is nearly, if not wholly, of equal value. *Hill's* Hiſt. of Foſſils, p. 31, 32.

TERRIFICATIO, a word uſed by ſome chemical writers to expreſs the coalition of the earthy particles of ſome bodies after fermentation, or during the time of it.

TERROR. The effect of *Terror*, or of ſudden frights, in diſeaſes, often are very great.

It is generally obſerved, that people who are moſt afraid of the plague in times of contagion, catch the infection ſooneſt, and that thoſe who are moſt terrified and diſheartened at firſt in the diſeaſe, generally die of it. It is indeed uncertain, whether this be to be attributed to the *Terror*, or whether the *Terror* itſelf, as a conſequence of dejection of ſpirits, be not merely a ſymptom of the diſeaſe. *Kerkring*, Spicileg. Anat. Sudden frights, in acute diſeaſes, have evidently killed many, by the agitation into which they have thrown the ſpirits, already too much diſordered. We have alſo accounts of perſons abſolutely killed by *Terrors*, when in perfect health at the time of receiving the ſhock from them: People ordered to be executed, but with private orders for a reprieve, have expired at the block, without a wound. And Kerkring gives an inſtance of a perſon, who, walking along the ſtreets, was foretold by a beggar that ſhe ſhould die on a certain day, then nearly approaching, and who really expired on that day. The world gave the beggar the credit of predicting future events; but the phyſicians rather ſuppoſed that the effects of the *Terror* killed the patient. Id. ibid.

TERSIO, the name given by Pliny, and the antients, to the *porpeſs*. It is ranked among the cetaceous kind, and is the ſmalleſt fiſh of that tribe.

The *porpeſs*, properly ſo called, ſeldom exceeding five feet in length, in which it differs from the dolphin; a fiſh very often confounded with it; but which is frequently ſeen of ten or twelve feet in length. The ſnout of the dolphin is alſo much larger than that of the *porpeſs*; which is another thing that may ſerve to determine their difference.

In the diſſection of the head of this fiſh, the *meatus auditorius* was found to be two inches diſtant from the exterior canthus of the eye, forming a very ſmall hole, which ſeems the provident care of nature, leſt the water, getting in, ſhould prove an inconvenience to it. Ariſtotle and Mr. Ray, indeed, agree in ſaying, that there are no ear-holes found in the head of this fiſh; but a careful inſpection ſhews, that they were both miſtaken.

The *porpeſs* has no gall-bladder, and thence authors have concluded that it has no gall; but this is too haſty a concluſion; for there is a duct which ariſes in the liver, and has a great many branches, and which, tending downwards, joins itſelf to the pancreatic duct; and theſe two, ſo united together, form a canal, or common duct, about four or five lines long, before they diſcharge their contents into the duodenum; from whence it appears that the *porpeſs* has always a diſcharge of bile into the duodenum, though it is thin and diluted, and ſuch as, in other animals, is uſually called *hepatic bile*. *Klein's* Hiſt. Piſc.

TERTHRON, a word properly ſignifying the extreme part of the ſail-yard in ſhipping. Hippocrates uſes it in a metaphorical ſenſe, to expreſs the extremity of a diſeaſe.

TERTIAN (*Cycl*)—The medical writers diſtinguiſh this diſeaſe into two kinds, the ſingle and the double; and beſide theſe, into the legitimate and the ſpurious and ſub-continual. In the ſpurious *Tertian* the cold fits are ſhorter, and the chilneſs leſs intenſe, and the heat ſcarce ever goes off at all; beſide this, it is uſually attended with a cough, and with violent laſſitudes and pains in the limbs after the fits; a vertiginous diſorder in the head, reſtleſsneſs in bed, and a want of appetite.

The ſimple *Tertian* is alſo carefully to be diſtinguiſhed from thoſe acute fevers, principally of the epidemic kind, which frequently affect the appearance of it, when they happen in the ſpring ſeaſon, and the patient is ſubject to crudities in the primæ viæ. Theſe laſt, beſide the appearance of the ſimple *Tertian*, always carry with them the certain marks of malignity, and often are attended with petechial ſpots on the fourth day or later. The juſt diſtinguiſhing all theſe appearances, in diſeaſes that reſemble the ſimple *Tertian*, is extremely neceſſary, as the treatment of them, in the way of the ſimple *Tertian*, muſt be attended with very bad conſequences.

The ſigns of the ſimple Tertian are theſe: It uſually ſeizes people in the morning, frequently about 11 o'clock, and often earlier, and begins with a very remarkable horror and coldneſs, with which the patient trembles violently: This is firſt felt in the region of the loins, and thence propagates itſelf up the back, and ſo to every part of the body; this is ſucceeded by a nauſea, and a ſtraitneſs of the præcordia; and when the *Tertian* is legitimate and genuine, this nauſea proceeds to abſolute vomiting, by which there is uſually voided a thick viſcous and mucous matter; but ſometimes a bilious ſaburra; and in the firſt fits, uſually ſome of the food of the day before, indigeſted. Sometimes there are only violent reachings to vomit, without any thing coming up; and in ſome a diarrhœa comes on in the place of the vomiting. When theſe ſymptoms have continued an hour or two, the coldneſs goes off, and there ſucceeds an univerſal languor and ſoreneſs in the joints; and this is the more violent, as the nauſea has been the leſs ſo. This languor is followed by a violent heat, which ſometimes comes on at once, and ſometimes ſlowly and gradually, and is attended with pains in the head, and a violent thirſt, and bitter taſte in the mouth. *Junker's* Conſp. Med. p. 364.

As ſoon as the violence of the heat abates a little, a ſweat comes on; but this is not great, and often does not appear at all in the firſt paroxyſms. The more ſtill and quiet the perſon is, the more quickly the heat goes off, and the ſweating comes on. The whole fit rarely continues leſs time than ſix hours; uſually it holds eight, and ſometimes eleven hours; but when it continues longer than this, it is to be ſuſpected for being of the ſpurious kind, and degenerating into a continual one. The fit returns in the ſame manner as at firſt every other day, or, as the medical writers term it, every third, including the days of both paroxyſms; and uſually, while undiſturbed, returns on the patient at the very ſame hour.

The double Tertian. The ſigns of this are, that the fits return every day; but then the ſucceeding paroxyſms do not anſwer to one another; but the alternate ones; thus the third fit anſwers to the firſt, the fourth to the ſecond, and ſo on. It is by this, that this diſeaſe is diſtinguiſhed from the quotidian, which has its fits every day coming on at the ſame hour; while in the double *Tertian*, if the firſt fit comes on in the morning, the ſecond comes in the afternoon; then the third comes on in the morning as the firſt, the fourth in the afternoon as the ſecond, and ſo on.

The anomalous *Tertian* obſerves no regular time of coming on at all, but will begin one day in the morning, another in the evening, a third at noon, and a fourth in the afternoon, and ſo on.

Perſons ſubjects to TERTIANS. Young people are much more frequently ſubject to this diſeaſe than older, and men oftener than women. People of an active life are more ſubject to it than thoſe of a ſedentary one: But no people ſo eaſily fall into it as thoſe men who are apt to be ſick after dinner, and make a cuſtom of ſuppreſſing their inclination to vomit.

Cauſes of it. Theſe are the eating immoderately of foods difficult of digeſtion, and eſpecially when this is done againſt the ſtomach, or while that is afflicted with nauſeas, violent commotions of anger, or the other paſſions, immediately after a full meal; and to theſe is to be added, a coldneſs of the abdomen after meals, by which digeſtion is impeded, and the driving back any cutaneous humour.

Prognoſtics and Method of Cure. It is commonly obſerved, that *Tertians*, when not improperly treated, are rather conducive to health, than injurious to it; and that people are uſually much better after they are cured of them, than before they were attacked by them. If thoſe who have a *tertian* uſe a moderate diet and good regimen, it often goes off of itſelf, without the aſſiſtance of medicines; but when ill treated, as by giving violent ſweating medicines in the time of the hot fit, the patients are greatly weakened, and ſometimes very dangerous inflammations of the viſcera, and acute fevers are brought on; and this the more certainly, as the patient is younger, of a more plethoric habit, and uſed to a high diet, and the uſe of wine, or other ſtrong liquors.

The more the gentle ſweat, which ſucceeds the hot fit, is encouraged, the weaker the fits grow at every period, and the diſeaſe

disease finally goes off much more safely by this means, than when violently thrown off at once by astringents.

The *double Tertian* requires the same method of cure with the simple one; for which see the articles PERUVIAN *Bark*, and AGUE. *Junker*'s Consp. Med. p. 366.

Continual TERTIAN, in medical writers, a term used to express a kind of compound fever, which has paroxysms something like those of the *Tertian*, but in which the heat never goes wholly off; but is often so extream, as to continue in great violence from one fit to the time of another.

There are three species of these compound fevers; they are all composed of the intermittents of the several periods, and of an acute fever: The first is the *continual quotidian*, the second this *continual Tertian*, and the third the *continual quartan*.

The first of these is the same with the catarrhal fever of the benign kind. The second here treated of, is what was called by the antients, the *extended Tertian*. For the *continual quartan*, see the article QUARTAN.

Signs of it. The paroxysms are begun in the same manner as in the simple *Tertian*, that is, by a shaking coldness; and this is succeeded by a heat which is at first very violent, but afterwards grows more and more languid, yet never goes wholly off, but continues, in some degree, to the access of the next paroxysm. In this disease the appetite is lost, and the strength fails very sensibly, the sleep is troubled and unsound, and there is a continual head-ach; there is a quick pulse at all the times of the fever, and a dryness of the mouth and tongue, with great thirst. *Junker*'s Consp. Med. p. 396.

Persons subject to it. This fever is very often the consequence of a common simple *Tertian*, when injudiciously treated, especially when it has been suppressed by giving hot medicines just before the coming on of the fit, or when the patient has been cooled in the time of the sweat, or has been blooded during the time of the disease; it sometimes also attacks persons who have had violent cutaneous humours, as the itch, &c. struck in; and sometimes the air alone gives it, from being full of fermentative particles.

Prognostics in it. When the disease is of this epidemic kind, and arises from faults in the air, it is always attended with greater danger, and has worse symptoms than when proceeding from other causes; in this case it is sometimes attended with purple spots on the breast and other parts. When treated cautiously, and with a gentle regimen, it very often changes to a common intermitting *Tertian*, and is then easily cured; but even from this less dangerous state, it sometimes changes into a hectic, when it has been treated with large doses of absorbents under that form; and finally, when it is treated with the common hot medicines and regimen, it too often degenerates into a violent and dangerous acute, and usually inflammatory fever.

Method of Cure. Before the coming on of every fit, the patient should take a scruple of a powder, prepared of diaphoretic antimony, oister-shells sated with juice of lemons, nitre, and tartarum vitriolatum, each in equal quantities; and while the heat continues violent, he must drink plentifully of warm and weak liquors; and when this violent heat is gone off, he must be kept in a gentle sweat, by the milder alexipharmics, till the return of the paroxysm again.

In cases where the heat is very violent, and the temperament of the body is hot and plethoric, the acids, such as lemon-juice, and the like, are of very singular service. During the whole course of the disease, the bowels must be kept open by all means; but they must not be stimulated; and as the force of the distemper wears off, more powerfully laxative medicines are to be given, and that at such times that their effect may not be over at the time of the access of the paroxysm.

The bark can properly have no place in the cure of this disease; and after the cure of it by the means above prescribed, the patient must continue the use of some of the medicines, and must harden himself to the air by degrees, for fear of a relapse. *Junker*'s Consp. Med. p. 399.

TERTIANARIA, in botany, a name given by some authors to the *scutellaria*, or hooded willow herb. *J. Bauhin.* vol. 3. p. 435.

TERTIAS, a word used very frequently in the writings of physicians, with the addition of *ad*; but it is capable of a double signification. *Ad Tertias* is often used to express how far the liquor is to be boiled away in medicinal decoctions; yet it may in this case signify either the boiling to two thirds, or to one third part, of the whole. The more usual sense, however, is to boil away one third part of the original liquor, and in the same manner to fill a vessel *ad Tertias*, does not signify to fill a vessel one third part full, but two thirds, leaving only one empty.

TERTIUM *Sal*, a *third salt*, a term used in chemistry to express a salt resulting from the mixture of an acid and an alkali, which partakes so of the nature of both, as to be itself neither acid nor alkali, but neutral.

TERTIUS *Adducens*, in anatomy, a name given by Spigelius to one of the four muscles called the *quatuor recti oculi* by authors.

This is the muscle called the *adductor* by Molinett; and by some others, the *bibitorius*.

TERTIUS *Hyoidis Musculus*, in anatomy, a name given by Fabricius and others, to the muscle generally known by the name of *stylohyoidæus*.

TERTIUS *Oculum Movens*, in anatomy, a name given by Vesalius to one of the muscles called by Albinus, the *quatuor recti* of the eye; this is the same with the first of that author, the *atollens oculi*, the *superbus* of others.

TERTIUS *Palpebrarum*, in anatomy, a name given by some authors to the muscle called by Albinus and others, *obliquus superior oculi*.

TERTIUS *Thoracis*, in anatomy, a name given by many of the earlier writers to a muscle now called *serratus posterior superior*. See the article SERRATUS.

TERZETTO, in the Italian music, a little tune or air in three parts. See the article TRIO.

TERZO, in the Italian music, sometimes signifies a composition consisting of three parts, or designed for three voices or instruments.

It is also used for a third part of any thing, as *un Terzo di battuta*, a third part of the bar. See the article TRIO.

TERZOLA, in botany, a name by which some authors have called the *eupatorium cannabinum*, or water hemp agrimony. *Ger.* Emac. Ind. 2.

TESSARACONTA, Τεσσαρακοντα, among the Athenians, were forty men who went their circuits round the several boroughs, and had cognizance of all controversies about money, if not above ten drachms; as also of actions of assault and battery. *Potter*, Archæol. Græc. T. 1. p. 122.

TESSARACONTERIS, in the naval architecture of the antients, a word used to express a sort of galley, in which there were no less than forty tires of rowers one above another.

Many have doubted whether such monstrous vessels as these were ever built; but we have absolute accounts of one such of Philopater's, which must have required above four thousand men to manage the oars.

Ptolemy Philadelphus is said to have had one with thirty tires of rowers, requiring three thousand men; and we have accounts of another at the same time of twenty tires, requiring two thousand: But tho' such vessels as these were really built, we are not to suppose they were common. The triremes, or those gallies which had three tires of rowers were found the most serviceable of all others; and from these they built pretty frequently up to the enneeres, which contained nine rows or tires; and these were the largest ever brought into common use, as is fully proved by Meibom against Salmasius, on the authority of Pliny, Plutarch, and Polybius. *Meibom.* de Trirem.

This author has also taken off much of the imaginary height necessary, according to common computation, for these vessels, having found a more convenient way of placing the rowers.

TESSARACOSTON, Τεσσαρακοστον, in antiquity, a solemnity kept by women on the fortieth day after child-birth, when they went to the temple, and paid some grateful acknowledgments for their safe delivery. *Pott.* Archæol. Græc. T. 1. p. 432. and T. 2. p. 335.

TESSELÆ, a word used in pharmacy to express lozenges cut into regular figures.

TESSELARII, among the Romans, artificers of chequered or mosaic work. See the article MOSAIC, *Cycl.*

TEST, (*Cycl*) in metallurgy, is a vessel of the nature of the coppel, used for large quantities of metals at once. The coppels or small vessels made of ashes, serve for operations of this kind, when small quantities only are concerned; but when larger are worked on, vessels of a larger size and coarser texture are employed, which are distinguished by the name of *Tests*.

These are usually a foot and half broad, and are made of wood-ashes, not prepared with so much care as for coppel-making, and mixed with finely powdered brick-dust; these are made into the proper shape either by means of an earthen vessel of proper dimensions, or only an iron ring.

To make them in the first manner, an earthen vessel is to be procured, not glazed within, and by its depth and breadth proportioned to the quantity of metal to be worked; the inside of this vessel is to be well moistened with fair water, that the ashes to be put into it may adhere the better. Put into this vessel, thus prepared, the ashes and brickdust before-mentioned, and first moistened either with water alone, or with water with a little white of an egg mixed in it; let the quantity of this be so much as will half fill the vessel, then press the mass with a wooden indented pestle, or, if not for a very large *Test*, with a wooden cylinder, only of an inch thick: When thus pressed down, add fresh ashes, and press them in a second time, as in the making of coppels, and repeat this addition of fresh ashes till the earthen vessel be nearly full; then remove the superfluous ashes with an iron ruler, and let the inequalities remaining at the border be smoothed with a wooden ball rolled round about. This done, you are to cut the cavity with a bowed iron, that you may have a broad spherical segment, not very deep: And lastly, by means of a sieve, strew this cavity carefully and regularly over with dry ashes of bones of animals, ground extremely fine, and squeeze these hard

hard in, by the rotation of the wooden ball. Thus you have a *Teſt* finiſhed, which, together with its earthen pot, muſt be ſet in a dry warm place.

To make the *Teſts* in the other manner, or by means of an iron ring, let a ring of that metal be filled with aſhes mixed with brickduſt, and moiſtened as before-mentioned, in ſuch manner that they may riſe conſiderably above the ring; then preſs them ſtrongly either with your hands, or with an indented peſtle, and afterwards, with gentle blows of a rammer, preſs the aſhes from the circumference toward the center, in a ſpiral line, and that in ſuch manner, that, after having been ſufficiently preſſed, they may be a ſmall matter higher than the brink of the ring. If there are now any vacancies in the maſs, empty the ring, and fill it again with more aſhes; for if you ſhould attempt to fill up theſe by adding, were it but ever ſo little aſhes, the ſecond, or additional quantities, will never cohere ſo firmly with the firſt, but that they may probably ſeparate in the operation.

This done, turn the ring upſide down, and on the other ſide, or bottom, take out the aſhes to the quantity of one third part of the depth of the ring, and again fill the vacuity with the ſame aſhes, in ſuch a manner that there may remain no ſenſible cavity.

When the maſs is thus prepared, cut out a cavity in the larger ſurface of the ring, with a bowed iron, as in the former method.

The Germans have, beſide theſe, another kind of *Teſts*, which they call *treibſcherben*. Theſe are a ſort of veſſels which reſiſt the moſt violent fire, and are ſo extremely compact, that they ſometimes will retain not only melted metals, but even the glaſs of lead itſelf.

The figure and ſize of theſe veſſels may be the ſame with that of the coppel, but they are uſually made larger; and the great difference of theſe *Teſts* from coppels, and from the ordinary *Teſts*, which are indeed only a kind of large and coarſe coppels, is, that the matter of theſe is more compact and coherent.

The matter for the making theſe *Teſts* is thus prepared: Take of the pureſt and fineſt clay a ſufficient quantity, make it into balls, and dry them either in the air, or in the fire; when dried, beat them to powder in a mortar, and pour on the powder a great quantity of warm water: Let this mixture reſt a while, and when the clay has ſubſided, pour off the water which ſwims at top; and let this waſhing be ſo often repeated, that all the moſt minute lumps of the clay be broken, and whatever ſalt it contains perfectly waſhed out: Then add to this fine clay, of the pureſt ſand, of powder of calcined flints, ground, and well waſhed, of faulty, but clean Heſſian crucibles, or of any incombuſtible ſtones ground very fine, ſuch a quantity as will render the maſs thick, and hardly adhering to the hands in kneading it, or pliant when rolled into a thin lamina.

This is the matter for making this ſort of *Teſts*; but before any quantity of the veſſels be made of this earth, it will be prudent firſt to finiſh a ſingle one, and try it, by putting on it a quantity of glaſs of lead, and expoſing it for an hour or more to the ſtrongeſt fire; by this trial you will be certain whether or not the maſs is capable of making veſſels that will reſiſt both the fire and the glaſs of lead; and by no other means but this trial is it poſſible to determine the due proportion of the mixture of the ingredients for this uſe, on account of the variety of the clays. Nature in ſome places affords a clay ſo well tempered, that it is extremely proper for the making of *Teſts* without any preparation, or without the admixture of any other matter. Sometimes this only requires a ſimple waſhing, but commonly it is neceſſary to make it into balls, and powder and waſh them as before directed.

On the trial of a *Teſt* made of this, or the former mixed clay, if it runs into glaſs, you muſt add to it of the powder of ſtones, eſpecially ſuch as beſt reſiſt the fire. Great care is to be taken not to add too much powdered chalk to theſe compoſitions, ſince if the matter is tempered with that alone, the *Teſts* will indeed reſiſt the fire very well, but being too porous, they will yield a paſſage to litharge, which will ſoften them to ſuch a degree, that they will either fall aſunder of themſelves, or be totally cruſhed when taken hold of with the tongs.

Theſe veſſels are to be made in the following manner: Rub over the ſides and bottom of a ſmall mortar, and alſo its peſtle, with oil, or with the fat of bacon; fill it two thirds full of prepared clay, then make a ſlight impreſſion with your fingers in the middle of the clay; then place the bottom of the peſtle there, and force it down with blows of a hammer, the ſtronger the better. When thus properly hollowed, take it out of the mortar, and pare its edges, and dry it as the coppels are dried, in the air, in a dry warm place. *Cramer*'s Art of Aſſ. p. 60, 62.

Teſts, thus prepared, may be uſed as ſoon as dry, unleſs for ſalts, or litharge; but theſe bodies, when melted in veſſels not firſt baked or hardened in the fire, always make their way thro' them.

TEST *Liquor*, a term uſed by our dealers in brandies, &c. for a liquor which they uſe as the *Teſt* of brandy, &c. to prove whether they be genuine, or mixed with home ſpirit.

The people who uſe this, place great confidence in it, but it is really a very vague and uncertain thing. They pretend, that this liquor will ſhew by the colour which it makes, on being poured into brandy, whether it be genuine and unadulterated; or if not, in what proportion the adulterating ſpirit is mixed with it.

The whole fact is this: If a little common green or white vitriol be diſſolved in ſome fair water, it makes a *Teſt* liquor; a few drops of which being let fall into a glaſs of old French brandy, will turn the whole to a purple, or fine violet-colour; and by the ſtrength or paleneſs of this colour, the dealers judge the brandy to be genuine or mixed, in different proportions, with home ſpirits.

Old French brandy, having long lain in the caſk, takes a dilute tincture of the wood of the caſk, that is, of oak; and this being of the ſame nature with a ſolution or tincture of galls, naturally turns bluiſh or blackiſh with vitriol. A new diſtilled brandy, tho' wholly foreign, would not give this *Teſt*; and a common malt ſpirit, with oak chips infuſed in it, will turn as dark as the fineſt brandy. While our diſtillers indeed had nothing in uſe for the colouring their ſpirits but burnt ſugar, it was poſſible to make ſome gueſs at an adulteration with them, becauſe the brandy, in this caſe, would not become blackiſh in proportion to its former colour, the ſugar-colour not turning to ink with the vitriol like the other: But our diſtillers have of late found a way of uſing an extract of oak for the colouring of their ſpirits, and, ſince that, this *Teſt-liquor* is of very little uſe, our common ſpirits, of any kind, turning as deep with it as the foreign brandies.

The very beſt way of making this *Teſt-liquor*, is with a calcined vitriol of iron, diſſolved in a dilute or aqueous mineral acid. The liquor, when well made in this manner, is of a fine yellow colour, and will give, for a time, the fineſt blue to any ſpirituous tincture of oak.

The Engliſh were, at one time, very fond of high-coloured brandies, and it was then that the uſe of this *Teſt-liquor* was moſt eſteemed; afterwards we, as well as other nations, finding that this colour was only owing to the caſk, began to diſlike it, and to favour the pale brandies: At length we fell into the uſe of ſuch as were wholly limpid and colourleſs, and the re-diſtilling of all the old brandies people were poſſeſſed of took place; on this, the *Teſt-liquor* was found to be of no uſe at all, and accordingly rejected; but as we are of late again come into the eſteem of coloured brandies, and that with great juſtice, as the colour, when genuine, is a certain mark of the age of the liquor, this *Teſt-liquor* is again got into more credit than it deſerves.

The famous Helvetian ſtyptic depended wholly on this accident for its colour; and it was no ſmall mortification to our chemiſts, when, ſome years ago, it was introduced into uſe among us, that they could not make it with our own ſpirits, but muſt be at the expence of true French brandy for it; our own ſpirits, though equally coloured, would never make that violet tincture, becauſe their colour was owing to burnt ſugar, not a tincture of oak. At length this myſtery was explained, and a little ſcrapings of galls made all thoſe quantities of this ſtyptic, which had been ſet by as good for nothing, perfectly fine and well coloured. *Shaw*'s Eſſay on Diſtillery.

TESTA, in antiquity, the ſame with *oſtracon*. See the article OSTRACON.

TESTES (*Cycl.*) Theſe are wanting in moſt of the fiſh kind. The ſpinoſe fiſhes in general have neither *Teſtes* nor paraſtatæ; but all the cetaceous fiſhes have them, and not a few of the cartilaginous kinds. Thoſe fiſh that have them, have always two, as in land animals; but they differ much in figure and ſituation in the ſeveral kinds, particularly in the whale and flat fiſh. *Artedi* Ichthyol.

TESTICLE (*Cycl.*) *Tumours in the* TESTICLES. Tumours and inflammations of one or both the *Teſticles* are not unfrequently the conſequence of falls, blows, and contuſions, and very often are alſo brought on by venereal diſorders.

The beſt external applications to diſperſe theſe are vinegar of litharge, lime-water, ſpirit of wine camphorated, and ceruſs, tutty, or lapis calaminaris mixed in it. But in the night-time, when the applications of fomentations are not ſo convenient, a plaſter of the mercurial kind, doubly ſated with mercury, or, in ſlight caſes, one of ſimple diachylon, may very properly be kept on. Internal medicines, ſuch as nitre, and the thin decoctions of diſcutient remedies, are to be uſed; and, if occaſion call for it, bleeding in the arm is very proper.

This may be the method with tumours of theſe parts, from external injuries; but when they are from venereal cauſes, it is always neceſſary to give briſk purges, with the addition of a proper doſe of calomel to each, and warm and weak drinks ſhould be taken frequently, and by this means theſe tumours are often diſperſed. But if either remedies are applied too late, or the inflammation is very violent, the tumour generally ends either in a ſuppuration or gangrene. In this caſe the maturating remedies are to be applied, ſuch as warm cataplaſms, and the like; and if the tumour does not break of itſelf at a proper time, from the application of theſe, it muſt be carefully opened with the knife, and the matter being diſcharged, the wound is to be cleanſed by injecting vulnerary decoctions with a

a syringe, and afterwards healed by the balsams, as that of Peru, or the like.

The taint that occasioned the tumour is sometimes wholly eradicated, and the patient freed from it by a proper management of these abscesses. It not unfrequently happens indeed in them, that the scrotum is in part consumed, so as to leave the part bare, but this loss of substance may generally be restored by proper treatment, with digestive and balsamic remedies. *Heister's* Surgery, p. 191.

TESTICULATED *Roots*, are those composed of two tuberose knobs, resembling a pair of testicles. Of this kind are the orchises, *&c.*

TESTICULI *Musculus*, in anatomy, the name given by Fallopius, and some others, to the muscle now generally known by the name of the *cremaster*.

TESTO, in the Italian music, is applied to those words of a song, to which some air or tune is to be composed.

It is a matter of great importance in music, to understand well how to appropriate or adapt the music to the words of a song, to express the sense, and make a just application of the long and short syllables to the notes and times with which they are to be connected.

But this branch of the science, which depends greatly on the knowledge of poetry, has lain a long time almost unregarded, and even at present very little care is taken with respect to this in the modern music.

TESTUDO (*Cycl.*)—TESTUDO, the *Tortoise*, in the Linnæan system of zoology, makes a distinct genus of animals; the characters of which are, that the body is defended by a thick crust, and is furnished with a tail. *Linnæi* Syst. Nat. p. 50. See Tab. of Quadrupeds, N°. 28.

The *Tortoise* is a well known animal, of which there are several species. The shell, which covers this creature's body, is composed of a number of variously shaped pieces, often pentangular; these are affixed to a bony substance, like the skull of some animals, which surrounds the animal, and has two apertures; one before, which gives way to the going out of the head and the fore-legs; and the other behind, through which the hinder legs and thighs are protruded.

This bony substance is, in different parts of very different thicknesses; in some places an inch and half, in others not an eighth part of an inch. It is composed of two pieces, the one covering the creature's back, the other its belly; these are joined at the sides by very strong ligaments, but not so rigidly closed but that they easily give way to the creature's motions. *Ray's* Syn. Quad. p. 253.

This is the general order of nature in the structure of the shell of this creature; of which we have several species in different parts of the world, the shells of which are of different value.

1. The common *Tortoise*. This is variegated with black and yellow spots and lines on the back. The upper shell is extremely convex, and the under one flat. Its head is small, and like that of a snake, and it can thrust out this, or draw it into the shell at pleasure. It has no eye-lids, nor any external ears; this is a very long-liv'd creature, and passes the winter without food under ground.

2. The *Jaboti* of the Brasilians, called by the Portuguese *Cagado de Terra*. This has a black shell with several hexagonal figures engraved on it; the head is like that of the other kinds, and is brown, as are also the legs, but variegated with spots of a dusky greenish hue. The liver of this species is esteemed a very delicate dish.

3. The *fresh-water Tortoise*, or the *mud-Tortoise*. This lives in muddy places, frequently in the ditches that surround the walls of towns. The shell of this kind is scarce at all convex on the back, and the creature very disagreeable and ugly; it is also remarkable for the length of its tail, which is slender and tapering like a rat's. The shell is black, and is composed of several small pieces nicely joined together: it can at pleasure thrust out its head, or draw it back into the shell; it feeds on snails, insects, *&c.* and will live a long time without any food; and even when the head is cut off will retain motion and an appearance of life in the limbs and body for a long time.

4. The *common Turtle*, or *Sea-tortoise*. This much resembles the common land *Tortoise*, but that it is larger, and its shell much less beautiful and softer. Its feet are made like the fins of fishes, and well adapted for swimming. They have on each jaw a continued series of bone, which is received in a sinus in the opposite jaw, and serves to chew with.

They come out of the sea to lay their eggs, which they deposit on the earth in prodigious numbers; one female sometimes laying an hundred, and these are left to be hatched by the heat of the sun.

5. The *Jurucua* of the Brasilians, or *Tartaruga* of the Portuguese, called also the *Frank Tortoise*. This has a sort of fins in the place of feet, the fore-ones six inches long each, the hinder ones considerably shorter; and their shells are very elegantly variegated with different figures. *Ray's* Syn. Quad. p. 258. See the article JURUCUA.

6. The *Cawuanne Tortoise.** This is a sea-kind, much resembling the former in shape; but the shell is thicker, and the flesh but ill tasted.

7. The *Carette Tortoise*. This is a small kind, and does not deposit its eggs in the sand, as the others; but lays them among gravel and heaps of small pebbles. The flesh of this species is but ill tasted, but its shell is extremely valuable for ornamental works.

8. The *Jurura* of the Brasilians, or *Cagado d'Agoa* of the Portuguese. This is smaller than the other kinds, and its shell is of an elliptic figure. The shell of this species is considerably convex on the back; its head is long, and its tail short. Marggrave kept one of this species in his house one-and-twenty months without food.

9. The *small East-Indian Land-Tortoise*. This is not above three inches long, when at its full growth; its shell or crust is composed of three orders of scales, and a general rim surrounding them all. Its colours are white, purple, yellow, and black, and it is a very beautiful kind; when the scales of this shell are taken off, the vestiges of them are plain in a mottled black and white colour, with some yellowness. The lower shell is white, and marked with a great number of beautiful lines. The head and beak in this species, are like those of the parrot; and the upper part of the head is variegated with red and yellow; the neck is slender, and the fore-legs are covered with small scales. The feet are flat, and are divided into four toes. The hinder legs are much longer and slenderer than the fore ones, and are only covered with a tough skin; the feet however of these are scaly, and have four toes, as the others. The tail is slender and tapering, and about three inches long. *Ray's* Syn. Quad. p. 259.

10. The *lesser chequered Tortoise*, marked with stars. The shell of this is about seven fingers breadth long, and five wide; it is black, and marked out into rhomboidal figures; and is composed of three orders of prominences, beside the general surrounding rim; from the middle of these eminences there arise five, and from the sides four tubercles, from which there are a number of stellar figures radiated. The lower shell consists of eight pieces, two of which are much larger than the rest, and this is of a blackish and yellowish mottled colour.

11. The *great chequered Tortoise*. This species is found in the island of Madagascar, and is the most convex of all the *Tortoises*. It is a foot long, eight fingers broad, and six high. This is the size of one kept in the Museum of the Royal Society.

12. The *tessellated Surinam Tortoise*. 13. The *tessellated Virginian Tortoise*. And, 14. The *scaly Tortoise*. This is of the mud or fresh-water *Tortoise* kind. It is usually about a foot long, ten inches broad, and three and a half high; and the middle of the back rises into a very remarkable longitudinal ridge. This is somewhat allied also to the *carette Tortoise*. *Ray's* Syn. Quad. p. 260.

TETARTEMORION, among the antients, denotes the fourth part of the zodiac. *Pitisc.* in voc.

TETHALASSOMENOS, a term used by the old medical writers, to express wine mixed with sea-water.

TETIMIXIRA, in zoology, the name of an American fish, more usually known by the name of the *Pudiano*. It is a small fish resembling a pearch, with a purple back, and yellow sides and belly. *Marggrave's* Hist. Brasil. See the article PUDIANO.

TETRACERA, in botany, the name of a genus of plants; the characters of which are these: The cup is a six-leaved perianthium. The leaves are roundish, and stand expanded. There are no petals so far as can be seen in the dried specimens, and the growing plant has not been examined since the time that Houston was deceived by its external resemblance with the petræa, and described its fruit and the flowers of the petræa under the character of one genus, which he called petrea. The stamina are numerous simple filaments, of the length of the cup; they are permanent also, and the antheræ are simple. The germina of the pistil are four in number; they are of an oval figure, and gape open one from another. The styles are subulated, and very short; and the stigmata are obtuse. The fruit is composed of four capsules, which are oval and crooked; and are composed of one valve containing only one cell, and opening at a suture near the top when ripe. The seeds are single and roundish. *Linnæi* Gen. Plant. p. 249.

TETRACHORD (*Cycl.*)—The names of the sounds of a *Tetrachord*, considered by itself, were hypate, parypate, paranete, and nete. Aristoxenus calls them hypate, parypate, lychanos, and nete. *Wallis's* Append. at *Ptolem.* Harm. p. 159, 160.

When *Tetrachords* came to be joined, the parypate was sometimes called *trite*, as being the third from the *nete*; and the paranete was sometimes called lychanos, as in the fore-mentioned place of Aristoxenus. *Wallis*, ibid. See the article LYCHANOS.

The *Tetrachord of Mercury*, contained four strings or chords, in the proportions of 12, 9, 8, and 6; so as to give the fourth, fifth, and octave of the lowest chord. This is the opinion of Boëthius, and after him of Zarlino. Vid. *Wallis's* Append. Ptolem. Harm. p. 178.

TETRACTIS, in natural history, a name given by Linkius, and other authors, to a kind of star-fish, composed only of four rays, the more common kinds having five.

TETRA-

TETRADECARHOMBIS, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ.

The word is derived from the Greek τετρὰς, four, δεκὰς, ten, and ῥόμβος, a rhomboidal figure, and expreſſes a rhomboidal body conſiſting of fourteen planes.

The characters of this genus are, that the bodies of it are exactly of the ſame form with the common ſelenitæ; but that in theſe each of the end planes is divided into two; and there are by this means eight of theſe planes, inſtead of four. *Hill's* Hiſt. of Foſſ. p. 120. See the article SELENITES.

Of this genus there are only three known ſpecies. 1. A thin pellucid one, with tranſverſe filaments; which is frequent in the clay-pits of Northamptonſhire, and ſome other counties. 2. A dull thicker kind, with very ſlender tranſverſe filaments; this is a very rare ſpecies, and found as far as is yet known only in Leiceſterſhire in the yellow brick clay, and at ſmall depths. And, 3. A large ſcaly kind, conſiderably long, and of a very rough ſurface; this is found in Yorkſhire, and that ſometimes looſe on the ſides of the hills, but more frequently buried in the ſtrata of clay. *Hill's* Hiſt. of Foſſ. p. 133, 134, 135. See Tab. of Foſſils, Claſs 2.

TETRADYNAMIA, in botany, a claſs of plants, whoſe flowers have four of their ſtamina of more efficacy than the reſt: Theſe are always known by having the four efficacious ſtamina longer than the reſt.

The word is formed of the Greek τετρὰς, four, and δυναμὶς, power. Of this claſs of plants are ſcurvy-graſs, muſtard, radiſh, &c. See Tab. 1. of Botany, Claſs 1.

The *Tetradynamia* of Linnæus include thoſe called by Tournefort *cruciformes*, and by Ray *ſiliquoſæ*, and *ſiliculoſæ*. The general characters of the claſs are theſe:

The perianthium is of an oblong figure, and is compoſed of four leaves, which are oval, oblong, hollow, obtuſe, and converging toward one another, and are gibbous at the baſe; theſe all fall off with the flower, and ſtand in pairs; the oppoſite ones being always equal in length, this cup is properly the nectarium of the plant, and it is on this occaſion that it is gibbous at the baſe. The flower is of that kind, called by Tournefort, *cruciform*; it conſiſts of four equal petals, which have ungues of the length of the cup, erect, and flat; the petals are broad at the top, and obtuſe, and ſcarce touch one another at the ſides; and the inſertion of the petals and of the ſtamina is in the ſame place.

The ſtamina are ſix ſubulated erect filaments, the two oppoſite ones are of the length of the cup, the other four are ſomething longer, and are of a leſs length however than the petals. The antheræ are oblong and pointed, thick at the baſe and erect, with apices bending ſideways. The nectariferous gland in the different genera of this claſs is differently ſituated. It uſually however is found near the ſtamina, and moſt frequently of all is affixed to ſome ſhort filaments, and ſtands near their baſe. Two of the ſtamina are often curved, that they may not preſs upon this gland; and it is often owing to this, that two are ſhorter than the reſt. The germen of the piſtil is placed above the receptacle, and is every day in its growth raiſed higher and higher. The ſtyle is ſometimes wanting, but in ſuch plants as have it, it is of the length of the longer ſtamina. The ſtigma is always obtuſe.

The fruit or capſule is always a bivalve pod, which often contains two cells; this, when ripe, opens by ſplitting from the apex to the baſe, and it has always a little membranous ſubſtance ſerving within as a ſeptem, when the pod is bilocular; this ſtands out beyond the apex, and is the rudiments of what was before the ſtyle. The ſeeds are roundiſh, and the pod uſually narrow and oblong.

This is a very natural claſs of plants, and has been received as ſuch under whatever name by all the ſyſtematical writers in botany.

The plants of this claſs are generally ſuppoſed to be all antiſcorbutics. This claſs of plants is naturally ſubdivided into two ſeries: The one containing the ſiliculoſe plants, and the other the ſiliquoſe. The firſt have a ſhort pod, the others a long and ſlender one. The firſt pods uſually have more of the remains of the ſtyle than the others. *Linnæi* Gen. Plant. p. 309.

TETRAETERIS, τετραετηρὶς, in the Athenian chronology, a cycle of four years; for which ſee *Potter*, Archæol. Græc. l. 2. c. 26. T. 1. p. 459, ſeq.

TETRAGONIA, in botany, the name given by Linnæus to a genus of plants called by others *Tetragonocarpos*. The characters are theſe: The cup is compoſed of four oval coloured leaves, curled at their edges, and remaining after the flower is fallen. There are no petals. The ſtamina are twenty capillary filaments, ſhorter than the cup. The antheræ are ſhort, and incumbent. The germen of the piſtil is roundiſh, quadrangular, and placed under the receptacle. The ſtyles are four, ſubulated, crooked, and of the length of the ſtamina. The ſtigmata are longitudinal and hoary. The fruit is a coriaceous cruſt, formed into a kind of ſquare figure, by four longitudinal alæ. The ſeed is ſingle, oſſeous, and contains four cells, with oblong nuclei. *Linnæi* Gen. Plant. p. 249.

TETRANDRIA, in botany, a claſs of plants which have hermaphrodite flowers, with four ſtamina or male parts in each. See Tab. 1. of Botany, Claſs 1.

The word is formed of the Greek τετρὰς, four times, and ἀνὴρ, male. Of this claſs of plants are the teaſel, madder, plantane, &c.

TETRANGURIA, in botany, a name uſed by ſome authors for the citrul, a plant of the gourd kind, whoſe ſeeds are uſed in medicine. *Chabræus*, 133.

TETRAO, in the Linnæan ſyſtem of zoology, the name of a genus of birds of the order of the gallinæ; the diſtinguiſhing characters of which are, that the feet have each four toes, and the eyelids are naked and full of fleſhy tubercles. Of this genus are the pheaſant, partridge, quail, &c. *Linnæi* Syſt. Nat. p. 48.

TETRAO, is alſo uſed for a large bird of the gallinaceous kind, whereof there are two ſpecies, the one larger, and the other leſſer; they are called alſo by authors, the *urogallus major*, and *minor*.

The larger is common in Italy, and on the Alps; ſee the article UROGALLUS. The leſſer is common in ſome parts of England, and is called the *black game*, or the *grouſe*. *Ray's* Ornithol. p. 123. See the article GROUSE.

TETRAPHOE, in botany, a name given by the people of Guiney to a plant, which they give in decoction as a cure for fluxes. This plant grows alſo in Malabar, where they uſe the roots boiled in whey in the piles; and in the colic they give the root in powder, about a ſcruple for a doſe. It is called in this latter place *wellia cadavalli*, and by Petiver *xanthium malabaricum capitulis lanuginoſis*. The ſtalks of it are woody and hoary, eſpecially about the tops. Its leaves ſtand by pairs on ſhort foot-ſtalks, and while young they are hoary underneath, with a very ſoft and velvety down; the others are rough like the ſpotted lungwort, but ſeldom are ſo large. The flowers grow in ſpikes, and conſiſt each of fine green leaves filled with ſcarlet filaments: After theſe the fruit ripens, and is a ſort of woolly bur covered with ſoft and hooked prickles, very like the common Engliſh burdock, but not of a third part of the bigneſs. Phil. Tranſ. Nº. 232.

TETRAPYRAMIDIA, in natural hiſtory, the name of a genus of ſpars. The word is derived from the Greek τετρὰς, four, and πυραμὶς, a pyramid.

The bodies of this genus are ſpars influenced in their ſhape by an admixture of particles of tin; and are found in form of broad-bottomed pyramids of four ſides.

Of this genus there is only one known ſpecies, which is uſually of a browniſh colour, and is found in Saxony; as alſo in Devonſhire, Cornwal, and other counties of England, where there is tin. *Hill's* Hiſt. of Foſſ. p. 378.

TETRASTŒCHON, in botany, a term often uſed by the the Greek writers, and generally miſunderſtood by thoſe who copy their accounts. Pliny has made an error in the deſcription of the euonymus, which has confounded two different ſhrubs together ever ſince, by miſtaking the ſenſe of this word, uſed by Theophraſtus in his account of it. He ſays, that the fruit is divided within into four orders or ſeries of ſeeds; this he expreſſes by the word *Tetraſtœchon*, which Pliny ſuppoſing to be the ſame with the word *Tetragonon*, has tranſlated into *granum quadrangula figura*.

But this is by no means the ſenſe of the word which was uſed by the Greeks, to expreſs, that a thing had τέτταρας τάξεις, four rows, orders, or ſeries of ſeeds in it: Nor does it at all expreſs the ſeed's being ſquare, much leſs its being ſingle; for the original derivation of the word was from the term κατα ϛοιχὸν, uſed in dances. Theſe were compoſed of ſeveral ſeries of perſons, called ϛοιχοι, *ſtœchi*; and every ſtœchon conſiſted of ſeveral perſons, who all moved together.

It is plain from this, that *Tetraſtœchon* could not ſignify a fruit's having ſingle ſquare ſeeds, but muſt mean that it had four ſtœchi or orders of ſeeds in it; ſuch was the euonymus of the Greeks, which had a pod like that of ſeſamum to contain them; and had flowers of an offenſive ſmell, like that of corrupted blood. Theſe are all characters ſo very different from that of our euonymus or fuſanus, that it never would have been ſuppoſed by any perſon that they meant the ſame plant that we do by that name, had not Pliny led the world on to that opinion by his falſe and ſcarce intelligible tranſlation of the words of Theophraſtus.

TETRATONON, in muſic, the ſuperfluous fifth is ſometimes thus called, as containing four tones. *Broſſard*.

TETRAX, in zoology, the name of a bird of the gallinaceous kind, called by ſome authors *anas campeſtris*, or the field-duck; and by others the *canna*.

It is a very common bird in France, where it is called *canne patriere*, and ſeems indeed peculiar to that country; it is not called anas from any reſemblance it has to the duck, or any other water-fowl, in its make or ſtructure; but from its ſitting on the ground, juſt as the duck does on the water. It is of the ſize of a pheaſant, and has a beak like that of the common hen. It is taken with nets, as the partridge: It runs very ſwiftly, and, like the buſtard, has no hinder toes; and it ſeems properly a bird of that kind. Its belly is white, and its back is variegated with grey, red, and black. It feeds on vegetables, and on ſmall inſects. *Bellonius* de Avibus.

TETRASARIUS, a word uſed by ſome of the medical writers, to expreſs half an ounce.

TETREUMA, in botany, a name given by the people of Guinea to a species of shrub, very common among them, and used to cure whitlows. They dry the leaves, and reduce them to powder; and, moistening them with any liquor, apply them to the place. Petiver has called this *arbor guineensis laurustini facie*, from its great likeness to the common shrub, which we call the laurustine. The leaves are opake and stiff, and are an inch and a quarter broad, and two inches and a half long. These stand alternately on all sides the stalk, and are fixed on short pedicles. The flowers grow out of the bosoms of the leaves, and stand in clusters in the manner of those of the common laurustine. Phil. Transf. N°. 232.

TETTAR, in the manege, is an ulcer almost as broad as one's hand, that appears commonly upon a horse's croupe, sometimes on his head, and sometimes on his neck. It proceeds from bilious blood, that consumes and eats through the hide or skin, and causes such a violent itching, that it is a hard matter to keep the horse from scratching, and so enlarging and spreading the ulcer.

TETTIGES, τέττιγες, grasshoppers, in antiquity, a title the Athenians assumed to themselves. *Pott.* Archæol. Græc. l. 1. c. 1. T. 1. p. 2. See the article GEGENES.

TETTIGOMETRA, in natural history, a name by which the antients called the nymph of the Cicada, or *Tettyx*; and they named this nymph from which they frequently saw that fly hatched *Tettigometra*, which signifies the *mother of the cicada*.

It has been a great error in our dictionary writers, to call the *cicada* a grasshopper. It is a large four-winged fly, common in Italy, and other hot countries, and its noise is very troublesome there. This noise is made by means of certain organs placed in the belly. See HARVEST-*Fly* and CICADA.

This creature lays its eggs with a wonderful art in the dead branches of trees, and from these eggs are produced small animals like fleas, with six legs and a long trunk; these soon fall off from the tree, and, burying themselves in the earth, feed and enlarge themselves into a sort of hexapode worms; after this they pass into a state like that of the nymphs of our flies, or the chrysalis of butterflies; but they move and eat in this state.

They live in the form of the nymph more than a whole year, after which they crawl out of the earth, and climbing up the bodies of trees, there fasten themselves by their claws, till they are transformed into flies. In the time when they are in this nymph state they are found in great abundance buried about the roots of trees, often at two or three foot deep.

The antient Greeks used to dig them up from these places, and eat them; they were accounted a very good dish among them; and, according to Aristotle, were most valued, and esteemed the greatest delicacy, just before the time of their skin breaking to let out the fly. The antients also eat the cicada in its winged state, preferring the female when full of eggs, and the male at all other times. At present, though this creature is very common in most of the hot countries, and very troublesome by its continual noise; there is no account of their being eaten any where.

TETTIGONIA, in natural history, a word used by the antients to express the smaller species of *cicada*, with which they were acquainted. They called the larger *acheta*.

It is generally supposed that the *Tettigonia* was the same with our smallest kind, called by the French *cigalon*; but Mr. Reaumur observes, that as the antients knew two kinds of the *cicada*, we know three; and that our middle one seems to have been their *Tettigonia* or small *cicada*, and that they were not acquainted with our smallest kind, or cigalon, which is not larger than a hornet. See the articles HARVEST-*Fly*, and CIGALON.

TEUCHITES, in botany, a name used by some for the scænanth or schænanth, camel's hay.

It was originally used only as an epithet added to the name *Schænanth*, to signify the place from whence a peculiar kind of it was brought; but after-writers appropriated it as a name of the plant itself.

Dioscorides distinguishes the Arabian *Schænanth* from the Nabatæan; but this seems an unaccountable error, since Dioscorides one would think could not but know, that Nabatæa was only a region in Arabia. He afterwards makes the Babylonian the same with the Arabian, and says that it is called *Teuchites*. Pliny, on the other hand, gives the name *Teuchites* to the Nabatæan *Schænanth*.

Authors do not seem well to have explained the word. It is evidently an epithet given to the *Scænanth*, from the name of the place where it was brought, and probably it ought to be written *Teuochitis*. There is a city *Teuochis* in Ægypt near the borders of Arabia, and the geographers all mention a lake in the neighbourhood of this city; in this lake it is probable the *Scænanth* might grow; and being gathered there, and sold in the adjoining city of *Teuochis*, the purchasers might distinguish it with an epithet formed of the name of the place where they bought it. See the article SCHÆNANTH.

TEUCHTLACOT-*Zanhqui*, in zoology, a name by which the natives of some of the American nations call the rattle-snake. *Ray's* Syn. An. p. 291. See the article RATTLE-*Snake*.

TEUCRION, according to Pliny, a name given by some of the antient botanists to the *Chamædrys*, or germander.

This author supposes that plant and the *serrata* or *serratula*, to be the same in the accounts of some of the more early authors; but it does not appear, upon a strict enquiry, that they ever called any other plant than the common sawwort by the name *serrata*, though they called this plant by a great many other names beside that, as *betonica*, *cestrum*, &c.

TEUCRIUM, *Tree-germander*, in botany, the name of a genus of plants; the characters of which are these. The flower consists of one leaf, and is of the labiated kind; the stamina supplying the place of the upper lip; the lower lip is divided into five segments, the middle one being largest and hollowed like a spoon; the others standing over-against one another in the neck of the flower. The cup is bell-fashioned, and from it arises a pistil which is fixed in the manner of a nail to the hinder part of the flower, and is surrounded by four embryos, which afterwards become four roundish seeds, and ripen in the bell-shaped cup of the flower.

The species of *Teucrium*, enumerated by Mr. Tournefort, are these: 1. The shrubby *Teucrium*, with sinuated leaves, the Bœtic *Teucrium* of authors. 2. The broader-leaved Spanish *Teucrium*. 3. The American fox tail *Teucrium*. 4. The procumbent perennial *Teucrium*, with spear-pointed leaves. 5. The jagged-leaved annual procumbent *Teucrium* of Portugal. *Tourn.* Inst. p. 208.

TEUGA, in botany, the name given in the Hortus Malabaricus, to a genus of plants called by Linnæus and others, *coccus*. Hort. Mal. L. 1. 4. See the article COCCUS.

TEUTHOPHACE, a word used by the antients, to express a sort of food made of beet-roots and lentils, often prescribed as a good diet for the sick.

TEXT, TEXTURE, in chemistry, is used for any thing having a texture in a proper sense, or for an aggregate formed by admotion, composition, co-ordination, construction, whether fortuitous, or designed for some end, so that without such a texture the end could not be obtained; of which therefore, this texture must be considered as the true instrument.

In this sense living bodies have a texture, and may be strictly named *Texts*; and the more so, if they be sentient and have local motion; all which bodies, whether small or great, are formed of innumerable mixt and compound individual corpuscles. Vid. Observat. Halens. Tom. 4. Obs. 14. §. 8.

TEXT differs from *Aggregate*. See the article AGGREGATE.

TFUOI, in the Chinese manufactory of porcelaine, a word used to express a particular sort of varnish for that ware with violet colour and gold. The usual method of doing this at first, was by mixing gold with the common varnish, breaking the leaves very small, and then adding the common blue and the powder of calcined agate of a coarse kind, found in great plenty on the shores of their rivers. But they have since found, that the brown varnish called *Tsekin* succeeds greatly better, for when the blue is mixed with this, its brown colour is lost, and the gold lies on much better than it would any other way.

They had once a method of a varied varnish, which was very beautiful, but is much neglected now; this was the giving a vessel the brown varnish on the outside with a large portion of gold, and the common white varnish within. They also varied the degree of colour on the outside, by laying on more or less of the varnish; and gave this way a variety, even in the same colour. Observ. sur les Coutumes de l'Asie, p. 308.

THACAS, Θᾶκας, in antiquity, a general name given to the place or seat where the augurs made their observations. *Pott.* Archæol. Græc. T. 1. p. 322. See the article AUGUR.

THAIS, a name given by Ægineta, to a cosmetic cerate, intended to give a beautiful red to the face. Galen uses the same word to express a sort of bandage.

THALAMEGUS, among the antients, a ship of pleasure, or yacht used by princes. It was always provided with a good cabin, or bed-chamber. *Pitisc.* in voc.

Philopater king of Egypt had a very remarkable ship of this kind, for sailing in parade with his wife and children on the Nile. It is said to have been half a stadium, or 312 feet long; its breadth more than 30 cubits, and its height, with the pavilion erected on it, about 40 cubits. Its structure was likewise very singular, being broad-bottomed, and very wide above, especially towards the fore-part; and accommodated both with a double prow, and a double stern. On its decks were two long galleries of ivory, for walking in. *Hofm.* Lex Univ. in voc.

THALAMII, among the antients, those rowers who sat in the lowest part of the ship. *Pitisc.* in voc. See THALAMITÆ.

THALAMIUM, among the antients, a port-hole, through which the oars of the rowers in the bottom of the ship went. *Pitisc.* in voc.

THALAMITÆ, in the naval architecture of the antients, a term used to express those rowers in the Polyerete galleys, or those which contained several series of rowers, who sat on the *Thalamus* of the vessel, and made the lowest row. These moved their oars and hands under the seats of the row that sat

fat next above them. The word occurs chiefly in the defcription of the *Triremes*, or three-rowed galleys, in which the fecond row of the men were called *Zygitæ*, and the uppermoft *Thranitæ*. *Meibom.* de Trirem.

THALAMUS, in botany, a term ufed to exprefs that part of the flower in the capitated or flofculous flowered plants, where the embryo fruits of every feparate flofcule are lodged, and where afterwards the feeds are contained. This is the bottom of the cup, in the central part of which it adheres to the ftalk. *Tourn.* Inft. p. 438. See Tab. 1. of Botany, Clafs 1.

THALASSOMELI, the name of a medicine ufed as a purge among the antients. It was compofed of equal parts of honey, fea-water, and rain-water, expofed to the fun in the dog days, in a veffel pitched on the infide. It purged in the fame manner that fea-water alone would do, but only in a milder way.

THALIA, in botany, the name of a genus of plants, called by Plumier *cortufa*. The characters of which are thefe: The cup is a fpatha of an oval figure, terminating in a point, and compofed of only one valve. The flower is compofed of five petals, which are of an oblong ovated figure, and are hollowed and undulated at the margin; two of thefe, which are neareft the cup, are fmall and convoluted; the others are nearly equal in fize, and are ftrait and hollowed. The germen of the piftil is of an ovated figure, and the fruit is a berry of an oval figure, having only one cell, and within that a fingle bony feed which has two cells, in each of which is a thin kernel. *Plumier* 8. *Linnæi* Gen. Plant. p. 522.

THALICTRUM, *Meadow-rue*, in botany, the name of a genus of plants. The characters of which are thefe: The flower is of the rofaceous kind, being compofed of feveral petals arranged in a circular form. The piftil arifes from the center of the flower, and is furrounded by a vaft congeries of ftamina. This finally becomes a fruit compofed of feveral capfules gathered into a fort of head; thefe are fometimes alated, and fometimes plain, and each of them contains one oblong feed.

The fpecies of *Thalictrum*, enumerated by Mr. Tournefort, are thefe: 1. The larger *Thalictrum*, with angular or ftriated feed-veffels. 2. The larger *Thalictrum*, with fmooth feed-veffels. 3. The great yellow-flowered *Thalictrum*, with yellow ftamina, and bluifh-green leaves. 4. The columbine-leaved alpine *Thalictrum*, with purple ftamina. 5. The great columbine-leaved alpine *Thalictrum*, with white ftamina and green ftalks. 6. The leffer alpine columbine-leaved *Thalictrum*, with white ftamina and green ftalks. 7. The purple-ftalked columbine-leaved Canada-*Thalictrum*, with white ftamina. 8. The fmaller American *Thalictrum*. 9. The great yellow-flowered fweet-fcented *Thalictrum*. 10. The large-flowered afphodel-rooted fmall *Thalictrum*. 11. The early-flowering mountain-*Thalictrum*. 12. The leffer *Thalictrum*. 13. The narrow-leaved meadow-*Thalictrum*. 14. The little French *Thalictrum*, with thick fhining leaves. 15. The narroweft-leaved meadow-*Thalictrum*. 16. The fmall ftinking *Thalictrum*. 17. The little broad-leaved mountain-*Thalictrum*. 18. The little mountain-*Thalictrum*, with deep red fhining leaves. *Tourn.* Inft. p. 270.

THALLOPHORI, Θαλλοφοροι, in antiquity, the old men and women, who, in the proceffion of the feftival *Panathenæa*, carried olive boughs in their hands. *Potter*, Archæol. Græc. T. 1. p. 421.

THALYSIA, Θαλυσια, in antiquity, a facrifice offered by the hufbandmen after harveft. For the origin and ceremonies of which, fee *Potter*, Archæol. Græc. T. 1. p. 400.

THAMAR, a word ufed by the Arabian phyficians, to exprefs a date. Hence a pectoral decoction made with dates and other ingredients, was called *diathamyron*; and the word was afterwards corruptly written *dicameron*.

THAOCINUS *Color*, a term ufed in the Latin tranflations of the Arabian writers to exprefs what we call a blue purple, and the Latins *pavonaceus color*, peacock colour; which is alfo the literal fignification of the Arabian term.

The antient writers all tell us, that their *Indicum* when diluted, made the moft beautiful colour imaginable of that kind. This is one of many reafons for fuppofing the *Indicum* of the antients, and our *Indigo* to be the fame fubftance, becaufe this blue purple is the very colour of that drug when diluted.

THAPSIA, in botany, the name of a genus of plants; the characters of which are thefe. The flowers are difpofed in umbels, and are of the rofaceous kind, being compofed of feveral petals, difpofed in a circular order on a cup, which afterwards becomes a fruit compofed of two long ftriated feeds, furrounded with a foliaceous edge, and from both fides emarginated inwards. See Tab. 1. of Botany, Clafs 7.

The fpecies of *Thapfia*, enumerated by Mr. Tournefort, are thefe: 1. The largeft broad-leaved *Thapfia*. 2. The large hairy broad-leaved *Thapfia*. 3. The ftinking *Thapfia*, with libanotis-leaves. 4. The ftinking Portugal white-flowered *Thapfia*, with parfley leaves. 5. The narrower leaved Italian *Thapfia*, called *panax afclepium*, and Efculapius's all-heal. 6. The broadeft-feeded *Thapfia*, or giant-turbith. 7. The fhining alpine *Thapfia*, with thalictrum-leaves and white flowers. 8. The hairy thalictrum-leaved Portugal *Thapfia*. *Tourn.* Inft. p. 311.

The root of the *Thapfia* is ufed in medicine: There are two kinds of it, the white, and the black.

The white *Thapfia*, called alfo by fome grey turbith, is the root of a plant fomewhat refembling fennel. This is full of a milk-like juice, fo very fharp that it will bring off the fkin, if fuffered to touch the face. This root is feldom ufed under its own name, but is fometimes fold for the turbith root. They may be diftinguifhed however, by the turbith's being of a reddifh grey without, and of a whitifh grey within, and heavy and hard to break; on the contrary, white *Thapfia* is light, wrinkled, and of a filvery grey on the outfide, and fo hot and acrid to the tafte, that if new it will blifter the mouth.

The black *Thapfia* is of too dufky a colour to be ufed as an adulteration of turbith, and too hot and acrid to be prefcribed internally. *Lemery*'s Dict. des Drog.

Some of our druggifts receive the roots of this plant inftead of turbith, and fell it as fuch. It is happy for us, that it is not much in ufe. It purges very violently both upwards and downwards, and ought to be banifhed from among the number of medicinal fimples.

Befide the poifonous root known by the name *Thapfia*, the antients have defcribed three other vegetable fubftances under it. The Lycium-wood ufed at this time, as alfo of old in Crete, as a yellow dye: The *Scythica radix*, or liquorice; and the *luteola*, or dyers weed. The Greek *Thapfos* fignifies a pale dead yellow colour, and is applicable either to the fubftance or the juice or tincture of all thefe.

Paulus Ægineta and Alexander Trallian, in their catalogues of the things ufed to dye the hair yellow, mention the plant which they call *robia*, or *herba robia*, which they fay dyed every thing of a gold colour.

Democritus calls the fame plant *æcomenia*, and places it alfo among the herbs, ufed in tinging the hair. And fome of the more modern Greeks have called it *cymene*. It is ftill frequent in many parts of Greece, and is ufed there as well as here, to dye things yellow. Some have called it *carniola*; and Macer makes it the fame with the *ifatis* or woad; but very erroneoufly. Some have called it *rubia*; but thefe have carefully diftinguifhed it from the *rubiæ radix*, or madder, which dyes red. The old fcholiaft on Ægineta has alfo called this plant by the fame name with woad, and plainly fhews he thought the two names fynonymous, by rendering the *ifatis* of his author by the word *cymene*, which is plainly the fame plant with the carniola, that is the *luteola* of the Romans. See the article CYMENE.

THAPSOS, in the materia medica of the antients, a name given to a kind of wood of a pale yellow colour, ufed of old in dying linnen and woollen cloths.

It has by fome been fuppofed, that *Thapfos* and *Thapfia* were the fame plant; but there is no one circumftance in any of the accounts of authors, to favour fuch a conjecture. The *Thapfia* was always defcribed as a plant whofe root was poifonous; but the *Thapfos*, as a tree, whofe wood was not efteemed dangerous, and was ufed by the dyers; not the root, but the wood of the trunk and large branches. The natural colour of the wood being of a livid and dull yellow, it became an emblem of death; and the word *Thapfos* is ufed by fome of the Greek writers, as a name for the colour of dead corpfes.

The people of Crete at this time ufe the lycium-wood in dying a yellow colour, and it is probable that the *Thapfos* was this very tree. Diofcorides tells us, that the wood of this tree was alfo ufed at his time to tinge the hair yellow, which was a favourite colour with the Greeks. The lycium is of a colour fomewhat deeper than our box-wood, and parts with its ftain fo eafily that it feems very proper for fuch a purpofe. See the article THAPSIA, *fupra*.

THAPSUM, among the old Roman writers, a common name for the *verbafcum*, or mullein; but as there were many other plants, very different in their nature, yet whofe names refembled this; fuch as the *Thapfia*, or deadly carrot, and the *Thapfum*, or *geniftella tinctoria*; it was foon found neceffary to add fome other name, and it was then called *Thapfum barbatum*, or *barbaffum*.

The Greeks ufed the word *Thapfon* for a yellow colour, and called in general all yellow things by that name. Hence the great confufion that has arifen by calling the *Thapfia* root the liquorice root, the lycium wood, and the geniftella flowers, all by the common name *Thapfum*. The reafon of the geniftella being called *Thapfum*, was, that its flowers were yellow, and were ufed to colour the ladies hair; that being the favourite colour of thofe days. The flowers of mullein are yellow, and feem more fit for the colouring the hair, than thofe of the geniftella; their colour being more eafily feparated, and continuing on fo well that the glovers of many parts of England ufe them in the feafon for colouring their yellow gloves.

It is probable, that the ladies of old ufed this, as well as the geniftella, for this purpofe; and it might hence obtain the common name *Thapfum*. The other part of its diftinction, barbatum,

barbatum, feems owing to the leaves being fo covered with a woolly down that they look bearded. And when this word is written *barbaffum*, it may probably be given as the name of fome of thofe fpecies of mullein, which are not hairy, as our black or fage-leaved mullein, and be a corruption of the word *verbafcum*. This black mullein has no lefs title than the white or bearded kind, to the name *Thapfum*. Its flowers being of a yet finer yellow than thofe of that kind, and being as fit for the ufe of ftaining. The glovers of Hertfordfhire ufing this fpecies for their leather gloves.

THARGELIA, Θαργήλια, in antiquity, an Athenian feftival, in honour of the fun, and his attendants the hours; or, as others think, of the Delian Apollo and Diana. For an account of the ceremonies of this folemnity, fee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 400. feq.

THARGELION, Θαργηλιών, in chronology, the eleventh month of the Athenian year. It contained thirty days, and anfwered to the latter part of our April, and the beginning of May. See the article MONTH.

It took its name from the feftival *Thargelia*, kept in it. See the article THARGELIA, *fupra*.

THASIUM *Marmor*, in the writings of the antients, a name given to a fpecies of marble, ufed in building. It had its name from the ifland Thafus, one of the Cyclades, where it was dug; it was of a dufky greyifh white, and feemed to be compofed of the fame matter with the common white marbles with greyifh veins; only that the matter of the veins here did not run into thofe determinate parcels, but were blended among the whole mafs.

THAUGHTS, or THOUGHTS, in a boat, are the benches on which the rowers fit to row.

THEATRIC *Bandages*, a term ufed by Hippocrates, to exprefs the parade of furgery in applying bandages for fhew, when there was no real ufe in them. All fuch bandages he called *Theatric*, proper only to be looked at.

THEBANUS *Ophites*, in natural hiftory, a name given by fome of the antients, to that fpecies of the *Ophites*, or ferpentine marble, more commonly called *Ophites niger*, the black ferpentine. See the article OPHITES.

THEDO, in ichthyology, a name given by Figulus and others, to the trout. See the article TRUTTA.

THEIOCRUS, in the materia medica of the antients, a name given by fome to the *Melanteria*, a mineral fubftance of a vitriolic nature, and of a yellow colour, but turning black on touching common water.

This name *Theiocrus* fignifies only fulphur-coloured, and was at firft ufed with the name of vitriol, as expreffive of the difference of this kind from others; but in time it became common to ufe it alone.

THELE, a word ufed by fome to exprefs the nipple, and by others for the whole breaft.

THELIGONIUM, in botany, the name of a genus of plants, called by the common authors of botany, *cynocrambe*. The characters are thefe: The male and female flowers are produced in the fame plant. In the male flower the cup is compofed of one leaf, of a turbinated form, lightly divided into two fegments with the jaggs turning downward. There are no petals. The ftamina are numerous, being ufually twelve at leaft; they ftand erect, and are of the length of the cup; and the antheræ are fingle. The female flower has an extremely fmall one-leaved cup, which is bifid, and its fegments gape open. There are no petals. The piftil has a globofe germen; the ftyle is fhort, and the ftigma obtufe. The fruit is a globofe capfule, of a coriaceous texture, having only one cell, and containing only one globofe feed. *Linnæi* Gen. Plant. p. 406. *Tourn.* Inft. p. 485.

THEMIS, in aftronomy, a name given by fome to the third fatellite of Jupiter. *Lowth.* Abr. Philof. Tranf. Vol. 1. p. 408.

THENAR, (*Cycl.*) a very thick and flefhy mufcle, in fome meafure pyriform, lying on the firft phalanx of the thumb toward the palm of the hand, the large eminence in which is chiefly formed by it. It is fixed to the bone which fupports the thumb, and to the neighbouring part of the great internal annular or tranfverfe ligament of the carpus. It is in fome meafure bicipital; two diftinct portions anfwering to the two infertions. As it runs along the firft phalanx, thefe two portions unite, and diminifhing in thicknefs, are both inferted by one tendon in the lateral internal part of the head of the firft phalanx, in the lateral part of the bafis of the fecond, and in the lateral ligament of that joint. The void fpace between the two portions of this mufcle gives paffage to the tendon of the *flexor pollicis longus*. That portion which lies neareft the hollow of the hand is largeft; and its tendinous extremity is inferted in the firft fefamoide bone, fituated at the bafis of the fecond phalanx. *Winflow's* Anat. p. 196.

THENAR *Pedis*, a mufcle made up of feveral portions, and lying on the inner edge of the fole of the foot. It is fixed by three or four flefhy fafciculi to the lower and inner part of the os calcis, fcaphoides, and cruciforme majus, and a little in the annular ligament under the inner ankle, which belongs to the tendon of the flexor longus. From all thefe infertions the fafciculi approach each other, as they advance under the firft bone of the metatarfus, and are fixed in the internal fefamoide bone, and infide of the firft phalanx near its bafis; and there is another fafciculus fixed by one end of the os fcaphoides, and cuneiforme majus; and by the other to the external fefamoide bone, and outfide of the firft phalanx of the great toe. *Winflow's* Anat. p. 222.

THENSA, among the Romans, a veil or canopy, ufed in the chariots at games; and likewife to cover a feat of ftate. *Pitifc.* in voc.

Thenfæ could not be granted to any but by the exprefs allowance of the fenate. Hift. Acad. Infcript. Vol. 1. p. 359.

THEOBROMA, in botany, the name of a genus of vegetables, including the cacao and the guazuma of Plumier. The characters are thefe: The cup is a three-leaved perianthium reflex and open, and is compofed of oval, concave, and deciduous leaves. The corolla is compofed of five petals, erect, open, concavely galeated, and terminated by a bifid briftle. The nectarium is campanulated, and confifts of five petals; it is fmaller than the flower, and confifts of five connected parts. The ftamina are five-pointed filaments of the length of the nectarium; each has its top divided into five fegments, and carrying five apices or antheræ. The germen of the piftil is oval, the ftyle is pointed, and is of the length of the nectarium, and the ftigma is fimple. The fruit is a woody fubftance, ribbed in five places on the furface, and divided into five lodgments of feeds within. The feeds are numerous, flefhy, and of an oval figure. There is fome difference in the fruit of the feveral fpecies of thefe trees; the cacao having a long fruit, tapering at each end, and the guazuma a globular one, full of tubercles, and perforated in the manner of a fieve, but divided into five lodgments within. *Linnæi* Gen. Plant. p. 367. *Plumier*, Gen. 18. *Tourn.* Inft. p. 444.

THEODOLITE (*Cycl.*)—This inftrument is now commonly made ufe of by furveyors. One of the beft of the kind feems to be Mr. Sifon's lateft improved *Theodolite*; a defcription of which may be found in Mr. *Gardner's Practical Surveying improved*; from whence it has been inferted in a late treatife of practical geometry, publifhed at Edinburgh 1745, in 8°. under the care, as it is commonly thought, of the late celebrated Mr. M^cLaurin.

In this inftrument the three ftaves, by brafs ferrils at top, fcrew into bell metal joints, moveable between brafs pillars, fixed in a ftrong brafs plate; in which, round the center is fixed a focket with a ball moveable in it, and upon which the four fcrews prefs that fet the limb horizontal. Next above is fuch another plate, through which the faid fcrews pafs, and on which round the center is fixed a fruftum of a cone of bell-metal, whofe axis, being connected with the center of the ball, is always perpendicular to the limb, by means of a conical brafs ferril fitted to it, whereon is fixed the compafs-box, and on it the limb, which is a ftrong bell-metal ring, whereon are moveable three brafs indexes, in whofe plate are fixed four brafs pillars, that joining at top, hold the center-pin of the bell-metal double fextant, whofe double index is fixed in the center of the fame plate. Within the double fextant is fixed the fpirit level, and over it the telefcope.

The compafs-box is graved with two diamonds for north and fouth, and with 20 degrees on both fides of each, that the needle may be fet to the variation, and its error alfo known.

The limb has two flower-de-luces againft the diamonds in the box, and is curioufly divided into whole degrees, and numbered to the left hand at every 10° to twice 180°, having three indexes (with Nonius's divifions on each for the decimals of a degree) that are moved by a pinion fixed below one of them without moving the limb, and in another is a fcrew and fpring under, to fix it to any part of the limb: It has alfo divifions numbered for taking the quarter girt in round timber; to which a fhorter index is ufed, having Nonius's divifions for the decimals of an inch; but an abatement muft be made for the bark, if not taken off.

The double fextant is divided on one fide from under its center (when the fpirit-tube and telefcope are level) to above 60 degrees each way, and numbered at 10, 20, &c. And the double index (through which it is moveable) fhews on the fame fide the degree and decimal of any altitude or depreffion to that extent, by Nonius's divifions; on the other fide are divifions numbered for taking the upright height of timber, &c. in feet, when diftant ten feet, which at 20 muft be doubled, and at 30 trebled; and alfo the quantities for reducing hypothenufal lines to horizontal: It is moveable by a pinion fixed in the double index. See the article SURVEYING.

The telefcope is a little fhorter than the diameter of the limb, that a fall may not hurt it; yet it will magnify as much, and fhew a diftinct object as perfect, as moft of treble its length; in its focus are very fine crofs wires, whofe interfection is in the plane of the double fextant, and this was a whole circle, and turned in a lathe to a true plane, and is fixed at right angles to the limb; fo that whenever the limb is fet horizontal (which is readily done by making the fpirit tube level over two fcrews, and the like over the other two) the double fextant and telefcope are moveable in a vertical plane, and then every angle taken on the limb (though the telefcope be never fo much elevated or depreffed) will be an angle in the plane of the horizon, and this is abfolutely neceffary in plotting

ting an horizontal plane. Treat. Pract. Geom. p. 75. seq.

THEOGAMIA, Θεογαμια, in antiquity, a Sicilian festival in honour of Proserpine, which seems to have been instituted in memory of her marriage with Pluto. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 402.

THEOMANTIA, Θεομαντεια, in antiquity, divination by the supposed inspiration of some deity. For a particular account of which, see *Potter*, Archæol. Græc. l. 2. c. 12. T. 1. p. 298 seq.

THEOPHANIA, Θεοφανεια, in antiquity, a festival observed by the Delphians upon the day whereon Apollo first manifested himself to them. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 402.

THEOPHRASTA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The cup is a small perianthium, lightly divided into five obtuse segments, and remaining when the flower is fallen. The flower consists of a single petal, in form of a bell, slightly divided into five obtuse segments. The stamina are five tapering filaments, shorter than the flower. The antheræ are simple. The germen of the pistillum is of an oval figure. The style is tapering, and shorter than the flower. The stigma is acute. The fruit is a very large globose capsule, containing only one cell. The seeds are numerous and roundish, and are affixed to every part of their receptacle, which is loose. *Linnæi* Gen. Plant. p. 66.

THEOPHRASTICS, a name given to the followers of Paracelsus, from his name Theophrastus.

THEOPNEUSTÆ, Θεοπνευσται, an epithet given to enthusiastical diviners. *Pott.* T. 1. p. 302.

THEOPROPIA, Θεοπροπια, a designation given to oracles. See the article ORACLE, *Cycl.*

THEORI, Θεωροι, in antiquity, an appellation given to those Athenians who performed the solemnity called *Theoria*. See the next article.

THEORIA, Θεωρια, in antiquity, a solemn annual voyage to Apollo's temple in the island Delos, performed by the Athenians always in the same ship in which Theseus went. For the particularities of this naval procession, see *Potter*, Archæol. Græc. l. 2. c. 9. T. 1 p. 284. seq.

THEORY (*Cycl.*)—THEORY *of Chemistry*. Under the *Theory* of this art are to be laid down all the general truths which the particular experiments of chemists have hitherto demonstrated. These are, on this occasion, to be taken for granted, and the whole body of such truths makes the universal *Theory* of chemistry, for chemistry is no science formed *a priori*; 'tis no production of the human mind, or raised by reasoning, but collected *a posteriori* from experiments; it took its rise from various operations casually made, and observing those that had one and the same uniform tendency, without any expectation of what followed; and was only reduced into an art, by collecting and comparing the effects of such uncertain experiments, and noting the tendency thereof: So far then as a number of experiments agree to establish any unquestionable truth; so far they may be considered as constituting the *Theory* of chemistry. Such a *Theory* is necessary to be premised to every art; and something equivalent to this is practised by every artisan, in teaching his disciple how to proceed orderly in the exercise of his art; and accordingly it would be impossible to teach the practice of chemistry to advantage, without having first given some such *Theory*. Thus it would be to little purpose, to give a novice a parcel of rosemary, for instance, and bid him, without any addition, distil a water from it, which should contain the natural taste and odour of the plant; unless he knew before-hand this general truth, that plants, exposed to a gentle heat, like that of the summer's sun, do exhale their most subtle and volatile parts, which, being collected and condensed by means of proper vessels, appear in form of water, and are the thing required. *Shaw's* new Meth. of Chem. p. 3.

In the forming such a *Theory* of chemistry, a direct use may indeed be made of the demonstrations in physics, as particularly in mechanics, hydrostatics, and hydraulics; since the properties common to all bodies, and what farther affections certainly flow therefrom, have their place in chemistry. One cannot, however, be too reserved in this use, since those singular properties found in some bodies, will, if applied to others, falsify the mechanical demonstrations, which might hold true every where else. Thus Galilæo has fully demonstrated the law, by which an heavy body, let fall from on high, descends in a spiral or elliptic line, with a certain degree of acceleration to a point of the earth, perpendicular to the horizon of the point from whence it was first let fall; but if a loadstone be thus let fall, and in the course of its descent enter the sphere of activity of another load-stone, the demonstration will not hold. So what Archimedes has shewn, concerning bodies equiponderant in water, holds infallibly true, if considered only in common cases, but proves false in the instance of gold; which, tho' it sink in other fluids, is suspended and dissolved in light aqua regia. *Boerhaave*, Chem. p. 3.

Due regard being had to this rule, the discoveries of naturalists and mathematicians will always be advantageous, never injurious to the art of chemistry.

Chemistry, as now conceived, is an assemblage of very different parts, which antiently subsisted separate, or at least had a subsistence prior to each other, as the preparing of metals for human uses, the attempts of transmuting the baser metals into gold, the preparing of medicines, &c. If we are to trace the antiquity of chemistry, as an art that teaches to convert other metals into gold, or to procure an universal remedy for all diseases, the research will not carry us far back; but as it relates to the discovery of metals in the mine, and the digging, separating and purifying them, it challenges even the highest antiquity.

The art of metals is, no doubt, of very early standing. To find, procure, fuse, refine, and render malleable, and apply metal to use, is even of antediluvian origin, and was attributed by the antients to their gods. Moses, the oldest author extant, in his genealogy of the patriarchs, relates that Tubal Cain, the eighth from Adam, was the instructor of every artificer in brass and iron, to prepare the instruments and utensils of life; and 'tis apparent nothing of this could be effected without the knowledge of metallurgy. This account given us by Moses, is surprisingly seconded by prophane history and fables; for Diodorus Siculus, who lived in the time of Cæsar, when Ægypt was become a Roman province, had a fair opportunity of searching into the antiquities of the Ægyptians; and he relates, as the result of his enquiry, a very antient tradition of one Hephaistos, whom that people hold the first inventor of all arts and operations about metals, and every thing else that undergoes the fire; together with their uses; which art he delivered down to posterity, so far as it might be of service to mankind. This Hephaistos of the Ægyptians and Greeks, is the same with the Mulciber and Vulcan of the Latins, to whom the same art or invention is ascribed; and the Vulcan of the Latins we generally suppose to have been the Tubal Cain of the Hebrews, here mentioned by Moses as the inventor of the said art.

It appears from Homer, Hesiod, Orpheus, and all the most antient writers, that Vulcan had the art of working brass and iron; and that, living under mount Ætna, he was employed in forging arms for the gods and heroes. As Diodorus Siculus relates the story, he was the son of Jupiter and Juno, and the first king of Ægypt, and that he was afterwards preferred to be a god, for having invented fire, and taught men the use of it. The Ægyptians, as the same Diodorus observes, adored their god Vulcan as the inventor of the whole art and application of metals; so that the account of Moses and Diodorus perfectly agree, and prove the chemistry of metals almost coeval with mankind. *Shaw's* Chem. p. 10.

THEOXENIA, Θεοξενια, in antiquity, a festival in honour of all the gods, and celebrated in many cities of Greece, but especially at Athens. *Potter*, T. 1. p. 402.

THEOXINI *Malagma*, the name of a sort of cataplasm, good against pains of the feet.

THERAPIDION, in botany, a name given by some authors to the common oister-green, or sea-laver, a plant of the tremella kind. See the article TREMELLA.

THERMASMA, a word used by some of the antients to express any thing that warms the body, and by others particularly for a warm fomentation, prescribed by Hippocrates for removing pains in the side, and giving ease in pleurisies.

THERMOMETER (*Cycl.*)—Dr. Martin has made useful remarks on the construction and graduation of *Thermometers*, and has reduced the most remarkable of these instruments, which have been employed in different parts of Europe, for observing the changes in our atmosphere, to one general standard, so as to enable us to compare the several observations together. See his Physical and Medical Essays.

THERMOPOLIUM, a name for a sort of public houses among the antients, in which hot liquors were sold, in the manner of our coffee-houses.

THESEIA, Θησεια, in antiquity, an Athenian festival, in honour of Theseus, and celebrated on the eighth day of every month. For the ceremonies of this solemnity see *Potter*, Archæol. Græc. T. 1. p. 404.

THESIS, (*Cycl.*) in music, denotes the fall of the hand in beating time. The Latin writers call it *depressio*. *Brossard*.

THESMOPHORIA, Θεσμοφορια, in antiquity, a festival in honour of Ceres, which was celebrated by many cities of Greece; but especially the Athenians observed it with great devotion and pomp. For the ceremonies of this solemnity, see *Potter*, Archæol. Græc. T. 1. p. 403. seq.

THESMOTHETÆ, Θεσμοθεται, in antiquity, an appellation given to six of the nine Athenian *archons*; the first and chief of the nine was called, by way of eminence, *archon*; the second in dignity was called *basileus*, the third *polemarchus*, and the other six *Thesmothetæ*; for an account of whose power and jurisdiction, see *Potter*, Archæol. Græc. T. 1. p. 77.

THESPHATA, Θεσφατα, in antiquity, an appellation given to oracles. See ORACLE, *Cycl.*

THESPIANA, the name of an antidote, intended for internal abscesses.

THETA, Θ, among the antients, one of the Greek letters. It was used as a mark on the ballots of judges, by which they condemned the person to death, it being the first letter of the word Θανατος, death. Whence it had the epithet of *niger* and *infelix*, thus:

O multum ante alias infelix litera Theta.

 THETES,

THETES, Θῆτες, in antiquity, the loweſt claſs of people at Athens. Ariſtides repealed Solon's law, by which the *Thetes* were made incapable of bearing any office in the government. *Potter*, Archæol. l. 1. c. 4. p. 16.

THEVET, a name of one of the Hebrew months, anſwering to our December moon. See the article TEBET.

THEXIS, a word uſed by the old medical writers, ſometimes for wounds made by puncture with ſmall inſtruments, and ſometimes for the operation of the future, or the ſowing together the lips of a wound, to make it heal with a leſs ſcar.

THIGH (*Cycl.*)—THIGH-*Bone*. We have an account in the Philoſophical Tranſactions of a large piece of a young man's *Thigh-bone* being taken out, and the place ſo well ſupplied by a callus, that he walked ſtrait. See N°. 461. Sect. 2.

Fractured THIGH-*Bone*. The *Thigh-bone*, though the largeſt and ſtouteſt in the whole body, is yet frequently broken, both near its middle, and towards its ends or articulations; but more particularly near that part uſually called its neck, near its articulation with the hip-bone; and when this is the caſe, it is very difficult to ſet it, and retain it in its place. When the bone is broke in two places at once, which ſometimes happens, the danger is yet much greater; and if the patient, in this caſe, eſcapes death, which he ſeldom does, he is commonly lame, ever afterwards.

Sometimes this bone is broken tranſverſely, ſometimes obliquely, and at other times the ends ſlip a great way over one another, which makes it a very bad caſe; for the muſcles of this part being very robuſt, and ſtrongly contracted, draw the lower end of the bone with a conſiderable force upwards, ſo as to make it require great ſtrength to extend and replace it.

The oblique fracture of this bone more frequently ſlips out of its place again than the tranſverſe, and generally leaves the *Thigh* ſomewhat ſhorter than the other, notwithſtanding all the caution the ſurgeon can uſe in the ſetting it. It is therefore neceſſary, in theſe caſes, beſide the means that are common to all the fractures, to uſe a more ſtrict and tight bandage in this than in the tranſverſe fracture, to prevent the bones from being eaſily removed. When a fracture of the *Thigh-bone* happens near its middle, or towards it lower head, it is to be extended and replaced with the hands like other fractures, except that the extending force required is very great; and where the hands of a ſtrong aſſiſtant are not enough, ſlings, napkins, or linnen bandages, are to be bound round each head of the *Thigh*, whereby the fractured bone may be extended both ways, by the ſtrength of three or four perſons at once, while the ſurgeon cautiouſly reduces the fracture with his hands, and ſecures it with a proper bandage and dreſſing; there are ſometimes caſes where the joint ſtrength of three or four men, applid in this manner, are not ſufficient to make the neceſſary extenſion; in which caſe the ſurgeon is obliged to have recourſe to ropes and pullies, by means of which one man will pull more forcibly and equally than ſeveral can without them. But caſes that require this treatment are not common.

When the neck of the *Thigh-bone* is fractured, to which, from its oblique or tranſverſe direction, and ſpongy or brittle ſubſtance, it is very ſubject; it makes a fracture not only very difficult to reduce, but ſuch a one alſo as can ſeldom be cured without leaving the limb ſhorter than it was before. The reaſons of which are, that the fragments cannot but with great difficulty be preſſed into their right places, by reaſon of the great thickneſs and ſtrength of the muſcles which cover them; and that it ſeldom happens that the bones can be retained in their natural poſition, after they have been ever ſo well reduced; becauſe the muſcles which paſs over and are inſerted below the neck of this bone, draw its lower part upwards; and both theſe accidents happen the more naturally and eaſily, becauſe of the oblique poſition of the neck of this bone, which is inſerted into its head in a direction not perpendicular, nor parallel, but as it were ſloping on one ſide; ſo that it is no wonder that lameneſs, and other bad accidents, are the conſequences of this ſort of fracture.

To all theſe reaſons we may alſo add, that it is very difficult to diſcover when the neck of the *Thigh-bone* is fractured, this caſe being uſually taken for the head of the bone being ſlipped out of its ſocket or acetabulum; and this indeed, till of late, has been almoſt a general error. When we can think the external force to have been ſtrong enough to have produced a fracture, when the patient cannot bear any ſtreſs upon the limb, by ſetting his foot on the ground, when very acute pains are felt about the articulation itſelf; and when we find the affected limb ſhorter than the ſound one, it being an eaſy matter to turn the foot almoſt round from one ſide to the other, and any cracking or grating of the bones be perceived in that motion, me may reaſonably ſuppoſe the neck of the *Thigh-bone* is fractured; the limb muſt then be extended very gently and gradually, till it be brought to the ſame length with the ſound one; this may be eaſily done, either by means of a napkin, or the hands of an aſſiſtant in moſt caſes, in ſuch a manner, that the ſurgeon may be able to rejoin, in ſome meaſure, if not perfectly, the neck of the *Thigh-bone* with its head, ſtill firmly remaining in its ſocket: And though a ſhortneſs of the limb, or lameneſs, is generally left behind after this fracture; yet becauſe there are ſome cured without thoſe miſfortunes, it is always beſt to uſe, for that end, ſo ſtrict or tight a bandage, that it may retain the neck and head of the bone together, ſo that they may be in a way of uniting evenly. The bandage called *ſpica inguinalis* is the moſt convenient for this purpoſe, and a large and broad napkin, or other linnen cloth, is, with this, placed between the *Thighs*, to keep the body of it from ſubſiding; and laſtly, ligatures are put about the knee and ancle, by which the foot is faſtened to the lower part of the bed, to prevent the limb from being contracted upwards.

If the fracture of the *Thigh-bone* be accompanied with a wound, it makes the caſe very difficult and dangerous. And if theſe accidents happen to be inflicted on the neighbouring joint, death is generally the conſequence, more eſpecially when any of the large blood-veſſels are alſo wounded, which will be readily enough known by the hæmorrhage. In theſe fractures, with a wound, the eighteen-headed bandage is to be uſed for the dreſſing; and if the wound be much contuſed, ſo that extravaſated blood be lodged under the ſkin, and about its interſtices, it is to be carefully opened by ſeveral inciſions, of a ſufficient depth, that the extravaſated blood, which would in a ſhort time putrify, may be diſcharged. The injured parts are to be afterwards waſhed with lime-water, mixed with a fourth part of ſpirit of wine camphorated, till the contuſed parts are digeſted.

When this kind of fracture is accompanied with no very violent loſs of blood, nor the bone near, the proper dreſſing is dry lint folded up, with which the wound is to be filled. If the flux be greater, rectified ſpirit of wine, or other aſtringent liquors are to be uſed; but if the hæmorrhage be very violent, from an artery, the tourniquet is to be uſed, and the veſſel ſecured by a ligature. After the blood is ſtopped, and the wound cleanſed, the fragments of the bone are to be replaced, and the limb carefully bound up with compreſſes, ſplints, and the eighteen-headed bandage, and defended by a caſe of ſtraw. But if the fracture is attended with a violent hæmorrhage, and great ſplintering of the bone, from gun-ſhot wounds, ſo as to indicate the great crural artery to be wounded, the beſt method is to amputate the *Thigh*, and tie up the artery in time; for the crural artery is ſo large, that it ſeldom grows together; and if it does, the lower parts are ſoon ſeized with a gangrene. *Heiſter*, 129.

We have the deſcription and draught of a machine for reducing fractures of the *Thigh-bone*, by Mr. Ettrick, in the Phil. Tranſ. N°. 459. Sect 4.

Luxated THIGH. It has been formerly imagined, that the head of the *Thigh-bone* being diſplaced out of its acetabulum, was a very common caſe; but more knowledge in anatomy and ſurgery have convinced us now, that this accident is very rare. The reaſon it was before ſuppoſed common, was, that a fracture of the neck of the *Thigh-bone* was generally miſtaken for this luxation.

It will eaſily be conceived, that this is the true ſtate of the caſe, and that a real diſlocation of the *Thigh-bone* is very rare, if we conſider how very deep the ſinus or acetabulum is, into which the head of this bone is received, with what a broad concave cartilage the head of this bone is covered, how extremely ſtrong the ligaments are with which it is faſtened, how greatly it is defended with thick and ſtrong muſcles, and at the ſame time reflect how very weak and brittle the neck of the *Thigh-bone* is, in compariſon of any other part thereof; and from all theſe conſiderations, how vaſtly more eaſy it muſt be for the ſame force to break the bone off juſt under its head, than to diſplace it out of its ſocket. And, indeed, when luxations of the *Thigh-bone* do happen, it is much more frequently from internal than from external cauſes. For phyſicians have obſerved, that the ligaments of the *Thigh-bone*, though naturally of extreme ſtrength, may be, by various cauſes, and particularly by a flux of humours, ſo relaxed and weakened as to let the head of that bone ſlip ſpontaneouſly out of its acetabulum or ſocket; ſo that the *Thigh*, though not eaſily luxated by external violence, may eaſily happen to be ſo without any external violence, and while the patient lies in his bed. This is an accident, however, that happens much more rarely to adults than to infants.

Whenever the head of the *Thigh-bone* is thruſt out, it is almoſt always wholly diſplaced; ſo as to make a perfect luxation; the exact roundneſs of this head, with the great ſtrength of the circumjacent muſcles, and the narrowneſs of the ſides of the acetabulum, will not admit the bone to be partially diſlocated or thruſt out of its place a little way only; for as ſoon as the head of the bone is thruſt up to the edge of the acetabulum, it muſt unavoidably either turn quite out, or fall back again into its right place.

The thigh is found to be capable of luxation four ways, upward and downward, and backward and forward; but it is moſt frequently diſlocated downward and inward, toward the large foramen in the os pubis. For beſide, that the cartilaginous defence, on the lower part of the acetabulum, is not ſo high as in the reſt, the ligamentum rotundum is ever found to give way more readily in that part than in any other; and laſtly, the adjacent muſcles are found to be weakeſt in their reſiſtance on this part. And there is, beſide all theſe, a certain eminence in this edge of the acetabulum, which prevents the head of the bone from falling back again eaſily into its right place, when

when once it is got this way out of it. But if the head of this bone be diſplaced outwards, it generally ſlips upwards at the ſame time, it being ſcarce poſſible but that the very ſtrong muſcles of the *Thigh* muſt then draw the bone upwards; and there is no eminence in this edge of the acetabulum to reſiſt the head of the bone in that paſſage.

When the *Thigh* is diſlocated forwards and downwards, which is what moſt uſually is the caſe, the leg hangs ſtradling outward, and is longer than the other; the knee and foot alſo both turn outwards, and the head of the bone itſelf will be felt near the lower part of the inguen and os pubis. Sometimes there is a ſuppreſſion of urine in this caſe, which is occaſioned by ſome nerve which communicates with the bladder being violently compreſſed; in the buttock there alſo may be perceived a cavity from the trochanter major, and the reſt of the bones being diſplaced; and if the *Thigh-bone* be not timely reduced into its acetabulum, the whole limb withers ſoon afterwards. The patient, for this reaſon, can bear little or no ſtreſs upon that limb, but muſt always incline and throw the weight of his body upon the other; when he moves forward, he muſt move that limb in form of a ſemicircle, and ſupport his body by crutches under the arms; though there are not wanting particular caſes, where the head of the luxated *Thigh-bone* has grown ſo firmly to the adjacent parts, without the acetabulum, as to become, in proceſs of time, ſo ſtrong as to ſupport the body without ſticks, though the perſon could not, in any of the caſes that have been known of this kind, walk without halting.

If the *Thigh-bone* be diſplaced backward, it is uſually drawn upward alſo, as before obſerved, at the ſame time; hence there will be perceived, in this caſe, a cavity behind the inguen, and a tumour upon the buttock, becauſe the head, and trochanter of this bone, will be placed there. The tumour on the buttock being thruſt upward, the limb will become ſhorter than before, and the foot will be inclined to turn inwards. The heel will not touch the ground, but the perſon ſeem to ſtand upon his toes; and laſtly, the luxated limb will be much more eaſily bent than extended.

It is extremely rare that the *Thigh* is luxated forward or backward, without being alſo drawn upward or downward; but if it ſhould ſo happen, it will yet evidently be diſcovered by the rules before given, and by conſidering the nature of the articulation of the bone: As it is, however, at beſt very difficult to diſcover when the *Thigh-bone* is diſlocated, and when it is fractured, either by feeling or inſpecting, becauſe of the great thickneſs of the muſcles and integuments, it is therefore a matter of ſome conſequence to propoſe the ſigns by which one of theſe caſes may be known from the other. There is reaſon to judge the *Thigh-bone* to be luxated, when we find the ligaments of the bone have been relaxed by ſome preceding congeſtion of humours, when no external violence has been exerted upon it, when neither violent pain, tumours, nor inflammation follow; and laſtly, when the whole limb may be bent, and turned about at the acetabulum, without the ſurgeon's diſcovering any grating or cruſhing of the bones; and the contrary of theſe ſigns, which are what uſually take place, in what have been uſed to be called luxations of this bone, are very ſtrong indications of a fracture.

When the bone is found to be really diſlocated, it is to be reduced in a method agreeable to the nature and direction of the diſlocation. When it is diſplaced forward and downward, the patient is to be laid flat upon his back on a table; then a linnen napkin, or ſtrong ſling, is to be made faſt about the groin, over the part affected, ſo that one end of the ſling may come over the belly, and the other over the nates and back, to be both tied together in a knot upon the ſpine of the os ileum, and afterwards either faſtened to a hook fixed in ſome poſt, or held firm by ſome aſſiſtance: In like manner at the bottom of the *Thigh*, a little above the knee, there muſt be faſtened another napkin or ſling, or elſe the girt of Hildanus, with a compreſs between it and the *Thigh*; both theſe ſlings being drawn tight, the *Thigh* is to be extended, but that not vehemently; but only ſo much as is ſufficient to draw the bone out of its ſinus, that it may be replaced into its proper acetabulum by the ſurgeon's hands; to this purpoſe the ſurgeon is, with one hand, to preſs the head of the *Thigh-bone* outward, while the other conducts the knee inward. Or the reduction may be made by napkins faſtened about the *Thigh* near its extremities, in the manner of ſlings, and the limb extended that way, the knee being at the ſame time preſſed inward by the hands.

If theſe methods are not ſufficient, it will be neceſſary to have recourſe to the polyſpaſton or pulley, well known to the ſurgeons on theſe occaſions. This is to be the method of reduction of the *Thigh-bone* when it is diſlocated forward; but when it is found to be luxated backward, the patient is to be placed flat on a table, with his face downward; the *Thigh* is then to be extended more ſtrongly than in the former caſe, and the reduction is then to be performed by the ſurgeon's hand, an aſſiſtant all the while turning the limb ſomewhat inwards, and by this method the head of the *Thigh-bone* generally ſlips very readily from this ſort of diſlocation into its proper place. The limb is then to be ſecured with proper bandages, and the patient to be kept to his bed for three or four weeks. *Heiſter*, Surg. p. 167.

Saltzmannus relates an inſtance of a luxation of the *Thigh-bone*, without any fracture of its neck, and confirms what Ruyſch had obſerved of the epiphyſis of the os femoris, being as it were annihilated, or at leaſt changed ſo, as it could not be obſerved, when ſought after in one who had it broken.

THIGH, in the manege. The effect of the horſeman's *Thigh* is one of the aids that ſerves to make a horſe work vigorouſly. See the article AID.

Fore-thigh, or *arm* of a horſe, is that part of the fore-leg that runs between the ſhoulder and the knee: Though the *fore-Thigh* does not bend or bow, yet we commonly ſay, a horſe goes fine, that bends well the *fore-Thigh*, importing thereby, that he bends well his leg.

THILYPTERIS, in botany, a term uſed by Dillenius to expreſs the common female fern or brakes. *Dill.* Cat. 174.

THIMHIO, in the materia medica, a name uſed by ſome authors for a peculiar ſort of lignum aloes, which is blackiſh and very heavy, and extremely ſweet. *Camell.* Syll. p. 87.

THIN, in the materia medica, a name given by the Arabian writers to earth of any kind.

Thus the bole armenic of Galen is called by Aviſenna *thin armeni*; and hence the word *muthin*, an adjective ſignifying earthy, or approaching to the nature of earth; a term applied to many medicines of this kind.

THINA, in botany, a name by which ſome authors have called the larix or larch tree. *Ger.* Emac. Ind. 2.

THIRD (*Cycl.*)—THIRD *Major*. The logarithm, or meaſure [a] of the octave $\frac{2}{1}$ being 1 . 000000, the meaſure of the greater *Third* $\frac{5}{4}$ will be, 0 . 321928. [b]—[[a] See INTERVAL. [b] *Euler*. Tentam. Nov. Theor. Muſ. p. 109.]

The *third major* is by practitioners often taken for the *third* part of an octave; but this is a great error, ſince three greater *Thirds* fall ſhort of the octave by a dieſis: For $\frac{5}{4} \times \frac{5}{4} \times \frac{5}{4} \times \frac{128}{125} = \frac{2}{1}$; or by logarithms $3 \times 0 . 321928 +$ log. dieſis $= 0 . 965784 + 0 . 034215 = 0 . 999999$ or 1 . 000000 the logarithm of the octave. See the article DIESIS.

THIRD *Minor*. The logarithm or meaſure of the octave $\frac{2}{1}$ being 1 . 000000, the meaſure of the *third minor* $\frac{6}{5}$ will be 0 . 263034. Hence it appears that four leſſer *Thirds* exceed the octave. But practical muſicians are apt to ſuppoſe them equal to the octave, as they are apt to confound three greater *Thirds* with that interval. Three leſſer *Thirds* exceed the octave by a dieſis and a comma; as is eaſily proved by logarithms. *Euler*. Tent. Nov. Theor. Muſ. p. 109. See the article INTERVAL.

Diminiſhed THIRD, in muſic. We meet with ſeveral kinds of *Thirds* in the writings of muſicians, as greater and leſs, commonly called ſharp and flat; diminiſhed, ſuperfluous, deficient, and redundant. See the articles INTERVAL, DEFICIENT, REDUNDANT, &c.

THIRST (*Cycl.*)—It is ſaid, that thoſe who travel through the ſcorching deſarts of Arabia, Perſia, &c. find that brandy, and the ſtrongeſt wines, quench their *Thirſt* beſt. *Boyle*, Works abr. vol. 1. p. 52.

THISMA, a name uſed by ſome for any ſubterranean vein, or bed of a mineral.

THISTLE, *Carduus*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of ſeveral floſcules, which, at the upper end, are divided into ſegments, and ſtand upon the embryo ſeed. The general cup which contains theſe floſcules is of a prickly ſtructure; and the embryos finally become ſeeds winged with down. See Tab. 1. of BOTANY, Claſs 12.

The ſpecies of *Thiſtle*, enumerated by Mr. Tournefort, are theſe: 1. The calcitrapa, or ſtarry-headed *Thiſtle*. 2. The ſtarry-headed *Thiſtle*, with deep purple flowers. 3. The ſtarry-headed *Thiſtle*, with bright red flowers. 4. The ſtarry-headed *Thiſtle* with white flowers. 5. The ſtarry-headed *Thiſtle*, with broad jagged leaves, and large flowers. 6. The ſtarry-headed *Thiſtle*, with whole leaves ſerrated at the edges. 7. The yellow-flowered ſtarry-headed *Thiſtle*, with leaves like the blue-bottle or cyanus. 8. The yellow-flowered ſtarry headed *Thiſtle*, with leſs ſcaly or prickly heads. 9. The ſtarry-headed *Thiſtle* with undivided leaves, and purple flowers. 10. The aſſes *Thiſtle*, with ſmall heads, or the common wild *Thiſtle*. 11. The broad-leaved ſpear-*Thiſtle*. 12. The white-flowered broad-leaved ſpear-*Thiſtle*. 13. The very large and tall exotic ſpear-*Thiſtle*. 14. The very prickly *Thiſtle*, with alated and prickly ſtalks. 15. The purple-flowered *Thiſtle* with a bending head. 16. The white-flowered *Thiſtle* with a bending head. 17. The bear's-breech *Thiſtle*. 18. The common ladies *Thiſtle*, or milk *Thiſtle*. 19. The ladies *Thiſtle* with no white variegations. 20. The eryngo-like *Thiſtle* with prickly heads. 21. The great exotic milk *Thiſtle*, with brown ſeeds. 22. The galactite *Thiſtle* of John Bauhine. 23. The galactite *Thiſtle* with white flowers. 24. The common woolly *Thiſtle*, with acanthus-leaves. 25. The white-flowered woolly *Thiſtle* with acanthus-leaves. 26. The woolly acanthus-*Thiſtle* with narrower leaves. 27. The white-flowered woolly narrower-leaved acanthus-*Thiſtle*. 28. The very tall acanthus-leaved Portugal woolly *Thiſtle*. 29. The Portugal acanthus-leaved woolly *Thiſtle*. 30. The great-flowered Aleppo woolly *Thiſtle*, with acanthus-leaves. 31. The purple *Thiſtle* with round woolly heads,

32. The white-flowered *Thiſtle* with round woolly heads. 33. The Pyrenean woolly *Thiſtle*, with glomerated purple flowers. 34. The common *Carduus* or polycantha. 35. The Spaniſh polycanthus, with very ſhort leaves, armed with very long prickles. 36. The yellow centaury-like corn *Thiſtle*. This has been called by many, the yellow *knapweed* with prickly heads. 37. The hoary ſea-*Thiſtle*, with very tall ſtalks. 38. The hoary cretic *Thiſtle*, with a yellowiſh purple flower. 39. The hoary Portugal-*Thiſtle*, with alated ſtalks, and woolly heads. 40. The prickly round-headed *Thiſtle*, called by ſome the globular-headed jacea. 41. The ſuccory leaved purple Spaniſh *Thiſtle*. 42. The hairy jagged-leaved *Thiſtle*, with white flowers. 43. The powdered or duſty *Thiſtle*. 44. The knapweed-leaved *Thiſtle*, with ſmall heads and three-pointed ſcales. 45. The rockett-leaved Malteſe *Thiſtle*, with yellow flowers. 46. The Malteſe *Thiſtle*, with conglobated heads. 47. The Portugal-*Thiſtle*, with large hairy coronopus leaves, and yellow flowers. 48. The Portugal-*Thiſtle*, with hairy, rigid, coronopus-leaves, and ſaffron-coloured flowers. 49. The yellow Portugal-*Thiſtle*, with ſmooth and rigid coronopus-leaves. 50. The rape-leaved cretic *Thiſtle*, called by ſome the prickly *cyanus*, and prickly *knapweed* of Crete. *Tourn.* Inſt. p. 440. ſeq.

Gentle THISTLE, *Cirſium*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the floſculous kind, being compoſed of a number of oblong floſcules, divided into many ſegments at their edges, and placed on the embryo ſeeds. Theſe are all contained in a ſcaly but not prickly cup; and the embryos finally become ſeeds winged with down; to this it is to be added, that the leaves are ſurrounded with ſoft prickles. The diſtinguiſhing characters of the *Cirſium* and jacea are therefore theſe: The *Cirſium* has prickly leaves, and not prickly cups, and the jacea has no thorns either on the leaves or cups.

The ſpecies of *Cirſium*, enumerated by Mr. Tournefort, are theſe: 1. The great *Cirſium* with aſphodel-roots. 2. The great *Cirſium*, with a large ſingle head, and purple ſtamina. 3. The great *Cirſium*, with a large ſingle head, and white ſtamina. 4. The great *Cirſium*, with a ſingle large head, and hoary divided leaves. 5. The great *Cirſium*, with a ſingle large head, and with green ſmooth leaves much divided. 6. The hoary large *Cirſium*, with ſingle heads, with large ſcales. 7. The *Cirſium* with ſmall ſingle heads. 8. The *Cirſium* with ſmooth leaves and compact flowers. 9. The *Cirſium* with narrow and undivided leaves. 10. The common narrow-leaved *Cirſium*. 11. The broad-leaved meadow *Cirſium*, with aſphodel-roots. 12. The aſphodel-rooted meadow *Cirſium*, with finely divided leaves. 13. The purple-flowered *Cirſium*, without a ſtalk. 14. The ſilver-ſpotted *Cirſium*. 15. The purple-flowered field-*Cirſium*, with creeping roots, and ſow-thiſtle leaves. 16. The white-flowered field-*Cirſium*, with creeping roots, and ſow-thiſtle leaves. 17. The creeping-rooted ſow-thiſtle-leaved field-*Cirſium*, with tuberous ſtalks. 18. The common many-headed meadow *Cirſium*. 19. The broad-leaved *Cirſium*, with burdock heads. 20. The low narrow-leaved *Cirſium*. 21. The mercury-leaved alpine *Cirſium*. 22. The *Cirſium* with very large leaves, of the ſhape of thoſe of the ferratula. 23. The many-headed *Cirſium*, with a winged ſtalk, and ſinuous leaves. 24. The alpine *Cirſium*, with leſs divided leaves, armed with very frequent and long prickles. 25. The three-headed alpine *Cirſium*. 26. The purple-flowered acanthoide alpine *Cirſium*. 27. The acanthoide mountain *Cirſium*, with yellow flowers. 28. The many-headed meadow alpine *Cirſium*, with aſphodel-roots. 29. The many-headed alpine *Cirſium*, with ſmall purple flowers, and prickly ſtalks. 30. The tall Pyrenean *Cirſium*. 31. The oriental *Cirſium*, with jagged leaves. *Tourn.* Inſt. p. 447.

Torch-THISTLE. See the article TORCH.

Globe-THISTLE. See the article ECHINOPUS.

THISTLE *Fly*, in natural hiſtory, a ſmall fly produced from a fly-worm, hatching in the protuberances of the carduus hæmorrhoidalis. In the protuberances of this *Thiſtle*, while they are cloſed in all parts, the worm of this fly, from whoſe injuring it, at the time of depoſiting the egg from which it was hatched, the protuberances aroſe, undergoes its laſt transformation. It here makes of its own ſkin a ſhell, in form of an egg, within which it puts on the nymph ſtate. When this nymph becomes a living fly, the leaſt part of its difficulty is the finding its way out of this ſhell; it has a much ſtronger priſon than that, and before it can obtain its liberty, muſt force its way through the much more cloſely compacted fibres of the protuberance of the vegetable. It has, however, no other means of doing this difficult work, but that of inflating its head, and throwing out the bladder or muzzle with which all theſe creatures are provided in this ſtate. See the articles NYMPH, MUSEAU, and THISTLE-*Galls*, infra.

This is a difficult operation, and many of the creatures periſh in the attempt; but what much forwards the ſucceſs of it, in many caſes, is, that the ſtalk of the *Thiſtle* often becomes naturally half rotten before the time of the fly's egreſs. *Reaumur*, Hiſt. Inf. vol. 4. p. 338.

THISTLE-*Galls*, a name given by the more accurate authors to the protuberances on the ſtalks of a ſpecies of *Thiſtle*, called by authors, *carduus hæmorrhoidalis*, from theſe tubercles, which are ſuppoſed to reſemble thoſe of the hæmorrhoidal veins, in perſons ſubject to the piles. Theſe have been ſuppoſed a natural production of the plant; but they are far otherwiſe. The whole hiſtory of them is, that the juices of this plant, being peculiarly agreeable to the worms of a certain ſpecies of fly, that creature always depoſits its eggs on the ſtalks; and the young ones, when hatched, gnaw their way into the ſubſtance of the ſtalk, and the copious derivation of the juice, occaſioned by their ſucking, produces the turbercles which are found on it. See Tab. of Inſects, N°. 28.

Theſe tubercles are of a roundiſh or oblong figure, and are of various ſizes, from that of a pea to the bigneſs of a nutmeg; they are much harder than the reſt of the ſtalk, approaching to a woody ſtructure; when cut open, they are found to contain each ſeveral oblong and narrow cells; theſe have no communication with one another, and are each inhabited by a ſmall white worm, which has two hooks at the head; with theſe it breaks the fibres of the plant, in order to get at its juices. When it has arrived at the time of its change into the nymph ſtate, it ceaſes to eat, and drawing up its body much ſhorter than uſual, its ſkin hardens, and forms a ſhell, under which it changes into a very beautiful two-winged fly.

The wings of this animal are of a very ſingular appearance; they are whitiſh and tranſparent in the middle, but ſurrounded at the edges with a border of black in the form of a chain of figures like the letter Z. When the fly is ſeen in ſome lights, the white parts of the wing is loſt, and the whole appears a circle of theſe notched figures.

The body and breaſt of this fly are of a beautiful black, with ſome ſlight variegations of yellow; and the ſhoulders are elegantly ſtreaked with the laſt colour. The anterior part of the head is white, which gives the creature a very ſingular appearance, and its back part is edged with a fine yellow down or hairyneſs. The antennæ are reddiſh; and the legs are in part black, and in part of a fine clear brown. In obſerving the changes of the worms of theſe galls, there are often obſerved ſome which go through them in a different manner from the reſt, and finally produce a very different ſpecies of fly. Theſe are the progeny of the eggs of ſome other ſpecies of fly, whoſe worm being carnivorous, is lodged by the art of its parent, while it is yet in the egg ſtate in the ſubſtance of this gall, there to prey upon the defenceleſs inhabitants.

There are many other ſpecies of galls, the inhabitants of which are expoſed to the ſame ſort of enemies. In thoſe it is common to find the proper inhabitant and the devourer in the ſame cell; the one feeding on the juices of the plant, the other on its juices; but this is not the caſe here, theſe worms immediately deſtroying the proper inhabitants, and being found always alone in their cells. *Reaumur*, Hiſt. Inſ. vol. 6. p. 221.

THLASIAS, a term uſed by the antients to expreſs an eunuch made by a compreſſion or contuſion of the teſticles, not by the cutting them out.

THLASIS, a word uſed by the antients to expreſs either a contuſion without a wound, or a wound made by ſome blunt inſtrument, which contuſed the parts.

THLASMA, a word ſometimes uſed like *thlaſis*, to expreſs a contuſion either with or without a wound; ſometimes applied particularly to a receſs of the cranium inward without a fracture, an accident principally affecting children.

THLASPEOS *Semen*, in the materia medica, the name of a ſeed produced by the common *thlaſpi arvenſe ſiliquis latis*, or common treacle muſtard. See the article THLASPI, infr.

It is a plant of about eight inches high; the leaves are broad and oblong, and the flowers are white, and each compoſed of four leaves. The ſeed-veſſels are broad and flat, and the ſeeds ſmall and dark coloured. It grows wild in England, but is not very common.

The ſeed ſhould be choſen clean and freſh, of a reddiſh caſt, and very ſharp, and biting on the tongue. Great care ſhould be taken in the buying this ſeed, becauſe it is often adulterated, and the ſeeds of common garden creſſes are too frequently ſold in its place. It is an ingredient in ſeveral of our ſhop compoſitions, and is eſteemed attenuating, deterſive and aperient, and is ſaid to promote urine, and the menſes, and to expel the after-birth. *Lemery*, Dict. of Drugs.

THLASPI, *Treacle Muſtard*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of four leaves, and is of the cruciform kind. The piſtil ariſes from the cup, and finally becomes a roundiſh fruit, of a flatted ſhape, and uſually terminated all round with a foliaceous edge ſplit at the extremity, and divided by an intermediate membrane into two cells, which uſually contain a number of flat ſeeds. To theſe marks it is to be added, that all the *Thlaſpis* have whole, not divided leaves, in which they evidently differ from the *naſturtium*, or creſs kind.

The ſpecies of *Thlaſpi*, enumerated by Mr. Tournefort, are theſe: 1. The common *Thlaſpi*. 2. The ſmaller hoary-leaved *Thlaſpi*. 3. The field-*Thlaſpi* with broad pods. 4. The hairy podded *Thlaſpi*. 5. The *Thlaſpi* with heart-faſhioned pods. 6. The *ſecrodo-Thlaſpi*, or *Thlaſpi* ſmelling ſtrongly of garlick. 7. The larger perfoliated field-*Thlaſpi*. 8. The ſmaller perfoliated field-*Thlaſpi*. 9. The little red-flowered rock-*Thlaſpi*. 10. The purple-flowered alpine

alpine *Thlaspi*, with round fleshy leaves. 11. The little Portugal scurvygrass-leaved *Thlaspi*. 12. The little alpine *Thlaspi*, with thick narrow leaves. 13. The *Thlaspi* called the rose of Jericho. 14. The Virginian *Thlaspi*, with leaves like the Iberis, but broader and serrated at the edges. 15. The ever-green mountain-*Thlaspi*. 16. The candy-*Thlaspi*, with red and white flowers. 17. The bitter umbellated field-*Thlaspi*. 18. The lesser umbellated candy-*Thlaspi*, with white umbellated flowers of a sweet scent. 19. The grassy-leaved purple-flowered umbellated Portugal-*Thlaspi*. 20. The grassy-leaved umbellated Portugal-*Thlaspi*, with white flowers. 21. The rock-*Thlaspi*, with verniculated leaves. *Tourn.* Inst. p. 212. See the article THLASPEOS *Semen*, *supra*.

THLASPIDIUM, in botany, the name of a genus of plants; the characters of which are these. The flower consists of four leaves, and is of the cruciform kind. The pistil arises from the cup, and finally becomes a sort of double fruit, flat, and composed of two parts separated one from the other by an intermediate membrane, and each containing usually one long-shaped flatted seed.

The species of *Thlaspidium*, enumerated by Mr. Tournefort, are these: 1. The French *Thlaspidium*, with hairy leaves like those of hawkweed. 2. The hairy *Thlaspidium*, with auriculated flower-cups. 3. The pale yellow-flowered annual *Thlaspidium*. 4. The reddish-leaved *Thlaspidium*. 5. The ever-flowering shrubby *Thlaspidium*, with leucoium leaves. 6. The ever-flowering shrubby *Thlaspidium*, with variegated leaves. 7. The alkanet-leaved *Thlaspidium*. 8. The spiked Italian *Thlaspidium*. 9. The narrow-leaved smooth mountain-*Thlaspidium*. 10. The dwarf alpine rough *Thlaspidium*. *Tourn.* Inst. p. 214.

THLIBIÆ, in antiquity, a kind of eunuchs. See the article CASTRATION.

THOCOS, Θῶκος, in antiquity, the same with *Thacas*. See the article THACAS.

THOKES, in our old writers, fish with broken bellies, forbid by statute to be mixed or packed with *Tale-fish*. 22 Ed. IV. c. 2. *Blount*, *Cowel*.

THORACIS *Primus*, in anatomy, a name given by many of the anatomical writers to the muscle called by the French the *Souclavier*. See the article SUBCLAVIUS.

THORACIS *Quartus*, in anatomy, a name given by many of the earlier writers to a muscle called by the modern writers *serratus porticus inferior*. The same authors gave the name of *tertius Thoracis* to the *serratus posticus superior*.

THORÆ *Radix*, in the materia medica, the name of a root which keeps its place in the catalogues of officinal simples, but is seldom used.

The plant which produces it is the *Thora valdensis* of Gerard. It is kept in the gardens of the curious, but grows wild in the mountainous parts of Germany. The root is composed of a number of granules or small lumps, like that of the common ranunculus; the leaves are roundish and stand on small pedicles, and the stalks are about six inches high, and the flowers yellow, and like those of our common wild ranunculus's.

The root is acrid and corrosive, and the juice of the leaves is said to poison animals, and to have been used by the antients for that purpose. *Pomet's* Hist. of Drugs, p. 41.

THORAX (*Cycl.*) – Dr. Hoadley thinks it proved from Mr. Hales's experiments, in his vegetable statics and hæmastatics, that there is air in the cavity of the *Thorax*, between the lungs and the pleura. See his Lectures on Respiration.

Abscesses in the THORAX, or breast. One of the most remarkable accounts we have ever had of the effects of an abscess in the *breast*, is from Mr. Chicoyneau, of the academy of Montpelier, given in the Memoirs of the Academy of Sciences of Paris, in 1731.

The case was this: A young lady of about nine years old, of a thin habit, a sprightly temper, and dry constitution, seemed to be growing crooked, both her shoulders but particularly the left were more raised than they naturally should be, and her whole body became somewhat more bent than usual toward the right side. Mr. Chicoyneau was sent for at this time, to know whether any stop could be put to the progress of this bad arrangement of the parts. On examining the lady it was found, that though she was naturally lean, yet there was a fullness all about her shoulders, and that the edges of the shoulder blades toward the spine were so elevated as to have between them and the ribs a space of two fingers breadth wide; and the spine of the back, instead of running down in a perpendicular line was crooked, and from the fourth vertebra downwards was pushed out of its natural situation; this bending continued down to the loins, and formed a sort of arch, the convexity of which was toward the left-side, and was so sensible a little below the shoulder-blade, that it seemed two fingers breadth out of its place. It seemed from this that the consequences must be very bad, and that the young lady would inevitably fall into a terrible deformity, which neither art nor nature could prevent, and that the organs of respiration would be greatly injured, as is commonly the case in these bad arrangements of the parts.

Mr. Chicoyneau took his leave with giving her parents some flattering hopes that nature might restore the parts in their farther growth, as children whose bones are disordered by rickets often have them right again in more advanced years, and was intending to prescribe a slight regimen; when, about five days afterwards he was again called in on account of a fever which attacked the young lady with great violence, and was always worst during the night, going off by gentle sweating toward the morning; on thoroughly enquiring into the symptoms this appeared to be a putrid fever, and, beside all the other symptoms of that disease, the patient had a constant and terrible pain in her shoulders, and with this a very troublesome dry cough, and a difficulty of respiration, whence it appeared too plainly, that either the lungs or the pleura were threatened with an inflammatory fluxion: After twenty days the fever began to abate, but still did not quite leave her; and it was not long after when all the signs of an internal suppuration appeared, and Mr. Chicoyneau dreaded an incurable phthisis. The pulse after this grew much worse, and was very irregular; and two other physicians being called in, all agreed that the child had but few days to live, ordered only some gentle cordials, and acquainted the parents with the danger. When all hopes were over, the nurses acquainted the doctors on one of their visits, that since their last the patient had discharged by stool at several times a very large quantity of a white viscid matter, resembling pus; and that before every one of these evacuations the young patient had great irritations, and violent pains in the belly.

Nature had not given the patient over, though her doctors had, and soon shewed that she could do what baffled the efforts of art. The matter voided was found, on examination, to be true pus, with a very small mixture of blood, the voiding it by stool continued many days with the same frequency and violence, and the fever and other symptoms all going off at this time by regular degrees, the discharge was soon found to be critical, and there were some hopes of nature's performing a cure by it.

The discharge continued about twelve days, and at the end of a little longer time the patient was perfectly recovered. There is no doubt, from the cough and all the symptoms, that this matter was contained in the breast, and though it has appeared incredible to many, that matter thus formed should be taken up into the blood-vessels and carried in the course of circulation to the intestines, and there discharged, yet this case seems an incontestible proof of the possibility of it.

There remained now no danger to the patient, but that of the increase of her deformity by the progress of the displacing of the spine, and other bones, as there was all the reason in the world to believe, that during the time of this long and terrible illness these parts had grown much worse; but, on inspection, nature was found here to have been as good a physician as in the other case; and, to the amazement of all that were present, the bones were all found in their natural places.

It was easy to see from this, that the displacing of the bones had been wholly owing to this tumor within the breast, the inflammation and suppuration of which had occasioned all the illness the patient had endured. The tumor was doubtless formed in the posterior region of the *Thorax*, whence it enlarged itself afterwards, extending to the neighbouring parts, and as to this alone was owing the cause of the displacing the bones, it is no wonder that when this cause no longer subsisted, they again reassumed their places. Mem. Acad. Scienc. 1731.

Mr. le Dran remarks, that whenever any considerable quantity of pus is contained in either cavity of the *Thorax*, that side will appear larger than the other. Med. Eff. Edinb.

Wounds of the THORAX. The wounds of the *Thorax* or breast, are of three kinds; either the wound is inflicted on the external parts only, or it penetrates into the cavity of the breast; or thirdly, the contents of the *Thorax* partake also of the wound.

It may be discovered whether wounds do or do not penetrate into the cavity of the *Thorax*, either by the sight or by the hearing, observing whether any sound proceeds from the wound at the time of inspiration, by feeling with the probe or a finger, and observing whether they pass into the cavity, or meet with any resistance, by injecting warm water, which if the wound does not penetrate will return strongly upon you; and lastly, you will be convinced that it does not by the absence of bad symptoms, such as difficulty of breathing, fainting and sick fits, which always attend a wound that penetrates into this cavity. If the wound is found not to penetrate, it is to be treated as a common slight wound. But sometimes an external wound of this kind runs very deep, and obliquely between the muscles and the ribs, and is thereby rendered very difficult to be cleansed from grumous blood and matter; and the matter in this case frequently destroys the neighbouring parts, and produces ulcers, and very dangerous or incurable fistulæ; nay, sometimes it makes its way through the pleura, into the cavity of the *Thorax*, and forms an empyema, or brings on a phthisis, and death itself.

The great business in this case is to clear the sinuses from the blood and matter confined in them; and this is to be done either by pressure, or by ordering the wound to be sucked by

a

a healthy perſon, or by drawing it out with a ſyphon, or making farther openings with a knife. A proper ſyringe with its mouth applied to the wound, and a ſtrong ſuction made, often will fill itſelf with the confined blood and matter, and by repeating the operation prove of very ſignal ſervice.

In wounds that penetrate into the cavity, when a large quantity of blood is ſpilt into the cavity of the *Thorax*, the expanſion of the lungs, the office of reſpiration, and the courſe of the blood through the lungs are impeded, and the blood in the lungs being inſpiſſated by frequently being retarded there, life cannot be ſupported; but where the quantity of extravaſated blood is not ſo large as to occaſion theſe accidents, there ſtill is danger that it ſhould putrify by degrees, and corrupt either the diaphragm, pleura, or lungs, which muſt occaſion very bad ſymptoms, and finally death itſelf, and that in a ſhort time. When blood is extravaſated in the *Thorax*, we muſt therefore uſe all diligence to get it away. If the wound is inflicted on the middle or lower part of the *Thorax*, and has not a very narrow opening, it will be convenient to lay the patient upon the wounded ſide, and adviſe him to fetch his breath deep, or cough; and if the diſcharge is hindered by lumps of grumous blood ſtopping up the orifice, they muſt be removed with a probe, or with the fingers, or drawn out with a ſyringe. If the blood is become too thick to flow out of the wound, an injection of barley-water with the addition of a little honey of roſes and a ſmall quantity of ſoap muſt be uſed; this is to be injected, and the patient made afterwards to lie on the wounded ſide, to let it run out again; and this muſt be repeated, till it appears that all the grumous blood is waſhed away. But if the wound is ſo narrow and oblique that this method cannot be uſed, it muſt be enlarged with the inciſion-knife. Great caution is to be obſerved not to fatigue the patient too much, by attempting to diſcharge all the extravaſated blood at one time. It will be more ſafe to do it by intervals, at different times, eſpecially if he be ſubject to ſwoonings; but the wound muſt be kept open in the mean time, by introducing a ſilver or leaden pipe into it, or at leaſt a large tent with a ſtring faſtened to it. This method of cleanſing the cavity of the *Thorax* is to be repeated, till the diſcharge ſhall entirely ceaſe, and the external wound can be conveniently healed.

When a wound is made in the upper part of the breaſt, the patients lying on the wounded ſide cannot at all let out the matter in the cavity; but an opening muſt be made in the lower part of the *Thorax*, between the ſecond and third rib, counting upwards, if it is on the left ſide; but if it is on the the right ſide then between the third and fourth rib, about a hand's breadth from the ſpine. The place where the opening is to be made ſhould be firſt marked with ink, and the inſtrument generally uſed to make it is the *trocar*, which muſt be driven above the rib into the *Thorax* with great caution, and gentleneſs; after it has penetrated, the ſteel inſtrument is to be drawn out, and the pipe left in as a paſſage for the extravaſated blood to be let out by; and if it does not readily make its way out by this, its evacuation may be forwarded by the ſuction of a ſyringe. The trochar is in common uſe on this occaſion; but as the lungs are very liable to be wounded by the paſſing of this inſtrument forcibly into the cavity of the *Thorax*, it is better to divide the common integuments with an inciſion-knife, as alſo the muſcles and pleura, carefully avoiding the lungs, which are very apt to adhere to the pleura in this part; when this perforation is properly made, it is carefully to be kept open as long as neceſſary, and the wound above to be healed up as ſoon as poſſible.

The cavity of the *Thorax* being thus cleanſed, the wound is to be dreſſed once every day, and the dreſſing performed with all poſſible expedition; and the utmoſt diligence uſed to guard the contents of the *Thorax* from the injuries of the external air. *Heiſter*'s Surg. p. 70.

THOS, Θώς, in zoology, a name given to an animal of the wolf kind, but larger than the common wolf. It never touches men or cattle, and rather provides its food by cunning than open force; preying chiefly on poultry and water-fowl. *Hofm.* Lex. univ. in voc.

THOUGHTS, in a boat, a name given by ſeamen to the benches, on which the men ſit down to row.

THOWLES, in a boat, are thoſe pins in its gunnel, between which the men put their oars when they row.

THRACIA *Gemma*, a ſtone mentioned by Pliny, and deſcribed by him to be of three kinds; the one of a plain green, but a conſiderably deep and ſtrong colour, the other of a paler green without variegation, and the third ſpotted with blood-coloured ſpots. This is a ſhort deſcription, but the ſtone ſeems to have been a jaſper, of the nature of our green oriental jaſper and heliotrope.

THRACIUS *Lapis*, in the natural hiſtory of the antients, a ſtone often mentioned, and firſt called *benæ lapis*, from the place where it was firſt found, which was in the neighbourhood of Bina, or Bena, a town in Thrace.

It has been by ſome authors allowed a place in the catalogues of the materia medica; but it is impoſſible for us to ſay with any certainty which of ſeveral ſubſtances now known (which all anſwer in ſome degree to the accounts left us of it) is the real body they meant by that name.

It was an inflammable body, found in mines, and in the beds of rivers; and, in burning, afforded a very offenſive ſmell. Some of the late authors have ſuppoſed it was our common pit-coal, the antients expreſſed by this name; others, that it was jet; and others, the common cannel coal. *Hill*'s Theophraſtus, p. 34.

THRANITÆ, in the Roman trireme gallies, or thoſe which had three rows of rowers; thoſe of the upper row were called by this name, the ſecond the *Zygitæ*, and the loweſt *Thalamitæ*.

The *Zygitæ*, or middle row of men, in theſe veſſels took up but very little room, having a conveniency of moving their hands and oars under the ſeats of thoſe who ſat next before them.

Meibom, in his diſcourſe of the naval architecture of the antients, has proved that the builders of theſe veſſels found much better places for the ſeveral tires of rowers, than the commentators on the works of the authors who mention them have done; and that hence the vaſt height ſuppoſed neceſſary in theſe veſſels is much of it imaginary, and that the teſſaraconteris of Philopater, a veſſel ſaid to have forty tire of oars, may have been built and managed, though requiring four thouſand men to row it.

This author is of opinion, that according to the plan he has given of the Roman naval architecture, we might very much improve our own gallies and galleaſſes. He acknowledges our form indeed to be preferable in general to theirs; but would have the ſame proportions kept up by us that were by them in their long veſſels. *Meibom.* de Trirem.

THRASOS, a term uſed by Hippocrates, to expreſs a wildneſs and fierceneſs in the eyes of perſons, who approach to a delirium in fevers.

THRAUPIS, in zoology, the name given by many authors to the bird more commonly called *citrinella*; a ſmall bird of the ſize of a linnet, kept in cages in Italy for its ſinging, and of a green, yellow, and grey colour. See the article CITRINELLA.

THRAUSMA, a name given by the antients to a kind of gum ammoniacum, which was drier than the common, and more eaſily crumbled to pieces.

THRAUSTOMICTHES, in natural hiſtory, the name of a genus of compound earths. The word is derived from the Greek θραυστος, brittle, and μιχθεις, mixt.

The bodies of this genus are loams compoſed of ſand and a leſs viſcid clay, and are therefore of a friable or crumbly texture.

The earths of this genus are generally uſed to make bricks; and there are ſeveral ſpecies of them. 1. A whitiſh one, dug in great plenty in Staffordſhire, and ſome other counties. 2. A browniſh white one very plentiful about London. 3. A pale yellow one, common in moſt parts of England at ſmall depths. 4. A ſharp rough one, of a deep yellow, dug near the town of Hedgerley near Windſor, and commonly called Windſor loame: It is not found in any other place, and is of great value; it makes the bricks uſed for the iron furnaces, and ſerves at the glaſs-houſes and among the chemiſts as a very ſtrong and valuable lute; and is not only uſed in England, but carried to Holland and Germany, and many other parts of the world. 5. A deep duſky yellow one, dug in moſt parts of England, near the ſurface. 6. A hard brown one, found at ſome depth in Buckinghamſhire, and uſually found full of ſmall ſhells: It is uſed for covering the ridges of barns, and copings of walls; and makes very firm and durable barn-floors. 7. A light pale brown one, the looſeſt and moſt friable of all the genera, uſed in many places for making the bell-founders moulds. 8. A yellowiſh brown one: This is common in moſt parts of the kingdom, and makes the fine red bricks uſed for ornamenting buildings. *Hill*'s Hiſt. of Foſſ. p. 424.

THREAD (*Cycl.*)—The *Thread* of the Laplanders is very fine, white and ſtrong, but it is of a very different nature from ours; they know nothing of flax or hemp, nor of any other plant whoſe ſtalks might ſupply the place of theſe in making *Thread*, but theirs is made of the ſinews of the rain-deer. They kill of theſe animals a very great number continually, partly for food, partly for the ſkins which they uſe in cloathing themſelves, covering their huts, and on many other occaſions; the ſinews of all that they kill are very carefully preſerved, and delivered to the women, whoſe province it is to prepare this neceſſary matter. They beat the ſinews very well, after having ſteeped them a long time in water, and then they ſpin them out.

The *Thread* they thus make is of any degree of fineneſs they pleaſe; but it never is any longer than the ſinew from which it is made. They uſe this in ſowing their cloaths, ſhoes, gloves, &c. and the trappings of their rain-deer. The *Threads* of the ſame ſinew are laid up together, and are all of a length; and as the different ſinews afford them of very different lengths, they accordingly pick out ſuch as the preſent uſe requires, both in regard to length and fineneſs. This ſort of thread is made with much more labour than ours; but it is greatly ſuperior to it on many occaſions, where ſtrength is rather required than beauty.

Theſe people have, beſides this, a way of making a ſort of yarn

yarn of sheeps wool, which they weave into garters and a sort of ribbands, used by way of ornament; but they place no value on it, because of its want of strength. *Scheffer's* Hist. Lapland.

Air-THREADS, a term used by some to express those fine long white filaments or thready substances, which we meet with in vast numbers floating about in the air, in August and September. The world has been much perplexed about the generation of these, till it was known that they were the work of spiders, and that they served these creatures to move from place to place by. They are long, downy, and very soft, and though they hold together when untouched, they stick to the fingers in handling, and easily break with a slight touch.

The greater number of spiders have the property of spinning this sort of *Thread*. The long-legged field-spider, called the *shepherd*, and some others, want it; these have nothing to do with the *Air-threads*, so much wondered at; but all the others, that is, all those which nature has endowed with a power of spinning, make them.

The general method of these creatures spinning and weaving their webs, is by letting down the thread and then drawing it after them, and so disposing it as they think proper; but in the midst of their work of this sort, if they are closely observed, they will be sometimes found to desist, and turning the tail to the contrary way of the wind they will emit a thread with great violence, no less than that with which a jet of water is discharged from a cock. In this manner they continue darting forth the thread, which the wind takes, and carrying it forward it soon becomes many yards long. Soon after this the creature will throw herself off from the web, and trusting herself to the air with this long tail, will ascend swiftly, and to a great height with it. The fragments of these lines, or the whole lines, and the spiders attached to them though unobserved, make these *Air-threads*, and the use nature destines them for, is evidently the wafting the creature along the air, and giving it an opportunity of preying on gnats, and many other insects that inhabit the air, out of the reach of these creatures by any other means.

The young spiders, as well as the old ones, have this property of spinning *Threads*, and sailing in the air by means of them; and it is common to see very minute spiders at the ends of very long lines. No one particular kind is famous more than the rest for this practice, but all that can spin, at the proper season of the year do it.

The threads themselves shew the use they are of to the creature in seizing its prey; for they, as well as the webs below, are usually found filled with the fragments of devoured animals, the legs of flies, and the like.

When the *Threads* are newly spun, they are always single, and are generally seen ascending up higher and higher in the air; but when they are seen coming down, they are found sometimes composed of three or four others, and either without any spider at the ends, or with two or three or more. It is plain that this happens from the meeting of these threads one with another in the air, and their tangling together; and this incommodes the creatures, and brings them down. The whole process of the workmanship of these threads is easily seen, by observing some of the spiders which have not yet mounted into the air, but seem to be meditating their flight. It is common to see one of these creatures at such a time mount the top-most branch of a bush, and from thence dart out at its tail one after another several of these long *Threads*, by way of assaying what it can do, and how it shall like them. When the creature has darted out a thread to the length of several yards, it will of a sudden draw it all up again, and wind it up into a link with its fore-feet; but more frequently they break it off, and let it go. One spider will sometimes dart out, and break off in this manner a great number of *Threads*, before it spins one that it will trust to; but at length it will please itself with some one, and commit itself to the air on it.

These broken *Threads* are what fill the air with the loose threads we see in autumn; and as these soon entangle together, and bring one another down, it is no wonder that they are more frequent in the lower regions of the air, than those with the spiders adhering to them, which usually rise to great heights, and sustain themselves there. And hence the origin of the *Threads* was much perplexed among the enquirers, because they were found without any mark of the animal to which they owed their existence. The business of feeding is not all the use of these *Threads*, but the creatures evidently sport and entertain themselves by means of them, floating about in the air, and changing height and place at pleasure.

When a spider has once raised itself from the earth in this manner, it does not descend always on the same *Thread* it arose by, but draws that up at times, and winds it up into a hank with its fore-feet, and darts out another by way of support; and the new *Thread* is made more or less long, as it is intended for a higher or lower flight.

These *Air-threads* are not only found in autumn, but even in the depth of winter. The serene days about Christmas bring out great numbers of them; but the *Threads* are at this season only short and slender. They are the produce of the young spiders, hatched only the autumn before, and are seldom used to sustain the animal, but seem a mere sporting of it, being thrown out and broke off at small lengths. The thicker ropes of the autumn are the only ones intended for the support of the old spiders in the air, when there is plenty of small flies that inhabit the airy region, and make it worth the creature's while to take up its habitation among them. Phil. Trans. N°. 50.

THREX, among the Romans, an appellation given to gladiators, either because they were natives of Thrace, or wore armour after the manner of that country. *Pitisc.* in voc.

THRIFT, *Statice*, in botany. See the article STATICE.

The several more common species of this plant have been used to be raised promiscuously for making the edges of flower-beds, instead of box; but the necessity of transplanting them every year to keep them within due bounds, has made them of late much disused.

They are all propagated by parting their roots; the best time for doing which is in autumn, and they will grow with very little trouble, and flower in the May following, continuing in flower about three weeks or a month, if the weather is not too dry. *Miller's* Gardener's Dict.

THRIO, Θρίω, in antiquity, a festival in honour of Apollo. *Potter*, T. 1. p. 405.

THRIPS, in natural history, a name used among the antients, to express a sort of worm hatched from the egg of a beetle; which, while in the worm-state, eats its way into wood, and forms cells and cavities in it of various shapes, and in various directions, often resembling the figures of letters or other things.

The antient Greeks are said to have used small pieces of the wood thus eroded in particular forms, as seals before the engraving of these utensils was invented, and indeed they must very well have served this purpose, since it is scarce possible to conceive how one of these pieces of corroded wood should be counterfeited, or the impression imitated.

Lucian mentions his marking his olives with a signature of one of these pieces of wood greatly eroded, and uses the word *Thrips*, not as the name of the animal, but of the piece of wood eroded by it. Theophrastus, Pliny and Aristotle, also use the same expression; and we find that the word *Thrips* was as frequently used to signify the pieces of wood eroded, as the animal which eroded them.

THRISSA, in ichthyology, the name given by the Greeks and by the modern Latin writers, to the fish which we call the *shad*, or the mother of the herrings.

This is called by Artedi the clupea, with the top of the upper jaw divided, and with black spots on each side. This accurate author observes also, that the *agonus* or *agone* of Salvian, the *saracbus* of Charleton, and the *alosa minor* and *harengus minor* of Willughby, and others, which we call the pilchard, differ only from the *Thrissa* in size; all being the varieties of the same species of fish, and all charactered by this specific name.

THROAT (*Cycl.*)—*Sore*-THROAT, in medicine. See the article QUINZY, *Cycl.* and *Suppl.*

THROAT-*Wort*, in botany, the name of a plant of the bell-flower kind, called in Latin *Trachelium*. Its characters and species, see under that head.

This plant yields, when wounded, a milky juice in great plenty, and this if received into a shell or other small vessel, curdles immediately, and the whey runs from the thick part; this whey is of a brown colour, whereas that of the wild lettuce is of a fine purple, and dries into a cake that may be crumbled into a purple powder. The juice of the *Throat-wort* smells sour, and its curdled part being dried burns like resin at the flame of a candle. Phil. Trans. N°. 224.

THROMBUS, a word used by some medical writers, to express a grume or clot of blood.

THROSTLE, an English name for the common mavis, or song-thrush. See TURDUS.

THROWING, among bowlers. See the article BOWLING.

THRYALLIS, in botany, a name given by Nicander, and some other writers, to a species of mullein used in the coronæ and garlands of the antients; and, as he expresly says, different from the common wild mullein.

Dioscorides seems to make this his third species, and calls it *lychnitis*, from its use in lamps; the Greeks beating out its thready stalks, and using them for the wicks of lamps. We have a kind of *verbascum*, or mullein, which we call *lychnitis*, in commemoration of Dioscorides's name; but it does not appear to be the same species that Nicander and the other Greeks called by that name. Some also called it *nekeia*, or *necuia*, from its use in making a kind of torch; that was the thing with which they kindled the funeral piles of the dead.

THUMB, *Pollex*, in anatomy, one of the members, or parts of the hand. See the article HAND, *Cycl.* and *Suppl.*

The first phalanx of the bones of the *Thumb* is not like those of the other fingers. Antient authors reckon it among the bones of the metacarpus, which it resembles very much, and by this means allow only two phalanges to the *Thumb*, and

make five metacarpal bones. The convex fide of this phalanx is very much flatted, and is much broader toward the head, than toward the bafis. On the concave fide is a kind of angular line, which in fome meafure diftinguifhes it into two parts. Its head is like thofe of the metacarpal bones, only flatted at top. The articular fide of its bafis is proportioned to the digital fide of the *os trapezium* of the carpus, and framed in fuch a manner as that the figmoide cavities and eminences in the two bones crofs one another. This articulation has fomething very particular in it; it is a kind of double ginglymus, which readily allows of flexion and extenfion, adduction and abduction, but with difficulty permits the oblique motions, becaufe then the two fides run counter to each other.

The fecond phalanx of the *Thumb* is fhorter than the firft; its body is convex or femi cylindrical on one fide, flat on the other, and contracted between the edges. The articular fide of the bafis is gently concave, and is furrounded near the edges by fmall tuberofities; as alfo near the angle of the phalanx. The head is the regular portion of a pulley, which projects more on the concave, than on the convex fide; and on each fide of it there is a fmall foffula, and fome inequalities in form of tubercles. On the flat or concave fide of the phalanx are two rough lines, one near each edge; they are the impreffions or marks of the articular vaginæ. The connection of this phalanx with the firft, is by a kind of arthrodia, or by a flat enarthrofis, which permits a motion in feveral directions, though more limited than in other articulations of the fame kind. It is articulated with the third by a very perfect ginglymus.

The third phalanx of the *Thumb* reprefents the half of a fort of cone, cut lengthwife, and by joining it to the fame bone of the other *Thumb*, an entire cone is formed; the convex fide is more even than the flat fide, and on each edge there is a tuberofity near the bafis: The bafis has two hollow fides, which form a ginglymus with the head of the fecond phalanx The head is flat and fmall, ending in a rough femi-circular border, which on the flat fide of the bone reprefents a horfe-fhoe. *Winflow*'s Anat. p. 87.

THUNDER (*Cycl.*)—The noife of *Thunder* and the flame of lightning are eafily made by art. If a mixture of oil or fpirit of vitriol be made with water, and fome filings of fteel added to it, there will immediately arife a thick fmoak, or vapour, out of the mouth of the veffel; and if a lighted candle be applied to this, it will take fire; the flame will immediately defcend into the veffel, and this will be burft to pieces, with a noife like that of a cannon.

This is fo far analogous to *Thunder* and lightning, that a great explofion and fire are occafioned by it; but in this they differ, that this matter when once fired is deftroyed, and can give no more explofions; whereas in the heavens one clap of *Thunder* ufually follows another, and there is a continued fucceffion of them for a long time. Mr. Homberg explained this by the lightnefs of the air above us, in comparifon of that here, which therefore would not fuffer all the matter fo kindled to be diffipated at once, but kept it for feveral returns.

THUNDER-*Stone*, in natural hiftory, the fame with that called by authors *Brontia*. See the article BRONTIA.

THUNDER-*Storms*. It is frequent in the *Thunder-ftorms* in hot climates, to fee a bituminous matter fall with the lightening to the ground, and there continue for fome time burning in a mafs, or elfe burft at once into a multitude of fparks, which burn every thing they touch, and always leave a violent fmell of brimftone behind them.

Something of this nature, but concreted into a folid form and refembling common brimftone, was fome years ago obferved in the ifle of Wight; of which Mr. Cook, an inhabitant of Newport there, has given the following account:

The month of July, in the year 1737, had been very fultry, and the nights often ftormy, in particular there was one evening a very violent ftorm of *Thunder* and lightening, attended toward the end with a great deal of rain. The morning afterwards, as a countryman was walking over a meadow near the fea-fide, he obferved a yellow ball of a fhining matter, lying loofe upon the turf or grafs. When he had taken it up, he found it to be no other than a lump of fulphur, of an uncommonly ftrong fmell, and covered all over with a multitude of fine fhining cryftals of a yellowifh colour, which fell off on the lighteft touch. The whole fubftance appeared to be fomewhat fpungy, and it had a large hole in one part; it was near an inch long, and fomewhat more than half an inch in diameter, and when put to the fire proved readily inflammable, and burnt with a whiter flame than common brimftone, and with lefs acid and fuffocating fumes.

The author of this account feems to think, that there is great probability that this ball was generated, not under ground but in the air, and that it was of the nature of thofe maffes of bituminous matter falling fo frequently in *Thunder-ftorms*, in the hotter countries, but that by fome accident it miffed taking fire, and was therefore left perfect in its folid form. It feems not to have been generated under ground, fince if it had, it could never have been found on the furface fo perfectly clean, with its pores all empty not filled with earth, and its covering of cryftals untouched, though they adhered fo very lightly to it that the gentleft touch threw them off. Phil. Tranf. N°. 450. p. 449.

THURIBULUM, among the Romans, a cenfer or veffel, in which incenfe was burnt at facrifices. *Pitifc.* in voc.

THURIFICATI, in church hiftory, a defignation given to thofe, who, to avoid the perfecution of the Roman emperors, offered frankincenfe to the heathen gods. *Hofm.* Lex. in voc. See the article PERSECUTION.

THURSIO, in ichthyology, a fpecies of fifh, mentioned by Pliny, l. 9. c. 9. It is thought by fome to be the *Phocæna*, or porpoife; and by others the *Sturgeon*. *Hofm.* Lex. univ. in voc. See the articles PORPOISE, and STURGEON.

THURUS, in natural hiftory, the name of a creature defcribed by Gefner, and fome others, as a diftinct fpecies of wild bull; but the accounts of it feem either fabulous, or miftaken defcriptions of the wild bull. See the article Bos.

THUYA, *Tree of life*, in botany the name of a genus of trees, the characters of which are thefe: The embryo fruits are of a fquammofe ftructure, and finally become a fort of oblong fruit, between the fcales of which there lie a fort of marginated feed. To this it is to be added, that the leaves are fcaly.

The fpecies of *Thuya*, are the common *arbor vitæ*, and the Chinefe kind. *Tourn.* Inft. p. 587.

THWART *the Hawfe*, in the fea language. See the article HAWSE.

THYIA, Θυια, in antiquity, a feftival in honour of Bacchus, celebrated by the Eleans. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 405.

THYITES *Lapis*, in the materia medica of the antients, the name of an indurated clay, approaching to the nature of a ftone. It was found in Egypt, and ufed in diftemperatures of the eyes.

This fubftance has been very much mifunderftood by the late writers, and by moft of them fuppofed to be loft at this time; but this was wholly owing to their miftaking the clafs of bodies among which they were to look for it. Some imagining it to have been a fpecies of green marble; and others the turquoife-ftone, that Diofcorides meant by this name. It is very plain however, that it was no other than an indurated clay of the morochthus kind, and no more a ftone than that fubftance, that being alfo frequently called *lapis morochthus*.

It is of a fmooth, even and regular texture, very heavy, of a fhining furface, and of a pale green, without the admixture of any other colour. It does not at all adhere to the tongue, nor ftain the fingers in handling; but drawn along a rough furface, leaves a flender white line. It melts flowly in the mouth, and is of a fharp acrid and difagreeable tafte; and when rubbed down with water on a marble, it melts into a milky liquor of a pure white, not the leaft greennefs being fenfible in it. It is found at prefent in the great mine at Goffelar in Saxony, and feems to owe its colour to particles of copper; to which alfo it owes the virtues attributed to it by Diofcorides, acting as a weak kind of verdigreafe. *Hill*'s Hift. of Foff. p. 36.

THYLACION, a word ufed by the antient medical writers, to exprefs the bag formed by the membranes of the fœtus at the orifice of the pudenda, before the birth.

THYLLA, Θυλλα, in antiquity, a feftival in honour of Venus. *Potter*, T. 1. p. 405.

THYMALLUS, in ichthyology, the name of a fifh of the truttaceous kind, called in Englifh the greyling, or umber.

It is of a long and flatted body, the belly is fomewhat broad, and the back rigid and thin. It feldom exceeds a pound, or at the utmoft a pound and half weight. Its back is of a dufky brownifh green, with a fomewhat bluifh caft intermixed, and its fides of a more blue fhining glofs with an admixture of gold colour. The fcales are of a fort of rhomboidal form, and the fide-lines are much nearer the back than the belly. The fides are variegated with black fpots placed irregularly; but there are none of thefe near the tail. The back has two fins, and the tail is forked. The head is fmall, the eyes large and protuberant; the mouth is moderately large, and the upper jaw larger than the under; it has no teeth, but the whole jaws are rough like a file.

It is caught in the frefh rivers in the mountainous counties of England, and in the like fituations in Germany, and other kingdoms, and is one of the fineft tafted of all the frefh-water fifh. It feeds on worms, and fpawns in May. See Tab. of Fifhes, N°. 31. and *Willughby*'s Hift. Pifc. p. 187.

THYMBRA, in botany, the name of a genus of plants; the characters of which are thefe: The flowers and feeds are in all refpects like thofe of thyme, but that they are placed verticillately round the ftalks.

The fpecies of *Thymbra*, enumerated by Mr. Tournefort, are thefe: 1. The *Thymbra*, fimply fo called, and named by others *candy favory*. 2. The Spanifh *Thymbra*, with leaves like marjoram, called *marum*, and *maftichina*; and by fome *clinopodium*. 3. The roundifh-leaved Spanifh *Thymbra*. 4. The Spanifh *Thymbra*, with leaves like the coris, called by fome *ferpillum*; and by others a fpecies of thyme. And, 5. The St. Julian *Thymbra*, or true favory, called alfo by fome fpiked favory, and the St. Julian's Savory. *Tourn.* Inft. p. 197.

THYME, *Thymus*, in botany, *&c.* See the article THYMUS.

THYMELÆA, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, and is funnel-shaped, and cut into four segments at the edges; from the bottom of this there arises a pistil, which finally becomes an oval fruit; which in some species is succulent, and in others is dry; but in all contains oblong seeds.

The species of *Thymelæa*, enumerated by Mr. Tournefort, are these: 1. The flax-leaved *Thymelæa*. 2. The African flax-leaved *Thymelæa*, with pale-coloured, and very sweet-scented flowers. 3. The African flax-leaved *Thymelæa*, with broad, obtuse, and shining leaves. 4. The African flax-leaved *Thymelæa*, with flowers collected into clusters. 5. The dwarf alpine flax-leaved *Thymelæa*, with purple sweet-scented flowers. 6. The dwarf alpine flax-leaved *Thymelæa*, with sweet-scented white flowers. 7. The small hairy knot-grass-leaved Portugal *Thymelæa*. 8. The common toad-flax-leaved *Thymelæa*. 9. The Spanish *Thymelæa*, with toad-flax-leaves. 10. The African *Thymelæa*, with very narrow, and short rosemary-like leaves. 11. The African *Thymelæa*, with long and narrow rosemary-like leaves. 12. The rosemary-leaved African *Thymelæa*, with long flowers. 13. The white-flowered shrubby African *Thymelæa*, with rosemary leaves. 14. The Spanish *Thymelæa*, with broad olive-like leaves. 15. The Italian silvery olive-leaved *Thymelæa*. 16. The olive-leaved rock *Thymelæa*. 17. The white-flowered alpine *Thymelæa*, with leaves hoary on both sides. 18. The smooth *Thymelæa*, with leaves like the polygala. 19. The hairy *Thymelæa*, with polygala-leaves. 20. The chamelæa-leaved *Thymelæa*, with short hairy leaves. 21. The woolly kali-leaved *Thymelæa*. 22. The juniper-leaved *Thymelæa*, with procumbent branches. 23. The Pyrenean juniper-leaved Thymelæa, with erect branches. 24. The African *Thymelæa*, with narrow heath-like leaves. 25. The *Thymelæa*, with white, soft, and silky leaves. 26. The African *Thymelæa*, with tufted flowers. 27. The woolly *Thymelæa*, with small houseleek leaves. 28. The Spanish *Thymelæa*, with hoary myrtle-like leaves. 29. The African *Thymelæa*, with butcher's-broom leaves. 30. The shrubby African *Thymelæa*, with milkwort-like leaves and jasmine flowers. 31. The narrow-leaved jasmine-flowered African *Thymelæa*. 32. The nepa-leaved prickly African *Thymelæa*, with small purple flowers. 33. The ever-green bay-leaved *Thymelæa*, called the *laureola mas*, or male spurge-laurel. 34 The bay-leaved *Thymelæa*, with deciduous leaves, called the female spurge-laurel. And 35. The bay-leaved *Thymelæa*, with deciduous leaves, with white flowers and yellow fruit. *Tourn.* Inst. p. 494.

THYMELÆÆ *Radix*, in the materia medica, the dried root of the *Thymelæa foliis lini* of Tournefort and other authors.

It is a light root of different sizes, of a reddish colour without, and greyish within, woody, and full of fibres, and tastes sweet at first, but is hot as fire when it has been held a little time in the mouth. It loses however both this fiery taste, and its acrid quality, in long keeping, and with them its virtues.

It is to be chosen new, well fed, and not worm-eaten. The fruit of this plant is the *granum cnidium* of the shops. They are both of an acrid quality, and are not in use in the shops at present. *Pomet*'s Hist. of Drugs, p. 46.

THYMELÆA is also a name by which some authors have called the *laureola*, or spurge-laurel, an ever-green shrub, common in our woods: But it is more usually made the name of the *mezereon*, or spurge-olive, and, with many, is understood only as the name of the spurge-flax. *Tourn.* Inst. p. 415. *Boerhaave*'s Index, vol. 2. p. 213.

THYMELE, in the antient theatre, a kind of pulpit, where the fingers called *thymelici* performed. See the articles THYMELICI and LOGEUM.

THYMELICI, among the Romans, were musicians, who sung in the interludes, or who danced and kept time with their gestures. The place where they performed was called *Thymele*, whence Juvenal. VI. 66.

Attendit thymele, thymele nunc rustica discat.

THYMIAMA, Θυμιαμα, in antiquity, an offering of incense to God. See the article INCENSE, *Cycl.*

THYMIAMA, in the materia medica, a name by which some authors have called the *cascarilla bark*; called by some *cortex thuris*, or Indian bark. *Ray*'s Hist. Pl. vol. 2. p. 1841.

THYMIAMATA, a kind of fumigations among the antients, the ingredients of which were so various, that it appears they always consulted utility as well as pleasure, in their composition of them. Many of the ingredients, named in the oldest prescriptions for the making them, being the names of things not sweet-scented, the commentators have supposed that the antients expressed other things by those words, and not those which we at present mean by them; but all this is founded on the error of supposing these things intended only as sweet-scented preparations.

We find the gum ammoniacum of the antients used in them: And Neophytus reconciles the use of it in this manner very easily, by alledging, that it had the smell of coriander-seeds, which, as he observes justly, is an agreeable scent, and might do very well in mixture with others of this kind. It is pretty certain, that the ammoniacum of the antients was not the same gum which we now know by that name; but as the account of Neophytus, as to its smell, comes from an older Greek author, Dioscorides, we are to refer to him for the certainty of the expression; and by this it appears that Neophytus errs greatly, in attributing to ammoniacum the smell of coriander-seeds; for that the word used by Dioscorides, and which he has translated coriander, is κορὶυ; and this, as we find by many other passages of the same author, is an abbreviation of the word *castorei*, καστορίυ.

The smell of castor is also attributed to ammoniacum by Theophrastus and others; whence it is evident that the antients used salutiferous as well as sweet-scented things in these fumigations. Galbanum is a worse smell than ammoniacum, and yet this also we find, together with myrrh, and other gums, is made an ingredient in the oldest prescriptions of this kind. And Pliny mentions the ammoniacum with the schænanth, and other sweets used for this purpose.

THYMOXALME, in the materia medica of the antients, was a composition used externally in the gout, and many disorders of the limbs, and was given inwardly in distemperatures of the stomach, a quarter of a pint for a dose. It operated as a purge, and was prepared in the following manner: Take two ounces of bruised thyme, as much salt, a little meal, rue, and penny-royal. These were to be put into a pot, and three pints of water, and fourteen ounces of vinegar are to be poured upon them; after which they are to be covered with a coarse cloth, and set in the sun for some time. *Dioscorides*, l. 5. c. 24.

THYMUS, *Thyme*, in botany, the name of a genus of plants, the characters of which are these: The flower consists of one leaf, and is of the labiated kind: The upper lip is erect, and usually bifid, and the lower is divided into three segments. The pistil arises from the cup, and is fixed in the manner of a nail to the hinder part of the flower, and surrounded by four embryos, which afterwards become as many seeds, and ripen in the cup of the flower. To these marks it may be added, that the stalks are usually hard and woody, and the flowers collected into heads.

The species of *Thyme*, enumerated by Mr. Tournefort, are these: 1. The common-headed *Thyme*. 2. The common broader-leaved *Thyme*. 3. The common narrow-leaved *Thyme*. 4. The white narrow-leaved strong-scented *Thyme*. 5. The white procumbent sweet scented *Thyme*. 6. The scentless *Thyme*. 7. The small-headed *Thyme*. 8. The Portugal *Thyme*, with narrow hairy leaves, and large long purple heads. 9. The Portugal *Thyme*, with narrow hairy leaves, and round heads of purple flowers. 10. The great-headed Portugal *Thyme*. 11. The small-headed Portugal *Thyme*. 12. The headed Portugal *Thyme*, with large scales. *Tourn.* Inst. p. 196.

We have three or four species of this plant propagated in our gardens, partly for use in the kitchen, and partly for curiosity. They are propagated either by sowing, or by parting the roots, both which should be done in March.

The seeds should be sowed on a bed of light earth, and must not be buried too deep. When they come up, they must be kept clear of weeds, and watered at times; and in June they should be thinned, leaving the plants at about six inches asunder. After this they will grow very fast, and will require no farther care.

If they are to be propagated the other way, the roots should be taken up, and parted into as many slips as can be, and each planted at six or eight inches distance, on beds of light earth, watering and shading them till they have taken root.

The common garden *Thyme* is a cephalic. It also is good in all obstructions of the viscera, in the rheumatism, and in flatulencies.

The serpillum, or wild mother of *Thyme*, is one of the greatest nervous simples of our own growth. An infusion of it alone will do wonders in tremors, lowness of spirits, and headachs. It makes a very agreeable liquor, drank in the manner of tea, and this, continued for some time, has proved a remedy in many cases where every thing else has failed. It is almost infallible in the cure of that troublesome disorder the nightmare.

THYMUS, (*Cycl.*) in anatomy. Dr. Pozzi says, that the *Thymus* of a calf, softened by maceration, discovers a lobe, from which a milky liquor runs out when wounded; and if air is afterwards blown into it, the whole *Thymus* is distended, and may be dried, when it plainly appears to be composed of cells communicating with each other; upon the sides of which muscular fibres are to be seen: From which structure he concludes, that the *Thymus* in fœtuses supplies the use of the lungs, serving as a receptacle for the chyle to be prepared in. Med. Ess. Edinb.

The *Thymus* is thought by some to furnish the liquor found in the thorax of fœtuses. See Mem. de l'Acad. des Scienc. Par. 1733.

THYNNIA, Θυννια, in antiquity, a sacrifice offered to Neptune by the fishermen, after a plentiful draught.

The word comes from Θυννος, a tunny, that being the sacrifice offered.

THYNNUS, in ichthyography, the name of a fish called in English the *tunny*, or Spanish mackrel, common in the Mediterranean,

diterranean, and others seas, and sometimes, though not frequently, caught on the English coasts.

It is a very large fish, growing sometimes to seven or eight foot long, and more than an hundred weight. It is of a rounded and thick body, growing gradually smaller toward the tail, till it is at length extremely slender. It very much resembles the *pelamys* in its whole figure, but that it wants the oblong black streaks which that fish has on its sides, and is much larger. The back is black, or, if held in some lights, is of a shining bluish or greenish hue. Its belly and half its sides are of a silvery whiteness. Its scales are very small. Its snout pointed. Its jaws both of equal length, and armed each with one row of teeth. The mouth is large and black within, except that part of the palate is red. The eyes are large. The larger black fins are two in number; the foremost placed near the head, and rising out of a cavity in the back, and the other at a small distance behind that; and, in some fish of this species, of a reddish or yellowish colour; and behind this last, there are eight, nine, or ten small fins running down the ridge of the back at equal distances to the tail. The tail is very forked. The fins at the gills are black, small, and terminate in a point. The belly fins are placed but at a small distance behind these, and are also small; and both these, and the gill-fins have sinuses in the body of the fish, into which they may be depressed. Behind the anus is a fin like that on the back, and behind it eight more small ones, answering to those on the back also; and the skin of the sides, near the tail, is extended into two fins; so that this part of the fish looks in some sort square. It is a good fish for the table, and is salted in vast quantities in Spain and Italy. See Tab. of Fishes, N°. 29. and *Ray*'s Ichthyography, p. 176.

THYOS, Θυος, in antiquity, an offering of fruits, leaves, or acorns, which were the only sacrifices at first in use. *Potter*, Archæol. Græc. T. 1. p. 213.

THYREOSTAPHILINUS, in anatomy, a name given by Douglass to a muscle, called by Albinus and others, *palatopharyngæus*. See the article PALATOPHARYNGÆUS.

THYRRÆUM *Vinum*, a sort of wine among the antients remarkable for its thickness and dark colour; it was sweet, and luscious, and not astringent.

THYRREUS *Lapis*, in natural history, the name of a fossil, which the writers of the middle ages have called *syrus*.

It has many virtues ascribed to it; but all the account we have of its real properties are from Pliny, who observes that it swam upon the water while whole; but when broken into small pieces, these sunk to the bottom. It seems to have been a sort of bitumen of a spongy structure.

THYSSELINUM, in botany, the name of a genus of umbelliferous plants, the flowers and fruit of which are the same with those of the *petroselinum*, or mountain parsley; from which it differs in nothing, except that it yields a milky juice when broken or wounded.

The species of *Thysselinum*, enumerated by Mr. Tournefort, are these: 1. The *Thysselinum* of Pliny, or milky parsley. 2. The marsh *Thysselinum*, called by some the *milky seseli*. *Tourn.* Inst. p. 319.

TIBERIADES *Water*, the water of a hot spring near *Tiberiades* in Egypt.

Dr. Perry, when on the spot, tried some experiments on this water, which give us a much better idea of its nature, than we have from any other accounts of it. Half a dram of oil of tartar being mixed with an ounce and half of the water, it becomes turbid and muddy; and after twelve hours, three parts of the whole appear like white wool, only leaving a small portion of clear water at the top. This white woolly matter dried, produced only a small quantity of yellow ochre.

Spirit of vitriol added to the water in the same quantity, affords a large unctuous sediment of a white colour. A solution of sublimate being mixed in the same quantity, it became turbid and yellowish, and yielded an earthy sediment in small quantity; whence it seems evident, that it contains a sal murale. Saccharum saturni being added in the same quantity, the water deposited a lateritious sediment in a small quantity. Mixt with spirit of sal armoniac, it turns to a bluish green turbid liquor, and finally yields a woolly sediment. Sugar of violets mixed with it, turned it to a yellowish colour; and the scrapings of galls mixed with it, turned it to a deep purple; and on shaking, this became as black as ink.

It appears from these experiments, that the water contains a good deal of a gross fixed vitriolic salt, some alum, and a sal murale. It is too salt and nauseous for internal use; but it must be of use as a bath in all cutaneous foulnesses, especially in scorbutic and leprous cases; for it will powerfully deterge, scour and cleanse the excretory pores, and it may, by its weight and stimulus, restore them to their natural state and tone, and restore the true state of the vitiated solids in general. Phil. Transf. N°. 462. p. 52.

TIBERIANUM *Marmor*, in the natural history of the antients, the name of the green and white marble, common in tables, &c. at this time, and by our artificers called *Ægyptian marble*. The Romans applied this name, however, only to one appearance of this species of marble, which was, when its white part was not arranged into regular lines, or arched figures, but diffused irregularly through the whole mass; for where it was thrown into these sort of arches, it was called the *augustan* marble. These were, however, very idle distinctions, since the same block, to this day, often affords us the white veins, in both these dispositions, in its different parts.

The antient Romans had it from Ægypt, and we also have the finest pieces thence; though the greater part of what we use is not brought quite so far. *Hill*'s Hist. of Foss. p. 481.

TIBERIANUM *Tormentum*, in medicine, a name given by some to the colic. See COLIC.

TIBIA (*Cycl.*)—*Cartilages of the* TIBIA. The *Tibia* has four or five proper cartilages, and two additional ones. The two proper cartilages which cover the two superior surfaces of the head of the *Tibia*, are the thickest. These are both gently hollow; but the internal, or that next the other *Tibia*, is more depressed in the middle than the other. The third proper cartilage covers the small surface which lies on the lower part of the external condyle. The fourth covers the lower surface of the basis of the *Tibia*, being continued over the outside of the inner ankle. There are likewise superficial cartilaginous incrustations on the back part of this basis, behind the inner ankle, and likewise on the backside of the outer ankle, all for the passage of tendons.

The additional cartilages of the *Tibia* are two in number, called semilunar from their figure, and intermediate or interarticular from their situation; each of these cartilages is in the shape of a crescent, or Roman C. Their convexity, or greatest curvature, is very thick; their concavity, or smaller curvature, very thin, and something like the edge of a sickle. They lie on the two upper surfaces of the head of the *Tibia*; each cartilage is broad enough to cover about two thirds of the surface of the *Tibia* on which it lies, leaving one third bare in the middle; their under sides are flat, their upper sides hollow, and, together with the middle portions of the surfaces of the head of the *Tibia*, they form cavities proportioned to the convexity of the condyles of the os femoris. *Winslow*'s Anatomy, p. 128.

Ligaments of the TIBIA. This bone is connected to the os femoris by several ligaments, two lateral, one posterior, two middle, and one capsular. The innermost and broadest of the two lateral ones is fixed pretty low down on the inner side of the superior part of the *Tibia*. The external, which is narrower and thicker than the former, is fixed partly in the *Tibia*, immediately above the fibula, and partly in the upper extremity of the fibula; both these ligaments lie a little behind the middle of the articulation. The posterior ligament is fixed by several expansions in the posterior part of the head of the *Tibia*. One of the crucial ones is fixed by one end to the internal superficial impression in the notch of the os femoris, and by the other, to the notch in the head of the *Tibia*: The other is fixed by one end to the external impression in the notch of the os femoris, and by the other between the anterior portions of the superior surfaces of the head of the *Tibia*. The cornua of the semilunar cartilages degenerate into ligaments, short and strong, by which they are fastened, and communicate by some small portions with the crucial ligaments: They have likewise a common ligament, which like an arch runs transversely between their anterior convexities, to the tuberosity or spine of the *Tibia*. The patella is fastened also by a strong ligament; this runs directly down from the apex of the patella; and, beside this, it has several small lateral ligaments fixed in the lower part of its edge on each side, and inserted anteriorly and a little laterally in the edge of the head of the *Tibia*.

The capsular ligament is fixed round the edge of the head of the *Tibia*, and in the edge of the patella. The crucial ligaments, and those of the semilunar cartilages, are inclosed in this capsule; but the lateral and posterior ligaments, and those of the patella, lie without it. The capsule is also joined to a considerable portion of the circumference of the semilunar cartilages, and is strengthened by many ligamentary fibres. Its inside is smooth, and shining; and where it is not covered with tendons, is very thin. There is likewise a very thin ligament, fixed by one end to the lower part of the cartilaginous side of the patella, and by the other to the anterior part of the great notch between the condyles and the os femoris. The use of which seems to be, to prevent the articular fat from being compressed in the motions of the knee. *Winslow*'s Anatomy, p. 129.

TIBIÆ *Quintus*, in anatomy, a name given by the old authors to a muscle called the *biceps cruris* by Albinus and Winslow, and the rest of the moderns.

TIBIALIA, among the Romans, a kind of swaths with which they used to cover their legs. *Pitisc.* in voc.

TIBIALIS (*Cycl.*)—TIBIALIS *Gracilis*, a muscle of the leg, called also *plantaris*. It is a small pyriform muscle, situated obliquely in the ham, below the external condyle of the os femoris, between the poplitæus, and external gastrocnemius; and its tendon which is long, flat, and very small, runs down on the side of the gastrocnemius internus all the way to the heel. The fleshy body, which is no more than about two inches in length and one in breadth, is fixed by a short flat tendon above the outer edge of the exterior condyle of the os femoris; from thence it runs obliquely over the edge of the poplitæus, and terminates in a very small, but long flat tendon. This tendon runs between the body of the gastrocnemius externus and soleus all the way to the inner edge of the upper part of the tendo achillis, and from thence continuing

its course downward, it joins this tendon, and is inserted, together with it, in the outside of the posterior part of the os calcis, without communicating with the aponeurosis plantaris. Sometimes this muscle is wanting, and in some subjects it is situated lower down. *Winslow*'s Anatomy, p. 220.

TIBIALIS *Anticus*, a long muscle, fleshy at the upper part, and tendinous at the lower, situated at the fore-side of the legs, between the *Tibia* and the extensor digitorum pedis longus. It is fixed above by fleshy fibres in the upper third part of the external labium of the crista tibiæ, and of the inside of the aponeurosis tibialis, or of that ligamentary expansion which goes between the crista tibiæ, and the anterior angle of the fibula. It is likewise fixed obliquely in the upper two thirds of the outside of the tibia, or that next the fibula. From thence it runs down, and ends in a tendon, which first passes through a ring of the common annular ligament, and then through another separate ring, situated lower down; afterwards the tendon is fixed, partly in the upper and inner part of the os cuboides, and partly in the inside of the first bone of the metatarsus. *Winslow*'s Anatomy, p. 217.

TIBIALIS *Posticus*, a long fleshy penniform muscle, broader above than below, situated between the tibia and fibula, on the backside of the leg, and covered by the extensor digitorum longus. It is fixed above by fleshy fibres, immediately under the articulation of the tibia and fibula, to the nearest part of those two bones, chiefly to the tibia, reaching to the lateral parts of that bone above the interosseous ligament, which is here wanting. From thence its insertion is extended below the oblique line or impression in the tibia, over all the neighbouring part of the interosseous ligament, and through more than the upper half of the internal angle of the fibula. Thro' all this space it is fleshy and penniform, and is covered by the extensor digitorum longus. After this, it forms a tendon which runs down below the inner malleolus through a cartilaginous groove, and an annular ligament, and is inserted in the tuberosity of the lower part of the os schaphoides. *Winslow*'s Anatomy, p. 220.

TIBICEN, in zoology, a fish of the cuculus kind, called by many authors, *lyra*, or the *harp-fish*; and in some parts of England, the *piper*.

The head of this fish runs out into two broad horns, which are serrated, or beset with a sort of teeth, or small spines, all along their edges, which is its principal distinction from the hirundo or swallow-fish. Above the gill-fins it has on each side a long and sharp spine. The forehead is elevated into a sort of eyebrows over the eyes; and at the angles of these there are small and short spines; these are crooked; and the spines on the back of this species are longer than in any other of the cuculi. The side lines feel but very little rough to the touch, and the forehead between the eyes is not hollowed as in the other cuculi. The whole head is covered with a bony crust, which runs into two horns or spines behind. It has three fingers or filaments on each side, from the roots of the gill-fins; and its jaws are rough like files, but have no distinct teeth. The tail-fin, and the middle of the back in this fish are red. It is caught in the Mediterranean, and in some other seas. In our county of Cornwal, it is not unfrequently caught about the shores, and from the noise it makes when taken out of the water, is called the *piper*. *Ray*'s Ichthyography, p. 282. *Willughby*'s Hist. Pisc. p. 282.

TIBURO, in zoology, a fish very badly and falsely described by several authors, and proving, on a strict enquiry, to be no other than the lamia or white shark. *Willughby*'s Hist. Pisc. p. 49. See the article LAMIA.

TICK, in the manege, a habit that some horses take of pressing their teeth against the manger, or all along the halter or collar, as if they would bite it.

TICKLISH, in the manege. A horse is said to be *ticklish* that is too tender upon the spur, and too sensible, that does not freely fly the spurs, but in some measure resists them, throwing himself up, when they come near and prick his skin. A *ticklish* horse has somewhat of the ramingues, *i. e.* the kickers against the spurs; but with this difference, that the latter put back, leap and kick, and yerk out behind, in disobeying the spurs; whereas a *ticklish* horse only resists for some time, and afterwards obeys, and goes much better, through the fear of a vigorous ham, when he finds the horseman stretch his leg, than he does upon being actually pricked.

TIDE (*Cycl.*)—In the Philosophical Transactions, N°. 4. we have an account of an extraordinary *Tide* near the western isles of Scotland. For some days one flood and ebb run twelve hours eastward, and the other twelve hours westward, till four days before the new and full moon, and then they resume their ordinary regular course as before, running east during the six hours of flood, and west during the six of ebb.

There is another uncommon irregularity in these *Tides*. Between the vernal and autumnal equinoxes, the course of irregular *Tides* about the quarter moons is to run all day, that is, twelve hours eastward; and all night, for twelve hours more, westward. But during the other six months, from the autumnal to the vernal equinox, the current runs all day westward, and all night eastward.

TIES, aboard a ship, are those ropes by which the yards do hang; and, when the halliards are strained to hoise the yards, these *Ties* carry them up.

TIFACOUM, a word used by some of the chemical writers to express quicksilver.

TIFATUM, a word used by some of the chemical writers to express sulphur.

TIFFE *de Mer*, in natural history, a name given by Count Marsigli to a species of sea plant, commonly but erroneously reckoned among the spunges, and called by authors, a *branched spunge*. This author has called it by this name from its resemblance to the heads of the *typha palustris*, or cat's tail, when ripe in the month of September.

The spunges must be of a lax and cavernous texture; but this plant is smooth and firm, and has no inequalities on its surface, excepting a few short hairs, which give it a velvety look, when first taken out of the water. It is a very elegant and beautiful plant; it grows to two foot in height, and is very elegantly branched. It grows on rocks and stones, and, when first taken out of the sea, is full of a viscous water, as yellow as the yolk of an egg; but when this water is pressed out, and the plant comes to dry, it loses its yellow, and becomes of a dusky brown colour. It is very tough and firm while in the water, but when dry it usually breaks of itself into little pieces, and may be crumbled to powder between the fingers. This is a very strong proof, among others, of its not being of the nature of the spunge.

When viewed by the microscope, the whole surface is found to be covered with extremely fine and slender hairs; and, amongst these, there are an infinity of little apertures, thro' which the sea-water makes its way, for the nourishment of the plant. When a branch of it is cut transversely, there are seen a number of long and fine canals, by means of which the water, received at these superficial apertures, is conveyed to the whole substance of the plant; for these plants are all root, and imbibe their nourishment at every pore. *Marsig.* Hist. de la Mer, p. 82.

TIGEGUACU, in zoology, the name of a small Brasilian bird, of the size of a sparrow, and with a ridged and triangular bill, in which it resembles the moucherolle. Its eyes are of a fine blue, and its legs and feet yellow. It is all over of a deep black, but that it has a large blood-red spot on the top of its head. Its tail is short and black. *Marggrave*'s Hist. Brasil.

TIGER, *Tigris*, in zoology. See the article TIGRIS.

TIGH, in our old writers, a close or inclosure mentioned in antient charters, and is still used in Kent in the same sense. Chart. Eccles. Cant. *Blount*.

TIGILLUM, a word used by some chemists to express the tile with which they cover the mouth of their crucibles; and, by others, for the crucible itself. See the article TILE.

TIGRIS, the *Tyger*, or *Tiger*, in the Linnæan system of zoology, makes a distinct genus of the quadruped class; the characters of which are, that it has four paps placed near the navel, and feet adapted to climbing. The author takes in the panther to this genus, and distinguishes the *Tiger* by the name *Tigris maculis oblongis*, and the panther by that of *Tigris maculis orbiculatis*. *Linnæi* System. Naturæ, p. 35.

The *Tiger* has its name from its supposed swiftness, and has been described by almost all authors as one of the swiftest of all the wild carnivorous animals; but this has been wholly contradicted by such authors as have seen the creature, who all declare that it is a slow and sluggish animal, and is unable to overtake a man, or almost any animal that has an opportunity of running away from it. It will give two or three large leaps; but if it do not seize its prey in these, is but ill qualified to catch it afterwards. *Ray*, Syn. Quad. p. 165.

It exceeds the lion in size, and is of an unconquerable fierceness. It agrees with the panther in the variegation of its colours, but differs in the disposition of them; for in the panther the colours are disposed in round spots or eyes, and in the *Tyger* they are disposed in long streaks.

Marggrave describes three species of American *Tygers*, the first called *jaguera* by the natives, and by the Portuguese *onça*; the second distinguished by the natives by the name *jaguarete*, but called by the Portuguese by the same name with the other; the third called by the Indians *cugua-cuarana*, and by the Portuguese, the *Tyger*. But the two first seeming to be the same with what we know by the name of the *ounce*, and having round, not long variegations, seem properly of the panther, not of the *Tyger* kind.

It were much to be wished that the antients had left us more certain marks, and fuller descriptions of the *Tyger* than they have.

The *Tyger* is found in the East Indies, in many parts of Asia, and in America: But there seems some difference in species between the Asiatic and American *Tygers*, and possibly fuller observation may prove, that the Asiatic are swift, as the antients have described them, and the American ones, of the slowness of which we have accounts, may be a different species.

The manner of carrying off the young brood of this animal is described by Pliny as follows. The Hircanians and Indians bring up the *Tyger*, says he, an animal of a dreadful swiftness, which

which is moſt put to the proof when going to be taken. The whole brood, which is always very numerous, is carried off upon a horſe, as ſwift as poſſible, and often removed to a freſh one. When the mother *Tyger* finds the neſt empty, and the brood gone, for the males take no care of them, ſhe traces the ſcent with furious ſpeed; and when ſhe is arrived within hearing of the perſon who is carrying off her young, he throws down one of them; this ſhe takes up in her mouth, and, as if made more ſwift by her load, carries it back, and then returning, is treated in the ſame manner till the perſon gets on board a ſhip, and leaves her to vent her rage on the ſhore. Vid. *Pitiſc.* Lex. Ant. in voc. *Plin.* Nat. Hiſt. l. 8. c. 18.

TIHOL, in natural hiſtory, a name given by the people of the Philippine Iſlands to a ſpecies of crane very frequent among them, and remarkable for its ſize, being taller than a man, when it ſtands erect, and holds up its neck. They call it alſo ſometimes *tipul.*

TIJEGUACU-*Paroara*, in zoology, the name of a Braſilian bird, of the ſize of a lark. It has a ſhort and thick beak, brown above, and whitiſh below. Its head, throat, ſides, and the lower part of its neck, are of a fine yellow, variegated with red in the female, and all over of a perfect blood-red in the male. The upper part of the neck, and the whole back, are grey, with a mixture of brown; the wings are brown, tipped with white; the tail is of the ſame colour; and the ſides of the neck, the breaſt, belly, and thighs, are white. *Marggrave*'s Hiſt. Braſil.

TIJEPIRANGA, in zoology, the name of a Braſilian bird of the ſparrow kind. It is a little larger than the lark. Its whole body, neck, and head, are of a very fine red or blood colour, and its wings and tail black.

There is another ſpecies alſo of this bird, which is of the ſize of a ſparrow, and is of bluiſh grey on the back, white on the belly, and of a ſea-green on the wings. The legs of this are of a pale grey. *Marggrave*'s Hiſt. Braſil.

TIKE, the Zetland name for an otter, of which there are many to be found about that iſland. Phil. Tranſ. N°. 473. Sect. 8.

TILE, or TYLE, (*Cycl.*) in aſſaying, a ſmall flat piece of dried earth, uſed to cover the veſſels in which metals are in fuſion.

Theſe are made of a mixture of clay and ſand, or powder of flints, or broken crucibles, made into a paſte, and ſpread thin with a rolling-pin, on a table, or flat ſtone. From theſe cakes or plates, pieces are to be cut with a knife, to the ſhape and ſize of the mouths of the veſſels to be cloſed. It is beſt then to pare away the borders of the under ſurface of the piece thus cut off, that this ſurface may immediately touch all the way the edge of the mouth of the veſſel, leaving a prominent rim, by which means the *Tile* ſits cloſe upon the veſſel, and is not ſo eaſily diſplaced by accidents, as a touch of the poker, or of the coals put on to mend the fire, as it otherwiſe would be. Finally, put on the middle of the outer ſurface a ſmall bit of the ſame matter, which ſerves as a kind of handle, by means of which it may be conveniently managed by the tongs, and eaſily taken off and put on again at pleaſure. *Cramer*, Art. Aſſ. p. 66.

TILIA, the *Lime-Tree*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the roſaceous kind, and is compoſed of ſeveral petals, arranged in a circular form. The piſtil ariſes from the cup, and finally becomes an unicapſular huſk, containing oblong ſeeds.

The ſpecies of *Lime*, enumerated by Mr. Tournefort, are theſe: 1. The large-leaved common *lime.* 2. The common *Lime*, with ſmaller leaves. And 3. The hairy-leaved *Lime*, with red twigs and ſquare fruit. *Tourn.* Inſt. p. 611. See the article LIME-*Tree.*

Lime-tree flowers are eſteemed cephalic and cordial; they are alſo recommended in paralytic and nervous diſorders of all kinds.

TILLS, a name given by our farmers to the lentil, a kind of pulſe propagated in ſome parts of the kingdom; they are the ſmalleſt of all pulſe. They require but an ordinary ground, but they produce a vaſt quantity, tho' they lie in a ſmall compaſs. They make a fine ſweet fodder, and are the beſt of all things of this kind for calves, or any other young cattle. They are alſo the beſt of all ſorts of food for pigeons. *Mortimer*'s Huſbandry.

TILLÆA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe: The calyx is a flat perianthium, divided into three large oval ſegments. The flower is compoſed of three flat, oval, pointed petals, ſmaller than the ſegments of the cup. The ſtamina are three ſimple filaments, ſhorter than the cup. The antheræ are ſmall. The piſtillum has three germina. The ſtyles are three, and ſimple. The ſtigmata are obtuſe. The fruit is three long pointed capſules, of the ſame length with the flower, bent back, and ſplitting open longitudinally in their upper part. The ſeeds are of an oval figure; and two are contained in each of theſe capſules. *Linnæi* Gen. Plant. p. 36.

TILLAGE. The term *Tillage*, in its proper ſenſe, ſignifies the opening, breaking, and dividing the ground by the ſpade, the plough, the hoe, or other inſtruments which divide it by attrition, as the addition of dung does by fermentation.

Dung is only to be had in a limited quantity, and that in moſt places, except in the neighbourhood of great towns, too ſmall a quantity for the huſbandman's occaſions; but *Tillage* is in the power of the workman in every degree; and by this the field of ſubterranean paſture for the plants may be enlarged almoſt without limitation. Though the external ſurface is always confined to the ſame narrow bounds, *Tillage* may extend the earth's internal ſuperficies, in proportion to the diviſion of its parts; and as diviſion is infinite, ſo may alſo that extenſion of the ſuperficies be, which is the conſequence and effect of it.

Every time the earth is broken by any ſort of *Tillage* or diviſion, there muſt ariſe ſome new ſuperficies of the broken parts, which never has been open before; for when the parts of the earth are once united and incorporated together, 'tis morally impoſſible that they, or any of them, ſhould be broken again only in the ſame places; for, to do that, ſuch parts muſt have again the ſame numerical figures and dimenſions they had before that breaking, which, it is eaſy to ſee, will never happen.

Although the internal ſuperficies may have been drained by a preceding crop, and the next plowing may move many of the before divided parts, without new breaking them, yet ſuch as are new broken have, at ſuch places where they are broken, a new ſuperficies, which never was, or never exiſted before.

Tillage, as well as dung, is beneficial to all ſorts of land. Light land being naturally hollow, has larger pores, which are the occaſion of its lightneſs: This, when it is by any means ſufficiently divided, the parts being brought nearer together, becomes, for a time, bulk for bulk heavier; that is, the ſame quantity of it is made to lie in leſs room, and ſo it is made to partake of the nature and benefit of a ſtrong and firm land; that is, it will keep out too much heat and cold, and retain the roots of plants much more ſteadily than it could do before that *Tillage.*

The ſtrong and tough land being naturally leſs porous than it ought to be, is made for a time lighter, as well as richer, by a good diviſion: The ſeparation of its parts makes it more porous, and cauſes it to take up more room than it does in its natural ſtate, and then it partakes of the natural advantages of a lighter land. When ſtrong land is ploughed, but not ſufficiently, ſo that its parts are left groſs, it is ſaid by the farmers to be rough; in this caſe it has not the proper benefit of *Tillage*; for its pores and interſtices are left too large, and it has all the inconveniencies of a hollow land that is untilled. When the light land is ploughed but once, that is not ſufficient to diminiſh its natural hollowneſs or pores; and, for want of more *Tillage*, the parts into which it is divided by that once ploughing, remain too large, and conſequently the artificial pores are large alſo, and, in that reſpect, they and the illtilled ſtrong land are alike.

Light land having naturally leſs internal ſuperficies than any other kind, ſeems to require more *Tillage* or dung to enrich it: As when the poor hollow thin downs have their upper part, which is the beſt, burnt, whereby all, except a caput mortuum, is carried away; yet the ſalts of this ſpread upon that barren land, which is unburnt, divide it into ſuch very minute parts, that their paſture will nouriſh two or three very good crops of corn. But then the plough, even with a conſiderable quantity of dung, is never able to make another diviſion equal to that which thoſe ſalts had done; and therefore, after theſe two or three crops, the land always remains barren. Artificial pores cannot be two ſmall, becauſe the roots of plants can the more eaſily enter the ſoil that has them; quite contrary to natural pores; for theſe may be, and generally are, too ſmall and too hard for the entrance of all weak roots, and for the free entrance even of ſtrong roots. Inſufficient *Tillage* leaves ſtrong land with its natural pores too ſmall, and its artificial ones too large; and it leaves light land, with its natural and artificial pores both too large. Pores which are too ſmall, in hard ground, will not permit roots eaſily to enter them; and pores which are too large in any ſort of land, can be of little other uſe to the roots of plants, but only to give them paſſage into other pores that are more proper for them; and if in any place they lie more open than they ought to the air, they are dried up and ſpoiled before they reach them.

The fine fibrous roots are the only parts of a plant which take in the nouriſhment, the larger part of the roots ſerving only to receive it of them, and convey it to the plant; and theſe fine and ſmall fibrous roots can take in no nouriſhment from any part of the earth, unleſs they are in contact with it, and preſs againſt the ſuperficies: This is the caſe in the ſmall pores in the earth; but by no means in large ones; for a fibrous root can never be compreſſed againſt the ſides of a cavity, whoſe diameter is much greater than its own, as is the caſe in all theſe large pores. The ſurfaces of great clods form declivities, which have large cavities at the bottom; theſe ſerve to receive and convey what rain and dew bring too quickly downward below the ploughed part.

The firſt and ſecond ploughing of land with the common plough, ſcarce deſerve the name of *Tillage*; they rather prepare

pare the land for *Tillage*; the third, fourth, and every subsequent ploughing, are of infinitely more advantage to the ground, and are done at a much smaller expence; but the last ploughings will be most advantageously performed in the manner of hoeings. See the article HOEING.

The finer any land is made by *Tillage*, the richer it will become, and the more plants it will maintain; and it has been frequently observed, that in a large field, where at some time one part of the ground has been better tilled than the rest, that part of the ground has produced the best crops, and been easily distinguished by it from the rest of the field, even six or seven crops after the time of the particular good *Tillage*. A piece of ground being once made finer than the rest, will a long time shew the advantage of it; because the dews have more power to enrich it, they penetrating farther than the superficies, whereto the roots are able to enter. The fine parts of the earth are impregnated throughout their whole substance with some of the riches carried in by the dews, and there reposited until, by *Tillage*, the inside of those fine parts become superficies; and as the coro drains them, they are again supplied as before; but the rough large parts cannot have that benefit, and the dews not penetrating but to their surface, they remain poor. The experiments mentioned by Mr. Evelyn prove this beyond contest. Take of the most barren earth you can hod, powder it well, and expose it abroad for a year, incessantly agitating it, and after this, without any other management, this earth will be the most fertile that can be conceived, and will readily receive any plant from the farthest Indies: All vegetables will prosper and flourish in this once barren earth, and bear their fruit as kindly with us, under a due degree of artificial heat, as in their native climates.

The artificial dust will entertain plants which refuse dung and other violent applications, and has a more nutritive power than any artificial dung or compost whatsoever: And by this pulverising and exposing, the very nature of a soil may be changed, and the toughest clay made as light and friable as common light earth, and as fit for the nourishment of the tenderest plants as any other; though, in its natural condition, its pores were too small to give way to their tender roots, and had no communication one with another.

This is a sort of improvement of land that cannot be practised in the large way, in fields, &c. but as it only consists in dividing and breaking the particles of earth, and exposing them thus broken to the air, it is plain that common *Tillage* approaches more or less to it, as more or less labour is employed; and the experiment proves, that the farmer need never fear bestowing too much *Tillage* on any sort of ground.

It is without dispute, that what was one cubical foot of the original barren earth, and had in that state only six cubical feet in superficies, has after this powdering more than a thousand cubic feet of superficies in its internal parts. The very poorest land, and the very richest, in their natural state, do not differ so much as one, and twenty; that is, a cubic foot of the richest land in the world will not produce more vegetables than twenty foot of the poorest; and as, in this method of pulverising, the ground is made greatly more than twenty times richer than it was before, it is a necessary consequence that any poor land may, by proper *Tillage*, be made richer than the best land in the world naturally is.

There is also another very great advantage, when a soil has a large internal superficies in a small compass, as is always the case after much *Tilling*; which is this, that the roots of plants in it are then better supplied with nourishment; their food being nearer to them on all sides, and more within reach than it can be when the soil is less fine, as in common *Tillage*, and the roots must extend much farther in the one than in the other, in order to reach an equal quantity of nourishment: They must range and fill perhaps twenty times more space, in order to the coming in the way of an equal quantity of food. Hard ground makes too great a resistance to the passage of roots, and air makes too small a pressure upon their superficies; in water they have a free passage to the utmost of their extent, and have every where an equal, proper, and even pressure; and in light and fine earths, such as those divided by an equal and careful *Tillage*, they have much the same free passage and even pressure as in water.

The general custom of farmers is to leave off *Tillage* just when they have brought their lands into such a condition, that *Tillate* would be of vast advantage to them. They usually suppose the soil to be fine enough, when, with the help of harrows, they can cover the seed, and afterwards with a roller they break the clods, to the end that if a crop succeed, they may be able to mow it, without being hindered by these clods. *Tull*'s Horsehoing Husbandry, p. 24.

TILMUS, a term used by some of the medical writers to express the effect of a sort of delirium, in which people pull the bedclothes, or pick out threads from the sheets. This is usually esteemed a dangerous symptom.

TIMBER (*Cycl.*)—The uses of *Timber* are so many, and so great, that the procuring a sufficient supply of it, extremely well deserves the care of every state; as it must be a great disadvantage to it to be obliged to have recourse to its neighbours, and purchase at a very considerable and continually renewed expence, what might, by an easy œconomy, be sufficiently supplied at home.

This œconomy, however, must be applied in time; for our natural indolence, our love to reap the advantages of every thing ourselves, and our little care for posterity, give great room to fear succeeding ages will want wood both for private and public exigencies. All our arts should be employed on this subject, with two views, the one to preserve and cherish our growing wood, the other to renew the trees which have been and are continually cut down.

The quantity of acorns that the oak bears, has made many people suppose, that nature has taken care for a renewal for us, and that of this vast quantity of seeds which annually fall, there will be always an over-sufficient supply of young trees, which will grow up in the place of the old ones: But experience proves, that this is by no means the case. The greater number of these fallen acorns are devoured by a number of different animals, for whose nourishment nature has provided that abundance of them: And of those which escape this fate, we are to consider how few can come to good, from the natural accidents they are unavoidably exposed to; they fall on a covered ground, where dead leaves, and decayed parts of branches of trees, usually prevent their touching the earth, into which they are to shoot; or, if they can shoot here, it is merely from the surface, where they are, in their slow growth, liable, while very tender, to all the inclemencies of frosts; and add to this, that it is very difficult for such tender plants as the young seedlings of these, to find room for growth or nourishment among the every way spreading roots of other trees; and the continual shade and want of free air, must render them very weakly and irregular in their growth, even supposing them to get over all the other difficulties.

It is very certain, that *Timber-trees* of oak are frequently met with among the underwood of forests; but we shall always find this to be the case, not in the close places, but in certain spots where there has been a vacancy or opening; and that usually where there are not, nor have at any time been, oaks in the neighbourhood of the spot. The acorns that fall from the oaks usually come to nothing, from the before-mentioned accidents; and these trees which grow at distances, are owing to the acorns brought thither by birds, and accidentally dropped there. This is an instance familiarly verified, by observing, that there are frequently little bushes near woods, which, though of white-thorn or other trees, are usually surrounded and ornamented with young oaks; the jays and the like granivorous birds are the authors of this crop; for, bringing the acorns from the adjoining woods, to eat under these bushes, they drop many by the way, which they do not trouble themselves to look for on the ground, and which having here a freer ground to strike root into, and an open air to grow in, seldom fail of coming to good, unless destroyed while young.

In order to the preserving our growing *Timber-trees*, it would be a very useful law, that all who cut down any number of oaks, should also leave a given number in good condition for after-cutting; and that no *Timber* should be cut down, but at a proper age, in regard to the nature of the soil; since it is certain, that trees grow to their perfection at very different periods of time, in proportion to the depth of soil they have to grow in; and that as it is, on the one hand, not for the interest of the state to suffer trees to be cut till at their perfection for size and soundness, so, after they are arrived at that perfection, it is equally certain, that they gradually decay.

The quality of the soil the tree stands in, may be necessary to be observed to this purpose; but the quantity or depth of it is the great subject of enquiry; and a great number of observations have proved, that the proper season for cutting oaks in a soil of two foot and a half deep, is at fifty years old; those which stand in a soil of three foot and a half deep, should not be cut down before seventy years; and those which stand in a soil of four foot and a half deep, or more than that, will encrease in goodness and in size till they are an hundred years old: And observation has proved, that after these several periods, the trees begin to decay.

This seems the best rule to establish, in regard to the common soils; but those which grow in a lighter or more sandy soil, may have their periods changed from these to forty, to sixty, and to eighty years at the greatest depth; and after these times it is always best to fell the wood meant for public service, whether then wanted or not, since it is much better to keep it in public magazines, than to leave it to be daily decaying.

Heaths, and other uncultivated places, where there is no regular growth of wood; but where fern, and useless plants alone seem to flourish, usually afford also some straggling trees of the oak. These probably have had their origin from acorns dropped by birds; but these seldom grow tall or regular; since, not having been defended from the injuries of cattle, they are usually browsed on, and stunted while young, and so become crooked and short-trunked, or pollard trees. These, though not of such value as the more regular oaks, yet deserve care, both with respect to their preservation and felling; since they afford a number of trees naturally bent, and formed for many parts of ship-building.

The little care usually taken of these trees, though on this occasion

cafion of great value, feems to threaten a general lofs of them; but as trees, thus naturally crooked and bent, are of value, it is a laudable attempt to try at the finding a regular method of producing fuch; and this is eafily practicable, by following the fame methods by which thefe wild ones become fo. They wholly owe their figure to the cattle's biting off their tops while young, and afterwards biting off again the tops of the fhoots from the firft wound. In this manner, if a number of young trees, fet apart for the experiment, have their tops cut off at two, four, fix, eight, ten, and twelve feet from the ground, and four years afterwards the fhoots from thefe ftunted tops are again cut in the fame manner, the trees will be found afterwards to grow up in all the irregularly crooked figures that can be conceived, and by this means a fupply of naturally crooked wood may be raifed for all the occafions of fhip-building, with infinitely greater eafe and more certainty than by the method propofed by fome, of bending them down with weights tied to their tops while young.

As to the fupply of young wood in the place of what is cut down, there are fome circumftances which have not had the attention paid to them which they deferve. The fpring frofts, which come on at a time when the fhoots, by which nature is to raife the fupply for what is cut down, are juft preparing to grow, are of prodigious injury, and do not lefs mifchief to thefe than to the young fhoots of garden plants, though the diftant hope of the fucceffion to the proprietor, and ufually alfo the diftance of place, and want of repeated obfervation, occafions its not being perceived. This, however, may, in a great meafure, be guarded againft. Frequent experiments, and repeated obfervations, prove, that the mifchief done by thefe frofts, affect in a much greater degree thofe fhoots which are expofed to the fouth, than thofe which face the north; and that it is greatly more powerful againft fuch as are wholly expofed to the wind, than againft fuch as are fheltered. Thefe known circumftances may give the hint to a method of faving, at leaft a great part of a wood to be felled, from this deftruction, to its renewal, by the making it a rule to begin cutting down on the north fide; and, as the whole felling is a work of fome years, the ftanding wood of every feafon will defend the young fhoots of the newly cut ftumps the following fpring, not only from the fouth expofure, but will fhelter them alfo from the wind.

Many prudent managers have made fine eftates of their coppice-woods, by regularly felling a certain portion every year, and providing for a renewal of the firft cutting, againft the felling of the laft portion, by proportioning the time of growth to the quantity to be cut every year; and there is great intereft to be made of a true knowledge of the growth of wood in this manner. Whoever obferves the growth of young trees, will find that the fecond year's growth is much more confiderable than that of the firft; the third year is more than that of the fecond, and fo on for many years; the yearly growths of young wood greatly encreafing every feafon up to a certain time or age of the tree, after which the increafe in bulk, by growth, becomes gradually lefs. The great advantage to be made of coppice-wood, would be by knowing this interefting period, and feizing on it, always to cut down the trees juft at that time when they arrived at the end of their quick growth, and fo fetting nature to work with new fhoots, to employ the fame fpeed on enriching again the owner. Regular obfervation and experiment alone can afcertain this happy period; but any man who has much coppice-wood upon his eftate, may affure himfelf of it, by cutting a given quantity every year, for ten years fucceffively, and then carefully reviewing the differences of the yearly produce. Memoirs Acad. Scienc. Ann. 1739.

Strength of TIMBER. The celebrated Monfieur de Buffon has attempted a rational calculation of the ftrength of *Timber*, ufed in building, on the principles of his excellent demonftration of the growth of trees. See the article WOOD.

He has proved that all wood confifts of a feries of woody cones laid in woody beds, all along the tree, and connected by a fort of reticular work of much lefs ftrength than their own fubftance. He infers hence, very juftly, that when there are, in any fpecies of wood, more of thefe cones, which fhew themfelves in fo many concentric circles in a tranfverfe fection of the wood, and confequently more of thefe weaker reticular fubftances which connect them, that wood muft neceffarily be weaker than fuch in which, in an equal thicknefs, there are much fewer of thefe cones, and confequently fewer alfo of thefe weaker inter-fpaces.

If the irregularities of the ftructure of wood were only thefe, it would be eafy to compute, from the ftrength of a ftaff of an inch diameter, of any wood, what would be that of a beam of the fame, of any given fize; but this is by no means the cafe; for the difpofition of the cones, beds, and interfticial matter, is by no means the fame in a large beam, formed by the workman, as in a little branch in its natural ftate of growth.

This is eafily conceived, when we confider that, in order to make a beam of *Timber*, they fquare a branch or part of the tree, or cut off four cylindric pieces from it, of what is called the blea. The heart of the wood lies now in the middle of the beam; this is the firft woody bed, which all the others fucceffively cover, in form of fo many concentric circles: The larger of thefe concentric circles is of the diameter of the whole piece of *Timber* now cut, and the circles, which naturally furrounded this, are now no longer perfect, but form only portions of circles, diminifhing all the way to the ribs of the beam. A beam, thus fquared, is therefore compofed of a cylindric compleat piece of firm and hard wood, and of four angular portions, cut out of a much lefs folid and firm wood. This is the condition of a beam, fquared out of a large arm of a tree, and made nearly of the diameter of that arm; but a beam of like fize, cut out of the trunk of a larger tree, or out of one fide of fuch a trunk, is a very different thing, and is compofed only of the longitudinal fegments of the annual woody beds; and thefe fegments fometimes lie parallel to one of the furfaces of the beam, and fometimes more or lefs inclined to one or the other fide; they are alfo fometimes longer, fometimes fhorter; and fometimes more, fometimes lefs, cut into the woody beds of the trunk of the tree they were cut from, and the beam is confequently more or lefs ftrong accordingly.

There are alfo two pofitions in a beam, the one of which is much ftronger than the other; for thefe fegments of the woody beds of the tree, form fo many parallel flats. If you place the beam in fuch a pofition that thefe planes or flats are vertical, it will refift a much greater force than if they are placed horizontally in the pofition of the beam.

From thefe obfervations, it is eafy to fee how very fallacious the calculations and tables of the ftrength of different kinds of *Timber* muft be, while the authors have formed all their fyftems upon experiments made on pieces of one or two inches in diameter, and have given themfelves no trouble to enquire into either the number or difpofition of the woody beds in thofe pieces, nor the directions in which the feveral beds were found on breaking them. Thefe, however, are extremely neceffary and effential circumftances; nor are thefe the only variations which they have omitted to obferve; there are perhaps others equally neglected in all fuch attempts, and yet equally neceffary to make them of any real ufe. Young wood has always much lefs ftrength than the older, and there is a great difference between the pieces cut out of the foundeft part of the body of a tree, and thofe from the young branches of the fame tree. A piece cut out of the outer part of the trunk of a tree, near the blea, is alfo much weaker than one of equal diameter, cut out of the center or heart of a tree. The different age, and degree of drynefs in wood, makes alfo great differences in its ftrength; for a green branch of a tree is always more tough, and lefs eafily broken, than a dry one: And the time employed in putting wood to the trial, as to its ftrength, is alfo a circumftance very neceffary to be confidered; fince a beam of *Timber*, which will fuftain a certain weight for a few minutes, will not fuftain it perhaps for as many hours; and experiment has proved, that wood will often bear, for a fhort time, a weight it cannot bear for a longer time; a beam having been found to bear a certain weight for one day, and the fame beam afterwards having been broken in fix months time by only two thirds of that weight. It is eafily feen, from thefe confiderations, that all the calculations in which thefe confiderations have been neglected, can be of very little certainty; and that to make fuch as may be certainly depended on, is a work of great difficulty.

As the advantages refulting from fuch calculations are, however, yet greater than the difficulties attending the attempt, this gentleman was encouraged to purfue the enquiry to the utmoft. He caufed certain pieces of wood to be broken by a determinate force, and calculating, according to that, what ought to be the force to break fuch as were much larger; he tried afterwards what was the real force that would break them, and how far his calculations approached to the truth; in this he ever found extremely great differences between calculation and reality; and after many repeated trials, was never able to bring the fact any thing near the calculations. And trying, according to the fame rules, others of greater lengths and thickneffes, in proportion to the ftandard piece, he found the calculations as far faulty as before. The difappointment in thefe attempts determined him, however, to try a compleat courfe of experiments, from which a certain table of the force required to break the different kinds of wood might be eftablifhed, to which both himfelf, and the reft of the world, might refer to upon occafion. And this he executed in the following manner.

He began by choofing in a certain fpot of one of his own woods an hundred oaks, which were all found and lively growing trees, and ftood as near to one another as they conveniently could. This caution was ufed, that the wood might be all of the growth of the fame foil, fince it is well known that the growths of different foils are in the fame fpecies of wood, of very different ftrengths, and miftakes of this kind might have rendered the whole attempt fruitlefs. Thefe oaks were all of the fame fpecies, and were in fize from two foot and a half to five foot round. They were chofen purpofely of different growths, or fizes, that the experiments might be the

more similar to the usual customs of the workmen. For when a carpenter has occasion for a piece of four or five inches square, he does not for this purpose cut a tree that might have furnished a piece of a foot square, because of the expence; and it too often is their custom to use such pieces as have a very large share of the blea on them. Not unfrequently indeed they use also rafters, sawed out of large pieces of *Timber*; but these are, of all others, the very worst; and the use of them in building ought to be prohibited, the small wood being infinitely more advantageous for these purposes.

As the degree of dryness of wood alters its strength very much, and as it is also very difficult to be assured with any degree of certainty, of the degree of drying or seasoning of *Timber*; since two trees cut down at the same time shall often be found to dry very differently, it appeared to this gentleman much more eligible to take wood perfectly green for his trials, than that in any degree dried or seasoned.

The trees were felled one by one, and were carried into a proper place; the day after they were felled the carpenters were employed to square them, and the joiners to take their exact dimensions; and on the day afterwards, the pieces were put to the proof; and the following is the method in which most of the experiments were made. Two strong tressels were taken, of seven inches square, three foot high and three foot long, and strengthened in their middle by a very strong piece of *Timber*. On these two tressels were placed the two extremities of the piece of wood which was to be broken; there were also ready several square iron buckles, or rings, made of round iron work, the largest of which was nine inches wide, and was made of iron of seven inches about; the next was seven inches wide, and the iron it was made of was five inches round, and others of different degrees below these.

The piece of wood destined for the experiment, was passed through these rings; the larger of which served for the thicker pieces, the smaller for the thinner. Every one of these rings had on its upper part and on the inside, a rib nicely filed, of two or three twelfths of an inch broad.

The intent of this was to prevent the ring from inclining one way or other, when in use; and on its under part it had two hooks of iron, of the same thickness with the ring itself; these were placed at such a distance from each other, as to form another ring of about nine inches in diameter, into which there was to be put a key of wood of the same diameter, and of four foot long. This key carried a strong table of fourteen feet long, and six feet broad, which was made of rafters of five inches thick, nicely fitted one to the other, and secured by strong bars of wood. This was suspended to the ring by means of the large wooden key, and served to place the weights on; these consisted of three hundred quarters of stones, which were all numbered, and weighed from twenty-five to two hundred pounds each. These stones were put upon the table, and a heap of stones were placed together as long and wide as the table, and as high as was necessary for the breaking of the piece.

There was always great care used to place the piece and the tressels on a level; and they were then fastened, to prevent their displacing themselves. Eight men were employed continually to fill the table, and began by placing in the center weights, first of two hundred, then of an hundred and fifty, next of a hundred; and so on to twenty-five pounds. Two men placed on a scaffold, suspended in the air by cords, placed the fifty and twenty-five pound weights, which could not have been otherwise done, without danger of the mens being crushed to death; four other men held firm the four corners of the table, that they might not stir; and another, with a long ruler of wood marked how much the piece bent and gave way, as they loaded it with weights; while another marked the time, and wrote down the weight, which was often, twenty, twenty-five, or twenty-seven thousand pounds.

Mr. Buffon caused more than an hundred pieces of wood to be broken in this manner; some regular square beams, others rafters sawn out of large trunks, beside three hundred bars; and this great number was but barely sufficient to give a regular scale of the force and strength of *Timber*, in proportion to its several lengths and thicknesses.

This gentleman observed, that a large piece of wood never broke, without first giving some notice of it; that green wood broke with much more difficulty than such as was dry; and in general, such sort of wood as had a spring, resisted more than such as had none. The blea of the wood, the wood of the branches, that of the top of the tree, and in general all the young wood, is weaker than that which is older.

The strength of wood is not at all proportioned to its size; and a piece which is double or quadruple the thickness of another of the same length, is much more than of twice or four times its strength; as for example, there required not quite four thousand weight to break a piece of *Timber* of ten foot long, and four inches square; and yet there required ten thousand to break a piece of double that measure; and to break one of four times the measure, it required twenty-six thousand weight; that is, to break a piece of ten foot long, and eight inches square.

The same observation is also made good, in regard to the different lengths, as well as the thicknesses. The laws of mechanics would inform us, that a piece of *Timber* of eight foot long, ought to bear just twice the weight of one of sixteen feet. But experiment shews us here also, that the piece of eight foot long carries much more than the double of the other.

The wood which grows quickest, supposing the land the same, is always the strongest: That which has grown more slowly, and the annual circles of which, that is, its several woody cones, are thin and slender, is always weaker than the wood in which they are thick.

The strength of wood is proportionable to its weight; and a piece of wood of the same length and thickness with another, but considerably heavier than another, is found stronger also, and that very nearly in the same proportion. This is a remark of no small consequence; and, as the general weight of wood is easily known, it may save the expence of too much wood in building, as well as the danger from the greater error of using too little.

This accurate observer takes notice, that some may imagine his experiments to be the less conclusive, that the *Timber* he broke was loose at the ends; and that in a wall, or building, it is usually fixed at both ends. But he observes, that the difference of this circumstance is not worth considering, for that the piece fixed in a wall is liable to bend in the middle, before it breaks; and that the fixures have no power to retain the ends, when they are pulled by this force.

This gentleman took no notice of any pieces which had faults, as many of those he tried had, and broke with much less than their proportion of weight; but confined his observations and reasonings only to such pieces as were perfectly sound and firm.

It might be supposed, that so great a number of trials as these, and that on so easy a subject, should have left nothing farther to be done in it; but the author himself willingly acknowledges that there is yet much to be known. The proportion of the longitudinal strength of wood to its transverse, is a subject deserving enquiry; as wood in buildings is often used in very different positions, and where the force acts upon it, not transversely, but longitudinally or obliquely in different directions. Mem. Acad. Scienc. Par. 1740.

Seasoning of TIMBER, a term used by our husbandmen, to express the preparing *Timber* after it is felled, for cutting and working up for use.

As soon as felled, it should be laid up in some dry airy place, but out of the reach of too much wind or sun, which, when in excess, will subject it to crack and fly. It is not to be set upright but laid along, one tree upon another, only with some short blocks between, to give it the better airing, and prevent its becoming mouldy, which will rot the surface, and produce mushrooms on it. Some persons daub the trees all over with cow-dung, which occasions their drying equally, and prevents their cracking, as they are otherwise very apt to do.

Some recommend the burying *Timber* in the earth, as the best of all ways of seasoning it; and others have found it a fine preservative to bury their *Timber* under the wheat in their granaries; but this cannot be made a general practice. In Norway, they season their *deal* planks, by laying them in salt-water for three or four days, when new sawed, and then drying them in the sun; this is found a great advantage to them; but neither this, nor any thing else, can prevent their shrinking.

The seasoning *Timber* by fire is the best way of all, for piles and other pieces that are to stand under the earth, or water. The Venetians first found out this method, and the way they do it in is this; they put the piece to be seasoned into a strong and violent flame, in this they continually turn it round by means of an engine, and take it out when it is every where covered with a black coaly crust; by this means the internal part of the wood is so hardened, that neither earth nor water can damage it of a long time afterwards. This method is practised in many places for seasoning the posts for paling of parks, &c. and has this to recommend it, that in the very oldest ruins we have ever been acquainted with, there have been found many times pieces of charcoal, all of which has been found uninjured, though buried in the earth for ever so many ages. *Mortimer's* Husbandry, V. 2. p. 132.

When *Timber* has been properly felled, and seasoned, by being exposed to a certain degree of air and sun, there is yet a method of preserving it, much better than it could otherwise be, by external applications. When they are wrought and fixed in their places, the rubbing them over with tar or linseed-oil, has been found of great use. The antients, particularly Virgil and Hesiod, advise the smoak-drying of all instruments made of wood, by hanging them up in the chimnies where wood fires are used. The whole benefit arising from this, seems to be the oil of the wood that is burnt, entering into the pores of the other as carried up in the smoak. But it would be a much more cleanly and easy method to apply some oil of this kind at once, and in any quantity that should be judged requisite. *Mortimer's* Husbandry, V. 2. p. 104.

The Dutch, who have *Timber* about their fluices, and other buildings upon the water, more expofed to the injuries of wet and weather than any other that is known; have a way of preferving it, by coating it over with a mixture of pitch and tar, which they fmear over the whole furface; and immediately, while it is moift, they throw on it as much fand and powder of cockle-fhells as it will retain. Thus it is coated over with a rough cruft which will defend it from all kinds of injuries. See the article SULPHUR.

Green *Timber* is apt to fplit and cleave in feveral places, after it is wrought into form. Workmen have different methods of remedying this deformity, for which fee the article CLEFTS.

Felling of TIMBER. See the article FELLING.

Hardening of TIMBER. See the article HARDENING *of Timber*.

TIMBER-*Lode*, in our old writers, a fervice by which tenants were to carry *Timber* from the woods to the lord's houfe. *Blount*.

Meafuring of TIMAER, To meafure round *Timber* without the help of inftruments: let the mean circumference be found in feet, and decimals of a foot; fquare it, multiply this fquare by the decimal 0.079577 and the product by the length. For inftance, let the mean circumference of a tree be 10.3 feet, and the length 24 feet; then $10.3 \times 10.3 \times 0.079577 \times 24 = 202.615$ = the number of cubical feet in the tree. The foundation of this rule is, that, when the circumference of a circle is 1, the area is 0 0795774715, and that the areas of circles are as the fquares of their circumferences. Treat. Pract. Geom. p. 150.

The common way ufed by artificers for meafuring round *Timber*, mentioned in the Cyclopædia, differs much from this rule. One fourth part of the circumference or girt, is by them reckoned the fide of a fquare, whofe area is equal to that of the fection of the tree; they therefore fquare the girt, and then multiply by the length of the tree. According to this method the tree of the laft example, would only be computed at 159,13 cubical feet.

TIME (*Cycl.*)—TIME, in the manege, is fometimes taken for the motion of a horfe, that obferves meafure and juftnefs in performing a manege; and fometimes it fignifies the interval between two of his motions. In the manege of a ftep and a leap, the horfe makes by turns a corvet between two caprioles; and in that cafe the corvet is one *Time* that prepares the horfe for the caprioles.

The *Times* obferved in making a ftop, are nothing but fo many falcades.

TIME alfo fignifies the effect of one of the aids, thus, we fay, a good horfeman difpofes his horfe for the effects of the heel, by beginning with one *Time* of the legs, and never runs precipitately upon his *Times*.

TIMOROSO, in the Italian mufic, intimates that the fong is to be played or fung, in fuch a manner as to exprefs an awe or dread, either to fhew refpect, or to reprefent fear.

TIMOROUS, in the manege. See the articles STARTING, SKITTISH, &c.

TIN (*Cycl.*)—The combinations and feparations of metals, are fubjects that have employed the thoughts of the moft accurate chemifts in all ages; yet new difcoveries are ftill to be made, and in thefe experiments as well as in many others, we are by no means yet arrived at the utmoft perfection.

Mr. Groffe in the memoirs of the academy of fciences of Paris, has delivered a method he had invented of feparating *Tin* from lead or filver.

The advantages arifing from the mixtures of different metals, are very numerous and of many different kinds; to this we owe the metal ufed for bronzes, for bells, for reflecting mirrors ufed in opticks, and a multitude of the like matters; a mixture of this kind makes brafs of copper, a little copper in the fame manner, gives filver a hardnefs that greatly adds to its utility, and gives hardnefs and a more pleafing colour to gold; a little copper or antimony give *Tin* a hardnefs, and render it more fonorous: and a multitude of advantages befides might be enumerated. But there is no lefs neceffity and advantage alfo in the feparating metals, fometimes when they have been joined by art, or are found united by nature: in thefe cafes fometimes both the metals are preferved, fometimes the bafer or lefs valuable is deftroyed.

Of thefe feparations of metals fome are very eafy; lead and mercury are feparated from gold and filver by heat alone, and fo are antimony from gold, or zink from copper. On the other hand there are fome feparations which cannot be effected without great trouble; of this kind are the mixtures of *Tin* with lead and with filver. It is not common to mix filver and *Tin* together on any occafion; but they are fometimes found mixed, and give the refiners great trouble; and even the chemifts, who have often mixt *Tin* with filver to increafe it, have always found it very difficult to feparate it again.

Mr. Groffe happened to be prefent at the melting fome filver, which plainly indicating that it contained fome other metal, in the refining he ordered the workman to examine the lead which he ufed, and found that there was *Tin* among it. The fcoriæ of the metal, which contained with the *Tin* a large quantity of filver, had on thefe occafions been ufed to be fold to the bell-founders, to the great lofs of the proprietor of the metal. Some indeed had advifed different methods of recovering the metal from them, but without fuccefs. It was on thefe fcoriæ that Mr. Groffe tried his experiment; it feemed to him that one great ftep toward the feparation of the filver, was the haftening the calcination of the *Tin*, and with this view he tried a mixture of charcoal, falt-petre, and earth, which he put together into the copel with the fcoriæ. It is eafy to fee that a detonation would happen from this, and this muft greatly add to the force of the fire, in acting upon the fcoriæ, while the ferrugineous matter well known to be contained in the charcoal mixed itfelf with the *Tin*, and muft greatly accelerate its calcination, divide its parts, and give the fire a new action over it. The confequence of this perfectly anfwered expectation, and recovered a large quantity of filver from the fcoriæ, in which the *Tin* had before held it firmly imbodied; repeated experiments proved the truth of this obfervation, and it was found to be eafy by this means at any time to feparate filver from *Tin*, or to purify filver without lofs, by means of lead in which *Tin* has accidentally been embodied. The common method ufed by the plumbers to feparate their folder from old leaden pipes, &c. might feem an eafy way of feparating *Tin* from lead, but this is not truly the cafe; the *Tin* in this inftance not being feparated from the lead, but only a mixture of *Tin* and lead, which had been employed as folder is feparated from fimple lead, which had been foldered with it. The method of making this feparation, is only by melting the folder off from the fimple lead by a fire not ftrong enough to melt the lead itfelf.

The fcoriæ in which *Tin* is mixed with filver, are compofed of *Tin* half calcined, and run into an opake vitrified fubftance, which forms a fort of net-work, in which the filver is confined in extremely fmall particles. If this is thrown into aqua fortis, the whole is diffolved: but then it requires a very ftrong fire to make the *Tin* lofe its metallic form; finally if the whole is finely powdered and then put into this menftruum, the filver only is taken up or diffolved, the *Tin* remaining untouched at the bottom of the veffel.

The fame gentleman found alfo a method of feparating *Tin* from filver, by means of corrofive fublimate of mercury. To conceive the manner in which this feparation is effected, a piece of fine *Tin* need only be caft into a folution of fublimate; in which cafe the acid of the fea-falt is feen to leave the mercury in order to fix upon the *Tin*.

And, according to the fame principle, if fublimate corrofive be added to a mixture of *Tin* and filver, the fame effect is produced, the acid affixes itfelf to the *Tin*, and makes with it a butyrum joviale or butter of *Tin*, the mercury becomes diffipated in the mean time by the action of the fire, and the filver remains pure and alone; but in this experiment, if too much corrofive fublimate be added, there is danger of lofing fome of the filver; fince the abundant acid will prey upon and carry off a part of that metal, making a fort of luna cornea which diffipates itfelf in the air, or if the operation be performed in a clofe veffel, a butyrum lunare.

Gold may alfo be purified from *Tin* in this manner, and in this there is no rifk of lofs, fince the acid which takes up the *Tin* has not the leaft power over that metal: In all thefe proceffes, however, the operator muft avoid the fumes iffuing from the crucible, for they are very dangerous.

Thefe methods of feparating *Tin* from filver are very certain and infallible, but they are too expenfive to be employed in common, and in larger works.

The feparating *Tin* from lead to be employed in the refining of filver is a matter of great importance; and this may be done in the following manner: Melt the lead, and when in fufion throw into it a quantity of filings of iron, then increafe the fire to a confiderable degree, and the furface of the metal will be covered with a fort of fcum, which is no other than the iron and *Tin*. At this time there fhould be a little alkali falt thrown in, and by this means the fcoriæ readily feparate themfelves, and the pure lead remains in form of a regulus at the bottom. The fame method may be ufed to feparate *Tin* from filver in the larger way, but it will be neceffary for this purpofe to add fome lead, fince otherwife the fufion will be very flow and difficult, and the *Tin* will calcine without feparating from the filver. This is a very eafy and very cheap method, and will obviate moft of the mifchiefs which happen to the refiners, of which they would have much lefs frequent reafon to complain, if they nicely examined the lead they were to employ. But if gold or filver be mixed with *Tin*, the fhorteft method in fmall quantities is to calcine the whole very brifkly, and in order to compleat the vitrification and feparation of the *Tin*, to caft in a little glafs of lead, which will immediately join itfelf with it and carry it off from the mafs.

It may feem fingular that iron being one of the hardeft of the metals to melt, and *Tin* being of all the eafieft, they fhould fo readily and eafily unite in thefe experiments; but this feems to be the refult of one of thofe natural and unexpected alliances which accident frequently difcovers to us in bodies. There is one conjecture, however, that may be worthy a place in this refearch, which is, that all *Tin* ore contains a quantity of arfenic, and it is well known that iron very readily mixes with arfenic, and is employed to feparate the arfenic from other ores, and a regulus may be formed of arfenic and iron. It is eafy to fuppofe that *Tin* is in its metalline form, not wholly divefted of the arfenic it contained when in the ore, and if this be allowed,

lowed, it is no wonder that the two metals are eafily brought together by the mediation of that principle. Memoirs Acad. Scienc. Par. 1737.

Mr. Cramer gives the practical rules of feparating filver from *Tin*, thus: Divide one centner of *Tin* into two equal parts; put each of thefe into a feparate teft, and add to each fixteen centners of granulated lead, and one of copper; put the whole under the muffle, and make a very ftrong fire; the *Tin* will be calcined immediately, and will fwim upon the lead. Then diminifh the fire a little, till the afhes of the *Tin* that fwim upon the furface do no longer fparkle; when you fees this, add with a ladle two centners of glafs of lead to each teft, in fuch manner that it may be fpread wide over the whole furface of the rejected calx; the calx will then change its form of powder into that of glafs; then increafe the fire to its higheft degree, ftir up the whole with an iron rod made warm; and when the fcorification is perfected, pour out the mafs into a mould; the fcoriæ being feparated, put both the regulus's into two coppels well heated; and into a third put fixteen centners of lead, and one of the fame copper ufed in the procefs; examine all thefe beads after the coppelling is over; if the two firft weigh exactly alike, 'tis a proof the procefs has been well performed, and fubftracting the weight of the bead, feparated from the third pan, from the joint weight of the other two, the remainder is the weight of the pure filver contained in the quantity of *Tin* which was examined. *Cramer's* Art of Affaying, p. 228.

Tin eafily melts with filver, gold, or copper; but when they are mixt with it in equal or lefs quantity, it renders them extremely brittle. Silver is peculiarly fufceptible of this mifchief, and becomes almoft as brittle as glafs, by the admixture of a very fmall quantity of *Tin*. Much greater quantities of *Tin*, however, in fome metallic maffes, leaves them ftill pliant in fome degree. Ten parts of *Tin*, and one part of copper, melted together, make a mafs more rigid than pure *Tin*, but ftill fomewhat tractable; and it is by this artifice, that veffels and utenfils are made of tin, and yet are found confiderably hard.

If to ten parts of *Tin*, and one part of copper, a little zink or brafs be added, it makes a very fonorous metal, but brittle. This is fometimes the mixture ufed as bell-metal, and cannons are in fome places caft of it. Lead becomes fomewhat more rigid, or lefs ductile than before, by being mixed with *Tin*; but of all the metals it fuffers the leaft by the mixture.

If filings, or thin plates of iron, be made red hot in a crucible, and a double quantity of *Tin* put to them in a great fire, the whole will run into a brittle white regulus, which will yield to the magnet.

The vapours of *Tin* are very noxious to filver, gold, and copper, rendering them all brittle; nay, if only a little *Tin* be put into the fire, in which they are to be melted, they become brittle as foon as red-hot, and will break like glafs under the hammer.

This metal, expofed to the focus of a powerful burning-glafs, melts, and emits a thick white fume, and, if held there a long time, wholly diffipates itfelf in that fume. If, on the contrary, this metal be fufed in a coppel by the fame heat, it fumes confiderably, and its furface becomes covered with a white calx, which greatly rarifies and expands, and there finally appear numbers of cryftalline and bright ftriæ like needles in that calx. If this be continued in the focus on a piece of free-ftone, thefe cryftals ceafe to fume, and remain fixed while the ftone itfelf melts and runs. And in the coppel there is ufually a part of thefe run into a reddifh matter, refembling a fort of enamel. If the calx of *Tin* (that is, *Tin* reduced to a grey powder, by being divefted of a part of its oil in the fire) be expofed to the focus of the burning-glafs, it fumes more than plain *Tin*, and is very foon transformed into cryftalline ftriæ, or needles. And if thefe are again expofed to the fame focus, placed on a piece of charcoal, they readily melt, and again affume the form of common *Tin*. The charcoal, in this cafe, furnifhes to the calx of *Tin* that oily matter which the fire had divefted it of; and it is well known, that if the calx of *Tin* be made red hot in a crucible, and any fatty or inflammable matter be added to it, it immediately refumes the form of *Tin* again; this reduction is wholly upon the fame principle with the other, the oil of charcoal doing in the firft, what the fat does in the laft.

It appears, upon the whole, that *Tin* contains an oily matter, which is eafily driven off by fire, and very eafily received again on the mixture of any fat fubftance; that the earthy matter, which is the bafis of *Tin*, is of a cryftalline nature, and very hard to fufe, fince no common fire can vitrify *Tin* alone; and even the focus of the moft powerful burning-glafs does it but with great difficulty, and imperfectly; this femi-vitrification is what throws the calx into needles, whereas were it perfect, the whole would be one uniform mafs, Mem. Acad. Par. 1709.

TIN, in medicine, though greatly celebrated by the writers of many paft ages, is not much efteemed at prefent. It is faid to be good in convulfions, epilepfies, and the madnefs arifing from the bite of a mad dog. Its preparations are thefe: 1. *Stannum pulverizatum*, or powdered *Tin*. 2. *Sal Jovis*, or falt of *Tin*. 3. *Diaphoreticum Joviale*, or antihectic of Poterius. 4. *Aurum mufivum*, or, as it is commonly called, *mofaicum*, mofaic gold.

The powder of *Tin* is faid to be a good remedy againft worms, particularly of the flat kind, which often elude the force of other medicines. See the article WORM.

TIN is alfo a word ufed by fome of the chemical writers to exprefs fulphur.

TIN *Floors*, a contrivance ufed by our hufbandmen who propagate hops, to dry them after the gathering. The common way of doing this, is either on a hair-cloth on a malt-kiln, or elfe by theooft. See the article OOST.

In both thofe ways, however, the hops fuffer very much; the beft way is by the *Tin floor*. It is thus done: Let a fquare brick room be built, with a door on one fide, and a long fire-place of a foot wide in the middle, reaching almoft acrofs it; let holes be made at the fides of this fire-place, to let out the heat into the room; and at the height of five foot above this let a floor be made of laths of an inch thick, laid lattice-wife. Let this be covered with great plates of double *Tin*, taking care that the joinings of the *Tin* be well foldered, and lie upon the laths, not over the interftices, which may be about four inches wide. Let a row of boards be fitted round the edge of this floor, to keep the hops from falling off, then lay on a covering of hops of a foot thick; then make a fmall fire of charcoal in the mouth of the fire-place, and the hops will dry very quick and very regularly. They may be continually ftirred about while drying, and when enough, a part of the boarded edge of the kiln may be taken down, and the dried parcel thruft out, and a frefh parcel laid on in their place. A very fmall quantity of fuel is fufficient in this way, and any fuel will do, for the fmoke never comes at the hops. There is a very great improvement ftill upon this method of drying hops, ufed by fome people; this is the making a wooden cover, of the fize of the *Tin floor*; this is covered with plates of *Tin* nailed on, and is fufpended over the kiln in fuch a manner, that it may be let down at pleafure, when the lower parts of the hops are dry. This is to be let down within ten inches of their furface, and there it acts as a reverberatory, and drives back the heat on the upper ones, fo that they are dried as foon as the lower ones. Thus all the trouble of turning is faved, and the hops are much better dried than in any other way. *Mortimer's* Hufbandry, p. 186.

TIN *Hatch*, in mining, a term ufed by the people of Cornwall, to exprefs the opening into a *Tin* mine. They alfo call it a *Tin-fhaft*.

They make feveral openings in the fides of the hills where they fufpect veins of ore to be. All thefe, except that which opens on the head of the mine, are called *effay-hatches*; but that which does fo, is made their entrance afterwards, and changes its name to that of the *Tin-hatch*.

TIN *Ore*. The firft procefs toward the feparating the metal from this ore, is the roafting it, which the affayer performs in this manner: Put fix centners of *Tin* ore in coarfe powder in a teft, under a muffle made thoroughly red hot, fhutting firft the veffel for a few minutes, and then opening it. If the fire is pretty ftrong, the volatile part will be feen expelled in a thick white fmoak, fmelling like garlic. When this is over, take out the teft, and when the ore is cold, beat it to powder, and roaft it again in a fomewhat ftronger fire, till it exhales no more arfenic, which may be known by putting upon the teft, when juft taken from the fire, a thick cold plate of iron, which will be covered on its under furface with a fmall whitifh cloud, if the ore yet exhales any arfenic. *Cramer's* Art of Affaying, p. 332.

When the roafting is thus finifhed, the ore may be run into malleable *Tin* in the common manner, as the common lead ore is, only with this caution, that the fire in the operation be carried as foon as poffible to the higheft degree that is neceffary here, and the veffel taken out of the fire, as foon as the operation is judged to be finifhed.

TIN *Plates*, an article of manufacture very common among us, and vulgarly called *Tin*. It is iron plated over with *Tin*. The French call it *fer blanc*, white iron, as we fometimes do in England. It was once known under a diftinct name, *latin*. See the article LATIN.

TINA, a name given by the old medical writers to a bath made of a ftrong decoction of many carminative ingredients, to be ufed in the colic.

TINCA, the *Tench*. See the article TENCH.

TINCA *Marina*, the *Sea-Tench*, in zoology, a name given by fome authors to the common *turdus*, called in Englifh, the *wraffe*. *Willughby's* Hift. Pifc. p. 320. See the article WRASSE.

TINCTURE (*Cycl.*)—A general rule for the properly making light *Tinctures* may be taken from the following bitter. Take half an ounce of Seville orange-peel fhaved thin, half a dram of gentian-root thin fliced, a fcruple of the tops of Roman wormwood, half a dram of cardamum-feeds, and the fame quantity of cochineal, each of them lightly bruifed; put thefe ingredients into a pint of French brandy, let them fteep for one night, and filter the liquor the next morning, and thus you have a fine light bitter.

Thefe

These bitters are of the number of many other substances, where the goodness of a *Tincture* does not more depend upon the choice of the ingredients, than upon the manner of their being infused; for if such be suffered to remain too long in the menstruum, or if heat be used in extracting the *Tincture*, the gross, terrestrial, and nauseous parts of the ingredients will be fetched out, and the *Tincture* will thus be loaded with a heavy indolent matter of little virtue. *Shaw's* Lectures, p. 202.

If however, a greater strength be required in the *Tincture* than can be procured by so slight an infusion, when the ingredients are of this nature the matter should never be suffered to be heated or stand long on the same ingredients, but should be when strained off, poured on fresh ones, and so on till of any strength desired, yet perfectly free from the grosser parts.

Apothecaries usually commit the same error in their finer *Tinctures*, that they do in their cordial waters, saturating the liquor in both cases with the grosser and more useless part of the ingredients: whence the cordial waters of the shops too often abound with a gross heavy oil, and the *Tinctures* with a gross heavy earth, or kind of bituminous matter, instead of the brisk, lively, and invigorating spirit, which alone is the thing required in both cases.

To extract the *Tinctures* of hard, resinous, or gummy bodies, however, requires a different treatment, and must be effected in another manner. See the article Gum-*Lac*.

A great variety of *Tinctures* may be given to common water, and many remarkable things occur in their changes on the addition of common menstruums. Take a large spoonful of the syrup of pomegranate-flowers, mix it with five spoonfuls of water; the mixture will be of a very lively and brilliant red: for a violet colour, take the same quantity of syrup of violets and the same of water. When these *Tinctures* are thus prepared have at hand a vial in which is a small portion of oil of tartar, which will only look like water remaining after the washing of the vial. Pour the red or the violet *Tincture* into this vial, and it immediately becomes a fine grass green. Dissolve the quantity of a walnut of crude sal armoniac in a glass of water, pour all out except three or four drops at the bottom, and pour into this glass the fine red liquor, and it immediately becomes black as ink. In order to change the purple liquor red, only have a small quantity of spirit of vitriol in the bottom of a vial, and pour into this; the violet water it immediately on this becomes of a florid red.

Steep Brasil wood in common water, or in white wine twenty hours, the liquor will then look of the colour of red wine; pour this into a glass washed with vinegar and it becomes of a fine yellow, like sack. If this experiment be made with white wine, the wood and the vinegar make so little alteration in it, that it may be drank afterwards, and the whole process seems a way of turning red port into sack. Into this liquor when yellow, drop a few drops of a *Tincture* of benjamin made in spirit of wine, and it immediately loses its yellow colour and becomes white. Beat some galls to fine powder, and rub the powder on a towel, then put into a bason of water, in which any person is going to wash their hands and face, a small piece of common green vitriol, or copperas, after the person has washed, let them have this towel to wipe on, and the hands and face will be as black as if washed with common writing ink. The copperas in the water and the galls on the towel making real ink where they mix. This does no lasting injury to the skin, but will come off again upon washing with soap. Phil. Trans. N°. 238. p. 88.

Tincture *of Ambergrease*. See the article Amrergrease.

Tincture *of Antimony*, *Tinctura Antimonii*, is thus made; take salt of tartar a pound, antimony half a pound, rectified spirit of wine a quart; reduce the antimony to powder, and mix it with the salt by fusion over a strong fire. When it is cold, powder it, and pour on the spirit of wine; digest them together three or four days in a sand heat, and then filtre off the clear *Tincture* for use. The salt of tartar yields a *Tincture* as well as the antimony. It is a diaphoretic and attenuant.

Tinctura *Antiphthysica*. See Tinctura *Saturnina*.

Tinctura Foetida, the stinking *Tincture*, a form of medicine in the late London Dispensatory prepared in this manner; take assafœtida four ounces, rectified spirit of wine a quart, digest them together for some time, and then strain off and filtre the *Tincture* through paper.

Tinctura *Martis cum Spiritu Salis*, a medicine thus prepared: take filings of iron half a pound, Glauber's spirit of sea-salt three pounds; digest all together without heat, as long as the spirit will work upon the filings; then after the fæces have subsided, pour off the clear liquor, evaporating it to one pound, and adding rectified spirit of wine three pints.

This *Tincture* is good in all the cases, in which the *sal martis* is so. See the article Sal *Martis*.

Tinctura Sacra, a *Tincture* of aloes, called also *hiera picra*.

The late London dispensatory have ordered this to be made of only eight ounces of aloes, and two ounces of winter's bark, powdered and put into five quarts of white wine, which is to be shook often, and kept in fusion a week or more without heat, and then strained off for use. *Pemberton's* Lond. Disp. p. 266.

It is a very good method to mix some clean white sand with this, to prevent the aloes from running together in lumps.

Tincture *of Saffron*. See the article Saffron.

Tinctura Saturnina, the lead *Tincture*, a name given in the late London dispensatory to the *Tincture* before called *Tinctura Antiphthisica*.

It is made of sugar of lead and green vitriol, each two ounces; of rectified spirit a quart. The salts are separately to be reduced to powder and then put into the spirit, then the whole is to stand some days without heat to extract the *Tincture*, and afterwards filtered through paper. *Pemberton's* Lond. Disp. p. 277.

Many persons have found great perplexity in making this *Tincture*, it having at first begun to shew a good colour, but afterwards lost it; this accident is owing to heat usually employed in making the *Tincture*.

This *Tincture* is a powerful styptic, and is often used with good success in hectic fevers, spittings of blood, heat of the kidneys, simple gonorrhœas, fluor albus, and tabes dorsalis.

It was first recommended by Etmuller; who from its effect gave it the name of *Tinctura antiphthysica*, which our college of physicians have changed to that of *Tinctura Saturnina*. We also find it in the pharmacopœa of Edinburgh, and in the best of the foreign ones. Mr. Boyle recommends it, and our most eminent physicians use it; notwithstanding that some authors consider it as a dangerous medicine, on account of its principal ingredient, the *saccharum saturni*, which some call a slow poison. Whether it be so or not when given in substance, there it is certain, that there is a great difference between a corrosive salt so given, and a *Tincture* made of the same, in spirit of wine, and given in small doses, as Dr. Mead observes. Who adds, that in slow hectic fevers attended with a looseness, profuse sweats, and a colliquation of the humours, he reckons two or three drachms, given at different times in cooling liquors every twenty-four hours, to be a convenient dose. But the usual dose is thirty drops in Bristol water, or some temperate or cool julep. See *Acc. of a medical controvers. in the City of Cork*. p. 58, 59.

Tinctura *Sĕnæ*, a form of medicine prescribed in the new London pharmacopœa, and intended to stand in the place of the medicine commonly called elixir salutis, and Daffy's elixir. It is thus made, take stoned raisins sixteen ounces, leaves of sena a pound, carraway seeds an ounce and half, cardamom-seeds half an ounce, proof spirit a gallon; digest all together without heat, and when the *Tincture* is well extracted press off the spirit and filtre it for use. *Pemberton's* Lond. Disp. p. 278.

Tinctura *Styptica*, a form of medicine made with very little trouble and apparatus, and serving to supply the place of that elaborate preparation the *Tincture* of Helvetius; it is prescribed in the late London pharmacopœa, and is to be made by mixing a dram of calcined green vitriol with a quart of French brandy *Tinctured* by the cask, this is to be shook together that the brandy may turn black, and then strained off for use. *Pemberton's* Lond. Disp. p. 280.

Tinctura *Thebaica*, a name now given to the *Tincture* of opium, commonly called *laudanum*.

The method of making this is also much altered, as well as the name in the late London dispensatory, where the saffron being looked on as an useless ingredient is wholly left out, and the medicine ordered to be prepared in the following manner: Take of opium strained two ounces, of cinnamon and cloves each a dram, white wine a pint, infuse without heat a week and then strain off the wine through paper. *Pemberton's* Lond. Disp. p. 266.

Tinctures, in heraldry, a word used to express colours, red, blue, green, and the like.

The writers on heraldry have had great disputes about which of these colours or *Tinctures* are the most honourable. All agree in giving the pre-eminence to the metals gold, and silver that is to the yellow and white colours; as to the others, some esteem them more noble as they approach more to light, that is to whiteness. Upton on this account ranges them thus; azure or blue, gules or red, purpur or purple, vert or green, sable or black; others wholly diffent from this, and prefer those colours most which can be seen at the greatest distance; with these, sables or black is the most honourable or first colour; and they alledge the imperial black eagle, placed in a white field as an instance of this. Leigh prefers the red to the blue, as the red has some alliance to gold, and the blue to silver; the sable is generally preferred to green and purple, by those who give the red and blue the first places: it is in this esteem on account of its strong appearance; and green is preferred to purple, because the latter is but of very late use in heraldry, and is called a new colour.

All the precedence given to *Tinctures* must however be considered with this special proviso, that there is no particular reason for bearing them otherwise in the arms of kingdoms and families. In all coats of arms there should be two colours or *Tinctures*; and it is the general rule that the field should be of a nobler colour than the figures placed upon it:

thus

thus in the arms of Scotland the field is yellow, and the lion placed upon it red: and if the field confifts of two different colours parted by fefs or by pall, then the nobleft colour muft always be in the beft place, as on the upper part, or on the right hand of the fhield; but all thefe rules are to be underftood with this limitation, that there are no other fpecial reafons in the family for the contrary. *Nefbit's* Heraldry, p. 19.

TINEA (*Cycl.*)—TINEA *Campeftris*, the *field moth*, in natural hiftory, the name given by Mr. de Reaumur to a fpecies of infect, which in all refpects refembles the *moth* fo deftructive of cloaths, except in its food; as that feeds upon woollen, and makes its neft or covering of that fubftance; this eats the leaves of trees, and in the fame manner makes itfelf a covering from the fibres and integuments of them.

Their changes are the fame with thofe of the common moth, and performed in the fame manner; they only feem to differ in having a more moift food.

Mr. Reaumur firft obferved thefe on the leaves of the afh. This creature for a great part of its life wants no covering, but like the afcarides making its way through the upper integument of the leaf, it feeds on the parenchyma and juices; at length when it has eat away all the fubftance of the leaf, it bites out a piece from each integument of it, over and under its body, and faftens the edges all round with threads of its own fpinning; thus making a compleat cafe or covering, enabling it to bear the open air. This done, it marches from its place to find another leaf fit to fupply it with more nourifhment: thus it changes place feveral times during its life, and as often changes its covering, which requires but a very little time to make a new.

This creature may eafily be found by the curious fearcher in the fpring; for at that time, if the leaves of the afh are examined, many of them will be found flaccid and as it were dry, and the creature will ufually be found buried among the parenchyma of thefe, between their two integuments. Toward the end of fummer thefe creatures pafs into the chryfalis ftate, and from this, after a fhort ftay, into a fmall fort of moth, which flies about the leaves of the fame tree; and is very beautiful when examined by the microfcope, but is too fmall for obfervation by the naked eye. Thefe of the afh are very common, and there is alfo another kind little lefs fo, which at length changes into a two-winged fly, very fmall but of very great beauty; thefe feed upon the leaves of the willow, and make their cafes of the downy matter which envelops its feeds.

Thefe are fmall animals of this genus; but there are others which are confiderably larger, and which make their coverings of various matters and of different ftructure; they are ufually very rough and rugged, and feem made of any matter that happens to be in the way; fome fpecies ufually make them of pieces of ftraw and particles of chaff, others of fmall twigs of bufhes, others of the dry leaves of the oak, broom, and other plants. One fpecies there is that erodes wood; but it never pierces deep into it, but only eats off a part of the furface to furnifh itfelf with matter for its covering. Several fpecies of thefe alfo are inhabitants of the water in this ftate: thefe form their cafes of various materials, in the choice of which they do not feem at all nice. Some of them make them principally of fand; others take the fragments of water-plants, and the fhells of fmall frefh water fhell-fifh into their work. This cafe makes the fhell, under which they fuffer their change into the nymph-ftate; and as according to the general rule of nature, in regard to the water nymphæ of winged animals, thefe have a neceffity of taking in water at times, one end of this fhell or cafe is never clofed up, but only covered with a reticular clofe work. In this ftate they float upon the furface of the water, till the time of the perfect fly's appearing. There are befide thefe, alfo a fpecies of wall *Tinea*, which have been fuppofed by fome to eat the very ftones and other materials of which the walls they crawl upon are built. This however is an error, for they feed only on the liverworts and other plants which grow upon them, and make their cafes out of the integuments of their leaves, and of the fibres of moffes and other things they find there. There is yet another fpecies of thefe moths feeding on vegetables which differs from all thefe, in that it fpins its covering of a fort of filk, which it produces out of its own entrails in the manner of the filk-worm. Thefe cafes are not made fo fpeedily as the others, but are formed of feveral fcales applied at different times one over another, and refemble a fort of coat of armour. Under the cover of this the creature feeds at large on feveral forts of vegetables, and when it has lived the deftined time in this ftate, it draws its whole body under this covering, faftens up the apertures, and thus defended from injuries paffes into the nymph ftate, and after a proper time is feen iffuing out of that in form of an infect of a middle nature, between the fly and butterfly, called a mufco-papilio.

There is a fpecies of *Tinea* or moth, found in the flowers of the lillies in many gardens, which ufes its own dung as the matter to form its cafe of. This fpecies at length becomes a beetle. Another fmall beetle of a purple colour, and very remarkable for its beauty, is produced from a fmall worm of this moth kind, which is as remarkable for its uglinefs; this has three pair of cruftaceous feet, as the other worms of the beetle kind have: both thefe kinds, while in the *Tinea* or worm ftate, collect together all their dung as they void it, and, by a very nice fort of workmanfhip, form themfelves very compact and firm cafes of it, which they drag about with them where-ever they go.

Finally there is another field *Tinea*, the beetle produced by which is of a purple colour on the body, and black in every other part. This, while in the worm ftate, covers itfelf with a cafe made of its own dung, but has this fingularity, that when the time of its change approaches, it defcends to the ground, and buries itfelf there till the time that it comes out in form of a beetle.

All thefe animals might have been defcribed as the dependants on the beetle and fly kinds; but as they have this remarkable quality of feeding in the fame manner, and making themfelves cafes of different materials in the manner of the *Tinea* or cloaths moth while in the worm ftate, and in this ftate they are much more obvious to the eye than the flies, beetles, &c. produced of them, many of which are fo fmall as to efcape obfervation; this accurate author has chofen to defcribe them together, and in this their imperfect ftate. He adds an account of another fet of animals fomewhat allied to them, which he therefore calls the *pfeudo-Tinea*, or falfe moth. *Reaumur*, Hift. Inf. Tom. I. See the article PSEUDO-*Tinea*.

TINEMAN, in our old writers, a petty-officer in the foreft, who had the nocturnal care of vert and venifon, and other employments in the foreft. Leg. *Canut.* ap. *Blount*.

TINET, *Tinettum*, in our old writers, is ufed for brufhwood and thorns to make and repair hedges. In Herefordfhire to *tine* a gap in a hedge is to fill it up with thorns, that cattle may not pafs through it. Chart. *Blount*.

TINEWALD, the parliament or annual convention of the people of the Ifle of Man, of which this account is given; the governour and officers of that ifland do ufually fummon the twenty-four keys, being the chief commons thereof, once every year, *viz.* Upon Midfummer-day at St. John's chapel, to the court kept there, called the *Tinewald*-court; where, upon a hill near the faid chapel, the inhabitants of the ifland ftand round about the plain adjoining; and here the laws and ordinances, agreed upon in the chapel of St. John, are publifhed and declared unto them. At this folemnity the lord of the ifland fits in a chair of ftate with a royal canopy over his head, and a fword held before him, attended by the feveral degrees of the people, who fit on each fide of him, &c. *King's* Defcipt. of the Ifle of Man.

TINGING *of Marble*. The art of doing this has in feveral peoples hands been a very lucrative fecret, tho' there is fcarce any thing in it that has not at one time or other been publifhed.

Kircher has the honour of being one of the firft, who publifhed any thing practicable about it. This author meeting with ftones in fome cabinets fuppofed to be natural, but having figures too nice and particular, to be fuppofed of nature's making, and thefe not only on the furface, but funk through the whole body of the ftones, was at the pains of finding out the artift who did the bufinefs; and on his refufing to part with the fecret on any terms, this author with Albert Gunter a Saxon endeavoured to find it out; in which they fucceeded at length very well. The method is this,

Take aqua fortis and aqua regia of each two ounces, fal armoniac one ounce, fpirit of wine two drams, about twenty-fix grains of gold, and two drams of pure filver, let the filver be calcined and put into a vial, and pour upon it the aqua fortis, let this ftand fome time, then evaporate it, and the remainder will firft appear of a blue and afterwards of a black colour. Then put the gold into another vial, pour the aqua regia upon it, and when it is diffolved evaporate it as the former. Then put the fpirit of wine upon the fal armoniac and let it be evaporated in the fame manner. All the remainders and many others made in the fame manner from other metals diffolved in their proper acid menftrua, are to be kept feparate and ufed with a pencil on the marble. Thefe will penetrate without the leaft affiftance of heat, and the figure being traced with a pencil on the marble, the feveral parts are to be touched over with the proper colours, and this renewed daily till the colours have penetrated to the defired depth into the ftone. After this the mafs may be cut into thin plates, and every one of them will have the figure exactly reprefented on both furfaces, the colours never fpreading: The niceft method of applying thefe, or the other *tinging* fubftances, to marble, that is to be wrought into any ornamental works, and where the back is not expofed to view, is to apply the colours behind, and renew them fo often till the figure is fufficiently feen through the furface on the front, though it does not quite extend to it. This is the method that of all others brings the ftone to a nearer refemblance of natural veins of this kind. *Kircher's* Mund. Subter.

TINNITUS *Aurium* (*Cycl.*)—In the *Tinnitus*, the ear ufually receives founds which do not exift, or at leaft which are not produced by the motion of the external air; and the ear be-

ing filled with a certain fpecies of found, cannot admit other founds, unlefs they are very violent.

The antients imagined that this fymptom was produced by the motion and agitation of the air which was included in the ear, and fuppofed this agitation to be occafioned by flatulencies and vapours being conveyed into the ear, and that thofe flatulencies arofe either from the whole body, as in fevers; or from any particular part, as the ftomach, or brain; or from pituitous humours lodged in the cavities of the ear; and from the differences of thefe they attempted to account for all the various noifes heard in this diforder, as if they were in fome fort real: but when we confider the nature of the noifes heard in this diftemperature of the ear, fuch as the loud roaring, or the murmuring of waters, and the jangling of bells, we fhall eafily conceive thefe can be no real founds; and it is indeed very evident that they do not arife from either wind, or any other matter, ftriking the membranes externally.

As a *Tinnitus* confifts in the hearing a found which either is not real or exifts only within the ear, in order to conceive the meaning of this, we are to confider that the action of hearing confifts in the agitation of the immediate organ appointed for that purpofe; and it is fufficient to produce a found that that organ is agitated, whether it be by the air or not. In order to determine what may be the caufe of this agitation, we need only examine what are the diforders in which a *Tinnitus* ufually occurs; we fhall find thefe to be inflammations, and abfceffes of the tympanum and labyrinth, and the diforders of the meatus auditorius. Inflammations of the tympanum and labyrinth neceffarily produce agitations in the fpiral lamina and in the femicircular ducts, either by tenfion of the membrances, or by the vapours which tranfpire, and mix themfelves with the air in the tympanum.

Acrid fubftances, worms, extraneous bodies, a conftriction of the meatus fucceeding a diftenfion of the glands, and in general every thing that can caufe in the meatus auditorius, pain, and the other fymptoms before defcribed, agitate the membrane of the meatus, and the membrana tympani; and this agitation is able to communicate itfelf to the immediate organ of hearing.

The fecond fpecies of *Tinnitus* is when we perceive a real found which is formed within the ear itfelf: thus we hear a humming noife when we ftop our ears. This noife is caufed by the friction of the hand, or by the compreffion which influences the fkin and cartilages, whofe parts being put into motion may produce an agitation there. The elafticity of the air alfo and the tranfpired matter from the hand, mixing with the internal air in the meatus, may alfo ftrike the organ, tho' not ftrongly, yet fufficiently to occafion a noife, as the offending matter is fo near.

Commotions of the cranium, and diforders which contract the meatus, may alfo caufe a *Tinnitus* in the ear. Several perfons alfo are fubject to a peculiar noife in the ear, which is plainly a pulfation; this ufually affects them moft after exercife, and may very often be heard by other perfons, who place their heads near the difeafed perfon's ear: this is unqueftionably the true pulfation of a dilated artery, fince it always regularly keeps time with the heart.

There feem alfo to be fome fpecies of *Tinnitus*, in which, tho' the humming noife is very ftrong, yet the organ of hearing is itfelf no way diftempered; fuch are thofe of perfons in deliriums in fevers, and of fuch as are fubject to epileptic fits; thefe laft ufually hear a humming in their ears, before they are attacked with a fit, and this feems wholly produced by the agitated fpirits, which difturb thofe parts of the brain where the extremities of the auditory nerve terminate.

The *Tinitus* are therefore of two kinds; the one proceeding from a diftemperature of the organ of hearing, the other from a diforder of the brain; and the cure is to be attempted accordingly. In the fharper *Tinnituffes*, which are ufually occafioned by inflammations and pains in the ear, where the parts are ufually very tenfe and dry, we muft ufe the fame means as in acute pains, and tenfions of the membrana tympani; but in dull humming heavy noifes, which are ufually occafioned by rheums and fuppurations, where the membranes are relaxed, we are to ufe the fame remedies which give relief in pains occafioned by cold: After which it will be no difficulty to chufe the moft proper, while we have a due regard to the circumftances, from which the more juft indications may be taken. *Du Verney*.

TINNUNCULUS, in zoology, the name of one of the long-winged hawks, called by others *Cenchris*, and in Englifh, *Keftrel*, *Stannel*, or *Windhover*.

It is about the fize of a common pigeon. Its bill is fhort, crooked, and very fharp, and covered with a yellow fkin at the top; near this the bill is white, elfewhere it is blue. Its tongue is bifid; its mouth very wide, and its palate blue. Its head is large and flatted, and is of an afh-colour, with longitudinal ftreaks of black. Its back and wings are brown, variegated with black fpots; its rump is grey, with fome tranfverfe black fpots; and its breaft and belly of a pale ruft-colour, with a few longitudinal ftreaks of black. Its tail is long and pointed, its tip of a pale ferrugineous hue, with a broad tranfverfe ftreak of black over it; and the reft of the tail is a mixed grey and brown, with black fpots and ftreaks. Its legs and feet are of a fine yellow. It builds in hollow oaks, and lays four eggs, which are white, variegated with a number of fmall red fpots. It feeds on partridges and other birds. *Ray*, Ornithol. p. 50.

TINTINNABULUM, among the antients. See the article BELL.

TINUS, *Lauruftine*, in botany, the name of a genus of trees, the characters of which are thefe: The flower confifts of only one leaf, and is of the rotated kind, and divided into many fegments at the edges. The center of the flower is perforated by the pointal of the cup, which finally becomes an umbilicated fruit, of the fhape of an olive, containing a pear-fafhioned feed.

The fpecies of *Tinus*, enumerated by Mr. Tournefort, are thefe: 1. The common *Lauruftine*. 2. The *Lauruftine* with nervous leaves. And 3. The fmall-leaved *Lauruftine*. *Tourn*. Inft. p. 607.

TIPHLE, in zoology, a name by which fome authors exprefs the acus, or tobacco-pipe fifh. *Bellon*. de Aquat. 446.

TIPIOCA, a name given by fome authors to a fort of cream or flower made from the yucca or manihot-root, by maceration of it in water, after expreffing the juice.

TIPSARIA, or TAPSARIA, a word ufed by fome medical writers for barley-water.

TIPUL, in natural hiftory, a name given by the people of the Philippine iflands, to a fpecies of crane common there, and fo tall, that when it ftands erect, it can look over a man's head.

TIPULA, in natural hiftory, the name of a genus of fly, remarkable for the great length of its legs, and ufually called by us the *long-legs*.

There are a great variety of kinds of the *Tipulæ*; and the fmaller fpecies fo much refemble gnats, that the generality of authors, not excepting even Goedart and Swammerdam, have confounded the two genera, and defcribed thefe among the gnats. The external appearance, however, is all that conveys an idea of likenefs between them; for the gnat is furnifhed with a trunk, and other offenfive weapons, by means of which it is able to pierce our flefh; and, on the other hand, the *Tipula* has only a mouth without teeth, and has neither inclination, nor is in a condition to do any harm. It is indeed very happy for us, that this is the cafe, fince the *Tipulæ* are greatly more numerous than the gnats, and were thofe vaft clouds of fmall *Tipulæ*, which we fee in marfhy places and elfewhere, and ufually call clouds of gnats, in reality fuch numbers of thofe mifchievous animals, we fhould not eafily efcape a good deal of trouble from them.

The long form of the body, the pofition of the wings, and the length and pofition of the legs, are the circumftances that make the refemblance between the gnats and *Tipulæ*; but the ftructure and organs of the head are alone a very fufficient diftinction. All the fpecies of gnats have their origin from water-infects, whofe form they never quit, till they become winged; but the *Tipulæ* are not fo regular, in this refpect; fome of them being produced from water-worms, and others from infects of the like form, that have lived on earth, and preyed upon the juices of plants.

As the *Tipulæ* differ from the gnats in the figure of the mouth, and in being without a trunk, they differ as much from the other flies of that character, by their refembling the gnat in the fhape of their body. They differ alfo in the conformation of the mouth, and its feveral parts and organs. The opening of the mouth is a flit extending itfelf from the fore-part of the head toward the hinder part, and its lips cannot be called upper and lower; but they are lateral ones. When the body of the creature is preffed, this mouth opens, and fhews what feem to be a fecond pair of lips within. Thefe are more firmly clofed than the others, and refemble only certain duplications of the flefh. The exterior lips are cartilaginous, and are furnifhed with fhort hairs; the interior are perfectly fmooth, and of a flefhy texture. The head of the *Tipula* is of a long and flender figure, and is of the nature of thofe which we call the femi-trunk heads, as they much approach to the figure of the trunks of fome other infects. The lips are articulated at the extremity of this head, and on each fide there ftands, on the upper part, a fort of beard, which, when nearly examined, is found to be articulated in the manner of the antennæ of infects. Thefe two beards, in their ufual pofition, are placed clofe together, and bent forwards over the head: Their office feems to be the covering the aperture of the mouth. Thefe feem conftantly to be found in all fpecies of the *Tipulæ*, and placed exactly in the fame manner. They may therefore be ufed as a character of the creature; and if there fhould be found any fpecies wholly refembling the *Tipulæ*, but wanting thefe, it may be very properly called a *protipula*. *Reaumur*, Hift. Inf. vol. 9. p. 7.

The larger fpecies of *Tipulæ* are ufually found in our meadows, and thefe are in no danger of being confounded with the gnat kind, their fize alone being a fufficient obvious diftinction. Thefe are often found of nearly an inch in length from head to tail; but their bodies are very flender, and are compofed of only nine rings. The male *Tipula* is eafily diftinguifhed, at fight, from the female. It is much fhorter in the body, and is thicker at the tail than any where elfe; this tail alfo ufually turns upwards, whereas that of the female is placed in the

fame

ſame line with the body, and is ſlender, and compoſed of ſeveral ſcaly parts, proceeding from the laſt ring of the body. Theſe creatures are found in our meadows through the whole ſummer; but the end of September and beginning of October is the time when they are moſt of all plentiful: They are ſo common in ſome meadows, in theſe months, that there is no walking a ſtep without putting up whole flights of them. They are extremely well furniſhed by nature either for walking or flying. In the middle of a hot day they will often riſe to a great height in the air, and take long flights; but at other times they uſually only fly to one part of a field from another. They ſometimes uſe their wings alſo in the manner of the oſtrich, aſſiſting their legs with them in running; and ſometimes they make no ſmall uſe of their legs in their ſhort flights, the ſpring with which they throw themſelves off from a plant, carrying them to half the diſtance they are going to.

The legs of theſe creatures are greatly diſproportioned to the body, according to the common rules of nature, eſpecially the hinder pair, which are in the larger ſpecies uſually three times the length of the body. Theſe carry them ſafely and eaſily among the plants, and ſeem of the ſame uſe to them that ſtilts are to boys, in wading through dirt. This large ſpecies is a creature of no great beauty. Its body is of a browniſh colour, and its corcelet is ſo elevated, that the creature ſeems hump-backed. The head is ſmall, and the neck very ſhort. The reticulated eyes are ſo large, that they cover almoſt the whole ſurface of the head; theſe are of a greeniſh colour, with a caſt of purple, when viewed in ſome lights. Mr. Reaumur very carefully examined the head, to find out ſome of thoſe ſmaller ſhining eyes which other inſects of the fly kind have, and which reſemble thoſe of ſpiders: Theſe are uſually placed in a triangular figure on the head; but in this creature there are none of them in the common place; there appear indeed two lucid ſpecks, one at the origin of each of the antennæ, when the head is carefully examined with a microſcope: But Reaumur does not allow theſe to be eyes, he rather ſuppoſes that two very lucid ſpecks, on the anterior part of the breaſt, are eyes, though placed in ſo very ſingular a manner. The wings of this creature are long, but very narrow, and ſeem ſcarce well proportioned to the ſize of the animal; they are tranſparent, but have a ſlight caſt of brown; and their ribs, when viewed by the microſcope, appear beſet with ſcales, or feathers, in the manner of thoſe of the gnat kind. Some ſpecies of the *Tipulæ* have them alſo fringed, with theſe ſcales at the edges. There are no ailerons, or petty-wings, at the origin of theſe, as is the caſe in many of the other ſpecies of two-winged flies; but in the place of them there are two very fine balancers or mallets. Theſe have long pedicles, and roundiſh or oval heads. The ſtigmata of the corcelet are four; one pair are placed immediately underneath theſe balancers, and the other immediately below the firſt pair of legs. The firſt pair are very long, the others ſmall, and thoſe on the rings of the body, if there be any, are too ſmall for our ſight, even with good glaſſes. Each ring of the body is compoſed of two half cylinders, which are joined into one, by means of a membrane, which gives them room to diſtend or cloſe up at the creature's pleaſure. The large *Tipulæ* all carry two antennæ, or horns, upon their head; but theſe are of no remarkable ſtructure, they are only compoſed of a great number of joints, each covered with a fine downy hairyneſs; and at the joining of each to the next, there is a tuft of longer and more ſtiff hairs. This is the deſcription of the common large *Tipula* which we find in the meadows; and in almoſt all its parts, is applicable to the generality of the larger ſpecies of theſe inſects. *Reaumur*, Hiſt. Inſ. vol. 9. p. 13.

The ſmaller kinds are very numerous, and of great variety. Theſe are frequent in all places, and at all ſeaſons of the year: The ſpring ſhews us immenſe clouds of them, and even the coldeſt winter's day ſhews a great number of them in the ſunſhine about noon. Theſe creatures fly much better than the large *Tipulæ*; they ſeem indeed to be almoſt continually upon the wing, and their manner of flight is very ſingular; they are continually mounting and deſcending again, and that without quitting the direction of the line they go forward in; this they will often do for many hours together. In tracing theſe flies from their origin, they are all found to be produced from worms which have no legs, and have a regular ſcaly head. Thoſe from which the larger *Tipulæ* are produced, live under ground; they are moſt fond of marſhy places; but any ground will do that is not often diſturbed. They uſually are found at about an inch under the ſurface, and are ſo plentiful in ſome places, as greatly to injure the herbage. When they get into corn-fields, they cauſe whole acres of the corn to wither before it grows into the ear, and even in paſture-land the graſs is ſometimes ſo entirely deſtroyed by them, that there is no food for cattle in places where the herbage uſed to be ever ſo plentiful and ſtrong. It has been ſuppoſed from this, that they eat up the roots of the plants; but this is not the caſe; they feed only on the ſmall inſects which live under ground, and take in a large quantity of dirt with them into their ſtomachs. The miſchief they do, is by their being continually in motion, and looſening by this means the earth from about the roots, ſo that they dry up with the ſucceeding heat of the ſun.

Theſe creatures do not find it neceſſary to their living, that plants ſhould be upon the ſurface of the earth in which they live. There is frequently found in the hollows of the ſtumps of old trees, a ſort of earth which ſeldom produces any vegetables; yet the female flies of this ſpecies well know that their young will find a proper ſubſtance there; and there are uſually found great numbers of them in all theſe places. The hollow elms and willows, ſo common in our hedges, and by ditch-ſides, afford innumerable proofs of this: but it muſt be obſerved, that they are only found in ſuch earth of this kind, as is continually ſomewhat moiſt; that is, ſuch as is placed in a cavity which will retain the wet that falls into it; for when the earth lies in places where the water eaſily drains off, there never are found any of theſe inſects in it. Mr. Reaumur mentions a very ſingular ſpecies of large *Tipula*, which was produced with him from one of the worms found in the earth of an old elm; this was of the larger kind, and had ſome beautiful ſpots on the wings. It had alſo very elegant tuſted antennæ; whereas, in the common large *Tipulæ*, theſe are plain and ſimply granulated ones, as well in the males as females. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 17.

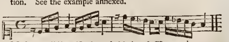
Mr. Ray, in his hiſtory of inſects, deſcribes fourteen ſpecies of this fly found in England. 1. The common *Long-legs*. This is about an inch long, and its antennæ are ſhort and ſlender, and its eyes black. The male of this ſpecies is more obtuſe at the tail than the female. 2. A very large kind, with large wings ſpotted with brown and white. 3. A large kind, with two large black ſpots on the wings. 4. A very beautiful *Tipula*, with black ſhoulders and back, a yellow belly, and ſome brown ſpots on the wings. 5. The yellow-winged *Tipula*, with ſpots on the wings, and a black and yellow body. 6. The common ſmall *Tipula*, with brown wings, ſpotted with white, and with opake dark brown ribs. 7. The middle-ſized black and yellow *Tipula*. 8. The long-legged *Tipula*, with ſhining black eyes. 9. The ſmall purple-winged *Tipula*, with a black back and yellow belly. 10. The middle-ſized green-eyed *Tipula*. 11. The browniſh-grey *Tipula*, with extremely long antennæ. 12. The elegant *Tipula*, with plumoſe antennæ. 13. The ſmall *Tipula*, with brown wings ſtreaked with black. And 14. The ſmall *Tipula*, with ſtriated wings, each having one very large black ſpot near the end. *Ray*'s Hiſt. Inſ. p. 72.

The white *Tipula* is a very beautiful little inſect; it is very common in gardens, and among buſhes in September and October; and tho' it appears all over white when ſeen at a diſtance, yet is not found to be ſo when examined more nearly. The wings, when the creature is ſitting, cover the whole body, and theſe are white; but the body itſelf is of a yellowiſh-green in that part next the head, and of a browniſh-black in the hinder part. The head of this creature is very ſmall, but the antennæ, or horns, are extremely long, and very beautifully feathered; they ſeem indeed a load to the creature to carry, and in their uſual poſition are croſſed one over the other in ſuch a manner, as to appear only one body together. *Reaumur*, Hiſt. Inſ. vol. 9. p. 20.

TIRATA, in the Italian muſic, is uſed to expreſs, in general, any quantity of notes, of whatever kind, provided they be of equal value, moving either upwards or downwards in conjoint degrees; thus they ſay, *Tirata di Semiminime*, when there are many crochets following one another in the manner above mentionod; *Tirata di Legâture*, when there are many notes of the ſame value following one another, among which the laſt of one bar, and the firſt of the next, are tied together by a ſemicircle, thus; ◡ or ⌒.

Tirata is particularly uſed for a ſeries of quavers, or, in the modern notation, of demi quavers or demi-ſemi-quavers, aſcending or deſcending by gradual intervals.

Theſe *Tirate* often, tho' not neceſſarily, begin with an unaccented note, and end on ſome accented one of greater duration. See the example annexed.



Muſicians diſtinguiſh ſeveral kinds of *Tirate*, thus:

1. *Tirata mezza*, or *mezza Tirata*, is that compoſed of three or four quick notes to aſcend, or deſcend to a note, a fourth, or fifth, higher or lower than the note from whence the *Tirata* begins; as in the examples before given.

2. *Tirata defectiva* is when theſe running notes go beyond the fifth, but do not reach the octave.

3. *Tirata perfecta*, is when it runs through the notes of a whole octave, aſcending or deſcending.

4. *Tirata aucta*, or *excedens* is when it goes beyond the compaſs of an octave.

The French call the *Tirata*, *Tirade*, and ſome call them *roulodes*, but improperly, ſays Broſſard.

TIRSIO, in ichthyology, a name given by Gaza and ſome other authors to the phocæna of Willughby and others, the porpeſſe, or marſuin. It is a ſpecies of the delphinus, according to the Artedian ſyſtem; and is called the dolphin with a conic ſhaped body, a broad back, and a ſharp ſnout. Pliny,

Bellonius, and many others, call it *turfio*. See the articles TURSIO, PHOCÆNA, and DELPHINUS.

TIRSITES, a word ufed by fome to exprefs foffile coral.

TISRI, or TIZRI, the firft hebrew month of the civil year, and the feventh of the ecclefiaftical or facred year.

The Hebrews call it *Rofh-hafhanna*, that is, the beginning of the year. It anfwered to the moon of September. On the firft day of this month was kept the feaft of trumpets, becaufe the beginning of the year was then proclaimed by found of trumpets. On this day they refrained from all forts of fervile bufinefs, and offered in facrifice a calf, a ram, and feven Lambs. Levit. xxiii. 24. Numb. xxix. 1. *Calm.* Dict. Bibl. in voc.

TITANIA, τιτανια, in antiquity, a feftival in memory of Titanes. *Potter*, T. 1. p. 433.

TITANOS, a word ufed by fome authors to exprefs lime, by others for the calx of burnt gypfum or plaifter of Paris, and by others a lixivium of quicklime.

TITHENIDIA, τιθηνιδια, in antiquity, a Spartan feftival, fo called from τιθηναι, nurfes, who at this time carried the male infants committed to their charge to the temple of Diana Corythallia. For the ceremonies obferved on this occafion, fee *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 432. feq.

TITHYMALOIDES, in botany, the name of a genus of plants, the characters of which are thefe: The flower is compofed of only one leaf, and in fome degree refembles a fhoe; the piftil finally becomes a fruit like that of the *Tithymal* or fpurge.

The fpecies of *Tithymaloides* enumerated by Mr. Tournefort are thefe: 1. The fhrubby *Tithymaloides* with very large myrtle-like leaves. 2. The orpine-leaved fhrubby *Tithymaloides*. 3. The nerium-leaved fhrubby *Tithymaloides*. *Tourn.* Inft. p. 654.

TITHYMALUS, *Spurge*, in botany, the name of a large genus of plants the characters of which are thefe: The flower confifts of one leaf, and is of the campaniform kind but globofe, divided into feveral fegments at the edge, and inclofed in two little leaves which feem to ferve in the place of a cup to it. The piftil arifes from the bottom of the flower, and is ufually of a three-cornered fhape; this ripens into a fruit of the fame form, which contains many oblong feeds.

The fpecies of *Tithymal* defcribed by authors are thefe: 1. The myrtle-leaved tree-*Spurge*. 2. The broader-leaved tree-*Spurge*; this is evidently no other however than a variety of the firft fpecies, fince, though very different in appearance, it arifes from the feeds of that plant. 3. The turberofe-rooted tree-*Spurge*, with fmooth leaves, and a rough wart-like feed. 4. The leaflefs African tree-*Spurge*. 5. The cotinus-leaved American tree-*Spurge*. 6. The cotinus-leaved tree-*Spurge*, with fmaller leaves ftanding in bundles about the ftalk. 7. The blunt almond-leaved tree-*Spurge* of America. 8. The toad-flax-leaved tree-*Spurge* of America. 9. The box-leaved fhrubby American-*Spurge*. 10. The pale flowered Æthiopian tree-*Spurge*, with leaves like thofe of the German mezereon. 11. The red almond-leaved exotic-*Spurge*. 12. The wood-*Spurge*, with lunated flowers. 13. The hairy-leaved almond-*Spurge*. 14. The creeping-rooted almond-*Spurge*. 15. The gromwel-leaved *Spurge*. 16. The broad-leaved *Spurge*, called *lathyris* and *cataputia* by authors. 17. The broad leaved Spanifh *Spurge*. 18. The wild German broad-leaved *Spurge*. 19. The yellow-leaved *Spurge*, with hairy and finely indented leaves. 20. The foft hairy wood-*Spurge*. 21. The great broad-leaved *Spurge*. 22. The hoary meadow-*Spurge*. 23. The red-ftalked willow-leaved and blite-leaved *Spurge* of Curaffo. 24. The green ftalked willow and blite-leaved *Spurge* of Curaffo, with fmooth leaves. 25. The little annual narrow-leaved *Spurge*, called by many authors *efula*. 26. The little rock-*Spurge*. 27. The obtufe-leaved little *Spurge*. 28. The annual *Spurge* with leaves like thofe of flax. 29. The gentle mountain fmall *Spurge*, called fweet *Spurge*, and *efula dulcis*. 30. The wart-*Spurge*, or rough-fruited *Spurge*. 31. The narrow-leaved wart-*Spurge*. 32. The narrow-leaved almond-*Spurge*, called *alypum* by fome authors. 33. The cyprefs-*Spurge*, called alfo *humipinus*, and *efula* in the fhops. 34. The red-bearded cyprefs-*Spurge*. 35. Alpinus's cyprefs-*Spurge*. 36. The toad-flax-leaved *Spurge*, with a lunated flower. 37. The pine-leaved *Spurge*, the *pithiufa* of Diofcorides. 38. The fea-*Spurge*, called *Tithymalus paralius*. 39. The flax-leaved tree-*Spurge*, called by Boccone the juniper-leaved fea-*Spurge*. 40. The prickly fea-*Spurge*. 41. The narrow-leaved almond-*Spurge*. 42. The jaggy-leaved almond-*Spurge*. 43. The almond-*Spurge*, with a thick pear-fafhioned root. 44. The little willow-leaved *Spurge*. 45. The tuberofe or knotty-rooted *Spurge*, called by fome *apios*. 46. The long-rooted tuberous *Spurge*. 47. The fhrubby marfh-*Spurge*. 48. The broad-leaved triangular-fruited Portugal *Spurge*. 49. The olive-leaved bluifh green *Spurge*. 50. The little fmooth *Spurge*, with leaves like thofe of money-wort, called *chamæfyche*. 51. The little hairy *Spurge*, with leaves like thofe of money-wort. 52. The roundifh-leaved not dentated *Spurge*, called by authors *peplus*, and *efula rotunda*. 53. The common fun-*Spurge*, or heliofcope-*Spurge*. 54. The annual *Spurge*, with oblong fharp pointed leaves, called by Boccone the annual *peplis* with a moffy flower. 55. The creeping annual *Spurge*, with a rounded yet pointed leaf. 56. The red fea-*Spurge*, with obtufe and auriculated leaves; the leaves and ftalk of this plant are all red. 57. The green fea-*Spurge*, with obtufe auriculated leaves; both the leaves and ftalk of this are green. 58. The many-fruited Sicilian *Spurge*, with leaves like thofe of purfelain. 59. The perennial fhort blunt-leaved kind. 60. The Spanifh kind, with long heart-fafhioned leaves. 61. The Aleppo *Spurge*, with round hoary leaves. 62. The fpreading American *Spurge*, with ferrated leaves, and flowers ftanding in clufters in the alæ of the leaves. And, 63. The erect American *Spurge*, with ferrated leaves, and cluftered flowers ftanding on long foot-ftalks. *Tournef.* Inft. p. 88.

TITILLARES *Venæ*, a name given by fome Authors to the iliac veins.

TITILLICUM, a word ufed by fome anatomical writers for the arm-pit.

TITMOUSE, in zoology. See the articles PARUS, and FRINGILLAGO.

TITT, in the manege. See the article NAG.

TIZRI, a Jewifh month, anfwering to our September moon. See the article TISRI.

TIZZONAIOS, in the glafs art, are two apertures, one on each fide the working furnace, by which a fervitor night and day puts in coals to maintain the fire. *Neri*'s art of Glafs, p. 242.

TLAM, or SLAM, in the alum works, a word ufed by the workmen to exprefs a fort of mud or foulnefs which does great hurt to the alum, rendering it foul and coarfe. The *flam* is a muddy fubftance fettling to the bottom of the veffels; but in the boiling the liquor it gives it a reddifh colour, and diforders the whole works when in any great quantity. They always pafs their liquor over four parcels of the alum rock, and the laft if not carefully calcined generally gives it this difadvantageous mixture. Phil. Tranf. N°. 142.

TLAOLI, in botany, a name ufed by fome authors for the plant called *maize*, *frumentum Indicum*, or Indian wheat. *Hernand.* p. 242. Pifo, Mant. Arom. p. 99.

TLAPALEZ-PATLI, in botany, a name ufed by fome authors for the tree whofe fruit is the ben-nut, and whofe wood the Lignum Nephriticum of the fhops. *Hernand.* p. 119.

TLAQUACUM, in zoology, the name given by the Spaniards and fome others to a very remarkable animal in America, commonly known among us by the name of the *poffum* or *opoffum*. See the article OPOSSUM.

TLAQUATZIN, in zoology, a name by which the natives in fome parts of America call the *opoffum*. See the article OPOSSUM.

TLAQUATZIN *Spinofum*, in zoology, the name by which Hernandez has called the cuanda, a fort of Brafilian porcupine. See the article CUANDA.

TLATLANCUAYE, in botany, a name by which fome authors have called the plant which produces the long pepper ufed in medicine. *Hernandez*, p. 126.

TLANHQUACHUL, in zoology, the name of a Brafilian bird, very much approaching to the nature of the European platea or fpoonbill.

It is a very voracious bird, and feeds on live fifh, but will not take or meddle with dead ones, and is all over of a beautiful red. It has a black ring round the upper part of its neck, and is common about the fhores of the fea and rivers. *Marggrave*'s Hift. of Brafil. See the article PLATEA.

TLAYOTIC, in natural hiftory, the name of a ftone found in new Spain, and ufed as a fovereign remedy againft the colic, and feveral other difeafes: it is a fpecies of jafper, approaching to the nature of the lapis nephriticus, and of a green colour. The natives cut it into feveral forms for ufe. See the article *Colicus* LAPIS.

TLEUQUECHOLTOTOTL, in zoology, the Mexican name of a bird of the wood-pecker kind, defcribed by Nieremberg, under the name of the *avis falutiferus*; the feathers of a red creft it carries on its head, being fuppofed a remedy for headachs.

TLILZOCHITL, in botany, a name ufed by fome authors for the plant whofe pod is the fruit called vanilloes, and ufed in chocolate. *De Laet.* Ind. p. 230.

TMOLITES, the name of an excellent wine among the antients, like the Falernian.

TOAD, in zoology. See the article RUBETA.

TOAD-*Fifh*, in ichthyology, an Englifh name for the rana pifcatrix or lophius. See the article RANA.

TOAD-*Flax*. See the article LINARIA.

TOAD-*Powder*, *Pulvis Bufonum*. Dr. Kramer fays, *pulvis bufonum*, when applied by way of pultice, with barley flour and urine, is an excellent remedy for ripening peftilential buboes, but that it has no fuch effect in venereal, or any other than peftilential buboes.

TOBACCO (*Cycl.*)—In the ifland of Ceylon, there are two kinds of *Tobacco* cultivated for profit. They call both kinds *dunkol*, which fignifies a leaf the ufe of which is to be fmoaked. The one kind they call *hingele dunkol*, or *fingele dunkol*; for they make no difference between the letters S and H in their pronunciation; the other they call *dunkol kappada*; *kappada* fignifies gelding, and is a word of Portuguefe origin. This *kappada-Tobacco* is much ftronger and more intoxicating than the other; but both kinds are the produce of the fame plant; only the fingle *Tobacco* has very little care

 taken

taken of it, being, after the sowing, in a manner left to itself, while the other has great pains bestowed upon it during the whole time of its growth, and till it is fit for use, in the following manner: They clear a little piece of ground, in which they sow the seed of the *Tobacco*, and against the time that the young plants have got three leaves a-piece, they choose out another piece of ground into which to transplant them: This they hedge round, and turn their horned cattle into it, that their dung may fall upon it, and sufficiently enrich it. The ground is then dug with a sharp hoe, or spade, in the form of a pick-ax, and the dung, by this means, thoroughly worked into it. When the earth is thus prepared, they take up the young plants, and set them in this new ground, at about a foot square distant from one another.

The manner of giving more or less strength to this *Tobacco*, is by suffering the plants to grow to a greater or less height before they top them, or cut off the stalk at the summit. The usual way is to cut off the top when the plant has fifteen leaves. If they intend the *Tobacco* to be a little stronger, they do this when it has only thirteen; and when they would have it strongest of all, they do it when there are only eleven or twelve leaves. On the contrary, when they would have a milder *Tobacco*, they cut it not off till there be eighteen or twenty leaves; but in this way of counting the leaves, they never reckon the three or four lowest, which do not grow so large and fine as the others. The cutting off the top, prevents the juices of the plant from being wasted in flowers and seeds, which are of no value; and, in consequence of it, all being, after this time, employed to furnish the growth of the leaves, they grow four times as large and thick as they otherwise would do.

To prevent all unnecessary wasting of the sap, these plants are tended every day; and as the young sprouts appear in the joining of the leaves and stalk, they are continually cut off: This is done once in three days, till the leaves have their full bigness, which is about that time when the flowers would have been ripe, had the plant been suffered to grow in its natural way: They are immediately to be gathered when they are full grown, otherwise they waste and decay. They cut down the whole plant, and bring them into their houses, laying them on a heap. When they have lain a little time together, they begin to sweat and grow hot: When they have been a little while fermenting, they turn them, bringing those which were in the middle to the surface, and placing those which were at the surface in the middle; by this means the whole quantity of leaves ferments equally. The longer they lie in this manner, the darker-coloured the *Tobacco* becomes. When they have left it thus to sweat as long as they judge necessary, they hang every stalk separately on cords; and when the whole is thoroughly dry, they carefully take off the leaves, and lay them by in bundles, till they have occasion for them. This is the manner of their preparing the *kappada*.

The single *Tobacco* is sown in the same manner with this; but it is never transplanted nor tended, it grows as it pleases, and when the flowers are ripe, it is cut down, and laid carelessly in heaps, where some of it ferments too much, and some too little. This is much weaker therefore than the *kappada*; and as both kinds are common in the place, the natives smoak them either separately or together, mixed in different proportions, as they like. Some of the Ceilonese chew this strong *Tobacco* with their beetle, and some, who smoke it alone, use no pipe, but, taking a long leaf of it, they roll it up into a long form, and cover it with the leaf of the wattukan-tree; they then light one end of it, and smoak by the other, till the whole is consumed. Philos. Transf. N°. 278. p. 1145.

There are four or five kinds of *Tobacco* frequently raised by the curious in England. They are to be sown in March, upon a moderate hot-bed, and when the plants are come up, they should be transplanted to another hot-bed of moderate warmth, and set at four inches distance, watering and shading them till they have taken root: And as they grow stronger, giving them as much air as the season will permit. In the beginning of May the plants will grow so large as to touch one another; and they are then to be taken up with a large ball of earth about their roots, and removed to a good soil, where they are to be planted at two foot asunder every way. *Miller*'s Gardener's Dict.

Tobacco beat into a mash with vinegar or brandy, and laid on the stomach, has sometimes good effects in removing hard tumours of the hypochondria. We have the history of two cures made by such applications in the Medic. Ess. Edinb.

The juice of this plant is said to be good against ulcers and mortifications. *Boyle*, Works abr. Vol. I. p. 56.

TOBACCO-*Pipe Fish*, the English name of the *acus*. See Tab. of Fishes, N°. 25. and the article ACUS.

TOBACTLI, in zoology, a name which Nieremberg says is often given to the American bird, more commonly called *Hoactli*. See the article HOACTLI.

TOBIANUS, in ichthyology, a name given by Schoneveldt and others, to the ammodytes, or sand-eel.

TOBIS, in ichthyology, a name given by the Swedes to the ammodytes, or sand-eel. The name *Tobianus*, given to this fish by Salvian, seems formed from its Swedish name *Tobis*. Salvian is the first author who has described this fish, but his figure is not accurate, for he has given it two back fins instead of one.

TOCCATA, in the Italian music, is much the same as *Ricercata* or *Phantasia*, *Tastatura*, &c. But what distinguishes the *Toccata* from the other kinds of symphonies, is, first, its being usually played on instruments that have keys, as organs, spinnets, &c. Secondly, that it is commonly composed to exercise both hands. Thus, sometimes the bass holds out a sound, while the upper part makes diminutions, passages, or tiratas; and afterwards this part does the same, while the bass moves in its turn. *Brossard*.

TOCCATINA, in the Italian music, a short research, or *ricercata*. See the articles TOCCATA, *Suppl.* and RESEARCH, *Cycl.*

TOCCAVIENSIS *Bolus*, *Bole of Tokay*, in the materia medica, a fine medicinal earth, dug about Tokay in Transylvania, and esteemed a powerful astringent. Kentman calls it the *bolus Pannonica vera*; and Crato, *bolus Hungarica*.

This last author esteemed it superior even to the bole armenic of Galen, and had a great opinion of it in malignant fevers. It is a fine and pure earth, and very heavy, moderately compact in its texture, but not very hard; and in colour of a considerably deep and strong yellow. It is naturally of a smooth surface, and does not stain the fingers in handling. It ferments violently with acid menstrua, and does not become red in burning. *Hill*'s Hist. of Foss. p. 7.

TOCKAY, in zoology, the name of a species of Indian lizard, distinguished from the other kinds, by being spotted all over.

TOCMOL, in natural history, a name given by some to the common turtle.

TODDA-*Panna*, in botany, the name by which many authors call the *palma farinifera*, or sago-tree. *Herm.* Cat. vol. 3. p. 9.

TODTENVOGEL, in zoology, a name by which Gesner and some other authors have called that species of œnanthe, known in England by the name of the *stone-chatter*, *stone-smich*, or *moor-titling*. *Gesner*, de Avib. See the article STONE-*Chatter*.

TOES (*Cycl.*)—*Adhesions of the* TOES. It is a frequent thing to meet with new-born infants with their fingers or *Toes* cohering or grown together, either by a strict adhesion of the flesh, or else by some loose productions of the skin, as in the feet of ducks and geese; and a disorder of the same kind is also sometimes found in adults, from accidents; as when the fingers or *Toes* have been neglected, after an excoriation of them by burns or wounds. In both these cases the surgeon's assistance is necessary, partly to remove the deformity, and partly to restore the proper use of the fingers.

These adhesions, according to the nature of the disorder, are to be separated two ways, either by cutting out the intermediate skin with a pair of scissars, or else barely by dividing them from each other with the same instruments. When this is done, to prevent their cohesions again, each finger must be invested separately with a spiral bandage about an inch broad, dipped in lime-water and spirit of wine.

Sometimes the fingers, instead of adhering to each other, grow to the palm of the hand, from wounds or burns, so that they cannot be by any means extended, or drawn back to open the hand. The method of relieving this disorder is first very carefully to separate the fingers from their adhesions to the palm, without injuring their tendons, then dress them with a vulnerary balsam, and scraped lint, and extend them on a ferula or thick pasteboard; and let them remain in this extended posture, separately to be dressed till they are perfectly healed; but at every dressing they must be gently moved, to prevent a rigidity or stiffness of the joints. *Heister*'s Surgery. p. 330.

Bones of the TOES. Each of the *Toes*, except the greater one, consists of three phalanges. The great *Toe* indeed has but two; but then there are five metatarsal bones, whereas there are but four metacarpal. The bases of the phalanges remain for a long time epiphyses. The first phalanx of the great *Toe* is very like the second of the thumb; but its basis is more hollow, answerably to the convexity of the first bone of the metatarsus, by which it is supported; its head is in form of a pulley, as in the thumb, but much broader: The second, or last phalanx of the great *Toe*, is like the third of the thumb, but bigger and broader, especially at its basis. The tuberosity, in form of a horse-shoe, which terminates this bone, is also more unequal and more flat than in the thumb.

The first phalanges of the other *Toes* are the longest, but they are shorter and more convex than those of the fingers. Their bodies are very narrow, and contracted in the middle, the bases are generally excavated, and the heads made after the same manner as in the fingers. The second phalanges are very short, and almost without shape; both their bases and heads are formed for articulations by ginglymi, but they are very imperfect. The bodies are of some length in the second and third *Toes*; but they are very short in the other two, especially in the little *Toe*, in which the body is broader than it is long. The third phalanges are nearly of the same figure with those of the fingers, but much shorter and thicker in proportion. In the two last *Toes* they are often united with the

the ſecond phalanges, which is owing, perhaps, to the continual inaction and compreſſion occaſioned by ſhoes. *Winſlow's* Anat. p. 103.

Ligaments of the TOES. The firſt phalanges of the *Toes* are tied to the heads of the metatarſal bones, by a ſort of orbicular ligament, ſet round the edges of the cartilaginous portions of the head, and thoſe of the baſes of the phalanges. In the four leſſer *Toes* of each foot, the inferior part of this ligament is very thick, and is cruſted over as it were with a cartilaginous ſubſtance, fixed to the baſes of the phalanges, and from thence continued over the head of the metatarſal bone next it. This ſubſtance grows hard with age like a ſeſamoide bone.

Of theſe ſeſamoide bones, as they are called, the great *Toe* has two belonging to the firſt phalanx, which are largeſt, ſooneſt formed, and moſt conſiderable of all. The ſecond and third phalanges of all the *Toes* being articulated by ginglymi, have lateral ligaments which go between the ſides of the baſes, and thence to the ſides of the heads: At the inferior edges of all theſe baſes there is a cartilaginous matter joined to theſe ligaments, which hardens with age in the ſame manner with thoſe of the firſt phalanges. *Winſlow's* Anat. p. 135.

TOE, in the manege, is the ſtay of the hoof upon the fore-part of the foot, comprehended between the quarters.

We commonly ſay the *Toe* before, and the heel behind, in French, *Pince devant et Talon derriere*; implying, that in horſes, the *Toe* of the fore-feet is ſtronger than the *Toe* of the hind-feet: And, on the other hand, that the heels behind are ſtronger than thoſe before; and accordingly, in ſhoeing we drive higheſt in the *Toes* of the fore-feet and in the heels of the hinder feet. See the article DRIVE.

A horſe that does not reſt his hinder feet all equally upon the ſhoe, but raiſes his heels, and goes upon the *Toes* of his hind-feet, is called in French *Rampin*. See the article RAMPIN.

TOGA *Picta*, among the Romans, a purple gown embroidered with gold; which was worn during the ſolemnity of a triumph, by thoſe who had that honour conferred on them. It was an antient habit of the Etruſcans, and not brought to Rome till after *Tarquinius Priſcus* had ſubdued the twelve ſtates of that nation. *Hoſm.* Lex. univ. in voc. *Picta*.

TOGOCH, in zoology, a name uſed by many for the umbla minor, or red charre, a fiſh caught in the lakes of Wales. The name is originally Welch. See the article CHARRE.

TOGULA, among the Romans, a narrow kind of *Toga*, uſed by the poorer ſort of people. See the article TOGA, *Cycl.* & *Suppl.*

TOKENS, in peſtilential caſes, thoſe livid ſpots which appear in the ſeveral ſtages of the diſeaſe, and are the certain forerunners of death. They generally appear only under the moſt deſperate circumſtances, and when the patient would otherwiſe be declared dying; but Hodges gives us inſtances where they appeared before any other ſymptoms of the diſeaſe, and came out without any pain or trouble; yet even in theſe caſes the perſon always died. Theſe *Tokens* are the mark by which the ſearchers conclude of the cauſe of the death of the perſon, and are the rule for ordering the houſe to be ſhut up, to prevent the ſpreading the diſeaſe. But the nurſes, and other crafty people have a way of diſguiſing this ſymptom after death, by covering the body with wet and cold ſheets. Theſe ſtrike in the ſpots, ſo that the perſon may be thought to have died by ſome other diſeaſe. *Hodges* de Peſt.

TOLCESTER, *Tolceſtrum*, in our old writers, an old exciſe or duty paid by the tenants of ſome manors to the lord, for liberty to brew and ſell ale. *Blount*.

TOLLENON, among the Romans, a warlike machine, formed in this manner: one beam was fixed very deep in the earth, and on the top of it another more than twice as long, and moveable upon a center. On one end of this croſs-beam were placed a covering of hurdles or planks, within which a few ſoldiers were put, and, by pulling down the other end with ropes, theſe were raiſed above the walls of a beſieged town. See *Pitiſc.* in voc.

TOLLENON, was alſo an engine for raiſing water out of a draw-well. *Pitiſc.* in voc.

TOLLES, or TOLÆ, names given by ſome to the tonſils, and by others to the glandular abſceſſes ſometimes affecting the limbs.

TOLSEY, in our old writers, denotes the place where merchants meet in a city or town of trade. *Blount*.

The word is compounded of the Saxon *Tol*, *tributum*, and *ſee*, *ſedes*.

TOLT, in law, a writ whereby a cauſe depending in a court-baron is removed into the *County-court*. Old. Nat. Br. 4. And as this writ removes the cauſe to the *county-court*, ſo the writ *pone* removes a cauſe from thence into the court of common-pleas, &c. *Terms of Law*, *Blount*, *Cowel*.

TOLTERCAIZTLI, in natural hiſtory, the American name of a ſtone, much reſembling the novacularum lapis, but variegated with red and black ſpots. They uſe the powder of this ſtone and cryſtal calcined together for diſeaſes of the eyes.

TOLUIFERA, in botany, the name of a genus of plants, ſo called from producing the balſam of Tolu. The characters are theſe: The perianthium conſiſts of one leaf, and is of a campanulated form, divided into five ſegments, and having one angle more remote than the others. The flower is compoſed of five petals, which are inſerted into the cup; four of theſe are ſtrait and equal in ſize, and are a little longer than the cup; but the fifth is twice as large as theſe, and is cordated at the end, and has an unguis of the length of the cup. The ſtamina are ten very ſhort filaments, but the antheræ are of the length of the cup, or ſomething more than that. The germen of the piſtil is oblong; there is ſcarce any ſtyle, and the ſtigma is acute. The fruit and ſeeds are yet unknown. *Linnæi* Gen. Plant. p. 182.

TOMATO, the Portugueſe name for the fruit of the lycoperſicon, or love-apple; a fruit cultivated in gardens for the ſingularity of its appearance, and eaten either ſtewed or raw by the Spaniards and Italians, and by the Jew-families in England. See the article LYCOPERSICON.

TOMBAC, a name given by the French to a yellow metal, very nearly approaching to what we call prince's metal, and made by mixing and fuſing together a large quantity of zink with a ſmaller of copper.

TOMEION, a general name uſed to expreſs any ſharp or cutting inſtrument, uſed either in ſurgery, or in the mechanic arts.

TOMENTOSE-*Leaf*, among botaniſts. See the article LEAF.

TOMIAS, Τόμιας, in antiquity, an appellation given to the ſacrifice offered at the ratification of ſolemn leagues.

It was ſo called becauſe they cut out the teſticles of the victim, and took the oath ſtanding upon them. *Potter* Archæol. Græc. T. 1. p. 252.

TOMIN, in our old writers, a weight of twelve grains, uſed by goldſmiths and jewellers. *Blount*.

TOMINEIO, in zoology, a name by which ſome authors have called the guainumbi, or humming bird, the ſmalleſt of all birds. *Joſeph Acoſta*, Ind. Occ. L. 4. c. 37. See the article GUAINUMBI.

The name ſeems derived from the Spaniſh *Tomino*, a grain weight, as if they would call it a bird of a grain weight.

TOMOTOCIA, a word uſed by ſome authors, to expreſs the Cæſarean ſection.

TONE (*Cycl.*)—TONE, *in Muſic*. The word *Tone* is taken in four different ſenſes among the antients: 1°. for any ſound. 2°. For a certain interval, as when it is ſaid the difference between the diapente and diateſſaron is a *Tone*. 3°. For a certain *locus* or compaſs of the voice; in which ſenſe they ſaid the Dorian, Phrygian, Lydian *Tones*. 4°. For tenſion; as when they ſpeak of an acute, a grave, or a middle *Tone*. *Wallis's* Append. ad Ptolem. Harm. p. 172.

In tempered ſcales of muſic, the *Tones* are made equal, but in a true and accurate practice of ſinging they are not ſo. Dr. *Pepuſch*, in Phil. Tranſ. N°. 481. p. 274.

It is uſual in the modern practice of muſic to divide the *Tone*, whether major or minor, into two *ſemi-Tones*. But a late learned muſician contends, that the diviſion of the *Tone-major* is harſh and in-elegant; ſo that, in dividing the fourth into its different ſpecies, the *Tone-major* ought either to be an individed interval, or make part of one. Phil. Tranſ. ibid See the article SPECIES.

According to Mr. Euler, the *Tone* contains two *ſemi-Tones*, taken in a large ſenſe; that is, including the greater and leſſer limma, under the term *Tone*. Thus the *Tone-major* is the ſum of the *ſemi-Tone major* and leſſer limma; as alſo the ſum of the leſſer *ſemi-Tone*, and greater limma. See the article LIMMA. And the *Tone-minor* is the ſum of the greater and leſſer *ſemi-Tones*. Laſtly, the greateſt *Tone*, *Tonus maximus*, is the ſum of two greater *ſemi-Tones*. *Euler*, Tentam. Nov. Theor. Muſ. p. 109.

But what Mr. Euler calls *Tonus maximus*, is more commonly known by muſicians under the name of a diminiſhed third. For thus they call the interval, for inſtance, between G♯ and B♭; it being compoſed of two diatonic intervals G♯ to A, and A to B♭. Vid. *Broſſard*. Dict. Muſ. p. 179.

TONE-*Major*—Six *Tones-major* exceed the octave by more than a comma. *Euler*, Tent. Nov. Theor. Muſ. p. 108.

TONGUE (*Cycl.*)—The *Tongue* is generally eſteemed a neceſſary organ in ſpeaking, ſwallowing, and taſting, yet a woman, who loſt her *Tongue* entirely by a cancer when four years old, ſpeaks diſtinctly, ſings prettily, ſwallows eaſily, and taſtes accurately. Phil. Tranſ. N°. 464. §. 11.

And this inſtance is not ſingle. Another occurs in *Lamberti's* Memoirs; and a third, in the Memoirs of the Academy of Sciences.

TONGUE-*tied*, the popular name for a diſtemperature of the *Tongue* in children, when it is tied down too cloſe to the bottom of the mouth, by a ligament connected all along its middle, and called its frænulum, which requires to be divided, to give the *Tongue* its proper motion.

This is ſometimes the caſe in adults, but oftner in children, who cannot then exert their *Tongues* to ſuck. This is however, by no means ſo common as the women uſually imagine; nor ſo much as one child in a thouſand being afflicted with it; nor is the operation in cutting it of little conſequence, ſince often bad accidents follow it, and ſometimes the loſs of a child's life. When the infant can put its *Tongue* out of its mouth, the frænulum wants no inciſion; but when the *Tongue* cannot be extended beyond the teeth, the operation is neceſſary. *Heiſter's* Surgery, p. 466. *Heildan*. Cent. 3. Obſ. 28.

To perform this, the end of the *Tongue* ſhould be covered with a linnen rag, and held with the fingers to prevent its ſlipping, and the ligament of the *Tongue* running between the ranular veins and internal ſalival ducts, is to be divided by a pair of obtuſe pointed ſciſſars, till it give room enough for ſucking or ſpeaking, but in doing this great care muſt be taken not to wound the ſalival ducts, or the proper veins and arteries of the *Tongue*; for children have been known to periſh upon the ſpot from the cutting the ranular veins in this operation. Midwives often tear this ligament with their fingers as ſoon as a child is born; but this is a dangerous and bad practice.

TONGUE *Wounded*. The *Tongue* is frequently bit in fits of the epilepſy, and in violent falls; and is ſometimes wounded by a bullet.

If the wound is not very large, it will eaſily heal by the application of oil of almonds and ſugar-candy mixt together, or of honey of roſes and oil of myrrh made *per deliquium*; but large wounds of the *Tongue* will not unite without the aſſiſtance of the ſuture. It is therefore no wonder that wounds near the root of the *Tongue* always leave a fiſſure in the part, ſince their ſituation does not allow the uſe of the needle. To prevent the loſs of ſpeech enſuing upon large wounds on the fore part of the *Tongue*, the divided parts ſhould be brought together with the needle as ſoon and as neatly as poſſible, and afterwards anointed with oil of almonds and ſugar-candy, or honey of roſes and oil of myrrh; ſince ſticking plaſters cannot take place here. Gun-ſhot wounds on the *Tongue* can only be healed with theſe unctions, ſince the future can be of no uſe in them: the patient ſhould be kept from talking, and live upon ſpoon-meats during the cure, but more particularly at the time when the wound is about to unite. *Heiſter's* Surg. p. 81.

TONGUE *of Fiſhes*. All fiſhes have either a perfect *Tongue* or the rudiments of one in their mouths; but this organ is very different in the various ſpecies, in its figure, mobility, and other qualities and properties: as to the figure, it is in ſome pointed before, as in the clupeæ; in others it is rounded in this part, as the pearch and clariæ have it. And in others it is ſomewhat bifid, as in the pike. In ſome it is ſmooth on the upper part, as in the gadi, cyprini, and mackrel; in others it is rough and dentated in this part, as in the ſalmon, mullet, &c. In many fiſh the *Tongue* is immoveable adhering firmly to the bottom of the mouth, as in the pearch, cyprinus, and indeed in the greater part of fiſhes; in others it is looſe, as in the whale.

In the cetaceous fiſhes the *Tongue* being looſe, as in quadrupeds, it is uſed by the animal in the ſame manner; but in other fiſhes it is of no uſe in the moving the food about in the mouth, nor is it the genuine organ of taſte, being in many of a cartilaginous ſubſtance, and therefore not proper for receiving the notices of that ſenſe. The principal uſe of the *Tongue* in theſe fiſh, ſeems to be in its ſerving as an aſſiſtant organ of ſwallowing, its being more elevated than the other parts of the mouth, rendering it fit for the toſſing the food down the throat. The true uſe of the *Tongue* in thoſe fiſhes which have it dentated, is that it ſerves to retain the prey from running out of the mouth, and afterwards in the ſwallowing it; what renders them the more fit for this uſe is, that, they have always the prickles turning inwards. It is the opinion of Mr. Ray, that the *Tongues* of the cartilaginous kinds have ſome ſenſe of taſte, and this is more probable, than that the more hard and rigid ones ſhould have any ſuch ſenſe. *Artedi*, de Piſcib.

It is but of late, that we have known enough of the anatomy of ſea-animals, to be able to refer to their proper origin many of the foſſile bodies which belonged once to them: an eminent inſtance we have of this in the *Tongue* of the fiſh called the *paſtinacha marina* by compariſon with which Sir Hans Sloane explained the nature of a very elegant foſſil, found ſometimes with us, but oftner in the Eaſt-Indies, ſometimes in the Weſt, and every where till then ſuppoſed to be a petrified muſhroom. The paſtinacha marina is a fiſh of a flat ſhape, and allied to the thornback kind. The *Tongue* of this fiſh is made up of many bones, all of them crooked, their two ſides making an obtuſe angle, ſuch as the ſides of the under mandible of a man do.

The uppermoſt ſides of theſe ſeveral bones, have furrows and pieces ſtanding together, after the manner of the teeth of a ſhort ſmall-toothed comb, or ſomewhat reſembling what we call the gills, on the under ſide of a common muſhroom; and to this furrowed appearance in the foſſile pieces, was owing the general error of taking them to be of the fungus kind. The extant parts of theſe toothed points in the *Tongue* anſwer to the like parts in the bones of the upper jaw of this fiſh; and between theſe and this bony *Tongue*, the food of the fiſh is cut and ground to pieces. The under ſide of the *Tongue* is, in the ſame manner as the upper, divided into ſeveral crooked pieces; but theſe have in this part no teeth or points: the whole *Tongue* of this fiſh is ſometimes found foſſile, converted into a ſort of ſtone, but this more frequently happens to the ſeveral joints or ſingle bones of which it is compoſed, and theſe are often mutilated or broken. The palate of the ſame fiſh is alſo ſometimes found either whole or in parts, and both the one and the other are of the number of thoſe things, called by Mr. Lluyd *ſiliquaſtra*, from a ſuppoſed reſemblance in them to the pods of the lupine, or ſome other ſuch plant; but he has diſtinguiſhed theſe from the reſt by calling them *ſiliquaſtra pectinata*, or the comb-like ſiliquaſtra. Phil. Tranſ. N°. 230.

TONGUE *of a Muſcle*. What is vulgarly called the *Tongue* in this fiſh from its ſhape, is truly an organ by means of which it ſpins a ſort of threads in the manner of ſpiders or caterpillars; to fix itſelf to the rocks by. See the article MUSCLE.

TONGUE, in the manege. The aid of the *Tongue* or voice, is a ſort of agreeable clacking, or a certain ſound formed by the cavalier, in ſtriking his *Tongue* againſt the roof of his mouth, when he means to animate the horſe, and ſuſtain him, and make him work well in the manege. See the article AID.

To ſwallow the TONGUE, in the manege. A horſe is ſaid to draw in or ſwallow his *Tongue*, when he turns it down his throat, which makes him wheeze as if he were ſhort winded. This fault is cured by giving him a bitt with a liberty for the *Tongue*. See the article LIBERTY.

TONICUM *Diatonum*. See the article GENUS.

TONOS, a word uſed by Hippocrates to expreſs in general any nerve, whether ariſing from the brain or ſpinal marrow. It is alſo uſed to expreſs a tenſion in any part.

TONSÆ, among the Romans, the blades of oars, or that part of them which beats againſt the water. *Pitiſc.* in voc.

TONSILLS (*Cycl.*)—*Inflammation of the* TONSILLS. This is a very common complaint from taking cold, and in its different degrees requires different methods of cure: in general the ſame means are to be uſed as in quinſeys, except that ſuch copious bleedings are not neceſſary; nor indeed is there occaſion for bleeding at all unleſs the patient is of a plethoric habit, or the inflammation be very violent, for in that caſe, the taking away a moderate quantity of blood often prevents its coming to ſuppuration. The patient is firſt to be purged with an infuſion of tamarinds, ſena, and cream of tartar, and this repeated to the third or fourth doſe, if there be occaſion; in the intermediate times, the diaphoretic attemperating and nitrous medicines are to be given in powders, and a large quantity of diluting liquors allowed, which ſhould be gently acidulated, and have a ſmall quantity of nitre diſſolved in them. Gargariſms made of decoctions of biſtort root, red roſes, and other gentle aſtringents, are to be frequently uſed; and the frequent waſhing the feet in warm water often has a very remarkable good effect.

If after four or five days the diſtemper is found not to give way to theſe means, but the tumour ſtill remains; there is then but little hopes to be had of its reſolution, and a very different end is to be attempted; emollient gargariſms are now to be uſed and maturating plaſters externally applied, ſuch as diachylon with the gums, and the like; and ſuppurating cataplaſms are to be applied to the whole neck and throat: theſe methods are to be continued till the tumour either burſts of itſelf, or is ſo ripe as to be fit for opening by the hand of the ſurgeon. After this has been done, and the matter is diſcharged, gargariſms muſt be uſed of decoctions of ſome vulnerary herb, or common green tea, ſweetened with honey of roſes, may be uſed to ſerve the purpoſe. The mouth and throat are to be frequently waſhed with this till the part is healed. It is to be obſerved, however, that the reſolution of theſe tumours is never to be deſpaired of, not even during the uſe of the ſuppurating medicines, for it is often ſeen that the tumour has been wholly diſcuſſed even during the uſe of theſe means, the reſolution often being extremely ſlow.

This is a very troubleſome complaint, and with ſome perſons is apt to return very frequently; the beſt preſervative againſt it is a moderate diet and bleeding about the time of the equinoxes, either in the arm or foot. Some have found it neceſſary to open an iſſue in the arm, in this caſe, and have been by this means perfectly cured, but on its drying up have always found the diſeaſe return. *Heiſter's* Compend. Med. p. 131.

TOOTH-*Ach* (*Cycl.*)—When this terrible pain will give way to no other remedy, it is ſaid it may be ſpeedily removed by cauterizing behind the ear underneath the protuberance termed antitragus. There are ſeveral methods of doing this: ſome uſe a cautery prepared on purpoſe, others only a common ſmall iron nail, or a piece of iron wire, and others heat a ſcalpel red hot and plunge into the part; others alſo affirm that as much ſervice is to be done by cutting there without cauterizing, ſuppoſing that the operation deſtroys a nerve going thence to the *Tooth*, which is the occaſion of the ſenſe of pain in it. But it is to be doubted whether this ſevere remedy be as certain of ſucceſs as ſome pretend. *Heiſter's* Surgery, p. 434.

TOOTH-*drawing*. *Tooth-drawing* according to Cicero was invented by Eſculapius, in whoſe temple the antients hung up a pair of leaden pullicans, very properly ſignifying that no *Teeth* were fit to be pulled out, but ſuch as might be removed with a leaden forceps; that is ſuch as were looſe and ready to fall out of themſelves; for they very little conſult their own welfare, who pull out their *Teeth* while firm and ſound: for drawing the *Teeth* is not only a painful operation, but often brings on bad accidents, and ſometimes even hazards the patient's life.

Tooth-drawing, however wrong in many cafes, yet is certainly right and neceffary in others. 1. In children for the removing their lacteal or deciduous *Teeth*, for when thefe are left too long in their fockets, they difplace the new ones and turn them awry. 2. In infants it is alfo neceffary to draw fuch *Teeth* as grow out of the palate, or out of improper parts of the mouth, and are placed fo as to impede theirfpeaking or fucking. 3. In the *Tooth-ach* proceeding from a *Tooth's* being carious, and giving way to no medicines, drawing is the laft refort, and is abfolutely neceffary. 4. Thofe *Teeth* ought to be drawn which by their irregular figure and pofition lacerate the gums and lips, and cannot be brought into fhape by the file. And laftly, it is fometimes neceffary to draw a *Tooth* for the curing a fiftula, or ulceration of the gums near the roots of the *Teeth*.

The regular method of drawing them is this: If the *Tooth* is in the lower jaw, the patient muft be feated on a low feat, or on the floor, and if in the upper jaw, he muft be placed on a high ftool or table; then the proper inftrument is to be felected, and the *Tooth* carefully drawn as a nail out of a piece of wood. But this muft never be done while the gums are inflamed, fwelled, or otherwife diftempered. *Heifter's* Surgery, p. 456. See alfo *Fauchard's* Chirurgien Dentifte.

Wolf-Tooth. See the article Wolf.

Tooth-*Wort*, in botany. See the article Plumbago.

TOP (*Cycl.*)—Top *of a Ship*, a round frame of boards lying upon the crofs-trees near the head of the mafts, here they furl or loofe the *Top*-fail, &c.

Top-*Armours*, in a fhip of war, are a kind of cloths hung about the round-*Tops* of the mafts for fhow; and alfo to hide the men which are in the *Top* in a fight, who lie there to fling ftink-pots, &c. or to fire fmall fhot down on the enemy in cafe of boarding.

Top-*Mafts*, in a fhip are four, which are made faft and fettled unto the heads of the main-maft, foremaft, mizzen-maft, and bow-fprit refpectively.

Top-*Gallant-Mafts*, in a fhip are two, *viz. main-Top-gallant-maft*, and *fore-Top-gallant-maft*, which are fmall round pieces of timber, fet on their refpective *Top-mafts*; on the top of which mafts are fet the flag-ftaffs, on which the colours, as flags, pendants, &c. hang.

Top-*Ropes*, in a fhip, are thofe with which the *Top-mafts* are fet or ftruck. They are received through a great block, which is feized on one fide under the cap, and then are reeved through the heel of the *Top*-maft, where is a brafs fhiver placed athwart fhips; after this they are brought up and faftened on either fide the cap with a ring: the other part of them comes down by the ties, and fo is reeved into the knight-head; and when it is to be heaved, it is brought to the capftan. Thefe *Top-ropes* belong only to the main and fore-maft.

Top-*Sail-Lifts*, on board a fhip. See the article Lifts.

Top-*Sails*, and Top-*Gallant-Sails*, in a fhip, are thofe belonging to the *Top*-mafts, and *Top*-gallant-mafts.

Top-*a-Starboard*, on board a fhip, the word of command to hale upon the larboard lift.

Top *the Yard-Arms*, on board a fhip, a word of command to make the yards hang higher or lower. See the article Yard.

TOPAN, in zoology, a name by which fome have called the horned-beaked Indian raven, more ufually known by the name of the rhinoceros-bird, *Worm.* Muf. p. 113. See the article Rhinoceros-*Avis*.

TOPAZ, Topazius. The name given by the moderns to a gold-coloured gem, called by the antients the chryfolite, or gold-coloured gem.

This is a very valuable and beautiful gem, when pure and in its moft perfect ftate, but fuch are very rare; and the lefs perfect ones common among our jewellers are of little beauty or price.

The *Topaz* is never found very large; the far greater number of the oriental ones are as fmall as the head of a large pin, and it is but here and there one, which arrives at the fixth of an inch diameter, and very few indeed exceed that ftandard. The American ones are fomewhat larger than thefe, and the European are the largeft of all; but of the leaft value. It is always found in a pebble-like form; roundifh or oblong, and flatted on one fide, and of an irregular and uneven furface, but ufually bright and of a good natural polifh, unlefs where fouled by accidents. It is never found in a columnar or cryftal-like form, notwithftanding that our dealers in gems carry on a large trade with what they call *Topazes*, which are of this fhape: but all thefe when brought to the wheel are found to be no more than common cryftals, accidentally tinged to a yellow colour, as is very common for the cryftals and fpars to be, in and about mines, from an admixture of metalline particles; and almoft all the common *Topazes* worn in rings are of this falfe kind.

The colour of the *Topaz* is ever a pure yellow; but, like the other gems, it has this in very different degrees: the fineft *Topazes* are of a true and exact gold-colour, and are of great fplendour; but they vary from this in degree, up to the deepeft faffron-colour, and down to that of the paleft amber.

The fineft *Topazes* are of equal hardnefs with the ruby and fapphire, and are fecond only to the diamond; from this they degenerate down to the hardnefs of a garnet, and yet lower; but in all the genuine *Topazes*, even the very meaneft are, when brought to the mill, found to be much harder than cryftal. The fineft *Topazes* have a luftre at leaft equal to any gem except the diamond; but the others are but dead and heavy: the oriental ones divefted of their colour, by putting them in the fire, make a very clofe counterfeit.

The *Topaz* is found in the Eaft and Weft-Indies, and in many parts of Europe: the oriental are greatly fuperior to thofe of any other part of the world; and the American are not much better than the German. The fineft gem of this kind ever known, is in the poffeffion of the Great Mogul; its weight is faid to be 157 carrats, and its value more than twenty thoufand pounds. *Hill's* Hift of Foff. p. 598. feq.

Counterfeit Topaz. To counterfeit the oriental *Topaz* in pafte: Take cryftal prepared two ounces, ordinary minium or red lead feven ounces; put thefe into a crucible luted, and bake them twenty-four hours in a potter's kiln. If the mafs is not fufficiently clear and fine, cover it up again and give a fecond baking, and it will come out of a fine *Topaz*-colour. *Neri's* Art of Glaff. p. 131.

TOPE, in ichthyology, an Englifh name for a fpecies of the fqualus according to the Artedian fyftem, diftinguifhed from the other fquali, by the noftrils being placed extremely near the mouth, and by certain foramina, or apertures near the eyes. It is the fifh called by the antients γαλεὸς κύων, *galeus canis* and *canicula*. See the article Galeus *Canis*.

TOPIARIA, in botany, a name by which fome authors have called the acanthus, or bear's breech, a plant common in the gardens of the curious. *Ger.* Emac. Ind. 2.

TOPICS (*Cycl.*)—*Topics* are fuch medicines, as by the fmallnefs and mobility of their particles, attended for the moft part with a gentle acrimony, are able to make their way into the fubftance of the parts to which they are applied, without eroding or wounding any of the folids; and thence are juftly called penetrating *Topics*.

It may be a queftion how *Topics* in medicine act. It is commonly faid that this or that medicine penetrates the pores; but the ideas annexed to fuch expreffions do not feem very diftinct. Writers on this fubject have feldom been at the pains to tell us what pores they mean. We have an effay on this fubject in the Medic. Eff. Edinb. Vol 2. Art. 4. by Dr. Armftrong, who thinks that the effects of fuch medicines are not owing to their particles entering the orifices of the abforbent veins; nor to the opening of the exhalent veffels on the furface of the body by thefe medicines; nor will he allow the particles of penetrating *Topics* to force their way through the coats of the veffels; but he fuppofes, that fubtile medicines are conveyed by the exhalant veffels of the fkin, to thofe parts of the fmaller arteries, where the circulation is choaked by obftruction.

Topic, in rhetoric. See the article Locus.

TOPPING *the Lifts*, aboard a fhip, the fame as haling the top-fail-*lifts*, and therefore they fay *top-a-ftarboard*, or *top-a-port*, that is, hale upon the ftar-board, or larboard lift. See the article Lifts.

TORCH-*Thiftle*, *Cereus*, in botany, a fpecies of plants belonging to the *Cactus*-genus. See the article Cactus, Append.

This plant confifts of a fingle ftem or body, twenty, thirty, or more feet high, and about five inches in diameter. It is of an angular figure, and armed with clufters of fharp firm fpines, growing from tubercles placed along the ribs. The flowers, when open, are of the fize of a large rofe, and confift of forty or more petals; the outer ones purplifh or greenifh, the inner ones white.

It is a native of Surinam, and many parts of fouth America. It has gotten the name *Torch-thiftle*, from its being much ufed for *Torches*.

This plant is frequent in our ftoves among the curious in exotic vegetables, but it fo rarely flowers, that many who have kept feveral fpecies of it in their ftoves for their whole lives, have not happened to fee it. Dr. Trew gives a particular account of the flowering of one of thefe plants, at Nuremberg, in the year 1730; which may be agreeable to the curious, who have not themfelves feen it.

The plant which flowered there was a branch feven years before feparated from another *Cereus* in the fame garden, which had never flowered. It had in this time grown to be fix foot high, and thirteen inches thick: it had feven angles near the bafe, eight in the middle, nine near the top. Its upper part appeared of a bluifh green, from a dufty matter it was covered with; its lower part was of a fine grafs-green, and the down of the prickles was whitifh near the top, and every where elfe brown. On the fifth of September, within an inch of its top, their appeared a round knot growing out of the trunk, this increafed in fize very faft and grew out horizontally, on the fourteenth of the fame month, it was eight inches long, and plainly fhewed the rudiments of a flower, tho' as yet clofed up, and fome elegant ftains of green, purple, and white were vifible on it.

The fame evening the flower began to open, and at midnight was fully expanded, it was then fix inches in diameter, and was of a ftrong but not pleafant fmell. After midnight it began to contract; it grew lefs by half an inch in a few hours, and remained of this fize till the next day at noon; it then foon con-

contracted to half its former diameter, and the next morning it was quite closed and withered, but it hung on the trunk till the thirtieth of September.

The beginning of the flower is a sort of tube, three inches long and about an inch diameter; of a colour between a yellow and a pale green: Its surface is channelled with several small furrows, between which there ran several blunt protuberances in a parallel order along the ridges; where the tube expanded itself, it divided into more than forty petaloide segments, ranked in six separate series; the three exterior and inferior whereof, here and there confounded their order, while the three superior and interior remained separate and unmixed. These several series differed in size and colour, the first or exterior series was of the same colour with the tube, that is of a pale yellowish green, but its upper part gradually inclining to purple. The second and third series had half their inner part greenish, and their edges of a more intense purple; the fourth was between yellow and white, terminating in purple tops; the tops of the fifth were likewise purplish. The petaloide segments of the sixth series were very tender and white, all the segments were of an oblong figure, and in the first series were terminated with blunt tops, in all the others with more and more pointed ones to the very innermost series. The innermost series, which contained thirteen of these segments, had all their edges lightly and irregularly cut and divided: the pistil was of equal height with the surface of the flower, and was a hollow tube, terminating at its upper part in a number of fine tender filaments, expanded in the form of a crown; these were as many in number as the segments of the innermost series, that is thirteen. The day before the flower dropped from the ovary, the place where it was to fall off was marked with a blackish circle, and at this the tube readily and evenly separated from the rudiments of the fruit. The pistil still firmly adhering to the ovary: the petaloide segments of the flower were found not be separated from the tube without tearing, and were really segments, not distinct petals as might have been guessed by a cursory view of the flower. The fruit did not come to its full growth, but grew so far as to shew that it would never have been prickly: upon dissection it afforded a viscous juice, and within it was a cavity, the sides of which were every where beset with small villi, except at the bottom; and at the end of each of these hairs hung a small white vesicle which was the rudiment of a future seed. The error of the common opinion of supposing the flower of the *cereus*, polypetalous, is evident from this description, and all that is observed of this strange and elegant flower, has been since verified by the flowering of the same species with us. About six years ago I was on a visit at the late Lord Petres at Therndon in Essex, when his gardener, who had been some time ordered to watch a *cereus* of this species which was about to flower, called us out at midnight to see it. It had opened three flowers at different heights upon the stalk, and they were all of the same size, something larger than the standard given by Dr. Trew, but in all other respects perfectly agreeing with his description. Philos. Trans. N°. 416.

The propagation of all the kinds of this remarkable plant is by cuttings, which must be laid in a dry place ten days or a fortnight before they are planted, or if it be three weeks, there is less danger of their miscarrying. They are to be planted in small pots, filled with a light sandy earth, with a mixture of lime rubbish, laying some stones at the bottoms of the pots to drain off the moisture. The pots are then to be placed in a gentle bed of tanner's bark, and once a week are to have a gentle watering; this is best done in June, or July: toward the middle of August, they must have air given them by degrees, and at the end of September they must be removed into the stove, where they are to remain the winter. They should always have a dry situation, and should never be exposed to the open air even in the midst of summer. When the top of an old plant has been cut off for propagating; it always throws out several young shoots from its angles, which may all be easily propagated in the same manner, and it will continue to do this in such a manner, that there will be a continual supply even from one stock. They may be brought in small pieces from the West Indies packed up in straw, and will grow when planted here, as well as if cuttings from our own plants. *Miller's* Gardener's Dict.

TORCHENES, in the manege, a long stick with a hole at the end of it, through which a strap of leather is run, the two ends of which being tied together, serve to straiten and closely tie up a horse's nose as long as the stick is stayed upon the halter or snaffle. This is done to keep the horse from being unruly, when he is dressed, or upon any other occasion.

TORDINO, in zoology, a name by which the Venetians call a bird of the lark kind common in their markets, and called by authors *spipolletta*. See the article SPIPOLETTA.

TORDO *Marino*, in zoology, the name of a bird of the starling-kind, called also the *codirosso maggiore*, or *ruticilla major*, and by the Austrians the *stein-reitling*. Aldrovandus has named it the *merula saxatilis*, or rock-blackbird. It is of the size of our starling, and much resembles it in figure, its breast is greyish and has a black transverse streak, and behind that the whole is of a yellowish hue. Its head and back are of a blackish hue with some slight variegations of grey, from the tip of the feathers being of that colour. The tail is long and of a reddish orange colour, and the under feathers of the wings are of the same hue; the females are of a less elegant colour than the males, viz. a mouse-colour variegated with white on the back, and ash-colour on the belly; what is yellow in the male birds is also very pale in the females. It is not uncommon in Germany, and may be taught like the starling to imitate the human voice. *Ray's* Ornitholog. p. 145.

TORDYLIUM, in botany, the name of a genus of umbelliferous plants; the characters of which are these: The flowers are of the rosaceous kind, being composed of several heart-fashioned petals of irregular sizes disposed in a circular order on a cup which afterwards becomes a fruit nearly of an orbicular figure, being composed of two flattish seeds with a high and usually denticulated margin, which easily deposit their covering.

The species of *Tordylium* enumerated by Mr. Tournefort are these: 1. The greatest *Tordylium*, called by some the largest *caucalis*. 2. The smaller Narbone *Tordylium*, called by some the smaller Cretic *seseli*. 3. The least Apulian *Tordylium*, called the least *seseli*. 4. The small Syrian *Tordylium* with a granulated limb, called by some *gingidium*, and the great seeded *caucalis*. And, 5. The Portugal *Tordylium*, with hemlock-leaves, and striated seeds. *Tournef.* Inst. p. 320.

TORMENTILLA, *Tormentill*, in botany, the name of a genus of plants, the characters of which are these: The flower is of a rosaceous kind, consisting of four leaves disposed in a circular form: the cup is of the shape of a bason, consisting of one leaf, divided into several segments; the pistil arises from this cup, and finally becomes a globose fruit composed of several seeds closely laid together, and covered by the cup.

To these it may be added, that the leaves grow always more than three together, at the ends or summits of the stalks.

The species of *Tormentill* enumerated by Mr. Tournefort are these: 1. The common wild *Tormentill*. 2. The large Alpine *Tormentill*. 3. The creeping *Tormentill*, with gold yellow flowers. 4. The great *Tormentill*, with green deeply divided leaves. 5. The lesser *Tormentill*, with leaves deeply indented. *Tournef.* Inst. p. 298.

TORMENTILLÆ *radix*, in the materia medica, is the root of the common wild *Tormentill*, which is frequent with us in woods and on heaths, and flowers in June and July. It is a small trailing plant, and the leaves grow about seven at a joint; the flowers are small but of a lively yellow; the root is tuberous and often an inch thick, brown or reddish without, and of a flesh colour within, of a very astringent taste, and are to be chosen from the druggists large, plump, fresh dried. It is a cordial and a very valuable astringent; it makes a very good addition to the common white drink, changing it to a red colour and increasing its virtue. *Pomet's* Hist. of Druggs, p. 48.

TORPEDO, (*Cycl.*) the *cramp*, or *numb fish*, in ichthyology, a name given to that species of ray-fish which is wholly smooth. See the article RAJA.

The phænomena of this fish are fully explained in the cyclopædia under the article TORPEDO.

TORQUATA, in zoology, a name given by many authors to the common or water-snake, from the remarkable ring it has about its neck. See the article NATRIX.

TORQUILLA, in zoology, the name of a species of woodpecker, more commonly known by the name jynx, and called in English the wry-neck, from its manner of twisting its neck about, and turning its head over its shoulders. *Ray's* Ornitholog. p. 95. See the article JYNX.

TORTOISE (*Cycl.*)—It is said *Tortoises* will live some days after their heads are cut off, and that this is a preparation for dressing them in Pegu. *Boyle's* Works Abridg. Vol. I. p. 28. See the article TESTUDO.

TORTURA, a word appropriated by many medical writers, to express only the distortions of the face, and particularly of the mouth in convulsions.

TORUS, in architecture. See the article TORE, *Cycl.*

TORUSCULA, a word used by some medical writers to express a drop.

TORYNE, in pharmacy, the name of a kind of spatula intended for the stirring up the ingredients of decoctions while boiling.

TORYNETOS, a name given by some to a mixture of bread and water boiled together, whether meant as a kind of a panada, or for a pultice.

TOTANO, or TOTANUS, in zoology, the name of a bird, of the ægocephalus or godwit kind, common in the Italian markets, and more usually known by the name of vetola. See the article VETOLA.

TOTANUS, is also used by some for the limosa. See the article LIMOSA.

TOTAQUESTAC, in zoology, the name of a beautiful American bird, described by Nieremberg from Antonius Herera. It is said to be something smaller than a pigeon, and all over of a most beautiful green; its tail-feathers are of a very great length, and are greatly esteemed. The Indians value the bird so highly that it is death by their laws to kill it, so that when it is caught they only strip it and let it go again. *Ray's* Ornithol. p. 303.

TOTTAVILLA, in zoology, a name by which ſome authors have called the *alauda arborea*, or common wood-lark. See the article ALAUDA.

TOUCAN (*Cycl.*)—TOUCAN, in zoology, the name of a very remarkable Braſilian bird, a kind of magpie, of a middle ſize between our common magpie and the thruſh, but having a beak thicker and longer than its whole body; this beak is hooked at the end, and is of a very thin ſubſtance, not exceeding the thickneſs of a membrane, and very light and hollow, yet bony in ſubſtance and very bright and ſhining. It has a ſort of toothed edge, which prevents its ſhutting cloſely, and giving paſſage for the air, enables the bird to live without noſtrils.

It is yellowiſh on the outſide and red within, and is covered with a ſort of ſcaly ſubſtance eaſily ſcraped off with a finger at the edge. Its head is large in proportion to its body, and is black on the crown, the reſt of it and the neck and back are ſlightly variegated with white; its breaſt is of a bright orange-colour, and its belly and thighs of a very fine and bright red, and the tail is black, but red at the end: it is on the whole a very ſingularly beautiful bird. It is ſaid that it feeds on pepper, and Thevet affirms that it devours it greedily and returns it again undigeſted, and that the natives gather up that pepper, and uſe it in their food, as leſs hot and acrid than the freſh pepper. See Tab. of Birds, N°. 11. and *Ray's* Ornitholog. p. 88.

TOUCH-*Hole*, or VENT, in gunnery, is the ſmall hole at the end of the cylinder of a gun or muſquet, by which the fire is conveyed to the powder in the chamber. In a firelock, carabine, or piſtol, it is called the *Touch-hole*, but in a piece of cannon it is more properly called the vent.

TOUCH-*Needles*, ſmall maſſes of gold, ſilver, and copper, each pure, and ſimple, and in all the different combinations, proportions, and degrees of mixture, prepared for the trying gold and ſilver by the *Touch*-ſtone; by compariſon with the mark they leave on it.

The metals uſually tried by the *Touch*-ſtone, are gold, ſilver, and copper, either pure, or mixed with one another in different degrees, and proportions, by fuſion. In order to find out the purity, or quantity of baſer metal in theſe various admixtures, when they are to be examined, they are compared with theſe needles, which are mixed in a known proportion, and prepared for this uſe. The metals of theſe needles both pure and mixed, are all made into laminæ or plates, one twelfth of an inch broad, and of a fourth part of their breadth in thickneſs, and an inch and half long; theſe being thus prepared, you are to engrave on each a mark indicating its purity, or the nature and quantity of the admixture in it.

The manner of making the *Touch-needles* is by the proportions of the mark, a weight of half a pound, or eight ounces, being divided into fixteen half ounces, the half ounces each into four drams, the dram into four penny-weight, and this into two half penny-weights.

Silver TOUCH-*Needles*, theſe muſt be only tempered with copper, and the proportion determined by the mark divided into half ounces and grains.

You muſt uſe therefore for this purpoſe one mark of ſuch a weight that it may conſtitute a ſufficient maſs of metal for the making one needle, let it weigh for inſtance one dram, then weigh ſuch a mark of the pureſt ſilver, wrap it up in a ſmall paper and upon this write fixteen half ounces, which will ſignify that the whole mark of this metal is the pureſt ſilver, make the firſt needle of this maſs.

Next weight fifteen half ounces of pure ſilver, and one half ounce of pure copper, wrap theſe both in a paper, and write on it fifteen half ounces, which will ſignify that there are in that ſmall maſs fifteen parts of pure ſilver, and one part of pure copper; make of this the ſecond needle. In the ſame manner go on with the reſt, add two half ounces of copper to fourteen half ounces of ſilver, mark it fourteen half ounces, make the third needle of this, and in the ſame manner proportion the ſmall maſſes of ſilver and copper for making the other needles, and put inſcriptions upon every one in the following manner.

For the needle	half oz. of ſilver	half oz. of copper.
1.—	16	0
2.—	15	1
3.—	14	2
4.—	13	3
5.—	12	4
6.—	11	5
7.—	10	6
8.—	9	7
9.—	8	8
10.—	7	9
11.—	6	10
12.—	5	11
13.—	4	12
14.—	3	13
15.—	2	14
16.—	1	15

When you have gone thus far, and have the metals in each of theſe proportions, wraped up in its ſeparate paper; put each ſeparately, into a new crucible never uſed for any operation, and adding a little borax melt them together in a very quick fire, which muſt be well kindled before with bellows: or what is yet better, throw them ſuddenly into a hot crucible, and as ſoon as they melt, ſtir them with a dry wooden peg, burnt at the end, and pour them immediately into an ingot. When this is done, wrap up each maſs, when cold, in its own paper again, and weight them ſingly, in a nice ballance. If they ſtill weigh a whole mark, they are good; but if there is any conſiderable deficiency in their weight, it is a ſign that your fire having been too weak, or of too long duration, has conſumed as much copper as is wanting in the weight; therefore this maſs muſt be eſteemed uſeleſs, and another made in its place in the ſame proportion.

When this is all finiſhed, make with a hammer out of each theſe ſmall maſſes, a *Needle*, making them a little hot; then engrave on each of theſe *Needles*, the number of half ounces it contains, as before marked on its paper; that is, upon the firſt 16, upon the ſecond 15, and ſo on, and then pierce them at one end, and running a ſilver wire thro' their eyes, collect them in order according to their different numbers. Theſe are the *Silver Touch-Needles*, made of the different allays of ſilver and copper.

In Holland they make uſe of the mint mark, divided into grains for the making their *Needles*. The firſt *Needle* made of pure ſilver is ſaid to be of twelve penny-weights. The ſecond is made of eleven penny-weights and eighteen grains, by the addition of ſix grains of copper. The third is made of eleven penny-weights and twelve grains, by the addition of twelve grains of copper; and ſo on, the proportion of ſilver decreaſing always ſix grains, that is, one quarter of a penny-weight at a time, and that of the copper being always increaſed in the ſame proportion, till at laſt the weight of the ſilver is reduced to one penny-weight, and that of the copper encreaſed to eleven penny-weights, which proportion conſtitutes the laſt *Needle*.

It is needleſs however, to go through the whole ſeries of the *Needles*, by ſo ſmall progreſſions to the very laſt, for very delicate proportions cannot be very accurately diſtinguiſhed in the operation.

Gold TOUCH-*Needles*. Theſe muſt be mixt either with ſilver alone, or with ſilver and copper, variouſly intermixed. This mixture is called allaying or carracting, and is determined with a mark divided into carracts, or weights of two ſixth parts of an ounce. There is nothing to be obſerved about the making of theſe *Needles*, beſide what has been already ſaid in regard to the *Silver Needles*; except that the proportions of the weights are determined in another manner. Theſe *Needles* are made according to the following diviſion and order; and they all weigh one mark.

The firſt is entirely of pure gold.

	pure gold	pure ſilver.
2.	23 Car. 6 Gr.	6 Gr.
3.	23 Car.	1 Car.
4.	22 Car. 6 Gr.	1 Car. 6 Gr.
5.	22 Car.	2 Car.
6.	21 Car. 6 Gr.	2 Car. 6 Gr.
7.	21 Car.	3 Car.
8.	20 Car. 6 Gr.	3 Car. 6 Gr.
9.	20 Car.	4 Car.
10.	19 Car.	5 Car.
11.	18 Car.	6 Car.

The decreaſe goes on thus, by whole carracts, till the weight of the gold is arrived at one carract, and that of the ſilver at twenty three; for after the ninth *Needle* you cannot make ſo exact a diſtinction of the half carracts.

This mixture of gold and ſilver is called the white allay; but when copper together with ſilver enters into the mixture of the gold, then it is called a mixt allay. The *Needles* for trial of pieces thus debaſed, are made of mixtures analogous to the former, except only that thoſe portions which in the firſt caſe were pure ſilver, here conſiſt of copper and ſilver mixt. Therefore you have here a double ſeries; for the mixture is either of two parts of ſilver, and one of copper, or of two parts of copper and one of ſilver. For inſtance,

The firſt is of pure gold.

	of pure gold.	of pure ſilver.	of pure copper.
2.	23 Car. 6 Gr.	4 Car.	2 Gr.
3.	23 Car.	8 Gr.	4 Gr.
4.	22 Car. 6 Gr.	1 Car.	6 Gr.
5.	22 Car.	1 Car. 4 Gr.	8 Gr.
6.	21 Car. 6 Gr.	1 Car. 8 Gr.	10 Gr.
7.	21 Car.	2 Car.	1 Car.
8.	20 Car. 6 Gr.	2 Car. 4 Gr.	1 Car. 2 Gr.

and ſo on as in the foregoing.

If in this table you take pure copper inſtead of pure ſilver, and ſilver inſtead of copper, this gives you a third ſeries of golden *Needles*. And you may have a fourth by mixing with gold equal quantities of ſilver and copper in the ſame proportion. Theſe allays of gold are much in uſe, but workmen may eaſily employ a multitude of other variations, which compared with the already mentioned will be diſtinguiſhed in a thouſand different ways by an experienced perſon, ſo that it is neither poſſible, nor neceſſary to imitate them all.

But that theſe *golden Needles* may not be too expenſive, they

they may be made much ſhorter than thoſe of ſilver, and afterwards ſoldered to plates of copper, that may be ſufficiently long for uſe.

The uſe of theſe *Needles* is by means of the touchſtone; and ariſes hence, that every metal when pure muſt have its ſpecific colour, that diſtinguiſhes it from the reſt: but metals being the moſt opake of all known bodies, the ſpecific colour of every one appears moſt diſtinctly when you rub it againſt a very black hard ſtone; and if the colours of two or more metals are expreſſed by large lively ſpots, made near each other on the ſame plane, by rubbing them againſt the ſurface of the ſtone, you will by that means eaſily diſcern their difference, or their likeneſs.

The ſtone adapted to this uſe, and called from its office the *Touch-ſtone*, muſt have the following qualities. It muſt be of the deepeſt black, leſt the tincture of the metal ſhould be altered by ſpurious rays of light ſhining among it: it muſt be capable of being pretty well poliſhed, for when too rough, the colours of the metals rubbed againſt it cannot be neatly or regularly diſtinguiſhed; and if it is too ſmooth, the metals are but faintly, and too ſlowly abraded or ſcraped by it, eſpecially when gold is tried. It muſt alſo be neither too hard, nor too ſoft. Tripoli, coal-duſt, and tin aſhes are uſed in rubbing off the thin metalline cruſts, and in a ſhort time the ſtone when very hard is apt to acquire too ſmooth a ſurface; and when it is too ſoft it eaſily wears, throws off a duſt, and contracts furrows.

The black rough marbles, and the ſofter black pebbles from the beds of rivers, are moſt proper for this uſe, and are to be made into the form of a quadrangular priſm, about an inch thick, and two or three inches long.

The method of uſing your *Needles* and the ſtone is this: When you meet with a piece of metal to be tried; firſt wipe it very well with a clean towel, or piece of ſoft leather, that you may the better ſee its true colour; for from this alone an experienced perſon will in ſome degree judge before-hand what the principal metal is, and how, and with what debaſed.

Then chuſe a convenient not over large part of the ſurface of the metal, and rub it ſeveral times very hardly and ſtrongly againſt the *Touch-ſtone*; that in caſe a deceitful coat or cruſt ſhould have been laid upon it, it may be worn off by that friction. This however is done more readily by a grindſtone or ſmall file if you have them at hand. Then wipe a flat and very clean part of the *Touch-ſtone*, and rub againſt it over and over, the juſt mentioned part of the ſurface of the piece of metal, till you have on the flat ſurface of the ſtone a thin metallic cruſt, an inch long and about an eighth of an inch broad: this done look out the *Needle* that ſeems moſt like to the metal under trial, wipe the lower part of this *Needle* very clean, and then rub it againſt the *Touch-ſtone* as you did the metal by the ſide of the other line, and in a direction parallel to it. When this is done, if you find no difference between the colours of the two marks, made by your *Needle*, and the metal under trial; you may with great probability pronounce that metal, and your *Needle*, to be of the ſame allay; which is immediately known by the mark engraved on your *Needle*. But if you find a difference between the colour of the mark given by the metal, and that by the *Needle* you have tried; chooſe out another *Needle*, either of a darker or a lighter colour than the former, as the difference of the tinge on the *Touch-ſtone* directs; and by one or more trials of this kind you will be able to determine which of your *Needles* the metal anſwers, and thence what allay it is of, by the mark of the *Needle*; or elſe you will find that the allay is extraordinary, and not to be determined by the compariſon of your *Needles*.

But if the metal under trial, has been altered by tin, arſenic, zink, or other ſuch admixtures, the workmen may be deceived by the colour, ſo as to take for pure gold, or ſilver, that which is not by any means ſuch. Deceits of this kind however are found out by the aſſiſtance of acid menſtrua. *Aqua fortis* anſwers this purpoſe, when the maſs is of the colour of gold, and *aqua regia* when it is of the colour of ſilver; for the firſt of theſe menſtrua diſſolves all metals except gold, and the latter all metals except ſilver. In this caſe then you are to pour upon your metallic ſtreak on the ſtone, one ſmall drop of either of theſe liquors, and extend it gently over it with a feather. If it is neither gold nor ſilver the whole ſtreak will be obliterated and conſumed, but if there is any gold or ſilver in it, this remains undiſſolved, and ſhews another colour, becauſe the other parts have been ſeparated from it by the ſolution. When theſe menſtrua are uſed, great care muſt be taken that there is no oil in the way; for that would ſpoil and deſtroy their effects.

Beſide theſe the following particulars are to be obſerved: Gold and ſilver when pure, whether ſeparate or both mixed together, without the addition of any other matter, when made hot in the fire, not only preſerve their colour, but if they were tarniſhed before, they recover their ſplendour there, not loſing the leaſt part of their weight: and by this quality in theſe two metals, the *caratura alba*, or white allay, made by the mixture of gold and ſilver alone, is diſtinguiſhed from all the others. If you have not liberty to try the whole maſs in the fire, you may make this experiment on a ſmall piece of it with a blow pipe.

If you find a *Needle* of the ſame allay with the metal under trial, the ſtreaks made by both upon the touch-ſtone muſt undergo exactly the ſame changes when *aqua fortis* is poured on them; and this ought always to be made a part of the trial by the *Touch-Needles*, that no fraud may be at the bottom.

All gold rendered brittle, when compared with the *Touch-Needles* by the ſtone, will appear leſs pure than it really is; and on the contrary all ſilver rendered brittle, has the whiteneſs of ſilver in a higher degree: nor is there any wonder in this, when rightly conſidered, ſince the bodies which make gold and ſilver brittle are only a few metals, and ſemi-metals, all of a very bright white colour, and neceſſarily adding to the whiteneſs of ſilver, and taking from the yellowneſs of gold, ſuch are tin, lead, regulus of antimony, biſmuth, zink, and arſenic. Theſe dilute the yellow colour of gold or copper, into a whiteneſs, ſo that the colour of copper mixed with the ſilver is hidden by admixtures of this kind, whereas gold on the contrary appears by them to have much more ſilver in it than it really has.

In a white allay, *aqua fortis* does not diſcover the preſence of ſilver from twenty-three, to ſeven carracts, becauſe *aqua fortis* does not ſeparate ſilver from gold, unleſs the maſs contains three times more ſilver than gold.

Metallic ſtreaks or cruſts which have been left ſome time upon the *Touch-ſtone*, cannot be compared with freſh ones, with any degree of uſe, becauſe their remaining long on the ſtone always alters their colour.

Silver when tempered with braſs appears whiter than it would do with a like quantity of copper, and as it may then be rendered ſufficiently ductile by a proper operation, you will hardly be able to find out the fraud with the *Touch-ſtone*, unleſs you make a ſecond time the ſame compariſon with the ſtreak of a *Needle* of the ſame colour, having previouſly poured *aqua regia* upon the metallic cruſt laid by rubbing on the touch-ſtone; nor are *Touch-Needles* tempered with braſs, of any great uſe on this occaſion, ſince this artificial metal is ſometimes more and ſometimes leſs yellow.

Laſtly, if the metal laid upon the *Touch-ſtone* by rubbing does not appear neat or diſtinct enough, lick it over with ſpittle that is not frothy; and the colours will be by that means more diſtinctly and livelily reflected. *Cramer's* Art of Aſſaying, p. 116.

TOUCH-*Stone* (*Cycl.*) The *Iriſh* TOUCH-STONE, called *Baſanus Hibernicus*, by Molyneux and ſome others, is a black marble found in the county of Antrim in that kingdom, in angular columns, forming that amazing pile called by the vulgar, the giant's cauſeway.

This marble has the property of trying metals by the *Touch* beyond any other known ſtone; but it is not eaſily wrought into form, being ſo hard that it turns the edges of all the tools uſed to cut ſtones. Were it not for this it is admirably calculated for building, and for ornamental works; but nobody has attempted to uſe it in this manner, any where, except in the church of Ballywellan in the neighbourhood, and here the trouble of cutting is avoided, for the joints are taken as they found them, and the church is built of theſe in their natural ſhape, piled one upon another. The outer ſurface of this ſtone is of a whitiſh colour like lime-ſtone, but this is only the effect of the weather upon it; for where-ever it is broken it is found to be of a fine iron grey, and when poliſhed appears of a true and deep jetty black.

The accounts Pliny and others give of the *baſaltes* or *baſanus* found in Æthiopia and other places, agree extremely well in all reſpects with this Iriſh marble. They ſay it was always found in form of columns, and was much harder than the common marble, and of an iron colour: Kentman and other later writers, deſcribe alſo a pillared ſtone, found in Miſnia, the accounts of which agree perfectly well both with this and with the *baſaltes* of the antients: ſo that there is no great room to doubt but that both the Miſnian and the Iriſh columnar marble are the ſame with the *baſaltes* of the Greeks and Romans; and that this *baſaltes* is always found in the ſame columnar form, in whatever part of the world it is met with; and conſequently that the giant's cauſeway in Ireland, is no work of art as vulgarly thought, but only an immenſe congeries of this *baſanus* or *baſaltes* in its natural ſtate and form.

The columns of this marble are all regularly angular, but they conſiſt of a great number of ſides in ſome, and of a ſmall number in others. Some columns being octangular and others only triangular, and others of all the different numbers of angles between three and eight.

The Miſnian *baſaltes* is ſaid to have no columns of more than ſeven angles, or of leſs than four; by this account it appears that the Iriſh kind has two orders of columns which that wants, but this may be owing to want of due obſervation of the Miſnian kind: for Dr. Molyneux in his firſt account of this cauſeway, ſays, that its columns conſiſt of five angles at leaſt, or ſeven at moſt, but future obſervations alone can ſhew whether the Miſnian kind may not have other numbers of angles in ſome of its columns, from thoſe at firſt taken notice of, as well as this. Some of our Engliſh authors have been of opinion that the ſtone of the giant's cauſeway was of the *entrochus* or *aſteria* kind; but this is very abſurd, for the ſize of thoſe ſtones ſeems to be limited, as they are the remains of animals, and nothing

nothing of that kind can be larger than the part of the animal it had its origin from, whereas we can never suppose any animal so monstrously large to have at all existed, as that these columns should have been only a part of it.

The substance of this stone is also an unsurmountable difficulty against the opinion of its being of the nature of the *entrochi* and *asteriæ*, for they are all composed of spar, and are soft and crumbly; whereas this is too hard even for cutting in the common way of working other stones.

The columns of *basaltes* in Misnia, either are not jointed like those in Ireland, or the joints have not been observed; but supposing that they really are not jointed at all, they may nevertheless be the same stone, since the joints may have been obliterated by the stones coming together while yet soft, and subject to injury by pressure from above given by the succeeding addition of new joints: and, even in the Irish kind, the joints, tho' so very regularly formed in the way of ball and socket, in some are much less regular than in others, and, in some of the inland columns, are only two flat and smooth surfaces laid one upon another. It is not difficult to conceive that if these surfaces had met together in this close contact, while a little moist, they would have cohered together; so as to have left no mark of the joining.

Agricola describes a kind of marble found in the district of Hildesheim in Germany; which also agrees very well with our *basanus* of the giant's-causeway, and with the *basaltes* of the antients; and an author, who has wrote on the same subjects since his time, confirms his account: he says, that the marble is black, and in form of beams and columns standing up above the surface of the earth in the hills, and that being struck forcibly against with a bar of iron, it gives a strong smell like that of burnt horn. This agrees very well with the marble of the giant's causeway, which when put to the same trial has evidently the same effect. Philos. Transf. N°. 241.

TOURNEFORTIA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The cup is a small *perianthium* divided into five segments, and remains after the flower is fallen; the segments are of a pointed figure. The flower consists of a single petal in form of an oval tube, longer than the calyx, divided into five slight segments, somewhat broad and pointed and spread open. The stamina are five tapering filaments of the length of the tube of the flower. The antheræ are simple and stand in the mouth of the flower. The germen of the pistil is globose, and situated under the cup. The style is simple and of the length of the stamina, and the stigma is simple. The fruit is a globose berry, containing two cells, the seeds are of an oval figure, two in number, and separated by the pulp. *Linnæi*, Genera plantarum, p. 62.

TOURNEQUET, in surgery, an instrument made of rollers and compresses with the help of a small stick, and used to stop the effusion of blood from large arteries in amputations by forcibly tying up the limb. The things necessary for this are a roller of a thumb's breadth, and of an ell in length, a small cylindrical stick, a conglomerated bandage two fingers thick and four long, some compresses of a good length, and about three or four fingers breadth, to surround the legs and arms, and a square piece of strong paper or leather about four fingers wide.

The manner of applying this instrument is this, the rolled bandage is to be applied to the trunk of the wounded artery length-ways, covering it in a contrary direction with compresses surrounding the leg, foot, or arm, as it were with a ring; the roller must be passed twice round these applications, and fastened in a knot, but so loosely that you may easily introduce your hand between it and the part: the leather or thick paper must now be nicely placed under it, upon the external part of the leg, and the roller tightened by degrees by turning round the stick, which is to be introduced into the knot; this to be done till the hæmorrhage is entirely stopped: the stick must now be kept in this situation till the wound is properly treated, and the return of the hæmorrhage prevented. When this end is acquired, the *Tournequet* is to be loosened, or entirely taken off, as shall be judged most convenient; but where it is applied to the arm, the rolled bandage is to be placed near the *axilla* in the internal part of the *humerus*, and the stick in this case is to be fastened on the opposite side, the situation of the artery there requiring this position; and when it is to be applied to the thighs, the bandage is to be put as the case shall require, either to the upper part of the thigh, or just over the knee. *Heister*'s Surgery, p. 47.

TOW (*Cycl.*)—Tow-*Chain*, in husbandry, a name given by our farmers to a chain, that makes a part of the structure of the plough, fastening the plough-tail to what they call the plough-head.

This is an iron chain of few links, and very strong; it is fixed at one end to a collar fastened to the middle of the beam of the plough, and at the other end passes thro' that part of the plough-head called the box, which is the timber thro' which the spindle of the two wheels run. The stake of the plough, which is an upright piece running parallel with the crow-staves, pins this in at the bottom, running thro' that link which comes out by the box; this stake is fastened by withs or cords in two places to the left crow-staffs, and the chain is thus kept firm. *Tull*'s Husbandry.

TOWER, in glass-making. See the article Leer.

TOXICODENDRON, *poison-wood*, in botany, the name of a genus of plants the characters of which are these. The flower is of the rosaceous kind, being composed of several leaves disposed in a circular form. The pistil arises from the cup, and finally becomes a fruit of a roundish shape, dry, not juicy, and usually of a striated structure.

The species of *Toxicodendron* enumerated by Mr. Tournefort are these: 1. The smooth trifoliate *Toxicodendron*. 2. The trifoliate *Toxicodendron*, with hoary sinuated leaves. *Tourn.* Inst. p. 610.

The most common American kind of this tree, is the ash-leaved one; it grows in marshy places, and is called by the common people marsh-sumach; its leaves resembling those of the common sumach, which are very well known to resemble ash-leaves in their pinnated structure. It grows to about four inches in diameter, and at the utmost does not exceed twenty feet in height. It spreads much at the root, and where one has been at any time cut down, there are always seen a great number of young ones growing from its stump. It is of very quick growth, but is not durable. The inside of the wood is yellow, and contains a juice which is as glutinous as turpentine; the wood itself has a very strong and disagreeable smell, but the juice stinks like carrion.

This tree poisons two ways; by handling of it, and by the smell. The scent of it when cut down in the woods has poisoned many people, and many more have suffered by it while burning in their fires. People with only handling it have been made blind for several days, and persons who sit near a fire when it is burning are often swelled and choaked up in all parts of the body in a terrible manner. It is very remarkable that the effect of this poison seems confined to some few persons, and that one may handle it ever so long, and even chew it without hurt, while another is poisoned by only touching it; and a whole company sitting by a fire where it is burning, shall often all escape except one or two, who will be swelled with it. The poison of this tree is never mortal, but goes off of itself in a few days; and the people who suffer by it generally carry its effects off the sooner, by using sallad oil and cream to the parts. The first notice the person has of being affected by it, is by feeling a violent itching in the skin; this provokes scratching and rubbing; and in consequence of this the part inflames and swells. Sometimes a person's whole body is swelled and poisoned in this manner, and sometimes only a particular part, as the legs; and, in this case, they often discharge a considerable quantity of water, and then grow well.

People who have been poisoned by handling it, affirm that it is so much colder to the touch than other wood, and that it may be distinguished by this in the dark; when it is burning some people are so affected by it as to swoon away, others yawn and seem uneasy, while the rest feel nothing of it. The fruit of this tree is a white roundish dry berry, growing in clusters. Philos. Transf. N°. 367. p. 144.

TOXICUS, in botany, a name by which some authors have called the *arundo farcta*, of which the walking-canes are made. *Chabræus*, p. 193.

TOXOTÆ, τοξόται, among the Athenians, bowmen, a sort of inferior officers, or rather servants, who attended the lexiarchi.

They were much like the Roman lictors: there were a thousand of them in the city of Athens, that lived in tents, erected first in the forum and afterwards in the areopagus. *Potter*, Archæol. Græc. T. 1. p. 79. See the article Lexiarchi.

TOZZIA, in botany, a name given by Micheli and continued by Linnæus to a genus of plants, the characters of which are these: The perianthium is very short; it consists of one leaf of a tubular figure, divided into five segments at the end, and remaining when the flower is fallen. The flower is one-leaved and open; the tube is cylindric, and longer than the cup. The extremity forms two lips; the upper lip is bifid and the lower trifid, and all the segments are nearly equal in size and of a roundish figure. The stamina are four filaments hid under the upper lip of the flower. The antheræ are roundish. The germen of the pistil is oval; the stile is capillary, of the length of the stamina; and the stigma is capitated. The fruit is a globose univalve capsule, having only one cell, in which is contained a single oval seed. *Linnæi* Gen. Pl. p. 302. *Michel.* p. 16.

TRACHEA (*Cycl.*)—Tracheæ, in vegetables, are certain air-vessels evident in many plants, but in none more beautifully or distinctly observable than in the melon.

Mr. Bulfinger observed that in cutting the root of the common melon transversely, there appeared, beside the bark and other commonly known parts of the root, a multitude of foramina, which were larger or smaller as the portions of the root were cut from a thicker or a thinner part. These are easily visible to the naked eye, for they are arranged into a number of fasciculi, which surround the axis of the root: there are usually three circles of these distinguishable in the smaller parts of the root, and four in the larger; and the matter in which they are

are placed is different from that which furrounds it, being much harder and more firm than that.

Moft of thefe fafciculi or foramina finally become divided into two or three portions, and the interftitial matter in that cafe is always the fame with that which furrounds them. If any number of thefe fafciculi are examined, the order and difpofition of the foramina, and even their numbers, are found the fame in all; they are fo regularly continued along the root, that air, and light fluids, may be fucked into the mouth thro' pieces of the root from two to nine inches long, and this even when they are contorted and crooked in their growth: the cafe is the fame alfo, whether the piece be cut from the root or from the ftalk of the plant, or from both; for when fuch a piece is cut, half of which is root and half ftalk, the continuation of thefe foramina is found to be the fame, and the air paffes, whether it be blown in at one end or the other: this is plainly feen on immerfing one end in water, and blowing in at the other, the bubbles of air arifing readily and in great quantities. Comment. Petropolit. Vol. 4. p. 182.

In the trunk or ftalk of the melon, there are always regularly twelve of thefe fafciculi with their regular foramina; and it is evident to the eye that thefe foramina are perfectly empty, if a fmall fegment of the root or ftalk be placed between the eye and a ftrong light. The number of fafciculi in the ftalk is the fame, whether it be cut near the root, or at ever fo great a diftance from it: the fame in the fmaller branches, and even in the pedicle which fuftains the fruit. The number of the cellules in the fruit alfo anfwers to that of thefe fafciculi in the ftalk, there being always the fame number when the fruit is perfectly and regularly formed, tho' fometimes from accidents there are only ten or eleven to be counted. In the pedicle of the fruit there are indeed more than twelve to be obferved, but thefe fupernumeraries are only ramifications of the orignal twelve; on the contrary in the pedicles of the leaves there are only nine of thefe fafciculi to be counted; five of thefe are placed on the convex fide of the ftalk, and are greatly ftronger than the others; and there are two middle-fized, and two others very fmall, in the other part. Thefe have their origin from the nine fafciculi of the ftalk which are neareft the pedicle; the other three run on without any divarication or without fending off any branches, and form the pedicle of the next leaf; fo that new leaves are produced by thofe alternate fafciculi. The three which run on uninterrupted, form the three great middle ribs of the leaf into which the pedicle expands, and the two lateral fmaller ribs are formed each of three other fafciculi taken in from the ftalk; and in fome of thefe the three fafciculi may be eafily difcerned on cutting them tranfverfely; in others only two fhew themfelves on examination; and fome part of one of thefe fafciculi may be always traced running out into every ramification of thefe ribs in the leaf, fo far as the beft glaffes are able to carry the fearch. Thefe fafciculi, as they are continued both thro' the ftalk and pedicles and even thro' the ribs of the leaves, carry the external appearance of a white ligneous fibre; and as they are protruded to great lengths and run into very flender ramifications, their foramina become lefs and lefs apparent, and at length efcape the obfervation with the very beft mifcrofcopes.

If at any time the ftalk near the infertion of a leaf, and the leaf itfelf near that part, has happened to rot; it is eafy to draw out thefe fafciculi regularly in the proper number; and thefe in their larger part fhew all their foramina very beautifully, while in the fmaller they become lefs and lefs diftinct. The main ftalk or trunk of the plant has a cavity or hollow in the middle, which is not continued to the root, nor to the pedicles of the leaves; and near the origin of the young branches, in that part of the ftalk to which the inner part of the leaf correfponds, there is a greenifh diaphragm which occupies the middle of the ftalk, into which the fibres of the ftalk, after making their ramification for forming the fafciculi of the pedicle, are inferted laterally; after which, penetrating the ftalk, and coming out at that part where the origin of the leaf is to be, they form a fort of thin membrane, which covers the tender firft fhoot of the leaf and the young branch. This membrane finally fhews its twelve fafciculi; and thus the true number is every where continued, unlefs in fome few places where two of them have happened to cohere on their running too clofe together; but in this cafe they foon divide again, and fhew their true number. Comment. Petropol. Vol. 4. p. 184.

From the whole it may be concluded, that if the *Tracheæ* of plants are continuous canals, containing only air, and compofed of a firm matter in their fides, thefe fafciculi before defcribed, as found in the root, ftalks, *&c.* of the melon, are true *Tracheæ*: for it is plain that they are empty canals, or containing no other matter than air; neither need it be doubted that there are fuch in all plants, becaufe in fome even the beft microfcopes cannot difcover them: for we find in this very plant that thofe *Tracheæ*, which in a part of their length are very confpicuous, become fmall and not to be diftinguifhed as hollow, in their finer and fmaller extremities; and in fuch plants as are fuppofed to have none of them, they may either be fo minute as not to have a difcernable hollow, or elfe their cavity, or at leaft the new made orifice of it, may be occluded by the other veffels of the plant throwing out their juices into it, on being wounded. We fee that in the melon thefe *Tracheæ* are carried from the root to every part of the plant with great regularity, and that they are included in what we commonly call the woody fibres of plants, and have their fides formed of the matter of thofe fibres; whether thefe fibres have any juices circulating thro' other fmaller canals, or are only deftined to fupport the *Tracheæ*, or air veffels, is a queftion not eafily determined: they are much dryer than any other fibres of the plant, and feem to contain no juices, except thofe deftined for their own proper nutrition. They have by fome been fuppofed to ferve for the carrying back to the root fuch juices as were not employed in the nourifhing the plant; but all experiments feem to difcountenance this conjecture, and it feems to have been built upon the obferving this part of the vegetable without feeing its true ufe, or finding out the numerous *Tracheæ* which it fuftained. The cavity in the middle of the ftalk may be attributed to the expanfion of the green fibres, and of the utriculi which form fo great a part of the plant; and the motion of the juices in thefe may poffibly be owing to the motion of the air in thefe *Tracheæ*, regularly dilating and contracting them. But the great eafe and plainnefs with which they are followed in this fearch is owing to their largenefs, and the tendernefs of the ftalk.

It is eafy to fee in what manner the ligneous parts of plants contribute to vegetation, fince in thofe parts only the *Tracheæ* are fituated: and hence alfo the reafon appears very obvious, why grafts do not fucceed unlefs the ligneous part of the ftock be touched in the operation; all the *Tracheæ* of the ftock being in this part, and it being impoffible that the *Tracheæ* of the graft fhould have any communication with them, unlefs brought into contact by opening this ligneous part of the tree. Act. Petropol. Vol. 4. p. 187.

Nothing fhews the *Tracheæ* of plants in fo beautiful a manner as a tranfverfe fegment of a young fhoot of the vine. They may be in this difcovered in a good light even by the naked eye; but with the help of but a fmall magnifying glafs they appear very beautiful and diftinct. In the generality of other trees, thefe *Tracheæ* are fo fmall, that even the largeft magnifiers in our microfcopes cannot well diftinguifh them: fo that Fontenelle and many other great men have doubted their exiftence: but even where thefe are fmalleft of all, as in the petiola or middle ribs of the leaves of plants, they may, tho' wholly imperceptible to the fight, be proved to exift, by experiments. If a fmall cylindric glafs be filled with water, and have all its air exhaufted from it by the air-pump, and the middle rib of a leaf be then cleared from the other parts, and cut off at both ends, and plunged at one end into this water; while yet in the exhaufted ftate, the bottom of the petiolum being fupported from touching the bottom of the glafs, the fituation and number of the *Tracheæ* in it will be eafily diftinguifhed by a ftring of bubbles, which, arifing from each of them, will make a row of beads, as it were rifing in a continued chain to the furface. Act. Erudit. Ann. 1722. p. 24.

TRACHELAGRA, a term ufed by fome medical writers to exprefs the gout in the neck.

TRACHELIUM, in Mr. Tournefort's fyftem of botany, the name of a diftinct genus of plants the characters of which are thefe: The flower confifts of one leaf, and is fhaped like a funnel, and divided into feveral fegments at the edge. The cup of the flower is finally converted into a membranaceous fruit, which is ufually of a trigonal form, and is divided into three cells, which ufually contain a number of very fmall feeds.

The fpecies of *Trachelium* enumerated by Mr. Tournefort are thefe: 1. The blue-flowered umbelliferous *Trachelium*. 2. The jagged-leaved violet-coloured umbelliferous *Trachelium*. 3. The hairy *Trachelium* with flowers growing in clufters from the alæ of the leaves. 4. The rock-*Trachelium* with flowers collected into heads. 5. The violet-coloured African *Trachelium*, with flowers growing fcatteredly all upon the ftalks. 6. The American fow-thiftle-leaved *Trachelium*, with very long white flowers. *Tournef.* Inft. p. 130.

TRACHELOMASTOIDÆUS, in anatomy, a name given by Albinus to a mufcle, called by Winflow and others the *complexus minor*, or *maftoidæus lateralis*.

TRACHELOS, a word ufed by fome anatomical authors to exprefs the neck.

TRACHIDNA, in ichthyology, a name given by Jovius and fome others to the *draco marinus* of the old authors, called by us the *weever*.

It is a fpecies of the *trachinus*, defcribed by Artedi under the name of the *trachinus* without beards and with the lower jaw longer than the upper. See the next article.

TRACHINUS, in the Linnæan fyftem of zoology, the name of a genus of fifhes, of the general order of the acanthopterygii: the characters of thefe are, that the opercula of the gills are pointed, and the eyes are placed near one another in the top of the head. *Linnæi* Syftema Naturæ, p. 53.

The characters of this genus, according to Artedi, are thefe: There is one or more prickles at the upper angle of the coverings of the gills, and the head has fome rough tubercles on

on it. The eyes are placed near one another in the upper part of the head. There are two back fins. The foremoſt one is very ſhort. The appendices of the pylorus are from eight to twelve in number.

The ſpecies of this genus are only two: 1. The *Trachinus* with the lower jaw longeſt, without beards. This is the fiſh called the *draco* and *araneus marinus*, and by us the *weever*. The other is the *Trachinus*, with ſeveral cirri in the lower jaw.

This is the uranoſcope, or *Trachinus* of authors, called alſo *callionymus*. *Artedi* Gen Piſc. See the article URANOSCOPE.

The name is originally Greek, the word τραχεινος ſignifying rough, ſharp, or prickly. It was given to this fiſh from the rays of its back-fin being remarkably rigid, and ſharp like prickles.

TRACHINUS *Lapis*, a ſtone mentioned by the writers of the middle ages, as poſſeſſing many great medicinal virtues. It ſeems to have been a kind of *lapis nephriticus*, being deſcribed as bright, but not tranſparent, and being of two kinds, the one blackiſh, the other green.

TRACHURUS, in zoology, the name of a fiſh of the cuculus-kind, called in Engliſh a *ſcad*, and by ſeveral authors, *ſuro*, *ſaurus*, and *lacertus marinus*.

It very much approaches to the nature of the common mackrel in colour, ſhape, and taſte; inſomuch that the French call it *maquereau-batard*, or baſtard-mackrel; but it never grows to the full ſize of the mackrel, and is of a more flat ſhape. Its back is of a very ſhining blue. Its belly white, with a faint bluſh of reddiſhneſs. Some have erroneouſly ſuppoſed, that it had no ſcales; but it is covered with conſiderably large ones. Its ſide-lines are one on each ſide, and are made each of a row of bony ſcales. Theſe have all eminences in their middle, and riſe ſo high near the tail, as to make that part of the body of the fiſh appear ſquare. The eyes are large, and the lower jaw is a little longer than the upper. The jaws are rough like files. The back has two fins, a ſhort anterior one, and a long one behind it; and the tail is conſiderably forked. This fiſh uſually ſwims in large ſhoals, and is caught in the Mediterranean, and on the Engliſh coaſts in Cornwall, and ſome other places. It is eſteemed a very well taſted fiſh. *Ray*'s Ichthyography, p. 290.

TRACHURUS *Braſilienſis*, a name given by Mr. Ray to a fiſh of the cuculus-kind, commonly eaten in the Braſils, and known among writers on theſe ſubjects by its Braſilian name *guaratereba*. *Ray*'s Ichthyology, p. 291. See the article GUARATEREBA.

TRACING, in huſbandry, a term uſed by our planters for the method of preſerving the maize, or Indian corn. This, being a large grain, is apt to ſpoil, if not carefully preſerved.

Some thraſh out the corn as ſoon as the ears are gathered, and lay it up in holes of the earth, which are their granaries: But thoſe who have not opportunities of doing this, *trace* it, that is, they leave it in the ear, and weave, or faſten together a great number of ears by the ends of the huſks: Theſe *traces* of corn they hang up within doors, on ſuch ſupports as will keep them from one another; and they will, in this manner, keep good the whole winter.

This is a method of our introducing; but their own, of burying the clean corn, was at leaſt as good, and was the ſame practiſed by the Ægyptians of old, and by all the wiſeſt nations of the eaſt at this time. But whether we have improved their huſbandry in this particular, or not, it is certain that we have greatly aſſiſted them in the planting this corn, which we do by the plough, inſtead of the troubleſome method they had of doing it with the hoe. The manner of our planting it is this: We plough ſingle furrows the whole length of the field, and at about ſix foot diſtance one from another; we then plough others acroſs at the ſame diſtance, and then, wherever the furrows meet, the corn is thrown in; it is then covered either by the hoe, or by running another furrow behind it with the plough; and when the weeds begin to overtop the corn, they plough the ſpaces again, and by this means deſtroy and turn in all the weeds, and give the earth ſtirring, that greatly aſſiſts vegetation.

The famous method of horſe-hoing huſbandry, ſo celebrated by Mr. Tull in a book written on that ſubject, is no other than a bringing home this method of our American planters, in the culture of the maize, and applying it to our European corn, with which, however it can never ſucceed ſo well. The Indians, and our planters, join in the method of raiſing a hill of earth round every ſtalk of the maize; and when the ground is poor, or out of heart, they bury two or three fiſhes, of a kind called by them the *aloofe*, under every hill, and by this means they have a crop double to what would otherwiſe have been produced. The Engliſh have learned this manure from the Indians; and in New England, where they are near the fiſhing-ſtages, they bury the heads and garbage of the cods, which ſucceed as well as the aloofe, and coſt nothing but the carriage.

The lands on which the maiz or Indian corn has grown, are as well fitted for our European corn as if they had been laid fallow. The reaſon of this is, that the plants of the Indian corn ſtanding at ſix feet diſtance from each other, the far greater part of the ground has remained unoccupied, and at the ſame time has had the advantage of often ploughing to kill the weeds, which is a benefit equal to that of dung and reſt. All this, though it tends to prove the doctrine of horſe-hoeing huſbandry not new, yet it ſtrengthens the ſyſtem greatly.

The Indians, who do not intend an after-crop of European corn, occupy all the ground which they have been at the pains of clearing for the maiz, in another manner: They plant with the corn, in the ſame hill, a kind of kidney bean; this grows up with the corn, and its ſtalks climb up about thoſe of the maiz, which ſerve as well as ſticks or poles for it. In the center, at every vacant place between the hills, they plant ſquaſhes or pompions, which ſucceed very well; and often, after the laſt weeding of the ground, they ſprinkle in a quantity of turnep-ſeed; ſo that when the harveſt is over, they have a crop of turneps for the winter. Phil. Tranſ. N°. 142.

TRACING, among miners. See the article TRAINING.

TRACTORIÆ, among the Romans, were diplomas or tickets given by the emperor to ſuch as he ſent into or called out of the provinces, whereby they were entitled to the uſe of the public poſt, and to be maintained at the expence of the government. *Pitiſc.* in voc.

TRAGACANTH, or *Goat's-Thorn*, *Tragacantha*, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and its piſtil, which ariſes from the cup, finally becomes a bicapſular fruit, containing ſeveral kidney-ſhaped ſeeds: To this it is to be added, that the leaves ſtand in pairs upon the ribs, which uſually terminate in a prickly point.

The ſpecies of *Tragacanth*, enumerated by Mr. Tournefort, are theſe: 1. The common *Tragacanth*. 2. The woolly *Tragacanth*, ſuppoſed to be the *poterium* of Cluſius. 3. The purple-flowered ever-green Alpine *Tragacanth*. *Tourn.* Inſt. p. 417.

TRAGACANTHUM *venereum Indicum*, in natural hiſtory, a name given by ſome writers to the birds neſts ſo famous in ſoops in China, and in ſome parts of Europe, for their cordial reſtorative, and provocative virtues. They are the neſts of a kind of Indian ſea-ſwallow, and are made up of a ſubſtance reſembling gum-tragacanth, and, like it, melting in a jelly in any warm and watery liquor.

TRAGASIAN *Salt*, a term uſed among the antients for a ſort of ſea-ſalt, very little different from the common kind, being made by the evaporation of the water of ſome ſalt ponds near the ſea-ſhores.

TRAGELAPHUS, in zoology, the name of an animal of the goat-kind, of which there are two ſpecies, the one deſcribed by Geſner, the other by Bellonius.

The *Tragelaphus* of Geſner is a little larger than our common deer; its colour the ſame with that of this creature, and its hair of the ſame ſort and length; but its body is thicker; and its legs much ſhorter. Under its chin it has the beard of the goat; and all the way along the under part of its throat there runs a ſeries of long hairs, which hang down almoſt to its knees; the upper part of its neck has a mane of long hairs alſo, which are much darker-coloured than thoſe of the body. Its knees are covered alſo with long and thick tufts of hair, reaching a good way backwards. Its hoofs fall off every year. The horns reſemble thoſe of the ram, or rather of the goat, and are black, and bent backwards. The ears are ſhort. The eyes, the tail, and the parts of generation, are the ſame as in deer. It is a very gentle animal, and full of ſport and play, and is found wild among the rocks.

The *Tragelaphus* of Bellonius, is a creature with the hair of the goat, but without its beard; its horns do not fall of, and are of the ſhape of thoſe of the goat, but not unfrequently curled like thoſe of the ram. Its head, face, and ears, are very like thoſe of the ram; and its ſcrotum is very large, and hangs down in the ſame manner with that creature's. Its legs are of the length of the ram's; its hips under the tail are white; its tail black; and its neck, both on the upper and under part, and its breaſt alſo, are ſo hairy, with long hairs, that they look as if covered with one continued beard. The hairs on the ſhoulders and breaſt are long and black; it has on each ſide a remarkable grey ſpot; its noſtrils are black, and its mouth and the under part of its body white. *Ray*'s Syn. Quad. p. 82.

TRAGIA, in botany, the name of a genus of plants, the characters of which are theſe: It produces male and female flowers on the ſame plant. In the male the perianthium is divided into three ſegments, which are ovated, acute, and expanded. There are no petals. The ſtamina are three capillary filaments, of the length of the cup; and the antheræ are roundiſh. Plumier makes this cup a monopetalous funnel-faſhioned flower; but this does not appear to be really the caſe. In the female flowers the cup is divided into five ſegments, which are ovated and hollow. The germen of the piſtil is roundiſh, and furrowed with three lines. The ſtyle is ſingle, erect, and longer than the cup. The ſtigma is trifid and expanded. The fruit is a very large tricoccous capſule, of a roundiſh figure. The ſeeds are ſingle and roundiſh. *Linnæi* Gen. Plant. p. 448. *Plumier*, Gen. 12.

TRAGIC *Dance*, in antiquity. See the article EMMELIA.

TRAGICUS *Musculus*, in anatomy, a name given by Albinus to one of the muscles of the eye, called by Santorini and Winslow, *Musculus Tragi.*

TRAGIUM, in botany, a name by which some authors have called the fraxinella, or bastard-dittany, the root of which is used in medicine. *Ger.* Emac. Ind. 2.

TRAGIUM *Germanicum*, in botany, a name given by some authors to the *atriplex olida*, or stinking orach. *Ger.* Emac. Ind. 2.

TRAGO-ORIGANUM, in botany, a name given by some authors to the *marum Syriacum*, or Syrian herb mastic. *Pluk.* Alm. p. 374.

TRAGOPOGON, *Goats-beard*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the semiflosculàr kind, being composed of a number of semi-flosculès placed on the embryo-seeds, and contained in a cup divided into many segments; but not of the scaly kind. The embryos finally ripen into seeds, which are enveloped in a sort of covering, and winged with down, and are all fixed to the thalamus of the flower. See Tab. 1. of Botany, Class 13.

The species of *Goats-beard*, enumerated by Mr. Tournefort, are these: 1. The great yellow-flowered meadow-*Tragopogon.* 2. The lesser yellow-flowered meadow-*Tragopogon.* 3. The *Tragopogon*, with long sinuated leaves. 4. The *Tragopogon*, with leek-like leaves, and pale violet-coloured flowers. 5. The leek-leaved *Tragopogon*, with bluish purple flowers, commonly known by the name of *artis.* 6. The leek-leaved *Tragopogon*, with blackish-purple flowers. 7. The leek-leaved *Tragopogon*, with blue flowers. 8. The leek-leaved *Tragopogon*, with white flowers. 9. The grassy-leaved *Tragopogon*, with bright red flowers. 10. The crocus-leaved *Tragopogon*, with bluish purple flowers. 11. The yellowish purple small *Tragopogon.* 12. The hairy *Tragopogon.* *Tourn.* Inst. p. 477.

There are two or three species of this plant well known among us, the one wild in our meadows and pastures, by the name of *go to bed at noon*, from its flowers always shutting up in the middle of the day; another kept in our gardens for its beautiful red flowers; and a third cultivated for its esculent root, and known by the name of salsafy. This was originally from Italy, and is still kept in many gardens as a good root; but is not common in our markets.

These plants are propagated by sowing their seeds in spring on an open spot of ground. The salsafy should be sowed in rows at nine or ten inches distance; and when the plants are come up, they should be left at about six inches asunder in the rows; they then require no farther care but to be kept clear from weeds; and if the soil be light, and not too dry, they will grow to a considerable size by winter. The roots are to be taken up for use when the leaves are decayed, and continue in season till March; and then the young shoots, which are very large and thick, are by many boiled as asparagus, and make a very delicate dish. *Miller's* Gardeners Dict. in voc.

TRAGOSELINUM, in botany, the name of a genus of umbelliferous plants, the characters of which are these: The flower is rosaceous, consisting of several heart-shaped leaves, irregular in size, and disposed in a circular form, and standing on a cup which afterwards becomes a fruit, composed of two oblong seeds, which are gibbose and striated on one side, and flat on the other.

The species of *Tragoselinum*, enumerated by Mr. Tournefort, are these: 1. The great *Tragoselinum*, or pimpernel-saxifrage, with white flowers. 2. The great *Tragoselinum*, or pimpernel-saxifrage, with red flowers. 3. The great *Tragoselium*, or pimpernel-saxifrage, with burnet-leaves. 4. The lesser *Tragoselinum*, or common small pimpernel-saxifrage. 5. The tall African *Tragoselinum*, called by authors the great African pimpernel-saxifrage.

TRAGULA, among the Romans, a strong kind of javelin, with a barbed head. *Pitisc.*

TRAGUM, in ichthyology, the name given by Aristotle, and others of the old Greek writers, to the *trugum* of Elian, Athenæns, and Oppian. Both names are used to express the fish called by authors the *pastinacha marina*, and by us the *fire-flaw*, or *fire-flaire.* The fish is a species of the raja, and is distinguished by Artedi by the name of the smooth-bodied ray, with no fin on the tail, and with a long spine placed on it, serrated before. See the articles RAJA and PASTINACHA.

TRAINING, or TRACING, (*Cycl.*) in mineralogy, a term used by our miners to express the tracing up the mineral appearances on the surface of the earth to their head or original place, and there finding a mine of the metal they contain.

The principle on which this practice depends, is the change wrought in the face of the earth by the deluge, of the effects of which these remains are a very great proof. The superficial, or upper part of veins, or loads of ore, is always the poorest, the richer ores lying deeper down, the poor ones only serving to lead the way. These poor ores, or stones impregnated with the metalline matter of the mine, and called by our workmen, *shoad-stones*, were, probably, at the creation of the earth, brought regularly up to the surface, and shewed the places of the metals below. But at the time of the covering the earth by the waters of the deluge, they were, with the rest of the surface, washed off, and carried, with the descent of the water, down into the plains, or into the beds of rivers, and there carried many miles down the stream. This being an allowed truth, the art of *Training* a mine is easy; for though this carrying the shoad-stones and poor ore, was done so many ages ago, yet all the way that some pieces were carried on, others would be deposited by the way, and the heaviest and richest falling first, the lightest would always be carried farthest, and there would be always left a stream of this matter all the way from the place where it was first produced, that is, where the mine now is; for the breaking of the surface of the earth, at this great catastrophe, was not so deep as to reach that; and this stream or *train* of matter will be found richer and richer as it approaches the mine, and finally will stop at the place where it is.

Where there is supposed to be a mine of any metal, the hills and country all about are diligently searched; the situations, and descent of the lands, and the earth, stones, and other fossile bodies, are examined, particularly the colour and nature of the various sorts of earths and stones which are found on the hills where the mine is suspected to lie, that they may be readily known again if any of them are found in the neighbouring valleys. The stones which denote the loads, and are called *shoad-stones*, are found two, three, four, or even five miles from the hills, where they originally lay; but if the same sort of stones are remembered on the hills, the *Train* is to be made out.

After any great land-flood, in which it is supposed there are usually some new frets made in the banks of the rivers, these are carefully examined, to see whether any metalline stones may be found in their sides and bottoms, all being then so clean, that the smallest shoad-stone may usually be seen. If no stones of this kind are found, it sometimes is of use, in order to farther researches, to examine whether any pieces of earth, of a different colour and nature from that of the rest of the bank be found; for this being, if any such is found, washed also from the neighbouring hills, it proves a great direction which side of the hill to search into.

If no shoad-stone or grewt of a different nature from the rest be found in these frets or newly worn banks, the miners leave the place for the present. For though the bed of the river afford many metalline stones, they never regard them, the continual change of place they receive from the current of the water rendering them only tokens that there is metal somewhere in the country; but they confound and perplex rather than instruct in the search after the places where it is.

If there be found indeed stones of the shoad-kind, full of protuberances, or having sharp angles, as if newly broken, it may be worth while to see whether they are not washed out of some part of the neighbouring banks by the late floods; as this sort of appearance is a token of their having been newly taken into the bed of the river. But if they are rounded and smooth, it may be concluded that they have been long subject to the action of the water, and brought, perhaps, many miles from the places where they were originally lodged in the earth, and where only they could have been of any use to the *Tracer* of the mine.

When the frets in the sides of rivers have been traced in vain, the searcher after a mine goes up to the sides of the hills most suspected to have mines in them, and there seeks for a convenience of bringing a little stream of water to run down. When this is found, he cuts a trench about two foot over, and as deep as the shelf. The water is turned into this cut, and after two or three days running in it, all the filth will be washed away, and the looser part of the earth cleared off; and if any shoad-stones are lodged within the whole course of this cut, they will be found. If any such are found, it is an unquestionable proof that there is ore in the higher parts of the hill; this encourages the work, and there is always found a mine, or at least a squat, which will, without much danger, repay the expence and trouble. The squats are flat parcels of the ore, lying in different and distinct places of the hills, and not communicating with one another.

Sometimes a great deal of this labour is saved, and the shoad-stones are found on the surface of the ground, either turned up by the plough, or thrown up in small quantities in mole-hills, or raised by some other accident; for they are seldom found naturally lying on the very surface of the earth; for the putrid remains of vegetable and animal substances, and other adventitious matter, has raised the surface of the earth in all places, since the time of the flood, and made indeed a sort of new surface. These stones were certainly laid bare on the surface of the ground, at the time of their being carried down from the mines; but this adventitious matter has buried them in this long tract of time, and they are generally found under about a foot of a sort of vegetable mould. If, by any of these searches, a shoad is found, the miners have nothing to do but to follow it to its head, and there make the opening; but if no such direction can be had, nor any shoad found, and there is yet suspicion that there is a mine in the hill, the method is to make an *essay-hatch*, as it is called; this is sunk near the

foot or bottom of the hill, and is an opening of about fix foot long, and four foot broad, made in the fearch of a vein as deep as the fhelf; this is a caution that muft be always carefully obferved, for if they are made lefs deep than this, they may mifs of the vein tho' there is one. And the finking thus deep is always attended with certainty, for if no fhoad is found on this, it may be concluded there is none there; except that fometimes it is found that the fhoad has been wafhed clean away, within two or three foot from the land: and then the load or vein is two foot farther or thereabouts up in the hill. If any fhoad is found in the effay-hatch, there is a certainty of a vein of ore; neither doth it add a little toward the making a conjecture how high up the hill, or how far off the vein ftring, or bonny is, carefully to mark how deep from the furface of the earth the fhoad lies, for this is held an infallible rule, that the nearer the fhoad lies to the fhelf or faft ground, the nearer the vein itfelf is, and *vice verfa.*

When there is no fhoad or appearance of a mine found in the firft effay-hatch, if the conjecture of a mine being in the hill has any tolerable foundation, the *tracing* it does not end here; but they go ten or twelve fathom up the hill and there open a fecond effay-hatch, and if no ore or fhoad-ftone is found in this, they go as many fathom on each hand at the fame height with the fecond hatch; and there open a third and a fourth hatch, of the fame depth and dimenfions with the firft; if in neither of thefe there is found any fhoad-ftone, they afcend proportionably with three more hatches, if the fpace of ground require, at every ten or twelve fathom, and in this manner open them three abreaft, at twelve fathom diftance up to the top of the hill. If no fhoad is found in any of thefe, it is concluded then that there is no *tracing* a mine there, and the hill is left.

If any fhoad is found in any of thefe hatches or openings, the afcending hatches from this are kept on in a direct line, and the deeper the fhoad lies the nearer the vein is. The fhoad grows gradually deeper from the furface, but nigher the fhelf as they approach the mine; as fuppofe it be but half a foot from the fhelf and feven foot deep from the furface, the vein is then concluded to be within a fathom or two; and on this the firft proportion of twelve fathom between every hatch is leffened, to fix, four, two, one, or even lefs than that, as the vein is conjectured to be more and more near.

It often happens, for want of a good guefs in this matter, that the diggers over-fhoot the load; that is, they open their next hatch too high up the hill, or above the load or vein: this is a miftake eafily difcovered and eafily rectified. If a fhoad is found lying near the fhelf in one hatch, and in the hatch above there is no fhoad at all, it is a proof that the hatch is too high, and the remedy is only to fink a hatch at a middle diftance between the laft two, which will probably fall upon the very point of the load, and finifh the work of *tracing*.

Sometimes it happens, that in continuing the *tracing* of the firft fhoad, a fecond or new one is found; it is not uncommon for two fhoads to be thus found in one hatch, and this is eafily difcovered without any danger of miftake; for fuppofe in the laft hatch the fhoad which they *trace* lay at eight foot deep, and in this it lies at ten foot, and befide this there is a fhoad found at two foot depth; it is very certain that the fhoad at ten foot deep is the fame they were before *tracing*, and this is a new one pointing to another vein or load, which is now firft difcovered fo near the furface of the earth. This has generally gravel or earth mixed with it, and is to be carefully examined; when the higher hatches are opened, this is continually found as well as the old load; and when the firft is *traced* to the point of the vein, this fecond is to be continued in the fame manner, by other hatches opened at the fame diftances above: it often happens that in *tracing* this fecond fhoad, the hatches dug for it difcover another new one or a third fhoad; all thefe are to be *traced* one over the other by the fame hatches, and will all be found worth the feeking after. The old writers on mineralogy agree with us in this obfervation, and tell us, it is not uncommon in fome places to find as far as feven loads lying parallel to one another in the fame hill. In thefe cafes, however there is ufually one mafter-load, or grand vein; the other fix, that is three on each fide, being the leffer or concomitant veins. Five in the fame manner, fometimes lie in this order, the grand load in the middle and two on each fide, but the more common method is three, a large one, and two fmaller.

Every load has a peculiar coloured earth or grewt about it, which is found alfo with the fhoad, and this always in a greater quantity the nearer the fhoad lies to the load, and becomes leffened by degrees to the diftance of about a quarter of a mile, further than which that peculiar grewt is never found in any quantity with the fhoad; fo that this is a proof that the load or vein is near when it is found in quantity.

A valley may chance to lie at the foot of three feveral hills, in fuch a manner, as to contain three feveral grewts, or that earth which was moved with the fhoad in the concuffion of the ftrata at the deluge, with as many different fhoads or *Trains* of fhoad-ftones in the midft of each: in this cafe it will be very neceffary to know the caft of the country, and of each hill in refpect to its grewt, for the furer *training* of them one after another as they lie in order: according to the foregoing rules of effay-hatching, the uppermoft in this cafe always directs which hill to begin with firft.

It fometimes happens, that after having *trained* the fhoad found in a valley up to the upper parts of a hill, there is only a fquatt, or bonny found inftead of a right vein of ore, for thefe detached parcels of ore have their fhoads as well as the right veins. Thefe are ufually about two or three fathom long, and a fathom broad; few of them are larger, moft lefs, and they never communicate with any other load or vein, nor ever fend forth any of their own. The extremities of thefe beds of ore terminate without fending out any ftrings, not lying within walls as the loads; but tho' they are in the fhelf or faft ground, not moved by the flood, their furface is equal every where with that of the imaginary fhelfy one, and they go down five or fix fathoms deep and there terminate at once. The ore contained in thefe are rich, and they are always wrought out to the confiderable advantage of the owners.

Thefe are the general rules of *tracing* mines, and tho' fomewhat tedious and expenfive, they are certain, and never liable to the error and difappointment the other fhorter ways, as they are called, are liable to. Thefe fhort ways are by the *virgula divinatoria* or the hazel-wand, whofe bending in certain places without any external vifible force, is to point out the place where the vein of ore lies: the waters thought to iffue from the particular loads are alfo ufed by fome as a fhort means of finding the veins; other of thefe ways are alfo by mineral fteams and effluvia, by the barrennefs of the foil, and the pitching of nocturnal lights on the fuppofed orifices of mines. But thefe methods are too extravagant or too uncertain to be ufed in cafes of fo much confequence. When the mine is found by the more certain rules of *tracing*, the digging it is a matter of lefs difficulty. Phil. Tranf. N°. 69. See the article DIGGING.

TRAMELLED, in the manege. A horfe is faid to be *tramelled*, that has blazes or white marks upon the fore and hind foot of one fide; as the far foot before and behind. He is fo called from the refemblance the white foot bears to a half *tramel*.

Crofs-TRAMELLED *Horfe*, is one that has white marks in two of his feet that ftand crofs-ways, like St. Andrews crofs; as in the far-fore-foot, and the near hind foot, or in the near foot before, and the far-foot behind.

TRAMMELS, a kind of net ufed in fowling, the defcription of which fee under the article LARK.

TRAMIS, a word ufed by fome medical writers, to exprefs the line running along the middle of the *fcrotum*, from the *penis* to the *anus*.

TRANCHEFILE, in the manege, the crofs chain of a bridle that runs along the bit-mouth, from one branch to the other.

TRANSCENDENTAL (*Cycl.*)—TRANSCENDENTAL *Cofmology*. See the article COSMOLOGY.

TRANSFORMATION (*Cycl.*)—TRANSFORMATION *of Infects*. It is well known that flies are not produced in that form, from the eggs of their parent fly, but undergo a change like that of the butterfly, and the like winged infects; the egg hatching into a worm; and this after eating, and performing all the operations of animal life for a certain time, enters into a ftate of reft, and thence is changed into a fly.

Though the general courfe of nature is the fame in this refpect in flies and butterflies, yet the means and manner of it are different; the butterfly makes its coat for this *Transformation*; the fly-worms of many kinds have only a fhell of their own proper fkin to undergo this change in.

All the fly-worms of the firft and fecond, and many of thofe of the third clafs, have their cafe thus made only of their own fkin; the different fpecies afford indeed fome varieties in the manner of this, but a general idea of the work may be had from obferving the worm or maggot of the common flefh-fly in its feveral ftages.

When this creature has arrived at its full growth, it finds it not convenient any longer to remain among the food it has till then lived upon; it quits it and now goes in fearch of a place where it may wait for its metamorphofis. To this purpofe it creeps into the earth, where it remains two or three days without any change; at the end of this time, inftead of its pointed figure, its white colour, and foft flefhy fubftance, it acquires the figure of an egg, and becomes of a chefnut colour, or fomewhat redifh, and looks opake and cruftaceous; it is in this ftate perfectly ftiff, and deftitute of motion, and the creature feems not only to have loft its form, but wholly to have loft its life alfo. *Reaumur's* Hift. Inf. Vol. 4. p. 288.

This however is not the cafe, all that is done, is that the creature has abfolutely quitted its fkin, which is now become hard and of a determinate figure, and is within it compleating all its changes. Ibid. p. 289.

The manner in which this change of figure is given to the fkin, is by the creature's drawing its head, and the two or three firft rings of its body, within the reft, and by that means making itfelf of this fhape, fhort and equally thick at each end. It does this within a few hours after it creeps into the earth, and if taken out after that time is always found of this fhape, and feems to be *transformed*, only that its fkin has not yet acquired

quired its brown colour. This however is not at all the cafe, for it can now walk as before, and thrufting out its head and the rings it had drawn in, can again acquire its former figure, which however it lofes afterwards at once, and becomes rigid in a few minutes, and in two or three hours the fkin it has quitted, and which is now a fhell, becomes reddifh, and after a little more time acquires its proper chefnut colour. Ibid. p. 290.

This coat is now no more a fkin, but a fhell, and fit to perform all the offices of one; it is no longer connected to the body of the animal, but is become hard, brittle, and rigid. It may however yet be diftinguifhed, efpecially by the help of the microfcope, to be made up of a great number of rings, which may be more diftinctly counted than they could be in the worm: there are nine of thefe between the caps, which make the two ends; two rings at leaft, without counting the head, go to the forming the anterior cap, which is purfed or wrinkled up like the top of a bag when clofely drawn together; but thefe folds or wrinkles do not abfolutely meet and clofe up the end. The microfcope fhews at each extremity of one of the diameters of this cap two little bodies not at all diftinguifhable by the naked eye; each of thefe is one of the anterior ftigmata.

On the two rings which follow this cap immediately, underneath each of thefe ftigmata; there may be obferved a fmall band, very little elevated above the furface of the reft of the fhell. Thefe feem the two ftrongeft parts of the fhell, but they are in reality on the contrary the two weakeft, and are the places where the fhell is to fplit and open to give paffage to the fly. Ibid. p. 293.

On the cap which makes the other extremity of the fhell may be feen, the two pofterior ftigmata, thefe are the moft confiderable in the creature, and are each a collection of three oblong ftigmata. Ibid. p. 294.

The *Transformation* in this fhell is double, before the infect becomes what it is to be finally, a fly like its parent; the firft *Transformation* is into an oblong mafs of matter, void of all form, either of the worm it was, or of the fly it is to be; but from this it by degrees affumes the figure of the nymph, in which all the lineaments of the future fly are diftinguifhable. This *Transformation* (which is in thefe, and perhaps in all the worms that make a cafe of their own fkin, prior to their change into the nymph ftate) may be called the change into the long ball or fpheroide, or into the ellipfoide. This fly-worm of the blue fly is one of thofe, which with moft difficulty fhews this *Transformation*; but on boiling it at a proper time and afterwards carefully opening the fhell, it will always be found in this ftate. Ibid. p. 295, 296.

It is a very eafy thing to be provided with thefe worms in their fhell ftate, in a fufficient quantity; and it is a very pleafing examination to boil and open feveral of them daily, to fee the progrefs in their refpective *Transformations*; by this means after two or three days one may diftinguifh the legs on the anterior part of the body, but very fhort; the day following, the wings will begin to fhew themfelves, and the ends of the legs will be found extended toward the hinder part; a day afterwards the end of the trunk may be diftinguifhed, and the head begins to fhew itfelf. And finally the legs will be feen in their due length and proportion, and the reticular eyes will very plainly fhew themfelves. Ibid. p. 299.

Several accidents, as the heat or cold, and drynefs and wetnefs of the feafon, contribute much to the forwarding or backwarding thefe fucceffive changes: in fummer the worms will remain fometimes in a moift earth fix or feven days without changing; and others will acquire their fhell-ftate in a dry earth in two or three days: a moift earth may alfo very eafily much impede the fecond *Transformation*, from the ftate of the oblong ball into the nymph. Since in order to this there is required an evaporation of a great deal of moifture, which is in the fhell; and this cannot be fuppofed to be fo readily performed in a moift as in a dry place; and that fuch an evaporation is required is very plain, from the change of weight in the fhell in thefe two ftates; for when the contained animal is in the form of its oblong ball, the fhell is in the whole heavy enough to fink in water; but when it has acquired the form of the nymph, it is fo light that it fwims. Ibid. p. 305.

The time required for thefe feveral changes often differs a little, and fometimes confiderably; but at a medium it ftands thus: the worms which have been feen to creep into the earth on the 21ft of April, have come out perfect flies on the 16th of May, and that in a cold feafon for the time of the year.

The fhells of feveral of this brood opened on the 28th and 29th of April, fhewed the infect in form of the oblong ball; the parts of the nymph were not difcoverable in any opened before the 30th of April; but thefe fhewed the legs of a third part of the length of the body: thefe nymphs had all a cavity on their anterior part; but thofe opened on the 2d and 3d of May had not this cavity; but the dart and hooks vifible in it before were now applied againft the furface of the cap, and the head of the future fly fhewed itfelf: on the fourth of May the trunk appeared very fair, and the reticular eyes were become vifible, tho' all that was now vifible, was feen thro' a thin and delicate fkin. Ibid. p. 306.

On the 6th of May the *antennæ* were diftinguifhable, and their form very perfectly finifhed; on the 7th the fmooth fmaller eyes were diftinguifhable. The 8th of May the reticular eyes had acquired a reddifh colour; the 9th the colour was yet more natural; the 10th thefe were become of a deep red, and the fmooth eyes looked reddifh; and on fome of the ftigmata of the nymph, the fpots of the former worm were now eafily difcoverable; on the 11th the nymphs were all become hairy; on the 12th thefe hairs were more vifible, and of their natural colour, and the legs were become greyifh, and of their full length. The lips of the trunk were of their natural colour, almoft black; and the antennæ began to be coloured; and the whole fhape of the fly was very diftinct. The 13th, 14th, and 15th days made no great changes, as the parts were now already formed, and only wanted their proper ftrength and confiftence; and on the laft day, before their egrefs, and not before, did they appear to have any power of motion; which, as foon as they had it, was applied to the freeing themfelves from their fhell, and coming out in the form of the parent fly. Ibid. p. 308.

The changes a multitude of other fly-worms undergo, and their fhells made of their proper fkin, are the fame in all effential points with thofe of the flies firft mentioned. Some fpecies have their fhell more deeply annular, others almoft entirely fmooth; fome have the two ends fomewhat pointed, and others only one of them fo; and in fome this larger inflated end is the anterior, and in others the pofterior. Ibid. p. 309.

Swammerdam, to whom the world is indebted for the firft true infight into the wonders of the infect world, has evidently proved, that what had before been called by the pompous and myfterious names of changes and *Transformations* of one animal into another, as of a worm into a fly, and the like, is, in reality, no more than a gradual and natural growth and evolution of the parts, not any metamorphofis of them; and this growth refembles very well, when judicioufly confidered, not only the increafe of other animals, but alfo the natural budding and increafe of plants.

The progrefs of thefe changes, as they are called, in infects, is expreffed by two different terms in their two moft remarkable ftates; the words are the *nymphæ* and the *chryfalis*.

Thefe words are often mifunderftood, and even mifapplied and confounded by authors one with another. What the moft accurate authors have originally meant by them, however, is this:

The nympha is the change of the worm, which carries the proper fhape of the future little animal; and the chryfalis, or aurelia (for thefe words have the fame fenfe, derivation and meaning) the change of that caterpillar, which fhews no parts at all of the animal that is to come.

This is the regular meaning of the two words; but Swammerdam proves them to exprefs, as the fchoolmen call it, diftinction without difference, for that he was always able to difcover the feveral parts of the future animal, as well in the chryfalis as in the nympha; and that others had only made the difference from the want of due attention and application.

This author therefore makes no other difference between the nympha and chryfalis, but this; that fince the parts of the future animal are not fo plainly difcernable in the chryfalis as in the nympha, and a fine golden colour is very common in the more obfcure ftate of the animal, and is not found on any of thofe fo perfect, as to be vulgarly called nymph; it may be proper to exprefs, by certain forms of fpeech, thofe flight but obvious differences; but not to give them the pompous names of *Transformations*, and the like. The nymphs he therefore calls fimply puppets, and the chryfalis's by the name of gilt puppets.

Swammerdam refers the general changes, as they are called, of the infect tribe, into four claffes, one or other of which takes in that of every known infect, a very few excepted, whofe progreffions have not yet been fufficiently inquired into, to afcertain their nature. The four general claffes, or ranks of changes, are diftinguifhed by four different ways of production, change, and growth.

The firft rank, which he expreffes by the name of nymph-animal, hath a little animal fully formed in the egg, which, after the evaporation of the fuperfluous moifture, comes forth perfect, and fo grows up. Such is the loufe, and the like.

The fecond clafs are diftinguifhed by the name of *nympha-vermiculus*. Thefe have the parts of the future infect imperfectly fhaped in the egg, and, after hatching, leave the creature to acquire its perfection vifibly by outward food. Of this kind are the grafshopper, the locuft, the cricket, and many other the like creatures.

The third clafs he diftinguifhes by the name of *nympha-chryfalis*, or *nympha-aurelia*. Thefe, after hatching, obtain their perfection darkly, and not till after the cafting off the laft fkin; fuch are the butterfly and the like. The fecond and third clafs agree in this, that not a perfect animal, but a worm is produced from the egg, and precedes the growing of the perfect parts; yet with this difference, that in the fecond the little creature grows up manifeftly and obvioufly to the eye; but in the third all is in darknefs and obfcurity under the fkin, and, as it were, within the body of the creature.

The fourth clafs is diftinguifhed by the phrafe *nympha vermiformis*; and the creatures of this clafs remain always fhut up in the cafe of the worm or maggot, without any poffibility of difcerning the parts, till cafting both fkins at once, it becomes a perfect and free animal, capable of propagating its fpecies.

Thofe infects which come forth perfect, and in their own proper form, out of the egg, fuffer no future changes, but only the cafting off their fkins; but thofe which come forth under the envelopement of a vermicular coat, do, befide cafting their fkins, after a proper time of eating and crawling about in that ftate, become nymphæ; and that all infects, as well thofe which come out of the egg in the worm ftate, as thofe which come forth in their own form, are originally, in the egg, all in the nymph-form; and that thofe which come out of the egg perfect animals, have no other difference in the manner of their productions, from the others, but that they have fuffered in the egg, and out of the way of our infpection, all thofe changes which the others do undergo in the chryfalis or nymph-ftate, in our fight. The parts of the nymphæ of thefe animals protuberate and expand themfelves by degrees, much in the fame manner that the buds of flowers of plants do; and the caterpillar is certainly the butterfly itfelf, only covered with a mantle which hides its feveral limbs from our eyes till thrown off.

Thus are the general tribes of infects regularly reduced to thefe four claffes, in regard to the manner of their production. Thofe particular fpecies which feem not reducible to thefe, or any other rules, or for which farther obfervation at leaft is required, are the glow-worm, the fcolopendra, the julus, the weavil or curculio, the dung-beetle or pilularius fcarabæus, the fmalleft water-beetle, and the fcorpion. See thefe under their feveral heads. *Swam.* Hift. Infects.

TRANSFUGA, in antiquity, a deferter. Among the Romans, deferters were commonly punifhed by cutting off their hands, it being thought, that living in fuch a miferable truncated condition, would ftrike more terror than death itfelf.

We find, however, that deferters were likewife crucified, burnt alive, thrown from the Tarpeian rock, or expofed to wild beafts at public fhews. *Pitifc.* in voc.

TRANSMUTATION (*Cycl.*)—Transmutation *of Metals*. Among the many things urged in favour of the belief of the poffibility of this effect of chemiftry, the experiment of Thurneiffer, who, in the prefence of the Great Duke of Tufcany, converted one half of a common iron nail into gold, by only dipping it, while hot, into a certain liquor, has given great encouragement to the fearchers after that famous fecret. The nail is ftill preferved in the repofitory of the Great Duke of Tufcany at Florence; and we have, in a very famous Englifh collection, the blade of a knife, half iron and half gold, faid to have been effected in the fame manner, and purchafed by the prefent poffeffor at a very confiderable price.

Tachenius, however, has difcovered the cheat of the Florentine nail; and probably the matter does not ftand much better, on examination, with the Englifh knife. This author gives a procefs by which iron may be fo prepared as to be made to mix perfectly with gold. This was the whole fecret of Thurneiffer, who in this manner made his nail half iron and half gold, and then coating it all over with a ferrugineous matter, made it appear all iron. When this had been, in this ftate, fubjected to the examination of the prince, and a great many other perfons, he heated it red hot, and by that means burnt off the ferrugineous part of the golden end; and then dipping it into a certain oil, which he pretended to have great efficacy, the gold appeared, and was pretended to have been made by the oil from the iron. *Tachenii* Hippocrat. Chem.

Mr. Boyle thinks there is no impoffibility in the nature of the thing, that one metal fhould be *tranfmuted* into another: And in confirmation of this opinion, he mentions a *tranfmutation* of gold into filver, by means of his *menftruum peracutum*. Monfieur Homberg declares, he has changed filver into gold by heat [a]. Mr. Boyle alfo mentions an anti-elixir, which, in very fmall proportion, would confiderably debafe gold [b] in many refpects, and particularly by reducing its fpecific quantity from 19 to $15\frac{2}{3}$ times that of water.—[[a] Mem. Acad. Scienc. Anno 1709. [b] Works abr. vol. 1. p. 78.]

Transmutation *of Colours*. The change of colour of a decoction of the nephritic wood, according to the different lights it was viewed in, long perplexed the wits of thofe who attempted to account for it; but Wolfius has carried the experiments on this decoction much further, and found a way of giving it its colours again, after taking them wholly away. If this decoction be held between the eye and the light, it appears of a blue colour; but if the eye be placed between it and the light, it appears then of a yellowifh or a reddifh colour. If a few drops of oil of vitriol be dropped into it, it will appear of a gold yellow in whatever light it is viewed; but if too much of this oil be added, the whole becomes foul and obfcure; and if a few drops do not produce the effect, it is a fign that the decoction is too ftrong, and that it muft be diluted with water.

Oil of vitriol has the fame effect upon many other decoctions of the woods, particularly on that of Brafil wood, which is of a fine red, but immediately becomes yellow on dropping a fmall quantity of this acid into it. And, as in the other inftance, fo in this, it is neceffary to the fuccefs of the experiment, that the tincture be not over ftrong. A few drops of oil of tartar added to this yellow liquor turn it red again, as at firft; and if more oil of tartar be added, the colour becomes bluifh, with a tinge of red, much ftronger than the colour of the nephritic wood at firft, when held between the eye and the light. In all experiments of this kind, the weaknefs of the tincture produces the greateft beauty; and therefore it is beft, inftead of making a decoction, to make only a cold infufion, by putting a fmall quantity of the chips of the wood into water, and letting this ftand cold for fome time. Act. Erudit. Ann. 1718. p. 321.

A tincture of red rofes, made with common water and oil of vitriol, is well known to be of a very beautiful red colour; yet when the water has ftood ever fo long on the rofes alone, it has fcarce any colour: If it be ftrained off in this colourlefs ftate, and the oil of vitriol then added, the red colour is produced as ftrongly as if this acid had been dropped into the water while the rofes were yet in it. When the liquor is of this fine red colour, a fmall quantity of oil of tartar makes it immediately green; and if more oil of vitriol be added to this green liquor, it becomes red again, but is muddy, and not fo well coloured as before. If a few drops of a folution of corrofive fublimate be added to this, it does not at all change colour; and on adding more water, with falt of tartar diffolved in it, the liquor became red again, but of a very different red from what it was before in its muddy ftate, being now clear and deeper. When the tincture of rofes has fcarce any colour, a fmall quantity of falt of tartar makes it green, but a large quantity makes it yellow. A few drops of oil of vitriol added to this yellow liquor, turned it to a pale red, and this could never be made green again by oil of tartar. Alum-water, added to a folution of falt of tartar, makes a white and opake fluid, though they are both feparately pellucid.

What is moft obfervable in thefe experiments on the infufion of woods, is, that oil of tartar, and a folution of falt of tartar in water, have a very different effect. Thus an infufion of Brafil wood is red; and on dropping to it a few drops of oil of vitriol, it becomes yellow. If oil of tartar be added to this liquor, it only makes it yet more yellow; but if a folution of falt of tartar in water be added to this, it makes it red again. Act. Erudit. Ann. 1718. p. 322.

TRANSPIRATION (*Cycl.*)—Transpiration *of Plants*. It is evident that plants as well as animals continually fuffer a lofs of their fubftance and juices, and that in two manners; by a fenfible *Tranfpiration*, and by an infenfible one. The latter of thefe is perceived very plainly in obferving, that in the heat of fummer, toward the clofe of the day, thofe plants which in the morning were very lively and vigorous, and in a perfectly good ftate, are then found feeble, and, as it were, withering, and bending down toward the earth. It is with thefe plants juft as it is with men and other animals, who are in the fame manner faint and languid, by reafon of their great *Tranfpiration* during the heat of the day.

The fenfible *Tranfpiration* of plants is lefs eafily proved than this infenfible one, which feems fomewhat ftrange. By fenfible *Tranfpiration* in a plant we underftand an evacuation made by means of the pores of the leaves of a fubftance too thick and coarfe to be evaporated as foon as difcharged, as the matter of the infenfible *Tranfpiration* is. This matter is, however, not unfrequently found on the leaves of trees, though it is there ufually miftaken for the remains of dew fallen upon them.

This, however, is not the cafe, as may be eafily determined by the following confiderations: 1. That the fluid matter upon the leaves of thefe trees is not merely aqueous, but is vifcid and glutinous, and fweet to the tafte. 2. That it is always found in greater quantity on thofe leaves which are expofed to the fun, than on thofe which are fhaded. 3. The leaves which abound in this appear lucid and gloffy in feveral places, thefe lucid parts fometimes appearing only in form of fpots, and fometimes in fmall fpaces of a twelfth of an inch long; and fometimes leaves are found with their whole upper furface covered with one continued coat of it. 4. There is no appearance of this matter upon the leaves, either in the night, or before fun-rife in the morning; the occafion of which is, that it is only drawn out by the heat of the fun; and being in itfelf of the nature of manna, that is, being foluble in aqueous menftruums, it is carried off and diffolved by the dews which fall in that time. 5. The bees are often found collecting this matter from the leaves of trees, as carefully, and loading themfelves with it in the fame manner, in order to make honey, as they do the fweet fubftances from the bafes of flowers. This matter is the fame with that in flowers, both are extravafated in the fame manner, and both are collected by the bee without injury to the plant. Since honey, therefore, is the matter of the fenfible *Tranfpiration* of plants, it cannot be wonderful that it fhould fometimes have the flavour of that plant whofe juices it once was a part of, or that the Narbonne honey fhould have the flavour of rofemary; and fo of others.

The trees which yield this fenfible *Tranfpiration* in the moft obvious manner, are the feveral fpecies of maple and of lime. It is found more or lefs on a vaft number of others; and many plants,

plants and all flowers abound with it, almoft without exception. It is in thefe moft obvious in the bottoms of the monopetalous kinds, fuch as the jafmine and the meadow-trefoil; on fucking of which there is always a great deal of it evident to the tafte. The leaves of any of the trees which afford this fenfible matter of *Tranfpiration* being put into water renders it purgative, and in all things analogous to a folution of manna; but, in general, more agreeably tafted. Mem. Acad. Par. 1707.

TRANSPORTATION (*Cycl.*) — TRANSPORTATION *of Plants.* In the fending plants from one country to another, great cautions are neceffary. The plants fent from a hotter country to a colder fhould be always put on board in the fpring of the year, that the heat of the feafon may be advancing as they approach the colder climates; and, on the contrary, thofe which are fent from a colder country to a hotter fhould be fent in the beginning of winter.

The beft way of packing up plants for a voyage, if they be fuch as will not bear keeping out of the earth, is to have boxes with handles, filling them with earth, and planting the roots as clofe together as may be; the plants fhould be fet in thefe boxes three weeks before they are to be put on board, and in good weather they fhould be fet upon the deck, and in bad removed or covered with a tarpaulin.

If they are going from a hotter country to a colder one, they muft have very little moifture; if, on the contrary, they are going from a colder to a warmer, they may be allowed water more largely, and being fhaded from the heat of the fun, they will come fafe.

Very many plants, however, will live out of the earth a great while; as the fedums, euphorbiums, ficoides, and other fucculent ones. Thefe need no other care than the packing them up with mofs in a clofe box; and there fhould be a little hay put between them, to prevent them from wounding or bruifing one another, and holes bored in the boxes to keep them from heating and putrefying. In this manner they will come fafe from a voyage of two, or three, or even four or five months.

Several trees alfo will come fafely in the fame manner, taking them up at a feafon when they have done growing, and packing them up with mofs. Of this fort are oranges, olives, capers, jafmines, and pomegranate-trees. Thefe, and many others, are annually brought over thus from Italy; and though they are three or four months in the paffage, feldom mifcarry. And the beft way of fending over feeds, is in their natural hufks, in a bag, or packed up in a gourd-fhell, keeping them dry, and out of the way of vermin. *Miller*'s Gardeners Dict.

TRANSTRUM, in the naval architecture of the antients, a term ufed to exprefs a fort of crofs or tranfverfe feats that were placed in the polycrote gallies of thofe times, and ferved for the places of feveral of the rows of men, who could move and work their oars under the feats of the other or lateral rowers of the next tire.

Meibom, who has written exprefly on the naval architecture of the antients, has better underftood the places and ufe of thefe *Tranftra*, than any other author of late times; by a proper arrangement of thefe feats, and the lateral ones above and below each, he has taken off greatly from the height allowed by Scaliger, and others, to the polycrote veffels. *Meibom.* de Trirem.

TRANSVERSALES *Abdominis* (*Cycl.*) — Thefe are mufcles nearly of the fame breadth with the oblique; they take their name from the direction of their fibres, and each of them is fixed to the ribs above, to the os ilium, and ligamentum Fallopii below; and to the linea alba before, and behind to the vertebræ.

Its upper part is fixed to the lower part of the cartilaginous furface of the two loweft true ribs, and of all the five falfe ribs, by flefhy digitations; the fibres of which become tendinous, as they approach the linea alba. The middle part is fixed to the three firft vertebræ of the loins, by a double aponeurofis or two tendinous planes. The internal and external planes having inclofed in their duplicature the mufculus facrolumbaris, and quadratus luborum, unite in one ftrong aponeurofis at the edges of thofe mufcles. The inferior part of this mufcle is fixed by an infertion wholly flefhy to the internal labium of the crifta of the os ilium, and a great part of the ligamentum Fallopii. *Winflow*'s Anat. p. 168.

TRANSVERSALIS *Anticus primus Capitis*, a fmall, pretty thick, and wholly flefhy mufcle, about the breadth of a finger, fituated between the bafis of the *os occipitis* and the tranfverfe apophyfis of the firft vertebra.

It is fixed by one end in the anterior part of that apophyfis, and from thence turning up a little obliquely. It is inferted by the other end in a particular impreffion between the condyle of the *os occipitis* and the maftoide apophyfis of the fame fide behind the apophyfis ftyloides, and under the edge of the jugular foffula. *Winflow*'s Anat. p. 238.

TRANSVERSALIS *Anticus Capitis fecundus*, a fmall mufcle, fituated between the tranfverfe apophyfis of the two firft vertebræ of the neck. It is fixed by one extremity very near the middle of the fecond apophyfis, and by the other near the root or bafis of the firft.

TRANSVERSALIS *Colli major*, a long thin mufcle, placed along all the tranfverfe apophyfis of the neck, and the four, five, or fix under apophyfes of the back between the complexus major and minor, and lying as it were on the infertions of the firft of thefe mufcles.

It is compofed of feveral fmall mufcular fafciculi, which run directly from one or more tranfverfe apophyfes, and are inferted fometimes in the apophyfis neareft to them, fometimes in others more remote, the feveral fafciculi croffing each other between the infertions of the two complexi, which are likewife croffed by them. *Winflow*'s Anat. p. 243.

TRANSVERSALES *Colli minores*, very fmall and fhort mufcles, found in the interftices of feveral tranfverfe apophyfes in which they are inferted, and called by fome alfo *inter-tranfverfales*. *Winflow*'s Anat. p. 244.

TRANSVERSALIS *gracilis Colli*, a long thick mufcle, refembling the *Tranfverfalis* major in every thing but fize, and fituated on the fide of that mufcle.

It is commonly taken for a portion or continuation of the facrolumbaris. Diemerbroek diftinguifhed it by the name of *cervicalis defcendens*; and Stone, and others after him, have called it *acceffiorius mufculi facrolumbaris*. *Winflow*'s Anat. p. 243.

TRANSVERSALES *Dorfi minores.* Some particular mufcles of this kind are found fixed to the extremities of the three loweft tranfverfe apophyfes of the back: The reft are all in fome meafure continuations of the *Tranfverfalis major*; but thefe few which are diftinct, and lie in the interftices between the apophyfes and diftinct mufcles, are properly enough called by this name. *Winflow*'s Anat. p. 248.

TRANSVERSALIS *Digitorum Pedis*, a fmall mufcle which lies tranfverfely under the bafis of the firft phalanges, and which at firft fight appears to be a fimple mufcular body, fixed by one end to the great toe, and by the other end to the little toe. When carefully examined, it is found to be fixed by a very fhort common tendon to the outfide of the bafis of the firft phalanx of the great toe, conjointly with the antithenar, and by three digitations to the interoffeous ligaments which connect the heads of the four metatarfal bones next the great toe. The three digitations are very flender, and gradually cover each other. *Winflow*'s Anat. p. 225.

TRANSVERSALIS *Penis*, in anatomy, a name given by fome writers, particularly Cowper, to a mufcle called by others *virgæ lateralis parvus*, and by Albinus the *Tranfverfus perinæi*. Winflow calls it *Tranfverfus urethræ*.

TRANSVERSO-SPINALIS *Lumborum*, called by fome *facer*, a mufcle compofed of feveral oblique converging or tranfverfofpinal mufcles, in the fame manner as in the back and neck.

It lies between the fpinal and oblique apophyfes of the loins reaching to the os facrum. The loweft of thefe mufcles are fixed to the fuperior lateral parts of the os facrum, to the ligamentum facro-fciaticum, and to the pofterior fuperior fpine of the os ilium. The reft are fixed to the three loweft tranfverfe apophyfes, and to the four loweft oblique apophyfes of the loins, and to their lateral tuberofities; from thence they run up to all the fpinal apophyfes of thefe vertebræ. The external, or thofe that appear firft, being longer than the internal, efpecially toward the lower part. *Winflow*'s Anat. p. 248.

TRANSVERSUS *Auriculæ*, in anatomy, a name given by Albinus to a mufcle of the ear, not allowed to be fuch by other authors; but defcribed by Santorini, and others, under the name of *fibræ tranfverfæ in gibbo auriculæ*, and *fibræ in convexa conchæ parte.* See the article EAR.

TRANSVERSUS *Nafi*, in anatomy, a name given by Santorini, and others, to that mufcle of the nofe called by Winflow *Tranfverfalis five inferior*; and by Albinus, the *compreffor naris.* See the article COMPRESSOR.

TRANSUM, in gunnery, is a piece of wood which goes acrofs the cheeks of a gun-carriage, or of a gun to keep them fixed together; each *Tranfum* in a carriage is ftrengthened by a bolt of iron. See the article CARRIAGE.

TRAPA, in the Linnæan fyftem of botany, a genus of plants; the diftinguifhing characters of which are thefe: The cup is a perianthium compofed of one leaf, divided into four at the edges, and remaining when the flower is fallen. The flower is compofed of four petals larger than the fegments of the cup, and placed vertically. The ftamina are four filaments of the length of the cup; the antheræ are fimple. The germen of the piftillum is of an oval figure; the ftyle is fimple, and of the length of the cup; and the ftigma is headed, and has a ridge round it. The fruit is an oval oblong ftony capfule, containing only one cell, and armed with four thorns placed oppofitely on the fides; thefe are thick and pointed, and are what were originally the leaves or fegments of the cup. The feed is a nut of an oval figure. *Linnæi* Gen. Plant. p. 50.

TRAPEZIUM, in geometry, a plain figure contained under four unequal right lines.

TRAPEZIUM *Os*, in anatomy, is one of the bones of the carpus; it is the firft bone of the fecond row, and has its name from its figure, which is a fort of unequal fquare. Its outer furface is rough, and makes a part of the outer or convex furface of the carpus. On its inner furface is an oblong eminence, which makes one of the four eminences on the concave fide of the carpus; and on the fame fide it has a

groove or channel; there is likewise a small tubercle on its outer surface.

This bone has several articular cartilaginous sides, *viz.* one brachial, one digital, and two cubital. The brachial side, which is hollow, is articulated with the os scaphoides; the digital with the first phalanx of the thumb; one of the cubital with the os trapezoides, and the other with the first bone of the metacarpus. The side which is articulated with the first phalanx of the thumb, appears to be made up of two superficial sigmoide or semilunar half-sides, distinguished by an eminence of the same figure, being each more hollow towards the sides than at the middle, which makes a portion of a sort of superficial pulley, with the edges much worn. One of the cubital sides, which is articulated with the os trapezoides, is large; and the other, which joins the first metacarpal bone, is small. *Winslow's* Anat. p. 83.

TRAPEZIUS (*Cycl.*)—This muscle is a large, broad, thin, fleshy plane, situated between the occiput and back, and thence extending to the shoulder, in figure of a large irregular square, and, together with the *Trapezius* of the other side, it forms a kind of lozenge. Above it is fixed in the superior transverse line of the os occipitis, by a thin series of fleshy fibres reaching to the musculus occipitalis, and seeming to cover that muscle by a kind of aponeurosis. Behind it is fixed to the five superior spinal apophyses of the neck, by means of the posterior cervical ligament, and immediately to the extremities of the two lowest spinal apophyses of the neck, and of all those of the back. From all these insertions the fibres run in different directions, and terminate by one continued insertion in about one third part of the clavicula, in the posterior edge of the acromium, and through the whole superior labium of the spine of the scapula, all the way to the small triangular surface in that spine, over which surface the fibres slide and pass freely, without being fixed therein. This muscle covers immediately the splenius or mastoideus superior, part of the complexus major, the angularis, rhomboides, and part of the latissimus dorsi. The common insertion of the two trapezii in the cervical ligament, is the reason that in pulling either of them toward one side of the neck, the other will follow it a little beyond the spinal apophyses. *Winslow's* Anatomy, p. 173.

TRAPEZOID, in geometry, a plane irregular figure, having four sides, no two of which are parallel to each other.

TRAPEZOIDES *Os*, in anatomy, is the second bone of the second row in the carpus. It has its name from its figure supposed to approach that of an unequal square; but it might much more properly have been called os pyramidale, being in figure rather a kind of a pyramid, with its point broken off. Its basis makes a portion of the outer or convex side of the carpus, and its truncated point a part of the concave side.

It has several articular sides; one brachial, which is the least of all, and is articulated with the os scaphoides; one digital, of a considerable length, notched on each side, and divided into two halves by a sort of middle line or angle, which gives it the appearance of a pulley, articulated with the basis of the first metacarpal bone; one radial, irregularly triangular, and articulated with the os trapezium; and one cubical, a little hollow, and articulated with the os magnum. *Winslow's* Anat. p. 84.

TRAPEZUNTINA *Laurus*, a name used by some botanical authors, for the *Laurocerasus*, or common laurel. *Chabræus*, p. 51.

TRAPPINGS. Among the antients some will have the horse *Trappings* to have been placed on their breasts; others, on their forehead; and others again, on their cheeks. That on the breast was a small kind of shield, finely polished. *Hofm.* Lex. univ. in voc.

TRAQUENADE, in the manege. See the article ENTREPAS.

TRASCINA, in zoology, a name by which some authors have called the fish, more usually known by the name of the draco marinus, and araneus. *Salvian* de Aquatic.

TRAVAIL, in the manege. See the article TRAVICE.

TRAVELLING. The common method of *travelling* in England being on horseback, it may be proper to give some general rules for the keeping the creature sound, and doing the business agreeably, and without many of the accidents which usually attend it.

Care must be taken that the shoes be not too streight, and do not pinch the horse's feet any way; but be well shaped, and set easy. It is proper to have them put on fresh a few days before the journey, that they may last well, and that they may be settled to the feet before the setting out. The bridle is next to be examined; that the bit of it be proper, and not too heavy: for if it be, it will incline him to carry low when he grows tired, and rest upon the rider's hand: This is what they call the using a fifth leg. It is a very disagreeable thing, but may often be avoided, only by taking a proper care of the bit. The mouth of the bit should rest upon his bars, about a finger's breadth from his tushes, so as not to make his lips uneasy. The curb should rest in the hollow of his head, a little above the chin; and if it gall him, the place must be defended with a piece of buff or other sort of leather.

The next thing to be regarded, is the saddle; and proper care must be taken as to this, that it do not rest either upon the withers, reins, or back-bone; and that one part of it do not press upon the back, any more than another. Some riders gall a horse's sides below the saddle with their stirrup leathers: This is most likely to happen to a lean horse; and to prevent it, a leather strap should be fixed between the points of the fore and hinder bows of the saddle, and the stirrup-leathers should be made to pass over these leathers.

It is always best to begin a long journey by short stages, and this is the more necessary if the horse has not been exercised for some time before. If it be a horse that is rid, he should be suffered to stale as often as he likes, and even invited to it; but, if a mare, she is to be less indulged in it as less necessary, and often diminishing her Strength. It is always advisable to ride very softly for a quarter of an hour, or half an hour before coming in to the inn at night, that he may not be over hot when put into the stable; but if the haste of the journey will not admit of this, the horse should be walked in some person's hands, to cool him gently before he is put up.

If the weather is cold a cloth should be laid over him while he is walked; and when taken in, his whole body should be rubbed and dried with straw. Some have a custom of ordering their horses legs to be rubbed well down, on their first coming in; but this is very prejudicial while the horse is hot, and should always be let alone till he is perfectly cooled.

As soon as the horse is cooled, and ceases to heat in the flanks, the bridle is to be taken off, the bit washed, and hay given him that he may eat at pleasure. The dust in very dry weather will sometimes clog up the tongue of the horse in such a manner, that he cannot eat without great difficulty; In this case some bran and water should be first given him to wash his mouth, or the servant should do it with a wetted spunge.

These are the proper methods, when the horse has been rode moderately; but when he has been hurried at a great rate, the saddle is to be taken off as soon as he is put up, and the sweat rubbed off with a sweat knife; and then the whole body and legs are to be rubbed carefully down, and the head is to be wiped with a cloth, as also the back under the saddle, and the thighs; then the saddle should be clapped on again, and the horse gently led up and down, till cool and dry. The feet are also to be examined, to see if a shoe be wanting, or if any of them press upon the sole; and the dirt, gravel, or other foulness is to be picked out from between the shoe and the foot. The openings of the feet may be stopped with cow-dung, and the hoofs if brittle should be anointed with some fatty substance just at the setting on; and in dry weather they should be greased, not only at night, but noon. Many horses, as soon as unbridled, will lay themselves down, instead of eating.

Many are apt on this to suppose the horse sick; but it is generally owing only to the heat and pain they find in their feet, which renders them unable to stand upon them: In this case if their eyes are examined, they will be found brisk and good, and the hay being offered them as they lie, they will eat it greedily. This shews there is no inward disorder, and the heat and tenderness of the feet, if examined, will shew that they are the part in pain. The principal thing to be done in this case, is taking care that the shoes do not rest upon the soles. This is not easily known but by taking off the shoes, which in cases of extremity should always be done; it will then be found where the sole is touched by the shoe, being in that part more smooth and shining than elsewhere. In this case the feet are to be pared in those parts, and then the shoes are to be fixed on again, anointing the hoofs, and stopping the soles with hot black pitch or tar.

These are the means by which *Travelling* will be rendered easy and commodius both to the rider and the horse; but there is some care also to be taken of the creature, after he comes off from a long journey. The first thing to be done is, that the two heel nails of the fore-feet are to be drawn, and if the shoe be large, then four should be drawn; two or three days after the horse should be blooded, and for ten or twelve days after this he should be fed with wet bran, without any oats; but he is to be kept well littered. The reason of drawing the heel nails is, that the feet are apt to swell after journies; and if this is not done the shoes press upon them in that part, and become very uneasy to them; it is adviseable to stop them also with cow-dung for some time; but they are in the wrong who pare them down after taking off the shoes, for the humours being all in motion after this, they are apt to fall into the feet.

If there appear any danger of the creature's legs swelling after the journey, it may be easily prevented by this means: Take a quantity of the dung of an ox or cow fresh made, mix it with so much vinegar as will reduce it to a soft paste, and add to it a handful of salt; with this rub all the hips thoroughly up to the knees, and let it dry on; give the water in a pail that evening that the legs may not be wetted, and the next morning the horse is to be led to water, and the whole remaining matter washed off. The jockies have a very cunning trick to recover the hoofs of a horse injured by a long journey:

journey: They make a hole in the foot, and fill it with moiftened cow-dung; they keep this in it a month, and the continual moifture occafioned by it makes the hoof grow very quick, and foon recover the proper dimenfions, but it foon after drys and fhrinks fo, that the foot is ftreightned, and the whole hoof becomes brittle.

Cow-dung applied to a horfe's foot always moiftens the fole; but it drys up the hoof, if continued any length of time to it. The beft method of recovering a horfe's hoofs is to make a hole in the ftable floor filled with blue clay a little wetted, in this the horfe fhould keep his fore-feet a month; this will have more effect then a fmall portion of cow-dung in the foot; and the effect will be of fo different a nature, that the hoof will be rendered more tough than before, inftead of being made brittle by it.

Moft horfes that are fatigued, or overworked by long journies, have their flanks altered by it, without being purfy; efpecially horfes naturally vigorous, which have been worked too violently. The beft remedy in this cafe, is to give the horfe half a pound of honey in the morning, mixed among a feed of fcalded bran: If he eats the half pound readily, give him a pound the next morning; continue this till the honey ceafes to purge the creature; after this, powder of liquorice may be added to the fcalded bran, and this continued fome time, and two or three glyfters at convenient diftances of time will be found very ferviceable. If the horfe be very lean, it will be proper to give him fome wet bran over and above his proportion of oats; and grafs is alfo very proper, if the creature be not inclined to be purfy. This caution, however, is to be had at all times, that exceffive feeding may be bad, by fubjecting the horfe to the farcy. When the horfe begins to drink heartily, it is a fign that he will foon recover. Though this fometimes fails, it is a good general rule.

TRAVERSE (*Cycl.*)—TRAVERSE, in the manege. A horfe is faid to *traverfe*, when he cuts his tread crofs-wife; throwing his croupe to one fide, and his head to another.

TRAVERSE-*Board*, in a fhip, a little round board hanging up in the fteerage, and bored full of holes upon lines fhewing the points of the compafs: Upon it by moving of a little peg from hole to hole, the fteerfman keeps an account how many glaffes, that is, half hours, the fhip fteers upon any point.

TRAVERSE-*Table*, in navigation, is the fame with the table of difference of latitude and departure; being only the difference of latitude and departure ready calculated to every degree, point, half-point and quarter-point of the quadrant; and for any diftance under 100 miles, though it may conveniently ferve for more.

This table is one of the moft neceffary things a navigator has occafion for; for by it he can readily reduce all his courfes and diftances, run in the fpace of twenty-four hours, into one courfe and diftance; whence the latitude he is in, and his departure from the meridian may be found.

TRAVERSE *the Yard*, on board a fhip, is to brace it aft.

TRAVICE, in the manege, is a fmall enclofure, or oblong quadrangle placed before a farrier's fhop, and confifting of four pillars or pofts, kept clofe together by crofs-poles. This enclofure is defigned for holding and keeping in a horfe that is apt to be unruly or diforderly in the time of fhoeing, or of any operation.

This in fome of the remoter parts of England goes by the name of a *break*; and is called in French *Travail*.

TREACLE (*Cycl.*)—Dr. Shaw, in his Effay on Diftillery, has endeavoured to bring into ufe feveral forts of *Treacles*, which might be made at home, and would ferve very conveniently for the diftillation of fpirits, or the making of potable liquors.

Thefe are the infpiffated juices or decoctions of vegetables: Such as the fweet juice of the birch, or fycamore, procured by tapping or piercing the trees in fpring, and the common wort made from malt, or from other vegetable fubftances treated in the fame manner. Thefe liquors are feverally to be boiled down in a copper till they begin to infpiffate, and then to be poured into a balneum mariæ, when the remainder of the evaporation may be finifhed without burning the infpiffated juices: Thus prepared it may be at any time reduced to the ftate of wort, only by adding a fufficient quantity of warm water. *Shaw*'s Eff. on Diftill.

TREAD, in the manege. See the article PISTE.

TREASURER (*Cycl.*)—TREASURER *of the County*, he that keeps the county ftock.

There are two of them in each county, chofen by the major part of the juftices of the peace, &c. at Eafter feffions.

They muft have 10 *l.* a year in land, or 150 *l.* in perfonal eftate, and fhall not continue in their office above a year; and they are to account yearly at Eafter feffions, or within ten days after, to their fucceffors, under penalties.

The county ftock, of which this officer hath the keeping, is raifed by rating every parifh yearly; and is difpofed of to charitable ufes, for the relief of maimed foldiers and mariners, prifoners in the county gaols, paying the falaries of governors of houfes of correction, and relieving poor almshoufes, &c. And the duty of thefe *Treafurers*, with the manner of raifing the ftock, and how it fhall be difpofed of, is fet forth particularly in the ftatutes of 43 Eliz. c. 7. Jac. I. c. 4. 11 & 12 W. III. c. 18. 5 Ann. c. 32. 6 Geo. I. c. 23.

TREASURER, in cathedral churches, an officer whofe charge was to take charge of the veftments, plate, jewels, relicks, and other treafure belonging to the faid churches. At the time of the reformation, the office was extinguifhed as needlefs in moft cathedral churches; but it is ftill remaining in thofe of Salifbury, London, &c.

TREASURY (*Cycl.*)—The Athenian *Treafury* was facred to Jupiter Σωτὴρ, or the faviour, and to Plutus the god of riches. Befides other public monies, there were always a thoufand talents kept in it, which it was capital to touch, unlefs on the moft preffing occafions. See the article OPISTHODOMUS.

The funds among the Athenians which fupplied their *Treafury*, were four, *viz.* the *tele*, τελη; the *phori*, φοροι; the *eifphoræ*, εισφοραι; and the *timemata*, τιμηματα. Each of which fee in its place.

The public *Treafury* was divided into three parts, according to the ufe it was applied to; as, 1. The χρηματα τῆς διοικήσεως, or that expended in civil ufes. 2. The Στρατιωτικα χρηματα, or money defigned to defray the charges of war. 3. The Θεωρικα, or money intended for pious ufes; in which they included the expences at plays, public fhews, and feftivals, &c. *Potter.* Archæol. Græc. T. 1. p. 82.

To each of thefe branches of the public revenue there was a *Treafurer* appointed, as Ταμιας τῆς διοικησεως, των στρατιωτικων and Θεωρικων.

TREATY (*Cycl.*)—in antiquity. For the folemn manner in which the Romans ufed to conclude *Treaties*, fee Liv. l. 1. c. 24. The ceremonies obferved by the Greeks in making *Treaties* may be feen in *Potter*, Archæol. Græc. l. 2. c. 6. T. 1. p. 252. feq.

In general it appears that the antients were very religious, grave and folemn in making *Treaties*; which were always confirmed by facrifices and mutual oaths, with horrid imprecations to the party that fhould break the terms of agreement.

TREBIUS, in ichthyology, a name given by Joannes Cuba and fome other writers, to the fifh called *phycis* by Ariftotle, Ælian, and Pliny; and *truca* and *tinea marina* by the later writers. It is nearly allied to the blennus clafs. See the article BLENNUS.

TRECHON, one of the many names by which the chemical writers, have called quickfilver.

TRECHEDIPNA, τρεχεδειπνα, in antiquity, a kind of livery or diftinguifhing habit worn by parafites; the wearing of which was a fufficient pafport to the tables of their patrons whofe livery it was. *Pitifc.* in voc.

The word comes from τρεχω, *I run*, and δειπνον, *a fupper*.

TREE (*Cycl.*)—Heat is fo effential to the growth of *Trees*, that we fee them grow larger and fmaller in a fort of gradation as the climates in which they ftand are more or lefs hot. The hotteft countries yield in general the largeft and talleft *Trees*, and thofe alfo in much greater beauty and variety than the colder do; and even thofe plants which are common to both arrive at a much greater bulk in the fouthern, than in the northern climates; nay, there are fome regions fo bleak and chill, that they raife no vegetables at all to any confiderable height. Greenland, Iceland, and the like places, afford no *Trees* at all; and what fhrubs grow in them are always little and low.

In the warmer climates, where *Trees* grow to a moderate fize, any accidental diminution of the common heat is found very greatly to impede vegetation; and even in England, the cold fummers we fometimes have, give us an evident proof of this; for tho' the corn and low plants have fucceeded well enough, and goofeberries, currants, rafberries, and other low fhrubs, have brought forth fruit in fufficient plenty, yet the production of taller *Trees* have been found very much hurt; and walnuts, apples, and pears have been very fcarce among us.

Heat is heat be it from what caufe it will, and acts as well upon vegetation one way as another. Thus the heat of dung, and the artificial heat of coal fires in ftoves, is found to fupply the place of the fun.

Great numbers of the Indian *Trees* in their native foil flower twice in a year, and fome flower and bear ripe fruit all the year round; and it is obferved of thefe laft, that they are at once the moft frequent and the moft ufeful to the inhabitants; their fruits, which hang always on them in readinefs, containing cool juices, which are good in fevers, and other of the common difeafes of that hot country.

Plantations of ufeful *Trees* might be made to very great advantage in many places in every country, and the country greatly enriched by it, while the public would be alfo benefitted by it, fince it would raife a continual fupply of timber ufed in fhip-building, and on other public as well as private occafions.

We have in many places, heaths, and other barren and uncultivated lands, of very great extent; and how great an advantage would it be to the public to bring thefe to be truly valuable. Many, if not all of thefe heaths, would be found on trial capable of producing *Trees*; and fome of them are truly the

the remains of deftroyed forefts; and though the profit to be reaped from the planting them would come late, yet the expence of doing it would be very trifling in comparifon of that profit, and the means eafy.

The authors who have given rules for planting, having employed themfelves only about fmall fpots of ground, the eftablifhing orchards or parks, are by no means to be fuppofed proper guides in attempts of this kind; and Monfieur de Buffon, who had a great opinion of the knowledge of our Evelyn and Miller, who feem to fpeak of every thing from their own experience, found when he fet about large plantations, that their opinions and rules were erroneous; and was obliged to have recourfe to experiments only; which he varied a thoufand ways: and though many of them proved unfuccefsful, yet they all gave hints toward others, by which the attempt might afterwards be brought to fucceed.

This fagacious enquirer into the operations of nature in the growth of vegetables, having fet apart a confiderable quantity of land for the trial, and procured a number of young *Trees*, firft divided the whole quantity into a number of fmall fquares, and having made a plan of it, examined the nature, depth, and other circumftances of the foil in each, and minuted the whole down on a proper part of the plan: that himfelf or whoever fucceeded him might judge from the different growths of a number of *Trees* planted in the fame ftate in thefe different foils, the different advantages and difadvantages of every circumftance in the depth and nature of the ground, in regard to the growth of ufeful *Trees*. Different numbers of labourers were employed about different fpots of this ground, and the acorns for the young growth planted at different feafons; but the refult in general was, that what fhould feem the beft methods fucceeded the worft; and thofe pieces where many labourers had been employed, and the acorns planted before winter, were much thinner of young oaks, than thofe where the leaft labour had been beftowed upon the ground, and where the acorns had been planted in the fpring: but thofe places which fucceeded beft from the fowing, were thofe which had the acorns planted in holes made by a pick-ax, without any preceding culture of the ground. And thofe where the acorns had only been laid upon the earth, under the grafs, afforded a great number of vigorous young *Trees*, though the greater part had been carried away by birds and other devouring animals. Thofe fpots of ground where the acorns were fet at fix inches depth, were much worfe furnifhed with young fhoots, than thofe where they had been buried but at an inch deep; and in fome places where they were buried at a foot deep not one fhoot appeared, though in others where they had been buried at nine inches there were many.

Thofe acorns which had been fteeped for eight or nine days in wine lees, and in the water of the common fewers, appeared out of the ground much earlier than thofe which were put in without this previous management.

But the moft fuccefsful of all the trials, was that of planting in the fpring fuch acorns as had been fown together in another place, and had time to fhoot there; of thefe fcarce any one failed, and the plantation was perfectly flourifhing, tho' the growth of thefe young fhoots was not fo quick or vigorous as thofe of the acorns, which had remained when firft fown; which was probably owing to the injury the tender radicles received in tranfplanting.

Thus fucceeded the experiments by fowing, while of thofe made by planting young *Trees*, fuch as had been brought out of woods and places under covert, fucceeded much worfe than thofe which had grown in more expofed places.

The young *Trees* of the feveral parts of the plantation kept on their growth in the manner they had begun to fhoot, thofe of the more laboured parts continuing more weak, and lower than thofe of the lefs laboured.

Thus were a number of neceffary experiments carefully tried, and the refult of the whole was, that to make a plantation of oaks, on a foil of the common clayey or loamy kind, the moft fuccefsful method is this: The acorns muft be preferved during the winter in the earth in this manner: let there be made a bed of earth of fix inches deep, on this place a layer of acorns two inches deep, over thefe lay a bed of another half foot of earth, over that another layer of acorns, and fo on fucceffively, till as many are employed as there will be occafion for; the whole is then to be covered with a foot depth of earth, to preferve all from the froft. In the beginning of March thefe beds are to be opened, and the acorns which will by that time have fhot out, and are then in reality fo many young oaks, are to be planted out at a foot diftance each, and the fuccefs of a plantation of this kind need not be feared. This is a manner of planting that is done at a fmall expence, and even that might be in a great meafure fpared, were it not for the birds and other devouring animals; fince, could the acorns be defended from thefe, they might be only laid on the furface of the ground under the grafs in autumn, and they would infallibly fhew themfelves in fo many young oaks the fucceeding fpring.

It is eafy to continue the carrying the acorns, when taken out of their winters bed, to the place where they are to be planted, without doing them much injury; and the fmall ftop the tranfplanting puts to their growth, is in reality rather an advantage than an injury; fince it only retards the young fhoots for about three weeks, or lefs than that: and by that means fecures them from the few cold mornings that may be expected about the time of their natural appearance. Memoires Acad. Scien. Paris 1739.

Trees in corn fields are a worfe enemy than any weeds, they fuck up the nourifhment from the corn about them, even to a great diftance: nor is it peculiar to corn to fuffer by them. Mr. Tull gives an inftance of a fingle *Tree* ftanding in a field of turneps, which fpoiled no lefs than half an acre of the crop. It has been fuppofed that *Trees* injured thefe lower herbs by their fhadow; and fome thought that the mifchief they faw from them, was owing to their droppings; but by this inftance, it is plain both thefe conjectures are erroneous: the fouth fide of the *Tree*, where no fhadow comes, is found to fuffer as much as any other; and the droppings reaching only as far as the bows, and the mifchief fo much farther, it is plain that the mifchief is owing to neither of thefe caufes, but to the *Tree*'s drawing all the nourifhment, by extending its roots fo far, and in fuch numbers, on every fide the extent of ground through which the turneps were thus injured, probably fhewing the extent of the roots of the *Tree*, which are found by this to run farther than is ufually fuppofed.

On felling of *Trees*, letters have fometimes been found in the midft of them. We have inftances of this kind, mentioned in the Phil. Tranf. N°. 454. Sect. 16. Where the trunk of of a beach being fawed, difcovered feveral letters in the wood, about one inch and an half from the bark, and near the fame diftance from the center of the trunk. It feems thefe letters had been formerly cut into the bark, and in procefs of time thefe might be covered. See the place cited. See alfo the fame number Sect. 17. in the remarks.

In the fame Tranfaction, we have an account of the horn of a deer, found in the heart of an oak. Crucifixes have alfo been found in *Trees*, and were to be fure fhewn as miraculous to the ignorant. See p. 236. of the faid Tranfaction in the remarks.

Trees are often found buried in the earth. See the article *Foffile* Wood.

How Trees may be injured by froft. See the article Frost.

Fruit-Trees. See the article Fruit-*Trees*.

Juices of Trees. See the articles Juice and Sap.

Diftemperature of Trees. See the article Distemperature.

Felling of Trees. See the articles Felling and Timber.

Trees in a fhip are of feveral forts, as, *Chefs-Trees*, *Crofs-Trees*, *Roof-Trees*, *Wafte-Trees*, *Treffel-Trees*. See the article Chess-*Trees*, Cross-*Trees*, &c.

Roof-Trees, in a fhip, fmall timbers that bear up the gratings from the half deck to the fore-caftle, fupported by ftantions that reft upon the half deck.

TREENELS, in a fhip, long pins or nails of wood, whence they are called *Tree-nells*, or *Tree-nails*, made out of the heart of oak, to faften the planks to the timber; and thofe have always oakam driven into them to prevent any leak.

TREET, *Triticum*, in our ftatutes, is ufed for fine wheat. See Statute 51. Hen. 3. *Blount*.

TREFOIL, *Trifolium*, in botany, the name of a genus of plants; the characters of which are thefe: The flower is of the papilionaceous kind: The piftil which arifes from the cup finally becomes a capfule, which remains covered with the cup, and ufually contains kidney-fhaped feeds. To this it is to be added, that the leaves grow three on every ftalk; though there are fome inftances of thefe plants truly of this genus, which have four or five on the ftalk.

The fpecies of *Trefoil*, enumerated by Mr. Tournefort, are thefe: 1. The bituminous, or ftinking *Trefoil*. 2. The common purple meadow-*Trefoil*. 3. The larger purple *Trefoil*, with longer and narrower leaves, and deeper coloured flowers. 4. The common white-flowered *Trefoil*. 5. The fmaller and fmoother white-flowered meadow-*Trefoil*, called by fome the female meadow-*Trefoil*. 6. The white meadow-*Trefoil*, with a bivalve pod, a hollow ftalk, and leaves marked underneath with purple fpots. 7. The bladder purple *Trefoil*. 8. The wild hop-*Trefoil*. 9. The fmalleft hop-*Trefoil*. 10. The mountain hop-*Trefoil*. 11. The large purple mountain-*Trefoil*. 12. The purple mountain-*Trefoil*, with fharp pointed and crenated leaves. 13. The purple mountain-*Trefoil*, with obtufe-pointed crenated leaves. 14. The leffer purple mountain-*Trefoil*. 15. The white mountain-*Trefoil*. 16. The *Trefoil* with a round red fpike, called the greateft lagopus or hares-foot *Trefoil*. 17. The *Trefoil*, with an oblong red fpike. 18. The mountain-*Trefoil*, with a very long red fpike. 19. The narroweft-leaved fpiked mountain-*Trefoil*. 20. The narrow-leaved Spanifh *Trefoil*, with a pale red fpike. 21. The narrow-leaved Spanifh hares-foot *Trefoil*, with very red flowers. 22. The common fmall-fpiked field-*Trefoil*, called common lagopus, or hares-foot *Trefoil*. 23. The fmall hares-foot *Trefoil*, with fharp-pointed and not crenated leaves, and fmall pale purple flowers. 24. The yellowifh flowered hares-foot *Trefoil*, called the meadow-*Trefoil*, with fulphur-coloured flowers. 25. The ftarry-headed *Trefoil*, with globofe hufks. 26. The common purple ftarry-headed French *Trefoil*. 27. The fmall ftarry-headed *Trefoil*, or dipfacus-headed *Trefoil*. 28. The globofe *Trefoil*, or round-headed

headed hares-foot *Trefoil*. 29. The creeping globofe headed *Trefoil*, or bur-headed *Trefoil*. 30. The fmooth or woolly-headed *Trefoil*. 31. The larger foft-headed, or woolly-headed *Trefoil*. 32. The larger rough-headed *Trefoil*. 33. The fmaller rough-headed *Trefoil*. 34. The thyme-headed *Trefoil*. 35. The *Trefoil*, with oblong rough heads. 36. The ftrawberry-*Trefoil*, with heart-fafhioned leaves and red flowers. 37. The ftrawberry-*Trefoil*, with deep violet-coloured heads. 38. The long-leaved purple ftrawberry *Trefoil*, which feems only a variety of the former fpecies. 39. The reticulated *Trefoil*, which buries its feed under ground. 40. The annual *Trefoil*, with heads like thofe of dodder. 41. The little procumbent *Trefoil*, with heads covered with a thick woollynefs. 42. The fmall hairy *Trefoil*, with large feeds, and foft heads in the alæ of the leaves. 43. The *Trefoil*, with round heads at the knots of the ftalks. 44. The blackifh luxuriant *Trefoil*, with four, five, or fix leaves on a ftalk, called the quadrifolium hortenfe. *Tourn.* Inft. p. 405.

Trefoil, or clover, is a plant greatly efteemed by the Englifh farmers, for the great improvement it makes upon land, the goodnefs of its hay, and the value of its feed. The great advantage of *clover*, or *Trefoil*, to the land on which it grows is, that it feeds a vaft number of cattle at a time, and their dung is fo rich a manure to the ground that in two or three years time it becomes fit for corn again, though it had been ever fo much exhaufted before. Clayey lands, in particular, are greatly improved by it.

There are feveral kinds of *clover*, but the great fort is efteemed the beft, whofe feed is like that of muftard, except that it is more oblong. The Englifh feed is preferable to that of all other places, and the farmer fhould choofe fuch as is of a greenifh colour, with a caft of red; that which is black never growing fo well. An acre of land will require ten pound of feed, fometimes twelve pound, and it is better to fow too much than too little. It delights moft in a rich warm foil, and always thrives beft in thofe lands which have been well dunged or manured; but the clay-lands, which are long in acquiring a coat of grafs, or fwarding as the farmers exprefs it, and are little fubject to weeds, are of all others the beft land for *clover*; becaufe in thofe lands, where the common grafs grows fpeedily, it foon eats out the *clover*. Light lands are in general more fubject to this fudden growth of common grafs, and they have alfo another difadvantage in regard to the *clover*, which is, that they eafily wafh away from its roots after fharp rains; and then the roots, being left bare, are killed by the firft froft that comes; in good grounds it will bear crops for three or four years; but not longer than that, even in the moft proper foil, and with all the neceffary cautions.

There is a very eafy method of determining what is good *clover*-feed and what bad; it is only neceffary to throw it into a glafs of water, and that which finks is good, what fwims is bad, and will never vegetate. It is eafy, from this trial, to know what feed is to be depended upon, and what is not; and to know what allowance is to be made in bad feeds, for the quantity loft in the proportion for every acre.

The beft way of fowing of *clover* is, either with barley or oats after the corn is fown; and, upon this account, the corn is to be fown fomewhat thinner than ordinary. The ufual time of fowing it, is in the end of March, or the beginning of April in a calm day; but if the land be very dry, it is better to fow it with black oats, as early in the fpring as may be, that fo it may get up while the fpring rains laft, and be of fome ftrength before the dry weather comes. Some fow it with wheat or rye at Michaelmas; this gives it an opportunity of fhedding its feed on the ground, and by that means, the crop of the next year is rendered much ftronger than it would have been made by any other means; but then it is beft to be fown upon dry lands, which will bear the fowing both of the wheat and the rye upon broad ridges; which is ufually very fuccefsful, if a mild winter follows; but if there are long and fevere frofts, or deep fnows, it is very hazardous. Some advife the fowing it alone, at Michaelmas; which they fay makes it come up the freer from weeds, than if fown in the fpring; and that it will get ftrength enough before winter, to fupport itfelf againft the frofts, and will grow finely in the enfuing fpring.

Some farmers fow rey-grafs with the corn at Michaelmas, and early in the fpring they fow *clover*, which they only cover by rolling it. The beft management of all feems to be the feeding it bare before winter comes on, and then it is fafe; for the frofts, though they often deftroy the leaves of the *clover*, yet never hurt its roots, unlefs they happen to lie bare. About the middle of May, or at the utmoft toward the end of that month, is the time of mowing the *clover* for the firft crop. This takes up more time and labour in the making into hay, than the common grafs, and muft be well attended; but if it grow not too ftrong, it will be found exceeding rich for the fattening of cattle. The exact time for the cutting this firft crop is when it begins to knot, and after this fome mow two other crops before winter. *Mortimer*'s Hufb. p. 32. feq.

Hop-Trefoil, or *Hop-Clover*, the farmers name for the fmaller fpecies of *Trefoils*, or three-leaved grafs, which they fow in many places inftead of the large clover: it is efteemed much finer and fweeter than the large clover, and upon fome land is a very great improvement, though 'tis reckoned to grow upon any foil.

Hartlip, in his legacy, fays, there are twenty-three forts of it, and that every fort loves a peculiar foil; fome fpecies thriving beft on clay, fome on fand, fome in watery places, and fome on fun-burnt grounds. The feeing one kind or other of it thus growing on all forts of foils, may have been the occafion of the error of fuppofing that every kind of it would grow every where: there are very certainly fometimes feen thin crops of it, and the moft natural fuggeftion as to the reafon of it, feems, that a wrong kind for the foil has been fown there. It may be no fmall improvement in this branch of the farmer's bufinefs, to find out which it is that particularly loves each foil, and always fow the proper fpecies in the proper places. *Mortimer*'s Hufbandry, p. 41.

It may be fown either with corn, or alone on ploughed lands, or fprinkled over meadows to make a better crop with the common grafs. They commonly allow twelve pounds of the feed to an acre; and when fown alone, it is efteemed much more lafting than the rey-grafs, efpecially the yellow hop-clover. When fown among the hay-grafs in meadows, it much improves the crop both in quantity and quality.

The laft crop is, however, often damaged by the weather, and it feems, upon the whole, better for the farmer to make only one crop after that in May. This fecond crop he fhould alfo calculate to get feed from; and for this purpofe he muft let it ftand till the heads are thoroughly ripe before it is cut, for it is a fort of feed that is not eafy to fhed.

When the feed is firft perceived in the head, it is a notice that in a month's time it will be ripe, and fit for cutting. It muft be watched about this time, and the ftalk will be found to turn brown, and the feed greenifh, at the time when it is fit for cutting. It muft be mowed in a dry feafon, and kept carefully as dry as can be.

It ripens fome years confiderably fooner than others, and therefore there can be no rule laid down for the time of cutting, but this muft be guided by the ripening of the feeds in the heads.

If the clover is apt to wear out the ground, and become thin upon it, let it be mowed in May, and after that let it ftand till the feed is ripe, and falls out of the hufks upon the ground; then cattle may be turned in to feed upon it, and it will rife up as frefh and full from thefe fcattered feeds, as if it had been new fown with all the art and care in the world. One acre of this grafs will feed as many cattle as five acres of common grafs; but the moft advantageous way of feeding them, is not to turn them in upon it, becaufe in that cafe they tread down more than they eat; but to cut it with a fcythe, and give it them in racks.

If the cattle are to be turned in to feed at large upon it, this muft be done gradually, and with great caution; for if they are at once removed from common grafs into this, they will over-feed upon it, and even burft themfelves; they are therefore to be put in at firft only for half an hour in the middle of the day; a fecond day they may be left in an hour; and the third day two or three hours; and after this, for three or four days, they are to be turned in as foon as the morning dews are off the ground, and driven out again before the evening dews fall. After this, it may be fafe to let them remain in it entirely.

Clover is apt to do harm to milch cows, more than to any other cattle; and it is a very good method fome have, to take off from the too great richnefs of the crop, by fowing rey-grafs among the *clover*. This upright grafs grows well among the branches of the *clover*, fhooting up its ftalks above it, and being eaten with the *clover*, takes off from its too great richnefs, at the fame time that it makes the crop the larger.

The *clover* that is intended for feed is preferved dry all the winter, and in March it is to be thrafhed for the feed: what feed firft comes out is to be cleanfed from the ftraw, and the hufks then are to be trafhed again. When all is obtained that can at one time, let the ftraw be well dried in the fun, and toffed about with a rake, and then on the thrafhing it again, more feed in confiderable quantity will be obtained: two bufhels of feed may thus be procured, out of the produce of an acre of good Land where the *clover* has throve. Id. ibid.

Shrub-Trefoil. See the article Cytisus.

TREMELLA, *Laver*, in botany, the name of a genus of fmall and feemingly imperfect plants, the characters of which are thefe: They are a kind of plants feemingly of a fort of a middle nature between the *alga* and *conferva*. Thefe produce no flower, nor feed, fo far as has been yet obferved, but are throughout of one uniform and tender texture, pellucid and membranaceous, and frequently gelatinous; they for the moft part live in the water, and confift of flat and plain leaves, often very broad, and fometimes tubular. See Tab. of Moffes, N°. 3. *Dillen.* Hift. Mufc.

There are feventeen known fpecies of this plant. 1. The common fea *Tremella*, called oifter-green or fea-*Laver*. 2. The frefh-water *Laver*: this is much fmaller than the former, and of a very tender ftructure. 3. The navel-*Laver*: this is diftinguifhed by having its leaves rounded and umbilicated in the center. 4. The marygold-leaved *Laver*: this is of a blackifh green colour, and has all its leaves oblong, jagged, and growing on pedicles. 5. The leek-leaved *Laver*: this grows

grows to three or four inches long, and is of a pale green. 6. The fasciated, or double ribband-*Laver*: this is of a bright green, and finely undulated. 7. The gut-*Laver*, commonly called the sea-chitterling: this is hollow and waved in various manners; it is common in salt-water ditches. 8. The thready and tape-like *Laver*: this is naturally of a fine green, but becomes white with long lying on the shores. 9. The small cluster-*Laver*: this consists of small and convoluted branches, forming a thick tuft; it is of a dusky green, and is common on pebbles near the sea-shore. 10. The jelly-like buckthorn sea-*Laver*: this is common on the sides of small salt-water ditches, and is of a fine bright green; the branches are somewhat distended, but not wholly cylindric. 11. The gelatinous fern moss-like *Laver*: this is a very beautifully ramified species, and grows on small pebbles; it is very tender and of a beautiful green. 12. The tender crisp or curled ground-*Laver*: this of a beautiful deep green, and is very common under old walls and pales, in January, February, &c. 13. The horned ground-*Laver*: this grows to three or four inches high, and is variously and elegantly divided into a number of branches, or horns; those are of a membranaceous structure, and of a pale green colour when growing, but a little yellowish when dried: while growing, it much resembles some of the lichenoides. 14. The jelly rain-*Laver*, called *nostoch*. See the article NOSTOCH. 15. The black gelatinous tree-*Laver*, called by the country-people witches butter: this is of a dusky-reddish black, and consists of a thick wrinkled membranaceous substance; it is common in Herefordshire, and some other countries on the barks of old trees. 16. The bladdery gelatinous river-*Laver*: this is corrugated in the manner of the mesentery, and is covered with granulous tubercles resembling seeds; it is of a bright green, and is found in the rivers of Wales. 17. The bladder-headed-*Laver*: this arises from a greenish irregular crust, into a sort of hollow tubercles or bladders, which at first lie close upon it, but afterwards rise upon small pedicles; these heads or bladders are distended each by a drop of water, which when it is rarified by the sun's heat often bursts the bladder, and the whole collapses and looses its form. *Dillen.* Hist. Musc. p. 50.

TREMOLANTE, in the glass-trade, a name for the preparation of calcined brass, otherwise called orpello, used either for a sky-blue, or a sea-green. *Neri's* Art of Glass, p. 35.

TREMOR (*Cycl.*)—TREMOR *Artuum*, in medicine, a distemper consisting in a violent agitation of the limbs in contrary directions, owing to a deficiency of the due tone and proper nisus of the affected parts. Medical writers distinguish this *Tremor* into the active and passive; the active is that which happens in violent passions of terror, anger, joy, &c. or in intermittent fevers, and is to be referred to the semi-convulsive motions; the passive are owing to a privative cause, and are allied to the semi-paralytic affections.

The passive *Tremors* of the limbs, when considered as a disease, are to be distinguished from those which are caused by external accidents, such as the being plunged into cold water, the drinking tea, coffee, or other warm liquors, in many constitutions, and other such accidental causes. The persons subject to *Tremors* of the limbs are principally old people, in whom the vital principle is weak and languid.

Causes. The internal causes, are a flaccidity of the nerves and remission of the tone of the parts; the external and accidental ones are the omission of accustomed evacuations, a diaphoretic regimen, and an abuse of spirituous liquors. *Junker's* Consp. Med. p. 680.

Prognostics and Method of Cure. This is usually in old people a very obstinate complaint, and the more it is confirmed by being grown habitual, the more difficult is the cure; but if a case of this kind be taken in hand, as soon as it seizes the patient, and be treated in a rational manner, it is often perfectly cured. In order to this, the first step must be the perfectly cleansing the *primæ viæ*, by repeated doses of rhubarb, or of an extract of black hellebore; if any habitual evacuation have been omitted, as bleeding or the like, this must be restored in the accustomed manner; and if any natural flux of blood by the hæmorrhoids or otherwise have stopped, this also must be recalled by proper medicines, or by the application of leeches: after this the due tone of the parts is to be restored by nervine medicines, as by wine impregnated with serpyllum, lavender, sassafras, guaiacum, and the like ingredients; and externally by rubbing the parts with spirit of castor and serpyllum, and bathing them in decoctions of tanzy, savin, feverfew, and the like herbs. One great rule in the cure of this disease, is, that the patient is to abstain from all hot things, otherwise an atrophy is easily brought on, and proves a much worse thing than the original disorder. *Junker's* Consp. Med. p. 681.

TRENCHING *Plough*, (*Cycl.*) in husbandry, the name of an instrument used to cut out the trenches, drains, and carriages in meadow and pasture-ground. It is also used for cutting the sides of turf even, which are to be laid down again either in the same, or in some other places.

It consists of a long handle, with a knob or button at the end, and at the other end it turns upward like the foot of a plough, to slide in the ground. In this part is placed a coulter, of the length proportioned to the depth to be cut, and with a sharp edge; this has two wheels to make it run easy, and does a great deal of business in a very little time. *Mortimer's* Husbandry.

TREPAN (*Cycl.*)—Where it is ambiguous whether there be an extravasation of liquors, or a depression of the skull, the operation of the *Trepan* is said to be the safest method. Mr. Quesnay gives us some histories of the *Trepan* being performed several times with success, for the same disease; and of large parts of the skull being taken away, without loss of the patient's life. See Mem. de l'Acad. de Chirurg.

We have the description and figure of a *Trepan*, differing from and turning more equally than the common, by Mr. Monro, in the Med. Ess. Edinb. vol. 5. art. 41.

TREPANING (*Cycl.*)—Not only the head, but the sternum, is sometimes necessarily the subject of this operation, as abscesses are sometimes formed under the sternum between the membranes of the mediastinum, by a fall or blow, an inflammation, or other causes; in which cases there is hardly a possibility of discharging the matter by any other method.

The great difficulty is to determine when and when not this is necessary; that is, when there really is an abscess formed there. When this is known to be the case, the operation is to be performed in the following manner: The patient is to be inclined backward, and a crucial incision made in the integuments upon the lower part of the sternum, where the abscess sometimes makes a point; then the integuments being freed from the sternum, the *Trepan* is to be applied, and worked in the same manner as in *Trepaning* the cranium; and when the perforation is made, the patient is to be stooped forward, and ordered to cough or breathe hard, in order to promote the discharge of the matter; and the abscess is afterwards to be cleansed with detergent injections, and healed in the usual way. *Heister's* Surgery, P. 2. p. 21.

TREPIGNER, in the manege, the action of a horse who beats the dust with his fore-feet in managing, without embracing the volt; and who makes his motions and times short, and near the ground, without being put upon his haunches. This is generally the fault of such horses as have not their shoulders supple, and at liberty, and withal have scarce any motion with them. A horse may *trepigner*, in going upon a strait line.

TRESSEL (*Cycl.*)—TRESSEL-*Trees*, in a ship, are those timbers of the cross-trees that stand along ships, or fore and aft at the tops of the masts. See the article CROSS-*Trees*.

TRESSIS, among the Romans, a copper coin equal in value to three *asses*. *Pitisc.* in voc. See the article As, *Cycl.*

TREWIA, in botany, the name of a genus of plants, the characters of which are these: The perianthium is permanent, and is composed of three oval reflex and coloured leaves. There are no petals. The stamina are numerous capillary filaments, of the length of the cup. The antheræ are simple. The germen of the pistil is placed under the cup. The style is simple, and of the length of the stamina, and the stigma is simple. The fruit is a three-square turbinated coronated capsule, formed of three valves, and containing three cells. The seeds are single, and are in figure convex on the one side, and angular on the other. *Linnæi* Gen. Plant. p. 236. Hort. Mal. vol. 2. p. 42.

TRIAD, *Trias*, (*Cycl.*) among the antient Mythologists. See the article TERNARY.

TRIANDRIA, in botany, a class of plants which have hermaphrodite flowers, with three stamina or male parts in each.

The word is formed of the Greek, τρὶς, three, and ἀνὴρ, male. Of this class of plants are the valerian, saffron, a great many of the grasses, &c. See Tab. 1. of Botany, Class 1.

TRIANGLE (*Cycl.*)—Plutarch informs us, that Xenocrates the philosopher resembled the Deity to an equilateral *Triangle*, the genii to an Isosceles, and men to a scalenum. A *Triangle* has since been applied by Christians to represent the Trinity, sometimes single, and at other times with additional lines, expressing a cross. Thus we find them variously combined upon the medals of the popes, published by Bonanni. And nothing was more frequent formerly with printers, than to place these figures in the front of their books; at first, doubtless, with a religious intent, till at length, by common use, they became only press marks, and badges of distinction among the trade; as they now are with merchants, who mark their goods with them both here and abroad. Phil. Trans. N°. 474. Sect. 1.

TRIANGULAR (*Cycl.*)—TRIANGULAR *Leaf*, among botanists. See the article LEAF.

TRIANGULARIS (*Cycl.*)—TRIANGULARIS *Coccygis*, in anatomy, a name given by Santorini, and others, to the muscle now generally called simply *Coccygæus*. See the article COCCYGÆUS.

TRIANGULARIS *Labiorum*, in anatomy, a name given by Santorini and Winslow, to the muscle called by Albinus *depressor anguli oris*, and by Cowper and others, *depressor labiorum communis*.

TRIANGULARIS *Penis*, in anatomy, a name given by Morgagni, and others, to a supposed muscle, called also by some *dilatator penis*, and *dilatator posticus urethræ*; and by others *levator ani*.

It is truly no distinct muscle, but a process of the *sphincter ani* running into the perinæum.

TRIAN-

Triangularis *Piscis*, in zoology, the name of a sea-fish of a very remarkable figure, called in English the *coney-fish*, of which there are two species, the one having two horns, the other wanting that character.

The horned kind is usually six or seven fingers breadth long, and about three fingers broad. The tail ends in a somewhat long fin. The mouth is small, and capable only of admitting a pea. It has twelve strong serrated teeth in the upper jaw, and eight larger ones in the lower. The head rises gibbously from the mouth to the horns; and the back is humped in the same manner in the middle. It has only one small fin near the tail. Its eyes are large, and placed near the horns. Beside the single fin near the tail, it has four others, the tail making one, one more being situated on the back, and two on the belly. It has two horns like cocks spurs, growing strait out of its forehead, and two others in a contrary direction, out of its belly near the tail. It has no scales, but has a hard skin, white on the belly, and brown every where else, and wonderfully marked with trigonal, tetragonal, and pentagonal and hexagonal figures. The species which has no horns, has a broader belly, a longer tail, and is marked all over its body only with hexangular figures, and innumerable small tubercles. Its belly is yellowish, and the rest of its body of a greyish or brownish yellow. The mouth is narrow, and the teeth small; five in the under, and eleven in the upper jaw. The eyes are large and round. It is hollow, and has very little flesh. See Tab. of Fishes, N°. 68.

Both those species are caught among the rocks, on the shores of the island of Java, and are sometimes eaten by the inhabitants, being first skinned. *Clus.* Exot. L. 6. c. 27. *Willughby*'s Hist. Pisc. p. 150.

Triangularis *Splenii*, in anatomy, a name given by Spigelius and others, to a muscle of the head called by Winslow, the upper portion of the *splenius*, or *superior mastoidæus*, and by Albinus, the *splenius capitis*. The old authors have described it under the name of the *primus caput moventium*.

TRIBULASTRUM, in botany, a name given by Jussieu to a genus of plants, since called by Linnæus *neurada*. See the article Neurada.

TRIBULOIDES, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, being composed of a number of petals, arranged in a circular form. From the cup arises a pistil, which finally becomes, together with the cup, a roundish prickly unicapsular fruit, containing a seed like a chesnut. The prickles of the fruit are only the leaves of the cup become rigid. There is only one known species of this plant, which is the water *Tribuloides*, commonly called the *water Tribulus*. The kernel of the fruit is eatable.

TRIBULUS, *Caltrop*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the rosaceous kind, consisting of several leaves, arranged into a circular form. From the cup arises a pistil, which afterwards becomes a sort of cruciform or turbinated fruit, composed of several parts, each ending in a prickly point, and all collected into a firm head, and containing oblong seeds.

The species of *Tribulus*, enumerated by Mr. Tournefort, are these: 1. The chich-leaved land *Tribulus*, with prickly seed-vessels. 2. The great prickly-headed land *Tribulus* of Curasso 3. The long-leaved Armenian *Tribulus*, with turbinated heads. And 4. The vetch-leaved hairy *Tribulus* of the East-Indies. *Tourn.* Inst. p. 265.

Tribulus *Murinus*, the *Caltrop-Shell*, in natural history, the name of a peculiar species of the purpura. It is of a whitish colour, and has three rows of spines. See the article Purpura.

TRIBUNES *of the People*, (*Cycl.*) in antient Rome, by virtue of their office, claimed and exercised a power of summoning the senate at any time, whenever the affairs of the people required it, though the consuls themselves were in the city. It has been taken for granted, on the authority of Valerius Maximus, that the *Tribunes* of the people, on their first creation, were not admitted into the senate, but had seats placed for them before the doors in the vestibule. But we may reasonably conclude, that a magistrate so ambitious and powerful, who could controul, by his single negative, whatever passed within doors, would not long be content to sit without. *Dionys.* Halic. x. 31. *Middlet.* of Rom. Senat. p. 129. *Val. Max.* l. 2. c. 27.

A. Gellius says, that they were not made senators before the law of Atinius [a], who is supposed to be C. Atinius Labeo, *Tribune* of the people, A. U. 623. [b]; but that cannot possibly be true, since it is evident from the authority of Dionysius, that near four centuries before, the *Tribunes*, by the mere weight, and great power of their office, had gained an actual admission into the senate, within two years after their first creation [c]; in which we find them debating and enforcing, with great warmth, the demands of the commons, for a liberty of intermarriages with the nobles, and the choice of a plebeian consul [d]. So that the intent of this Atinian law could not be, as it is commonly understood, that the *Tribunes* should be senators in virtue of their office, for that they had been from the beginning; but that for the future they should always be chosen out of the body of the senate, or, which is the same thing, out of those who had already borne the office of quæstor [e]. —[[a] *A. Gell.* 14. 8. [b] V. *Pighil.* Annales, A. U. 623. [c] *Dionys.* l. x. 11. [d] *Dionys.* xi. 57. [e] *Middleton*, of Rom. Sen. p. 45.]

TRICEPS (*Cycl.*)—Triceps *Primus*, a fleshy and flat muscle, situated between the os pubis and the whole length of the os femoris; the first and second cross each other in such a manner, as that the muscle which is the first on the os pubis, becomes the second on the os femoris; but the third keeps its rank.

The *Triceps primus* is fixed above by a short tendon to the tuberosity or spine of the os pubis, and to the neighbouring part of the symphysis, its fibres mixing a little with those of the pectineus. From thence it runs down, increasing in breadth, and is inserted by fleshy fibres interiorly in the middle portion of the linea femoris aspera. At the lower part of this insertion a portion of the muscle separates from the rest, and sends off a long tendon, which, together with a like tendon of the *Triceps tertius*, is inserted in the inner condyle of the extremity of the os femoris. *Winslow*'s Anatomy, p. 208.

Triceps *secundus*, a fleshy and flat muscle, fixed above by fleshy fibres below the superior insertion of the *Triceps primus* in all the outside of the inferior ramus of the os pubis, as low as the foramen ovale; but seldom so low as the ramus of the os ischium. This insertion is broader than that of the former muscle. From thence it runs down, and is inserted in the upper part of the linea aspera, between the pectineus and *Triceps primus*, mixing a little with each of those muscles. This insertion appears sometimes divided. *Winslow*'s Anat. p. 208.

Triceps *tertius*, a fleshy and flat muscle, fixed above by fleshy fibres to the anterior part of all the short ramus of the ischium, and to a small part of the tuberosity of that bone; this insertion covers some part of the tendon of the semi-membranosus; from thence it runs down and is inserted by fleshy fibres in the linea aspera, almost from the little trochanter down to the middle of the os femoris.

It goes lower down than the first *Triceps*, sending off a separate portion, like that of the secundus. These two portions join together and form a common tendon, which running down to the lower extremity of the os femoris is inserted in the back part of the tuberosity of the inner condyle; this separate portion is sometimes large enough to be mistaken for a distinct muscle, making a quadriceps instead of a *Triceps*. In all this progress this muscle is joined to the vastus internus by a perforated aponeurosis, through which the blood-vessels pass. *Winslow*'s Anatomy, p. 208.

TRICHECHUS, in ichthyology, a name given by Artedi to the creature commonly called the manati, or sea-cow. He makes it a distinct genus of the plagiuri or cetaceous fishes; the characters of which are these: The teeth are flat and stand in each jaw, and there is no fin on the back. This creature grows to twelve or fifteen foot in length, and to six or seven foot in breadth. The head is oblong and cylindric, and more resembles that of a hog than any other creature's. The eyes are small, there are small apertures in the head by way of ears, and the lips are very thick; two teeth stand out on each side, of the thickness of a man's thumb, and five or six inches long. The pectoral fins are two, and stand on the breast; they are composed of five distinct bones resembling fingers, joined together by a membrane; each bone has three articulations. The tail is placed horizontally, and there is no fin upon the back: In the females there are two round breasts placed between the pectoral fins. The parts of generation are like those of the human species in both the male and female; and there is a navel. The skin is hard, and almost impenetrable; the hairs are few, and of a greyish colour. The creature lives about the openings of great rivers into the sea, and feeds on grass and sea-plants. The flesh is white and well tasted. It makes a noise, and is said to be easily tamed, and to love the human species. Its great enemies are the crocodile and the shark, both which are very fond of its flesh. *Artedi* Gen. Pisc. 61. *Linnæi* System. Nat. p. 5.

The name is originally Greek, and is formed of the words θρίξ, a hair, and ἰχθύς, a fish. It is given this fish to express its being hairy; as it is almost the only fish in the world that has a title to this adjective hairy.

TRICHERIÆ, in natural history, the name of a genus of fossils, of the class of the fibrariæ; the characters of which are, that they are not elastic, and are composed of strait and continuous filaments. See Tab. of Fossils, Class 1.

The word is derived from the Greek τρίχες, capillaments or fibres. The bodies of this genus are divided into those which have broader, and those which have narrower filaments; and there are six known species of it: 1. The gypsum striatum, or striated plaster-stone; see the article Gypsum *Striatum*. 2. A yellowish white kind, found in the clay and gravel pits in Northamptonshire, and elsewhere. 3. A white kind, with foliaceous flakes, made up of several conjunct series of filaments, and emulating the external appearance of the talcs, though wanting their characters: This is found in the alabaster pits of Derbyshire. These three are of the broad fi-

bred kind. Of thofe with narrower fibres, there are, 1. A flefh-coloured fpecies, with very little glofs, found in many parts of Yorkfhire, and worth enquiring after, as it readily burns to a very fine plafter, like the gypfums. 2. A dull-looking white fpecies, with very fhort though continued filaments, found in the pits of red marl in Derbyfhire, and elfewhere. And, 3. A greenifh white kind very gloffy, with ftrait narrow and continued filaments. This is a very fcarce fpecies, but is found fometimes in the marl-pits of Derbyfhire and on the fhores of Yorkfhire, having been wafhed out of the cliffs by the waves in high tides. All thefe fpecies burn very readily to a fine plafter, like the gypfums; and fome of them are found in particular places in fuch great abundance, that it would be a very advantageous thing to collect and burn them. *Hill's* Hift. of Foff. p. 90.

TRICHESTRUM, in natural hiftory, the name of a genus of foffils, of the clafs of the felenitæ, but differing extremely in figure and ftructure from the common kinds.

The word is derived from the Greek τρίχες, hairs or filaments, and ἀστὴρ, a ftar; and expreffes a fet of bodies compofed of filaments arranged into the form of a ftar. The felenitæ of this genus are compofed of filaments fcarce any where vifibly arranged into plates or fcales, but difpofed in form of a radicated ftar, made of a number of disjunct ftriæ. See Tab. of Foffils, Clafs 2. *Hill's* Hift. of Foff. p. 123.

Of this genus there is only one known fpecies, which is of a pale brown, and is compofed of extremely fine and flender filaments. It is formed like the lepaftrum in the accidentally open cracks in the feptaria, or ludus Helmontii, and is no other way different from the bodies of that genus, than as in all the felenitæ the plates they are compofed of are made up of filaments nicely arranged, in this as in fome other of thofe bodies, the filaments have never arranged themfelves into plates at all, but are difpofed into the form of a ftar compofed of fingle threads. This body very readily and regularly fplits according to the arrangements of the fibres, and is in fome pieces tolerably pellucid. It is found only in one place, fo far as is yet known, which is under the cliffs of Sheppy-ifland in Kent; where it is confiderably plentiful, and makes a very elegant figure on the broken maffes of feptaria, which are in immenfe numbers ftrewed upon the fhore. *Hill's* Hift. of Foff. p. 150.

TRICHIASIS, in medicine, the name of a diftemperature of the eyes, in which the eye-lids are inverted, and in which the eye-lafhes hurt and irritate the eyes.

The cilia or margins of the eye-lids are fometimes inverted fo as greatly to irritate the fenfible coats of the eye, and bring on intenfe pains and inflammation, which, without timely affiftance, may greatly injure, if not totally deftroy the fight. This diforder is generally owing to accident, as the irregular cicatrix left on the part from a burn, the fmall-pox, an ulceration, or wound, or fome other external injury. But fometimes a relaxation of the fkin, and a paralytic diforder of the eye-lids, are the chief caufes of it.

Whatever caufe it is from, it is always difficult enough to be remedied; for it is hardly poffible for the furgeon to remove it, fo as to prevent its returning, without extirpating the offending hairs; and if thefe be cut off clofe, it will be to no purpofe, becaufe the rigid ftumps of the hairs will irritate the eye even worfe than the whole hairs did before. It is a very nice operation alone that can make a cure; here the hairs muft be pulled up fingly by the roots, and the places of their infertion fingly cauterized with a hot broad-pointed needle; but this the patient will feldom fubmit to, and the only remaining method then, is to fill up the finus's out of which they were extracted with the lapis infernalis. But in this the greateft care muft be taken, that no part of that application get into the eye. The eafieft method is the touching the cavities, out of which the hairs have been pulled up, with a pencil-brufh dipped in a mixture of fpirit of fal-armoniac and highly rectified fpirit of wine, by which means they will clofe up, and no more hairs will grow from them. *Heifter's* Surgery, p. 369.

TRICHIDES, in zoology, a name ufed by the antients, for a fifh of the harengi-form kind, probably the pilchard, which they called alfo *Sardinia* and *Sardella*. *Willughby's* Hift. Pifc. p. 224.

TRICHOMANES, in the Linnæan fyftem of botany, the name of a genus of capillary plants, defcribed by Plumier; the characters of which are thefe: On the margin of the leaves ftands a fingle erect turbinated cup, and a ftylus in the manner of a briftle terminates at the capfule. The plants of this genus are very different from what other authors call the *Trichomanes*; which, according to Linnæus, is not a diftinct genus of plants, but is a fpecies of afplenium. See Tab. I. of Botany, Clafs 16. and the article ASPLENIUM.

The characters of this genus, according to Mr. Tournefort, are thefe. The flowers are not difcovered, but the feeds grow in clufters on the backs of the leaves, as in fern. The leaves are compofed of little ufually roundifh leaves, which grow by pairs along a middle rib.

The fpecies of *Trichomanes*, enumerated by Mr. Tournefort, are thefe: 1. The common *Trichomanes*. 2. The *Trichomanes*, with leaves elegantly jagged. 3. The fmall tender *Trichomanes*. 4. The great branched *Trichomanes*. 5. The *Trichomanes* with round dents, furrounded by a black rim. 6. The *Trichomanes*, with leaves lightly prickly. 7. The *Trichomanes*, with triangular crenated leaves. 8. The *Trichomanes* with heart-fafhioned leaves. 9. The leffer branched *Trichomanes*. 10. The *Trichomanes*, with leaves partly bifid, partly whole. 11. The broad-leaved dentated *Trichomanes*. 12. The pendulous foft and filky *Trichomanes*. 13. The filvery *Trichomanes*, black at the edges. 14. The *Trichomanes* with bifid indentings.

The fruit of the *Trichomanes* is a roundifh capfule, of a membranaceous texture, and covered with a fort of fcales; thefe are furrounded with an elaftic ring, by the contraction of which they are burft, and the feeds thrown out. *Tourn.* Inft. p. 539.

This plant ferves with us, as a fuccedaneum for the true adiantum, or maiden-hair, which is not a native of England, and by the careleffnefs of our druggifts is feldom brought over to us. The whole plant, ftalks and leaves together are ufed, and the virtues are in their greateft perfection, if it be gathered in the month of September; it is fpoken of by all authors, as a good medicine in difeafes of the breaft and lungs, and is much recommended by fome in the ftone and gravel. *Dale*, Pharm.

TRICHOSANTHES, in botany, the name given by Linnæus to a genus of plants, called by Plumier, Micheli, and others, *anguina*: the characters are thefe: It produces male and female flowers, on diftinct parts of the fame plant; in the male flowers, the perianthium is one leaved, clavated, and very long; it is fmooth on the furface, and has a fmall mouth reflected backwards, and divided into five fegments. The flower is divided alfo into five fegments, it is fixed to the cup, and is plain and expanded; the fegments are of a lanceolated oval figure, and are fringed at their edges, with a great number of long and branched hairs: the ftamina are three very fhort filaments, reaching to the top of the cup; and each anthera is an oblong erect cylindric body, furrounded above and below with a line containing a large quantity of farina. There are in this flower three ftyles, which are very fmall, and grow to the fides of the cup, but they are always abortive. In the female flower, the perianthium is the fame as in the male, but it ftands in this upon the germen of the piftil, and foon perifhes; the flower is the fame with the male; the piftil has an oblong and flender germen, and has a capillary ftyle, arifing from it, of the length of the cup; the ftigmata are three in number, they are long, pointed, and gaping in the middle; the fruit is an extremely long pomum, and contains three cells, very remote one from another: the feeds are very numerous, and are compreffed, and of an obtufely oval form, and covered with a coat. *Linnæi* Genera Plant. p. 466. *Micheli*, Nov. Gen. p. 9. *Plumier*, Rar. p. 100. Hort. Malab. Vol. 8. p. 157.

TRICHOSTEMA, in botany, the name of a genus of plants, the characters of which are thefe: The perianthium is compofed of one leaf, and is bilabiated; the upper lip is divided into three fegments, and is twice as large as the under one, which is divided only into two. The flower confifts of one petal, and is of the labiated kind; its tube is very fhort; its upper lip is compreffed and falcated, and the lower is divided into three fegments, the middle one is oblong, and is the fmalleft of the whole; the ftamina are four capillary filaments, they are crooked and extremely long, two of them are fomething fhorter than the others; the antheræ are fimple; the germen of the piftil is divided into four parts; the ftyle is capillary and of the length of the ftamina; and the ftigma is bifid; the cup remains after the flower is fallen, and then becomes larger and the upper lip falls over the under one, it then becomes diftended in the middle and clofed at the mouth, and contains four feeds. *Linnæi* Gen. Plant. p. 265.

TRICHOURI, in natural hiftory, a term ufed by fome authors to exprefs fuch flies, as have one or more hairs growing out at their tails; thefe are called alfo feticaudæ, and are diftinguifhed into three genera, as they have one, two, or three hairs growing out at the tail. See the article SETICAUDÆ.

TRICHRUS, in natural hiftory, the name of a ftone defcribed by the antients, and faid to yield three colours; in their common way of preparing bodies of this kind for medicinal ufe, (which was by rubbing them down on a porphiry, or other hard ftone with water) this firft coloured the water black, then red, and laftly white. It feems to have been a kind of hæmatites, or blood-ftone.

TRICIPITIS *Caput Primum*, in anatomy, a name given by many authors to a mufcle of the thigh, called by Albinus *abductor femoris*; Douglafs calls it *abductor primus femoris*, and Winflow the *mufculus primus tricipitis*. It is the *pars octavi femoris* of Vefalius; that author, and indeed many others of the earlier anatomifts, not efteeming it a diftinct mufcle.

TRICOR, a name, by which fome of the chemical writers have called gold.

TRIDE, in the manege, fignifies fhort and fwift; thus a *Tride pace*, is a going of fhort and quick motions, tho' united and eafy. A *Tride career*, is a very faft gallop, with the times or motions fhort and nimble; and fo of other motions. Some apply the word only to the motion of the haunches.

TRIEDROSTYLA, in natural hiftory, the name of a genus of fpars.

The word is derived from the Greek τρεις, thrice, ἕδρα, a fide, and στυλος, a column.

The bodies of this genus are fpars, in form of trigonal columns, adhering by one end to fome folid body, and terminated at the other by a trigonal pyramid. Of this genus there are four known fpecies: 1. A flender one with a long obtufe pyramid: this is one of the moft common of all the the fpars, and is found in almoft all parts of the world; fometimes in fingle and large fpecimens, but more frequently in large congeries, coating over the fiffures of ftone in form of crufts. 2. One with fhort but pointed pyramids: this is common on Mendip hills, and is found in fome other parts of England. 3. A thick one with a longer pyramid, found in Northamptonfhire, and fome other parts of the kingdom, encrufting the fiffures of ftone. And 4. One with a very fhort column, and a long obtufe pyramid: this is frequent in the mines of Germany, and not lefs fo in thofe of England, particularly in Derbyfhire. *Hill's* Hift. of Foff. p. 222.

TRIEMERUS, the three-day fly, in natural hiftory, a fly fomewhat like the butterfly; it has four large yellowifh wings, and a long body, with a head furnifhed with long antennæ, large eyes, and a fpiral trunk. It is found among the nettles and mallows.

TRIENTALIS, in botany, the name of a genus of plants, the characters of which are thefe: The perianthium is compofed of fix leaves, and is permanent; the leaves are narrow, pointed, and wide expanded; the flower is of the ftellated kind, and is compofed of feven petals, which ftand flat and open, and adhere together very flightly at the top, thefe are a little longer than the leaves of the cup; the ftamina are feven capillary filaments, of the length of the cup, but inferted into the flower; the antheræ are fimple; the germen of the piftil is globular; the ftyle is capillary, and of the length of the ftamina; and the ftigma is headed; the fruit is a dry berry of a globular form, formed of an extremely thin cruft, and having only one cell; the feeds are few in number, and are of an angular figure; the receptacle is large enough to hold a great number of them; the number of the leaves of the cup fometimes varies. *Linnæi* Genera Plant. p. 187.

TRIERARCHI, τριηραρχοι, among the Athenians, commiffioners chofen annually out of the richeft citizens, who were obliged to provide all forts of neceffaries for the fleet, and to build fhips at their own charge. See *Potter*, Archæol. Græc. l. 1. c. 15. T. 1. p. 86.

TRIETERIS, τριετηρις, in the antient chronology, a cycle of three years. *Potter*, Archæol. Græc. T. 1. p. 459.

TRIEXAHÆDRIA, in natural hiftory, the name of a genus of fpars.

The word is derived of the Greek, τρις, thrice, ἕξ, fix, and ἕδρα, a fide.

The bodies of this genus, are perfect and pellucid cryftalliform fpars, confifting of thrice fix planes, being compofed of an hexangular column, terminated at each end by an hexangular pyramid: Of this genus there are three known fpecies. 1. A clear one with narrow and oblong pyramids: this is found in the mountains of Germany, and in North-Wales; but with us it is fmall and coarfe. 2. One with fhort pyramids and a long column: this is found in the mines at Goffelaer in Saxony. And, 3. One with fhort pyramids, and a thick and fhort column: this is found with us in the leadmines of Yorkfhire. *Hill's*, Hift of Foff. p. 204.

TRIFOLIUM *Trefoil*, in botany. See the article TREFOIL.

TRIFOLIUM *Paluftre*, *Buckbean.* This plant, tho' mentioned by feveral writers, before Simon Pauli, yet he was the firft who recommended it in fcorbutic cafes. He fays it is more fubtle and penetrating than *nafturtium* or creffes.

It feems at prefent to be coming into great repute in many chronical diftempers; and frequently prefcribed among alexipharmics.

Many have got it into ufe in their families in the form of tea, and experience its conftant ufe to be very effectual againft fcorphula's the king's evil, and obftinate fcorbutic diftempers. Its tafte at firft, is not very grateful, but time wears off that diflike; its ufe in fhop compofitions is not yet known. Vid. *Quinc.* Pharm. P. 2. Sect. 4. p. 124.

Buckbean ferves in Hampfhire to a very remarkable ufe; the brewers ufing it in their beer in the place of hops. It is as good a preferver of the drink, and is a bitter of as agreeable a flavour: it has this advantage alfo, that one eighth part of the quantity is fufficient, it is a very harmlefs plant, and is given by many as an antifcorbutic, and by fome in rheumatifms, and other chronic cafes. It might be extremely worth while to try this practice in other parts, as the plant might be eafily cultivated in any quantity, and that with this advantage, that it will grow on the worft kind of boggy land, that will produce nothing elfe. *Mortimer's* Hufbandry.

TRIFOLIUM *Acidum*, in botany, a name given by many authors to the oxys, or wood-forrel, from its having its leaves always three on a ftalk, and being of an acid tafte. See the article OXYS.

TRIFAX, among the Romans, a javelin three cubits long, which was thrown by the catapulta. *Pitifc.* in voc.

TRIGEMINI *Tertius*, in anatomy, a name given by Spigelius and others, to a mufcle called by Winflow the *complexus minor* or *maftoidæus lateralis*, and by Cowper and Albinus *trachelo-maftoidæus.* See the article MASTOIDÆUS.

TRIGLA, in the Linnæan fyftem of zoology, the name of a genus of fifhes, of the general order of the acanthopterygii: the diftinguifhing characters of thefe are, that the membrane of the gills has feven bones, and the pectoral fins have articulated appendages. Of this genus are the *lyra*, *hirundo*, *malvus*, *mullus barbatus*, &c. *Linnæi* Syftema Naturæ, p. 53. See the article LYRA, HIRUNDO, &c.

The characters of this genus, according to Artedi are thefe: The branchioftege membrane contains feveral bones; the head is very declivious, from the eyes to the end of the fnout, and is large, aculeated, and as it were fquare; the head is the broadeft part of the fifh, it thence grows gradually narrower, till it ends in a very fmall tail: in many of the fpecies of this fifh, there are two or three articulated appendices growing under the pectoral fins: the eyes ftand on the top of the head, and are covered with a fkin; there are two back fins, the firft of which is prickly; the pectoral fins in fome of the fpecies are very large.

Many of thefe fifhes are capable of making a noife; and fome of them by the help of their pectoral fins, can fuftain themfelves for a time out of the water, and fly to fome diftance. The appendices of the pylorus are from five to twenty.

Of thofe *Triglæ*, which have continuous, obtufe, and undivided fnouts, the following are the fpecies: The *Trigla* with a fmooth head, and with two fins on the lower jaw: this is the *mullus barbatus* of authors. 2. The *Trigla* with a fmooth head, with four yellow, not tranfverfe lines, on each fide, parallel to one another: this is the *mullus major*, or furmullet of our fifhermen. 3. The *Trigla* with a fmooth head and and without beards, all over of a red colour: this is called by authors the *mullus imberbis*, or king of the mullets. 4. The *Trigla* with the head fomewhat aculeated, and with a fingle little pinnule at the pectoral fins: this is the *milvus* of authors, or the kite-fifh; it flies four or five foot above the water, and that to a confiderable diftance. 5. The *Trigla* with a prickly head, and with three appendices on each fide at the pectoral fins: this is the *hirundo* of authors, and is called by our fifhermen the tub-fifh. Of thofe *Triglæ* which have the fnout a little forked, the following are the fpecies: 6. The *Trigla* with a fomewhat bifid fnout, and with the lateral line bifid at the tail: this is the *lucerna* of the Venetians, and the *milvus* of fome authors. 7. The red *Trigla*, with the fnout divided into two little horns, and with the opercula of the gills ftriated: this is the *cuculus*, and *lyra* of fome authors. This fifh grunts when taken out of the water, and the noife has been fuppofed to be like that of a cuckow, whence the name.

Of thofe *Triglæ*, which have the fnout very deeply divided, and opened into two very broad parts; the following are the fpecies: 1. The variegated *Trigla*, with the fnout divided into two prickles, and with two little prickles to each part: this is *gurnardus grifeus* of Ray, or the grey gurnard. 2. The *Trigla* with the fnout divided into two fpines, and with tubulous noftrils: this is the *lyra* of authors, called by our fifhermen the *piper*. 3. The *Trigla* with many cirri, and with an octangular body: this is the *lyra cornuta* of authors: the body is rendered angular, by having fix rows of acute and hard rhomboidal fcales. *Artedi*, Gen. Pifc. p. 32.

TRIGONAL-*Leaf*, among botanifts. See the article LEAF.

TRIGONELLA, in botany, the name of a genus of plants, including the fænugreek of authors; the characters are thefe: The perianthium is formed of one leaf, and is campanulated and lightly divided into five fegments, which are pointed, and nearly equal in fize; the corolla is papilionaceous, and feems compofed of three petals; the vexillum is oval, obtufe, and bent backwards; the two wings are of an oval oblong figure outwardly, by bending backwards, fo that in the vexillum, they feem to compofe a tripetalous flower of the common form; the carina is very fhort and obtufe, and occupies the middle of the flowers; the ftamina are diadelphous and fhort; the apices fimple; the germen of the piftil is of an oblong oval figure; the ftyle is fimple and erect, and the ftigma is fimple. The fruit is an oblong oval pod, of a compreffed figure, containing feveral roundifh feeds; the fhape of the flower alone, fufficiently diftinguifhes this from all the other genera of this clafs. *Linnæi* Gen. Plant. p. 362. *Tournef.* Inft. p. 270. *Rivin.* p. 497.

TRIGONELLA *Foffilis*, in natural hiftory, the name of a foffile fhell, of the cockle-kind, but approaching to a triangular figure, having a broad bottom to which it defcends, almoft in ftrait lines: on each fide from the head or cardo, thefe are ufually found fmall, but there are fome met with of four or five inches round: they are found at different depths, in ftone quarries, bedded in the matter of the ftrata; and that often in the hardeft ftone. In fome inftances, the fhells are found remaining in their native ftate; but moft frequently the fhell itfelf is perifhed and gone, and there is a ftony or fparry matter depofited in its place. *Hill's* Hift. of Foff. p. 646.

TRILL-*Hooks*, thoſe uſed to hold the ſides of a cart up to the horſe. See the article CART.

TRILLETTO, in the Italian muſic, a little ſhort ſhake or quaver; it differs from *trillo*, only in point of continuance being its diminutive. See the next article.

TRILLO, in the Italian muſic, is often found marked with a ſingle T; or tr, and often alſo by a ſmall t, as well in vocal as inſtrumental parts. It is deſigned to intimate, that you beat quick upon two notes in conjoint degrees, as *e f*, or *d e*, alternately; beginning with the higheſt, and ending with the loweſt. This makes what the French improperly call *cadence*, and properly *tremblement*. But it is alſo very often found in the Italian muſic to give notice, that the ſame ſound be ſtruck many times over, beginning a little ſlow, and ending with all the quickneſs, that the throat or finger can form them. Thus, ſuppoſing the firſt two or three quavers, then as many ſemi-quavers, and then ending with demi-ſemi-quavers, all in the ſame pitch or tune.

The manner wherein we have deſcribed this, comes far ſhort of what able maſters can ſhew in practice: This *Trillo* is more particularly uſed, after a note has been long held out, to eaſe the voice; which ſo long a tenſion had weakened. *Broſſard.*

TRILOBOUS-*Leaf*, among bontaniſts. See the article LEAF.

TRILOCULAR-*Capſule*, among botaniſts. See the article CAPSULE.

TRIMODIA, among the Romans, a bag like an inverted cone, in which ſowers carried their ſeed. It was ſuſpended from their necks, and was ſo called from its containing three buſhels. *Pitiſc.* Lex. Ant. in voc.

TRINGA, in the Linnæan ſyſtem of zoology, the name of a diſtinct genus of birds, of the order of the ſcolopaces: the diſtinguiſhing characters of this is, that the feet have each four toes, and the beak is ſhorter than the toes. *Linnæi* Syſtema Naturæ, p. 47.

There are three ſpecies of this genus: The firſt called by almoſt all authors *Tringa*; the others the *pinirole*, and our *ſandpiper*. See the article SANDPIPER and PINIROLE.

The firſt ſpecies, or *Tringa*, moſt uſually ſo called, has been however named *cinclus*, by Bellonius; and *gallinula*, *rhodopus*, *phœnicopus*, and *ochropus*, by Geſner. It is ſomewhat larger than the black-bird, the colour of all its upper-ſide, is a very gloſſy greeniſh brown; and its ſhoulders and the ſmaller feathers of its wings are ſpotted with white. In the male, there are numerous white ſtreaks, and ſpots on the head, but in the female theſe are wanting; the throat is white ſpotted with black; the breaſt and belly are of a pure ſnow white; the long feathers of the wings are brown, and thoſe of the tail variegated with brown and white; its beak is a finger and half long, and of a greeniſh colour; and its legs of a bluiſh green; the hinder toe is very ſmall. They live about the ſides of ponds and lakes; its legs are ſometimes ſeen reddiſh or yellowiſh. *Aldrovand.* Tom. 3. p. 481.

TRINGA *Minor*, in zoology, a name by which ſome authors called the bird, commonly known in England, by the name of the ſandpiper. See the article SANDPIPER.

TRINITY (*Cycl.*)—By a ſtatute of king William the 3d, if one educated in, or having profeſſed, the chriſtian religion, ſhall be convicted in any of the courts of Weſtmiſter, &c. of denying any one of the perſons of the holy *Trinity* to be God, or maintaining that there are more gods than one, or of denying the truth of the chriſtian religion, or the divine authority of the ſcripture, he ſhall for the firſt offence be adjudged uncapable of any office; and for the ſecond diſabled to ſue any action, &c. Anno 9 and 10. *Will.* III. cap. 32.

TRINK, in our ſtatutes, is uſed for a fiſhing-net. 2 *Hen.* 6. c. 15. *Blount.*

TRIONUM, in botany, the name of a genus of plants, called by Ruppius *bammia*; the characters are theſe: The perianthium is double; the external one is compoſed of twelve ſlender leaves; the internal one is only compoſed of one leaf, and is inflated and divided into five ſegments at the end; the flower conſiſts of five petals, cordated at the top, and growing together at the bottom; the ſtamina are numerous, they grow into a cylinder at the bottom, and are free at the tops; the antheræ are kidney-ſhaped; the germen of the piſtil is roundiſh; the ſtyle is capillary and terminated, by five obtuſe reflex ſtigmata; the fruit is oval, but ribbed with five ridges, and is compoſed of five valves, and contains as many cells; the ſeeds are numerous and are kidney-ſhaped. It is plain from theſe characters, that this genus is nearly allied to the hibiſcus. *Linnæi* Gen. Plant. p. 383. *Ruppii* Flora Jenenſis, p. 16.

TRIOPHTHALMUS, a name given by authors to ſuch pieces of agate, or other ſemipellucid ſtones, as happen to have three ſmall circular ſpots, reſembling eyes upon them: theſe are of the nature of the common agate, &c. The ſpots are mere accidental varieties in the diſpoſitions of the veins, and do not make a diſtinct ſpecies of ſtone.

TRIOPTERIS, in botany, the name of a genus of plants, the characters of which are theſe: The perianthium is very ſmall and permanent, and is compoſed of one leaf divided into five ſegments; the flower is compoſed of ſix equal petals of an oval figure, and theſe are ſurrounded by three other ſmaller petals, which are alſo of an equal ſize one with another; the ſtamina are two filaments, beyond the petals of the flower, and are fixed to the cup; the external ones are ſomewhat ſhorter than the interior, and the antheræ are ſimple; the germen of the piſtil is divided into three parts; there are three erect and ſimple ſtyles; and the ſtigmata are obtuſe: there is no fruit to encloſe the ſeeds, but they ſtand naked, and are three in number, and are hollowed at the back, and edged with alæ, which when newly produced have the appearance of petals. Indeed what are called petals in this deſcription, are not ſo; but are the alæ of the germen, for the ſtamina are placed without them; but as they very much reſemble petals, a young botaniſt will more eaſily diſtinguiſh the genus, by their being taken for ſuch, than by any other means. *Linnæi* Gen. Plant. p. 195.

TRIORCHIS, a word uſed by ſome, to expreſs a man who has three teſticles.

It is alſo uſed as the name of a buzzard; and of a plant, called ladies traces.

TRIPENTAHÆDRIA, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek, τρὶς, thrice, πέντε, five, and ἕδρα, a ſide.

The bodies of this genus are ſpars, compoſed of thrice five planes; being made of a pentangular column, terminated at each end by a pentangular pyramid. Of this genus we only know one ſpecies; this has a moderately long column, and very ſhort and broad pyramids; it is found in Derbyſhire, Yorkſhire, and Cornwall, and is very frequent about Goſſelaer in Saxony. *Hill's*, Hiſt. of Foſſ. p. 205.

TRIPHARMACUM, an ointment, in the late London diſpenſatory, ſo called from its being compoſed of three ingredients: the preſcription is this: Take common plaſter four ounces, oil olive two ounces, vinegar one ounce; ſet them over a gentle fire, and ſtir them continually, till they become an ointment. *Pemberton's*, Lond. Diſpenſ. p. 370.

TRIPOLI, (*Cycl.*) in natural hiſtory, the name of an earthy ſubſtance, uſed by the lapidaries to poliſh ſtones, and by the braſiers, and other the like artiſts to clean metalline veſſels. It is of two kinds, the yellowiſh, and reddiſh white; the yellowiſh white kind is called by authors, *alana gleba*, *tripolis* and *terra tripolitana*; this is the produce of Germany, Saxony, and France; there is alſo of it in the neighbourhood of Venice, but it is found in greateſt plenty in many parts of Africa. It is found a dry hard earth, of a very pale yellowiſh white, of a firm texture, and moderately heavy; it is ſometimes found of itſelf, conſtituting a ſtratum; but is more frequently met with in detached pieces among ſtrata of other matter. It is of a rough, irregular, duſty ſurface; it adheres ſlightly to the tongue, is dry, hard, and harſh to the touch, is not to be broken between the fingers, and ſlightly ſtains the hands: it makes no efferveſcence with aqua fortis, and makes a ſlight hiſſing noiſe on being thrown into water. The reddiſh *Tripoli* is of our own production, though not peculiar to ourſelves; it is found in great abundance on Mendip-hills in Somerſetſhire, nor leſs plentifully in many parts of Germany. This is well known in the ſhops as a ſubſtance of great uſe in poliſhing braſs, but is not applied to any of the other uſes of the yellowiſh kind: this like the former is moſt frequently found in detached maſſes, and while in the earth is tolerably ſoft, and eaſily falls into flakes. When dry it becomes of a conſiderable hardneſs, and is of a fine pale reddiſh white, of a looſe open texture, compoſed of a multitude of extremely thin plates or flakes laid evenly on one another, and conſiderably heavy; it is of a ſmooth and ſomewhat gloſſy ſurface; it adheres very firmly to the tongue, is dry and harſh to the touch, too hard to be broken between the fingers, and does not ſtain the hands: it makes no efferveſcence with acids, and burns to a paler colour, with ſome additional hardneſs. *Hill's*, Hiſt. of Foſſ. p. 68.

TRIPUDIUM, in antiquity, a ſpecies of divination, in which omens were drawn from the rebounding of corn thrown to chickens. *Hofm.* Lex. Univ. in Voc.

TRIPYRAMIDES, in natural hiſtory, the name of a genus of ſpars.

The word is derived from the Greek τρὶς, thrice, and πυραμὶς, a pyramid.

The bodies of this genus are ſpars, compoſed of ſingle pyramids, each of three ſides, ſtanding on no column, but affixed by their baſes to ſome ſolid body.

Of this genus there are only two known ſpecies: 1. A ſhort and thick one, found on the ſides of the ſtacks of ſtone in Northamptonſhire and elſewhere; but this is not common, and is uſually ſmall. 2. A long one with a narrow baſe: this is not found in England, but is common in the German mines. *Hill's*, Hiſt. of Foſſ. p. 226.

TRISACTIS, in natural hiſtory, a name of a genus of ſtar-fiſh, compoſed of a body and three rays, the more uſual number being five. See the article STELLA *Marina*.

TRIQUETRA *Oſſa*, triangular bones found in ſome craniums.

TRIQUETRUM *Folium*, among botaniſts. See the article LEAF.

TRISCÆDECACTIS, in natural hiſtory, a name given by Linkius, and ſome other authors, to a kind of branched ſtar-fiſh

fiſh or aſtrophyte; whoſe rays are thirteen in number, where they firſt leave the body, and each divides into many more.

TRIS-DIAPASON, *Triple-Diapaſon*, in muſic, what is otherwiſe called a *Triple eighth*.

TRISE, at ſea, the ſeamen's word, for haling up any thing with a dead rope, or one that doth not run in a block, but is pulled by hand or by main ſtrength: thus if any caſk, cheſt, or other goods hath only a rope faſtened to it, and ſo without a tackle be pulled up into a ſhip by hand, they ſay it is *triſed up*.

TRISETÆ, the *three-haired* flies, a term uſed by the writers in natural hiſtory, to expreſs a certain genus of the ſeticaudæ, or briſtle-tailed flies, which are diſtinguiſhed from the reſt, by having three hairs or briſtles growing from the tail: there are ſeveral kinds of theſe flies, found frequently among our hedges.

TRISEUS, in ichthyology, a name given by Salvian, Benedictus Jovius, and others, to that ſpecies of the gadi, which we call the eelpout, and authors in general the *muſtela fluviatilis*.

TRISPERMUM, in pharmacy, the name of a cataplaſm or pultice, conſiſting of three ingredients, theſe are cummin, and opium ſeed, and bay-berries.

TRISSA, in zoology, a name uſed by ſome authors, for the fiſh more commonly known by the name of alauſa, and called in Engliſh *ſhad*, or the mother of herring. *Rondelet*. de Piſc. p. 21. See the articles ALAUSA, and AGONUS.

TRISTO, a word uſed by Paracelſus, to expreſs what he calls the material fire; lodged in the matter of all the four elements, and exerting upon occaſion its influence, under the form of the proper effects of each element.

TRITÆOPHYES, a word uſed by the medical writers of the antients, to expreſs a kind of fever, much of the nature of the tertian, and taking its riſe from it.

TRITE (*Cycl.*) — This chord of the antient tetrachord, was ſo named from its being the third from the nete; and hence we might call it the anti-penultimate. It was otherwiſe in ſome tetrachords called parypate. See the articles PARYPATE, DIAGRAM, and NETE.

TRITE *Diezeugmenon*, in the Greek muſic, was the anti-penultimate note of the diezeugmenon tetrachord, and anſwers to Guido's c, ſol, fa, ut. *Wallis*, Append. *Ptolem*. Harm. p. 157. See the article DIAGRAM.

TRITE *Hyperbolæon*, in the Greek muſic, was the anti-penultimate note of the hyperbolæon tetrachord, and anſwers to Guido's f, fa, ut. *Wallis*, Append. *Ptolem*. Harm. p. 157. See the article DIAGRAM.

TRITE *Synemenon*, in the Greek muſic, was the anti-penultimate note of the ſynemenon tetrachord; and anſwers to Guido's b, fa. *Wallis*, Append. *Ptolem*. Harm. p. 157. See the article DIAGRAM.

TRITHEITÆ, in church hiſtory, a name given to ſuch heretics, as admit not only of three perſons, but of three diſtinct ſubſtances and natures, in the holy Trinity. See the article TRINITY, and TRITHEISM, *Cycl*.

TRITICUM, *Wheat*, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, the diſtinguiſhing character of which is, that the calyx is a glume containing ſeveral flowers, compoſed of two valves, and containing the flowers arranged into a ſhort ſpike; the valves are of an oval figure, and obtuſe; the flower is bivalve and of the ſize of the cup; the valves are nearly of the ſame ſize, and the exterior is bellied, obtuſe and pointed, and the interior ſmooth and flat; the ſtamina are three capillary filaments; the antheræ are oblong and ſplit at the ends; the germen of the piſtil is of a turbinated form; the ſtyles are two, capillary, and reflex; the ſtigmata are plumoſe; the flower incloſes the ſeed till ripe, and then opens and lets it out; the ſeed is ſingle, oval, and oblong, obtuſe at both ends, and convex on one ſide, and marked with a deep furrow on the other. Whatever plant has all theſe characters, whether the grain be eatable or not, is properly a wheat. *Linnæi* Genera Plantarum, p. 16.

TRITON *Avis*, in zoology, a name under which Nieremberg has deſcribed a bird of the Weſt-Indies, famous for its fine ſinging, and found in Hiſpaniola; it is ſaid to have three different notes, and to be able to give breath to ſounds of all three kinds at the ſame time; it is alſo ſaid to be a very beautiful bird. *Ray*'s Ornithol. p. 299.

TRITOPATORIA, τριτοπατορια, in antiquity, a ſolemnity in which it was uſual to pray for children, to the Θεοι γενεθλιοι, or *god's of generation*, who were ſometimes called τριτοπατορες. *Potter*, Archæol. Græc. T. 1. p. 434.

TRITTYARCHI, τριττυαρχοι, among the Athenians, were magiſtrates who had the command or government of the third part of a tribe. *Potter*, Archæol. Græc. T. 1. p. 78. See the article PHYLARCHUS.

TRITURATION, (*Cycl.*)—Mr. Lindern relates two obſervations, which contradict the doctrine of violent *Trituration*, ſaid to be performed by the ſtomach in digeſtion. 1. A dog having ſwallowed a die, vomited it up again eleven or twelve hours after, when the bony part of the die was much diminiſhed, but the pins of wood, on which the ſpots are marked, were entire, and ſtood out a conſiderable way from the bone. 2. Three ſtomachs of ſwine, were cruſted ſo thick over their interior ſurface with a ſtony ſubſtance, that all their cavity was filled, except a canal in the middle, of about an inch diameter. Notwithſtanding this, the fleſh of the creature was fair and ſound, and ſold well. Hiſt. de L' Acad. des Sciences. 1732.

TRIUMFETTA, in botany, the name of a genus of plants, the characters of which are theſe: There is no cup unleſs the flower itſelf be called ſo; this conſiſts of five ſtrait erect concave petals, obtuſe at the ends and bending backwards, and have a prominent point within the leaf, below the apex; theſe fall ſoon after they open, whence they appear rather the petals of a flower, than the leaves of a cup; the ſtamina are ſixteen erect ſubulated filaments, of equal height and of the length of the flower; the antheræ are ſimple; the germen of the piſtil is roundiſh; the ſtyle is ſimple, and of the length of the ſtamina; and the ſtigma is bifid and acute; the fruit is a globular capſule, every way beſet with crooked prickles, and containing within it four cells, in each of which are two ſeeds, convex on one ſide, and angular on the other. It is very rarely, however, that more than one ſeed comes to maturity in the ſame cell. *Linnæi* Genera Plant. p. 243. *Plumier*, Gen. 8.

TROADENSE *Marmor*, a name given by the antients, to a ſpecies of white marble, dug in mount Ida, and greatly uſed in building.

TROCHILUS, (*Cycl.*)—TROCHILUS, in zoology, a name uſed by Ariſtotle, Pliny, and others of the antient naturaliſts, for the *regulus criſtatus*, or, as we call it, the golden-crowned wren. *Ray*'s Ornithol. p. 163. See REGULUS.

TROCHILUS is alſo the name of a remarkable water-bird, being very long-legged, yet web-footed.

It is a very ſwift runner on the ground, and is thence called by the Spaniards *corriza*. Its beak is ſtrait and black at the end, and the opening of its mouth very wide; it has black eyes, ſurrounded by a white naked membrane, and that by a brown one. On its under part it is white; its back, ſhoulders, and wings, are of a ferrugineous colour; its running is ſo very ſwift as to equal the flight of moſt birds. *Aldrovand*, de Avib. l. 19. c. 35.

TROCHISCI *e Nitro*, a form of medicine, preſcribed in the late London diſpenſatory, the preparation is thus: Take purified nitre four ounces, fine ſugar a pound, reduce them to fine powder, and make them up into *Troches*, with mucilage of gum tragacanth. *Pemberton*'s Lond. Diſp. p. 323.

TROCHISCI *e Sulphure*, a form of medicine, preſcribed in the late London pharmacopœia, and made in this manner: Take of flower of ſulphur waſhed two ounces, of double refined ſugar four ounces; beat them together, and by gradually adding mucilage of quince-ſeeds, form *Troches*. *Pemberton*'s Lond. Diſp. p. 324.

TROCHITÆ (*Cycl.*)—Theſe ſingle joints of the entrochus are found in ſome places in ſuch vaſt numbers, as to make people ſuſpect that they could never have been ſo ſtrangely collected together, if they ever had been of animal origin; but this is one of the many too raſh concluſions of the modern naturaliſts.

If we conſider the vaſt number of arms or branches, of which the ſtar-fiſh conſiſts, whence theſe are produced, it will not a little tend to ſolve the difficulty: but if after this we conſider the manner of life of the animal, we ſhall find yet more reaſon to be ſatisfied, that the number of theſe foſſils is no argument againſt their being its remains. The ſpecies of ſtar-fiſh, whence they have their origin, is famous for the immenſe, and indeed amazing, number of its arms; each of theſe arms is compoſed of an immenſe number of theſe ſingle joints, and the creatures while living uſually herd together; and it frequently happens that in graſping after their prey, an arm or limb breaks off; the conſequence of this is, that wherever the mutilated limb touches the arm of another fiſh of the ſame kind with its truncated end, it adheres and grows to it, ſo as never to be ſeparated again: thus the two fiſh are for ever faſtened together. As they are continually reaching out their arms in ſearch of prey, this accident often happens among them; and it is not unuſual to find a cluſter, of twenty or more, of them thus growing together, and with their expanded arms forming a ſort of net. Now if it be conſidered, what a large number of ſingle joints or *Trochitæ*, go to the formation of the thicker part of one arm; and how immenſe a number of arms, ſuch a cluſter as this poſſeſſes, from ſo many fiſh, each furniſhed with ſo large a number, we ſhall find, that the dis-united joints of one ſuch cluſter as this, ſcattered over a ſtratum of clay, would appear an amazing number: how much more then, the produce of twenty, fifty, or a hundred ſuch, which it is no wonderful thing ſhould be found in one place, ſince they are gregarious animals.

The compariſon of a ſingle *Trochite*, or entrochus, with the arm of this recent ſtar-fiſh, will at once evince the truth of this account of their origin, and the great error of thoſe who have ſuppoſed them of a vegetable nature, and called them rock-plants. *Kepellus*, Epiſt. de Entroch. See the article ENTROCHI.

TROCHITIFER *Glans*. See the article GLANS *Trochitifer*.

TROCHLEARIS (*Cycl.*) in anatomy, a name given by Fabricius, and fome other writers, to one of the mufcles of the eye, called by Albinus the *obliquus fuperior oculi*; and by fome, from its office, the *opifex circumgyrationis oculi*.

TROCHUS, in natural hiftory, the name given by authors to a genus of fhells; fome of the fpecies of which refemble the figure of the *Trochus*, or top, which boys play with. As there are many fpecies of this fhell, however, which are flatted and have nothing of this form, the whole feries of them are much better named, by a denomination taken from the fhape of the mouth, which is of an oval figure, and is alike in all thefe fpecies, and different from all other fhells. They are therefore aptly charactered by a late French writer under the name of *cochleæ ore depreffo*. See the article COCHLEA.

TROCTUS, in ichthyology, a name given by Ariftotle, Ælian, Atheneus, and others of the Greek writers, to the fifh called *amia* by Pliny, and moft other of the later as well as antient Latin writers; but by fome, *lechia* and *glaucus*. It is properly a fpecies of the fcomber, and is diftinguifhed from the others by the name of the fcomber with two fins on the back, and with the laft ray of the hinder fin very long. This is an obvious character, by which it is eafily diftinguifhed from all the other fcombri, of which it is a genuine fpecies. See the article SCOMBER.

TROGLODYTES, in the Linnæan fyftem of zoology, the name of a diftinct genus of birds, of the order of the pafferes; the diftinguifhing character of which is, that the beak is thread-like and pointed, and is crooked, and longer than the head. *Linnæi* Syftema Naturæ, p. 49. See the article PASSER.

TROIS *Cinque*, in the French diftillery, a term ufed to exprefs their brandy when of a peculiar ftrength, confifting of five parts alcohol, and three parts phlegm.

The method of diftilling the wines into brandy in France, is exactly the fame with that ufed with us to draw the fpirit from our wafh or fermented liquor of malt, treacle, fugar, or whatever other kind. They only obferve more particularly to throw a little of the natural lee into the ftill, along with the wine; and the pooreft wines are found to fucceed beft on the trial, making by much the fineft brandies. We are apt to wonder, that we cannot from the wines of particular countries diftil their particular brandies; but the whole myftery confifts in this, that they do not fend us over the fame wines which they ufe in diftilling, becaufe thefe latter would not be liked as wines, nor would keep in the bringing over. Sometimes in Scotland, they meet with the poor and prick'd wines, the fame that the French diftil their brandies from; and from thefe they diftil a fpirit, not to be known from the brandy diftilled in France.

The lee, which the French add in the diftillation, gives the brandy that high flavour, for which we fo much efteem it; but they themfelves like it much the worfe for it. The French notion of a proof ftrength, determined by the chapelet or crown of bubbles, is the fame with ours; and all their fine fpirits are found of this ftrength.

But they have one particular expedient for thofe brandies, which prove foul and feedy, or retain the tafte of certain weeds which grow among the wines; they draw them over again, with a defign to free them from that adventitious flavour. In this operation they always leave out the faints, or rather they change the receiver as foon as ever the ftream comes proof; then mixing together all that run off before, they make a brandy ftronger than the ordinary kind, and this is what they call *Trois-cinque*.

The diftillers in France fcarce ever bring their brandies higher than this; for they have the art to perfuade the foreign merchant, that the phlegm of French brandy is natural and effential to it: but the truth is, that the fpirit alone contains the flavour and excellence of the brandy, and it might as well be reduced to half its bulk for exportation, and fent over in the ftate of alcohol, and then lowered with common water, to the proof ftrength.

The French ufe no art in colouring their *Trois-cinque*, any more than their common proof-brandy, nor do they add any thing to give them an additional flavour. The thing which they principally value themfelves upon, both in regard to brandies and wines, being to make them perfectly natural: fo that all the colour we find in their brandies, is acquired from the cafk, and the time they are left in it. This is often twelve or eighteen months, fometimes two or three years; in this time they acquire a brown colour, and lofe their acrid tafte.

The greateft adulteration of brandies is in England; the French have no temptation to do it, they having no cheaper fpirit, fince the prohibition of molaffes in their country. The Dutch are in the fame condition, having no molaffes fpirit; and only a very coarfe and naufeous fugar-fpirit, and a yet worfe malt fpirit of their own manufacture; a fingle gallon of which, would fpoil a whole piece of brandy. The French brandy alfo paying no duty in Holland, is as cheap, or nearly fo, there as in France itfelf. The duties being high upon brandy in England, it is greatly adulterated, and that with all forts of fpirits; as malt, melaffes, cyder, and fugar fpirits; and when this is done in a dexterous and fparing manner, the cheat is not eafily found out. *Shaw*'s Effay on Diftillery.

TROMBA, in the Italian mufic, either denotes the common trumpet, the buccina of the antients, or the modern facbut, but more properly our trumpet. See the articles TRUMPET, SACBUT, and BUCCINA, *Cycl.*

TROMBETTA, in ichthyology, a name given by the Italians to the fifh commonly called *fcolopax* by authors. See the article SCOLOPAX.

It is properly a fpecies of the baliftes, and is diftinguifhed by Artedi, by the name of the baliftes with two fpines in the place of the belly-fins, and another fingle fpine below the anus. See the article BALISTES.

TROMBETTA, in the Italian mufic, a fmall trumpet, being the diminutive of *tromba*. See the article TROMBA.

TROMBONE, in the Italian mufic, a facbut. See the article SACBUT, *Cycl.*

TROMBONE, *picciolo*, *groffo*, *primo*, *fecundo*, &c. See the article SACBUT. Ibid.

TROMPE, in the manege. See the article DECEIVED.

TRONCO *per Grazia*, in the Italian mufic, by the French called *coup de grace*; is ufed to intimate to the voices, as well as inftruments, that they are not to draw out the found to its natural length, but cut it fhort; that is, only continue it long enough to be heard, by which means there is a fmall filence between each found; which has a very good effect in expreffions of grief, to make figns; and alfo in expreffions of wonder and furprife, *&c.*

TRONE (*Cycl.*)—TRONE-*Pound*, in Scotland, contains twenty Scotch ounces. But becaufe it is ufual to allow one to the fcore, the *Trone-pound* is commonly 21 ounces.

TRONE-*Stone*, in Scotland, according to Sir John Skene, contains $19\frac{1}{2}$ pounds. Vid. Treat. Pract. Geom. p. 153.

TROOPER, in the military art, a private man in a troop of horfe.

TROPER, in our old writers, is ufed for a book of alternate turns and refponfes in finging mafs. *Lindewode* calls it *liber fequentiarum*. *Hoved.* Hift. p. 283.

TROPHY (*Cycl.*)—TROPHY, in architecture, an ornament which reprefents the trunk of a tree, charged or encompaffed all round about with arms or military weapons, both offenfive and defenfive.

TROPIC (*Cycl.*)—TROPIC-*Winds*. Dr. Lifter has advanced a very ftrange fyftem as to the nature and origin of thefe, which is, that they are owing to the halitus of fea-plants, growing in great abundance in particular places; he fuppofes that the Levant breezes are brifkeft about noon, becaufe the fun at that time exhales moft from the plant. The direction of this breeze from eaft to weft, he fuppofes may be partly owing to the general current of the fea; for a gentle air will be led by the ftream of our rivers, for example; and partly to this, that every plant is in fome meafure an heliotrope or turnfole, bending itfelf in fome degree after the fun, and confequently emitting its vapours according to the courfe of the fun. Phil. Tranf. N°. 156. See the article TROPICAL, *Cycl.*

TROSSULI, among the Romans, a name given by fome to the guards that attended the kings of Rome, otherwife called *Celeres*. See the article CELERES.

TROUSSEQUEUE, in the manege. See the article DOCK.

TROUT, (*Cycl.*) a very valuable river-fifh, the diftinguifhing characters of which are thefe: Its body is long; its head fhort and roundifh; the end of its nofe or fnout obtufe and blunt; its tail is very broad; its mouth large; and each jaw furnifhed with one row of fharp teeth; and in its palate there are three parcels of teeth, each of an oblong figure in the congeries, and all meeting in an angle near the end of the nofe; and the tongue has fix, eight, or ten teeth alfo on it; and its fides are beautifully variegated with red fpots.

This delicious fifh is obferved to come in; and go out of feafon with the ftag and buck; the time of its fpawning is remarkable; moft other fifh do this in warm weather, but the *Trout* in October or November. Among the feveral kinds of *Trout*, the red and the yellow are the beft for the table; and in the fame fpecies the female has always the preference to the male; the head of the female is fmaller, and the body deeper than in the male. They are known to be in feafon by the bright colour of their fpots, and by the largenefs and thicknefs of their backs; which laft is a general rule in regard to all fifh, to know when they are in feafon.

In the winter the *Trout* is fick, lean, and unwholefome, and very often is loufy. The loufe, as it is called, of the *Trout* is a fmall worm with a large head, which fticks very faft to the fides of the fifh; they live upon the juices of the fifh all the time of the cold weather, while he is poor and lies quiet in the deep waters; but when the warm weather in the fpring comes on, and the fifh leaves his lazy life at the bottom, and comes up to the fhallow gravelly places, where the ftream is fwift, he foon fhakes them off.

The *Trout*, at its firft coming into the fhallow waters, may be feen to rub his body continually upon the fharp gravel at the bottom; it is by this means that he gets off thefe worms or

or lice, as they are called. From this time he begins to feed on flies; but in May the peculiar fly that he is fond of is produced, and after feeding that whole month on this insect, the flesh of the fish becomes more red and firm, and its highest season begins.

The general baits for a *Trout*, are a worm, a minnow, or a fly, whether natural or artificial: among worms there are several kinds which this fish is fond of; such are the earth-worm, and dung-worm in particular; the lob-worm and branding-worm also are esteemed: but the best of all is the squirrel-tail worm, which has a streak down the back, a red head, and a broad tail. The brandling is commonly found in a old dung-hill, or under cow-dung, or else among tanners-bark; the others are found in the earth, and under large stones or stumps of trees: whatever worm is used, the longer it is kept to scower first, the better the *Trout* will take it: they are to be kept in an earthen-pot among moss, which is to be shifted once in three or four days, or oftner if the weather be very hot.

To take the *Trout* with a ground-bait, the angler should have a light, taper, rod, with a tender hazel top; and may angle with a single hair of three links, the one tied to the other, for the bottom of the line; and a line of three haired-links for the upper part: with this sort of tackle, if the sportsman have room enough, he will take the largest *Trout* in the river. Some fish with three haired-links at the bottom of the line, but there is very little sport to be expected this way, for the *Trout* is very suspicious and very quick sighted. The angler must always keep out of sight, and the point of the rod must be down the stream. The season for fishing for the *Trout* with a ground-bait begins in March, and the mornings and evenings in general are the best time; but if the weather be cloudy, the sport may be followed all day long. There must be a plummet at ten inches from the hook, which the angler must feel always touching the ground, and this must be heavier the swifter the stream is. The common worm is a good bait.

The minnow is a very good bait for the *Trout*, and with this the tackle need not be so slight, for the *Trout* will make at this bait with less consideration, and sieze it as soon as it comes in sight; the upper part of the line with this bait, may be of three silks and three hairs for the upper part, and two silks and two hairs for the lower; and the hook may be moderately large. The whitest minnows and those of the middle size are the best bait for the *Trout*, and they should be so fixed on the hook, as to turn round when they are drawn up against the stream. The best way of baiting this fish, is to put the hook in at the mouth and out at the gills, then drawing it thro' about three inches, to put it again in its mouth, and let the point and beard come out at the tail, and then to tie the hook and his tail with a fine white thread, letting the body of the minnow be almost strait down the hook; by this means it will turn, as it is pulled against the stream; and the more and quicker it turns the better: for want of a minnow, a small loach or a stickle-back will serve.

The most agreeable manner of fishing for *Trout* is, however, with the fly, when the sportsman has found the true method of doing it; the rod in this case must be light and pliable, and the line long and fine; if one hair be strong enough, as it may be made, by proper skill in the angler, there will be more fish caught, than where a thicker line is used; and the fly-fisher should have the wind in his back, and the sun before him.

TRUFFLES, (*Cycl.*) *Tubera*, in botany. See the article TUBERA.

The antients, it is evident from their writings, were not acquainted with the sort of *Truffles* which we have in use at present; they describe theirs to have been of a reddish colour, and smooth on the surface; we at present know this kind very well; it is common in Italy, and is called the wild *Truffle*, and disregarded. They had indeed the white African *Truffle*, sometimes brought to them, and held it in vast esteem for its flavour. The Romans called it the Lybian *tuber*, and the Greeks the Cyrenean *misy*; these people were very little acquainted with the African affairs, and called all the things they had from that part of the world by the name of Cyrenean.

Avisenna recommends those *Truffles* as the best which were of a whitish colour within; and this not being a clear white, he expresses himself by a word which signifies sand-coloured, alluding to dusky white sand, in common use at that time. Pliny has so far mistaken the sense of the author from whom he takes his accounts, that he says, the Lybian *tubera* or Cyrenean misy were more fleshy than the others: but Theophrastus says only, that they had a rich flesh-like smell, by which he distinguishes them from the insipid *Truffle* in common use with the Greeks at that time. The word *ramul* which the interpreters of Avisenna have rendered sand-coloured, may be perhaps properly *ramad*, which is ash-coloured; and if this be the true reading, we get over a great many difficulties, among the later writers about what the tubera arenosa or sandy *Truffles* of the antients were.

It is certain that the finest *Truffles* were called by some authors by this epithet *arenosa*, with a very different meaning, only expressing that they were produced in sandy countries: the European *Truffles* both then were, and now are mostly produced in dry ground on the sides of hills; but the Lybian were produced only in the burning sands of that country, and these were therefore called sand-*Truffles*. Serapio tells us, that the best of all *Truffles* were those produced in sand; and Martial alludes to these, where he describes the finest *Truffles* as breaking the surface of the earth into cracks, and by that means directing people where to search for them. This passage of Martial has been indeed severely criticised on by many; and our own observation, and the testimony of Pliny called in to prove the poet in an error: we do not indeed see the ground burst or crack where the *Truffles* are; and Pliny tells us expresly, that the *Truffles* of his time never broke the earth where they grew, but remained quietly under it without giving any indication of their being there. This may all be true both of the common Roman *Truffle* and of ours; but as Martial here plainly speaks of the finest kind, that is the Lybian *Truffles*, we must see whether the African *Truffles* do or do not break the ground where they lie, before we censure or applaud the poet. Leo Africanus is the most express in the account of the Lybian-*Truffle* of any author, and he says, that the places where they are may always be known by the earth on the surface being raised into hillocks, and breaking in numerous cracks: thus we find the poet is so far from being culpable in his expression, that he appears to have been better acquainted with the nature of the subject, than the author who wrote expresly upon it.

The *Truffle* is most abundantly produced in dry fields of a reddish loamy earth, not too poor; and they are found to flourish most near the roots of elms, the ilex, and some other trees. They do not well bear the severity of hard winters, but are usually scarce all the season after such. The smallest are found about the bigness of a pear, and they grow from this size sometimes to a pound weight, but such are not common; what are taken up in the spring are distinguished by their white colour, and insipidity to the taste, and are commonly called white *Truffles*: those taken up in autumn are of a variegated colour within, and are called marbled *Truffles*; the inner substance having swelled extreamly and changed colour, and the white part now remaining only in form of a number of pipes or tubules, which seem in many places to run to the extremity, and terminate in the chaps and wrinkles of the back. The greyish substance, which is wrapped up among these tubules, when examined by the microscope, appears to be a transparent parenchyma, composed of little bladders or hollow vessels, in the midst of which may be seen small round bodies, which are unquestionably the seeds of the *Truffle*.

When the *Truffles* are arrived at this degree of maturity, which is generally in August, they are of a fine high flavour and agreeable smell; and the heat and rains at this season greatly promoting their growth, has been the occasion of the old error, that thunder produced them; after this they continue good to the middle of winter, and sometimes even till March; but those gathered from this time till the end of July are small and only white, never marbled nor of their high taste.

If the *Truffles* are not taken up when fully ripe, they always rot and burst; whence it is plain that they are an annual plant, which lives no longer than till they have perfected their seeds. And if the place where the old ones have rotted and burst be examined, the seeds will be found after some time to have vegetated, and a great number of young *Truffles* to be produced in the place: these, if not destroyed by the frosts, are what in the ensuing spring furnish the younger white *Truffles*.

The *Truffle* is very apt to be pierced and eaten within by a worm, and this tho' a damage to the particular *Truffle*, is of some service to the people, who make it their business to seek for them: for this worm, after a proper time passed in that state, changes into its chrysalis state in the body of the *Truffle*; whence he soon after comes out, in the shape of a beautiful violet-coloured fly; and wherever these flies are found, they are an indication that there are beds of *Truffles* near, as they are never bred in any other root.

These communicate a bitterness to the whole *Truffle*, and and make it unfit for the table; tho', if the whole be carefully searched into, the part eaten by the worm, and the hole by which it made its way in, will be found to be in reality the only bitter parts, and the rest of the *Truffle*, when these are cut out, as good as ever: but, beside these destroyers, the microscope usually discovers on the surface of the *Truffle* a multitude of other devourers, which are small white animalcules, continually eating, and searching the cracks of the bark, as the places where the pulp is most easily come at; these somewhat resemble mites.

The earth that produces *Truffles* rarely affords any other plants, these taking up all the nourishment it can afford: the earth all about them smells so very strongly of them, that they are easily found out by it, by the animals which carry their noses near the ground: and those who fought after them

soon

foon found the way of ufing hogs to fearch them out; but thefe being a fort of unmanageable animal, dogs were found, which would fupply their place with more certainty, and much lefs trouble. Mem. Acad. Scien. Paris, An. 1711.

TRUFFLE-*Worms*, in natural hiftory, a fpecies of fly-worm which is found in *Truffles*, and lives in and feeds on them, till the time it undergoes the common metamorphofis of thefe creatures, for the production of a fly, like that from the egg of which it was hatched.

Thefe are a great nufance to the *Truffles*, and often wholly fpoil them: on preffing them in this ftate with the finger, one may ufually perceive fome places give way, and on opening thefe the worms are found.

They are very fmall, and have two brown fpots, eafily diftinguifhable near their hinder end; which are the two pofterior ftigmata. They are all over white, and very tranfparent; and one may very eafily diftinguifh the two black ftalks of their two hooks, with which they tear the fubftance of the *Truffle*, as the other fpecies do their food: the anus in thefe is very vifible, and is placed near the extremity, and under the belly; the creature fecretes from this a whitifh vifcid matter, which is a great means of haftening the corrupting of the *Truffle*: while in the *Truffle*, thefe worms are always furrounded with this vifcid matter; but when they have arrived at their full growth, which is ufually in a few days, they then leave the *Truffle*, and go to feek fome proper place, where they may reft during the time of their transformation; they enter the earth for this purpofe, and twelve hours after they have gone into it they are transformed into an egg-fhaped fhell, of a chefnut-brown, of the fame fort with that of the blue flefh-fly.

This fhell is in thefe, as in all the other infects of the fame clafs, made of their proper fkin; what it has particular is, that it is fomewhat flatted, efpecially at the anterior end; and all the way down this flatted part, on each fide, it is bordered by a fort of band or filament, like that on each fide at the anterior end of the fhells of the common flefh-fly worm.

The ftigmata are placed in a line with thefe, and the anterior ones terminate them; at the middle of the anterior end, there are feveral folds, like a purfe when drawn together, which encompafs the opening by which the firft ring is drawn in at the time of the formation of this fhell.

Thefe are the worms in a manner peculiar to the *Truffles*; but befide thefe, they often furnifh nourifhment to another fpecies, very common in mufhrooms of the ordinary eatable kind, and which has a yellow body and a black cruftaceous head. *Reaumur's* Hift. Inf. Vol. 4. p. 374.

TRUMPE, in ichthyology, a name given by fome of the Englifh writers, to that fpecies of whale, called by the generality of authors *cete*, and *balæna major*.

It is, according to the new fyftem of Artedi, one of the catodons; and is diftinguifhed from the other fpecies of that genus, by having the fiftula fituated in the neck: the Dutch call this the pot whale-fifh. See the articles CATODON, and BALÆNA.

TRUMPET (*Cycl*)—TRUMPET-*Flower*, *Bignonia*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is compofed of only one leaf, of a tubular form, wide open at the mouth; and feeming as if bilabiated: from the flower-cup arifes a piftil, which is fixed in the manner of a nail to the hinder part of the flower; this afterwards becomes a fruit or pod, divided into two cells by a longitudinal membrane, and containing flatted and ufually alated feeds.

The fpecies of *Bignonia* enumerated by Mr. Tournefort are thefe: 1. The afh-leaved American *Bignonia*, with great fcarlet-flowers. 2. The afh-leaved tree-*Bignonia* of America, with yellow flowers. 3. The fhort-podded American *Bignonia*, with tendrils to the ftalks. 4. The long-podded American *Bignonia*, with long tendrils to the ftalks. 5. The two-leaved climbing American *Bignonia*, with long and broad pods, and broad feeds. 6. The bifoliate-climbing American *Bignonia*, with fweet-fcented, violet-coloured flowers, and dry, oval fruit. 7. The bifoliate-climbing American *Bignonia*, with purplifh-yellow, fcentlefs flowers, and hard, oval fruit. 8. The tree-*Bignonia* of America, with thin box-like leaves. 9. The tree-*Bignonia* of America, with fingle undulated-leaves, and very long and narrow pods. 10. The heart-leaved tree-*Bignonia*, of the Eaft-Indies. 11. The long-leaved Indian tree-*Bignonia*. 12. The five-leaved Indian tree-*Bignonia*, with a rofe-coloured flower, and flat pods. 13. The fmaller five-leaved Indian tree-*Bignonia*, with a rofe-coloured flower, and angular pods. *Tourn.* Inft. p. 164.

TRUMPET-*Shell*, *Buccinum*, in natural hiftory, the name of a large genus of fhells, the characters of which are thefe; they are univalve fhells of the form of a *Trumpet*, according to old pictures; with a wide belly, and a large, broad, and elongated mouth. They have a diftinct and regular tail, ufually long, tho' fometimes fhort; they have a crooked beak, and the clavicle is often elevated, tho' fometimes depreffed and contabulated. See Tab. of Foffils, Clafs 9.

The family of the *Buccina*, when examined ever fo ftrictly, is very large; but according to the general cuftom of authors, of confounding together feveral genera under the name, it is ufually made to appear much larger than it really is. *Lifter* has made it comprehend a vaft number of fhells, by confounding with it the families of the *murex* and *purpura*.

It is not indeed peculiar to this author, to have confounded thefe genera; thofe who went before him have done the fame: and Pliny has comprifed the *buccinum*, *murex*, and *purpura*, under the general name *ceryx*.

To avoid the general confufion, which arifes from not diftinguifhing the families of the *buccinum*, *murex*, *purpura*, and *vis*, or fcrew-fhell, it will be proper to obferve, that there are regular characters, which diftinguifh them all, one from another: the characters are thefe:

The *buccinum* differs from the *purpura*, in that it has a very long mouth of an oval figure, and has an elevated head; whereas the *purpura* has a round mouth, and a head fomewhat flatted. The tail of the *purpura* is alfo ufually furrowed, and is fhorter than that of the *buccinums*.

The *buccinum* differs alfo from the *murex* in having a longer tail, by the fmoothnefs and variety of colours of its coat, and by having a larger mouth lefs furnifhed with teeth; the *murex* having a fmaller and longer-fhaped mouth, its furface covered with points or fpires, and feveral teeth.

It is eafier to diftinguifh the *Buccinum* from the fcrew-fhell, as this is always more long and flender than the *buccinum*; it has alfo a flat mouth, and has rarely any tail. Thefe are all very large families in nature, and it is highly neceffary for the naturalifts to be well acquainted with them.

The moft fingular fpecies of the *buccinum* clafs, is one that has its mouth turned the contrary way to all other fhells: this has been thence called by authors, the *unique* and the *fans pareille*. Aldrovand is of opinion, that the *buccina* may be ranked among the bivalve fhells; becaufe they have an operculum, or fhelly fubftance, fixed to the end of their body, which occafionally ftops up the aperture of the mouth; but if this were a fufficient reafon we fhould have many more genera to add to the bivalves, particularly the fnails of feveral kinds.

The *buccina* generate in the warm months, and fome fpecies of them are feen very frequently remaining in pairs together, upon the rocks deferted by the tide on that occafion. Thefe have been thence fuppofed to be of a different genus, and have been called *buccina littoralia*; they are ufually found in copulation early in the morning. *Rumphius*, de Teft. *Aldrovand*. de Teft. l. 3. c. 231. *Lifter*, Hift. Animal. Angl. p. 158.

The fpecies of the *buccina* being very numerous, they are arranged under feveral diftinct heads, according to certain obvious diftinctions; and are as follow: 1. Of the *buccina* with long diftinct tails and oblong mouths, there are thefe fpecies. 1. The great brownifh white, contubulated, and tuberous *buccinum*. 2. The fmall brown furrowed *buccinum*. 3. The *buccinum* with double and dentated lips. 4. The *buccinum* called the tower of Babel. 5. The red-fpotted *buccinum*. 6. The Perfian *buccinum*. 7. The radiated *buccinum*, with broad, blackifh-red fpots. 8. The *buccinum* fafciated and undulated on each fide, with a dentated columella. 9. The thick *buccinum*, with oblong and fpotted tubercles. 10. The ftriated and bottle *buccinum*. It is to be obferved that when the laft fpecies but one is polifhed, the lofs of its outer coat gives it a very different appearance; and it is found in many of the cabinets of the curious, variegated with blue and whitifh-brown fpots. 11. The *buccinum*, with a contabulated and pulvinated clavicle. 12. The ftriated *buccinum*, with three tuberous eminences. 13. The coftated and ftriated *buccinum*.

Of the *buccina* with a fhort tail and a wide mouth, we have the following known fpecimens: 1. The hairy *buccinum* of Rumphius. 2. The thick *buccinum* called Midas's ear, with a dentated columella: this when polifhed affumes a very different appearance, and is found in many cabinets under the name of the agate *buccinum*, as it carries a great refemblance of that ftone. 3. The grey wide mouth *buccinum*: this alfo when polifhed affumes a very different appearance, and is fpotted and lineated in an elegant manner; tho' wholly plain while it has its outer coat. 4. The undulated and ftriated *buccinum*. 5. The *buccinum* covered with pointed tubercles placed in regular order. 6. The depreffed umbilicated *buccinum*, with the lip and columella both dentated. 7. The yellow umbilicated *buccinum*. 8. The *fans pareil*, or *buccinum* with the mouth opening the contrary way to all the other. 9. The alated and punctuated *buccinum*. 10. The tuberous *buccinum*, with two high ribs. 11. The rough furrowed *buccinum*, with a thick lip and an oval mouth. 12. The hermit *buccinum*: this ufually has the hermit-fifh, a kind of fmall crab in it, and has its clavicle full of fmall balani.

Of the *buccina* which have long and erect clavicles, thefe are the following known fpecies: 1. The Chinefe town fhell, with a dentated columella. 2. The *buccinum* furrounded with red and white fafciæ. 3. The *buccinum* called tiara or papal crown, with the columella and lip dentated. 4. The mitre or plume *buccinum*. 5. The yellowifh *buccinum*, with a dentated columella. 6. The *buccinum* with zones of brown and yellow. 7. The great triton *buccinum*. 8. The wide mouthed

mouthed *buccinum*. 9. The ftriated *buccinum* with prickly ribs. 10. The reticulated *buccinum*, with oblong tubercles. 11. The red-mouthed fpotted *buccinum*, with an irregularly ftriated clavicle.

Of thofe *buccina* which have lefs erect clavicles and crooked roftra, there are the following known fpecies: 1. The rough *buccinum*, called the Swifs-fhell. 2. The diftortion or grimace fhell, with a ftriated lip and columella. 3. The *buccinum* with its lip elevated above the reft of the furface. 4. The fmooth-lipped *buccinum*. 5. The fmoother bodied *buccinum*: thefe are all of the grimace kind. 6. The rough *buccinum*, with elevated tubes or pipes. 7. The tuberous *buccinum*, with a dentated wide mouth, and a long crooked and furrowed roftrum. 8. The yellowifh tuberous ftriated *buccinum*, with a depreffed clavicle, and with furrowed lips and columella. 9. The yellow *buccinum*, with an erect clavicle and a red mouth. 10. The ftriated *buccinum*, with oblong tubercles. 11. The ftriated gold-yellow *buccinum*. 12. The *buccinum* with brown, yellow, and white ftriæ. Hift. Nat. Eclair. p. 263.

It appears from the writings of the antients, that the famous purple dye, which they obtained from a fhell-fifh was not peculiar to any one fpecies; but was found in feveral of the fmaller kinds of *buccina*; fome of which they called *murices*, from the hollow fpines, or long and flender proceffes, which run in different directions from their fhells.

Mr. Reaumur when on the coafts of Poitou, found certain eggs of fifhes, arranged in regular order, and in great numbers, on the rocks and falted banks, which had the fame property with the purple-dying liquor of the *buccinum*; and which, as it is not yet known to what particular fifh they belong, or what ufes they may hereafter be brought to ferve, it may be proper to defcribe here.

Each egg is of an elliptic fpheroidal figure, the fmalleft part of which is about a twelfth of an inch in diameter, and the largeft about one fifth, and it is attached to the rock or fand by a pedicle refembling that of a fruit; this is about a twelfth of an inch long, and a fourth part of its length in diameter. The egg itfelf is hollow, and is filled with the ftaining liquor; its furface is only a membrane in the nature of parchment: at the end, oppofite to that where the pedicle is fixed, there is a hole or aperture, refembling the mouth of a glafs-bottle; but that the liquor may not run out at this, it is ftopped with a tranfparent fubftance, which ferves as a cork to it; this however is placed exactly in a contrary direction to the corks of our bottles; for the larger end is on the infide, fo that all the force the included liquor can have on it, can be only to ftop up the mouth the more firmly: befide this alfo, it is cemented down all round by a fort of glue. This egg contains two liquors, the one white and the other yellow; as the common eggs have their yolk and white: but the yellow liquor in this, is not collected all into one body; but fwims about freely in the white in eight diftinct drops. The glutinous liquor by which the pedicles of thefe eggs are faftened to the ftone or fand, is of fuch force, that it is not eafy to pull them off without breaking the eggs; but by help of the thin blade of a knife, they may be taken off without injury. As there are always a great number of the *buccinas* of the fmaller kinds, about the places where thefe eggs are found, Mr. Reaumur was led to believe that they were the eggs of this fifh; in favour of which fuppofition, the colour they afford in common with that fifh, is alfo no fmall argument; what made this opinion appear lefs probable to him, was the largenefs of thefe eggs in proportion to thofe animals; but we are fo well affured of the largenefs of many fhell-fifhes eggs, in proportion to their own fize, that this feems but a weak argument againft fo probable an opinion. Mem. Acad. Par. 1711.

Pliny feems to derive the name *buccinum* from *buccina*, a kind of mufical inftrument [a]; but it is more probable that inftrument took its name from the fhell to which it bore a refemblance, and of which it might probably have been antiently made [b].—[[a] *Plin*. Hift. Nat. l. 9. c. 36. [b] Phil. Tranf. N°. 282. p. 1277.]

Buccina are of fome ufe in phyfic; when calcined they have a drying cauftic quality. *Lifter*, Ap. Phil. Tranf. N°. 197. p. 645. See Tab. of Shells, N°. 9. and Tab. of Foffils, Clafs 9.

Buccinum lapidofum is a figured ftone, fhaped like the former, and probably only a petrifaction of the fhell above-mentioned. *Mercat*. Metalloth. Arm. 9. loc. 36. c. 33. p. 301.

Ray fpeaks of a *buccinum* which not only petrified, but after petrifaction was converted into a pyrites. *Ray*, Phil. Lett. p. 202. See PYRITES, *Cycl.* and *Suppl.*

TRUMPETER, (*Cycl.*) in zoology, a name given in England, to a particular fpecies of pigeon, called by Moore the *columba tibicen*.

This fpecies is of the middle fize of the common pigeon, and made confiderably like it; but it is pearly-eyed; is of a mottled black, and is feathered down the legs and feet, and is turn-crowned like the nun, and fome of the other fpecies; fometimes like the finnikin, but much larger: this feems to be the beft fort as being the moft melodious. The beft character to know them by, is a tuft of feathers growing at the root of the beak; and the larger this tuft is, the more they are efteemed. The reafon of their name is, that they imitate in their cooing the found of the trumpet; but to be often entertained with their melody, it is neceffary to feed them frequently with hemp-feed. *Moore*'s Columbarium, p. 45.

TRUMPETER, in a man of war, one whofe office is always to attend the captain's command, and be ready at the entertainment of ftrangers. In the time of an engagement his proper ftation is on the poop.

TRUNGIBIN, in natural hiftory, a name given by Rawwolf, Tournefort, and others; to a fort of manna collected from the *albagi maurorum*, as the common manna is from the afh; and ufed in the eaftern parts of the world as a purge. It is what we call the *manna perficum*, and tho' in itfelf a very fine and clean kind of manna, yet it is ufually fo carelefly collected, and mixed with fo much filth, that it requires to be given in three times the dofe of ours, in order to purge. The name feems very evidently to be a corruption of the *tereniabin* or *teren-jabin* of the Arabians, which was the word ufed by all their authors to exprefs the *manna perficum*.

TRUNCATED *Leaf*, among botanifts. See the article LEAF.

TRUNK, (*Cycl.*) in natural hiftory, a pointed, hollow, flender, and oblong body; joined to the fore-part of the heads of many infects, and ferving them for fucking the blood or juices of the animals or vegetables, on which they feed.

The *Trunks* of flies ferve for diftinguifhing many genera of thofe little animals, from their different form and other accidents. Some of thefe are a tube formed all of one fimple piece, and others compofed of feveral fhorter pieces, nicely joined together: fome are thin and as it were fhelly, others thick and flefhy; thofe of fome flies are terminated by a fort of broad foot, or by a fort of thick lips; and thofe of others have no lips, or at leaft no fenfible ones; and others are made in form of a fpindle hollowed at the end.

It is often neceffary to have recourfe to the microfcope, to diftinguifh with nicety and exactnefs between thefe; and how indeed is it poffible to do any thing without the help of glaffes, in the diftinctions of the parts of animals, the whole bodies of which are fo very minute.

Without the affiftance of glaffes, however, it is eafy to diftinguifh among the flies of different genera, three different manners of carrying this organ when in a ftate of inaction. Many flies have *Trunks* which they can fhorten, when they are not ufing them; thefe are fixed in the fore-part of the creature's head, where there is a cavity deftined to receive them when they are not in ufe. In many fpecies, this cavity is no more than a mere finus or hole, in the fore-part of the head; but in others it is more nicely contrived, the anterior part of the head lengthening itfelf, and forming a kind of arched vault for its reception. Other flies have *Trunks*, which in the time of inaction are turned, or fomewhat folded from above downwards; the *Trunks* of bees are of this kind. Ibid.

There are others alfo, which have their *Trunks* contained entirely in a fort of cafe, where they lie ftrait at length, without being either turned or folded; but they are able to encline them in any direction, in regard to the pofition of their legs: of this kind are the *Trunks* of the cicadæ, gnats, &c.

Among the butterfly clafs, a great number are furnifhed with a *Trunk*; but there are alfo a great number that have it not: the fly of the filk-worm, and many, as well larger as fmaller kinds, are without this, (as it feems neceffary) organ, by which they fuck the juices from flowers; and which is the only way of their taking in nourifhment. Thofe fpecies which have it, fhew it to the firft view; it is placed in the middle of the head directly between the two eyes. And tho' in feveral fpecies it is very long, yet it takes up even in thefe but very little room; when it is not in ufe, it is always rolled up in a fpiral form, in the manner of the fpring of a watch; and even the fhorteft of them are thus turned as well as the longeft. Some of them make only one or two turns of this kind, others of a middling length make four; and finally the longeft of all frequently make eight turns. In the rolled ftate, we can fee only a fmall part of one of the outer turns of the fpiral; the origin and extremity, with a great part of the intermediate fpires, being hid under a remarkable fort of hood or mitre; which is formed of two hairy bodies, following the contour of the eyes, and arifing from their under-part in form of pieces of the fkin of fome animal, with the hair upon it. Thefe are moveable at the pleafure of the animal, and feem intended by nature only as a cafe, for the defence of this tender and neceffary organ to the creature. *Reaumur*, Hift. Inf. vol. 1. P. 1. p. 287.

This is the cafe in moft of the fpecies, but in fome others the office of thefe hairy bodies is fupplied by two rounded and very prominent parts, which in the fame manner follow the contour of the lower part of the eyes, and fill up a great part of the front of the head; leaving only a fort of channel or furrow between them as a place for the *Trunk*. Thefe parts the French naturalifts call the beards of the butterflies, and in fome fpecies they are of a very fingular figure; extremely different from thofe which have been here defcribed. If one is defirous to know in what manner this *Trunk* is ufed, he need only follow a butterfly to a flower, and there obferve its motions. As foon as it is fettled on the verge, it unrols

rols this *Trunk*, and extends it into a perfectly ftrait piece; it then directs it into the flower, and thrufts its extremity to the very bottom, where it is affixed to the cup; this is the cafe, however deep the flower be. When it has been a few minutes in the flower, it draws it out and rolls it up; and after a few moments, it extends and plunges it into the flower again: this it repeats four or five times, and then flies away to another flower. This is the thing that has occafioned the poets to make the butterfly the emblem of inconftancy, in its flying immediately from one flower to another; but the truth is, that the flower it leaves is no longer capable of affording it the nourifhment it wants.

There are among the butterflies, fome which never fettle upon any thing, but are eternally upon the wing in the manner of fwallows: thefe feed on the wing as thofe birds do. We often fee them buzzing about a flower in the manner of a bee, and in that cafe they fuftain themfelves in the air with their wings, while they unrol their *Trunk*, and thruft its extremity into the flower, to fuck from its bottom the honey-dew, which is the common food of them, of the bees, and of many other infects.

The *Trunk* of the butterfly is a flat body, being broader than it is thick, and is formed of a matter fomewhat refembling horn; if the head of the creature be fqueezed, it becomes neceffitated to unrol the *Trunk*, and may thus at any time be made to fhew it at its length. Its origin is juft in that part of its face, where the nofe in other animals takes its origin; and hence fome authors who have obferved it when unrolled, have called thofe butterflies which are poffeffed of it the long-nofed ones; but this is very improper, as it affuredly fupplies the place of a mouth. It is always largeft at the infertion, and thence gradually decreafes to a point at the other end.

The *Trunk* of the butterfly may alfo be unrolled, by getting the point of a pin between the circles at the center, and then drawing it gently from the head, the *Trunk* will by this means be drawn out to its full length; and if we tieze the creature a little, by gently preffing any part of it, it immediately opens a crack, in the middle of which it runs up by degrees to the origin or bafe, and fplits it in a manner into two.

It has been much difputed, among the curious obfervers of nature; whether the *Trunk* be originally compofed of two parts, or two *Trunks* laid clofe to one another; or whether it were owing to its tender ftructure, that it was eafily fplit by breaking its parts.

Mr. Bonani was of the firft opinion, and Mr. Riget agreed with him at firft, but he afterwards became of the contrary fentiment; and thought that they really broke in this fplitting, being originally only one: but Reaumur has determined the queftion in favour of Bonani; having, by repeated obfervations, found them compofed of two parallel *Trunks*, nicely and evenly laid fidewife together. This indefatigable fearcher after truth, examined the *Trunk* in the butterfly, while yet in its cryfalis, and when juft iffuing from it: he obferves that, in the firft cafe, the *Trunk* is not rolled up, but is laid evenly lengthwife along the body, and in this ftate it is eafily feen to be made up of two parallel *Trunks*; but in the fucceeding ftate, of juft hatching from the cryfalis, one may fee that it is compofed of two: for one of the firft efforts of the creature, is to roll this organ up into its fpiral form, and in doing this, the two pieces often gape fo wide afunder, and are rolled up fo irregularly, that it is fcarce to be conceived how the animal will be able to lay them even afterwards. This however is done by feveral times rolling and unrolling it; they join firft regularly at the bafe, and then by degrees all the way along to the point. It fometimes happens that there are difficulties in this, and the parts become folded, wrinkled, or otherwife injured in their figure; and if all this be not fet right in a few minutes, by the action of rolling and extending it; it never is done afterwards, but the organ dries in that form, and the creature lofes the whole ufe of it, and is doomed foon to perifh by hunger. Mr. Ray mentions a butterfly with a double *Trunk*; but Mr. Reaumur never having been able to find any fuch, it is very probable, that as Mr. Ray was unacquainted with this ftructure of the *Trunks* of all thefe creatures, he only found one whofe *Trunk* had never clofed. *Reaumur*, Hift. Inf. vol. 1. P. 1. p. 293.

The union of the two parts, of which the *Trunk* in thefe creatures is formed, is too ftreight to be owing merely to their contact; were they no better joined, they would frequently open and feparate, in the frequent rolling and unrolling of the whole, for the taking in of food. It is evident, on the contrary, that they are faftened together by a nice joining, and a very vifcous fluid.

There are among the *Trunks* of butterflies, only two fuch effential differences, as to deferve a general diftinction; the one kind of thefe are longer, flatter, and rolled up into more fpirals; the others are fhorter, thicker, and make fewer turns. The firft refemble a fort of thin blades, the others refemble a cord; fome of the flat ones are two or three inches long, and thick in proportion: thefe are the propereft for a microfcopic obfervation, in order to know their true ftructure; and when examined in this manner, they are found to be formed in an elegant manner, and made up of fibres, which divide themfelves into a number of rings, and refemble the annular ftructure of the *afpera arteria* in large anninals. Some of the *Trunks* of thefe animals are bright and gloffy, both on the under and upper fide; and fome of them have a number of fmall flat bodies iffuing from them which are ufually placed at the extremity, tho' fometimes at a diftance from it; thefe have been fuppofed by fome, to be a fort of fingers, whofe ufe was to collect together the nourifhment fit to be received into the *Trunk*; and others have fuppofed them the organs of fuction: but they appear rather to be only intended by nature, as fupports to the end of the *Trunk* while employed in fucking, as they have no organization proper for anfwering either of the other purpofes affigned to them, and as they are obferved only in the more weak and tender *Trunks*, the ftrong and thick ones having none of them. The two bodies which form the *Trunk* of the butterfly, have each of them a hollow running all the way along them, or are each of them properly a feparate canal, capable of receiving a fluid and conveying it up into the body of the animal. *Reaumur*, Hift. Inf. vol. 1. P. 1. p. 301.

Mr. Reaumur found out their ftructure with great eafe, by moiftening or foaking them in water after the creature was dead: after this treatment they became much more manageable and pliant than before, and could be rolled and unrolled at pleafure, and cut tranfverfely or in any other direction. The matter of which thefe *Trunks* are formed feems more of the nature of whalebone, than of any other known fubftance; and, like that, if thus fuppled by foaking in water, they are in fome degree tranfparent, from the thinnefs of their fides; and when they have been long enough in water, if they are preffed with the finger, there may be feen a feparate column of water moving about in each. And as this obfervation is moft eafily made on fuch *Trunks* as have been cut off tranfverfely from the head, thefe receiving the water the moft readily, the whole may in thefe be at pleafure preffed out at the ends where they are cut; and the joining of the two canals, or parts of the *Trunk*, along the middle, is more like that of the feathered part of a bird's plume, than any other combination in the parts of the animal world; and the joining of the two parts is fo nice, that there is another or third canal formed by it, which is nearly as clofe at the fides as the other two: this may ferve the creature for the conveying its food as well as the other two, but it appears more probable that its office is to convey the air for the creature's refpiration, and that the *Trunk* in this manner ferves in the office both of a mouth and a nofe.

The other kind of *Trunks* of the butterfly clafs, are the fhort and thick ones; thefe are not flat, but rounded like a cord; they are very robuft and ftrong, and they terminate in a fharp point, which in fome fpecies is capable of wounding the finger if preffed againft it: in all, however, it is capable of wounding and making its way into the tender fubftance of the leaf of a flower. The manner of the creature's getting its nourifhment is this: it plunges the end of the *Trunk* into the fubftance of the flower, by means of the hole made by this fharp end, fo far, that its apertures are in the place where the juices extravafate themfelves, from the wound the point has made; the point itfelf being often on the other fide, having pierced quite through. When it has thus drained away all the juice it can, it flies to another flower, and acts in the fame manner. There is a fpecies of butterfly, remarkable for having a fort of a figure of a death's head on its breaft; this fpecies has a thick *Trunk* of this kind, fo very fharp at the point, that it is capable of wounding the hand.

The action of the *Trunk* in fucking is eafily feen on giving a piece of fugar to a butterfly, that has been kept without food for fome days, after its being produced out of the cryfalis; many of the fpecies will in this cafe feed on the fugar in the fame manner that they would on the juices of flowers, and will fhew that the ufe of their rolling up their *Trunk* at times, is the fwallowing what they have received into it. The *Trunks* of the feveral fpecies of butterflies are as different in colour as in fhape; fome are black, others reddifh, many of a chefnut colour; fome are alfo of a pale brown, and fome of a beautiful yellow; many of them alfo are hairy on the under fide, and many are fmooth. The thicker *Trunks* are always fhorter than the flat ones, and have only one canal. *Reaumur*, Hift. Inf. Vol. 1. P. 1. p. 309.

TRUNKS *of Gnats*, the inftrument by means of which, the gnat ftrikes the flefh, and fucks the blood from animal bodies.

This is a machine well worth an attentive obfervation. As fine and fmall as this inftrument appears, it is neverthelefs of a very complex ftructure. The piercer, or more properly piercers of this inftrument, are all entirely hid in the fheath which makes what we call the *Trunk*; and is the only part we naturally have offered to our view. *Reaumur*, Hift. Inf. Vol. 4. p. 580. feq.

This *Trunk* appears to be cylindric, in the greateft part of its length; and is covered with fcales, not unlike thofe on the nerves of the wings of the creature; and refembling fmall leaves. Near its end, it has a little fwelling, where there is an oblong button, broader at its infertion than at its point: the end of this button is furnifhed with an aperture, out of which the creature occafionally thrufts a fine point. Many naturalifts have obferved this point; Swammerdam confidered it

it as a single pointed body, formed to pierce the skin; but Lewenhoek discovered that it was made up of a vast number of pointed bodies. There is no occasion, however, for all the accuracy of observation of Swammerdam, nor all the power of the magnifying glasses of Lewenhoek, to discover that this is a complex body; a common small magnifying-glass, and a careful examination, will at any time discover it.

If a gnat be held by the corcelet between the fingers, and a little squeezed, the sheath or case of the *Trunk* will be frequently seen to open itself lengthways on each side, sometimes only a little way, and at others almost along its whole length; and a fine glossy reddish filament shews itself at the opening of this case. This filament is bent and turned inwards, and one very soon distinguishes that it is indeed a congeries of a great number of filaments: these one may easily separate, in some measure, from one another, by means of any pointed instrument; and very often the filament separates of itself into several in the bending. It is plain, therefore, that the instrument destined to pierce the skin, and suck the blood, is of a complex structure; that what we might naturally take for this instrument, is only its case or sheath, and that this case, instead of a plain cylindric body, is really a composition of two semi-cylindric ones, which have the power of separating from one another for the animal's occasions.

The best way to get a regular sight of the *Trunk* of this creature, and of its manner of using it, is to suffer a gnat to settle upon the hand, and not disturb him in the operation; but with a magnifying glass in the other hand, to observe all his motions. In this case, we may first see a small and slender point thrust out at the end of the case, and try several different parts of the skin with this sharp instrument; when it has done this, it chooses that part which is most easily pierced; and where there lies a vessel underneath, capable of furnishing as much blood as he will have occasion to suck.

As soon as he has made his choice, the wound is immediately given; and since the point of the compound piercer cannot be protruded so far out of the case as it is necessary it should to strike to a proper depth, the use of the slit in this case is seen; for while the button at the end of this remains firmly applied to the orifice of the wound, where the piercer is introduced, and supports that delicate and feeble instrument from bending, the case opens at the slit, and its two sides bend to give room to the piercer to penetrate; and at length, when the piercer is sunk to its utmost depth, the two extremities of each piece touch, and the sides are brought close together.

Sometimes also one may observe in peculiar species of the gnat kind, when they are about to strike the flesh, a more complex structure of this sheath; for one may see, instead of the two antennæ which all the gnats have, an appearance of four, while the creature is in the act of sucking. It will be easy for any one to guess, that the second pair of these, which do not appear at any time, except when the creature is thus employed, are not true antennæ; and on a nice examination, they appear indeed to be no other than parts of the case of the piercers, which, as soon as the gnat of this species strikes the skin, are separated from the upper part of the case, and are two slender oblong bodies, of the same length with the case, except that part of it which we call the button. These two pieces of the cases at this time stand always in a parallel direction with the true antennæ, and are very nearly of their length. Each of these, examined in this state, has the appearance of a regular cylinder, but, probably, in its state of rest, is hollowed, and of a proper shape, to enclose and surround a part of the surface of the case; and this must of necessity be their real shape, since when the *Trunk* is in a state of rest, they are no other way distinguishable on it, than by the making it a little thicker; whereas, were they really cylindric bodies, as they appear in the state of action of the *Trunk*, they must, when it was at rest, be seen in form of two prominent lines on its surface.

The several species of gnats have great variety in their *Trunks*; and in the observing many kinds, the true structure of that organ in all will be most regularly and easily found. Some have the case of the piercers only one single tube split lengthwise along its upper part; others have this slit made by the junction of two cases, which cover closely a great part of its circumference; and others have the two tubes so well adjusted, and nicely fitted to one another, that a good glass cannot discover them from the rest of the *Trunk*, when in a state of rest; but in others this structure is easily discoverable, as the extremity of one of them, when best fixed, is still to be discovered somewhat separated from the *Trunk*, and adorned with a pencil of small hairs, like those of the antennæ. The male gnats, which have their antennæ feathered, are those which have the plumes at the extremities of these additional pieces of the case of the *Trunk*; and these have not the beards which are found situated over the *Trunks* of the other species of gnats.

There is, beside all these, one species of gnat whose piercer has no need of the button at the end of the case, common to all the rest, to support it while it enters the flesh. This has a case on which it rests itself as on a seventh leg, from which it darts a piercer, which, without any support, is of sufficient strength to penetrate the flesh, and do its office for the animal. This species of gnat has two very long beards placed above its *Trunk*, and terminated by an end, covered with white scales; what remains of these beards is covered with brown scales, and the body of the gnat is brown, and the corcelet reddish.

Tho' it is easy to find that the *Trunk* of a gnat is composed of several pieces, yet it is by no means easy to say what the number of them is. The best microscopes often shew the whole a single body, its several parts are so extremely well joined; and when they have been found to be more than one, it is very difficult yet to say how many they are. Lewenhoek imagined them to be four in number; and Swammerdam, who had first believed the whole a single filament, afterwards thought he discovered six pieces going to its composition.

After separating the piercer of the gnat wholly from its sheath, if it be cut transversely near its base or insertion in the head, and the section laid upon the plate of a microscope, and there touched with an extremely fine pointed instrument, it may be divided into four, and sometimes into five separate pieces. Two of these may often be seen to come out of a third, as out of a canal or tube: the seeming necessity of a tube in this instrument, for the sucking the blood, has made many ready to persuade themselves that they have seen one: but if we follow the analogy of nature in her other works, we shall find there is no absolute necessity for such an organization in this part; since, in the gad fly, the several pieces of which the piercer is composed are of themselves able to form a tube for the passage of the blood.

The figures of the several constituent parts of this instrument are as difficult to be determined as their number; thus much is certain, however, that the points of all the pieces are by no means alike, for some are much longer than others.

Out of the immense number of gnats that one sees in summer, in wet places, it is easy to determine that very few have any chance, even once in their lives, to suck the blood of larger animals. The rest, however, are far from being doom'd to perpetual famine; the herbs of the field afford them a sufficient nourishment; for these, like many other of the insect tribes, are partly carnivorous, partly otherwise, and feed equally on flesh and vegetables. *Reaumur*, Hist. Insect. vol. 4. p. 580. seq.

TRUNK-*Manna*. See the article MANNA.

TRUNSCHIBIL, a word used by Tournefort, to express the manna Persicum, called also by some *Trungibin*; both evidently corruptions of the terenjabin of the Arabians. See the article TRUNGIBIN.

TRUSSED, in the manege. A horse is said to be *well trussed*, in French *bien gigoté*, when his thighs are large and proportioned to the roundness of the croupe. On the contrary, a horse with thin thighs, that bear no proportion to the breadth of the croupe, is said to be *ill trussed*.

TRUTTACEOUS, in zoology, the name of a genus of fishes of the trout kind, which are distinguished from all other fishes by a small fat fin, which they all have near the extremity of the back, and which has no rays or nerves. Of the fish of this genus, some live only in fresh waters, never entring the sea or salt rivers: others frequent both the fresh and salt waters, and are therefore called *anadromi* or *catanadromi*. These leave the fresh waters while young, and go into the salt waters to feed and grow, and again return into the fresh rivers at the time of their full growth and spawning, that their offspring may have the same advantages themselves have had, of being hatched into life in fresh water.

The *truttaceous* fishes are divided into two orders, those which have, and those which have not teeth. Of the edentulous kind, or such as have no teeth, are the lavaretus, ferra, thymallus, oxyrynchus, and albula; and of the toothed kind, are the salmo, umbra, trutta, carpio, &c. In dissection, the *truttaceous* fishes have all apophyses to the pylorus, and are all a high-tasted and fine set of fish for the table. *Ray*'s Ichthyography, p. 182.

TRY (*Cycl.*)—TRY, at sea. A ship is said to *try*, when she has no sails but her main-sail aboard; when her tacks are close aboard, the bowlings set up, and the sheets haled close aft; when also the helm is tied close down to the board, and so she is let lie in the sea. And sometimes when it blows so hard that they cannot maintain the main-sail, as they say, that is, cannot bear it out, they make her lie a *Try* under a missen-sail only.

TRYBLION, a word used by the old medical writers, to express the pot or dish in which the medicines used in fumigations were placed at the time of use.

TRYCHNUS, in botany, the same as *Strychnus*, the name of the nightshade. The Greeks called it στρύχνος, and the Latins, as well as themselves, often left out the initial σ, as they do in many other words; thus they write *milax* for *smilax*, *maragdus* for *smaragdus*, &c.

Pliny uses the word *Trychnos* as the proper name of the plant; and Dioscorides, willing to distinguish the mad nightshade from the sleepy nightshade, which are the two poisonous kinds, so called from their different effects, calls the one *Trychnos* and the other *Strychnos*. But this is a trivial difference in the name, and would never be esteemed any difference

ference by thofe who know the Greek language, in which this is familiarly done without any intent of diftinguifhing.

Theocritus mentions the plant *Trychnus*; but he is to be underftood of a third kind, differing from both thefe poifonous ones, and bearing an efculent fruit. This was the plant we now call *lycoperficon*, or *pomum amoris*. The writings of Theophraftus warrant the poet in calling this plant, as well as the others, by the common name *ftrychnus*, or *Trychnus*; for he exprefsly fays, there are three kinds of *Trychnus*, one which caufes fleep, another which caufes madnefs, both poifonous, and a third, which is efculent.

The *poma amoris* are at this time eaten by the Jews with us, and by ourfelves in foups, and the like. The Italians, Spaniards, and Portuguefe, all eat them, and efteem them a very delicate difh. The later Greek writers have left off the ufe of the word *ftrychnus*, and ufe the term *melintzanion* for this plant. See the article MELINTZANIUM.

TRYGUM, in ichthyology, the Greek name given by Elian, Athenæus, and Appian, to the fifh which we call the *paftinacha marina*, or fire-flaire. Ariftotle and fome others write it *tragum*. The fifh is a fpecies of the ray, and is accurately diftinguifhed by Artedi by the name of the fmooth-bodied ray, with no fin on the tail, and with a long fpine ferrated on the anterior parts. See the article RAJA.

TRYING, in pharmacy, the purifying fat fubftances, by means of melting, and feparating them from their membranes, &c. In the college difpenfatory, the method laid down for the purifying lard, fuet, &c. is this: Melt them at a gentle fire, with the addition of a little water intermixed, and, when melted, ftrain them from the membranes. The addition of water in this keeps the fat from burning and becoming black, which it would otherwife do; for the water, not being capable of receiving any greater degree of heat than that of boiling, will keep the bottom of the veffel from growing too hot, much better than the niceft management of the fire could do. *Pemberton*'s Lond. Difp. p. 146.

TSAPHARI, in the materia medica of the antients, a name given by fome to the cadmia, called by Diofcorides, *placitis*, and by others of the Greek writers, *zonitis* and *onychitis*. It was a flat kind, forming a fort of coat or cruft on the walls or fides of the furnace: hence it had the name *placitis* or *cruftaceous*; and it was called *onychitis* and *zonitis*, becaufe, when broken tranfverfely, it appeared made up of feveral fucceffive plates, which had the appearance of fo many belts or zones. Serapio tells us that this and the botryoide cadmia were dug out of the mines; that is, that they were natural productions; but this is erroneous, and contrary to all the accounts of the antients.

TSHINKA, in the materia medica, a name by which fome authors have called the clove-tree, the tree which produces the fpice of that name. *Pifo*. Mant. A. p. 117.

TSIA, in botany, a name taken from the Japonefe, and ufed by fome authors for the tea tree.

TSIAM *Pangam*, in botany, a name ufed by fome authors for the tree whofe wood is the logwood ufed in dying and in medicine. Hort. Malab. vol. 6. p 3.

TSIANA *Cua*, in the materia medica, a name given by fome authors to the coftus root. Hort. Malab. vol 4. p. 15.

TSIN, in natural hiftory, the name given by the Chinefe to a ftone which they make great ufe of in their manufacture of porcelain ware. It is of a deep blue colour, much refembling Roman vitriol in appearance, and is found in lead mines, and fuppofed to contain fome particles of lead; its effects being the fame in the porcelain manufacture as thofe of cerufs or white lead; in making the other colours penetrate into the fubftance of the veffels. The deep violet colour that we fee fo beautiful on the China ware, is ufually made with this ftone. They find it about Canton and Peking; but the latter place affords the beft, and it fells at greatly the beft price.

The painters in enamel melt this ftone in their way, and ufe it very much; they form many beautiful works, by laying it upon filver; but it is apt to come off in time. When the *Tfin* is ufed in the porcelain manufacture, it is only ufed to the vafes that pafs a fecond baking, and are intended as the beft kinds.

The *Tfin* is prepared by only beating it to powder, not roafting it in the common way. They mix the powder with large quantities of water; and ftirring it together, they let it fubfide a little to feparate any earthy or extraneous matter that might be among it. They then let the powder fubfide. The water which is thrown away has no colour from this matter; and the powder itfelf is not of that fine blue it was in the lump, but of a pale afh-colour; but this recovers all its beauty when it is laid on the China, and baked. The fettlement taken from the water is dried and preferved in powder, and when it is to be ufed, they only mix it up with gum-water, or a folution of glue, and lay it on with a pencil. Obfervations fur les Coutumes del' Afie.

TSUBAKI, in botany, a name by which Kæmpfer calls the concellia. See the article CONCELLIA.

TUB (*Cycl*)—TUB-*Fifh*, in ichthyology, an Englifh name given to a fpecies of the *trigla*, commonly called the *flying fifh*, and by authors *hirundo*, *corvus*, and *milvus*.

It is diftinguifhed by Artedi from the other fifh of the fame genus, by the name of the *trigla* with a prickly head, and with three appendages on each fide to the pectoral fins. This is the only name to be judged fpecific for this fifh; for the others are fo vague in their fignification, that they have been applied by different authors to fifh of different fpecies, and even different genera, which had a power of fuftaining themfelves out of the water by means of their long pectoral fins. *Artedi*, Gen. Pifc. p. 74. See the articles HIRUNDO and TRIGLA.

TUBA, in natural hiftory, a name by which many old authors call the buccinum.

TUBBER, in mining, a name given in Cornwall to that mining inftrument, which is in other parts of England called a *beele*. It is an iron inftrument, pointed at each end, and having a hole in the middle for the handle. See the article DIGGING.

TUBBER-*Men*, are, in Cornwall, the people who work with this tool, and who are, from its other name of *beele*, called in other places *beel-men*. See the article BEELE.

TUBE *of a Flower*, among botanifts. See the article PETAL.

Glafs TUBES. See the article GLASS *Tubes*.

TUBEL, a word ufed by fome chemical writers to exprefs fcales of copper or brafs.

TUBEROUS, or TUBEROSE *Roots*, among botanifts, fuch as are large and flefhy, thicker than the ftalk of the plant, of an irregular figure, and wanting the characters of the bulbous. See the article ROOT.

TUBERA, *Truffles*, in botany, the name of a genus of plants, the characters of which are thefe; they are of a fungous flefhy ftructure, and are of a roundifh figure, growing fometimes fingle, fometimes many together, and always remaining under ground.

The fpecies of *Truffles* are only two. 1. The common *Truffle*; and 2. The tefticulated *Truffle*. *Tourn*. Inft. p. 565. See the article TRUFFLE.

TUBIPORA, in botany, the name given by Linnæus to the fea plants ufually called by authors *tubularia*. See the article TUBULARIA.

TUBOR *Terræ*, a name ufed by fome botanical authors for the cyclamen or fow-bread. *Ger*. Emac. Ind. 2.

TUBULARIA, in botany, the name of a genus of plants, the characters of which are thefe: That it grows under water, and is of the ftony hardnefs of coral, and compofed of a congeries of hollow pipes or tubes.

There is only one known fpecies of this, which is the purple *Tubularia*. *Tourn*. Inft. p. 575.

TUBULARIA *Foffilis*, in natural hiftory, the name of a fpecies of coral found very often foffile in Germany and Italy, and compofed of a great number of tubes, or longitudinal pipes, often refembling fo many worms ranged perpendicularly in the mafs. See Tab. of Foffils, Clafs 7.

They are ufually found either in maffes of a lax ftone, or in fingle tubules in thofe of the harder and firmer texture. In thefe two ftates this foffil makes two very different appearances; and, according to the different directions in the mafs, or the different views of them that the fections of it place them in, they make a number of very elegant figures. *Hill*'s Hift. of Foff. p. 641.

TUBULATED *Flower*, *Tubulatus Flofculus*, in botany, a term ufed by authors to exprefs thofe fmaller flowers, a great number of which go to compofe one large compound flower. Thefe are called tubulated in diftinction from another kind of them, which are, from their fhape, called ligulated The tubulated flofcules generally compofe the difk, and the ligulated ones the radius of the compound flowers. The tubulated ones are formed into a hollow cylinder, which expands into a mouth at the top, and is divided into five equal fegments, which ftand expanded, and in fome meafure bent backward. See Tab. 1. of Botany. Clafs 1.

TUBULUS (*Cycl*.)—TUBULI *Concamerati*, in natural hiftory, the name of a genus of the *Tubulus marinus*, diftinguifhed abundantly from all the others by its figure and inner ftructure.

They are long fhelly bodies, ufually either of a conic or cylindric form, or elfe refembling the dentales in fhape; and fometimes, but that very rarely, they have their fmaller end bent and twifted round. They are compofed within of a number of hollow compartments, each of which communicates with the next by means of a fiphunculus, which runs through the whole length in the manner of the thick nautilus, or the cornu ammonis. We know not thefe in their recent ftate at this time, but frequently meet with them foffile in the ftones brought from Sweden for pavements, and in fome others.

Some authors have called thefe by the name *alveoli*, confounding them with the conic body found in the belemnitæ. See ALVEOLUS. Others have called them *pyramidal entrochi*, others *obelifci marmorei alveolares*; and they are the bodies defcribed by Gefner and Aldrovand under the names of *lapides caudæ cancri* or *cancrites*. Some late authors have called them alfo *polythalamii*, and other *cone-ftones*. *Klein*. de Tubul. p. 7.

TUBULI *Foffiles*, in natural hiftory, the name given by authors to the cafes or *tubules* of fea-worms, found buried in the earth.

They are in their native ſtate of very various kinds, but by different accidents attending them in their accidental one, they are ſubject to a multitude of other appearances. They are found of very various ſizes, ſometimes compleat, and buried in the ſtrata of earth or ſtone; ſometimes they are more or leſs perfect, and are immerſed in maſſes of the *ludus helmontii* or *ſeptariæ*, and in this ſtate, they make one kind of *lapis ſyringoides*, or pipe-ſtone; but the moſt beautiful *ſyringoides*, or pipe-ſtones, are the parts of the bottoms of ſhips, or poſts fixed in the ſea, which have been pierced, in their original ſtate of wood, by theſe ſea worms, and afterwards, petrified with the caſes or *Tubuli* of the worms remaining in them; theſe are uſually of a pale yellow or whitiſh wax colour; and the body of the maſs of a browniſh or blackiſh hue, but retaining the ſtructure of the wood: of theſe, there are beautiful ſpecimens in great abundance on the ſhore of the iſland of Sheppy. We have the very ſame ſubſtances alſo buried in our clay-pits, about London and at Richmond; but in theſe the wood is highly ſaturated with the matter of the common vitriolic pyrites, and the pipes often filled with the ſame ſubſtance.

Thoſe *Tubuli* called *dentalia* and *entalia* are not leſs frequent, and are found of various ſizes; ſmall ſmooth ones are common in our clay-pits about London; and the larger ſtriated ones are not unfrequent in the hills of Yorkſhire; but they are much more plentiful in thoſe of France and Italy. *Hill's* Hiſt. of Foſſ. p. 648.

TUBULUS *Marinus*, or *Canalis*, in natural hiſtory, the name of a genus of univalve ſhell-fiſh; the characters of which are theſe: It is of an oblong figure, terminating in a point, and hollow within; ſo that it reſembles a tube or horn. Theſe are alſo called by the older writers *dentalia*, from their reſembling the tooth of a dog.

It has been a common error of authors to confound under the general name of *Tubulus marinus*, theſe ſhells, and thoſe very different ones of the *vermiculi marini*, which make a number of pipes or tubes joined together; theſe by their number and joinings, have induced a late French author to place them among the multivalve ſhells, while the *canales* are uſually ſingle and ſeparate, and can have no title to any claſs, but the tubular univalve one. Aldrovand obſerves, that the *Tubuli* called *dentalia*, and thoſe called *antalia*, differ only in ſize; and he thinks they have no title to the name *conchæ*, ſince they are neither of the nature of the common bivalve, nor univalve ſhells, ſuch as the patella and *auris marina*; but this is very idle, ſince by this rule the ſnails, and many other families, might be excluded as well as theſe. This author ſays, in another place, that the *antale* is formed of many circumvolutions; whence he ſeems to have taken in the *buccina* under this name; but later writers have more nicely diſtinguiſhed in theſe caſes. The ſea pencile is evidently of this genus, tho' extremely different from all the other ſpecies of it, in having its head pierced with a multitude of holes, in the manner of the head of a watering pot. Some authors, from the figure of the ſhell, call this *phallus marinus*, and the French call it *le priape*. *Aldrovand*, de Teſtac. l. 3. p. 382.

Of this general claſs of the *Tubuli* or *Canales*, there are four ſubordinate diſtinctions: 1. Some are ſtriated. 2. Some are ſtrait. 3. Some are bent like a horn: and, 4. Some are ſmall and even on the ſurface, and are bent a little into a figure approaching to that of a creſcent; theſe are now called by many *antalia*.

Of the ſtriated *Canalis*, we ſeem to have at preſent only one known ſpecies; tho' this varies ſo greatly in ſize and colour, that it might in its ſeveral ſtates be miſtaken by many for ſeveral ſpecies. There is alſo another very different form it aſſumes in our cabinets; this is owing to its being poliſhed, the ridges being by this manufacture taken off, and the ſhell made to appear extremely different.

Of the ſtrait kind we ſeem alſo to have only one ſpecies, tho' varied by accidents into ſeveral different appearances.

Of the crooked kinds we have. 1. The horn *Canalis*: this is a *Tubulus marinus* exactly of the ſhape of a horn moderately inflected. 2. The root-ſhaped *Canalis*. 3. The biſtort *dentalia*, or *Canalis*, of the figure of the biſtort-root. 4. The rape-*dentalia*, or *Canalis*, of the figure of the rape-root. 5. The *Canalis*, called vulgarly *dens-canis*, or the dog-tooth ſhell. 6. The *dens elephantis* or elephant's-tooth ſhell. 7. The whitiſh *Canalis*. And, 8. The greeniſh *Canalis*. To theſe is to be added, the *phallus* or *priape* of the French; called alſo by ſome of that nation the *arroſoir* or watering-pot; it is an oblong and ſtrait ſhell, with the head pierced full of ſmall holes like the head of a watering-pot.

Of the *Canalis* called by the French *antales*, we have only two ſpecies. 1. The white: And, 2. The yellowiſh *antalis*. Hiſt. Natur. Eclairc. P. 2. p. 245. See the articles PENICILLI *Marini*, DENTALIS, SOLEUS, BELEMNITES, and TUBULUS *concameratus*.

TUBULOSE-*Leaf*, among botaniſts. See the article LEAF.

TUCANA, in zoology, a name given by ſome to the toucan, a very remarkable American bird of the magpye-kind; but having a beak as long and thick as its whole body. *Ray's* Ornithol. p. 88. See the article TOUCAN.

TUCK *of a Ship*, the truſſing or gathering up the quarter under water; which if ſhe lie deep, makes her have a broad, or as they call it, fat quarter, and hinders her ſteering; by keeping the water from paſſing ſwiftly to her rudder; and if this truſſing lie too high above the water, ſhe will want bearing for her works behind, unleſs her quarter be very well laid out.

TUFECSI, a body of the Spahis, or horſe, in the ſervice of the Grand Seignior. *Pocock's* Egypt, p. 166.

TUFFO, in botany, a name given by the people of Guinea to a plant common in that country, and uſed in decoction to waſh ſore eyes with. It is of the ſun-flower kind, and is called by Petiver, *flos ſolis Guineenſis folio ſcabro flore minore*. It much reſembles ſome of the American ſun-flowers. Philoſ. Tranſ. N°. 232.

TUFTED *Duck*, in zoology, the Engliſh name for the *capo negro*, a ſpecies of duck with a blackiſh head, and a tuft of feathers hanging from it. See the article CAPO *Negro*.

TUGUS, in botany, the name of a ſweet aromatic plant, much eſteemed in the eaſtern parts of the world, and ſuppoſed by father Camelli, who very ſtrictly compared it with the accounts given by Dioſcorides and the antients of their amomum, to be that very plant. The cluſtered manner of growing of the fruit, together with its oblong ſhape, and the aromatic taſte of the ſeeds, ſeem greatly to countenance this opinion.

The *Tugus* is a plant of conſiderable height, growing up ſometimes to eight or nine cubits. Its leaves are of an oblong form, marked with large veins and ribs, covered with a ſoft hoary down underneath, and of a very agreeable aromatic ſmell. The flowers are red, and grow in cluſters, of a hand-breadth or more in length, in a kind of ear, ariſing either from the root, or from the main trunk of the plant. The fruit follows theſe flowers, and is no other than the inflated or enlarged cup of the flower, containing the ſeeds: this makes but a very thin and tender covering for them; and they, being delicious to the taſte, are much ſought after by birds, inſects, and field mice. One or other of theſe creatures uſually devours them before they become really ripe; and this makes the fruit ſcarce, even in the places where the plant grows, ſince very little of it can be collected.

Each fruit of the *Tugus* contains five or ſeven ſeeds; theſe are of an oblong figure, of a reddiſh colour, and of an agreeable aromatic taſte, but not too acrid.

The natives ſeem as fond of theſe, as the antients were of the amomum; and the young women ſtring them on threads, and wear them as bracelets; ſometimes they make the bracelets of the ſeeds alone; but more uſually they ſtring them alternately with pearls, and pieces of red coral: theſe bracelets they call *caropi*, as well as the fruit itſelf.

In ſome places, where the *Tugus* is ſcarce, they uſe the ſeeds of the abelmoſch, the cannacorus, or the ſago, inſtead of theſe of the *Tugus*; but the true are much more eſteemed. They are ſuppoſed, when worn by way of a necklace, to keep off the effects of a bad air, and to preſerve them from the bites of ſerpents or the centipes. If not a preſervative, they are however found, upon experience, to be a very good remedy in the laſt caſe, the common application for the bite of this animal being ſome of the ſeeds of the *Tugus* chewed in the mouth to a ſort of paſte.

The cluſter of fruit of the *Tugus*, or true amomum, when newly formed and unripe, ſomewhat reſembles the pſeudo-amomum of Garcias; but this likeneſs wears off as they ripen. Camelli, who hath given this excellent account of the *Tugus*, has added a figure of it in the Philoſophical Tranſactions, from which ſome at firſt ſight may object to the juſtice of his making it the ſame plant with the amomum; ſince Dioſcorides, and from him Pliny, affirm the leaves of the amomum plant to be like thoſe of the pomegranate; this no more agrees with his figure, than with his general deſcription of the common leaves of the *Tugus*, which are not at all like thoſe of that tree, but greatly larger and longer in their ſhape: but this is a difficulty eaſily cleared up, by obſerving that Dioſcorides, Pliny, and the reſt of the antients, when they deſcribe the amomum, never concern themſelves about the plant which produces that precious fruit, which probably they never ſaw; but all they mean by its leaves, are thoſe ſmall and ſhort leaves which they found adhering to the cluſter of the fruit, as brought over to them for ſale. Theſe are the leaves of the ear only, and theſe are not unlike thoſe of the pomegranate, on the plant while growing. Philoſ. Tranſ. N°. 248. p. 2.

TUI, in zoology, a name by which ſome call the *paroquette*. The word is originally Braſilian; and the names of ſeveral of the Braſilian ſpecies of this bird, deſcribed by Marggrave, have the word *Tui* as a part of them; as the *tuiete*, the *tuipara*, the *tuitirica*, and *tuiaputejuba*. See the article TUIETE, &c.

TUIAPUTEJUBA, in zoology, the name of a Braſilian ſpecies of paroquette, all over of a green colour, but in different ſhades, very deep on the wings, very pale and ſomewhat yellowiſh on the belly, and of a faint colour all over the reſt of the body. Its tail is very long; it is about the ſize of a ſwallow;

swallow; its eyes are large and black, and have a circle of yellowish green feathers round them, and over the beak, which is black and crooked; and on his head he has one spot of gold yellow feathers. *Marggrave*'s Hist. Brasil.

TUIETE, in zoology, the name of a Brasilian species of paroquette, of the size of a lark, and all over of a pale green colour, variegated with blue. The origin of its wings is blue, as are also all the ends of the wing-feathers, so that when the bird sits still, there is, as it were, a blue line seen running down each side; on its rump there is also a blue spot; its tail is but short; its beak small, crooked, and of a pale red; and its legs and feet grey. *Marggrave*'s Hist. Brasil.

TUITIRICA, in zoology, the name of a Brasilian paroquette, which is a little larger than the common kind; all over of a fine beautiful green, but deeper on the back and wings than elsewhere. Its beak is very hooked, and of a pale red; its eyes black; and its feet blue; its tail is but a little longer than the wings when closed. This is a species much esteemed in the Brasils, as it easily learns to talk, and becomes so tame, as to eat out of any one's mouth. *Marggrave*'s Hist. Brasil.

TULACUM, in natural history, a name given by the people of the East Indies to a species of yellow orpiment, of the coarser kind, variegated with red. They prepare this by several calcinations, and then give it internally in fevers, and many other disorders, esteeming it a sort of panacea. They say that gold may be extracted from it, which is not improbable; for it is well known, that some of the Roman emperors did actually procure gold from one of the other kinds of orpiment, which is now found at Gosselaer in Saxony.

TULIP, *Tulipa*, in botany, a large genus of plants, the characters of which are these: The flower is of the liliaceous kind, and is composed of six leaves, and somewhat of the form of a pitcher; the pistil occupies the center of the flower, and finally becomes an oblong fruit, divided into three cells, which contain flat seeds, arranged in a double order; the root is tunicated, and the fibres grow from its bottom.

The species of *Tulip*, enumerated by Mr. Tournefort, are these: 1. The yellow early-flowering *Tulip*. 2. The red early *Tulip*. 3. The purple early *Tulip*. 4. The amethystine early *Tulip*. 5. The early *Tulip*, with a dusky blackish purple flower. 6. The purple *Tulip*, with a pale cup. 7. The bright red *Tulip*, with a yellow cup. 8. The early white *Tulip*. 9. The early scarlet *Tulip*, with pale red edges, and red heart-fashioned spots at the bottoms of the leaves. 10. The early *Tulip*, with a crimson and red flower. 11. The variegated amethystine early *Tulip*. 12. The early *Tulip*, with a bright red flower, with white edges. 13. The early crimson *Tulip*, with white edges. 14. The variegated white and reddish early *Tulip*. 15. The early variegated red *Tulip*. 16. The variegated rose-coloured many-flowered early *Tulip*. 17. The early yellow variegated *Tulip*. 18. The early yellow *Tulip*, with red edges. 19. The early *Tulip*, of a blended red and yellow colour. 20. The beautiful scarlet *Tulip*, with yellow edges. 21. The broad-leaved yellow *Tulip*, with crimson edges. 22. The yellow *Tulip*, with edges striated with red, and a green bottom. 23. The yellow *Tulip*, with numerous small spots. 24. The yellow *Tulip* with gold-coloured spots. 25. The yellow *Tulip*, with rose-coloured edges. 26. The yellow *Tulip*, with red spots. 27. The yellow *Tulip*, with a red mark near the cup. 28. The yellow *Tulip*, with bright red spots. 29. The greenish yellow *Tulip*. 30. The pale lemon-coloured *Tulip*, with green streaks on the back. 31. The brimstone coloured *Tulip*, with deep red edges, and rose-coloured spots near the stamina. 32. The bright straw-coloured *Tulip*, with red edges. 33. The early purple variegated *Tulip*. 34. The rose-coloured *Tulip*, with yellow veins. 35. The bright red *Tulip*, with greenish streaks. 36. The *Tulip*, with reflex flowers of a bright red throughout within, and on the outside of a greenish colour, with a bright vermillion edge. 37. The early white *Tulip*. 38. The white *Tulip*, with green veins. 39. The white *Tulip*, with rose-coloured spots. 40. The white *Tulip*, with broad red spots. 41. The white *Tulip*, with red edges. 42. The silvery white *Tulip*. 43. The yellowish white early *Tulip*, with long red streaks. 44. The reddish white *Tulip*, with red edges. 45. The white wide-open *Tulip*, with red streaks. 46. The early narrow-leaved *Tulip*. 47. The early hyacinth-leaved *Tulip*. 48. The late flowering yellow *Tulip*. 49. The plain gold yellow *Tulip*. 50. The yellow *Tulip*, variegated with red and green. 51. The late-flowering scarlet velvety *Tulip*. 52. The late globose *Tulip*, spotted with gold colour. 53. The white *Tulip*, with a scarlet edge. 54. The white *Tulip*, variegated with a yellowish purple, and with yellow bottoms to the leaves. 55. The snow-white *Tulip*, with purplish-red edges. 56 The snow-white *Tulip*, with deeper purple edges. 57. The late-flowering stellate *Tulip*. 58. The changeable white-flowered *Tulip*, with red edges. 59. The scarlet *Tulip*, with white edges. 60. The late-flowering globose vermillion *Tulip*. 61. The late deep red *Tulip*. 62. The red changeable *Tulip*, with greenish spots in the middle of the petals. 63. The great branched late-flowering *Tulip*. 64. The smaller late-flowering branched *Tulip*. 65. The late green-flowered *Tulip*. 66. The late green *Tulip*, with double flowers. 67. The late flowering green *Tulip*, with white edges. 68. The late *Tulip*, with double red flowers. 69. The double late yellow *Tulip*. 70. The large dubious *Tulip*. 71. The largest dubious *Tulip*. 72. The middle-sized dubious *Tulip*, with sulphur-coloured flowers. 73. The yellow *Tulip*, with bright red spots. 74. The yellow *Tulip*, with red edges. 75. The large dubious *Tulip*, with orange-coloured flowers. 76. The middle-sized dubious *Tulip*, with variegated flowers. 77. The *Tulip* which bears bulbs in the alæ of the leaves. 78. The dwarf broad-leaved white *Tulip*. 79. The dwarf broad-leaved yellow *Tulip*. 80. The dwarf broad-leaved red *Tulip*. 81. The dwarf narrow-leaved *Tulip*. 82. The dwarf grassy-leaved *Tulip*. 83. The little yellow Italian *Tulip*. 84. The small broad-leaved *Tulip*. 85. The little red *Tulip*. 86. The cottony cretic *Tulip*. 87. The little French yellow *Tulip*. 88. The little yellow and purple *Tulip*. 89. The Persian variegated *Tulip*. 90. The Candey *Tulip*, with shining leaves. 91. The middle-sized changeable *Tulip*, with curled leaves adhering to the base of the flower. 92. The many-leaved yellow *Tulip*, called by some the monstrous double yellow *Tulip*. And 93. The great yellow *Tulip*, with jagged flowers, and spots of yellow and blood-red, in different parts of them. *Tourn.* Inst. p. 373. seq.

The characters of a good *Tulip* are these: 1. It must have a tall and strong stem. 2. The flower should consist of six leaves, three within, and three without; and the former should be larger than the latter. 3. The bottom of the flower should be proportioned to the top, and the ends of the leaves should be rounded, not pointed. 4. The leaves, when opened, should neither turn inward, nor bend outward, but stand erect; and the whole flower should be of a middling size, neither too large, nor too small. 5. The stripes must be small and regular, and should all arise from the bottom of the flower: The chives also should not be yellow, but of a brown colour.

Tulips are generally divided into three classes, according to their times of flowering; the early, the middling, and the late.

The early ones are not near so high as the late, but they are valued for their earliness, as they flower in February. The roots of these are to be planted in the beginning of September, under a warm pale or hedge. The proper soil for them is pasture-land with the turf rotted among it, and a mixture of one fourth part sand; this should be laid about ten inches deep, and should be renewed every year. If the weather is very severe when they first appear, they should be covered with mats; as also at nights, when they are in flower, if it be very frosty. When their flowering is over, and their leaves decay, the roots should be taken up and laid in a dry place, and afterwards cleaned and laid up in a safe place from vermin, till the September following.

The late blowers are propagated from what they call breeders, which are plain flowers, brought over principally from Flanders, which is the great mart for flower-roots; and these by culture, are changed into striped and variegated ones. They are also propagated by sowing the seeds; but this requires great care, as in the raising all the other fine flowers from seeds.

The seeds must be saved from the choicest flowers, and sowed in shallow pans or boxes of earth, in September. The spring following they appear like the leaves of grass, or young onions, and after standing two or three months these decay. The boxes are to be kept clear of weeds, and removed to different situations where they may enjoy the morning-sun, and be defended from sharp winds and frosts; at the Michaelmas of the following year they are to be removed out of the boxes into beds, where they should be planted two inches deep, and at two inches diameter from one another. In October, an inch depth of new earth should be sifted on them, and they are to remain two years in these beds; at the end of this time they will flower, and the best of them must be marked with sticks, that their roots may be distinguished when the leaves are decayed.

But there is no judgment to be passed either on *Tulips*, or any other flowers, on their first flowering; because the next year the good ones are often found to have degenerated, and the bad to have improved: After this, however, they may be concluded good or bad.

The breeders, as they are called, being thus raised, are to be shifted every year into fresh earth, and they will in time break out into very fine stripes. The earth they are planted in should be every year of a different kind, and the best general soil is made of a third part pasture-land with the grass rotted in it, a third part fine sea-sand, and a third part lime-rubbish; these should be mixed half a year before they are used, and often turned. The beds must be laid eighteen inches deep with this earth. This should be laid in first ten inches thick, and on this the roots should be placed in regular order, and at even distances; and then the other eight inches should be laid over these, the top of the bed being a little rounded to throw off the wet. Thus they are to remain till the buds appear, and then if the nights are very severe they are to be sheltered by covering them with mats. The flowers which break out into fine stripes here, should be separated after-

afterwards from the reft, and if they hold on their beauty to the laft, which the florifts call dying well, they will never return to plain flowers again; and the off-fets from the roots of thefe will always produce fuch flowers, and often more beautiful than thofe of the parent root.

When the *Tulips* have flowered, their heads fhould be broken off to prevent their feeding, which would make them flower much the worfe the next year. *Miller's* Gardener's Dict.

The Dutch have always been admirers of flowers, and before the prefent fafhion of cultivating the auriculas and carnations came up among them to the height it now is at, they took the fame care of *Tulips*. The prices they fold thefe at among one another, are amazing. Munting tells us, that in the years 1634, and the four or five following, they not only purchafed them at extravagant rates beyond credibility, but many of the burghers, fhopkeepers and tradefmen, quitted their fhops and trade, and addicted themfelves folely to the culture and cure of their *Tulips*. The fineft of them were then valued above gold or gems; and there is an account of one bargain for the purchace of that *Tulip* which they call the viceroy, preferv'd: The perfon who purchafed this, not having money, paid for it the following things; two lafts of wheat, four lafts of rye, four fat oxen, twelve fat fheep, eight fat hogs, two hogfheads of wine, four tons of beer, two ton weight of butter, a thoufand pound weight of cheefe, a bed, a fuit of cloaths, and a large filver beaker; the whole valued at two thoufand five hundred gilders. We have another account about the fame time, of twelve acres of good land offered for one *Tulip* root. And at a publick fale of a private perfon's collection there was made ninety thoufand gilders. This madnefs would have run yet higher among them, but the ftates at length took it into confideration, and finding it very detrimental to fubftantial and neceffary trade, put a ftop to it, and reduced the price. *Munting.* de Plant.

TULIP-*Tree*, a very beautiful American tree, which produces flowers fuppofed like thofe of the *Tulip*. Thefe trees ufed to be kept in tubs, and houfed in winter with great care; but fome of them having been planted out in the open air at Lord Peterborough's at Fulham, they throve much better than thofe which were fo carefully nurs'd up, and foon produced abundance of flowers.

The tree is commonly found wild in all the northern parts of America, where its timber is of very great ufe. The flowers are not in reality much like thofe of the *Tulip*, tho' vulgarly faid to be fo. The flowers are fucceeded by canes, which are often fent over from America; and the trees are frequently raifed with us, from the feeds contained in them. The feeds muft be taken out of the canes in fpring, and fown in pots of light earth, which muft be placed in a back bed, and covered with mats, and frequently refrefhed with a little water. When the young plants appear, they fhould be placed, during fummer, in a fhady fituation; and in winter they fhould be put into a frame, where they may have the benefit of the open air in mild weather, and be fheltered from feverity of frofts. In the fpring following, the plants fhould be tranfplanted into fmall pots, and taken the fame care of for four years, as while they were in the feed-pots; after this they will be ftrong enough to tranfplant finally into the places where they are to remain: it fhould be planted on a light loamy foil near other trees, but not over-fhaded by them. Some raife them from layers, but they are two or three years before they take good root, and then never make fuch ftrait and regular trees. *Miller's* Gardiner's Dict.

TULIPIFERA, a name given by Catefby, to the *liriodendron.* See the article LIRIODENDRON.

TULOS, a word ufed by fome medical writers to exprefs a callus.

TUMBABA, a word ufed by chemifts, to exprefs *fulphur vivum,* or crude fulphur.

TUMBALA, a word ufed by fome authors, to exprefs the *fquammæ* or fcales of any metal.

TUMBLER, (*Cycl.*) a name given to a particular fpecies of pigeon, called by Moore the *columba revolvens.*

It has its name from its peculiar property of *tumbling*, when it is in the air, which they are very fond of doing; and effect exactly in the fame manner as our pofture-mafters do it; by throwing themfelves over backward. It is a very fmall pigeon, and is always fhort bodied, full breafted, thin neck'd, narrow beak'd, and has a fmall fhort head; the iris of the eye in this fpecies, is ufually of a bright pearl-colour.

The Englifh *Tumbler* is ufually of one plain colour; black, blue, or white: the Dutch is much of the fame make, but has different colours, and is feathered on the legs fometimes; it has alfo a larger head, and thin fkin round the eye. Some of the fineft pigeons of this fort are bred from a mixture of the Dutch and Englifh kinds. Thefe pigeons are remarkable for the height they fly to; they never ramble far from home, but will rife almoft perpendicularly, till they appear no larger than a fparrow, or become quite out of fight; they will often keep at this height five or fix hours, and then come gradually down again: they never tumble when they are at any great height, but only as they afcend or come down again. There are particular times alfo, at which thefe birds will take much higher flights than at others; but they ought to be kept by themfelves, and practifed to it by the company of one of their own fpecies; for if they mix while young, with other pigeons, they will learn to fly as they do: a flight of a dozen of thefe birds fent out together, will keep fo clofe, as to be all in a compafs that might be covered with a handerchief; but they fhould never be turned out in foggy weather, or in high winds; in the firft cafe, they lofe fight of their home, and perhaps never find it again; and in the others, they are blown away; and if they return, it is not till another day; in the mean time lying out, they are in danger of cats, and other accidents.

Laftly, the hen fhould never be turned out with egg, for fhe is then fick, and not fit for flying; and befide often drops her egg, and the breed is loft by it. *Moore's* Columbarium, p. 39.

TUMEX, in the materia medica of the antients, a name given by authors to a fort of tutty, the fame with the *cadmia placitis* of Diofcorides and the Greeks. This was a worfe kind than the *botrytis*. The *botrytis* was formed on the roof of the furnace, and hung down thence in form of clufters of grapes; this was the pureft kind.

The *Tumex* or *cadmia placitis*, was a heavier and coarfer fort, which not being volatile enough to afcend to the top of the furnace, applied itfelf to the fides, and there formed a fort of coat or cruft, which was taken off at times, and referved for the more common ufes. This fort of cadmia, being formed by the fucceffive application of new coats of matter, at different times, was found to be of a cruftated texture, when broken tranfverfely, and refembled, in fome fort, the onyx, with its different zones or belts. It was therefore called by fome, *cadmia onychites*; and by Avifenna *mantheca*, which fignifies in the Arabian, *zonites*, or compofed of plates or zones.

TUMORS *of the Breafts*, *Mammarum* TUMORES. *Tumors* and inflammations of the breafts are a diforder that very frequently afflicts child-bearing women, and almoft conftantly happens, in fome degree, a few days after their delivery.

If the milk be impelled into the breafts too plentifully and forcibly, which frequently happens at that time, and the mother be at the fame time feized with a violent cold, or indeed be but affected by any violent paffions, the veffels become obftructed, and the breafts tumified, with great heat, rednefs, refiftance, and violent pain. The fame thing happens alfo very frequently to women who give fuck after their lying in, and often to fuch whofe milk is very fmall in quantity. Women at other times are alfo fubject to them, and even men have been known to have the fame diforder, from no other caufe than a great fright. One breaft of a man, opened on fuch an occafion, has afforded above two pounds of matter. This fort of abfcefs is ufually attended with a fever, thirft, head-ach, and difficult refpiraton, and is often preceded by fhiverings.

Tumors of this kind are generally prevented in thofe who do not intend to fuckle their children, by applying, foon after their delivery, plafters of fperma-ceti warm, all over the breafts, but perforated with a hole for the nipples. A moderately tight bandage ferves alfo as a help to keep away milk; and cooling plafters are of fervice to the fame purpofe, applied between the fhoulders. But if the lying-in woman intend to fuckle the child, there is no better way to prevent thefe *Tumors*, than very carefully to avoid colds, and violent paffions of the mind, and to let the child fuck very frequently, to prevent the milk from ftagnating. Plenty of fmall broth, and thin fluids, muft alfo be taken, which will prevent the milk, for the firft two or three weeks, from being too abundant, or from ftagnating in the breafts. But when the milk has once ftagnated, and a *Tumor* is begun, all endeavours are to be ufed to difcufs what has ftagnated in the fmall veffels, with all poffible expedition, both by internal and external remedies, in order to prevent the *Tumor* from running to a fuppuration, or into a fchirrus.

The beft external application, on thefe occafions, is the fperma-ceti plafter, covered with a warm bag, or cataplafm of falt and bran, or of chamomile, elder, and melilot flowers. The carminative feeds of fennel, annife, *&c.* are alfo very good external applications over a plafter, on thefe occafions. A calf's bladder, filled with a warm decoction of elder and chamomile flowers in milk, applied to the breaft, and renewed as often as neceffary, is alfo found of excellent fervice. Thefe not proving fufficient, recourfe muft be had to Venice treacle, rob of elder, litharge vinegar, cummin vinegar, and lime water, which muft be all applied hot to the breafts by means of linnen cloths dipped into them, and put to the breafts, as warm as can be conveniently borne.

If the breafts are very full of milk, part of it muft be difcharged by fucking, or by a glafs pipe; and this, with the other means, often repeated, till the pain and *Tumor* difappear.

If the *Tumor*, however, proves large, and will not be difperfed in four or five days by thefe methods, or when, as it very frequently happens, the furgeon is called in too late to put this method in practice, the beft method is to forward its maturation and fuppuration as quick as poffible, left it turn to

a

a schirrus or cancer by delay. The plaster of diachylon, with the gums, or some other such ripening plaster is to be applied forthwith; and with all convenient speed the proper cataplasms are to be used, to digest the matter; these are to be applied hot to the breasts, and very frequently renewed, keeping them on with large compresses and bolsters, the better to retain the heat. The *Tumor*, when the matter is ripe, will by this means either break of itself, or else it must be opened by the scalpel, the incision being always made in the lower part of the breast; and after the matter is all discharged, the wound is to be cleansed with the common digestives, incarned with the sarcotic, and healed with the balsam of Peru, or some other such vulnerary balsam. But where the suppuration has run very deep, the wound must be washed by means of a syringe, with vulnerary decoctions; and to prevent the opening from closing, before the bottom is healed, and filled up with new flesh, a sort of tent of scraped lint must be introduced, which may be shortened at every dressing, as the wound fills up, and at length wholly laid aside. *Heister's* Surgery, p. 187.

Encysted TUMORS, *Tumors* arising in different parts of the body, but contained in certain membranous coats: These are sometimes harder, sometimes softer, of a palish colour, and usually attended with little pain. These *Tumors* arise from obstructions either in the glands, or in the adipose membrane, more especially about the face and neck, where they occasion great deformity.

The membranous coat with which these *Tumors* are invested, is often of a considerable thickness, and is usually the coat of the disordered gland, or some of the adipose cells. At their beginning they are usually very small and moveable; but encreasing by slow degrees, they grow sometimes to an enormous bulk.

The consistence of some of these *Tumors* is soft and fluctuating, and of others more hard and firm. They are of all shapes and sizes, and some of them become hard as a callus, and unmoveable, while others are, for the generality, soft and moveable.

They are distinguished according to the consistence of their contents; some are called *atheromata*, from their contents resembling paste, others, which have them of the consistence of honey, are called *meliceres*; but if they are of a fatty substance, like suet or lard, they are called *steatomata*. If they happen in a gland which becomes indurated, they are called *schirrous*; and lastly, when they are of a fleshy consistence, they are called *sarcomata*. Some of these *Tumors* have been found also full of hair.

They are distinguished by others according to the places where they are situated. Those seated under the scalp are called *talpa*, *testudo*, or *lupia*. Those in the neck, *strumæ* or *scrophulæ*; and those in the hands and feet, especially if among the tendons, are called *ganglions*.

There is no general method for the cure of them; but the surgeon, according to their different circumstances, attempts this by discussion, suppuration, or extirpation. *Heister's* Surgery, p. 323.

Fungous TUMOURS, in surgery, are a sort of swellings much approaching to the nature of the œdema, and are often disorders of very bad consequence.

These are *Tumors* of a limb, taking their rise at the joint; they look pale, are void of heat and pain, easily yield to the pressure of the fingers, but rise again instantly on removing the finger, leaving no pit or impression behind; tho' no joint of the upper or lower limbs can be said to be secure from this disorder, yet the knees are ever most subject to it, and that because they abound in fat and glandular bodies, which are concealed among the ligaments and tendons. It is what we commonly know by the name of white swellings or scrophulous *Tumors* in the joints, and is of several species; for some *Tumors* of this kind are larger, some smaller, some softer, some harder; and with regard to the state of the inspissated fluid, some are more, some less glutinous. The noxious humours are usually situated without the joint, and are, in that case, properly what we are here treating of. But in some they are collected and retained in the joint itself, as the serum is contained in the testicle in an hydrocele. This last disorder is not improperly to be called a dropsy of the joint; and this may be commonly distinguished from the external fungous *Tumors* of the joints, by the inlargement which appears all round the joint; whereas the fungous *Tumor* is usually situated more on one or the other side of it.

The proximate cause of these *Tumors* is, doubtless, the viscidity of the serum about the ligaments of the joints, which is apt to stagnate after the ligaments have received any considerable violence from a fall or a blow. The *Tumor* sometimes rises in the external parts, sometimes in the articulation itself, by which the ligaments being weakened, the part loses its natural motion; and when the nerves or blood-vessels are greatly pressed upon by the *Tumor*, the parts below are usually deprived of nourishment; and while the joint, by degrees, becomes greatly enlarged, the parts below it diminish and waste.

In order to render the cure of recent and milder *Tumors*, of this kind, the more easy, by dispersing remedies, it will be proper to rub the disordered part with warm cloths every day, fomenting it afterwards with tartarized spirit of wine; and this method is to be carefully pursued, till the natural strength and form of the limb are restored. Purmannus's fomentation is excellent for this purpose. It is made of six ounces of roch-alum, an ounce and half of Roman vitriol, and two handfuls of sage leaves, boiled in a quart of herring-pickle, mixed with a pint of the sharpest vinegar; it is to boil together for about half an hour, and then to be used as the before-mentioned.

When the tumours begin to disperse, and the parts to recover their strength, it will be a great forwarding of the cure, to foment the limb well several times every day with tartarized spirit of wine, or with the fœtid oil of tartar, laying the bandages carefully on every time afterwards, to defend it from the injuries of the external air, of which it is very susceptible: And lastly, the following is an application by which many of these *Tumors* have been perfectly and happily cured. Take litharge half a pound, bole armenic an ounce, mastic and myrrh of each half an ounce, white wine vinegar a pint; mix these together, and let them boil for a quarter of an hour, and let coarse linnen rags be dipped in this liquor, or fine ones often doubled, and applied morning and night in bed to the part; and at the same time the patient is not to omit the proper internal remedies, which are the attenuants and sudorifics.

But if the *Tumor* be of long standing, and will not give way to any of these remedies, all the hope left is to make an incision into the dependant part of it, taking great care to avoid wounding the ligaments or tendons of the joint; and by this means the stagnating serum, if contained in one cavity, is instantly evacuated, and if it be lodged in several different cells, it will yet make its escape through the same orifice in the space of a few days. Before the incision is made, in this case, the *Tumor* should be pulled down as low as may be with the fingers, and a tight bandage made above to retain it in that situation; by this means the most convenient part for the incision to be made in will lie fair, and when the opening is made, the serum will readily burst forth like blood on the opening a vein, or lymph in the tapping for the hydrocele or ascites. When this is done, if any *Tumor* still remains, the part is to be dressed with diachylon or oxycroceum plasters, and washed with lime-water or spirit of wine. By continuing the applications, what remains inspissated in the *Tumor* will entirely disperse. When the limb is restored to its natural shape, the wound is to be healed with vulnerary balsams, diligently avoiding the use of fatty or oily medicines, as they are hurtful to the tendons and ligaments, with which those parts abound. If the serum, contained in the *Tumor*, is so glutinous that it cannot discharge itself for want of fluidity, throw up attenuating injections at every dressing. The best for this purpose are those prepared from a decoction of agrimony, birthwort, or ladies mantle, mixed with honey, in which rosemary or celandine have been infused. Notwithstanding that such of these *Tumors* as are opened by the knife are soonest discharged and healed, yet some surgeons prefer the application of caustic medicines to the knife, discharging the serum upon the falling off of the eschar. In either case it would be proper to warm and invigorate the ligaments and tendons, especially when the disorder falls upon the knee, by the use of some nervous ointment, or aromatic spirit.

It too frequently happens, however, that after the wound has been cauterized, the inspissated serum having been first ever so carefully evacuated, that there will be a fresh collection of a vitiated fluid in the part. In order to prevent therefore an accident of this kind, let the patient be kept in a strict course of purging, sudorific and attenuating medicines, and the wound be kept open with tents, cleansing it thoroughly every day, by throwing up an injection, such as has been before directed. It may be proper also sometimes to inject lime-water, and afterwards to cover up the part with a warm plaster, or foment it with some liquor of the same intention. It is, however, finally to be observed, that it is not every fungous *Tumor* of the joints that can be opened with safety; for if the *Tumor* is of a very long standing, hard, or of a very large size, or the patient is of an infirm weakly habit of body, the knife must not be thought of, as it would occasion disorders worse than the first; to wit, caries, fistulas, and gangrene. *Heister's* Surgery, p. 285.

We have an account of a very extraordinary *Tumor* in the knee of a person, whose leg was taken off by Mr. Peirce at Bath. The leg and foot weighed sixty-nine pounds. See Phil. Trans. N°. 452. Sect. 4.

Windy TUMORS. These *Tumors* are formed by the air inclosed under some membrane, which is dilated more or less by that air, according to its quantity, and from within which it cannot escape, at least not of a certain time.

These *Tumors* are usually round, circumscribed, or determinate, and if they are struck with a finger, they give a sound like that of a blown bladder. They have no particular seat in any part of the body, but almost every part is more or less liable to them.

The great difficulty in accounting for these *Tumors*, is to say how the air comes to be collected there; but the most probable cause seems to be the collecting together of a quantity of a fluid

fluid in some adjoining part where there is some obstruction. The air, which is naturally mixed with all the fluids in the human body, always remains in them while they continue in their fluidity, and in their natural motions; but when they are amassed together in any particular part, and their fluidity and motion become impaired, the air that was in them becomes immediately in a state of disengaging itself from them; and it usually does so disengage itself. The membranes of the part where this collection of the fluids is made, are relaxed by it, and their pores consequently enlarged, and the air which has disengaged itself, escapes easily by these pores, while the fluids are much too thick to be able to follow it, so that it escapes alone.

The air, thus separated, runs under some other adjoining membrane, which it immediately elevates and distends. As the liquors amassed in the other place are not yet so far altered, but that part of them are continually received again into the road of circulation, and consequently more fresh fluids left in their place: these fresh fluids contain more air, which is, by degrees, separated from them, as from the others, and finds its way, in the same manner, to the place where the rest of the air is; and hence is the continual increase of the *Tumors*; and it is very evident, that when a *Tumor* is once formed in this manner, it cannot go down, even though the first extravasation, which occasioned it, should wholly disappear, and all the fluids be again received into their vessels again; but, in fine, the air included in the *Tumor* may dilate the membrane, which encloses it, so far, that its pores may be sufficiently opened to let it escape; this, however, wholly depends on its quantity, and on the closer or laxer texture of the membrane.

Those acute pains which we call stitches in the side, and which are principally felt on the sides, and about the region of the breast, may possibly be sometimes occasioned by acrid humours, which prick the nervous fibres; and the pain, in this case, is sometimes very acute, and even attended with a sharp fever; but very often this pain is occasioned only by air included between the fibres, where it occasions a violent tension and pain; but often the relief from this is sudden, the natural elasticity of the parts restoring all to their pristine state, and the air being condensed again almost as soon as dilated. Very often the natural spring of the parts either entirely sends off the air, or else drives it to another place; and this is the reason why pains of this kind are often found to shift about and change place so suddenly.

But of all the effects of air in the body, none is so great as that found in the bodies of those who have died by loss of blood, whether that has been occasioned by wounds or natural hæmorrhages. There may, in this case, often be perceived, through the coats of some of the veins, little bubbles of air floating on the surface of the blood contained in them; and this is no way to be wondered at, since as a great part of the blood has been lost out of the body by the hæmorrhage, the remainder has been by this much injured in its power of motion, as well by loss of quantity to impel it, as of animal spirits to enliven it; and by the want of strength in the arteries to perform their pulsations, in order to the keeping it in motion; the consequences of these joint causes, according to the principles before laid down, must be, that the air must escape out of the blood, and appear freed as we see it.

If we perceive this only in the veins, the reason is plain, since there is no blood any where but in the veins of persons who have died in this manner, the arteries having been already drained; whereas, in other bodies there always remains some blood, though but little, in the arteries. Another consequence of dying by an hæmorrhage is, that the ventricles of the heart are always found empty of blood; which is not the case in those who have died by other means. The cause of this is, that the force with which the veins drive up the blood from their extremities toward their larger trunks, and thence to the heart, is much weaker than that by which the arteries throw the blood they contain toward the extremities. This being allowed, a great loss of blood cannot but diminish the force of the arteries and veins both; but its effect will certainly be greater on the veins; so that they may wholly lose their force before the arteries have lost theirs; and these last making at length one general contraction, may throw off all their contents into the veins, while they, having already lost all their power, can no longer move it forwards; so that, in this case, it all remains there, and consequently what blood remains in the body, must, on opening it, be found lodged in the veins.

It is sometimes observed in bodies which have died of hæmorrhages, that the smaller vessels, at considerable distances from the heart, have been all full and distended with wind; in this state it is not impossible that they may have been sometimes mistaken for lymphatic vessels; but in tracing them up to their trunks, they soon discover what they really are. After a large quantity of blood has been lost, it is plain that there can be but little in the lungs, while the quantity of air is always equal there; and as the air always easily disengages itself from the blood, when it is less fluid, and in smaller quantity than before, the air may, in this case, pass from the lungs to the heart with the blood, without being so intimately mixed with it as at other times; when the arteries have, after this, not power enough to impel the blood into the veins, their power may yet be sufficient to drive this wind into them, it being much lighter, and more susceptible of motion; and this alone seems a very natural and easy solution of this phænomenon. This supposes, indeed, that the motion of the blood being stopped, death comes on, as well by this means, as by the stoppage of respiration. Mem. Acad. Par. 1714.

TUMORS *of the Testicles*. See the article TESTICLES.

TUNA, in botany, the name by which some authors have called the *opuntia*, the Indian fig, or *ficus Indica*, as it is usually called. *Jonſ.* Dendr. p. 57.

TUNALLUS, in ichthyology, a name given by Albertus, and some others, to that species of the coregoni called by the generality of authors the *thymallus*, by us the *grayling*, or *umber*. Artedi distinguishes it by the name of the *coregonus*, with the upper jaw longest, and with twenty-three rays in the back fin. See the article COREGONUS.

TUNG, in natural history, the name given by the Indians to a little insect, called by the Spaniards *Piqué*, which is very common, and very troublesome in some parts of the East and West Indies.

It is of the size of a small flea; its place of laying its eggs is within the skin of the human body, and it diligently searches opportunities of doing this, and often succeeds in the attempt, to the great pain and trouble of the person who suffers it. The creature, knowing that it shall be soon crushed to death under the skin, generally makes its way either under the nails, or where there is some callus on the surface; there it eats its way along, and, in fine, lays its eggs, which hatch into so many young ones, and spread themselves between the flesh and skin all over the finger and hand, if not prevented by taking out the old one in time.

The person often does not perceive the creature's getting in, it enters so gradually and easily; but he is soon advertised of the place where it is by a violent gnawing pain, the creature really eating its way as it goes along. The only remedy in this case is, to enlarge the orifice at which it entered, and take it out whole; the wound soon heals up, and there is an end of the matter. This may often be done with the point of a needle; but if not, it is much better to submit to the opening it with a lancet, than to the ill consequences which otherwise will attend it. Observ. sur les Coutumes de l'Asie. p. 184.

TUNICA (*Cycl.*) TUNICA *Albuginea*, the name of the membrane that covers the body of the testicles. It is of the same substance with others of the thicker membranes of the body, and is supplied with proper vessels for its nourishment; but under this the body of the testicle is, on a strict examination, found to be only a congeries of vessels rolled up in regular and even folds, without any intermediate substance of whatever kind. It is necessary to have recourse to the use of glasses to see this structure; and there is one caution necessary to the persons who would make the experiment, which is, that as these vessels all contain a liquor, which being somewhat thick and whitish, soon dries when exposed to the air, and, in drying, acquires somewhat of the appearance of flesh, it is very apt to deceive the inspector into an opinion, that there is really a fleshy matter in the substance of the testicle, distinct from the vessels: What will set this right, will be the observing, that the object, when newly cut, and immediately viewed, has none of this flesh-like matter about it; but only a mucous humour may be seen ouzing from the mouths of the rolls or folds of the vessels where cut; and that afterwards, when the flesh-like matter becomes visible, it is only seen about the ends and edges of the piece of the testicle that is examined, and only in those places where it was before seen ouzing out in form of a fluid from the apertures of the vessels.

These vessels, of which the substances of the testes are composed, are extremely tender and fine; yet, while the subject is fresh, they may, by a delicate hand, be drawn out, and will sometimes be extended to half a yard long without breaking. The single vessel, when thus extended, has much the appearance of the external coat of the epididymis, and its corrugations. These tubes receive their contents in some sort from the arteries, and have a communication with them, insomuch that on injecting a coloured matter into the *arteria preparans*, and afterwards opening the testicle, this matter will be found to have made its way into several of the tubes composing the rolls or folds of the substance of the testicle.

It might be supposed, that this colouring of the tubes was only external, and that the matter of the injection had only spread itself on their surface, or penetrated into the plexus of vessels that cover them; but, on trying to wash off the colour with spirit of wine, it proves so permanent as not to give way to that; and, on curiously examining a part of a single tube pricked with a fine needle, the coloured matter of the injection may be distinctly seen ouzing out of the puncture. The glands in general are no other than the testes; and the pancreas, and many other parts of the body, have no parenchyma or intermediate fleshy substance between the vessels, but are made up of vessels or tubes filled with peculiar liquors, and generally owe their colour to that of the liquor they contain. No reputed gland is any other thing than a mere congeries of vessels, through which peculiar juices come and go; and the very coats

coats of the larger veffels fo much approach to this ftructure, that, though not wholly compofed of other veffels, they have fo many in them, that the far greater part of their fubftance is made up of thofe veffels, and of the fluids which are continually paffing through them, and which keep open their paffages.

Thefe liquors being deftined for the fupport of the coat of the veffel, are in general the fame with that which flows within it.

As to the tefticles being wholly compofed of thefe veffels or tubes, without any other fubftance, it is, perhaps, carrying the matter too far, to affert it in fuch abfolute terms. That there are certain membranes, connecting feveral of the veffels into, as it were, one roll or tube, appears in the nice examination of the tefticles of the rabbit, and fome other animals; and though there be no parenchyma, or flefhy fubftance, yet it is very probable, by the lubricous appearance of thefe veffels on the outfide, that there is originally among and between them a mucous or flimy matter, which may ferve in the place of a parenchyma. Philof. Tranf. N°. 53.

TUNICATED *Roots*, among botanifts, fuch as are formed of a multitude of coats furrounding one another. See the article Root.

TUNNEL-*Net* (*Cycl.*)—This net muft be made of three-twifted thread, and muft not be too thick: It fhould be dyed green, that the colour may give no fufpicion to the birds, and the mefhes fhould be about two inches and a half broad.

Into the hind mefhes, at the larger end, there muft be put a fmooth wooden rod, about the bignefs of a gun-rammmer; of this muft be made a fort of hoop, both ends being tyed together, and at different diftances from one another, there muft be placed many more fuch, which are to be rounded in the fame manner, and are to fupport the net its whole length in the tunnel form. Two ftakes, or ftrong pegs, muft be faftened at the fides of the entrances into the net, and one at the farther end, or narrower part; the two firft are to keep the mouth of the net fufficiently extended, and the laft is to keep it pulled out lengthwife to its full dimenfions, the hoop preventing its falling in.

There muft be ufed with this net two others of that kind, which they call *halliers*. Thefe are long and ftrait nets, and are to be faftened down to the mouth of the *Tunnel-net* on each fide, extending feven or eight fathoms on each fide from it, fo as to take in fourteen or fixteen fathoms in front, befide the breadth of the mouth of the *Tunnel-net*, and to direct all that fhall move forward within that compafs into the net.

In order to ufe this net, a covey of partridges is to be found, and then the net is to be placed at a confiderable diftance behind them: When this is fixed, the fportfman is to take a compafs, and get before the birds with a ftalking horfe or ftalking ox, and then to move forward, driving them towards the net. This is to be done gently, and carefully, they are not to be driven at once ftrait forwards; but the fportfman is to wind and turn about, and, at times to ftand ftill, as if the horfe was grazing. If the partridges, in the time of driving, make a ftand, and look at the machine, it is a fign they fufpect it, and are ready to take wing: In this cafe the fportfman muft ftand ftill, or even go back a little; and when they are become compofed again, he is again to advance upon them. If any fingle bird lies remote from the reft, the fportfman muft take a compafs round him, and fetch him in; for if he takes wing the reft will all follow; in this manner, with patience and caution, the whole covey may be driven like a flock of fheep up to the nets. A real horfe, trained to the purpofe, is, however, much better than a ftalking machine.

The halliers, or wings of the *Tunnel* muft not be pitched ftrait, but in a fort of femicircle; and the birds, when they ftop their march, will run along them to the middle, where the mouth of the *Tunnel* is open.

When they come to the mouth of the *Tunnel*, the old ones will make a ftand, as if to confider what was before them; but on preffing gently on them with the horfe, the young ones will run in, and then all the reft will follow.

The fportfman muft then make all the hafte he can to the mouth of the net, to fecure them from coming back again. The ftalking-horfe is to be made of canvas or linnen, painted in the figure of a horfe, and fupported by two crofs fticks, by which the fportfman carries it before him, fo that his own body is compleatly hid by it. There are to be holes made through it, by which the fportfman fees his game; and the tail is to be made of hair, and to hang loofe from the body, that it may play in the wind in moving.

TUNNY, a name given by us to the Spanifh mackrel, a larger fifh of the fcomber kind, called by authors *thynnus* and *arcynus*, by Salvian *limofa*, and *pelamys* by Ariftotle, Ælian, and the other old writers. See Tab. of Fifhes, N°. 29.

It is properly a fpecies of the fcomber, and is expreffively named by Artedi, the fcomber with eight or nine fins in the hinder part of the back, rifing out of a furrow; and a furrow at the place of the belly-fins. See the articles Thynnus and Scomber.

TUNUPOLON, in zoology, the name of an Eaft Indian fpecies of viper, found principally in the ifland of Ceylon. It is of a fmall fize, and of a fine fattin-like glofs, beatifully variegated with different fhades of brown. *Ray*'s Syn. An. p. 332.

TUPUTA, in zoology, a name under which Nieremberg has defcribed an American bird, which, he fays, is like a pheafant in fhape, and loves low bufhes and fedgy places, never flying into high trees, and which has no flefh, but merely a vaft affemblage of living worms between the fkin and the bones. Mr. Ray has fufficiently laughed at the abfurdity of this account; which probably had its origin from the diftempered ftate of one bird of fome well known fpecies; though Nieremberg thinking the worms a fufficient character, has given no farther account of it. *Ray*'s Ornithol. p. 298.

TURBAN-*Shell*, *Cidaris*, in natural hiftory, the name of a genus of the echinodermata, which are of a hemifpheric or fpheroidal figure, and have their name from the Latin *Cidaris*, a *Perfian Turban*, as in fome degree refembling that headdrefs. See Tab. of Teftaceous and Cruftaceous Animals, N°. 1, 2, 3, 4.

Of this there are feveral kinds: 1. The *Cidaris miliaris*, fo called from its eminences or tubercles, being as fmall as the grains of millet. Of this there are three known fpecies; one with a high top, a fecond with a flatter and more of a hemifpheric figure, and a third which is fomewhat angular.

The fecond kind is the *Cidaris variolata*. The eminences of this are of a middle fize, between thofe of the miliary and mammiliary kinds, and fomewhat refemble the puftules of the fmall-pox when ripe, whence they have their name. Of this kind there are three known fpecies: 1. The brifly echinus of Rumphius. 2. The fmall ovarius of Langius. And 3. The Turk's *Turban* of moft authors. And to thefe may be added a fourth, a very remarkable one of an elliptic form, with very few tubercles, and a large mouth. *Klein*'s Echinod. p. 17.

The third kind is the *Cidaris mammillata*, or the mammillary echini. The tubercles of thefe are very large, and imitate the appearance of breafts, with nipples to them. Of thefe alfo there are two known fpecies. 1. The fingered echinometra of Rumphius. 2. The fpecies called the *moor's Turban*.

The fourth kind is the *Cidaris coronalis*; the tubercles of which are fo difpofed as to make it reprefent the diadem of antient kings. Of this there is only one known fpecies, and that extremely rare.

The fifth kind is the *Cidaris corollaris*; the tubercles of which are fo difpofed, as to imitate the garlands made of flowers. Of this there are two known fpecies, the one thicker, and the other thinner.

The fixth kind is the *Cidaris afterifans*. Of this there is only one known fpecies, the tubercles of which are difpofed in form of a radiating ftar.

The feventh is the *Cidaris affulata*, or tiled *Cidaris*. This is fo called, becaufe the feveral parts of the fhell are joined tranfverfely to one another. Of thefe there are eight known fpecies. 1. Olearius's fpecies, compofed of twenty orders of affulæ. 2. Aldrovandus's *echinometra maxima pelagica Sardica*. 3. The flammated kind, the vertex of which has ten rays, like fo many flames. 4. The variegated kind, whofe tubercles are variegated with white, and a fine rofe colour. 5. The puftulofe kind, which is thick befet with tubercles, refembling ripe puftules. 6. The granulated kind; the tubercles of which are very fmall. 7. The fmooth kind, with a flat crown. 8. That fpecies called by Mercatus *anachytis*, which has a very gibbofe back.

The eighth kind is the *botryoide Cidaris*. Of this there is only one known fpecies, which bears a very great refemblance to the central part of the fea ftar-fifh, with contracted fragments of the rays.

The ninth kind is the *Cidaris toreumatica*. This has its name from the Latin *toreuma*, fignifying a chafed or wrought plate, the fuperficies of this being as if chafed and engraved into figures. There is only one known fpecies of this genus.

This clafs of the echinodermata is made out by the affiftance of the foffile, as well as the recent animals; many of the kinds being now unknown on any fhores. Id. Ibid.

TURBINATA *Offa*, the name of the turbinated bones of the nofe. See the article Nose, *Cycl.*

TURBINATUM, a name given by fome to the glandula pinealis.

TURBINES, in natural hiftory. See the article Turbo.

TURBINITÆ, foffile fhells of the turbo kind, or ftones found in thofe fhells. Among the people who have objected to the fhells found buried in the earth being the remains of real animals, it has been alledged by fome, that thefe in particular are always of a blackifh or afh-colour, when found in chalk or clay, and white from the rocks, or when they have been bedded in ftone.

To this Auguftino Scilla has very judicioufly anfwered, that the *Turbinitæ* found in chalk and clay, are not the real fhells, but are ftones which have been formed in thofe fhells, the fhells themfelves, which gave fhape to them, being decayed and gone; whereas thofe found bedded in ftone, are, at this time, the fhells themfelves, preferved in their natural beauty by the hardnefs of the bed they lie in; or, if not real fhells, that the only ftone which can form itfelf there being fpar, that is white, and the fhells giving origin to fuch a ftone will

appear as white in its fubftance, or more fo, than they would in their own. *Auguftino Scilla*, de Petrifac.

TURBAT, in ichthyology, the fame with *Turbut*. See the article TURBUT.

TURBIT *Pigeon*, a particular fpecies of pigeon, remarkable for its fhort bill, and called by the Dutch *cort bek*, that is, fhort-beak. Moore calls it in Latin, *columba fimbricata*: And its Englifh name feems no other than a bad pronunciation of its Dutch one. It is a fmall and fhort-bodied pigeon, and has a beak no longer than that of a partridge; the fhorter this is, the more the pigeon is efteemed: It has a fhort round head, and the feathers upon the breaft open, and reflect both ways, ftanding out like the frill of the bofom of a fhirt. This is called by many, the *purle*, and the more the bird has of it, the more it is efteemed. The tail and back are generally of one colour, as blue, black, red, yellow or dun, and fometimes chequered. The flight feathers, and thofe of all the reft of the body, are white. They are a light nimble pigeon, and, if trained to it, will take very high flights, in the manner of the tumblers. *Moore*'s Columbarium, p. 53.

TURBITH (*Cycl.*)—There is great uncertainty and confufion among the old writers, in regard to the drug called by this name. Avifenna, and the reft of the Arabian phyficians, all prefcribe *Turbith*; and we are apt to believe, that they mean our *Turbith*-root; but it does not appear fo either from the form or virtues of that medicine.

All the writers of later ages have placed the *Turbith*-root among the things of value and ufe, brought as merchandize from the Eaft Indies; and Garcias juftly defcribes the plant: But his defcription plainly proves, that it cannot be the *Turbith* of the Arabians; for all that they have faid about the *Turbith* is tranflated from Diofcorides, and he has faid it of the tripolium.

The tripolium of the Greeks is therefore the *Turbith* of the Arabians, and this is a very different thing from the *Turbith* of our times. Mefue indeed feems to make the *Turbith* a different thing from what all the others have made it; he fays, that it is the root of a plant of the lactefcent kind, which had leaves like the ferula or fennel giant. This is a defcription that can by no means agree either with the tripolium of the Greeks, or the *Turbith* of Garcias; and proves, that if Mefue was right in faying it belonged to the plant, of which what he calls *Turbith* was the root, then his *Turbith* is different from both the one and the other of thefe. Some other of the writers on thefe fubjects have alfo called two roots, different from all thefe, by the names of white and black *Turbith*. The black *Turbith* is the pityufa-root, a kind of fpurge; and the white *Turbith* the root of the alypum.

Avifenna calls the *Turbith*, *terbadh*. Some have fuppofed this word expreffed a thing different from all the others; but this is by no means the cafe, for the *Turbith*, or *turbadh* of Avifenna is the fame with the *Turbith* of Serapion, that is, with the tripolium of Diofcorides.

From this *turbadh* of the Arabians, the later Greek writers have formed the word τυρβιθ; but they have applied it, in a very loofe and vague manner, to feveral very different things. Neophytus makes the *Turbeth* a fpecies of myrobalan; but in this he errs, no other author having ever underftood the word in that fenfe. Upon the whole, it appears, however, that there are three different plants, called *Turbith* by authors, the tripolium, the pityufa, and the alypum; but all thefe are different from the Indian *Turbith*, which is the *Turbith* of Garcias, and the *Turbith* of our fhops. There is alfo in one part of Avifenna an account of *Turbith* different from all thefe, and making it a kind of wood.

TURBITH-*Mineral* has been ufed as a fternutatory, and is faid to have made wonderful cures in diftempers of the eyes. Mr. Boyle relates a cure of this fort, performed by the famous empiric Adrian Glafs-maker on Mr. Vatteville, a Swifs officer of diftinction in the French fervice, and totally blind. This gentleman was ordered to fnuff about a grain of *Turbith* up each noftril, which immediately operated in a violent manner by vomit, ftool, fweat, falivation, and the lacrymal glands, for twelve hours together; and alfo caufed his head to fwell greatly; but within three or four days after this fingle dofe had done working, he recovered his fight. *Boyle*'s Works abr. vol. I. p. 103.

TURBO, the *Screw-Shell*, in natural hiftory, the name of a genus of fhell-fifh, the characters of which are thefe: They are univalve fhells, with a long, wide, and depreffed mouth, in fome fpecies approaching to a round fhape, and in fome having teeth, in others not. They all grow narrow toward the bafe, and are auriculated, and terminate in a very long and fharp point. See Tab. of Shells, N°. II.

Aldrovand, and many others of the old authors, make no difference between the *Turbines* and fcrew-fhells, though the diftinction of the genera is very obvious; the fcrew-fhells having a long, large, and dentated mouth, which terminates toward the bafe in a narrower aperture than elfewhere: And the fhell itfelf always runs to a very fharp point at the end; whereas the *Turbines* terminate in a lefs fharp point, and have thicker bodies, and always much wider mouths. The fcrew-fhells are indeed very eafily confounded with the buccina; and it requires more accuracy to diftinguifh them, than has fallen to the fhare of the generality of writers on thefe fubjects an age or two ago. Aldrovand and Rondeletius have confounded thefe genera, and have brought in a third among them, by the epithet *muricatum*, which, when applied to the buccinum, is generally obferved to bring into that family a fhell of the murex clafs, and which might have been very properly called by that fhorter name.

That thefe may be, however, more juftly diftinguifhed for the future, it may be proper to add the genuine character of the *fcrew-fhell*; which is, that it is of a very long and flender fhape, and ends in a very fharp point. Its fpires run on imperceptibly, without any great cavity, and the bafe is fmall and flat, as is alfo the mouth. Lifter, who was for making all the long fhells buccinums, calls the fcrew-fhell, the intervals of the fpires of which are deep, a long twifted buccinum, with a flat mouth. Fabius Columna has confounded yet more the genera of fhells together; he brings in the trochus into the family of the buccina; and tells us, that the words *ftrombus*, *trochus*, *rhombus*, and *Turbo*, which he calls the poetical name, are all fynonymous terms, and exprefs the fame fort of fhell. *Lifter*, *Fabius Columna* Aquat. & Terreftr. P. 59. p. 65.

To avoid the obfcurity which muft naturally arife from fuch confufion of words, it is proper to obferve, that *Turbo* and *ftrombus* are derivatives of the fame Greek word ϛρέφω, to turn, and therefore are, properly, but one word in fenfe, and always to be accepted as fynonymous terms, and fignifying a long and flender fhell, whofe bafe and apex are both very fmall. *Bonani* Recreat. Ment. & Occul. p. 126.

The trochus has a fmall mouth, but then its bafe is large and flattifh, and its conic figure is one of the characters of its genus. Thus is this diftinguifhed from the former; and as to the *rhombus*, when we have obferved, that, though the word properly fignifies a lozenge figure, it is ufed in fhells for the name of a cylindric kind; it will appear, from the whole, that thefe four words are not all fynonymous, but that three diftinct genera are meant by them, the firft two only being of the fame fignification.

The moft remarkable fpecies of the *Turbo* or fcrew-fhell, is that called *fcalare* by Rumphius, from its fpires running up hollow, or with a fpace between them. This is a very fcarce and valuable fhell, when large, but is often found fmall in the Adriatic.

The fpecies of the *Turbo* are fo numerous, that it is proper to arrange them under different heads.

1. Of the *Turbines* which have a long and toothlefs mouth, and a wrinkled columella, thefe are the following fpecies: 1. The nail-*Turbo*, variegated with blue fpots. 2. The awl-*Turbo*, with yellow perpendicular lines. 3. The *Turbo*, with points difpofed in circles. 4. The fpotted and lineated needle-*Turbo*. 5. The fcrew-*Turbo*, with variegated lines and fpots. 6. The whitifh reticulated and granulated *Turbo*. 7. The virgated and corded *Turbo*.

2. Of thofe *Turbines* which have dentated mouths and a wrinkled columella, we have the following fpecies: 1. The fafciated contabulated *Turbo*. 2. The *Turbo*, called the child in fwadling clothes.

3. Of thofe *Turbines* which are of a pyramidal figure, and have depreffed mouths, we have the following fpecies: 1. The telefcope-*Turbo*, with tranfverfe furrows. 2. The whitifh *Turbo*, with yellow circular lines. 3. The Chinefe pyramid or obelifk *Turbo*. 4. The rough *Turbo*, with elated rows of tubercles. 5. The granulated and lineated little tower *Turbo*.

4. Of thofe *Turbines* which have long and erect mouths, we have the following fpecies: 1. The alated borer *Turbo*. 2. The whitifh borer *Turbo*. 3. The variegated borer *Turbo*. 4. The lineated borer *Turbo*.

5. Of thofe *Turbines* which have a flat mouth, and are of a longer fhape, thefe are the following: 1. The contabulated and roftrated caterpillar-*Turbo*: this is covered with tubercles, and has blue fpots and lines. 2. The white roftrated caterpillar-*Turbo*, with many tubercles and fpires.

6. Of thofe *Turbines* which have a large oval mouth, we have the following: 1. The *Turbo* called *vitta*, with black, yellow, and red veins. 2. The claviculated and variegated agate-coloured *vitta*. 3. The whitifh *vitta*, with a variegated clavicle.

7. Of the round-mouthed *Turbines*, we have the following fpecies: 1. The hollowed wreathed *Turbo*. 2. The bone-coloured *Turbo*, with twenty wreaths, depreffed into feveral finufes. 3. The yellow and white thick-wreathed *Turbo*. 4. The *Turbo* with feventeen furrowed wreaths. 5. The fcalar *Turbo* of Rumphius, with white lines. 6. The aurited *Turbo* of Rondeletius. Hift. Nat. Eclairc. p. 271.

TURBO *Cochlea*, in natural hiftory, a name by which fome authors have called the Perfian fhell, a fpecies of *concha globofa* or *dolium*.

Many have been puzzled with this fhell, not knowing in what clafs to rank it; and Aldrovand has placed it at the end of his work, faying, that it would feem to belong to the turbinated kinds, but that it wants the *Turbo*. See the article DOLIUM.

TURBUT, in ichthyology, a name given by us to the fifh called by authors the *hippogloffus*, *paffer major*, and *paffer Britannicus*.

According to the new system of Artedi, this is a species of the pleuronectes, and it is distinguished by him by the name of the wholly smooth pleuronectes, with the eyes on the right side. See the articles HIPPOGLOSSUS and PLEURONECTES.

TURCICA *Terra*, *Turkey Earth*, in the materia medica, a very fine bole or medicinal earth, dug in great plenty in the neighbourhood of Adrianople, and used by the Turks as a sudorific and astringent, and famous among them in pestilential diseases. It is sometimes brought over to us also, made up into flattish orbicular masses, of two or three drams weight, and sealed with some Turkish characters. This earth is of a somewhat lax and friable texture, yet considerably heavy, of a greyish red colour, but always redder on the surface than within; extremely soft, and naturally of a smooth surface. It breaks easily between the fingers, and melts freely in the mouth, with a considerably strong astringent taste. It adheres but slightly to the tongue, raises no effervescence with acids, and burns to a dusty yellow colour. *Hill's* Hist. of Foss. p. 15.

Many authors who have written of the materia medica, and of fossils in general, have indiscriminately called the various kinds of Lemnian earth by this name; but the true *Terra Turcica*, described by Schroder, Wormius, *&c.* is a different substance, though not sufficiently characterised by those authors to distinguish it from all the other earths.

TURCOIS (*Cycl.*)—See the Appendix.

TURDUS, in the Linnæan system of zoology, the name of a genus of birds, of the order of the passeres. The distinguishing characters of this genus are, that the tongue is jagged, and has a rim or margin round it; the bill is of a conic pointed figure, a little convex, and naked at the base. *Linnæi* Syst. Natur. p. 49.

This genus comprehends the thrush, black-bird, and starling. The distinguishing characters of this genus, according to Mr. Ray, are these: They are of a middle size between the pigeon and the lark. Their beak is moderately long and thick, and is a little bent downwards; their mouth yellow within; their tail long; and their food both vegetable substances, and insects in common. Most of these birds sing very melodiously, and may be taught to imitate the human voice in speaking. *Ray's* Ornithol. p. 137.

There are three subdistinctions of the *Turdus* kind: 1. The thrush, called by authors simply *Turdus*. 2. The merula, or black-bird, distinguished by its dark colour: And 3. The sturnus or starling, known by the breadth and flatness of its beak. We have four species of thrush in England: 1. The *Turdus visciverus major*, or missel-bird. 2. The *visciverus minor*, or song-thrush, or mavis. 3. The *Turdus pillaris*, or field-fare. And 4. The *Turdus iliacus*, or swine-pipe. See the articles MISSEL-*Bird*, MAVIS, FIELD-*Fare*, and SWINE-*Pipe*.

The two first of these build and remain the whole year with us, the others only visit us in winter. Id. ibid.

TURDUS *Chiappæ*, in zoology, the name of a bird of the West Indies, oddly and imperfectly described by Nieremberg, and said to be very dexterous at filling a pine with acorns, which are its only food, by making holes in its bark. These it fixes in so nicely, that it is not easy to get them out; and these are its store, which it eats occasionally. It is, from this practice, called also *passer faber*. *Ray's* Ornithol. p. 303.

TURDUS, in ichthyography, the name of a genus of fishes, of the class of those which have only one back-fin, the anterior rays of which are prickly; the hinder ones soft and smooth.

Of these fishes there are several species, which may properly be divided into two orders; the first, of those which are smaller and broad; the second, of those which are larger and oblong.

Of the first order are the *tinca marina*, or wrasse. See the article WRASSE. The *merula*, or *Turdus niger*. See the article MERULA. The *lepros*, and *pira pixanga*, which see. And the *Turdus viridis* or *verdone*. See the article VERDONE. *Ray's* Ichthyogr. p. 320.

Of the second order are the *pavo*. See the article PAVO. And the *Turdus viridis major*, and *Turdus fuscus maculosus*.

The *Turdus viridis major*, or great green *wrasse*, is of a fine green on its back and sides, even to the side-lines; and the lower part of the sides and belly are of a pale whitish yellow, variegated with greyish and pale blue spots. Its body is long, and not much unlike that of the pike in figure. Its back-fin is long, and has thirty-two ribs, the anterior nineteen of which are rigid and prickly, the hinder twelve soft, flexile, and ramose. The scales are large, the eyes small, and the teeth very large and strong.

The *Turdus fuscus maculosus*, or brown spotted wrasse, scarce at all differs from the other, except in colour. It is of a dusky hue on the back and sides, variegated with blue spots; and on the belly blue, with lines and spots of red. All the fins, except those of the gills, are of a red colour, spotted with blue; the tail also is of this colour, and the gill-fins are yellow. *Ray's* Ichthyogr. p. 322.

TURF (*Cycl.*)—TURF *Sweating*, an Indian method of curing diseases, which has been found to succeed very happily on many trials.

Paul Dudley, Esq; gives an account of a man of seventy-four years old in New England, who drinking cold water when very hot, had a pain settled in one side and arm, which baffled all art to remove; till after nine weeks confinement to his bed, when he was given over by every body, it was proposed to try this method of cure upon him.

An oven-full of *Turf* was ordered to be cut; the *Turfs* were of about eighteen inches square each, and were of the nature of the English *Turf* used in Gardens.

The Indian doctor, before the *Turf* was put into the oven, rubbed over their grassy side with some sort of oil or spirit, and then putting the two grass sides together, placed them in the oven. When they had been two hours there, and were well baked, he took them out, and made a bed upon the floor, the place for the head being a little raised: The old man was then taken out of bed without his shirt, but wrapped in a sheet, and being laid on the *Turf*-bed, such another parcel of the hot *Turf* was laid over him. The *Turf* was laid thickest on that side where the pain was, but none of it was put upon his breast or head.

He was then covered with a blanket to keep in the heat; and while he was in this warm bath, he was continually supplied with warm cordials to keep him from fainting, of which he was in great danger. After he had lain in this bath about three quarters of an hour, which was as long as he could bear it, he was put into a bed very well warmed, without his shirt, where he soon fell asleep, and sweated to that degree, that it run through the pillow and bed on the floor. After about two hours sweat, they rubbed and dried him, and put on his cloaths; and the old gentleman found himself much eased and refreshed. The operation was performed in the morning, and before night he walked about the house comfortably, his pain being almost all gone. The cordials were, after this, repeated, and, on the fourth day, the sweating was performed again; the day after which the old gentleman was well enough to go about his business. He lived eleven years afterwards in perfect health, and free from pain.

Great care is to be taken in this operation, that the patient do not lie too long in the *Turf*: In many cases, a quarter of an hour is found to be long enough; and the general rule is, that as soon as the patient begins to fetch his breath short or faint, he must be put to bed immediately, and the cordials must by no means be omitted; for the life of the patient is endangered without them. Philos. Trans. N°. 384. p. 129.

TURKEY, in zoology. See the article MELEAGRIS.

TURKINS, in our statutes, is used for a sky-coloured cloth. Stat. 1 R. 2. c. 8. *Blount.*

TURMERIC (*Cycl.*)—A plaster of *Turmeric*, well bruised, top and roots, is thought to be good against the bite of the rattle-snake. See Phil. Trans. N°. 479. p. 144.

TURN, (*Cycl.*) in mining, is a pit sunk in some part of a drift. If the mine be deep, there are many of these *Turns* one below another. *Houghton's* Compl. Miner, in the Explan. of the Terms.

TURN, in the manege, is a term commonly used in directing to change hands. See the article CHANGE and ENTIER.

TURN, in the sea language. See the article LAND-*Turn*.

TURNEP, *Rapa*, in botany. See the article RAPA.

It is but of late years that the farmers have brought *Turneps* into use, as an improvement of their fields. All sorts of land, when made fine either by dung and tillage, or by tillage alone, will produce *Turneps*, but not all equally.

Chalky land is too dry for them, and they are so long on it before they get into the rough leaf, that the fly often takes them, and they are destroyed. Sometimes, however, they succeed well in this sort of land, though rarely. Charlock is a weed very apt to infest *Turnep*-lands, and when the *Turneps* and this are both young, they are so alike, that there have been instances of the people sent to weed, mistaking one for the other, and cutting up all the *Turneps*, and leaving all the charlock.

Sandy and gravelly land are found to be the best for *Turneps*, because these soils are most easily pulverized, and have a warmth that makes the *Turneps* grow much faster than they would in a colder ground. By this means they are preserved from the danger of the fly, which only infests them while not yet grown into the rough leaf; and this sort of soil, when well tilled and hoed, never wants moisture even in the hottest weather. The dews reach as deep as the plough or hoe penetrates, which is six or eight inches; and the sun's heat with us is never so great as to exhale it wholly from that depth. *Tull's* Horsehoing Husbandry, p. 44.

When *Turneps* are sowed by hand, and hoed by hand-hoers, the plants grow too close, and the operation is never half performed, the workers usually leaving one half of the land unhoed, and covering it with the earth they cut up from the other parts; so that the weeds there being only buried an inch or two deep, grow more vigorously than before. The true method is to sow them by the drill, and horse-hoe them afterwards. By this means the plants are kept at a proper distance, and the earth opened between them. The effect of this, upon a fair trial, has been proved to be, that the drilled *Turneps*, when gathered, have been twice the quantity of the sown ones, upon an equal quantity of ground, though the handhoing of the latter had cost at the rate of ten shillings an acre.

In the method of drilling, they are sure to come up quickly, because in every row half the seed is planted at four inches deep,

deep, from which, or even a greater depth, this feed will come up well; and the other half is planted exactly over that at half an inch depth, falling in upon the earth that has covered the first half. Thus planted, if the succeeding weather be ever so dry, the deep half of the feed will certainly come up; and if it chance to rain much soon after the sowing, then the shallow half will be up first. The plants may also be made to come up at four successive times, by mixing the feed half new and half old, for the new will be sure to come up two days, or thereabout, before the old.

Turnep-feed should always be sown in this manner, in order to its escaping the danger of the fly, which otherwise often destroys whole fields of the young plants; but these four chances secure it; for though one coming up suffers, another escapes it, being often found, that the feed sown over-night has been ruined by the fly, while that sown the next morning has wholly escaped.

When the fly is found likely to devour them, they may be horse-hoed; this will bury the greatest part of those animals; or they may be drilled in another row, without new ploughing the land. This fly feeds only on the two first or feed-leaves of the *Turnep*, which are very sweet; the following leaves are rough, and do not suit its taste; so that if the plants escape being eaten up while in the feed-leaves, they escape entirely.

The most infallible of all methods of preventing the mischief from this fly, is to make the ground very fine, and then roll it with a heavy roller across the ridges, after it is drilled; this method closes up the cavities in the earth, and prevents the fly's entrance or exit to lay the eggs, hatch, or bring forth the young ones, to prey upon the *Turneps*. This rolling always disappoints the fly; but it sometimes also disappoints the owner, if he has sown the crop by hand in a scattering manner. These feeds, lying near the surface, are injured, and the ground, hardened by the rolling, will not let them grow well, but they become yellow, dwindle, and come to no perfection, unless they have a thorough hoing, as soon as the rough leaves appear. The drilled *Turneps*, being in single rows, with six-foot intervals, may be rolled without danger; for, be the ground ever so hard, the hand-hoe will easily single them out to a proper distance, at the expence of six-pence an acre, or less, if not in harvest, and the horse-hoe will plough in those wide intervals to great advantage, whether the season be wet or dry. Three or four ounces of feed in the drill way, answers for as much land as three or four pounds in the hand-sowing; and there is this other advantage, that the plants, all standing in rows, will be easily distinguished, and properly singled out to their due distances, while very young; which is a thing of great advantage, as they thrive much the better for being early separated from their useless neighbours. The six-foot ridges, whereon *Turneps* are drilled in single rows, may be left higher than for double-rowed crops; because there will be more earth in the intervals, as the single rows take up less.

There is no prefixed time for planting *Turneps*, because the nature of the soil must be consulted; some land will bring them as forward when planted in August, as other land will when planted in May; but the usual time is the middle between these, that is, about Midsummer. It is a practicable scheme, when *Turneps* are planted in rows, with these large intervals, to sow wheat between. In the latter end of September, when the *Turneps* are full grown, a ridge is to be ploughed in the middle of each of the intervals, taking the earth to the ridge in such quantity, as only to leave enough with the *Turneps* to keep them alive; wheat is to be drilled on this ridge: Toward spring the *Turneps* are, in this case, to be pulled up, and carried off the ground. The wheat being now left alone, the land is to be well horse-hoed in the intervals. In Spring the wheat may be sown in treble rows, and will afford a good crop. If the *Turneps* stand so thick in these single rows as to touch one another, when half grown, provided the intervals between the rows be well horse-hoed, they will yet attain to their full bigness; and they are often found to have thrust one another out of shape, and become oval instead of round.

It is best to give the first hoing alternately; that is, to hoe only every other interval; this keeps them from being stunted, and it proves better thus to give them their food at twice, than to do it all at once. Id. Ibid.

In horse-hoing it is not well to come nearer than within three inches of the sides of the rows; but where the *Turneps* are planted in double rows, as soon as their roots are grown as large as a finger, the prong-hoe is to be used between the plants; and even in that little space of three inches, left by the horse-hoe, when they are in single rows. Four of the alternate hoings in the intervals are found, on trial, to be equal in use to four whole hoings, though they are done at half the expence; for this half-hoing furnishes the *Turneps* with as much nourishment as they require, and 'tis in vain to give more.

Dry weather is very injurious to *Turneps*, when sown in the common way, and only hand-hoed; because the hoe, in this case, does not penetrate deep enough to keep the ground moist; but in horse-hoing the earth is cut so deep, that it is always kept moist, and a dry season does the crop no hurt. Dung and tillage will, in all cases, do their business quicker than tillage alone. On this principle, *Turneps* have more occasion for dung than any other plants, because they have less time to grow.

Twelve pound weight may be esteemed the middle size for the great *Turneps*, and they sometimes grow to sixteen or nineteen pound weight. The farmers great interest in them is their size; and it seems evident that every *Turnep* in a field may be made to grow to its full standard, or the largest size that nature has allotted it, provided it be properly managed, and nourishment supplied in a due manner. The greatest inconvenience that attends *Turnep* husbandry, is, that when they are to be eaten off in the Spring, which is their chief use, they do not leave time for bringing the land in tilth for barley; and the loss of a crop of this is more than the gain by the *Turneps*; but this is wholly remedied by the horse-hoing husbandry, in which the land may be almost as well tilled before the *Turneps* are eaten off, as afterwards.

If the *Turneps* be sown in June, the most experienced farmers will have only thirty plants left to a square perch in the hand-hoing, finding that if more are left, they starve one another, and the crop will be worse; but in drilling the rows at six foot intervals, there will be at least sixty left to the perch, and these will thrive well, if the soil be rich, and well broken.

Sixty *Turneps* to a square perch, at five pound each, which is but a third part of the size of sheep-*Turneps* at their full growth, will make a crop of above eighty quarters to an acre.

When *Turneps* are planted late upon poor ground, they may be left more numerous; because they will not have the advantage of heat for the hoing, that would make them grow larger, when set out at greater distances.

The greatest *Turnep* improvement of the farmer is for his cattle in winter; one acre of *Turneps*, at this season, will maintain more than fifty of meadow or pasture land. Most cattle will eat *Turneps*, and they breed milk better than any other food whatever. Sheep always refuse them at first, and, unless they have eaten them while lambs, they will be ready to starve before they will touch them; but as soon as hunger compels them to fall to, they are soon fattened by them. Lambs of three weeks old will eat them, scooping them very prettily, while those of a year old, which are called *tegs*, will not touch them of three or four days, till almost famished.

In some places, the greatest use of *Turneps*, except for fattening oxen and sheep, is for ews and lambs in the spring, when natural grass is not grown up on poor grounds. Sometimes the farmers are obliged to keep their ews and lambs upon them till April, though they were run up to feed in the mean time. Id. Ibid.

There are three manners of spending *Turneps* with sheep. See the article Sheep.

The white and purple-rooted *Turnep* are the two kinds raised for the use of the table in England. They thrive best in a dry sandy soil, that is not too rich; if the ground be too rich, they are apt to grow sticky; but they are always the best tasted when produced on fresh, not on worn-out lands. The common time of sowing them is from the beginning of July to the middle of August; but the gardeners about London sow them every month from March to August, that they may have a constant supply; those sown early always succeed best when sown on a moister soil than the others; for when on a dry one, they are subject to great damages, and are often almost wholly destroyed by a fly.

Turneps must always be sown in an open place, for if they stand near hedges, or under shelter, they run up into tall stalks, and do not grow at the root. *Miller*'s Gardener's Dict.

TURNESOL, a plant of considerable use by the colour prepared from it, and known under its name. The root of these plants is long and white; the leaves resemble in shape those of the xanthium, or lesser burdock; they grow on long pedicles, and are of a whitish or ash-coloured green. The flowers form a sort of cluster, and grow out of the alæ of the leaves; they are of two kinds on the same plant, barren and fruitful, or, as botanists express it, male and female.

The barren, or male flowers, occupy the top of every cluster, and are placed each in a cup, divided into five segments, and themselves consist each of five small yellowish leaves, with a bundle of stamina in the middle. The female, or fruitful flowers, are placed at the bottom of the cluster, and are surrounded each by a cup, divided into ten segments; they are composed of five stamina, which surround a pistil which is furnished with three forked filaments. This pistil, which is fixed in the bottom of the cup, finally becomes a round fruit, of a rough surface, and green colour, its protuberances only appearing a little whitish. This fruit is divided into three cells, and each of these contains one round feed. The whole fruit is attached to the cup by a very long pedicle, so that when the flowers are withered, and it has arrived at its maturity, it is found hanging from the alæ of the leaves, and seems to have been produced without any flower; and this is what has led some writers into the error of imagining, that the flowers and fruit of this plant grow on different stalks.

Some have translated *Turnesol* by the English word *sun-flower*, which has led many to suppose that the great yellow sun-flower

flower which we keep in gardens, was the plant that afforded the *Turnesol* colour: But this is a mistake; and it is to be observed, that the true *Turnesol* plant here described, is very common in the fields of France and Germany, but does not grow wild with us in England.

The juice of the berries of the *Turnesol* rubbed upon paper or cloth, at the first appears of a fresh lovely green, but presently changes into a kind of bluish purple. The same cloth, afterwards wet in water, and wrung out, will turn the water into a claret-colour: And it is to be observed, that these are the rags of cloth usually called *Turnesol* in the druggists shops. *Boyl*'s Works abr. vol. 2. p. 79.

The lixivium of this plant in lime-water and urine, or in the volatile spirit of wine, turns marble blue. See the article *Colouring of* MARBLE.

TURNESOL, in botany, &c. See the article HELIOTROPIUM.

TURNING (*Cycl.*)—TURNING-*Evil*, in cattle, a disease that causes them frequently to turn round in the same place. It is also called the *sturdy*.

The common remedy, recommended by Mr. Markham, is to throw the beast down, and bind him; then to open his skull, and take out a little bladder, filled with water and blood, which usually lies near the membrane of the brain, and then gradually heal the wound. *Boyle*'s Works abr. vol. 1. p. 87.

TURNO *Vicecomitum*, a writ that lies for those that are called to the *sheriff's turn*, out of their own hundred. Reg. orig. 173. *Blount*, *Cowel.*

TURNSTONE, in zoology, the English name of a bird called by authors the *morinellus marinus*, or sea-dotterel.

It is a little larger than the blackbird; its head moderately thick, and its body of a longish shape; its beak a finger's breadth long, thick at the base, and sharp at the point; and its head, neck, shoulders, wings, and the upper part of its breast, are of a brownish colour; its throat and belly are snow-white; the middle of its back has a very large white blotch; and its rump is variegated by a broad transverse streak of black; its legs are short, and of a reddish yellow or orange colour. *Ray*'s Ornithol. p. 231.

TURONILLA, in zoology, a name given by some authors to the common little prickly fish called the *stickleback* or *barnsticle*, and more usually known among authors by the names *pugnitius* and *aculeatus pisciculus*. *Rondelet.* de Aquat. p. 9. See the article PUGNITIUS.

TURPENTINE (*Cycl.*)—In the distilling of *Turpentine* and other balsams by a gentle heat, it has been observed, that there arises first an acid spirit, that will mix with water; which spirit, except the fire be very gentle, is lost. This grateful acid spirit, that first comes over, is, as a learned chemist and physician informs us, highly refrigeratory, diuretic, sudorific, balsamic, or preservative from putrefaction, excellent in nephritic cases, and for quenching thirst; all which virtues the bishop of Cloyne thinks contained in the cold infusion of tar, which draws forth only its fine flower, or quintessence, or the native vegetable spirit, together with a little volatile oil. See the article TAR-*Water*.

Turpentine is a fine resin, whereof there are four kinds in use; the *Turpentine* of Chios or Cyprus, which flows from the *Turpentine*-tree; the Venice *Turpentine*, which is got by piercing the larch-tree; the Strasburgh *Turpentine*, which Mr. Ray informs us is procured from the knots of the silver fir; it is fragrant, and grows yellow with age. The fourth and last kind is common *Turpentine*, which is neither so transparent nor so liquid as the former; and this Mr. Ray takes to flow from the mountain pine. All these *Turpentines* are useful in the same intention. Theophrastus says, the best resin or *Turpentine* is got from the terebinthus growing in Syria, and some of the Greek islands. The next best is that from the silver fir and pitch-pine.

Turpentine may be of use to preserve the bodies of insects. Mr. Boyle [a] took clear Venice *Turpentine*, and evaporating to two thirds, obtained a reddish transparent gum, clear of bubbles, easily soluble by heat, and as easily rendered brittle by cold. Having first pulverized it, he melted it for use, with a gentle heat, and dipped the body to be preserved several times therein, till it acquired a case of due thickness.—[[a] Works abr. vol. 1. p. 29, 30.]

Oil of TURPENTINE. The *oil of Turpentine*, taken in too large a dose, hath often very bad consequences, such as a strangury, bloody urine, and its total suppression, with a fever, violent thirst, and vomiting.

In the Medic. Eff. Edinb. vol. 2. art. 5. we have an account of such symptoms produced by the taking two drams of this oil in warm ale. The patient was cured by a warm bath, and drinking plentifully of Fuller's *emulsio Arabica*.

TURPENTINE-*Tree*. This tree, besides its proper fruit which succeeds the flowers in the usual way, is remarkable for producing what authors of little curiosity have named another fruit, called its *horn*. This horn is a membranous production, of the length and thickness of a man's finger; and what surprized those authors who esteemed it a sort of pod, was to find that it produced not seeds, but living animals, which they called flies.

The true history of this horn is, that it grows from the surface of the leaves, not from the stalks in the manner of fruit; and is no natural production of the tree, but a mere accidental thing, occasioned by the wound of an insect on the leaf. There are a genus of small animals called *pucerons*, some of which have wings, others not, and which we see very frequently in vast clusters on the leaves and stalks of several plants. A certain species of these animals is peculiarly fond of the juices of the *Turpentine*-tree, and always takes its abode upon its leaves. The female of this animal, soon after it is produced from its parent, makes its way under the covering or upper membrane of the leaf, and there lives secure till it produces its young. These, as soon as they are brought forth, begin to suck, and fixing usually upon the sides and top of the cavity in which they are placed, they occasion a great derivation of juices to that part of the membrane of the leaf which covers them; and the consequence of this is, that it rises up from the leaf, and begins to grow into a long body; the formation of this afterwards is the same with that of all other galls, and is owing to the same cause, a wrong derivation of juices. This gall-horn, or bladder, which ever it be called, continues to grow in length, till it burst somewhere at the sides, and then the winged and creeping brood appear. This, though esteemed so great a wonder by many, is far from being peculiar to this tree, for our common elm affords galls much of the same kind. See the article PUCERON.

TURPENTINE-*Tree*, in botany. See the article TEREBINTHUS.

TURREBA, the *Earth-Apple*, in natural history, a name given by the people of Guinea, and some other parts of Africa, to a very fine kind of truffle, which they find in great plenty in their barren desarts, four or five inches under the sand.

TURRITIS, *Tower-Mustard*, in botany, a genus of plants which have four-leaved cruciform flowers, succeeded by long pods, containing a number of seeds. The plants of this genus differ from the hesperis, in that they have flat pods; from the leucoium, in that the seeds are not marginated; and from the cabbage, both in the flatness of the pods, and in the whole appearance of the plant.

The species of *Turritis*, enumerated by Mr. Tournefort, are these: 1. The common or larger *Tower-Mustard*. 2. The smaller *Tower-Mustard*. 3. The branched *Turritis*. 4. The leucoium-leaved *Turritis*. 5. The cut-leaved alpine *Turritis*. 6. The *Turritis* with the lower leaves like those of succory, the others perfoliate. And 7. The purple spring *Turritis*. *Tourn.* Inst. p. 223.

TURSIO, in zoology, a name by which Bellonius, Scaliger, and several others, have called the *phocæna* or *porpesse*, distinctively from the dolphin, with which it is confounded by the vulgar. *Willughby*'s Hist. Pisc. p. 31. See the articles DELPHINUS and PHOCÆNA.

TURTLE, in zoology. See the article TURTUR.

TURTLE, in ichthyology, the name by which we commonly call the great sea tortoise. See the article TESTUDO.

TURTUR, in zoology, the *Turtle-Dove*, a very beautiful little bird of the pigeon kind. The head, neck, and back, are of the bluish-grey colour of the common pigeon, with some mixture of a reddish brown near the rump, and at the bottom of the neck. Its breast and belly are white; but its throat of a fine bright purple; and the sides of the neck are variegated with a sort of ringlet of beautiful white feathers, with black bases. It feeds on hempseed, and other vegetable matters. *Willughby*'s Hist. Avium. p. 134.

TURTUR, in ichthyology, a name given by Paulus Jovius, and some other writers, to the fish called the *pastinacha marina*. It is the *tragon* and *trygon* of the old writers, and is a species of the rayfish distinguished by Artedi by the name of the smooth-bodied ray, with no fin in the tail, but with a bony spine in it, serrated on one side.

TURTUR, the *Turtle-Shell*, in natural history, the name given by the collectors of shells to a very beautiful species of murex, common in the cabinets, but not found any where on the shores. This is owing to its having greatly altered its appearance in the polishing; for it is no other than the white and brown-mouthed murex, which is common in its rough state, with its outer coat taken off. See the article MUREX.

TUSHES, in the manege, are the fore-teeth of a horse, seated beyond the corner teeth, upon the bars; where they shoot forth on each side of the jaws, two above, and two below, about the age of three, three and a half, and sometimes four: and no milk or foal-teeth ever come up in the place where they grow. See the article TEETH.

TUSSILAGO, *Coltsfoot*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the radiated kind. The disk is composed of floscules; and the outer circle of semi-floscules; these stand upon the embryo seeds, and are all contained in a scaly cup. These embryos finally become seeds winged with down, and adhering to the thalamus of the flower. To this it is to be added, that the flowers appear before the leaves. *Tourn.* Inst. p. 487.

There is no other known species of this plant but the common *Coltsfoot*. See Tab. 1. of Botany, Class 14.

The common *coltsfoot* ftands generally recommended as a very great medicine in coughs, and all diforders of the breaft and lungs. It is alfo fometimes ufed externally in inflammations.

TUSSIS, the *Cough*. Medical writers define a *Cough* to be a difcuffory and elifory motion of the breaft, by means of which nature attempts to throw off fomewhat that is offenfive to her.

Phyficians diftinguifh *Coughs* into the idiopatic and the fymptomatic; the firft is truly pectoral; the other only affects the breaft, by means of the confent of parts. Of the fymptomatic, or, as fome exprefs themfelves, the confenfual *Coughs*, fome have a catarrhal difpofition, and have a coryza for their origin or attendant, or, more ftrictly fpeaking, a gravedo; fometimes a bronchus, hoarfenefs, and inflammation of the tonfils; others are called hypochondriacal, which fometimes arife from diforders of the ftomach, and are therefore called dry ftomachic coughs; and fometimes from fchirrofities of the liver, whence they are common to people in cachexies, and in hectics and dropfies.

A *Cough*, which rifes from internal caufes, is to be carefully diftinguifhed from one that rifes from external. The dry and the moift *Cough*, that is, thofe in which matter is fpit up, and thofe in which nothing is evacuated, differ alfo greatly, as well in regard to their fymptoms, as to the perfons they attack. The dry *Cough* is always more tedious in cure than the moift, and more eafily returns. The ftomachic *Cough*, which is owing to confent of parts, is known by the quantity and thicknefs of the matter that is fpit up, which is always moft frequent after meals, and gives a tendency toward a reaching to vomit. This moift ftomachic *Cough* differs in this manner, in all particulars, from the dry cough of the fame name and origin with it, as mentioned before.

The hypochondriac *Cough* is abundantly diftinguifhed from the other kinds, by its drynefs, and by its vehement violence, for it always leaves a hoarfenefs behind it; this always is moft violent after eating, and after drinking large draughts of cold liquors, or afcending fteep places. As alfo by its bearing very well a cold and humid air, and not being exafperated by it, as the pectoral *Coughs* are; and finally, by a fenfation of a concuffion of the diaphragm, when the effects in coughing are violent. *Junker*'s Confp. Med. p. 514.

The common habitual dry *Cough* is diftinguifhed from the other kinds by its remarkable drynefs; and the common moift habitual *Cough* by its abundant quantity of matter difcharged, and by its appearing pulpy and greenifh, and not fanious, or ftreaked with blood, and continuing in the fame degree ufually for a confiderable time. In this habitual *Cough* there is no wafting of the flefh, nor is there that violent exacerbation on the taking of opiates, which is always found in the phthifical *Coughs*, to which all opiates feem the greateft enemies. This *Cough* alfo always receives great benefit from purging medicines, but the phthifical *Cough* none at all: But both thefe differ greatly, according to the age and temperament of the body of the perfon afflicted with them.

Perfons fubject to Coughs. The fimple idiopathic *Cough*, arifing from internal caufes, whether it be of the moift or dry kind, is almoft peculiar to young people, and thofe of plethoric habits. The catarrhal fymptomatic *Cough*, which arifes from external accidents, is common to perfons of all ftates and ages; but is more frequent among old men than among others. The perfons moft fubject to the common dry *Cough* are young people of a florid conftitution and dry habit of body; and men of the middle or more advanced ages are fometimes alfo afflicted with it, from fuppreffions of the hæmorrhoidal difcharges, or from omiffions of habitual bleedings; as are alfo people who are badly conformed, gibbofe or crooked, and fuch as are afflicted with the evil, or have calculi in the bronchia, or nodes of a fchirrous nature in the lungs; and finally, fuch as have been ill-treated in the fmall-pox, or have had the itch, or any other violent cutaneous eruption ftruck in upon them. People moft fubject to a common moift *Cough* are thofe of a phlegmatic habit, fuch as are apt to cool their neck and breaft in autumn in damp cold air in evenings; fuch as have omitted their habitual bleedings, and fuch as have drank too freely of fpirituous liquors, or taken too much of acids. The idiopathic pectoral *Cough* arifes from a congeftion of humours in the breaft; and the hypochondriac *Cough* is either owing to a fault in the ftomach, or to a fchirrofity in the liver. *Junker*'s Confp. Med. p. 515.

Prognoftics in Coughs. The fimple idiopathic pectoral *Cough* very frequently goes off of itfelf, without the affiftance of medicines, or with no farther affiftance to nature than bleeding, judicioufly managed; but though thus gentle while recent, yet when it is become habitual, and fixed upon a perfon, it is very obftinate; and though at firft it is far from a confumptive *Cough*, yet there is no certainty but that it may, at fome time or other, occafion ulcerations in the lungs. A dry *Cough* in young people is much to be feared, when of long ftanding, for it not unfrequently degenerates into a fpitting of blood, or into a confumption: This kind fometimes alfo changes into what authors call the *ferine Cough*, which is fo violent, that perfons afflicted with it are fcarce able to recover themfelves after a fit of it. In general, any *Cough* that feizes a perfon in the Spring, is much eafier cured than one that attacks in Autumn. Periodic *Coughs*, that have been long ufed to return upon people at certain times, are always to be fufpected of danger, if they leave them fuddenly, and no natural or artificial evacuation is made in their place; for they too often bring on faults in digeftion, and fometimes fuffocative catarrhs, and paralytic diforders: A moift habitual *Cough*, when it fuddenly changes into a dry one, is alfo a bad prognoftic. A violent dry hypochondriac *Cough*, that frequently remits and recurs again, and is ufually worft in the night, gives great reafon to fufpect a fchirrofity in the liver; and the more regularly it returns at ftated times, the more certain is the defect of this or fome other of the vifcera; fo that the prognoftic is very fatal and very certain from it. *Junker*'s Confp. Med. p. 518.

Method of Cure. In cafe of a moift pectoral *Cough*, it is proper firft to give a purge, not violent, but yet moderately ftrong, to derive the matter from the breaft; and the catarrhal matter muft then be prepared for evacuation; when it is fimply mucous, the common refolvent and difcutient catarrhal medicines are to be depended upon; fuch are decoctions of the roots of pimpernel and iris, with the leaves of hyffop, horehound, fcabious, and fpeedwell; with thefe are to be given the attenuant gums, as ammoniacum, benjamin, and fagapenum, with the warm carminative feeds. When the matter is too tough and vifcous, the bufinefs then is, on the contrary, to incraffate and reduce it to a foft pulpofe body. This is effected by liquorice-root or juice, with gum arabic, figs, ftarch, together with all the fulphureous medicines. If, on the contrary, the matter is thin and acrimonious, and irritates violently, then the cure is to be effected by fuch things as obtund and fweeten it; of this kind are emulfions of almonds, and the cold feeds, with barley-water, water-gruel, the mucilages of quince, and fleawort feeds, and the like; and to thefe are to be added occafionally, fperma ceti, and oil of fweet almonds: When the *Cough* is habitual, laxatives are to be given after thefe, or in the intermediate times, during the taking them; and if the *Cough* returns, when the matter of it is no longer the caufe, it is to be quieted by gentle opiates, fuch as the ftorax pill; and finally, corroborants are to be given to reftore the due tone of the lungs.

In the dry *Cough* the gentleft purges only can properly have place, and nothing is fo proper as to begin with fmall dofes of rhubarb; after this, to difcufs the ftagnating blood about the breaft, decoctions of the pectoral herbs are to be taken in large quantities, fuch are coltsfoot, fcabious, maiden-hair, and the like. While the patient is taking thefe, he fhould frequently wafh his feet in warm water; and finally, the cure is to be compleated by fuch corroborants as reftore the due tone of the lungs; of this kind, Stahl's tonico-nervine mixture is a very excellent medicine.

In the hypochondriacal *Cough*, as there is generally a fault in the liver, the *Cough* can never be cured, unlefs that defect can be removed. The *Cough* is therefore to be judged, in this cafe, only a fymptom of the difeafe, and the method of treatment muft be the fame as in the infarctions of the liver. See the article HEPATIS *Infarctus*.

When this obftruction is removed, the *Cough*, occafioned by it, goes off of itfelf. In cafes where the hypochondriac *Cough* depends on a fault in the ftomach, the firft confideration to be had, is, whether it be dry or moift; when it is dry, we may conclude that the fault is not fo much in the ftomach, as in the parts about it; and hence the motion of the congeftions of blood toward the vena porta are to be regarded.

The moift ftomachic *Cough* always brings the breaft into confent, and is hence often called a *ftomachico-pectoral Cough*; for the mucous matter which lies in the fauces, and is daily evacuated rather by hawking than coughing, probably afcends up the cefophagus, and caufes a flight *Cough* in the day-time; but in the night, when that excretion ceafes, it is eafy for fome little humidity to flip down the afpera arteria; and this will be again thrown up by coughing in the morning. In the cure of this, there muft be firft given fome gentle purges; after thefe, fuch medicines as refolve vifcofities in their firft formation; in which intention the roots of elecampane and pimpernel, with that of florentine orrice, are of great effect; and in the food it will be proper to eat large quantities of ginger, pepper, and the other fpices; and at night, going to bed, drink a fmall glafs of brandy. When the difeafe begins to mitigate, the effence of amber is a medicine that will do the greateft fervice.

Bleedings in *Coughs* in general, when the conftitution is plethoric, and they are done at proper times, are of great fervice in breaking the force of the difeafe; nay, in cafes of a true phthifis, bleeding often greatly retards, and keeps off the bad fymptoms. It is to be obferved, however, in all thefe cafes, that, when the conftitution will bear it, the quantity taken away fhould be larger, for otherwife they only invite a larger afflux of blood to the breaft, and fo increafe inftead of mitigating the force of the difeafe.

Bleeding is always more neceffary in a dry *Cough* than in a moift one, unlefs the fuppreffion of fome natural hæmorrhage, or the omiffion of the habitual bleedings, have been the occafion of it. Bleeding is alfo the more neceffary in *Coughs*, as they

they return at times with renewed violence, and hurt the breast and lungs; and, in this case also, if cupping has been frequently used, and lately omitted, it must be had recourse to again. Purging medicines have the most speedy effects in moist *Coughs*, and indeed in dry ones they are not always safe, or, at the most, very gentle purgations alone are proper in this last case, where there is not a load of attending matter to be evacuated, as in the first. Sweating medicines are by some prescribed in *Coughs*; but they have no proper place in any judicious regimen for these cases, unless after the *Cough* is cured, and the matter carried off, when they may perhaps be of some service to compleat the restoration of the constitution to its pristine state, by an equal distribution of the humours through the whole body. In simple *Coughs* there is occasion for very few medicines, and, in general, inciding things, which dispose the matter to an easy evacuation, with gentle laxatives, do the whole business.

The commotions occasioned by humid *Coughs* are never extremely violent, nor of any great danger, and therefore it is not necessary to be at any great pains to allay them by opiates; but these are very successfully given in cases where the emotions are greatly too violent for the quantity of matter, or where they continue after the matter is carried off and evacuated. In this case the storax pill is of great service. *Junker*'s Consp. Med. p. 520.

TUTSAN, in botany, &c. See the article ANDROSÆMUM.

TUTTI, in the Italian music, is used to signify that all the parts are to play together, or to make a full concert.

In this sense *Tutti* stands opposed to *soli* or *solo*. See the article SOLO.

It is often found expressed by *omnes*, *ripieno*, *da capella*, *choro*, &c.

TUTULUS, among the Romans, a manner of dressing the hair, by gathering it up on the forehead into the form of a tower. *Pitisc.* in voc.

TUTULUS likewise signified a woollen cap with a high top.

TUTTY, *Cadmia fornacum* (*Cycl.*)—Dioscorides and Pliny differ considerably in their accounts of this substance, though they and all other authors agree in the material part of its history, *viz.* That it is a recrement of metals collected in the furnaces where they are melted.

Pliny mentions a kind called *capnitis*, or the *smoak Cadmia*. This is not mentioned by Dioscorides. This *Cadmia capnitis* was the finest and most subtile of all the kinds; it was found at the mouths of the furnaces, where the flames burst out on stirring up the fires.

The botryoide *Cadmia* was esteemed a very good kind. This was, according to Pliny, of two colours, grey and red. The red, he tells us, was very much the better kind. Dioscorides mentions no such thing as a red *Cadmia*, but only says, that the grey botryoide kind, when broken, appeared of a rusty colour, and spotted within. This is the worst kind, according to Pliny.

Dioscorides no where mentions his red kind, but he names after this a blue sort, which was greatly preferable, and which was white within.

As Pliny does not mention this blue *Cadmia*, nor Dioscorides the red, it is probable that they are the same thing, especially as both agree in their being the most excellent kinds. The Greeks had a way of expressing all things that were blue by the word *cyanizusa*, or resembling the *cyanus* in colour. This word κυανίζουσα seems to have been the word that Pliny mistook in his description taken from this or some other Greek author, for the other or better kind of botryoide *Cadmia*, and reading φοινίσσουσα for κυανίζουσα, translated it red instead of blue. We have so many inaccuracies of this kind in Pliny, that it is much better to reconcile his account of the cadmia thus, than to suppose he was acquainted with a species of that substance, which no body else ever knew.

TWAITE, in our old writers, a wood grubbed up and converted into arable land. Co. Litt. 4. *Blount.*

TWENTY *four Men*: Men chosen every half year to redress the grievances of the mines and miners; but every man generally serves his year when chosen. *Houghton*'s compl. Miner. in the Explan. of the Terms.

TWISTED, (*Cycl.*) in the manege, called in French *Bistourné*, is used for a horse reduced to the same state of impotency with a gelding, by the violent wringing or *twisting* of his testicles twice about; which dries them up, and deprives them of nourishment.

TYGER, or TIGER, *Tigris*, in zoology. See the article TIGRIS.

TYING *Course*, among brick-makers. See the article BRICK.

TYLOS, in zoology, a name by which many authors have called the *turdus iliacus*, or red-wing. See the article RED-*Wing*.

TYMPANA, τύμπανα, among the Athenians, a capital punishment, wherein the criminal being affixed to a pole, was beaten to death with cudgels. *Potter.* Archæol. Græc. l. 1. c. 25. T. 1. p. 134.

TYMPANOTRIBA, among the antients, a designation given to an effeminate person, who could do nothing but play on the tympanum. *Pitisc.* in voc.

TYMPANUM (*Cycl.*)—The *Tympanum*, or barrel of the ear, is a cavity irregularly semicircular, the bottom of it being turned inward, and the mouth joined to the circular groove of the external auditory passage. It has both eminences and cavities observable in it. The remarkable eminences are three in number, a large tuberosity lying in the very bottom of the barrel, a little toward the back part, and a small irregular pyramid, situated a little above the tuberosity, and a little more backward; the apex of it is perforated by a small hole, and on one side of the basis, two small bony filaments are often found in a parallel situation. They are seldom found to be wanting, on a careful investigation, though their tender structure exposes them to be very often broken. In the third eminence is a cavity shaped like the mouth of a spoon, situated at the upper, and a little toward the anterior part of the bottom of the *Tympanum*. This cavity is part of a half canal, and at a very small distance from its point, is a little bony ridge, which goes from one edge of it to the other, but is seldom found entire. The principal cavities are the openings of the cells of the mastoide sinuosities, the opening of the eustachian tube, the bony half canal, the fenestra ovalis and rotunda; and to these may be added the small hole in the pyramid. The opening of the mastoide cells is at the posterior and upper part of the edge of the barrel; the cells themselves, which end there, are dug in the substance of the mastoide process, being very irregular and full of windings and turnings. The opening of the eustachian tube is at the anterior, and a little toward the upper part of the edge of the barrel. This tube, which in France is usually termed the aqueduct, runs from the *Tympanum* toward the posterior openings of the nasal fossæ and arch of the palate. The bony portion of it, the only part spoken of here, is dug in the apophysis petrosa along the duct of the carotide apophysis; and when it leaves that, it is lengthened out by the spinal apophysis of the os sphenoides. These too cavities, the mastoide cells, and the eustachian tube, are, in some measure, prolongations of the *Tympanum*, one anterior, the other posterior. The bony half canal, of which the cavity, like the mouth of the spoon, is the extremity, lies immediately above the eustachian tube, toward the upper side of the apophysis petrosa, or rather in the very substance of that upper side, and in a natural state a small muscle is lodged in it. *Winslow*'s Anatomy, p. 47.

TYMPANY (*Cycl.*)—This disease has been generally accounted, both by the antients and moderns, a species of dropsy, but very improperly; for though it is often productive of, or complicated with an ascites, yet it is in itself a perfectly distinct disease, and accompanied with no extravasation of water in the abdomen, persons who have died of it having been found, on opening the body, with the abdomen as dry as in a state of health; but the stomach has been found, in some, greatly distended with flatulencies, and containing a viscid humour, though in no great quantity. The intestines are also usually found distended, and, as it were pellucid, and, on being pricked, they collapse, without the appearance of any water. And, in some cases, on opening the abdomen, the whole swelling has subsided, on the exclusion of a gross flatulence which had distended it. The intestines have, in some subjects, been found distended to the bigness of a man's thigh, in some parts, and in others lower down, so contorted and twisted together, that there could be no passage either for the wind or the excrements. It is not uncommon also, on dissection, to find great numbers of worms, of the common long kind, in the intestines.

A *Tympany*, without a dropsy, is most incident to women after labour, when the lochia have been suppressed by colds or otherwise, or discharged in too small quantities; a bad regimen during the lying in, and the omitting to swathe the belly properly down, has also often a bad effect this way. In cases of this kind, women find soon afterwards the abdomen inflated, with a considerable uneasiness, a difficulty of breathing, costiveness, and an unaccountable anxiety. These are the breeding symptoms of the approaching *Tympany*; and the same often happens after unskilful treatment in abortions, and after the leaving a part of the lochia behind, or the injuring the uterus in delivery.

Children are also subject to *Tympanies*, when violently afflicted with worms, and sometimes after the measles and small-pox; and if due care is not taken of these cases, at their beginning, the superior parts soon become extenuated, and the patients die. Extream voracity of children also, and their eating great quantities of food at a time, when the stomach is weak, sometimes brings on this disorder.

The *Tympany* is justly accounted one of the more dangerous kinds of diseases, since the persons afflicted with it much oftener die than recover. When it is accompanied with a dropsy, it is scarce ever cured; and a simple *Tympany* in women and children, if neglected at first, degenerates into a chronic disorder, and hardly admits of a cure. Some, indeed, have gone so far as to say, they never knew a patient, afflicted with a *Tympany*, recover; but this seems too rash a judgment. That distention of the abdomen, which is properly called a flatulent colic, is by some accounted a species of *Tympany*; but this is not naturally dangerous, and is easily cured, except

 where

when it is attended with fpafms of the vifcera, in which cafe the medicines, given to reftore the due tone of the inteftines, are by no means proper in regard to the fpafms.

In curing flatulencies of the ftomach and inteftines, the proper method is to promote the difcharge of the vapours by the anus, and to attenuate and carry off by ftool the vifcid matter which is the occafion of them. To this purpofe difcutient and evacuating glyfters are very ferviceable: thefe fhould be prepared of chamomile, hyffop, juniper-berries, and the carminative feeds, a little quantity of fal gem, crude fal ammoniac, or Epfom falt, in veal broth. After thefe, laxative medicines are to be given, with balfamic and carminative ingredients; and then the powders of zedoary, orange-peel, tartarum vitriolatum, are to be given; and, when neceffary, the pillulæ de ftyrace at proper intervals. In the mean time much fervice may alfo be done by external applications; fuch as the oils of mint, rue, nutmeg, and the like, with balfam of Peru; and the rubbing the belly with Hungary-water is often of immediate relief: By thefe means the flighter inflations of the ftomach and inteftines are ufually cured with eafe, and often beginning *Tympanies* yield to a continuance of them. *Hoffman.* Opera. T. 4.

TYPHIUM, in botany, a name ufed by fome authors for colts-foot. *Ger.* Emac. Ind. 2.

TYPHLE, or Typhline, a name by which fome authors have called the fifh, more ufually known by the name of the *acus*. *Willughby*'s Hift. Pifc. p. 158. See the article Acus.

TYPHLINUS, in zoology, the name by which the Greeks, and from them fome others, have called the *cæcilia*, or flow-worm. See the article Cæcilia.

TYPHOS, the name of a difeafe defcribed by Hippocrates and the old writers, and by them diftinguifhed into five kinds.

The firft kind of *Typhos* is a legitimate and continual fever, impairing the perfon's ftrength, and accompanied with pains in the abdomen, and a preternatural heat and weaknefs of the eyes, and a failure of fpeech.

The fecond kind begins with a tertian or quartan fever, and is attended with a pain in the head, and a large difcharge of faliva, and fometimes worms. The feet, and other parts of the body, are afflicted with foft fwellings, the eyes are painful, and the voice tremulous and faint, from the fticking of the faliva in the throat. The belly and back are alfo often in pain.

The third kind is diftinguifhed by the intenfe pains it gives in the joints, and fometimes over the whole body, and often with a lamenefs.

The fourth is known by the violent tenfion and pain of the abdomen which attends it; this is ufually followed by a diarrhœa, and fometimes by a dropfy.

The fifth kind is diftinguifhed by an unnatural palenefs all over the body, and a fort of tranfparence, as if the whole fkin were only a bladder, containing a watery juice, though not inflated; the eyes are hollow in this cafe, and the patient is continually feeling about the bed-cloaths, as if picking out threads. There is always an uneafinefs after eating, and frequent nocturnal pollutions.

The word *Typhos* is alfo ufed in a more general fenfe for *Typos*, to import the remiffions and exacerbations of difeafes.

TYPIC *Fevers*, an appellation given by medical writers to thofe fevers which are regular in their attacks, and in their general period: They are thus called by way of diftinction from the erratic, which obferve no regular type, or determinate appearance.

TYRANNUS, in zoology, a name given by fome to the lanius, or butcher bird, a fpecies of hawk, not larger than a thrufh, but a very fierce and fatal enemy to the fmall birds. *Ray*'s Ornithol. p. 52. See the article Lanius.

TYRBE, Τύρβη, in antiquity, a feftival celebrated by the Achæans, in honour of Bacchus. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 434.

TYRIUM *Marmor*, a name given by the antients to a fpecies of marble of a beautiful white, fometimes free from veins, and fometimes variegated with dufky blackifh grey ones. When pure, it was little inferior to the Parian, and often was ufed inftead of it by the ftatuaries.

TYROSIS, a name given by the antients to a diforder in the ftomach, occafioned by milk curdling in it, from the too great acidity of the humours.

TYRUS, a word ufed by fome of the barbarous writers for a ferpent or viper.

TZANATL, in zoology, the name of an American bird defcribed by Nieremberg, which, he fays, has all over very long and beautiful feathers, of a fine green, and of the fhining glofs of the feathers of the peacock. The upper fide of the wings is black, but their under part is of a very fine and fhaded green. It has a very beautiful creft on its head; its throat and breaft are of a fine fcarlet. The wing feathers are very long, and very beautifully variegated with feveral colours. The Indians efteem the feathers of this bird more valuable than gold; they drefs up the images of their gods with them. *Ray*'s Ornithol. p. 303.

TZANGÆ, among the antients, a kind of Parthian garments, according to fome; but others will have them to have been fhoes fet with precious ftones, formed into the figure of eagles, and defigned for the emperor's ufe. *Pitifc.* in voc.

TZANPAU, in zoology, the name of an American bird, defcribed by Nieremberg, and kept by the Spaniards in cages for its melody. It is famous for the modulations of its voice, and is by many efteemed the female of the polyglotta avis, or cencontlatolli of the Indians.

It is of the fize of our ftarling. Its breaft and belly are mottled with white, grey, and black, and its back with white, black, and a dufky brown. *Ray*'s Ornithol. p. 305. See the article Polyglotta *Avis*.

TZICATLINA, in zoology, a fpecies of ferpent, faid to be found in America, and reckoned among the moft beautiful of that kind of animals. It is nine inches long, about the thicknefs of a man's little finger, and variegated with alternate fwaths of white and red, croffing its body. It is likewife one of the harmlefs kinds of ferpents.

The name fignifies the *ferpent of ants*, becaufe it lives always in their nefts, and comes out along with them. *Hofman.* Lex. in voc.

TZINITZIAN, in zoology, the name of a very beautiful American bird, defcribed by Nieremberg, of the fize of a fmall pigeon, and ornamented with varioufly-coloured feathers. The beak is fhort, crooked, and of a pale colour; the head and neck are like thofe of the pigeon; the breaft and part of the belly are red; but that part which is next the tail is of a fine elegant blue, and a bright white, beautifully intermixed with one another; the tail is green on the upper part, and black underneath; the wings are variegated with white and black; the feet and legs are grey; and the fhoulders of a very beautiful green. It is moft frequent near the South-fea, and feeds on vegetables. It is kept in cages for its beauty, but never fings. The Indians make feveral beautiful works of its feathers. *Ray*'s Ornithol. p. 303.

TZTACTZON, in zoology, an American name under which Nieremberg has defcribed a fpecies of duck, remarkable for the variable and beautiful colours of its head, which are purple, blue, white, and green, and fhine like fattin. Its body is variegated with black, grey and white. Its legs are red, and is eaten as the other water-fowl. It is common in the lakes of Mexico; and has feet much more adapted to fwimming than to walking. *Ray*'s Ornithol. p. 299.

V

V in music, is often ufed to fhew that a piece is defigned for the violin; and VV, for two violins, or more.

V. S. is an abbreviation for *Volti Subito*. See the article VOLTI *Subito*.

VACCA, in zoology, the female of the ox-kind. See the articles Bos and Ox.

VACCARY, *Vaccaria*, in our old writers, a houfe or place to keep cows in; a dairy-houfe, or cow-pafture. *Flet*. lib. 2. *Blount*, *Cowel*.

VACCINIUM, in botany, a name by which fome authors have called the great bilberry, or *vitis idæa magna* of other writers. *Dale*, Pharm. p. 294.

VACUNALIA, among the Romans, a feftival kept in honour of the goddefs Lacuna.

It was celebrated in December by the country labourers, after the fruits were gathered in, and the lands tilled. *Pitifc*. Lex. Antiq. in voc.

VADIATION, *Vadiatio*, in the civil law. See the article VADARI, *Cycl*.

VA-EMBU, in the materia medica, a name given by fome authors to the *acorus Afiaticus*, or Afiatic fweet flag. Hort. Malab. vol. 11. p. 99.

VAGINA (*Cycl*.)—VAGINÆ *Femoris Tenfor*, in anatomy, a name given by Albinus to a mufcle of the thigh, called by others the *membranofus*, and the *mufculus fafciæ latæ*; and by fome *mufculus aponeuroticus*. See the article MEMBRANOSUS.

VAGINANS *Folium*, among botanifts. See the article LEAF.

VAGUE *Acid*, a term much ufed by the modern chemifts, and fignifying a certain volatile fluid falt or acid, fuppofed to be found every where in mines, and in combination with different other fubftances, to form many of the ordinary compound foffils.

This mixing with foffile oil, petroleum, oleum terræ, or the like, probably conftitutes the various forts of native foffile tranfparent fulphurs; uniting with femi-metals, it forms cinnabar, antimony, and other foffils, both folid and fluid; uniting with metals, it forms divers kinds of vitriols; with calcarious earths, different alums; and laftly, with pyrites, which is the matrix of vitriol, calcined in a wood-fire, it produces common fulphur.

It may probably be held much of the fame nature with that acid, which burning fulphur diffufes from its blue flame, fo fuffocating and fatal to all animals. Certainly the analyfis feems to intimate as much. And hence this may probably be looked upon as a male falt, ferving to impregnate the female falts and earths. *Boerhaave*, Chem. 112.

There feems to be a certain *vague* falt or acid diffufed in all parts of the earth, which, when alone, is volatile; but when it has a body, or proper fubject to adhere to, it becomes fixed. The idea of this falt we are at a lofs how to convey, otherwife than by its effects; it feems to come neareft the nature of fpiritus fulphuris per campanam, and is difcovered in all fulphur, in all vitriol, in all alum, in all nitre, in all foffile coal, and many other fubftances; and is, perhaps, that pernicious fume or damp found in mines, and the fmoke which flies from bituminous turf, and other the like bodies.

It is looked upon as an indeterminate principle, diftributed through every part of the globe, both infide, and out. It is this acid that diffolves iron and copper near fome hot baths. It is this that, meeting with foffile oil, becomes coagulated, and is converted into fulphur; that being received into the earthy part of the lapis calcarius, converts it into alum; and infinuating itfelf into the fubftance of iron, produces green vitriol; into that of copper blue vitriol.

This doctrine of a *vague* acid may feem a little hypothetical, till the actual feparate exiftence of fuch an acid can be fhewn; of which we do not know any clear inftances. The argument for it ftands thus: We find feveral mineral bodies that afford acids upon their analyfis; or appear to contain acids; and therefore nature makes ufe of thefe acids in the compofition of fuch mineral bodies: But to render this argument conclufive, the acids fhould be fhewn to exift in the earth, and inftances be produced of nature's working in this manner, with the feveral fteps of the procefs. Inftead of this direct proof, we only find a prejudged theory in authors, fupported indeed by probable reafonings, and a plaufible folution of phænomena: But all this may poffibly be no more than a bare accommodation to the mind. *Shaw*, Chem. 112.

VAI-*Hio*, in the materia medica, a name ufed by fome authors for a kind of lignum aloes, which is brought from China, and is very black, and fcented. *Dale*, Pharm. p. 448.

VAISSEAUX *Enfilez*, a term ufed by the French writers in chemiftry, for thofe veffels ufed in diftilling in an open fire, or in fand, which do not confift in the common way of a retort, joined immediately to a receiver, but have a receiver with a double opening, and a neck at each end, placed between the retort and the ordinary receiver. The neck of the retort is let into one of the necks of this middle veffel, and its other neck is thruft into that of the receiver; by this means the receiver, into which the liquor is to fall, ftands at a greater diftance than it otherwife would from the fire, and the vapours are more eafily condenfed in it by its coolnefs, while they have alfo a double or treble fpace to expand in, and by that means are not fo likely to burft the veffels.

VALDIA, in botany, a name given by Plumier to a genus of plants, fince called by Linnæus, *ovieda*. *Plumier*, Gen. 24. See the article OVIEDA.

VALE *of a Pump*, at fea, a term for the trough by which the water runs from the pump along the fhip-fides, to the fcupperholes.

VALERIAN, *Valeriana*, (*Cycl*.) in the Linnæan fyftem of botany, makes a diftinct genus of plants, taking in the *valerianella* of Tournefort, and the *valerianoides* of Vaillant.

The characters of this genus are, that the cup fcarce deferves the name of one, and is only a fort of rim or foliaceous edge, furrounding the germen. The flower confifts of a fingle petal, in form of a tube, prominent in its inferior part, and containing a honey juice, divided into five fegments at the edge, all which are obtufe. The ftamina are three, or fewer, pointed, erect filaments, and of the fame length with the flower. The antheræ are roundifh. The piftillum has its germen below the receptacle. The ftyle is thread-like, and of the fame length with the ftamina; and the ftigma is fomewhat thick. The fruit is a capfule, that fplits and falls off. The feeds are fingle and oblong. Thefe are the characters of the genus; but there is great variation among the different fpecies. *Linnæi* Gen. Plant. p. 8.

The characters of this genus, according to Tournefort, are thefe: The flower confifts of one leaf, and is fhaped like a funnel, and divided into feveral fegments at the edge. This ftands upon a cup, which finally becomes an oblong feed, of a flattifh form, and winged with down.

The fpecies of *Valerian*, enumerated by Mr. Tournefort, are thefe: 1. The great Pyrenean *Valerian*, with the leaves of cacalia. 2. The fcentlefs Alpine *Valerian*, with undivided leaves, and a creeping root. 3. The middle marfh *Valerian*, with flightly divided leaves. 4. The firft Alpine *Valerian* of Cafpar Bauhine. 5. The other Alpine *Valerian*, of the fame author. 6. The figwort-leaved Alpine *Valerian*. 7. The roundifh-leaved mountain *Valerian*. 8. The Alpine *Valerian*, refembling the celtic Spikenard. 9. The cretic *Valerian*, with the dropwort-root. 10. The celtic *Valerian*, commonly called celtic fpikenard. 11. The common broad-leaved red *Valerian*. 12. The fmall narrow-leaved red fea-*Valerian*. 13. The common narrow-leaved red *Valerian*. 14. The great broad-leaved fea *Valerian*. 15. The fmall narrow-leaved, white-flowered fea *Valerian*. 16. The garden *Valerian*. 17. The great wild *Valerian*. 18. The great wild *Valerian*, with fhining leaves. 19. The great marfh *Valerian*. 20. The fmaller marfh *Valerian*. 21. The little marfh *Valerian*, with a fmall flower. 22. The little Alpine *Valerian*. 23. The annual *Valerian*, with leaves like thofe of the calcitrapa. 24. The broad-leaved annual jagged Portugal *Valerian*. *Tourn*. Inft. p. 131.

The *Valerians* may be known, when not in flower, by their roots being fcented, and their leaves always ftanding two at a ftalk.

The great garden *Valerian* is an alexipharmic, fudorific, and diuretic. The root is the only part of it ufed in medicine; this is to be taken up in September, and carefully dried. It is then given in powder in afthmas, pleurifies, coughs, obftructions of the liver and fpleen, and in the plague, and all malignant and petechial fevers. It is alfo recommended by fome as a vulnerary, and by others as one of the greateft medicines in the world for weakneffes of fight.

The wild *Valerian* root is much more famous than this, but in a different intention. It is of a ftrong difagreeable fmell, and is given in nervous cafes with very great fuccefs. There are not wanting inftances of perfons cured of confirmed epilepfies by it. In all convulfions it is a very fuccefsful medicine.

VALERIANELLA, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf,

leaf, ſhaped like a funnel, and divided into ſeveral ſegments at the edge. This ſtands upon a cup, which afterwards becomes a fruit, always containing one ſeed only, but yet is of very various figures; one ſort is like a ſpear-point in ſhape, being compoſed of two flat pieces, containing a ſeed in one or the other of them; another is of an oval ſhape, umbilicated, and terminated by three points; others have beautifully regular hollows cut in each for a ſingle ſeed; others are longer, fungoſe, and lunated, containing a cylindric ſeed; and finally, others terminate in three hooks, and contain a ſomewhat crooked ſeed.

The ſpecies of *Valerianella*, enumerated by Mr. Tournefort, are theſe: 1. The low early field *Valerianella*, with flatted ſeeds. 2. The low early field *Valerianella*, with ſerrated leaves. 3. The taller late-flowering field *Valerianella*, with more turgid ſeeds. 4. The *Valerianella* with naked round umbilicated ſeeds. 5. The *Valerianella* with naked umbilicated ſeeds. 6. The *Valerianella*, with large hairy umbilicated ſeeds. 7. The *Valerianella*, with ſmall hairy umbilicated ſeeds. 8. The Indian *Valerianella*, with a galeated, purple, or white flower. 9. The ſtarry ſeeded *Valerianella*. 10. The great Portugal *Valerianella*, with ſeeds like thoſe of ſcabious.

The ſeveral ſpecies of this genus may be known, when not in flower or ſeed, by their ſtalks being always divided regularly into two, and their leaves being ſmooth, veiny, and and placed two at each joint. *Tourn.* Inſt. p. 132.

VALET, (*Cycl.*) in the manege, a ſtick armed at one end with a blunted point of iron, to prick and aid a leaping horſe.

Formerly a *Valet* was called *Aiguillon*, *i. e.* goad, and ſome of them had ſpur-rowels upon them, only the points beaten down: And when a horſe was firſt begun round a pillar, without a rider, they uſed to prick his flanks with the *Valet*, to make him know the ſpur, and obey it, without reſiſting. At preſent the *Valet* is not uſed for that purpoſe, and the name of *goad* is ſuppreſſed, as being only proper for oxen.

VALIGA, a name given by ſome medical writers to an infuſion or tincture of jalap in ſpirit of wine, or ſpirit of citron, with the addition of a little ſaffron.

VALVULÆ *Conniventes*. Mr. du Vernoi is of opinion, that the *Valvulæ Conniventes* of the inteſtines are formed by the arched veſſels and fat in the internal cellular coat, and covered by the villous or nervous coat. See Comment. Acad. Petrop. Tom. 4. p. 192.

VAN (*Cycl.*)—VAN *of a Fleet*. See the article SQUADRON.

VANDOSIA, in zoology, a name by which ſome authors have called the *leuciſcus*, the common dace, or dare. *Willughby*'s Hiſt. Piſc. See the article LEUCISCUS.

VANELLUS, in zoology, a name given by many to the lapwing, more commonly known by the name *capella*. See the article CAPELLA.

VANILLA (*Cycl.*)—This fruit is principally brought to us by the Spaniards, who traffic with the Americans for it. It grows in the warmer parts of America, and that uſually in places where there is water near. The natives diſtinguiſh it into three kinds, which the Spaniards call the *pompona*, the *ley*, and the *ſimarona*.

The pods of the *pompona* kind are thick and ſhort; thoſe of the kind called *ley*, are longer and ſlenderer; and thoſe of the *ſimarona*, which is alſo called *baſtard Vanilla*, are the ſmalleſt of all the kinds.

The *ley* kind is the only good *Vanilla*. It ought to be of a good reddiſh brown, neither too black nor too red, and neither too dry nor too moiſt; when perfect they always appear full, though dry; and a parcel of fifty in number ought to weigh above five ounces.

There is a kind which is larger, fifty pods of which uſually weigh eight ounces; this is called the *ſobre buena*, and is eſteemed of all others the moſt excellent.

The ſmell of the *Vanillas* ought to be penetrating and agreeable. And when the pods are freſh, and in good condition, they are found, when opened, to be full of a blackiſh oily balſamic liquor, in which there ſwim a great number of very ſmall black ſeeds. The ſmell, when the pod is freſh opened, is very lively, and in ſome degree intoxicating.

The *pompona Vanilla* has a ſtronger, but leſs agreeable ſmell than the former, and when taken, gives men violent headachs, and women diſorders of the womb. The liquid ſubſtance in the *pompona* is thinner than in the *ley*, and the ſeeds much larger, being nearly of the ſize of thoſe of muſtard.

The *ſimarona*, or *baſtard Vanilla*, has very little liquor, and has few ſeeds in the pod, and has ſcarce any ſmell.

The *pompona* and *ſimarona* are no ſaleable commodities, nor ever brought to market, except cunningly by the Indians, who mix them among the pods of the *ley*, or true kind. It is not yet certainly known, however, whether theſe three kinds are the produce of different ſpecies of plants, or whether they differ only as to age, or the ſoil where the plant grows.

They never put *Vanilla* into chocolate in any part of New Spain. There has been ſent over into France *Vanilla* from Caracca and Maracaybo. The pods of this are ſhorter than thoſe of the true *Vanilla*, and thicker than the *pompona* kind. It is, however, plainly a ſpecies of *Vanilla*, and is of a very good ſmell and taſte. There is alſo mention made by ſome of a *Vanilla* of Peru, the dried pods of which are two fingers wide, and above a foot in length; but of a much inferior ſcent to the *Vanilla*, and not retaining any long time even what it has.

The leaves of the *Vanilla* plant are about a foot long, and three fingers breadth wide. They are obtuſe at the end, and of a very dark duſky green. The flowers are ſingle, and of a whitiſh colour, variegated with red and yellow. The pods appear as ſoon as theſe fall, and are green at firſt, but grow of a yellowiſh colour as they ripen. It is at this time that they gather them. The whole ſhrub is a climber, of the nature of the vine, and muſt be thtee or four years old before it produces any fruit.

The time of gathering the pods for ſale is from September to December. They require no other management than to be gathered in a dry ſeaſon, and laid twenty days, to dry away the ſuperfluous humidity, and, at times, preſſing the pods gently with the hands.

The plant climbs up the talleſt trees, and its main ſtock, in time, becomes woody and hard as that of the vine; the root ſends up many off-ſets, which are planted by the natives, near the foot of a tree, and thrive very eaſily; and it is thus that the ſhrubs are propagated; and the time for doing this is in winter, or toward the beginning of ſpring.

It is remarkable that the young ſhoot is not to be planted into the ground as with us, but on the bark of the tree; this is, however, no ſingular caſe in the hot countries, for nature ſhews the way; the branches of trees, broken off by winds, often being blown againſt other ſpecies, and yet always taking hold on them, and growing; this is owing to the great abundance of the ſap in trees in theſe climates. Memoirs Acad. Scien. Par. 1722.

Vanillas are accounted cordial, carminative, ſtomachic, and reſtorative; they are alſo ſaid to be diuretic, and to promote the menſes.

VANNING-*Shovel*, among miners, an inſtrument uſed for waſhing the ores of any metal, after being reduced to powder, thereby to diſcover the richneſs and other qualities of the ore. See the article SHOAD.

VAPOUR (*Cycl.*)—*Fiery* VAPOURS, *Halitus Ignei*, a term uſed by ſome to expreſs thoſe exhalations from the earth, which either take fire of themſelves on the burſting forth into the air, or are readily inflammable on the bringing a candle to them.

Many of the ſuppoſed burning lakes are owing to theſe fumes burſting up through the water, and not to any quality of the water itſelf. Our famous burning well at Wigan in Lancaſhire is of this kind. The common people affirm, that the water of this ſpring burns like oil; but there is nothing of truth in this. There burſts up a *Vapour* through the earth in this place, which keeps the water bubbling, as if boiling over the fire, though it is not warm; and the ſtream of this breath may be felt iſſuing up in theſe places like a ſtrong wind. This breath alone is inflammable, and takes fire at the approach of a candle, burning with conſiderable violence for ſome time.

There are coal-pits in the neighbourhood, and the air is certainly of the ſame kind with that inflammable *Vapour*, often met with in thoſe places, and which may alſo be prepared from iron diſſolved in a proper menſtruum. The water itſelf, taken from the place, does not burn; and if the bottom be made dry, the vapour which aſcends from it will burn as ſtrongly as if the water were there. The flame is not diſcoloured like that of ſulphureous bodies, nor has it any bad ſcent; and the fumes, as they are felt burſting out of the earth, by the hand held over the place, are not hot. Phil. Tranſ. N° 20.

VAPPA, a word uſed by the antients to expreſs dead wine, or wine deprived of all its ſpirituous part.

The word is alſo metaphorically uſed to a peculiar ſtate of the blood, when it is in a low, diſpirited condition, as is the caſe even in healthy perſons, when worn out with exceſſive labour, and in cachectic and ſcorbutic perſons.

VARA, in commerce, a long meaſure uſed in Spain and Portugal. It is of various lengths in different places. That of Seville is $33\frac{127}{1000}$; that of Madrid, $39\frac{166}{1000}$; that of Portugal, $44\frac{31}{1000}$ inches Engliſh meaſure. Treat. Pract. Geom. p. 8.

VARIA, in zoology, a name by which ſome authors have called the leopard, or *pardalis*, from the beautiful variegations it is marked with. See the article PARDALIS.

VARIATION (*Cycl.*)—VARIATION *of Curvature*, in geometry, is uſed for that inequability, or change, which happens in the curvature of all curves, except the circle. And this *Variation* or inequability conſtitutes the quality of the curvature of any line. *Newton*, Meth. of Flux. and Inf. Series. p. 75.

Sir Iſaac Newton [a] makes the index of the inequability, or *Variation* of curvature, to be the ratio of the fluxion of the radius of curvature, to the fluxion of the curve; and Mr. Maclaurin, to avoid the perplexity that different notions, connected with the ſame terms, occaſion to learners, has adopted the ſame definition; but he ſuggeſts [b], that this ratio gives rather the *Variation* of the ray of curvature, and that it might have been proper to have meaſured the *Variation* of curvature, rather by the ratio of the fluxion of the curvature itſelf,

itſelf to the fluxion of the curve; ſo that the curvature being inverſely as the radius of curvature, and conſequently, its fluxion as the fluxion of the radius itſelf directly, and the ſquare of the radius inverſely, its *variation* would have been directly as the meaſure of it, according to Sir Iſaac Newton's definition, and inverſely as the ſquare of the radius of curvature. According to this notion, it would have been meaſured by the angle of contact contained by the curve and circle of curvature, in the ſame manner as the curvature itſelf is meaſured by the angle of contact contained by the curve and tangent. The reaſon of this remark may appear from this example [c]. The *variation* of curvature, according to Sir Iſaac Newton's explication, is uniform in the logarithmic ſpiral, the fluxion of the radius of curvature in this figure being always in the ſame ratio to the fluxion of the curve; and yet, while the ſpiral is produced, though its curvature decreaſes, it never vaniſhes, which muſt appear a ſtrange paradox to thoſe who do not attend to the import of Sir Iſaac's definition. — [[a] Meth. of Flux. and inf. Series, p. 76. [b] Fluxions Art. 386. [c] Phil. Tranſ. N°. 468. ſect. 6. p. 342.—]

The *variation* of curvature at any point of a conic ſection, is always as the tangent of the angle contained by the diameter that paſſes through the point of contact, and the perpendicular to the curve at the ſame point, or to the angle formed by the diameter of the ſection, and of the circle of curvature. Hence the *variation* of curvature vaniſhes at the extremities of either axis, and is greateſt when the acute angle, contained by the diameter, paſſing through the point of contact and the tangent, is leaſt.

When the conic ſection is a parabola, the *variation* is as the tangent of the angle, contained by the right line drawn from the point of contact to the focus, and the perpendicular to the curve.

VARICULA, a diminutive of the word *varix*, a term applied by ſome authors to the intumeſcence of the veins of the tunica adnata in the eye, ariſing from thick blood.

VARIETIES, in natural hiſtory, a word uſed to expreſs an accidental change in ſome body which is not eſſential to it, and therefore does not conſtitute a different ſpecies.

The naturaliſts of former ages have run into great errors, in miſtaking the accidental *varieties* of plants, animals, and minerals for diſtinct ſpecies. Many of them have called a plant a new ſpecies, becauſe its flower, which ſhould have been blue or red, is white on account of the poorneſs of the ſoil, or ſome other ſuch reaſon. Mr. *Ray* has eſtabliſhed a very good teſt for *varieties* in botany; he allows every thing to be a diſtinct plant which will propagate itſelf in its own form by its ſeeds; but ſuch, as when ſown, loſe their difference, and run back to the old ſtandard, he accounts *varieties*, however great their diſtinctions may appear. In the hiſtory of fiſhes as much confuſion has been introduced by miſtaking *varieties* for diſtinct ſpecies as in botany. Artedi is the only author who has rationally attempted to bring this part of natural hiſtory into order in this reſpect, and to ſettle regularly the rules by which to diſtinguiſh real and eſſential, from accidental differences.

The principal grounds of the error of ſuppoſing *varieties* diſtinct ſpecies of fiſh, have been theſe: The variable and inconſtant colour of fiſhes has been miſtaken for a ſpecific difference; in this manner Rondeletius has deſcribed many *varieties* of the turdi, labri, and other fiſhes, under the names of diſtinct genera.

Others have paid the ſame too great regard to the more conſtant *varieties* of colour, which are found only to differ in degree, in the ſeveral individuals of the ſame ſpecies, and their differences to be only in the degrees of the ſame colour, which is much more intenſe in ſome, and more remiſs in others. Theſe differences can only make *varieties* of the ſame fiſh, the ſpecies remaining always the ſame. Of the ſame kind are the miſtakes of thoſe who eſteem ſize or magnitude a ſpecific character: and thus, out of the *varieties* of the ſame fiſh, occaſioned by ſcarcity or plenty of food, or other ſuch occaſions, make larger or ſmaller ſpecies. The place where fiſh are caught, is alſo another occaſion of making new ſpecies, with theſe ſort of authors; thus though the *perca fluviatilis* of Bellonius, and the *perca marina* of other authors be the ſame fiſh, yet they are pretended to be different ſpecies. The time of ſpawning is alſo with ſome made a diſtinction of ſpecies; and thus we find the common pike divided into three ſpecies, according to its ſpawning, in ſpring, ſummer, and autumn, which it does according to the heat or coldneſs of the climate. See the article SPECIFIC *Names*.

All theſe differences are falſe and frivolous, and the utmoſt they can do, is to make what are properly called *varieties*, though few of them are ſufficient even for that. A ſalmon caught at ſea, is not different from one of the ſame brood caught in a river: and if the *perca marina*, falſly ſo called, be a little different from the *perca fluviatilis*, yet if its ſpawn will produce regular *percæ fluviatiles*, its difference can only amount to a *variety*, not a diſtinct ſpecies.

The trifling nature of diſtinction by colour, is ſeen by the variety we daily ſee in the colours of ſome of our moſt common fiſh; as the tench, the eel, the ſalmon, and ſome others, which vary more or leſs, from every change of the water; all the other diſtinctions, of ſize and place, are as frivolous; and the giant and the dwarf, the black and the white man, the Aſiatic and the European, may as well be called diſtinct ſpecies of men, as theſe of fiſhes.

Finally, the time of ſpawning is no eſſential difference; for we daily ſee the change of climate make changes of that kind in all creatures; and even in the ſame climate, and under the ſame circumſtances, the ſame ſpecies of birds will afford ſome individuals much earlier or later in laying their egg ſthan others. *Artedi* Ichthyol.

VARIUS, in zoology, a name uſed by moſt authors for a ſmall freſh-water fiſh, common in brooks and running waters, and well known in England, by the name of the *minow*, or *menow*; and called *Phoxinus lævis* by ſome other writers.

It is diſtinguiſhed from other fiſh of its ſize, by being of a duſky browniſh olive colour on the back, by its having a yellow line running on each ſide, from the gills to the tail, below which the belly and ſides are of a very varying colour; in ſome white, in others of a fine bright red, and in others, there is a line of a fine blue running on each ſide; and in others, the ſides are variegated with yellow, brown, and red lines. Its ſcales are ſo extremely ſmall, that it has been generally ſuppoſed to have none. Its mouth is very large. It is a very well taſted fiſh, and if but a little larger, would be very much valued. *Ray*'s Ichthyogr. p. 268.

VARIUS *Mus*, in the old authors of zoography, a name uſed for the ſame creature they otherwiſe called *mus ponticus*; which ſeems to have been no other than our ſquirrel. See the article SCIURUS.

VARNISH *(Cycl.) Amber* VARNISH. *Amber Varniſh* is prepared in the following manner: Put four ounces of amber into a crucible, and melt it with a ſmall degree of heat, and pour it out upon an iron plate, when cold, reduce it to powder, and add to it two ounces of drying oil, that is, linſeed oil thickened by boiling it up with litharge, and one pint of oil of turpentine, and diſſolve the whole together into a liquid *Varniſh*. *Shaw*'s Lectures, p. 424.

This has been long a great ſecret in the hands of the traders in theſe things; but deſerves to be made public, as a leading experiment towards the perfecting the arts of *varniſhing* and japanning.

China-VARNISH. The *China Varniſhes* have been always famous; the manner of making which is ſaid to be as follows: Take crude *Varniſh* ſixty ounces, common water the ſame quantity, mix them well together till the water diſappears; afterwards put this into a wooden veſſel five or ſix palms long, and two or three broad; mix them together with a wooden ſpatula, for a whole day in the ſummer's ſun, for two days if in winter, and afterwards keep it in an earthen veſſel, covered with a bladder. The water will not unmix itſelf again: this is called the ſun *Varniſh*. See VARNIH *for Porcelain*, *infra*.

The oil of wood, called by the Portugueſe *azeile de Pao*, is made in the following manner: Take twenty ounces of that oil, which they call oil of wood, and ten drams of the oil of the fruit; boil theſe a little together, and the oil will look yellow; then let it cool, and add to it five drams of quick lime powdered. To make the firſt grounds called *camiſeca*, take ſwine's blood and quick lime powdered, of each an equal quantity; ſpread this mixture upon the wood, and when it is dry, ſmooth it with pumice-ſtones.

To make the black *Varniſh*, take of the *Varniſh* prepared in the ſun ſixty ounces, ſtone black alum (ſuppoſed to be a ſort of copperas) diſſolved in a little water, three drams, and ſeventy drams of lamp-oil, called by the Portugueſe *azeile de Candea*. Theſe things are all to be mixed together in a wooden veſſel, putting the lamp oil in at twice, and ſtirring the whole together with a wooden ſpatula.

The pitch-coloured *Varniſh* is made in the following manner: take oil of wood, crude, forty drams; called *da Pao*, of the lamp-oil, called *da Candea* crude, forty drams; mix them together in the ſun in a wooden veſſel, in the ſame manner as the common *Varniſh* and water are ordered to be mixed in the firſt proceſs.

To make the red *Varniſh*, take ten drams of cinnabar, twenty drams of prepared *Varniſh*, and a little lamp-oil; mix, them all together.

To make the yellow *Varniſh*, take of the yellow colour ten drams, prepared *Varniſh* thirty drams, a little lamp-oil; mix all together: and

To make a *Varniſh* of a muſk colour, take of the red *Varniſh* ten drams, and of the black *Varniſh* four drams; mix them well together. Philoſ. Tranſ. N°. 261. p. 524.

Theſe are the accounts ſent to the great duke of Tuſcany by the jeſuits in China: Dr. William Sherard communicated them to the royal ſociety; and to render the accounts uſeful to the world, he preſented with them the ſeveral ſubſtances mentioned; theſe are depoſited in the muſæum of the ſociety, and may ſerve as inſtructions to all who are curious in this art.

VARNISH *for Porcelain*. The Chineſe have of late years diſcovered a new kind of *Varniſh* for their ware: they call this *Tſekinyeou*, that is to ſay, the browniſh gold varniſh; it is of the colour of the brown images, or of what we call coffee colour. The novelty of this has made it much eſteemed: it is made in the manner of all their other varniſhes, by diſſolving

ing the finer part of an earthy fubftance in water. The fubftance which they make it of is a common yellow earth: this they diffolve in water, and letting the coarfe parts fettle, they pour off the yet thick liquor, and what afterwards fubfides from this, is the pure and fine part, which they keep in form of a foft pafte, or thick cream. They ufe this only to the thinneft and moft delicate porcelain ware.

The manner of ufing it is this: they mix a quantity of this fine fediment with fo much water as renders it thin and liquid, like the common *Varnifh*: this and the common kind are to be ufed together, fo that care muft be taken that they are nicely of the fame degree of thicknefs: this the workmen try by dipping a petunfe or brick of their earth into both, and feeing which comes out moft covered, that which lies on the thickeft, is to be diluted with more water, or the other to be heightened with more of the earth, to bring them to the fame ftandard. They are both judged to be fufficiently liquid when they enter the pores of the petunfe. They then mix fome of the oil of fern afhes and lime, (fee the article FERN-*Oil*) along with the brown *Varnifh*, and add as much of this mixture to the common *Varnifh* as they find upon trial will give fuch a colour as is required. The common proportion for the brown colour moft efteemed at prefent, is two pints of the brown *Varnifh* to eight pints of the common; and to four pints of this mixture they add one pint of the *Varnifh*, or oil of fern. It might puzzle a ftranger to their terms, to underftand what thefe people meant by oil; but it is a word with them in ufe for any thing liquid; and they call all their *Varnifhes* fo, though made of the powders of earths and ftones mixed with water. They apply this *Varnifh* to the veffels by dipping them into it, and fo compleatly covering them infide and out before they put them into the oven; and the baking gives a great brightnefs to the colour. This is the niceft part of the whole manufactury of the porcelain, and other wares of that kind. The *Varnifhes* ufed by the Chinefe are two; the one they call *oil of ftones*, the other, *oil of fern*; which fee. They mix thefe together, and with great caution and delicacy apply them to the veffels all over equally, with a fteady hand and a fine pencil. Obfervat. fur les Coutum. de l'Afie, p. 304.

When the porcelain is very thin and fine, they give it two beds of the *Varnifh*, the one over the other, when dry; thefe are to be very thin, and they anfwer to the fingle covering of *Varnifh* given to the common good China, that is thick and ftrong. They give thefe coats by dipping, and ufe the foot of the veffel to hold it by: after this, they hollow the foot, and paint the circle that we fee round it, or mark it with fome Chinefe character.

The *Varnifh* they lay on is fo thick, that it often hides the colours, till the baking afterwards brings them out again: this is the cafe with the fine deep blues; we fee none on the beft china; it is all hid under the coat of white, and the veffel appears plain, till it has paffed through the fire again; but then the colour appears deeper than when at firft laid on. Obferv. fur l'Afie.

VASTUS (*Cycl.*)—VASTUS *Externus*, a very large flefhy mufcle, almoft as long as the os femoris, broad at the extremities, and thick in the middle, and lying on the outfide of the thigh.

Its upper infertion being fomething tendinous, is in the pofterior or convex rough furface of the great trochanter. It is likewife fixed by a flefhy infertion along the outfide of the os femoris, for above two thirds of its length downward, in the correfponding part of the linea afpera, and in the neighbouring portion of the fafcia lata. From all this extent, the flefhy fibres running downward, and a little obliquely forward, towards the rectus anterior, terminate infenfibly in a kind of fhort aponeurofis, which is fixed in all the neareft edge of the tendon of the rectus, in the fide of the patella, in the edge of the ligament of that bone, and the neighbouring lateral part of the head of the tibia. The body of this mufcle is bigger than its extremities, and its loweft fibres run a little below the rectus. *Winflow's* Anatomy, p. 213.

VASTUS *internus*, a mufcle very like the *vaftus externus*, and fituated in the fame manner on the infide of the *os femoris*.

It is fixed above by a fhort flat tendon in the anterior rough furface of the great trochanter, and by flefhy fibres in that oblique line, which terminates the bafis of the collum of the os femoris anteriorly on the forefide of the infertions of the pfoas and iliacus, in the whole infide of the os femoris, and in the linea afpera on one fide of the infertions of the three tricipites, almoft down to the internal condyle. From all this extent, the fibres run downward, and a little obliquely forward, and the body of the mufcle increafes in bulk: it terminates below in an aponeurofis, which is fixed in the tendon of the rectus anterior, in the fide of the patella, and of its tendinous ligament, and in the fide of the head of the upper extremity of the tibia. *Winflow's* Anatomy, p. 214.

VATERIA, in botany, the name of a genus of plants; the characters of which are thefe: The perianthium is fmall, acute, and permanent, and is compofed of one leaf, divided into five fegments; the flower confifts of five oval expanded petals; the ftamina are numerous filaments, fhorter than the flower; the antheræ are fimple; the germen of the piftil is roundifh; the ftyle is fimple and fhort, and the ftigma is headed; the fruit is turbinated and trivalved; the feeds fingle and oval. *Linnæi* Gen. Plant. p. 235. Hort. Mal. vol. 4. p. 15.

VATICANÆ *Pillulæ*, the name of an old form of medicine, intended as a purge. The recipe is in the Old London Pharmacopœa; but the late ones have difcarded it.

VAULT (*Cycl.*)—VAULT, in the manege. To *vault* a horfefhoe, is to forge it hollow, for horfes that have high and round foles; to the end that the fhoe, thus hollow or *vaulted*, may not bear upon the fole that is higher than the hoof; but after all, this fort of fhoe fpoils the feet; for the fole being tenderer than the fhoe, affumes the form of the fhoe, and becomes every day rounder and rounder. In Mr. Solleyfel's Compleat Horfeman, may be feen the true method of fhoeing for high and round foles.

VAUNING, in mineralogy, a term ufed by our miners to exprefs a coarfe and expeditious way of wafhing ores, for the examination of their nature and richnefs.

This inftrument called the *Vaun*, is a long and moderately deep wooden fhovel; into this they put the earthy or ftony matter, which they fufpect to contain the metal, in powder: they then add water many times, and fhaking and ftirring it thoroughly about, they throw out the water, and add frefh, till at laft the matter is feparated; the earthy part is wafhed away, and the ftony and mineral matter only remain, the one at the hinder part, the other at the point of the fhovel. This laft is collected feparate; and on being examined either by the eye or teft, they are able to judge very nearly of the general profit of the mine.

This method is often ufed with the ftones and earths found in the fhoads, or trains of mines. Phil. Tranf. N°. 69.

VAZABU, in the materia medica, a name by which fome authors have called the *Acorus Afiaticus*, or Afiatic fweet flag. *Herm.* Muf. Zeyl. p. 56.

UBIRRE, in zoology, a name given by fome to the anguilla marina, or fmall fea eel, a long fifh of the eel kind, living among rocks about the fea fhores, and growing to be very fat and well tafted. *De Laet's* Ind. occident. See the article EEL.

UDNON, in botany, the name by which Theophraftus and Diofcorides have called the truffle commonly ufed at table in their time.

Diofcorides tells us, that it was a root dug up at fmall depths under ground, and had neither ftalks, nor flowers, nor leaves; and that it was of a reddifh colour, and fmooth furface. By this, which is alfo the account of Theophraftus and Athenæus, we find, that the *Udnon* was indeed the truffle; but we alfo find that they were not acquainted with the better kind of truffle, which we cultivate at prefent.

This fmooth reddifh-coated truffle is common in Italy at this time, and is efteemed of no value, and called the wild truffle: the fort that is eaten there, and in all other parts of Europe, is the blackifh and rough-coated kind. In Africa they have a yet finer kind than ours; it has a white coat, and is of the moft delicious flavour. The Greeks were alfo acquainted with this, and denominated it Cyrenean, as they did almoft all the things they had from Africa: they alfo gave it the name *mify*; but this word being alfo the name of a vitriolic mineral, allied to the *fory* and the *melanteria*, fome confufion has been thereby introduced. Many having thought, that the Cyrenean mify was only a finer kind of the mineral of that name. See the article MISY.

UDO, in the materia medica, a name given by the *Portuguefe* to the lignum aloes. See the article LIGNUM *Aloes*.

It feems only a corruption of the monofyllable *Ud*, by which the Arabian phyficians have called that drug; and even this *Ud* poffibly was only a contraction of the orthography of the word *Heud*; which feems to have been the original name of this drug among the Arabs. See the article HEUD.

VEERING, in hufbandry, a term borrowed of the failors, and ufed for the turning two furrows toward each other, as they muft do to begin a ridge; they therefore call the top of a ridge a *Veering*; and they call the two furrows that are turned from each other at the bottom between two ridges, a *henting*, that is, an ending, becaufe it makes an end of plowing ridges.

VEGETABLE (*Cycl.*)— *Vegetables*, according to the analyfes made of them by chemiftry, are diftinguifhable into two grand tribes, the acid and the alkaline; the firft affording a volatile acid, and the fecond a volatile alkali, upon a dry diftillation: thus guaiacum, cedar, box, cinnamon, cloves, forrel, mint, balm, &c. afford an acid; but garlick, leeks, onions, horfe-radifh, fcurvy-grafs, muftard, &c. afford an alkali, which, when rectified, is hardly diftinguifhable from that of animal fubftances, fo as nearly to refemble the fpirit and falt of hartfhorn.

For the analogy between the animal and *vegetable* world. See the article ANIMAL.

Mufcles of VEGETABLES, fee the article MUSCLE.

VEGETABLE *Salt*. In the Philofophical Tranfactions we have fome very curious proceffes and obfervations by Redi, on the fubject of the falts of *Vegetables*. Burn any wood, herb, fruit, or flower to afhes; make a lye with thefe afhes with common water, not heated; filtre this through paper till it is clear as rock-water; then evaporate this lye to a proper degree in a balneum mariæ, in a glafs veffel. This degree of evaporation

tion muſt be carefully obſerved, according as the congelation of the ſalt is intended to be haſtened or retarded. In the common way of evaporating lixiviums of this kind in earthen veſſels over a naked fire, a great quantity of the ſalt is always loſt; part of this is carried off with the vapours raiſed too haſtily in this manner, and part penetrates the ſides and bottom of the veſſel, though it be ever ſo well glazed. The quantity of water neceſſary, is, in moſt caſes, about five pints to two pound weight of the aſhes. After all the ſalt that can be got is extracted by this operation, the aſhes being calcined again in a kiln, will afford more ſalt of the ſame kind, but in a much ſmaller quantity.

The ſalts of *Vegetables* made in this manner, are ſubject to run into water in damp weather, unleſs very carefully kept; but in this, art may be employed, and the running in a great meaſure prevented. Thus, if ſome ſulphur be added to the aſhes, when their burning is almoſt over, and conſumed by burning among them, very little difference will be made in the nature of the ſalts, but they will be more white and cryſtalline, and will keep much better. The proportion of ſulphur is to be in ſome meaſure regulated by the quantity of ſalt the aſhes are known to yield; but on a medium, five ounces of ſulphur is enough to add to a hundred pounds of aſhes. When the *vegetable* ſalts are thus made, they have each their peculiar figure, and this they retain, though diſſolved and cryſtalized again ever ſo often. If two or three of theſe ſalts, thus carefully made, and which have each their determinate figure, be diſſolved together in water, they will each of them ſhoot again ſeparate, and in their reſpective figures, not mixing and forming different figures, as might be expected.

This experiment holds good alſo, not only in theſe ſalts, but in all other kinds, which have naturally their determinate figures: thus, if in a veſſel of water, there be diſſolved together ſome blue vitriol, ſome roach alum, and ſome ſalt petre, the whole liquor will be of a blue colour from the vitriol; but when it is carefully evaporated to a proper ſtandard, the ſalts will all form themſelves again into their own regular and natural cryſtals: the vitriol will be blue as before, but all the reſt, though found in a coloured fluid, will be as colourleſs as at firſt, and each will have its own determinate ſhape. Though the lixivial ſalt of every plant thus treated, have its own peculiar figure, when diſſolved, and regularly ſhot again; yet, as in the ſea ſalt, and ſome other natural ſalts, there appear, on cryſtallization, maſſes of different figures, ſo in ſome of theſe the ſame ſalt will have two or three different figures, all peculiar however to itſelf. Two ſorts of cryſtals have been obſerved in the ſalts of the lettuce, the ſcozonera, the melon, and ſome others: three ſorts in the black pepper, and in the flowers of the red roſe; and four ſorts in the ſalts of the roots of white hellebore.

Beſides this diverſity of figures in many of the kinds of ſalts, there is one kind of cryſtals which run through the ſalts of almoſt all the kinds, in a greater or leſſer proportion: theſe are certain cubic grains or cryſtals. It is probable, that theſe are cryſtals of ſea ſalt, which is a ſalt found mixed among many others, and is naturally of this cubic figure in its firſt or ſimple concretions. It ſeems alſo a general rule, that the different parts of the ſame plant form cryſtals of a different figure; for the leaves of laurel form cryſtals very differently ſhaped from thoſe procured from the wood of the ſame tree; and the figures of the cryſtals in the ſalt of the pulp of a gourd are very different from thoſe of the ſalts made from the rind of the ſame fruit. See Tab. of Microſcopical Objects, Claſs 3.

Many ſalts made from different ſubſtances, have either abſolutely the ſame or very ſimilar figures in their cryſtals. The ſalt of the cucumber has a figure very like that of the ſalt of eye-bright; and the ſame form is obſerved in the cryſtals of orange-flowers, endive, liquorice, and many other plants.

In order to obtain theſe ſeveral cryſtals of the lixivial ſalts, determinate and exact in their figures, and not mixing one with another, it is neceſſary to uſe great caution in the evaporating the lye; for if it be totally evaporated, there remains only a cruſt of ſalt at the bottom of the veſſel, if it be only too far evaporated, though not totally: the ſalts ſhoot into large cluſters, and are never regular and perfect; and finally, if the lye is left too weak, then the evaporation afterwards, in order to the forming the cryſtals, is ſo tedious, that few can have patience to attend to it. Nothing but practice and experience can dictate when to ſtop the evaporation; but when this has been learned, the veſſel is to be taken out of the *balneum mariæ*, and the clear liquor is to be poured out of it into ſeveral ſmall vials. Theſe are to be ſtopped to keep out duſt and moiſture; and, after a time, the ſalts will congeal into cryſtals, which will be fixed to the ſides and bottoms of the vials, in their true and proper ſhapes, and in the likeneſs of rock-cryſtal, as to brightneſs and tranſparency.

Different plants and trees yield aſhes, which are impregnated in a different degree with ſalts. The ſame plants, at different ſeaſons of the year, contain alſo different quantities; and all theſe varieties make it neceſſary to attend carefully to the time of ſtopping the evaporation. It is alſo to be obſerved, that there is a great difference in the quantity of aſhes, to which plants and their flowers and fruits burn, as well as in that of the ſalt they yield; and what is moſt remarkable, is, that theſe have no connection one with the other. There are various inſtances of this kind in Redi's paper; he obſerves particularly, that an hundred weight of orange flowers reduced to aſhes, yielded only four pounds ſix ounces of them, and theſe aſhes only five drams of ſalt: that eight hundred weight of gourds made only four pounds of aſhes; but theſe yielded no leſs than ten ounces of ſalt, while an hundred weight of maiden-hair yielded nine pounds of aſhes, and theſe only four drams of ſalt. A great number of other proceſſes of this kind are mentioned in the ſame place; to which we refer the curious.

It was obſerved, that all theſe ſalts thus cryſtallized, had a purging virtue, from whatever plant they were made; and the ſalt drawn from pomegranate peels, or other aſtringents, is as ſtrongly purgative, as that from the moſt purgative drugs. The doſe in which theſe ſalts are to be taken, is from half an ounce to an ounce diſſolved in warm water; and it is all the ſame thing what *Vegetable* they are made from; the ſharp-pointed cryſtals and the blunt ones having the ſame degree of virtue. Garlick, and the like ſhop *Vegetables*, yield no ſalt at all of this kind. Philoſ. Tranſ. N°. 243. p. 296.

VEGETATION (*Cycl.*)—The great attention of all who ſtudy botany, is at preſent placed on the diſcovery of new plants; but we are yet unacquainted with many peculiarities in the moſt common ones, which may prove not a leſs worthy employment for our thoughts.

The irregularities in the *Vegetation* of the ſeveral parts of plants ſeems a ſubject well deſerving our attention; and Mr. Marchand has laid before us an inſtance of this in one of our moſt vulgar plants, the common garden radiſh.

In the month of July, this gentleman obſerved a plant of this ſpecies, which had accidentally fixed itſelf in an open place, and was then full of flowers and pods. Toward the end of one of the branches, he obſerved a kind of tuberoſity of an oblong ſhape, which looked ſomewhat like one of the pods of the plant, but that it was too long, and was very oddly twiſted and contorted; this daily increaſed in ſize, and in a week was come to its full growth, which was, in the whole, about two inches and a half in length, and three quarters of an inch thick. It was of a very rough and knotty ſurface, and like the reſt of the ſtalk, had ſeveral pedicles of flowers growing on each ſide from it; it terminated in a ſmooth end, divided into three parts, which all turned upwards.

The longeſt of theſe points terminated in a green cartilaginous flower of the ſame ſubſtance with the protuberance which produced it; in this there were all the regular parts of the flowers of the more perfect kind; there were four leaves which ſerved for a cup; four more within theſe, which repreſented the petals; ſix other ſmall bodies there ſtood in the middle of the flower, which repreſented the ſtamina; and among theſe another body which repreſented the piſtil; ſo that, here was in this irregular *Vegetation*, a repreſentation at large of every part of the perfect flower of the radiſh, excepting only the apices; but theſe were all very different in their nature and ſtructure, from their ſimilar parts in the natural flowers, being all of a hard, thick, and tough cartilaginous ſubſtance, and in colour of a greeniſh brown.

The ſhorteſt of the three points which terminated this tuberoſity, had alſo at its end a reſemblance of a flower compoſed of all the parts mentioned in the former, and of the ſame colour and ſubſtance with it, only differing in being a little ſmaller: and the third point had no regular reſemblance of a flower, but was of the ſame cartilaginous ſubſtance, and of a ſemi-circular figure, and had its upper ſurface ornamented with ſeveral irregular protuberances. This irregular *Vegetation* remained in vigour till October, when it gradually faded away, and there was no appearance of ſeeds in any part of it. The radiſh, when its ſtalks are wounded by the pucerons, or other inſects, will often throw out a protuberance of ſome irregular figure; but the reſemblance of flowers in this, was a ſingularity never before obſerved.

To explain this, it will be neceſſary to obſerve, that every organized part of a plant contains in it a number of inviſible ſeminal principles, capable of producing plants like that to which they have owed their origin; and this is a truth of which the ſucceeding inſtances will all bring very familiar and obvious proofs.

The graft of a tree, which from only one ſingle bud, produces a tree like that from which it was taken, certainly acts upon this principle; for the whole tree is quite different from the ſtock on which it is grafted, which ſerves for no other purpoſe but merely to convey to it a proper nutritive juice for the developing its parts.

We very well know, that there are many roots, which being cut into little ſlices of only a quarter of an inch thick, each of theſe will propagate its ſpecies, and ſend up new plants, like that which the root belonged to; and ſome roots being ſplit longitudinally into four quarters, each of theſe will in the ſame manner grow and flouriſh, and ſhoot out roots from one part, and ſtalks from another, ſo as to furniſh perfect plants the ſame year: and how can this be, but by their having been ſeminal points in all theſe pieces and ſections of roots, which being dilated, and put in action by the humidity of the earth, have grown into perfect plants. Several of the bulbous rooted plants produce off-ſets from the ſeveral ſcales of their roots, and from the

fides of their ftalks; thefe in three years time produce perfect plants with their flowers; and what are thefe but fo many feminal points ready upon occafion to be developed.

Nothing is fo obvious, as that the flips, or cuttings of trees, when planted in the ground, produce roots in one part, and buds for branches from another, and fo finally become trees, like thofe from which they were cut; and this, though the piece that is planted, has no vifible appearance of any bud in any part of it.

We alfo know, from daily experience, that many plants fhoot out roots from their ftalks as they grow, and that though this ufually happens in places where there is fome folid fubftance for thefe new roots to faften themfelves to, yet it happens alfo in fome plants where there is no fuch ufe for them; and what are thefe roots in a new part of a plant, but the effect of fo many feminal points, ready to grow both into roots and into branches, in all thofe places.

Among the thick and flefhy leaved plants, as the opuntia, and other of the fucculent plants of the Indies, there needs no more to produce a new plant, but to cut off a part of a leaf, and ftick it into the earth, where it will at once take root, and produce a new plant in a very fhort time. A thoufand other inftances of this kind might be given; but thefe may be fufficient to prove, that there are, in almoft all parts of plants, certain feminal points, which, like the plantula feminalis, inclofed in the perfect feed of each, need only humidity, and a proper degree of warmth, to develop and unfold themfelves into perfect plants.

We are not therefore to wonder at the imitation of perfection in any irregular productions of vegetables, fince it appears that there are numbers of perfect plants contained in every part of a growing plant, of the fame kind. Mem. Acad. Par. 1709.

The perpendicular afcent of the branches and trunks of trees, while their roots are at the fame time running perpendicularly downwards, has been a fubject of admiration to all who have confidered the laws of *Vegetation*; and none feem to have well underftood or explained it, till Mr. de la Hire, in the memoirs of the Paris Academy in 1708. He fuppofes that, in all vegetables, the root is furnifhed with juices of a much thicker and coarfer kind than thofe of the trunk and branches, and that the juices of this part are heavy and denfe; while thofe of the upper parts of the fame vegetable are much more light and fine.

In effect, the root of the plant paffes with all naturalifts as a part analogous to the ftomach in animals, where the nourifhment is digefted, and refined to fuch a degree as is neceffary for its being received into the finer and tenderer veffels of the trunk and branches.

This difference of the juices for the fervice of the different parts of the plant, neceffarily fuppofes a different fhape and fize of veffels for its reception, and, in a word, a different contexture in the parts; and there is no doubt but that this contexture is preferved in its different manner, even in the firft rudiments of the plant or tree, in the feed.

We are therefore to conceive, even in this embryo plant, a fort of divifion between the root and the ftalk; fo that all that is to be on the one fide of that divifion, is to receive a finer juice for its nourifhment, and all that is on the other fide, a coarfer. Now fuppofing that the plantula feminalis, or embryo plant in the feed, be turned the wrong end upwards, in the fowing or placing that feed, fo as to have its root turned upward, and its ftalk downward; yet the veffels of the root being larger than thofe of the ftalk, and confequently capable of receiving coarfer and heavier fluids; thefe weighty fluids muft always bend its tender fibres downwards, though their natural pofition in the feed would point them upward; they will always be bent downward alfo by the greater force, the longer they grow. For, fuppofing the fixed point, already mentioned, to be at firft at any given diftance from the extremities of the roots, and they bending downward, it is plain that, as they increafe in length, they will be of more force, as the arms of a lever are always more powerful the longer they are.

While all this is doing in the root, the communication being open between that and the ftalk, the finer juices are received there, and thefe as naturally throw the ftalk into an erect pofture, as the others bend down the root; fo that, in a few days the whole plant becomes turned right, the fixed point between the root and ftalk having remained unmoved, and all on the one fide of it having conftantly had a tendency upwards, while all on the other had the fame tendency downward.

From this time forward the root pufhes with more regularity downward, and the ftalk upward, than before. There is, however, this great difference in their growth, that the ftalk and branches find no refiftance to their fhooting up, while the roots find a great deal to their fhooting downward, by means of the folidity of the earth, whence the branches advance much fafter and farther in their growth than the roots; and thefe laft, often finding the refiftance of a tough earth unfurmountable, turn their courfe, and fhoot almoft entirely horizontally. Mem. Acad. Par. 1708.

Artificial VEGETATION. Many of the proceffes and operations in chemiftry afford productions, whether of falts or metals, or of whatever other fubftance, which very much refemble plants of one kind or other, whence they have been called *metallic Vegetations*. But though many have been hence induced to believe, that thefe productions were formed in the manner of vegetables, there is not the leaft ground for fuch an opinion from reafon or expriment.

Mr. Homberg, who has treated very accurately of the feveral kinds of thefe *chemical Vegetations*, divides them into three different claffes.

Thofe of the firft clafs are fuch as confift of a pure maffy metal, without the mixture of any foreign matter whatever. Thofe of the fecond clafs are compofed of a diffolved metal, which, though it has concreted afterwards, yet retains a part of the menftruum in it: And the third clafs contains thofe which have no metal in them, but are merely compofed of falts, oils, or earths, or of combinations of thefe.

All the productions of the firft kind are made without the admixture of any liquor, and are merely owing to the force of fire. Thefe are of a firm and folid texture, and may be taken out of the veffels in which they were made, without danger of breaking them. On the other hand, the *Vegetations* of the fecond kind are all formed in a fluid, and are all fo brittle, that they are not to be touched without breaking. Of the third kind, fome are formed, or will fubfift at leaft, in the dry air; others are very tender, and are formed only in fluids, the very ftirring about of which deftroys them.

Examples of the firft kind may be feen in the following proceffes: Make an amalgama, with an ounce or two of fine gold or filver, with fix times the weight of pure mercury revived from cinnabar; break the amalgam to pieces, and wafh it feveral times with river water, till it leaves no longer any colour or foulnefs in the water; after this, let it be dried, and, putting it into a glafs retort, diftil it in a gentle fand heat, which fhould be continued two days. The longer the heat is preferved, before all the quickfilver is raifed and carried over, the more beautiful and perfect will the *Vegetation* be. At the conclufion of the operation, the fire muft be raifed to fuch a degree, as to carry over all the mercury, after which, let the fire go out. All the mercury will be found in the receiver, and all the gold or filver will be left in the retort. It will be foft and pliable, and of the moft beautiful colour the metal is capable of receiving; and from the main mafs, at the bottom, there will be thrown out a number of beautiful branches, of different heights, and differently ramified, fo as to reprefent fhrubs or plants. Thefe may be feparated from the mafs at the bottom, and preferved. They really refemble, with great exactnefs, fome forts of vegetables; but when we confider the fortuitous rife of thefe, and the regular organized bodies of the true vegetables, with their manner of explication from the feed, there is but a very faint refemblance to be perceived between the one and the other.

Another of thefe *Vegetations* of the firft clafs, is this: Melt an ounce or two of pure filver in a crucible, and when it is in fufion, caft upon it, at different times, an equal weight of common fulphur in powder. Stir the whole about with an iron rod, and, taking it from the fire, let it cool. Beat the mafs to powder, and put it into another crucible. Set it in a fmall fire, or in a fand heat, to drive off the fulphur in fumes, without running the metal into fufion. As the fulphur rifes into vapour, it will carry up along with it a part of the filver, above the furface of the reft, in form of fine flender filaments, or flat and thin plates, which will remain fixed at their lower end to the mafs out of which they are raifed, and will be very foft and pliable, and extremely bright and gloffy. The filaments will often rife to two inches high in this procefs, and the flakes or plates will be of the length and breadth of a card ufed in play.

A third *Vegetation* of this clafs is the following: Melt together two ounces of filver, and fix ounces of lead. Put the mixture into a copel under a muffle in a furnace, and give fuch a fire as is neceffary to purify filver by the copel. When the filver appears fine, take the copel out of the fire, and leave it to cool. Soon after it is taken from the fire, there will arife out of the furface fome filaments of melted filver, of the thicknefs of a hog's briftle, and of three quarters of an inch high. They are often larger and thicker than this, and not unfrequently emulate the figure of branches of coral. They are ufually hollow within, and are fixed at the bottom of the mafs of the filver.

Of the fecond clafs, of metallic *Vegetations*, is the famous arbor Dianæ, and the feveral other ramifications of metals after folution. See the article DIANÆ *Arbor*, *Cycl.* & *infra*.

The third clafs, that is, of fuch chemical *Vegetations* as contain no metallic matter, the following procefs gives an inftance: Take eight ounces of falt petre, fixed by coals; fet it in a cellar, and let it run into an oil per deliquium: Filtre this liquor, and pour on it, by a little at a time, as much oil of vitriol as will perfectly faturate it. After this, evaporate all the humidity, and there will remain a compact faline mafs, which will be hard, very white, and of an acrid tafte; powder it grofsly, and pour upon it a fufficient quantity of water, in an earthen veffel; the water will begin to evaporate, after it has ftood uncovered

a few days; and, as this is effected, the falt will vegetate in feveral places into branches; thefe will furround the whole furface of the water, and will continue to form themfelves anew as the water evaporates, till it is all gone; after which they will ceafe; but if more water be added to the falt, they will appear again in all their beauty, as that afterwards evaporates.

Another example of thefe faline *Vegetations* is feen in the branched cryftallizations of falts, naturally produced on the fhore of the Spanifh and other feas, and which may eafily be imitated by art: This is no other than a natural confequence of the fea plants growing on the fhore, being, when their leaves are decayed, crufted all over their branches with cryftals of fea-falt, left by the evaporation of the water, which had been left upon them by the recefs of the fea; this procefs being very frequently repeated on them, every wetting leaves a frefh coat of falt over them; fo that, at length, the whole appears a mere plant of falt. Very beautiful fpecimens of this kind are often met with on the fhores; and may be imitated by art by means of fea-falt diffolved in water, and the folution carefully filtred. But, in doing this, it is neceffary to peel off the bark of the plant which ferves for the mould; for as the bark is ufually brown or green, or of fome colour different from that of the falt, it difcovers itfelf too plainly, and takes greatly off from the beauty of the whole.

A third very fingular inftance which Mr. Homberg gives of thefe *Vegetations* is this: He collected about three pints of rain-water from the bottom of an old wooden trough, in which it had ftood about half an hour, after running down from the tiles of an old houfe. This water had fallen in the time of a tempeft, attended with thunder. He had fet this bottle of water, carelefsly ftopped with a piece of paper, in a window, which looked toward the fouth, where it ftood three months. The water had appeared tolerably clear, when it was firft faved; but, by degrees, as it ftood, there fubfided to the bottom a greenifh fediment, of about a quarter of an inch in thicknefs. There was apparently a fermentation in this matter, and it appeared fpongy and cavernous, and had frequently air-bubbles rifing up from it. In the middle of a hot day, in July, Mr. Homberg obferving this bottle, faw that there was no muddy fediment at the bottom, but only a clear and beautiful green *Vegetation*, part of which had alfo raifed itfelf to the furface of the water, and part remained fufpended, in form of flender filaments, in the middle. The extremity of every one of thefe filaments was furnifhed with a fmall round globule, which appeared white and bright as filver, and refembled a fort of fruit at the top of the branch.. On fhaking the bottle about, the whole *Vegetation* difappeared, and the matter of it blended itfelf among the water in a loofe irregular manner. About ten o'clock the next morning, when the fun began to warm the bottle, the *Vegetations* appeared again in their former fhape, and were only owing to fmall bladders of air which, in their rifing from among the green mud at the bottom, drew up long ftrings of it along with them, and appearing in form of fmall round pearls at the tops of the branches. This appearance continues fo long as the fun fhines upon the bottle; after which the bubbles, and their pedicles, gradually fink together, and lie confufedly at the bottom, till the morning fun of the fucceeding day raifes them again in the fame manner from the bottom to the furface. Mem. Acad. Par. 1710.

The moft beautiful of all metallic *Vegetations* is the *arbor Dianæ*, or filver-tree. A great many proceffes for the making this have been publifhed; but fome of them are not found to fucceed, upon experiment; and others are too tedious to follow. Mr. Homberg gives a fuccinct account of the method by which he ufed to make it, and this is never known to fail. Make an amalgam in the cold, with four drams of pure filver, and two drams of crude mercury; diffolve this in four ounces of aqua fortis; mix this with a pint and half of water, and fet it by in a bottle well ftopped. When there is occafion to ufe it, pour about an ounce of it into a little vial; put into this a piece of the bignefs of a fmall pea of the common amalgama, either of gold or filver, made as foft as butter. Leave the vial to reft for two or three minutes; and in that time there will begin to arife a number of little upright ftalks from the ball. Thefe will vifibly increafe in length every moment, and, foon after, will throw out feveral fide branches. Thus, by degrees, the whole will have the form of a little tree; the ball of amalgama will be of a dead whitifh colour; but the trees will be like the brighteft filver. The whole of this beautiful *Vegetation* will be performed in a quarter of an hour: But it is to be obferved, that the liquor which has ferved once, will not do again.

The matter which forms the tree is not formed by the amalgam put into the liquor; but by the firft amalgam which was diffolved in it, the water added afterwards having fo much weakened the diffolvent, that it is not able to keep the matter fufpended, when there is offered any opportunity for its precipitating; and the mercury, thus diffolved, meeting here with mercury undiffolved, quits the diffolvent, and applies itfelf to it; but that not in its own form of globules, but in fuch fhapes as the mixture of filver, and of the falts of the nitrous acid in the diffolvent, determine it to.

This procefs may be varied a great many ways, as to the thicknefs or thinnefs of the branches, and the flow or fpeedy manner in which they are formed, according to the nature of the liquor, and of the amalgama. The weaker the liquor is, the flower will the branches be formed; and they will, in this cafe, be longer, and fewer in number, and by that means the more imitate a tree. On the contrary, when the liquor is too ftrong, the whole furface of the globule of amalgam thrown into it, will, in a few minutes, be covered with a low and fhort tuft of bufhes; and that water, which is ftrong enough of the folution to produce trees upon a thick amalgam, will not be able to produce any thing upon fimple mercury, and but very little upon a thin amalgam. And, on the contrary, that liquor which is ftrong enough to produce a ramification upon fimple mercury, will, on a thin amalgam, produce only a few fhort bufhes; fome yet lower than thefe will be formed by it on a thicker amalgam, and it will, in fine, diffolve the amalgam.

It appears from the whole, that there is in this nothing of true *Vegetation*, but merely a fimple cryftallization in this form. There is alfo another *Vegetation* formed by cryftallization, without the affiftance of mercury; but it is more flow, and wants the beautiful metalline colour of the laft. It is thus performed:

Diffolve one part of fine filver in three parts of aqua fortis, evaporate half the diffolvent, and add to the remainder of it twice its weight of diftilled vinegar, well dephlegmated; fet this mixture by for a month, and at the end of that time there will be found, in the middle of the vial, a tree, in form of a fir, with its branches reaching up to the furface of the water. This is no other than a cryftallization of the diffolved filver, whofe parts have been thrown into this form by the mixture of the falts of the vinegar with thofe of the nitre. This therefore has not the colour of filver, but is white and tranfparent, in the manner of a genuine falt, and makes a very elegant figure in the menftruum.

A third *Vegetation* of the metallic kind is thus performed: Take a quarter of a pound of common white river pebbles, calcine them two or three times over, quenching them every time in water; after this, beat them to a fine powder, and mix them exactly with twelve ounces of falt of tartar. Melt the whole in a ftrong fire, and let it cool, it will be a vitrified mafs. Powder it, and lay it on a marble in a cellar, it will diffolve into an oil per deliquium: Keep this in a vial; then take any metal you pleafe; diffolve it in aqua-fortis or aqua-regia; evaporate the diffolvent, and there will remain a grey powder. When you have a mind to fee the *Vegetation*, put a fmall piece, about the bignefs of a pea, of this calx into fome of this liquor. In three or four minutes there will iffue out of it a ftalk, which will grow longer and thicker every moment; and finally will fhoot out two or three branches from its fides, and each of thefe, as well as the main trunk, will be terminated by a large round air-bubble.

This is a *Vegetation* extremely different from either of the others. In them the branches were only cryftallizations of the diffolved metal; and the little mafs of matter, thrown into the liquor, furnifhed nothing to them. In this, the whole is owing to the matter thrown in, and is the mere effect of a fermentation. The calx of the metal yet contains fome acids. The alkaline liquor ferments with thefe; the fermentation indeed is but flow, becaufe the metalline particles envelope the acid falts. But as, in all fermentations, there is air difcharged; fo in this air-bubbles are fent upward from the mafs; but the metalline particles rifing with them, detain them, and make their afcent very flow, while they are compelled to draw up a long filament of the metallic matter with them. The metal is foftened during the time of the fermentation, otherwife it could not be thus drawn up with the air-bubbles; but it immediately hardens again, when out of the ftate of ferment, and becomes able to fupport itfelf in the branched form, even when taken out of the liquor it is formed in.

There is another metallic *Vegetation*, which is formed by merely amalgamating a metal with mercury, without the mixture of any acid liquor. Take three or four parts of mercury, purified by five or fix fublimations, and one part of fine gold or filver; make an amalgam without heat; fet this amalgam to digeft for fifteen days in a flow heat, in a matrafs hermetically fealed; the amalgam will in this time harden, and all its furface will be covered with branches and trees, fome of them rifing to an inch high; the quantity of mercury muft be nicely adjufted in this experiment, for otherwife there will be no *Vegetation*, whether the quantity be too much or too little; and if the veffel be not perfectly clofed, the procefs will fail, though the quantities and the degree of fire have been ever fo well obferved. This *Vegetation* is only made by the fire heating the mercury, and raifing it, in order to its flying off; in which rifing it lifts up parts of the metal with it, and leaves them in that pofture, in the forms of trees and plants. Mem. Acad. Par. 1692.

VEGETATION *of Salts*, a name given by Mr. Petit, of the academy of Paris, to the concretions which falts form, after folution in water, when fet in the air to evaporate.

Thefe concretions always appear round the furface of the liquor, affixed to the fides of the veffel, or arifing above its top, and

and are very different in the different falts, and in moft of them very beautiful.

This gentleman acknowledges that the obfervation was owing to accident; for having fet out feveral fmall veffels full of folutions of falts, in order to obferve the progrefs of their *Vegetation*, he was greatly pleafed and furprized to find this remarkable accident attending them. The firft falt he obferved it in was nitre; but foon after, finding that the folution of fal armoniac did the fame, and that with different-figured concretions, the figures which the reft would affume appeared to deferve an enquiry. He chofe to call thefe figures, not before obferved, *Vegetations*, in the language of the chemifts; not that he fuppofed them to be produced as plants, by a regular afcent of juices, but merely by appofition of faline particles one to another. Thefe are all properly of the third clafs of the chemical *Vegetations*, according to Mr. Homberg's diftinctions.

The feveral falts he chofe to experiment upon, were refined falt-petre, fal prunellæ, fal armoniac, fea-falt, fal ex duobus, or the impregnation of the caput mortuum, left after the diftillation of aqua-fortis, &c.

Thefe falts were diffolved in the feveral following liquors; common water, lime water, white wine, red wine, fpirit of nitre, fpirit of falt, fpirit of vitriol, oil of tartar per deliquium, fpirit of falt, and the volatile fpirit of urine, and mixtures of oil of tartar per deliquium, with fpirit of vitriol, and with fpirit of nitre.

Salt-petre, diffolved in common water, produced *Vegetations* refembling the rugged points of rocks; and the more the water is faturated with this falt, the more beautifully the *Vegetations* are formed: For this purpofe, one part of falt may be diffolved in three parts of water, in warm weather; but in colder weather the proportion of the water muft be increafed to four times, or four and a half, the quantity of the falt.

Salt-petre, diffolved in lime-water, affords the fame *Vegetation*; but the points are finer, and the whole bodies of the concretions fmaller. Wine diffolves a fmaller quantity of falt-petre than water; and though the *Vegetations* are fmaller from this folution, yet every particle compofing thefe is granulated in manner of the furface of a mulberry; and the whole concretions refemble fome of the botryoide mineral bodies in miniature, or grapes thick fet upon the bunches.

Spirit of nitre, and oil of tartar, being mixed together to the point of faturation, and the falt formed by this diffolved in a quantity of water juft fufficient for this purpofe, and the folution expofed in a glafs or earthen veffel to the fun, there are formed concretions of the fame kind with thofe of the common falt-petre diffolved in water, except that they are more fine and more ramified. It need not appear wonderful, that this mixture fhould produce the fame concretions with pure nitre, fince it is well known, that true and proper nitre is the refult of it.

An ounce of crude fal armoniac being diffolved in three ounces of common water, and expofed to the fun, there form, upon the edges of the veffel, *Vegetations* more thick and lefs pointed than thofe from nitre, and more refembling rude maffes of flints thrown confufedly one upon another. This folution being fet out in veffels of tin, the appearances are much altered, the concretions are all of a roundifh figure, and are covered on their outfides with numbers of fine points.

The fame falt, diffolved in lime-water, produces a different fort of concretion; thofe in glafs veffels are compofed of round heads, befet with feveral tolerably large points; and in veffels of other kinds, the concretions vary a little, but always keep the fame general form.

Spirit of falt, and fpirit of urine, mixed to the point of faturation, and expofed in earthen veffels, produce concretions very little differing from thofe of fal armoniac, when they are nicely examined; on a carelefs view, however, they appear very different, the feveral granules they are compofed of being much fmaller than in the common folution of that falt.

It is not ftrange that this mixture produces thefe concretions, as well as the fimple folution of fal armoniac, fince this mixture produces a true and genuine fal armoniac.

Sal armoniac diffolved in white or red wine, and expofed, produces, inftead of thefe roundifh concretions, a fort of oblong ones, fomewhat irregular in form, and granulated all over their furfaces, in the manner of a mulberry. Thefe are faftened to a fort of tails, and by this means are made to refemble, upon the whole, clufters of grapes. This might give perfons of warm imaginations an opinion, that the wine was fhewing itfelf again in the form of the grape, whence it was made; but it is to be obferved, that the flowers of fal armoniac, which rife in the diftillation of the volatile fpirit with falt of tartar, being diffolved in water, produce the fame grape-like clufters. And the common fal armoniac, diffolved in an impregnation of the caput mortuum of aqua-fortis, affords the fame grape-like concretions as when diffolved in wine.

The concretions of thefe falts will form themfelves in the fhade, but they are always much more beautiful when the veffels have been expofed to the fun; they are alfo much fooner formed by affiftance of the fun's heat: It will take a month at leaft to produce good *Vegetations* of either in the fhade; but in the fun, a week, or, at the utmoft, ten of twelve days, will be found fufficient. There are many folutions of falts, however, which have no occafion for the fun's heat to form them. Of this kind are the following:

A mixture of fpirit of vitriol, and oil of tartar per deliquium, being made up to the point of faturation, add fo much water as will be fufficient to diffolve the falt precipitated to the bottom of the mixture; if this folution be fet to *vegetate*, the concretions will form themfelves into a fort of little bufhes: Thefe are very beautiful; but fo many accidents muft concur to their formation, that they will not always appear, even from the fame quantities of the ingredients, managed feemingly in the fame manner.

One of the moft ready and moft beautiful of all the faline *Vegetations*, is that formed by a folution of the falts in the caput mortuum of aqua-fortis, with common water. If a pint of water be put to half a pound of this caput mortuum, and the whole boiled together, that the falts may be diffolved, and the liquor afterwards filtrated, and expofed in an earthen veffel, there will be formed, in about eight and forty hours, *Vegetations* wholly like thofe from the mixture of fpirit of nitre and oil of tartar, except that thefe from the caput mortuum are more ramified and more beautiful. When the folution is expofed in a glafs veffel, they form themfelves on the furface into very beautiful figures of trees, fhrubs, and bufhes; and this not only on the furface, but on both the infide and outfide of the glafs. Thefe can be compared to no known concretions, except to the *Vegetations* of iron, defcribed by Mr. Lemery; they differ indeed in nothing from thefe, but that the *Vegetations* of the metal are of a brownifh colour, whereas thofe of the falt are white.

This impregnation fucceeds beft in dry weather, for in a moift feafon the *Vegetations* form themfelves more flowly, and are much lefs beautiful. Glafs veffels are alfo effential to the *Vegetations* being formed in their greateft beauty; they are never nearly fo beautiful in earthen ones; and even in the former the *Vegetations* fucceed much better in fome forts of glafs, than in others. The caput mortuum of aqua-fortis alfo is very different, from the different diftillations; and all of it does not fucceed alike in this *Vegetation* of the falt. That which looks lighteft, and of the reddeft colour, feems the beft for this purpofe. An impregnation of this caput mortuum in red wine, produces no *Vegetations*, but only forms a cruft with fmall eminences on the fides of the veffel; and falt-petre, diffolved in the impregnation of this caput mortuum in water, produces a much more beautiful *Vegetation* than that of faltpetre alone; but at the fame time much lefs beautiful than that of the impregnation alone. Sea-falt, diffolved in the fame impregnation, fometimes will produce beautiful *Vegetations*, but fometimes only a rough cruft. Common rough falt-petre forms no *Vegetations*, but only crufts over the veffel, as is the cafe with the folutions of many of the metals in different acid menftruums. And the fame is the cafe in regard to many falts from which it might be natural to expect concretions of this kind. Memoirs Acad. Par. 1722.

VEGI, or UGI, the names given by the Arabian phyficians to the acorus. Thefe writers feem not to have been acquainted with the plant itfelf in its growing ftate, but only to have known that part of it which was ufed in medicine in their time; but the Greeks defcribe the plant in fome fort.

Serapion mentions the *Vegi* or *acorus* as a medicine; but he quotes no one Arabian who has named it, but tranfcribes his account of it from Diofcorides; and Avifenna fays it is the root of a plant much refembling the alburdi, that is, the paper-reed of the river Nilus. Avifenna adds, that the acorus grows only in wet places; and the old manufcripts of Diofcorides have the epithet *papyraceum* for the *acorus*, though imperfectly expreffed; and thence probably this author took the hint of refembling it to the paper-reed.

VEIENTANA *Gemma*, in natural hiftory, the name of a gem defcribed by Pliny, and faid to be found in Italy; he fays it was black, but furrounded with a circle of white; it was probably a ftone of the camea kind.

VEIN (*Cycl.*)—*Pulfations of the* VEINS. The pulfations of the arteries are well known; but though no fuch motion be natural to the *Veins*, yet there have not been wanting inftances in which a morbid ftate has been able to produce them. The pulfations of the arteries anfwer to the motions of the heart, that throws the blood into them; but when this fluid has once got into the *Veins*, it ufually returns through them to the heart again in an uniform and equable motion; and this is not only the cafe in the human body, but alfo in other animals, whether they be in health or in ficknefs. One of the inftances in which the contrary has been obferved, and where the *Veins* have had a pulfation, is a cafe related by Mr. Homberg to the Paris Academy. The patient was a lady of about thirty-five years old, afflicted with a grievous afthma, a pain in the head, a continual want of reft, and terrible palpitations of the heart.

On opening her body after death, the heart was found of twice its natural dimenfions, its cavities very large, and its fides very thin; and in each trunk of the arteries there was a flefhy polypus fixed to their internal furface. That in the trunk of the

the aorta was found to be two foot long, and plainly of a fibrous fleshy substance, for six or seven inches of its length; but from that downwards, it became only like clotted blood.

At the time that this lady was most violently afflicted with her asthma, the veins of her arms and neck were plainly perceived to have a pulsation wholly like that of the arteries, and plainly followed the motion of the heart: She had, in the latter time of her life, usually two of these fits in four and twenty hours; and when they were over, the pulsations in the *Veins* ceased. Mem. Acad. Par. 1704.

VEINS *of plants*, a term used by Dr. Lister, to express certain vessels in plants, which are analogous to the *Veins* of animals, and have been observed in some degree, by the naturalists of almost all ages, though differently described by authors. Pliny has described these parts of a plant under the names of *venæ* and *pulpæ*; and Dr. Grew calls them *fibres* and insertments on the ligneous body, interwoven with that substance which he takes to be the cortical body, that is, the several distinctions of the grain. This author also calls them the pores of the ligneous body; but that they are not merely such, may be plainly seen in cutting off a transverse piece of the stalk of some large wild plant, as the great wild angelica, or the like. In the cut stalk of this plant, the *Veins* every where shew themselves to be distinct from fibres, observable in the parenchyma of the same cortical body with themselves, the milky juice always rising beside the fibres not in any fibre: also in a transverse cut of the root of the common burdock, the like juice springs on both sides of the several radii of the woody circle, that is, in the cortical body, and the pith only.

Again, where there is no pith, there is none of this juice to be observed, and consequently none of these *Veins*, as in the roots of plants, and trunks of trees, but even in the bark of either. The sphondylium, the cicutaria, and many of the thistle kind, are instances of this. Dr. Grew describes pores in the cortical body, and pith; but these vessels are not of the number of the things designed by those pores; these pores are extended by the breadth of the plant; but the pores of this juice are extended lengthwise. The pith of a dried fennel stalk will shew these very beautifully, and with due care, they may be traced all along the whole length of that pith.

It remains therefore, that if these are pores, they must be of those pores of the cortical body, that are supposed to be extended the length thereof; but it is much more proper to call them *Veins*, or vessels, analogous to those of the human body, and covered with their proper membranes; for they are to be found in the pith, and sometimes in the cortical body of the plant, not included within the common tunicle of any fibres, but having their own proper membranes; which indeed, if they had not, the porous and spungy parts of the pith and cortex would be in all places filled alike with the juice; but on the contrary, it is found to rise in a few set and determinate places only, that is, according to the disposition and order of the vessels. If a ligature be made on the trunk of the spurge, and the trunk wounded, the juice bursts immediately out in large quantities; but if not wounded, none is discharged by means of the ligature: now the exterior part of the trunk of these plants is allowed by all observers to be perforated in almost innumerable places; and therefore, if this milky juice were not contained in its peculiar vessels, there is nothing to hinder, but it should rush out at these pores on the ligature made above; but it is evident, that it does not do this till the containing vessels are wounded.

The juices of plants are probably then all contained in these *Veins*, or distinct and proper vessels, covered with their own membranes, and not loosely distributed through the substance of the plants. Those things which are essential to *Vegetation*, are alike allotted to all plants; and it is to be supposed, that all plants have these vessels, though we cannot alike distinguish them in all. Those plants, whose juices are white or yellow, or of any other colour different from that of the body of the trunk, are always distinctly seen, pouring out those juices at separate holes in a wound. Those whose juices and stalks are of the same colour, do not so readily shew them; but there is a time, when they are, in some parts of these plants, if not in all, sufficiently plain to the naked eye.

The tender shoots of the greater and lesser maple, in May, are full of a milky juice, which is the known liquor of these *Veins*; and if a clean knife-blade be applied to a transverse cut of a young shoot of elder, and then raised gently away, the liquor of those *Veins* will be drawn up into strings, answering to the orifices of the *Veins* made by the wound. The pedicles of the leaves of our garden rhubarb, frequently shout out a fort of white and transparent gum: this must be an accidental exsudation of a gum, very constantly contained in the *Veins* of the plant, though not distinguishable in these stalks: this, and many other like instances, prove the existence of such vessels, though they are not obvious to the eye; and there remains no doubt but they are to be found in all plants by some trials. Even the mushrooms, the lowest class of plants, are not destitute of these vessels; there is one which shews them very evidently, this is the wood mushroom, whose stalk, when broken, or cut, discharges a milky juice, as hot as pepper, or more so; and this does not exsudate from the whole spungy substance of the stalk, but is plainly discharged from the mouths of certain wounded vessels.

The primary use of these *Veins* is certainly to carry the nutritious juice of plants; and this appears plainly in that where they are not, there is no vegetation, as is seen if an engrafted branch or arm is bared, or the clay stripp'd off; in this case, all the course of the vegetation will appear to have been made only by the bark, the wood having had no share in it. The bark is the place where these *Veins* lie, not the wood; and therefore, it is no wonder that the vegetation, if dependant on these *Veins*, is carried on only where these *Veins* are. The vegetable drugs of our shops are all of this nature, the juices contained in these *Veins* being evidently what give them their virtue. Phil. Trans. N°. 79.

VEIN, among miners, is that space which is bounded with woughs, and contains ore, spar, canck, clay, chirt, croil, brownhen, pitcher-chirt, cur, which the philosophers call the mother of metals, and sometimes full of all colours. When it bears ore, it is called a *quick vein*; when no ore, a *dead vein*. *Houghton*'s Compl. Miner, in the Explan. of the terms.

The *Veins* of Mines differ greatly from one another in depth, length, and breadth; some stretch obliquely, from the surface toward the central parts of the earth; and these the miners call deep *Veins*; others lie shallow, and circular, so as to encompass a large space; and these are termed spreading *Veins*; others possess a great part of the space they lie in, both in length and breadth; and these are called accumulated *Veins*, being no more than a space possessed by a large group of fossils of one kind. To give the compleat history of *Veins*, and fibres which are smaller *Veins*, their differences, their directions, their interstices, their discontinuations, their risings and fallings, and their goodness, would be a large work. Let it be observed, however, that these things seem all to proceed in a certain order, though that order, and the laws and rules of it, are not perfectly understood, so as to afford sure directions for practice; whence it sometimes happens, that after a *Vein* has been successfully traced for some time, it dips, breaks off, or takes a different course, leaving the workmen as it were at a fault.

When the *Vein* is found, a pit is to be sunk upon it, and a crane fixed at the top of the pit for craning up the ore. Burrows, or adits, are also to be cut horizontally through the hill in one or more places, reaching to the mine, and serving to wheel out the ore, instead of craning it up. *Shaw*'s Lectures, p. 246.

The manner of digging varies according to the nature of the *Vein*. If this be soft, it is dug with the spade, and turned out into wooden trays, placed to receive it. If the *Vein* be harder, it is to be knocked out with the hammer and chissel. If it be too hard for this method, they soften it by fire, which makes all stones brittle; but the most expeditious of all mine working, is that by gunpowder, which tears up, and breaks to pieces vast rocks in a moment.

VELITIS, in the natural history of the antients, the name of a peculiar sort of sand used in the making glass.

The antients, in their different ages, made glass of different materials. These, however, were principally thin natrum, which was, in most respects, the same thing with our alkali salts used in glass-making, mixed with flints, shells, or sand. Sand was the most universal mixture; and for this purpose, they always chose such sand as was found washed clean on the banks of rivers; and this they therefore called glass-sand, or *Velitis*, or *hyalitis*. *Hill*'s Theoph. p. 11.

VELLA, in botany, the name of a genus of plants; the characters of which are these: The perianthium is of a cylindric figure, and erect, and is composed of four slender and obtuse leaves, which fall with the flower; the flower is composed of four petals, and is of the cruciform kind; the petals are of an oval figure, and of the length of the cup; the stamina are six filaments of the length of the cup, only two of them are a little shorter than the other four; these two stand opposite to one another; the antheræ are simple; the germen of the pistil is oval; the style is conic; the stigma is simple; the fruit is a globose, cristated, pendulous pod, containing two cells, divided by a membrane, twice as large as the pod itself, and of an oval figure; the seeds are roundish. *Linnæi* Gen. Plant. p. 317.

VELLIA, in zoology, a name used by some authors for the *lanius minor*, or *lanius tertius* of Aldrovand, called in England the *flusher*. *Ray*'s Ornithol. p. 54. See the article FLUSHER.

VELOCE, in the Italian music, is used for quick.

VELOCISSAMENTE, or VELOCISSIMO, in the Italian music, is used for very quick, or with great rapidity. It is seldom met with; *presto*, or *prestissimo*, being mostly used in its stead. *Brossard*.

VELOCITY, (*Cycl.*) — In the doctrine of fluxions it is usual to consider the *Velocity* with which magnitudes flow, or are generated. Thus, the *Velocity* with which a line flows, is the same as that of the point, which is supposed to describe or generate the line. The *Velocity* with which a surface flows, is the same as the *Velocity* of a given right line, that, by moving parallel to itself, is supposed to generate a rectangle, always equal to the surface. The *Velocity* with which a solid flows, may be measured by the *Velocity* of a given plain surface, that

that by moving parallel to itself, is supposed to generate an erect prism, or cylinder, always equal to the solid. The *Velocity* with which an angle flows, is measured by the *Velocity* of a point, supposed to describe the arc of a given circle, which subtends the angle, and measures it. See *Mac Laur.* Fluxions, B. 1. ch. 1.

All these *Velocities* are measured at any term of the time of the motion, by the spaces which would be described in a given time, by these points, lines, or surfaces, with their motions continued uniformly from that term. *Mac Laur.* ibid.

The *Velocity* with which a quantity flows, at any term of the time, while it is supposed to be generated, is called its *fluxion*. See the article FLUXION.

VELVET (*Cycl.*)—*Colour of black* VELVET: The manner of giving this deep and fine colour to glass, is this: Take of crystalline, and pulverine frit, of each twenty pounds, of calx of lead and tin four pounds; set all together in a pot in the furnace, well heated; when the glass is formed and pure, take steel well calcined and powdered, scales of iron that fly off from the smith's anvil, of each an equal quantity; powder and mix them well; then put six ounces of this powder to the above described metal while in fusion; mix the whole thoroughly together; and let all boil strongly together, then let it stand in fusion twelve hours to purify, and after this work it. It will be a most elegant *Velvet* black.

There is another way of doing this, which also produces a very fair black. It is this: Take an hundred weight of rochetta frit, add to this two pound of tartar, and six pound of manganese, both in fine powder; mix them well, and put them to the metal while in fusion, at different times, in several parcels; let it stand in fusion after this for four days, and then work it. *Neri's* Art of Glass, p. 95, & *seq.*

VELUM, in ecclesiastical writers, the same with what is otherwise called *brandeum*. See the article BRANDEUM.

VELUM *quadragesimale*, a veil, or piece of hangings, antiently drawn before the altar in *Lent*, as a token of mourning and sorrow. *Blount.*

VENABULUM, in antiquity, a long kind of spear used in hunting wild beasts. *Hofm.* Lex. Univ. in voc.

VENCU, in botany, the Chinese name for an excellent fruit found in that country, which the Portuguese call *jamboa*, and the Dutch *pompelnioes*: It grows on prickly trees, like the limon-tree, only larger. Its flowers are white, exactly the same in shape with those of the limon, and have an exceeding sweet smell; a very fragrant water is distilled from them. The fruit itself far exceeds the citron in bulk, being in size equal to, and sometimes exceeding a man's head. The rind is like that of the golden rennet; the pulp is of a reddish colour, and its taste partakes of sweet and acid, resembling that of grapes not fully ripe. A liquor is pressed from it, as in Europe, from apples, pears, &c. It will keep for a whole year. *Hofm.* Lex. Univ. in voc.

VENDITOR *regis*, the *king's salesman*, or person who exposed to sale, goods and chattels seized or distrained to answer any debt due to the king. This office was granted by king Edward I. to Philip de Lardimer, in the county of York, *Ita quod ipse, vel certus suus attornatus, ibit ad mandatum vicecomitis de loco in locum infra com. præd. sumptibus suis ad venditiones faciendas, & capiat de unaquaque venditione pro feodo suo* xxxii. Den. but the office was seised into the king's hands for the abuse thereof. Anno 2 Ed. 2. *Blount.*

VENENUM *cocci*, a term used by many of the antients for the purple tinge, which the kermes berry, as it is usually called (see the article KERMES) gave to linnen, or other things.

The word *Venenum* being generally understood to express poison, it has been supposed by many, that the kermes was esteemed poisonous, or that there were two sorts of this drug; the one a harmless medicine, and the other poisonous. But there is no warrant for this in any of the old writers, and the whole seems indeed but a mistake about the sense of the word *Venenum*, which we find by many passages of the best authors, signified a stain, as well as a poison.

The antients called the vestments dy'd scarlet with the kermes indifferently, by the names of *flammeæ*, or *venenatæ*. Servius tells us, that in certain sacred ceremonies, it was necessary that the priest should be clothed in a scarlet robe; and he uses the word *venenato* to express it in some places, and *flammeo* in others.

VENER, one of the many names by which the chemists call Mercury.

VENEREA *concha*, in natural history, the name of a very large and elegant genus of shells, more usually called the *porcellanæ*. See the article PORCELLANA.

VENETA *bolus*, a fine red earth used in painting, and called in the colour-shops *Venetian red*.

It is improperly denominated a bole, being a genuine species of red ochre. It is of a fine bright, and not very deep red, approaching, in some degree, to the colour of minium, or red-lead, and is moderately heavy, and of an even and smooth texture, yet very friable, and of a dusty surface: it adheres firmly to the tongue, is very smooth, and soft to the touch, easily crumbles to pieces between the fingers, and very much stains the skin in handling. It has a slight astringent taste, and makes no fermentation with acids.

It is dug in Carinthia, and sent from Venice into all parts of the world, being an excellent colour, and very cheap; our colour-men, however, find too many ways of adulterating it. *Hill's* Hist. of Fossils, p. 59.

VENISON, *Cycl.*—The old huntsmen have determined, that every beast of the forest, that is food for man, is *Venison*. In many parts of the world, the bears are as regularly hunted, as the hare and buck, &c. are with us, and there are called *Venison*; but with us, at present, the word *Venison* seems limited to the flesh of the hart, the hind, the buck, the doe, and the other creatures of that kind.

Some have extended the signification of the word to the beasts of the forests, which were chased as game, and afforded the diversion of hunting, whether their flesh were eaten or not; thus, in some places, the wolf and the fox are reckoned among the *Venison* beasts. See the article FOREST.

VENOSA *arteria*. See the article ARTERIA *venosa*.

VENOSE *Leaf*, *Venosum folium*, among botanists. See the article LEAF.

VENTININA, a term used by Paracelsus and his followers, to express the art of divining, or knowing by the winds and their courses, the good or ill effects of seasons.

VENTRICULUS *succenturiatus*, in medicine, a name given by some to the duodenum, when very large. Medic. Ess. Edinb. abridg. Vol. 2. p. 34.

VENUS (*Cycl.*)—A smaller star having been observed by Mr. Short near *Venus*, which had the same phasis as that planet, has given some suspicion of its having a satellite. See Phil. Trans. N°. 459. sect. 23. where it is said, that M. Cassini, in his Elemens d'Astronomie, mentions a like observation.

VER-*puceron*, in natural history, a name given to a kind of insects which are fond of eating the *puceron*, and destroy them in vast numbers. See the article PUCERON.

They are thus called, as the ant-eater is, *formica leo*, from their destroying great numbers of them.

These *Ver-pucerons* are a sort of worms produced from the eggs of flies, and are of two principal kinds; the one having legs, the other none.

When we observe the vast number of young produced by every puceron, and the quick progress they make in their multiplication, we are apt to wonder, that every plant and tree in the world is not covered with them; but on the contrary, when we observe the devastation these devourers make among them, we are apt to wonder how any of them escape at all, to perpetuate the species. These worms indeed seem created for no other purpose but to destroy them; and this they do in so violent a manner as is scarce to be conceived. As the flies of many kinds lay their eggs on meat and other substances, which they know will afford food for the young ones, when hatched from them: so the parents of these worms lay their eggs on the branches and leaves of trees loaded with pucerons, on which they know they will feed. The worms produced from them are devourers from the very instant they are hatched, and find themselves placed in the midst of prey, being every way surrounded by a nation of creatures which are their proper food, and which are furnished with no weapons, either offensive or defensive, and which never so much as attempt to fly from them, but seem wholly ignorant of their danger, till seized upon by the devourers. *Reaumer's* Hist. of Insects, Vol. 6. p. 111.

These worms are very large in proportion to the pucerons, the difference not being less than that between the lion and the smallest quadruped. Their figure is varied at pleasure; but seems, in its most natural state, to be much larger at the posterior part than at the anterior; the posterior part also usually remains fixed, while the other is twisted about various ways; but the creature can, at its pleasure, shorten the body, by drawing in the several rings, and then it appears of an oval figure.

These worms are of different colours, and different species; those which are found on the elder are green, with a white ray down the back; those on the sloe and gooseberry-tree are whitish, variegated with yellow undulations. Other species are of a pale yellow, others of a somewhat deeper yellow, with two streaks running down their backs of a bright chesnut colour, between which there is one black one. Some have reckoned these several species among the caterpillars, but very improperly, as they have no one character of this kind, but every way resemble the worms or maggots, produced from the eggs of the common flies. These creatures have at their head a dart of a brown colour and hard substance, ornamented with two smaller points at the base, so that it represents, in some degree, a flower-de-luce: this is the weapon with which they destroy the pucerons, and this they either draw back within the head, or thrust out at pleasure. The mouth of the creature is placed under this dart, but is not easily discovered, the creature usually keeping it very closely shut; there are times however, when the creature is seen bending its head down several times towards its belly; and if the anterior and under part be then examined, the place of the mouth will be distinguished by means of a yellowish liquor which it throws out of it.

All these worms have two stigmata or apertures for the receiving air at the hinder part of the body. These are very distinctly

ſtinctly ſeen, and are either round protuberances, placed at the two ſides of the upper part of the ring; or two tubes or cylinders, either ſo placed or joined together, and elevated above the reſt of the ſurface. They have alſo two ſtigmata near the head; theſe are called anterior, as the others are poſterior; but theſe are ſmaller than the others, and have been generally overlooked by authors. There are ſeveral ſpecies of theſe worms that are hairy, and ſome are prickly. One very ſingular ſpecies is ſo much ſo, that it reſembles a hedge-hog; it is of a greeniſh white colour, but has three lines running along the back, compoſed of three ſeries of ſpots, thoſe of the middle line being black, and thoſe of the others brown. The ſpines or prickles upon this ſtand in the number of ten or twelve on every ring, and are all hooked, and have their points turned toward the hinder part of the body. They only are placed on the back and ſides, the belly being perfectly ſmooth. See Tab. of Inſects, N°. 24.

Theſe creatures have no legs; there are indeed certain fleſhy eminences on the under part of the rings of ſome of them, which aſſiſt them in walking; but their common method of moving is by fixing their head to any part, and then drawing the reſt of the body to it. This creature, however, has very little occaſion for motion; its whole buſineſs, in this ſtate, is to eat, and its parent has ſo placed it, that it need not hunt its food ſingly, like other creatures of prey; but it finds itſelf every way ſurrounded with the creatures it is to feed upon, and touched by them before, behind, and on every ſide; nay, they often walk upon its back without any apprehenſion of the danger: They remain in their places till he has cleared them away, by eating them; and when he has devoured all within his reach, it is then only that he need move his quarters, and that but a little way; for he ſeldom has farther to go than to the fartheſt place his head could reach, while he remained fixed in the former place. *Reaumur*'s Hiſt. Inſ. vol. 6. p. 117.

The way to ſee him eat, ſo as to diſtinguiſh the manner of it, is to keep one a few hours without food, and then placing him on a paper, or on the hand, and placing ſome of the pucerons about him, the manner of his feeding on them will be ſeen. It appears evidently that he has no eyes, for he tries to find them only by feeling, ſtretching out his head, and trying every where with it, before, behind, and on every ſide, while his hinder part remains fixed. As ſoon as he perceives a puceron, he darts his triple weapon into it, and ſticks it juſt as we do a mouthful of meat upon a fork; he then draws back the dart into the firſt ring, and that ring into the ſecond, and then uſes his mouth, which has a kind of trunk, with which he ſucks the juices of the puceron.

When the *Ver-puceron* is of the white, or otherwiſe pellucid kinds, it is a very ſurpriſing ſight to obſerve the manner of the feeding, which is clearly ſeen through the ſkin. The puceron being drawn into the ſecond ring of the body, there is ſeen juſt below that an oblong body, which is, at times, darted up to the body of the puceron, and down again from it. The movements of this are very ſwift, and the ſpace of reſt between them but ſhort. This is a ſort of pump, which ſucks in the parts and juices of the animal, and delivers them again to the œſophagus or ſtomach, placed behind it. During the ſhort ſpace of reſt, we ſee it diſtinctly diſcharge from its hinder part what it had before received from the animal, into this paſſage. This is ſometimes only its juices, which look like ſmall bubbles of air, and ſometimes a great number of little roundiſh granules, which are evidently the embryo pucerons, with which we know the body of all the grown ones to be loaded, all the pucerons being breeders.

When the worm is hungry it feeds very voraciouſly, when not ſo, it eats more at its leiſure. The ſkin of the puceron is always thrown out of the mouth, as ſoon as its juices and entrails have been ſucked, and it then looks perfectly like the exuvia, which the pucerons naturally throw off when they change their ſkins. The worm will ſuck one of theſe creatures thus dry in leſs than a minute, and then loſes no time, but throws it out, and immediately ſeizes another. In this manner Mr. Reaumur ſaw one worm eat twenty of theſe creatures in twenty minutes, and ſuppoſes that he continued the ſame ravage long afterwards; for having put him among an hundred pucerons, there was not one left after two or three hours.

When the worm is placed at its eaſe among vaſt quantities of them, it does not eat ſo very quick, but ſeems to amuſe itſelf by eating one in two or three minutes. This manner of feeding, however, deſtroys prodigious numbers, for they ſeldom reſt, but are almoſt continually at it; and it is hard to find one of them, at any time, without a puceron in its mouth. So that a branch of elder, which is covered on every part with theſe animals for four or five inches, ſhall be found wholly cleared in three or four days, by only three or four of theſe worms. *Reaumur*'s Hiſt. Inſ. vol. 6. p. 127.

The pucerons are never free from their enemies; there is no place where they are ſeen in any conſiderable number, where theſe worms are not alſo found; and their ſecureſt retreats do not preſerve them. The bladders of the elm, and other trees; the galls of the leaves and pedicles of the poplars, and the folded leaves of the ſame trees, which are all inhabited by the pucerons, are all ſubject to be viſited by theſe worms alſo. They do not always immediately make their way into them; but as ſoon as one of the winged pucerons has eſcaped out of the place, the hole at which he came out, lets in one of theſe worms, which ſoon deſtroys all the remainder of the family. Another great misfortune to theſe poor creatures, is, that the worms are not confined to any one ſpecies of them, but eat all indifferently.

The anus of the worm is placed in the fold of the two laſt rings of the body, and is almoſt continually voiding a blackiſh liquid excrement.

Theſe worms, when full grown, are greatly an over-match for the pucerons; and it is odd to obſerve the young worms in their attacks upon them. A worm juſt hatched, and not a third part ſo big as the puceron, will immediately, however, attack any one that is next it: The puceron, feeling itſelf wounded, will immediately run away; but the worm keeps its hold, and, raiſing its body by the head, ſticks to the puceron, and even kills and ſucks its juices while it is carried away. When it has done with this, it gets upon another, and ſo on, till it grows and gains ſtrength and ſize enough to reſiſt the force of the puceron, in endeavouring to carry it away, and then fixing itſelf by the tail among the heaps of them, it feeds at pleaſure. When it has eaten till it has arrived at its full growth, the time of its transformation into the fly ſtate approaches: It then ceaſes to eat, and crawling along the leaf or ſtalk of the plant, ſeeks out a proper place where it may be at reſt during its cryſalis ſtate.

When it has pitched upon the place, it begins to void the viſcous liquor before-mentioned in great quantity from its mouth. It extends this over a ſpace equal to its body, and then placing itſelf on the place, it becomes fixed there, and moves no more. It draws back its head, and the ſkin of the whole body hardens ſo as to form a ſhell, under which it paſſes the cryſalis ſtate. In this ſtate it makes a very beautiful appearance; for the ſkin, though become as hard as horn, yet has loſt nothing of its tranſparence, but, on the contrary, has gained a yet greater degree of it; and the nymph of the fly is ſeen clearly within it, the motion of the heart being very diſtinctly viſible.

After this, as the nymph grows every day more and more perfect, the eyes, the antennæ, and the ſeveral other parts, may be diſtinctly ſeen: And this indeed would prove the beſt of all ſubjects to convince thoſe who ſuppoſe, that maggots are ſuddenly changed into flies, and caterpillars into butterflies, of the error of their opinion; as they might here ſee, by the cleareſt occular demonſtration, that the change is very ſlow and regular.

The flies which are produced from theſe worms, are all of the two-winged kind; but there are ſeveral different ſpecies of them; the generality of them reſemble waſps, and have a very flat body. Goedart, who has deſcribed ſome of theſe flies, was ſurprized to ſee them very ſmall, when firſt produced from the cryſalis, yet growing very large in a quarter of an hour's time, and that without taking any nouriſhment; but this was only owing to their ſeveral parts having been greatly ſqueezed while in the cryſalis, and expanding themſelves when they were at liberty from the compreſſion. Theſe are the changes of this kind of *leo puceron*; but the other devourer of theſe creatures, which has ſix legs, is of a different kind, and indeed is in itſelf reducible to ſeveral ſpecies, ſome of theſe ſix-legged worms becoming four-winged flies, and others a kind of beetles. Theſe, from their near reſemblance to the formica-leo, are by Reaumur diſtinctly called *puceron-lions*. *Reaumur*, Hiſt. Inſ. vol. 6. p. 131. See the article Puceron-*Lion*.

Ver *Polipe*, in natural hiſtory, a name given by Reaumur, and ſome other authors, to a ſpecies of water-worm, by no means to be confounded with the creature called ſimply the *polype*, and which is ſo famous for its reproduction of parts cut off, and for many other ſingular properties. See the article Polype.

This *Ver-polype* is a ſpecies of water-worm, produced from the egg of a tipula, and had this name given it from ſome remarkable productions, placed at the anterior and poſterior parts of the body, which are ſuppoſed to have ſome analogy with the parts of the ſea-fiſh called the *polypus*.

Theſe worms are found in muddy ditches, uſually either crawling upon, or buried in the mud. They are of various ſizes, from more than an inch in length, to a fifth of an inch, and are ſmooth and even on their ſurface; they are compoſed of ſeveral rings, as other inſects of this kind, and have a brown ſcaly head, of a regular figure, and much harder than the reſt of the body. Juſt below the head, on the under part of the body, there are placed two membranaceous productions, which ſeem fragments of arms; they are conſiderably thick, and are cut off obliquely at the ends, and furniſhed with many hairs. At the other extremity of the body there are placed four other productions, reſembling four pieces of cords; two of theſe are affixed to the middle of the lower ſide of the laſt ring but one, and the other two, at the joining of this to the laſt ring. The anterior pair ſerve the creature greatly in its moving, and theſe hinder ones have their uſe in fixing that part of the body in the earthy caſe the creature ſometimes makes for itſelf, while the head is at liberty to move every where about in

fearch of prey. Thefe hinder ones are broadeft at their infertion, and fomewhat narrower at the point, and are very flexile and moveable every way.

The anus of the creature is placed near the end of the laft ring of the body, and is of a fquare figure; it is furrounded with a number of rigid hairs or fpines, and at each corner has a flefhy tubercle, which ftands out a confiderable way from the level of the body; the two under ones are much larger than the other two, and the creature evidently ufes them to pufh itfelf forward in its moving about. Probably, however, thefe parts have fome other more important ufe. The taking in of air or water is likely enough to be the ufe they are affigned for.

The cells which thefe creatures ufually live in are compofed principally of fragments of a light and fpungy earth, and to this they add the broken pieces of fticks and leaves, and other fuch fubftances as are juft heavy enough to fink in water. Mr. Reaumur fufpects that they have a method of fpinning fome glutinous fluid out of their bowels, to fix thefe things together with. But though they ufually refide in thefe cafes, they often quit them, and are found fwimming about the water, or with their tails at the top, and playing about with their bodies; or at the bottom, crawling on the furface of the mud.

When the creature has lived its deftined time in this ftate, it changes into a nymph, in the cafe in which it had lived to the time of this change; it throws off the head, and the productions that ferved as arms, and to faften it at the botttom of the cafe. Nature has generally made the nympth and cryfalis ftate of animals a time of reft and incapacity of motion; but in this, as in the great worms, has given even the nymph a locomotive power, and that a very brifk one. The creature, in this ftate, had fufficient need of it, and could never arrive at its laft change without it. When the time of this final change comes on, the nympth rifes to the furface of the water, and a crack opening on the back, the winged infect begins to appear. The getting thoroughly out is a work of time; and this is the moft perilous period of the creature's life; for if the weather be windy, it is commonly blown into the water, and drowned, before the hinder parts are loofe. *Reaumur*, Hift. Inf. vol. 9. p. 49.

VERANO *Ave*, or *Ave de* VERANO, in zoology, the name by which the Portuguefe in the Brafils call a large bird of the thrufh kind, approaching to the fize of a fmall pigeon, remarkable for its loud noife; and more commonly known by its American name, *guirapanga*. *Ray*'s Ornithology, p. 148. See the article GUIRAPANGA.

VERATRUM, *white Hellebore*, in botany, the name of a genus of plants, the characters of which are thefe: The flower is of the rofaceous kind, confifting of feveral petals, arranged in a circular form. The piftil arifes from the middle of the flower, and finally becomes a feed-veffel, compofed of three capfules joined together, and containing oblong feeds, fomewhat refembling grains of wheat, and alated or furrounded with a foliaceous edge.

The fpecies of *white Hellebore*, enumerated by Mr. Tournefort, are thefe: 1. The greenifh-flowered *Veratrum*. And 2. The earlier-flowering *Veratrum*, with blackifh purple flowers. *Tourn.* Inft. p. 272.

VERBASCULUM, in botany, a name given by many authors to the primrofe, and with the title of *odoratum* to the cowflip. *Dale*, Pharm. p. 187.

VERBASCUM, *Mullein*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of a fingle leaf, rotated, and divided into many fegments at the edge. From the cup there arifes a piftil, which is fixed in manner of a nail to the middle part of the flower, and finally becomes a fruit or cafe of an oval pointed figure, divided by an intermediate feptum into two cells, which ufually contain a number of fmall angular feeds fixed to a placenta.

The fpecies of *Mullein*, enumerated by Mr. Tournefort, are thefe: The common broad white-leaved yellow-flowered *Mullein*. 2. The white flowered common *Mullein*, called by many the female *Mullein*. 3. The great female *Mullein*, with a large yellow fcented flower. 4. Branched *Mullein*, with narrow thick leaves, and a gold-coloured flower. 5. Black *Mullein*, with a purplifh yellow flower. 6. Annual green-leaved *Mullein*, with yellow flowers. 7. The black *Mullein* of Diofcorides. 8. Black *Mullein*, with leaves like the yellow horned poppy. 9. The powdery *Mullein*, with fmall yellow flowers. 10. The taper *Mullein*, with fmall white flowers. 11. The branched perennial French *Mullein*. 12. The perennial Alpine black *Mullein*, with white flowers, and purple ftamina. 13. Branched *Mullein*, with fmall white flowers. 14. Low perennial Alpine *Mullein*, with leaves and flowers like thofe of borrage. 15. Hoary Alpine borrage-leaved *Mullein*, with white flowers. *Tourn.* Inft. p. 146.

VERBENA, *Vervain*, in botany. See the article VERVAIN.

VERBENA *Femina*. See the article ERYSIMUM.

VERDELLO, in natural hiftory, the name of a green marble, ufed in Italy as a touch-ftone, for the trying of gold, &c.

VERDETUM, the name of a green fubftance, ufed as a colour in painting. It is a very pure kind of verdegreafe, being an ærugo of copper, produced by the vapour of vinegar.

VERDITER *Cycl.*—Mr. Boyle informs us, that the London refiners, to part filver and copper, diffolve the mixture of them in aqua-fortis, and afterwards dilute the faturated menftruum with water, and then with copper plates ftrike down the filver. But as much copper remains in the menftruum; to improve their liquor to the beft advantage, they pour it upon whiting, that is, white chalk or clay finely powdered, cleanfed, and made up into balls, wherewith the tinged parts incorporating themfelves, will in fome hours conftitute a fort of *Verditer* fit for painters, leaving the reft of the menftruum an indifferently clear liquor; whence they afterwards, by boiling, obtain a kind of falt-petre, fit, with the addition of vitriol, to yield them a new aqua-fortis. But he obferves, that fometimes the refiners could not make this *Verditer* for a great while together. But a remedy was found at laft, which is, to warm the menftruum well before it be poured on the whiting. *Boyle*'s Works abr. vol. 1. p. 169.

We have a way of making this colour in England by a mixture of powdered verdegreafe and whiting. This is much inferior to that *Verditer* which is made with the copper-water ufed in the wafhing of filver; but its cheapnefs, and readinefs of preparation at all times, has recommended it into general ufe.

VERDONE, in zoology, the name of a fifh of the turdus or wraffe kind, called by fome authors *turdus viridis minor*.

It is of a fine green colour in all parts of its body; the back, fides, and belly, have all plainly the fame colour; but in fomewhat different degrees, the back being of the deepeft dye; the belly has fomething of yellownefs with the green, and the fides are variegated with lines of a fine blue. It has only one long fin on the back, which has thirty rays or ribs, the eighteen foremoft of which are rigid and prickly, the others foft and flexile. It is caught in the Mediterranean, and fold in the markets in Italy. *Salvian* de Aquat. p. 88.

VERGADELLE, in zoology, the name of a fifh of the mullet kind, called by others the *chelon*, remarkable for the thicknefs of its lips. *Rondelet.* de Pifc. See the article CHELON.

VERITH, in ichthyology, a name given by Ifidore to the fifh commonly called by authors, *thriffa*; by us, the *fhad*, or the mother of the herrings. See the article THRISSA.

It is eafily diftinguifhed from the herring, by the top of the upper jaw being bifid, and the fides fpotted; but it is the opinion of that accurate obferver Artedi, that it differs only in fize from the pilchard, and the agone, alaufa, and fardina, or fmall pilchard.

VERKENS *Vifch*, in zoology, the Dutch name of a fifh caught in the Eaft Indies. It is about feven inches long, of a blackifh-green colour, with fins and tail wholly black, and with yellow irifes to the eyes. It is caught in frefh waters in the Eaft Indies, and is a very delicate fifh. It is very near related to the caprifcus, if not the fame fpecies. *Ray*'s Ichthyogr. Append. p. 1. 3. See the article CAPRISCUS.

VERMELHO, in zoology, the name of an American fifh, more ufually known by the name of the *pudiano*. It is a fmall fifh, of the fhape of the pearch, with a purple back, and yellow fides and belly. *Willughby*'s Hift. Pifc. p. 339. See the article PUDIANO.

VERMES, *Worms*. See the articles VERMIS and WORMS.

VERMICULARIS *Crufta*, a term ufed by fome anatomical writers, to exprefs the internal hairy and corrugated coat of the inteftines.

VERMICULUM, a word ufed by fome chemifts to exprefs a tincture or elixir.

VERMICULUS *Marinus*, the *Sea-Worm*, in natural hiftory, the name of a genus of fhell-fifh of the multivalve kind.

The characters are thefe: They are multivalve fhells, formed in the fhape of tubes or pipes, and are rounded, wrinkled, and ufually crooked, though fometimes ftrait. Thefe fhells are called *vermiculi*, or fea-worms, from the fifh contained in them, which is always a fort of worm. They ufually are found in great clufters together, interwoven oddly with one another.

Bonani calls them fea-ferpents, inclofed in fhells, from the various twifted forms in which they adhere to fhips and rocks. The author eftablifhes them among the multivalves, becaufe they are never found fingle, but always in thefe clufters; in this fenfe he looks upon the whole clufter as the fhell-fifh under confideration, not any one of the fingle tubes: Though he acknowledges that each of thefe tubes is a perfect fhell, independant of the reft, and has its proper inhabitant. Strictnefs in natural hiftory therefore would not bear him out, in arranging them among multivalves, for they are certainly an univalve fhell, though many of them happen always to be found together.

Care muft be had not to confound thefe with the *dentalia* and *entalia*; for thefe laft are always found fingle; and the *vermiculi*, of the kind here treated of, are always found together in great numbers, forming clufters of ten inches, and often much more in diameter.

Of the *Vermiculi*, which are ftrait, we have the following fpecies: 1. The *Tubularia Purpurea*, by many efteemed a fpecies of coral. This is called by fome the *fea-organ*, and has greatly the appearance of common red coral, but is in reality only a mafs of thefe tubes of worms. 2. The pale red *Tubu-*

Tubularia. 3. The thicker *Vermiculus*, called the *great organ-pipe*. 4. The fmooth *Vermiculus*. 5. The ftriated *Vermiculus*. 6. The canaliculated or deep furrowed *Vermiculus*.

Of the crooked kind we have the following fpecies: 1. The gut *Vermiculus*. This fpecies always forms a large clufter, and refembles the inteftines of animals. 2. The varioufly curled *Vermiculi*, 3. The *Vermiculi*, terminating in elegantly twifted ends. 4. The brown wrinkled *Vermiculus*.

Of thofe *Vermiculi* which are difpofed in a fort of circles, we have the following: 1. The earth-worm *Vermiculus*. 2. The concamerated *Vermiculus*. This is a fpecies of *Vermiculus*, divided in the inner part into a number of chambers or cells, in the manner of the nautilus, and having a fiphunculus of communication running through the whole. 3. The mud-*Vermiculus*. This fpecies lies under the mud of the bottom, and adheres to ftones. 4. The oifter *Vermiculus*. 5. The mufcle *Vermiculus*. 6. The buccinum *Vermiculus*. Thefe are three diftinct fpecies, which always take up their abode on thofe peculiar fhells. 7. The red cancellated *Vermiculus*. 8. The brown twifted *Vermiculus*. 9. The rofe-coloured and white *Vermiculus*. Hift. Nat. Eclairc. p. 354.

VERMINA, a word ufed by many of the medical authors to exprefs a tormenting pain in the bowels, feeling as if worms were gnawing them.

VERMIS, *Worm*, in natural hiftory. See the article WORM.

VERMIS *Cæruleus*, a name given by the antient naturalifts to an animal they defcribe as living in the Ganges, and fome other rivers in the Eaft Indies, and of an enormous length. Pliny tells us that they are feventy feet in length; but he at the fame time convinces us, that they were not properly worms; for he tells us they had gills like thofe of fifhes, and fays they were called *Vermes*, only becaufe they were like worms. Ctefias mentions thefe Indian water-worms, and fo do many other old writers, all giving them the fame characters, but differing fomewhat in the length, which the laft-mentioned Greek author makes to be only feven feet, not feventy. Solinus has miftaken this account of the gills of this creature, and has tranflated or copied the authors he took his account from fo ill, as to call them arms, and gives them the length the other authors attribute to the whole animal. This creature was of a blue colour, and lived in the deep waters; but would, according to their accounts, rife up to the furface near the fhore, to feize upon cattle that came to drink. They even tell us of its feizing on the elephant in this manner; and, at this rate, the whole feventy foot length is neceffary. Inftead of feventy feet, fome copies of Pliny have it fixty; and the later authors from this have made it only fix: And Solinus has miftaken what Pliny fays of the creature, being called *Vermis* from its having the fhape of a worm, and fuppofes he means that it was called *cæruleus*, becaufe of its being of a blue colour; but we find nothing of this in the old authors, nor any other name for it but *Vermis*. The naturalifts of late ages have given no account of any fuch animal as this; and it is very probable that the authors who firft defcribed it meant nothing but the crocodile, which they had heard of as a terrible voracious reptile, living in the Ganges, as it does to this day; but had never had any tolerably accurate account of it. See the article CROCODILE.

VERMIS *Cerebri*, the *worm* in the brain, a name given by fome writers to an epidemical fever in Hungary, attended with terrible deliriums.

VERONICA, *Speedwell*, in botany, the name of a genus of plants, the characters of which are thefe: The flower confifts of one leaf, and is rotated and divided into fegments at the end. From the cup there arifes a piftil, which is fixed in the manner of a nail to the middle part of the flower, and afterwards becomes a membranaceous fruit, divided into two cells, and containing ufually fmall, but fometimes larger feeds. *Tourn.* Inft. p. 143.

The fpecies of *Veronica*, enumerated by Mr. Tournefort, are thefe: 1. The common fmall procumbent fmooth *Veronica*, called *male Speedwell*. 2. The longer-leaved fmooth creeping Pyrenean *Speedwell*, 3. The upright male *Speedwell*. 4. The broad-leaved fpiked *Speedwell*. 5. The purple fpiked *Speedwell*. 6. The narrow-leaved fpiked *Speedwell*. 7. The long-leaved fpiked *Speedwell*. 8. The fmall fpiked *Speedwell*. 9. The fmall rock *Speedwell*, with naked ftalks. 10. The common meadow *Speedwell*, with leaves like ferpyllum. 11. The fmooth erect Alpine male *Speedwell*, with lightly indented leaves. 12. The fmaller Roman fmooth *Speedwell*, with leaves like the fmall bafil. 13. The fmall creeping *Speedwell*, with roundifh hollowed leaves. 14. Hairy daify-leaved Alpine *Speedwell*. 15. The Alpine fhrub *Speedwell*. 16. The hard fhrubby *Speedwell*, with a long germander-like leaf. 17. The fhrubby Alpine *Speedwell*, with a roundifh fmall leaf. 18. The ever-green rock *Speedwell*. 19. The Auftrian *Speedwell*, with finely divided leaves. 20. The greateft *Speedwell*. 21. The greateft fingle-ftalked not-branched Pyrenean *Speedwell*. 22. The great fhrubby *Speedwell*. 23. The procumbent *Speedwell*, with the appearance of meadow teucrium. 24. The fmaller *Speedwell*, with the lower leaves round. 25. The white-flowered fmall *Speedwell*, with round-bottom leaves. 26. The little narrow-leaved branched procumbent *Speedwell*. 27. The many-ftalked *Speedwell*. 28. The leaft mountain erect, fquare-ftalked *Speedwell*. 29. The creeping *Speedwell*, with teucrium leaves. 30. The common *Speedwell*, with flowers growing to the ftalks. 31. The great round-leaved water *Speedwell*. 32. The fmaller round-leaved water *Speedwell*. 33. The larger long-leaved water *Speedwell*. 34. The fmaller long-leaved water-*Speedwell*. 35. The creeping olive-leaved water *Speedwell*. 36. The narrow-leaved water *Speedwell*. 37. The round-leaved Pyrenean *Speedweed*. 38. The ivy-leaved fpring *Speedwell*. 39. The germander-leaved *Speedwell*, with flowers ftanding on long ftalks. 40. The germander-leaved *Speedwell*, with flowers ftanding on long ftalks, and with leaves placed alternately on the ftalks. 41. The common fpring *Speedwell*, with trifid or quinquifid leaves. 42. The white-flowered annual knot-grafs-leaved *Speedwell*. And 43. The branched upright American fhrubby *Speedwell*, with vervain-like leaves. *Tourn.* Inft. p. 144.

In the Linnæan fyftem of botany, *Veronica* likewife makes a diftinct genus of plants; the characters of which are, that the cup is a perianthium, divided into four fegments, and remaining after the flower is fallen. Its feveral fegments are narrow and pointed. The flower confifts of a fingle petal, in form of a cylindric tube, of the length of the cup, or nearly fo; flat in pofition, and divided into four fegments at its extremity, each of an oval fhape, and the lower the narrower. The ftamina are two filaments, narroweft at the bottom, and bending toward the top. The antheræ are oblong. The piftillum has a compreffed germen; a thread-like ftyle, bent, and of the length of the ftamina; and a fimple ftigma. The fruit is a turbinated and heart-fafhioned capfule, flat at the top, containing two cells, with four valves, and full of a great number of roundifh feeds. *Linnæi* Gen. Plant. p. 4.

VERONUS, in zoology, a name given by many to a fmall river-fifh, well known in England by the name of the minow. *Ray's* Ichthyogr. p. 268. See the article PHOXINUS.

VERSIO *Chemica*, a term ufed by chemical writers to exprefs a change, wrought by their art, of manifeft forms into occult ones, which, they fay, is done by a corruption of the fpecific form, and the generation of a more general one; that is, by a converfion of decompounded elements into compound bodies, and of impure into fuch as are perfectly pure. Theatr. Chem. vol. 1.

VERTEBRÆ (*Cycl.*)—Anatomifts, in the defcription of thefe bones, divide them into the body, apophyfes, and cavities.

The body of the *Vertebræ* is that principal part or large mafs, fituated anteriorly, and fupporting all the other parts. In moft of the *Vertebræ* the body reprefents a portion of a cylinder cut tranfverfely, the circumference of which is more or lefs round on the fore-part, and floped on the back-part. It has two fides, the upper and lower, each of which is, as it were, bordered by a thin lamina, in form of an epiphyfis.

The apophyfes of moft of the *Vertebræ* are feven in number; one pofterior, called the fpinal apophyfis, which ends in a fmall epiphyfis, and has given the name to the whole fyftem of the *Vertebræ*; two lateral, called *tranfverfe apophyfes*, and four others, which are likewife lateral, two on each fide; one above, and one below. Thefe are called by the common name of *oblique apophyfes*, and diftinguifhed into the fuperior or afcending, or inferior or defcending. Thefe four are the leaft of all the apophyfes of the *Vertebræ*, and each of them has a cartilaginous fide. It would be more proper to call them *articular*, inftead of *oblique apophyfes*.

The cavities in the *Vertebræ* are thefe: A large middle hole between the body and apophyfes; four notches, two on each fide, one fuperior and fmall, the other inferior and large. The great foramen is part of the vertebral or fpinal canal; and the notches in one *Vertebra* meeting thofe in another, form the lateral holes which communicate with the canal. The inner fubftance of the *Vertebræ* is fpongy, or like a diploe, covered with an outer compact fubftance; which in the body of the *Vertebra* is very thin, but thicker in the proceffes. The *Vertebræ* are joined together by their bodies, and by their fmall apophyfes. The bodies, in a natural ftate, are principally united by a cartilaginous fymphyfis; that is, by the intervention of a pliable and elaftic cartilage, as is very manifeftly feen in the frefh bones. This cartilaginous connection makes the lateral holes of the fpine larger in the body than they appear in the dry fkeleton, where thefe cartilages are wanting. Their connection, by the fmall apophyfes, is by arthrodia, and not by ginglimus. And thefe two articulations are fecured by very ftrong ligaments. *Winflow's* Anatomy, p. 54.

The cartilages between the *Vertebræ* of the back yield confiderably to the preffure of the body, in an erect pofture, and expand themfelves in the night when perfons lie down. Hence arifes a very fingular phænomenon, but a very true one: which is, that a man is confiderably taller at his rifing in a morning, after the expanfion of thefe cartilages, during the abfence of preffure for feveral hours, than at night, when they have been preffed down all the day.

The reverend Mr. Waffe feems to have examined this difference more ftrictly than any other perfon. He found that feveral perfons, enlifted as foldiers in a morning, had been difcharged for want of height, on their being meafured again

before the officers in the evening; and on this occaſion meaſured ſeveral other people, and found the difference in many caſes to be not leſs than an inch. This gentleman obſerved in himſelf, that fixing a bar of iron where he juſt reached it with his head on getting firſt out of bed in the morning, he could loſe near half an inch in an hour, or leſs, if he employed that time in rolling his garden, or any other exerciſe of that laborious kind. He obſerved alſo, that riding often took off the height very ſuddenly; and what was more particular, that in ſitting cloſe to ſtudy for five or ſix hours without any motion, he loſt often a whole inch in height. People who uſe hard labour, ſink rather leſs in the whole, than thoſe of ſedentary lives; and the height once loſt, is never to be recovered that day, not even by the uſe of the cold bath; but a night's lying down alone can reſtore it. Philoſ. Tranſ. N°. 383. p. 87.

This difference in height takes place only in the human ſpecies, as we are the only creatures who walk erect, and throw the preſſure of our whole weight upon the back-bone. This gentleman meaſured horſes before and after riding, and could find no difference, even after the longeſt journeys.

The alteration in height, is much greater in young people, than in thoſe who are more aged. It is evident from this change happening to perſons when they ſit, as well as when they ſtand, that it is brought about merely by the back-bone; and we muſt admire the ſtructure of that part of the body, which owes its giving way thus, to its being formed together in that manner which alone could ſuit it to the ſeveral purpoſes it was intended for. The thickneſs and ſhortneſs of the bones, with the intervening cartilages, aſſiſted by the bony proceſſes, diſpoſe it to a motion peculiar to itſelf; whereas, had the bones been of any conſiderable length, upon bending the body, the articulations muſt have made a large angle upon their inmoſt edges, and the ſpinal marrow would have been continually liable to be injured; and had the cartilages been intirely wanting, it would have been as uſeleſs as if it were but one bone, whereby the trunk of the body being rendred incapable of bending, muſt have remained for ever in an erect poſture. Another particular, which beſpeaks the utmoſt wiſdom and deſign in the contrivance of this part is, the remarkable difference there is in the cartilages placed betwixt the ſeveral bones of the ſpine.

The *Vertebræ* of the back require but little motion, and the cartilages there are for that reaſon ſmall and thin, in compariſon with thoſe of the loins, which being very thick, the loweſt more eſpecially, the motion is much greater there, and much better to be borne. This being the ſtate and diſpoſition of the parts, during the whole ſpace of time in which we are uſually employed about our ſeveral buſineſſes, till the time that we diſpoſe ourſelves to reſt, the cartilages of the ſpine, will, by their compreſſible and yielding properties, become more cloſe and compact from the preſſure they ſuſtain, and conſequently the ſpine, which is the only ſupport of the trunk of the body, will become ſhorter; but when this ſuperior weight ſhall be intirely removed, by placing the body in an horizontal poſture, as it always is when we are in bed, the compreſſed cartilages will, by their natural elaſtic power, begin gradually to enlarge themſelves, till they, by degrees, recover the expanded ſtate they had before they gave way.

The cartilages between the ſeveral *Vertebræ*, are twenty-four in number, and every one of theſe is preſſed ſomewhat in our daily employments, ſo that when they all come to expand, the aggregate of their ſeveral expanſions cannot be ſuppoſed leſs than about an inch. Now, if this be the difference occaſioned by the preſſure of the common weight of the body alone upon itſelf, it muſt neceſſarily be much greater in thoſe perſons whoſe conſtant employment it is to carry heavy burdens. The compreſſion and expanſion of the cartilages in older people being leſs than in younger, is a neceſſary conſequence of the cartilages in time of age growing harder, and leſs capable of compreſſion; for they often grow almoſt bony in length of time; and hence it is, that old people are obſerved to loſe ſomewhat of their former height, the cartilages in them ſhrinking to a ſomewhat ſmaller compaſs as they grow bony; and this ſhortening is therefore not imaginary, as many have believed, but real, and owing to this plain cauſe. Phil. Tranſ. N°. 383. p. 90.

VERTEBRÆ *fractured*. When any of the *Vertebræ* are fractured without hurting the ſpinal marrow, we may reaſonably ſuppoſe, that the fracture is confined to ſome of the oblique, or ſpinal proceſſes, and therefore the patient will be in no great danger; but when the body of the *Vertebra* is either broke or ſplit, and the contiguous ſpinal marrow bruiſed or compreſſed; all parts of the limbs and viſcera beneath that *Vetebra* become immoveable and rigid, and death often follows. Laſtly, if the tranſverſe proceſſes of the *Vertebræ* are broken, which incline toward the cavity of the thorax, it is ſcarce poſſible, that the heads of the ribs which are connected there, ſhould eſcape being fractured alſo, which makes the caſe very deplorable. When only the proceſſes of the *Vertebræ* are broken, it will be the beſt way to reduce the bones into their places with the fingers, placing narrow compreſſes dipped in warm ſpirit of wine on each ſide the *Vertebræ*, and over them thick pieces of paſtboard, to be kept on by the proper bandages; for by this means the bones of the *Vertebræ*, which are very ſoft and ſpungy, will very quickly and eaſily grow together again.

If in theſe fractures the ſpinal marrow be divided, death is generally an inevitable conſequence; all that the ſurgeon can attempt in this caſe, is to lay bare the fractured *Vertebra* with the ſcalpel, and replace, or elſe remove, ſuch fragments as injured the ſpinal marrow; and the wound muſt be afterwards gently cleanſed, and treated with the vulnerary balſams, to be kept on with the napkin and ſcapulary bandage, till either the wounds ſhall be terminated by a perfect cure, or by death. *Heiſter's* Surgery, p. 125.

VERTEBRÆ *luxated*. The luxations which happen to the ſpine, and *Vertebræ* of the back, are generally imperfect ones; for it appears from an accurate conſideration of the ſtructure, and articulations of theſe bones, that none of the *Vertebræ* can be intirely diſplaced without being fractured, and alſo compreſſing and wounding the ſpinal marrow, which muſt produce danger of inſtant death. Even the imperfect luxations of theſe bones are very dangerous; which happen either between the two ſuperior *Vertebræ* of the head and neck, or between the reſt of the *Vertebræ*, when they are forced from each other. Such as have a luxation between the head and upper *Vertebra*, ſeldom eſcape being carried off by a ſudden death; for by this means, the tender medulla, which joins immediately with the brain, and is lodged in the ſpine, the brain itſelf, and the nerves which ariſe from beneath the occiput, are too much diſtended, compreſſed, or lacerated. The two condyloide proceſſes of the occiput uſually ſlide out of their glenoide ſinuſſes in the firſt *Vertebra* of the neck, when a perſon falls headlong from an high place, or from on horſeback, or when he receives a violent blow upon the neck. People die uſually very ſuddenly by this accident, and are uſually ſaid to have broke their necks, though there is really no more than a bare luxation; though it does really ſometimes happen, that the *Vertebræ* of the neck are broken. If life ſhould remain after ſuch an accident, which very rarely happens, the head muſt neceſſarily be diſtorted, commonly with the chin cloſe down to the breaſt, ſo that the perſon can neither ſwallow, ſpeak, or move any part that is below the neck; therefore, if ſpeedy aſſiſtance is not had, death enſues, from the compreſſure, or hurt of the medulla.

In order to reduce this luxation, the patient muſt be laid flat upon the ground, then the ſurgeon kneeling down with his knees againſt the patient's ſhoulders, muſt bring them together, ſo as juſt to contain the patient's neck between them; this done, he is quickly to lay hold of the patient's head with both his hands, and ſtrongly pulling and extending it, he muſt gently move it from one ſide to another, till he finds by a noiſe, the natural poſture of the neck, and a remiſſion of the ſymptoms, that the diſlocation is properly reduced.

The imperfect luxations of the *Vertebræ* of the back, are no more than their two upper or lower proceſſes being diſplaced, and that often but on one ſide: this happens ſometimes to only one of the ſpinal *Vertebræ*, ſometimes to more. Theſe luxations are generally very difficult to reduce; the beſt method of doing it is thus: When the apophyſes of the *Vertebræ* are diſlocated on both ſides, the patient is to be laid leaning on his belly over a caſk, drum, or ſome other gibbous body; and then two aſſiſtants are ſtrongly to preſs down both the ends of the luxated ſpine on each ſide; by this means the bones of the ſpine will be ſet free from each other, lifted, or puſhed up in form of an arch, and ſo gradually extended: this done, the ſurgeon puſhes down the luxated *Vertebræ*, and at the ſame time nimbly puſhes the ſuperior part of the body upwards, and by this means the luxated bones are ſometimes happily reduced into their places; if ſucceſs does not attend the firſt attempt in this way, the operation is to be repeated. When the *Vertebra* comes out on one ſide, the patient is to be placed inclining in the prone poſture now mentioned; but ſo, that when the left apophyſis is diſplaced, one aſſiſtant may preſs the lower *Vertebræ* inward to the right, and another may depreſs the right humerus, and *vice verſa*. After the *Vertebræ* are reduced, the part is to be bathed with ſpirit of wine camphorated, or to have compreſſes dipped in the ſame ſpirit laid on it, and the napkin and ſcapulary bandage is to be applied. *Heiſter's* Surg. p. 153.

VERTEBRÆ *of fiſhes*.—The *Vertebræ* of fiſhes are extremely different in ſhape in the ſeveral kinds, and even vary in number in the different ſpecies of the ſame genus. The anterior *Vertebræ* in ſome have three apophyſes, as in the cyprini, eſoces, pleuronecti, &c. and in the clupeæ they have no leſs than ſeven of theſe apophyſes, but they are ſlender and capillary. *Artedi* Ichthyol.

VERTIBULUM, a word uſed by ſome writers to expreſs the round head of a bone, which, in its articulation, is inſerted into the ſinus, or cavity of another bone.

VERTUMNALIA, among the Romans, a feſtival celebrated in honour of the god Vertumnus in the month of October. *Pitiſc.* in voc.

VERU, a comet, according to ſome writers, reſembling a ſpit, being nearly the ſame kind as the lonchites, only its head is rounder, and its train longer and ſharper pointed.

VERVA, a word uſed by ſome authors to expreſs an ivory amulet to be worn for the epilepſy.

VERVAIN, *Verbena*, in botany, the name of a genus of plants; the characters of which are these: The flower consists of one leaf, and is of the labiated kind. The upper lip is erect, and divided into two segments, the lower into three; and these are so disposed, that at first sight the flower has not at all the appearance of a labiated one, but seems only divided into five segments. The pistil arises from the cup, and is fixed in the manner of a nail to the lower part of the flower. It is surrounded by four embryos, which afterwards become four slender oblong seeds, which ripen in the cup, and fill it almost wholly up. To these marks it may be added, that the flowers of the *Vervains* grow in spikes, or sometimes in short heads, but never verticillately.

The species of *Vervain*, enumerated by Mr. *Tournefort*, are these: 1. The common *Vervain*. 2. The common *Vervain* with white flowers. 3. The taller broad-leaved Portugal *Vervain*. 4. The fine leaved *Vervain*. 5. The nettle-leaved *Vervain* of Canada. 6. The nettle-leaved *Vervain*, with jagged leaves, and larger flowers. 7. The narrow-leav'd nettle *Vervain*, of America, with blue flowers, and branched spikes. 8. The very narrow-leaved nettle *Vervain* of America, with numerous spikes and purple flowers. *Tournef.* Inst. p. 200. *Vervain* was used among the Antients at their sacrifices, and was thought to contain something divine. The Romans, in the beginning of the year, made a present of this herb to their friends. *Danet.* in voc.

VERVISE, in our statutes, is used for a kind of cloth, Stat. 1 R. 3. cap. 8. *Blount*, *Cowel.* See the article PLONKETS.

VERULCA, the same as *Verva*, a name for an amulet of ivory worn on the arm as a cure for the epilepsy. *Scribonius Largus.*

VERZELLINO, in zoology, the name of a bird common in Italy, and kept in cages for its singing, called by authors *citrinella*, and *thraupis*. See the article CITRINELLA.

VESICARIA, a name given by Rivinus to a genus of plants, the same with the *corindum* of Tournefort. *Rivinus*, 4. 144. See the article CORINDUM.

VESICULÆ *seminales.* These vessels are very evident in fishes; the females of most fish have double ovaria, though in some they are single, as in the osmerus, and perca fluviatilis of Bellonius; but the *Vesiculæ seminales* in the males are two in number in all fish, not excepting the males of these here mentioned. They differ, however, very much in regard to their figure and situation. As to their situation, they in some fish occupy almost the whole length of the abdomen, as in the spinose kinds in general, and in the petromyzum, accipenser, and many of the other cartilaginous kinds. In some fish, they are placed only in the lower part of the abdomen, as in the cetaceous kinds, *&c.* As to figure, in the generality of fish, they are oblong, and compressed, but in some they are round, as in the cetaceous kinds. The other parts of generation are wanting in most fish. *Artedi* Ichthyolog. See the article TESTES.

VESP, or WASP, *Vespa*, in the history of insects. See the article WASP.

VESP-*Ichneumon.* Of this insect, Mr. Ray mentions a great number of species; the greater part of which are common on the sides of mud banks in the borders of fields. These have all slender bodies, and are armed with stings.

The origin of this creature is very strange; it is usually found issuing from the body of the common cabbage caterpillar. The occasion of which is this: The parent fly strikes her tail through the skin of the back of this caterpillar, and deposits her eggs in the creature's flesh. The eggs hatch into small maggots of the carnivorous kind; and these prey upon the flesh of the caterpillar till they arrive at their full growth: the creature that supports them, keeping itself alive all this time by the vast quantities of nourishment it is continually taking in. At length, when these worms are arrived at their full growth, they spin themselves a webb, under which they change into chrysales, and soon after come out in form of the fly that laid the egg. This is not peculiar to this single species of fly; but many are educated thus in the bodies of caterpillars of several kinds: some of these spin their webs under the skin of the caterpillar, and eat their way through it, when arrived at their perfect state; but others crawl out while yet in their worm state, after having eaten their full time, and bury themselves under ground in order to spin their webs.

The species are these: 1. The red-tailed *Ichneumon*, with long wings spotted with black. 2. The black-tail'd *Ichneumon*, with a long and slender body, variegated with annular marks of red and black. 3. The black *Ichneumon*, with three hairs at its tail; the body of this species is intirely black, without the least variation. 4. The black *Ichneumon*, with a white circle on the legs, and on the antennæ. 5. The *Ichneumon* with a thick breast, and a body beginning by a slender filament, and terminating in a thick tail. 6. The great large winged *Ichneumon*, with a yellow body, and large yellow spots on the wings. 7. The smaller large-wing'd *Ichneumon*, with black wings, and a black body and tail. 8. The red-leg'd *Ichneumon*, with a body red at the beginning, and a white large spot upon the back. 9. The large *Ichneumon*, with a black head, breast, and legs, a red body, and black tail. 10. The flat-body'd *Ichneumon*, with a black back, and greenish white belly. 11. The slender body'd *Ichneumon*, brown on the back, with one yellow transverse line, and yellowish on the belly. 12. The small three-haired *Ichneumon*, with long antennæ.

13. The small black *Ichneumon*, with a white cross upon its back. 14. The reflex horned *Ichneumon*, with its anterior feet clypeated. 15. The black body'd *Ichneumon*, with two broad circles of yellow on the middle of the back. 16. The black body'd *Ichneumon*, with a white tail, and a white triangular spot on the shoulders. 17. The long bodied *Ichneumon*, with a yellow body and black tail: this is an inch and a quarter in length, and is a very beautiful species. 18. The large caterpillar *Ichneumon*, with the anterior half of the body of a bright orange colour, and the other half black. This is produced in the body of another species of caterpillar. 19. The black *Ichneumon*, with orange coloured legs. 20. The small *Ichneumon*, with yellow legs, and a yellow back, and three hairs at the tail. 21. The small *Ichneumon*, with three hairs at its tail, with shining wings. 22. The black *Ichneumon*, with several narrow yellow circles on the hinder part of the body. 23. The black breasted *Ichneumon*, with the anterior part of the body yellow, and the hinder part black. 24. The caterpillar *Ichneumon*, with no hairs at the tail, and with very long horns. 25. The long-bodied caterpillar *Ichneumon*, with only one hair at the tail: these are produced of worms lodged in the bodies of different kinds of caterpillars. 26. The black and yellow *Ichneumon*, with purple wings. 27. The slender bodied *Ichneumon*, with purple wings. 28. The orange-coloured *Ichneumon*. The whole body in this species, is of a reddish yellow, with no spot, or variegation in it. 29. The black bodied *Ichneumon*, with red legs, and shining wings; each marked with one spot. 30. The variegated leg'd *Ichneumon*, with a white circle on each antenna. The legs of this species are partly black, and partly red. 31. The large *Ichneumon*, with a yellow body and black tail: and, 32. The inky wing'd *Ichneumon*. *Ray*'s Hist. of Insects, p. 254, *& seq.*

VESPERTILIO, the *bat.* In the Linnæan system of zoology, this animal makes a distinct genus; but not as a bird, as the vulgar esteem it, but as one of the quadruped class. The characters of the genus are these: That the creature is viviparous, whereas all the birds are oviparous: that it has two paps: its feet have five toes on each; and the four feet are expanded into a sort of wings. Under this class, the author takes in the canis volans, and glis volans; the flying dog and flying dormouse, as they are called by other authors. *Linnæi* System. Nat. p. 37.

Bontius describes a very strange kind of *Vespertilio*, or bat, as he calls it, found in the East-Indies; and Piso, who has thoroughly considered the subject, doubts much, whether it can properly be referred to the bat kind or not. Indeed, it seems more properly to belong to the class of the flying squirrel. *Bontius* calls it the *Verspertilio admirabilis*, and describes it as being of the size of a cat, and of a fleshy body; and says, that it flies by means of membranes annexed to the sides of its body, and to its fore-legs; and that it can expand these to a vast compass. From all this it appears to be of the squirrel kind; but he adds, that they fly in flocks, like our wild geese, which seems very improbable; and it seems rather, that the creature was intended only for long leaps. If Scaliger had known this animal, it would be very natural to believe he meant it under the name of the *felis volans*, or flying cat; which is generally supposed another name only for the common flying squirrel.

VESPERTILIO, in conchyliology, the name of an elegant species of voluta, supposed to have some resemblance to the colour of a bat. See the article VOLUTA.

VESPIVORUS *buteo*, in zoology, a name given by some authors to the bird, called in English, the honey-buzzard, from its feeding its young with the maggot worms out of honey-combs. *Willughby*'s Ornithol. p. 39. See the article APIVORUS *Buteo*.

VESSEL (*Cycl.*)—*Extraordinary* VESSELS, in anatomy. It is not uncommon to meet in the bodies of dissected persons remarkable variations from the common course of nature in the structure of the body; and among these, sometimes duplicates of parts naturally single: thus Kerkring mentions a double *vena cava*, and a treble ductus thoracicus in different bodies, as also four spermatic arteries in one body, with no spermatic veins: there are accounts also of defects of parts usually judged essential; but it is to be observed, that the ends of nature being much more easily answered by the excess, than by the defect of parts, the accidents of excess are greatly more common than those of defect. *Kerkring*'s Spicil. Anat.

Chemical VESSELS. See the Appendix.

VESSIGON, in the manege, a wind-gall, or soft swelling, on the in and outside of a horse's hough, that is, both on the right and left of it.

VETCH, *Vicia*, in botany. See the article VICIA.

Horse-shoe VETCH. See the article FERRUM *equinum.*

Bitter VETCH, in botany. See the article AROBUS.

VETO, in Roman antiquity, was the solemn word used by the tribunes of the people, when they inhibited any decree of the senate, or law proposed to the people, or any act of other magistrates. *Liv.* 6. 37. *Middlet.* of Rom. Sen. p. 160. See the article INTERCESSION.

VETOLA, in zoology, a name used by the Venetians, and from them by many others for a water-bird of the godwit kind,

kind, called by Aldrovand, the *Totano*, and by Gefner, the *Fedoa fecunda*.

It ufually weighs about nine ounces; its beak is fhaped like that of the woodcock, and is red all over, except at the end, where it is blackifh; its neck is grey; its belly and breaft white; its head of a brownifh grey; and its back brown; but its rump has a white ring on it; its tail is compofed of black and white feathers. *Ray's* ornitholog. p. 216.

VETTONICA, in botany, the antient way of fpelling the word *Betonica*, the name of a plant called in Englifh, *Betony*.

It is called *Vettonica* by Pliny, who fays, it obtained that name from a people of Italy fo called, among whofe woods it grew.

We are far from being certain what plant the antients mean when they prefcribe *Betony*, fome having applied the name to the fame plant, which we at this time call by it; others calling the *ferratula* or faw-wort, by this name, and others rofemary.

Diofcorides mentions only one kind of *Betony*, which he calls *ceftra* and *pfuchrotropha* in the Greek, and which his tranflators explain by *Vettonica vel rofmarinus*; and this is countenanced in exprefs words by the author himfelf, in one place, where he fays the plant *ceftra* is called *pfuchrotropha*, from its being produced in damp places; and that the Romans called it *Betonica*, or *rofmarinus*.

This feems abfolutely confounding the two plants *rofemary* and *Betony*.

The *Betony*, faw-wort, and rofemary, of the prefent times, are three very different plants; and we are therefore not to cenfure the antients, if any one of them wants the virtues they afcribed to *Betony*, but to try them all round.

However, if any thing certainly can be judged of the *betonica* of the antients, it is, that it was our *ferratula*. See the article SERRATULA.

VEXILLARII, among the Romans, were veteran foldiers, the fame with thofe the old Romans called *triarii*. There were fix hundred of them in every legion. See the article TRIARII, *Cycl.*

VIATORES, among the Romans, officers whofe bufinefs it was to go into the country, and acquaint the fenators of the extraordinary days on which they were to meet. See Mem. de l'Acad. vol. 1. p. 405.

VIBA, VUBA, or VABA, names by which fome botanical authors call the common fugar-cane. *Pifo*, p. 119. *Marggrave*, p. 82.

VIBEX, (*Cycl.*) a word ufed by fome to exprefs a black mark upon the fkin, from a bruife.

VIBRANT, or VIBRION, in natural hiftory, the name of a clafs of flies, commonly known by the name of the *ichneumons*.

The word is derived from the Latin *vibro*, to fhake or quiver, and is applied to thefe flies, from the continual vibrating motion obferved in their antennæ.

VIBRISSÆ, a word ufed by medical writers to exprefs the hairs in the noftrils.

VIBURNUM, in botany, the name of a genus of trees, the characters of which are thefe: The flower confifts of only one leaf, and is of the rotated kind, and divided into feveral fegments at the edges. The center of this flower is perforated by the pointal of the cup, which finally becomes a roundifh, foft and juicy berry, containing a hard ftriated feed, of a flattifh figure.

There is only one fpecies of this tree, which is the common *Viburnum*. *Tourn.* Inft. p. 607.

VIBURNUM *Galls*, in natural hiftory, the name of a fpecies of galls, or fmall protuberances, frequently found on the leaves of the *Viburnum*. Thefe are of a very fingular nature, and feem to be compofed of a different fubftance from that of the leaf. They appear in form of brown circular fpots, of which there are fometimes forty or more on one leaf. Thefe are about a fifteenth of an inch in diameter, and they rife a little above the furface of the leaf, as well on the under as the upper fide; each of thefe has alfo a fmall prominence in the center, on each fide of the leaf, looking like a nipple ftanding on the breaft.

Thefe are found in great plenty in the months of June, July, and Auguft, and, when opened, each contains one infect, which is a fmall worm of a white colour, with fix legs, and two hooks of a brown colour at the head. The manner of watching the changes of this infect is this: Place feveral of the leaves of this fhrub, with their pedicles, in a veffel of water; fet this upon a fheet of white paper, on a fmooth table, and cover it with a box, the edges of which muft touch the paper every where; by this means the leaves will be kept frefh, fo long as is neceffary for the feeding of the animal in the galls; and this, after its proper changes, efcaping out of the galls, muft be found within the outer box. Mr. Reaumur tried this method with fuccefs, and found that thefe worms became, in fine, a very fmall fpecies of beetle, feveral of which he found crawling upon the paper. They were of a cinnamon colour, and had conic and granulated antennæ of a beautiful figure. *Reaumur's* Hift. Inf. vol. 6. p. 209.

VICARDI, the name of an office in the ifland of Candia. The word is probably a corruption of the Latin *vicarii*. The *Vicardi* is the governor of a village, and is fometimes the parifh-prieft; his office is to levy the public taxes, and to fend offenders to the cadic. This office is always appointed yearly. *Pocock's* Egypt, vol. 2. p. 2. p. 12.

VICARIO *Deliberando occafione cujufdam recognitionis*, &c. An antient writ that lies for a fpiritual perfon imprifoned. Reg. Orig. 147. *Blount*, *Cowel.*

VICES, a term ufed by the dealers in horfes to exprefs certain faulty habits or cuftoms in that creature, which render him troublefome to the rider, and are never to be worn off, but by attention to the regular methods.

The following are the tricks generally underftood as *Vices* by dealers, and their methods of preventing, correcting, and curing them.

1. If a horfe carry his head or neck awry, ftrike him twice or thrice with the fpur on the contrary fide; but if he be very ftiff-necked on the right fide, and very plying or bending on the left, the rider is to hold the right rein fhorter than the other, and give him fudden checks every time he inclines that way, having a fharp wire faftened in the reins, that ftriking in his neck, he may be compelled to hold it ftrait; but in this care muft he always taken to check him upwards, for otherwife he will get a habit of ducking his head, which will prove very troublefome.

2. If a horfe is apt to fhake his head and ears, upon the leaft occafion, or move his ears, when he is going to kick or bite, or caft his rider; the way of curing this, is to ftrike him on the head with a wand, as foon as he fhews the firft attempt to it; and, at the inftant of ftriking him, he is to be checked with the bridle, and be ftruck with the fpur on the contrary fide; this will put him out of his pace, and he is then to be ftopped, that he may have leifure to underftand the rider's meaning. Every time that he ftarts or winches, which are fignals that he is going to bite, or to ftrike with his heels, the fame is to be done, and he will, by degrees, be broke of thefe habits.

3. If a horfe is fubject to ducking down his head frequently, the rider muft, every time he is guilty of it, check him fuddenly with the bridle, and at the fame time ftrike him with the fpurs, in order to make him fenfible of his fault. If he be ftanding, he is thus to be made to bring his head in the right place as he ftands; and when he does fo, he is to be cherifhed, that he may underftand the rider's meaning, which, in time, he will certainly do.

4. If a horfe be fkittifh, and apt to ftart, fo that the rider is never free from danger, while on his back, the caufe of the malady is firft to be carefully enquired into: If it be found to proceed from a weak fight, which reprefents objects to him other than they really are; the method of curing him is, every time he does it, to give him leifure to view the things, and fee what they really are; he muft have time to view them well, and then be rid gently up to them. If, on the contrary, his fkittifhnefs depends on his being naturally fearful, and alarmed at every noife, he is to be cured of it by the inuring him to loud noifes of many kinds, as firing of guns, drums, trumpets, and the like; and he will, in time, come to take delight in what he was before afraid of.

5. If a horfe be reftive, and refufe to go forward, the rider is to pull him backwards, and this will often occafion his going forward; this is ufing his own fault, as a means of reclaiming him. The rider is firft cautioufly to find whether this *Vice* proceeds from real ftubbornnefs, or from faintnefs; if from the latter, there is no remedy but reft; but if actual ftubbornnefs be the fault, the whip and fpur, well employed, and perfifted in, will, at length, be found a certain cure.

6. If a horfe rear up an end; that is, if he rifes fo high before as to endanger his coming over the rider, the horfeman muft give him the bridle, and bear forwards with his whole weight. As he is going down, he fhould have the fpur given him very roundly; but this muft by no means be done as he is rifing, for then it will make him rife higher, and, probably, come over.

7. If a horfe be fubject to lie down in the water, or upon the ground, there is no better remedy than a pair of fharp fpurs refolutely applied. But there is fome caution to be ufed in the applying them, for bad horfemen generally are the occafion of the faults in horfes, by correcting them out of due time. The proper moment of fpurring is juft when he is going to lie down; but when this has diverted him from the thought of it, he is not immediately to be fpurred again. For the doing this frightens the creature, and puts him into confufion to that degree, that he at length becomes reftive, and thus one fault is only changed for another, and that perhaps a worfe.

8. If a horfe be apt to run away, very cautious means muft be ufed to break him of it. The rider muft be gentle, both with a flack curb, and keeping an eafy bridle-hand. He is firft to be walked without ftopping him; but only ftaying him, by degrees, with a fteady, not a violent hand, and always cherifhing him when he obeys: When he is thus made very manageable in his walk, he is to be put to his trot, and finally to his gallop; and from thefe he is to be brought into a walk again, always by degrees, and ftaying him with a fteady hand. By ufing this method from time to time, with judg-

judgment and patience, it is probable he may at length be cured.

9. If a horfe is apt to fly out violently, it is certain, that the more the bridle-rein is pulled, and the more he is hurt by tugging the curb, the fafter he will run: The beft method is therefore, if there be field-room enough, to let him go, as foon as he is going, by flackening the bridle, and giving him the fpur continually and fharply, till he flacken of his own accord. Thus, by degrees, he will find that himfelf is the fufferer, by all his flights, and he will then leave them off, tho' he could be never broke of them any way elfe.

10. Some horfes will not endure the fpurs when they are given them, nor ever go forwards; but faftening themfelves to them, they will ftrike out and go back; and if they are preffed more hard, they will fall to piffing without ever going out of the place. If the horfe who has this *Vice* be a gelding, it will prove very difficult to cure him of it. A ftone-horfe, or a mare are much eafier cured; but even thefe will be trying at it again afterwards; and if ever they get the better of their rider, they will not fail to keep it up in this particular.

Every horfe, of whatever kind, that has this fault of cleaving to the fpurs, as the jockies call it, and not going forwards with them, is to be rejected, in the buying for any gentleman's riding, for it is a fign of a reftive nature, and is a fault generally accompanied with many others.

VICIA, *Vetch*, in botany, the name of a large genus of plants, the characters of which are thefe: The flower is of the papilionaceous kind; and the piftil, which arifes from the cup, finally becomes a pod, furnifhed with roundifh or angular feeds; to this it is to be added, that the leaves ftand in pairs on the rib, and that terminates in a tendril.

The fpecies of *Vetch*, enumerated by Mr. Tournefort are thefe: 1. The common cultivated *Vetch*, with black feeds. 2. The common cultivated *Vetch*, or tare with grey feeds. 3. The cultivated *Tare*. 4. The great wild bufh *Vetch*. 5. The bufh-*Vetch*, with roundifh, but pointed leaves, and with black feeds. 6. The bufh-*Vetch*, with roundifh, but pointed leaves, and with fpotted feeds. 7. The bufh-*Vetch*, with narrower-pointed leaves, and a fmall black feed. 8. The many-flowered *Vetch*. 9. The hoary perennial many-flowered *Vetch*. 10. The great-many-flowered *Vetch*, with variegated blue and white flowers. 11. The hairy perennial many-flowered *Vetch*, with pea-like pods. 12. The white-flowered hairy wild *Vetch*. 13. The great early French hairy wild *Vetch*, with red flowers. 14. The bufh *Vetch*, with a roundifh, fhort, and blunt-pointed leaf. 15. The corn *Vetch*, with numerous hairy pods. 16. The corn *Vetch*, with fingle fmooth pods. 17. The leaft *Vetch*, with numerous fmooth pods. 18. The long-leaved *Vetch*, with longer pods. 19. The narrow-leaved violet purple-flowered *Vetch*, with broad fmooth pods. 20. The many-leaved *Vetch*, with fmooth pods. 21. The *Vetch* that buries many of its pods under the ground. 22. The leaft early French *Vetch*. 23. The procumbent *Vetch*, with broad, not ferrated leaves. 24. The procumbent *Vetch*, with very broad leaves, and with ferrugineous-coloured flowers and fruit. 25. The procumbent *Vetch*, with very broad ferrated leaves. 26. The largeft wild *Vetch*, with the appearance of the wild pea. 27. The wild yellow *Vetch*, with a hairy pod. 28. The perennial late-flowering yellow *Vetch*, with hairy pods. 29. The perennial late-flowering yellow *Vetch*, with fmooth pods. 30. The yellow-flowered *Vetch*, with a brown galea to the flower. *Tourn.* Inft. p. 397.

VICOMAGISTER, among the Romans, an officer whofe bufinefs it was to take care of the ftreets, that nothing might obftruct, or render them anywife incommodious. *Hofm.* Lex. Univ. in voc.

VICTORIATUS, among the Romans, a coin with victory reprefented on one fide, equal in value to half the *denarius*. See the article DENARIUS, *Cycl.*

VICTORIOLA, in botany, a name ufed by fome authors for the hippogloffum, called in Englifh the *Alexandria-laurel, horfe-tongue*, or *double-tongue*. *Ger.* Emac. Ind. 2.

VIDIMARUM, in botany, the name of the tree which bears the febeftens, a medicinal plum, of Afia and Ægypt. Hort. Mal. vol. 4. p. 77.

VIELLE *ridée*, the *wrinkled old Woman's Shell*, a name given by the French authors to a fpecies of *chama* of the mutilated kind, very much refembling the famous *concha veneris*, but longer, and without that peculiarly-fhaped oval aperture to which that fhell owes its name.

It has feveral fpines about the lips, as the *concha veneris* has, but they are fhorter and more obtufe than in that fhell. The whole furface of this fpecies is deeply and irregularly wrinkled. It is of a whitifh colour, variegated with brown.

VIELLEUR, in natural hiftory, the name of a fpecies of fly, common in Surinam, and fome other places. It is moderately large, though lefs fo than the lanthorn-fly, fo common in that place, and has a long head, and fome other particulars, in which it refembles that creature. Mrs. Merian has given a figure of it, and reports it as the opinion of the natives, that it changes at length into a lanthorn-fly. See the article LANTHORN-*Fly*.

VIGOROSO, or VIGOROS AMENTE, in the Italian mufic, is ufed to direct a performer to fing or play with vigour, ftrength, and firmnefs.

VIGESIMA, among the Romans, a tax of the twentieth part of the yearly incomes of all inheritances. It was firft eftablifhed by Auguftus. *Pitifc.* Lex. in voc.

VIGESIMA was likewife a cuftom paid for flaves fold, as alfo for one made free. *Pitifc.* in voc.

VIGESIMARIUS, among the Romans, an officer who had the management of collecting the *vigefima*. See the article VIGESIMA.

VILLANELLA, in the Italian mufic, a fort of air or tune to which the peafants of that country dance. There are fome of thefe *Villanellas* very agreeable, having fomething gay and enlivening in them, well adapted to their defign. The firft couplet is ufually played plain and fimple, afterwards come an infinity of variations, diminutions, &c.

VILLEIN *Fleeces*, in our Statutes, are bad fleeces of wool, fhorn from fcabby fheep. 31 Ed. 3. c. 8. *Blount, Cowel.*

VILLOSE *Stalk*. See the article STALK.

VILTRUM, a word ufed fometimes alone to exprefs a filtre, inftead of the word *filtrum*. But *Viltrum* is more commonly joined with the word *philofophorum*, and then expreffes the common alembic for diftillation.

VIMMALA, in natural hiftory, a name given by the people of the Eaft Indies to a kind of pyrites, of a braffy appearance, and of a cubic figure.

They alfo give it in the fame places to the *pyritæ* in general, when fmall and of a fimple internal ftructure.

VINAGO, in zoology, a name given by fome authors to the wood-pigeon, from the colour of its breaft, fhoulders, and wings, refembling that of red wine. Its more ufual name among authors is *Œnas*. See the article ŒNAS.

VINDICTA, among the Romans, the prætor's rod or fwitch, with which he touched a flave's head when he was affranchifed. *Danet.* in voc.

VINCETOXICUM, in botany, a name ufed by many authors for the afclepias, or fwallow-wort, from its fuppofed virtues as an antedote. See the article ASCLEPIAS.

The people of Stiria and Carinthia are more fubject than any other nation to fcrophulous difeafes; but nature has provided them alfo with a very ready and fafe remedy, which is the *Vincetoxicum*, or fwallow-wort. This grows in vaft abundance all over thefe countries; and the common people know it as a certain cure for this terrible difeafe. It is alfo found of excellent ufe in dropfies; and as it might be cultivated with us, or its roots imported in any quantities, it is wonderful that we do not ufe it.

VINE, (*Cycl.*) *Vitis*, in botany. See the article VITIS.

All the forts of *Vines* are propagated either from layers or cuttings. The former is the method ufually practifed with us, but the latter feems much the better.

In order to propagate them by cuttings; thefe muft be chofen fuch as are ftrong and well-ripened fhoots, of the laft year's growth, and fhould be cut from the old *Vine*, juft below the place where they were produced, taking a knot of the two years wood, which fhould be pruned fmooth. The upper part of the fhoot fhould then be cut off, fo as to leave the cutting about fixteen inches long. Thefe cuttings are to be placed with their lower part in the ground, in a dry place, laying fome litter about their roots to prevent them from drying. In this place they fhould remain till the beginning of April, which is the time to plant them. They are then to be taken up and wiped clean, and if they are very dry, they fhould ftand with their lower parts in water fix or eight hours. Then, having prepared the beds for them, they are to be fet at about fix foot diftance from each other, and making their heads flant a little toward the wall. The cutting is to be fo buried in the ground, that only the uppermoft bud be upon a level with the furface; the earth is then to be well clofed about the plant, and a little mould heaped up over the eye of the bud, to keep it from drying. After this, there is no more trouble neceffary, but to keep the ground clear from weeds, and to nail up the fhoot as it grows, to the wall, rubbing off all the fide-fhoots.

The Michaelmas following, if the cuttings have produced ftrong fhoots, they fhould be pruned down to two eyes. In the fpring following the ground is carefully to be dug up about the fhoots, and the ftalks to be earthed up to the firft eye. During the fummer all the lateral fhoots muft be rubbed off as they appear, and only the two from the two eyes which were left, muft be encouraged; thefe, as they grow, are to be nailed up againft the wall; and in the middle of July thefe fhould be fhortened, by nipping off their tops, and this will greatly ftrengthen the fhoot. At the Michaelmas following thefe fhould be pruned, leaving them each three eyes, if they are ftrong; but if they are weakly, only two. The next fummer there will be two fhoots from each fhoot of the laft years wood; but if there fhould be two from one eye, which is fometimes the cafe, then the weaker is to be rubbed off. At midfummer the ends of the fhoots are to be pinched off as before; all the weak lateral fhoots are to be difplaced, as in the preceeding fummer, and the whole management is to be the fame. This is all the culture neceffary to young *Vines*.

As to the management of grown *Vines*, it is to be obferved that thefe rarely produce any bearing fhoots, from wood that is more than one year old; the great care muft therefore be always to have plenty of this wood in every part of the tree.

The bearing shoots for the following year should be left at the pruning with four eyes each. The under one of these does not bear, and consequently there are only three which do. Many leave more eyes on the shoots, that they may have more fruit, which is the consequence; but then the fruit is much poorer; and this is so well known in the wine countries, that there are laws to direct that no more than such a number of eyes are to be left on each shoot, for the grapes would else be of a poor juice, and destroy the reputation of their wine. Each of the three eyes left, will produce two or three bunches; so that each shoot will give six or nine bunches, which is as much as it can bring to any perfection. These shoots must be laid in at about eighteen inches asunder on the wall; for if they are closer, when the side-shoots are produced, there will be no room to train them in upon the wall; and the largeness of the leaves of the *Vine* requires also that the shoots should be at a proportionable distance.

The best season for pruning *Vines* is the end of September, or beginning of October. The cut is always to be made just above the eye, and sloped backward from it, that if it bleed, the juice may not run upon the bud; and where there is an opportunity of cutting down some young shoots to two eyes, to produce vigorous shoots for the next year's bearing, it should always be done. In May, when the *Vines* are shooting, they should be looked over, and all the shoots from the old wood should be rubbed off, as also the weaker, whenever there are two produced from one eye. During the month of May the branches must be nailed up against the wall as they shoot, and toward the latter end of this month, the ends of the bearing branches should be nipped off, which will greatly strengthen the fruit. Those, however, which are to bear the next year, should not be stopped before the beginning of July.

When the fruit is all gathered, the *Vines* should be pruned, whereby the litter of their leaves is all removed at once, and the fruit will be forwarder for this the succeeding year. *Miller*'s Gardener's Dict.

The *Vine* is one of the trees most liable to be injured by frosts with us; its trunk is often split in frosty weather, and that most frequently when it stands in the warmest aspects. In the year 1683, the great frost split almost all our timber-trees; but this was owing to defects in them, by which the sap was detained in very large quantities in particular places, from their being wind-shaken, coltie, or otherwise distempered; but the *Vines* suffered the same accident, seemingly from another cause.

Those *Vines* were most split this year, which were exposed to a south aspect, and planted against the warmest walls. The sun, their usual friend, now proved their enemy, and daily thawing the sap in the trunk, it was again frozen every night. This often bending and unbending, softening and hardening the vivid spirituous juice of this plant, destroyed it; and the sap, being the same year disordered, and not gradually seasoned, but even stopped before Michaelmas-day, and the fresh sap wholly detained by the succeeding frosts from arising, the frozen and hard earth also denying its juices, even though the vessels of the plant had been in a condition to receive them; the trunks and branches of the *Vines* were filled only with a thin, watery, and mortified sap, and this most of it extravasated by the bursting of the vessels it was frozen in, many of them suffered as much as if cut off from the root. Thus perished the greater part of the *Vines* exposed to the sun's action; while the other, which stood in more shady places, not having their juices thawed and frozen daily, suffered but one change, and often escaped. It was also observed this year, that the red grap-trees escaped in general much better than the white, being hardier than they.

Other wall-trees, containing viscous juices, escaped very well, while the *Vines* thus suffered, even though exposed in the same manner. Among others, the plums, apricots, peaches, and wall-cherries, had very little damage. It is easy to conceive why plants with viscous juices should suffer less by frost, than those with more thin ones; and we see that this is the case between these two sorts of trees, the plums, &c. often exsudating their juices in form of gum-arabic; but the *Vines*, when they throw out any, shew that theirs is as thin as common water. The different kinds of trees have, doubtless, all their different consistences in their juices; and it may have principally been owing to that diversity in others, as well as in the plum and *Vine*, that some escape, while others perish by frosts. Phil. Transf. N°. 165.

VINE *Gallinsect*, an insect of the *gallinsect* class, principally found on the *Vine*, though capable of living on some other trees, and sometimes found on them. It is much of the same shape, figure, and manner of life with the other animals of this class; but differs from them in this; that as they lay their eggs all under their body, and continue absolutely to cover them, till they are hatched; these protrude them from their body, and they are found in prodigious abundance, lodged in a sort of cottony or silky bags all over the stalks and branches of the *Vines*; the dead animal is sometimes found covering them in part; but more frequently they are absolutely naked, and often are so numerous as to appear like thin cobwebs hung one over another all over the *Vine*. See Tab. of Insects, N°. 32.

These eggs might be easily mistaken for those of small spiders; they always hatch well, and come to maturity on the *Vines* they are found on; but if removed to others, they seldom come to any thing, which is very singular, since the *Gallinsects* of almost all other trees may be removed and propagated either on the same or on different trees. These nests of eggs, covered with down, and thus lodged on the *Vine*, are of no certain shape or form; sometimes they are convex and roundish; but that is not always the case, they stick to the fingers on touching, and are pulled away in small irregular threads; if these are pulled away to any considerable distance, the eggs come among them; they are oblong, reddish, and of smooth shining surfaces, and are amassed in vast numbers in the center of each of these little packets.

The insect, as it lays these eggs, directs them under its body toward its head, and thence downward toward the tail again; they are all arranged like the beads of a necklace, and make long chains or strings, thus directed, and running backward and forward with several sinuosities; and the cottony matter in which they are enveloped, is not like that of spiders, produced from certain particular organs appointed for the spinning it, but sweats out, as it were, from every pore of the creature's body; but most of all from its sides; it seems to be produced in extremely small and short filaments; but, being of a viscous nature, will draw out on the touch like glue or warm resin; and long threads of it are originally formed by the course of the chains of eggs before described, which take it up in their course, and form it into numerous threads of their own length, as it goes on.

These *Vine* insects are of the boat-fashioned kind; but, beside these, there are some other species which lodge their eggs in a cottony nest of the same kind. The common thorn affords a shorter and more convex kind that this does; these are a very small species; others are something larger; but the oak affords a sort equal in size, if not exceeding those of the *Vine*; some of these are brown, others bluish, and others reddish; and there are some minute differences in their shape. *Reaumur*, Hist. Inf. Tom. 4. p. 61.

VINE *Grubs*, in natural history, a name given by some authors to the pucerons, or little insects, which are usually of a green colour, and are found often in prodigious numbers, sticking to the leaves of trees and plants, and to their young stalks.

Mr. Reaumur has been very curious in his investigation of the nature of this insect; but its manner of propagating its species was never clearly observed, till Mr. Bonet discovered it.

Reaumur observes, that in every family of pucerons, there are some that have wings, and some that have not; and that, according to the usual course of nature, the winged ones should be males, and the others females; but, on the contrary, that both the winged and the unwinged *Vine-grubs* are females, all being viviparous, and each kind producing a number of living young; so that the males of these pucerons were never discovered, even by that careful observer; nor could he ever find out what it was that impregnated the one and the other kind. He leaves us queries on this subject, whether there is no copulation among them, and whether they are all hermaphrodites, each having in itself the organs of both sexes, as is the case in the river muscles.

Mr. Bonet, in order to inform himself of the process of nature in these creatures, brought up one of them in perfect solitude from its birth; he had an opportunity of observing it in the place where it was kept, and watched it very strictly for many months together. At the end of twelve days this creature, without having had any copulation with a male, began to breed. She produced in the whole ninety-five young ones, all alive, and constantly under the eye of the observer. This experiment was repeated several times with the same success; and, at length, repeated upon the young ones produced in this manner, and they were found to breed at the same period, and in the same manner with their parent, without having had any copulation with a male, as far as to the fourth generation.

A hasty observer would immediately conclude from this, that there was no copulation among the pucerons; but farther enquiry proves, that this is not the case; for the same observer has found a species of them in which there is copulation; so that both the winged and the unwinged kinds are truly females, and the male is a small fly, of a very different shape, as is the case in regard to many other insects. This male is the most salacious creature imaginable, copulating a vast many times successively, with the same, and with different females. As this is the case in regard to one species of this creature, it doubtless is so also in regard to the rest, though that has not yet been observed: And the singularity seems to be this, that after the male has copulated with the female, she not only becomes prolific, but her young ones are born ready impregnated, as far as to the fourth generation; after which, probably, there is a necessity for the copulation with the male again.

There is another very singular observation also in the production of the young pucerons; the females are properly viviparous, and usually bring forth live young; but they sometimes produce only a sort of foetus's, which are laid in long series one beside the other, as the caterpillar-eggs are laid by

the butterfly; and they are left to hatch, as it were afterwards, by the heat of the fun: Philof. Tranf. N°. 469.

VINEGAR (*Cycl.*)—It is plain that the original component matter of *Vinegar* is fugar, which, in the art of acetification, feems wholly converted into a fluid tartar, and if the aqueous liquor be feparated from *Vinegar*, we find the *Vinegar* is thereby made the ftronger, infomuch that if *Vinegar* were to be highly concentrated by congelation, it would become almoft folid, or a kind of actual tartar.

Whence the rule is eafy, that, in order to make an almoft folid *Vinegar*, we fhould endeavour to diffolve tartar in an aqueous liquor, whence to perfect the art of acetification. The diffolving of tartar largely with fugar or treacle, and the ftrongeft *Vinegar*, by repeated imbibitions, that and a proper management is much to be recommended to the perfons concerned in this trade. *Shaw's* Lectures, p. 205.

It is very well known that a very large quantity of water, or mere infipid phlegm, is contained in *Vinegar*, and that what we call *Vinegar*, would be infinitely ftronger, if cleared of that. It is for this reafon, that a great quantity of *Vinegar* will faturate but a very fmall portion of an alkaline falt; and a great deal of this aqueous acid is, for the fame reafon, required to diffolve a fmall portion of metal. A pint of the ftrongeft *Vinegar* will fcarce diffolve more than two drams of iron, and will not faturate more than the fame quantity of pure falt of tartar.

It has been wifhed by many, that fome method could be contrived of concentrating *Vinegar*, fo as to give it more ftrength; this muft depend alone on the extracting the aqueous humidity; and this has been attempted feveral ways. Of all others, however, that fucceeds beft which we find recommended by Stahl, which is by freezing. This method fo far deprives *Vinegar* of its fuperfluous water, and fo far collects its acetous penetrating fharpnefs, as to render it an extremely powerful menftruum, throwing out five or fix parts of phlegm, which fcarce taftes at all four, and having one fixth or one feventh part poffeffed of all the virtues of the whole. Dr. Shaw affures us, that he has repeated this experiment, and found it to anfwer perfectly upon the trial.

This condenfed *Vinegar*, toward the end of the operation, or in the laft congelations, lets fall a white fhining powder, which is a tartar that, though diffolved in great quantity in the whole aqueous fluid, could not be retained in this concentrated one. *Stahl* de Condenfat. Vini.

The thicker *Vinegar* is, the lefs fit it proves for diftillation, as there is always the greater danger of an empyreuma, or burnt fmell, which would fpoil the whole procefs, and as it ufually in this cafe comes over oleaginous. And the pureft white falt of tartar, faturated with this diftilled *Vinegar*, being afterwards ignited, turns black, and yields a fmell extremely like that of crude tartar in the calcination. *Shaw's* Chemical Effays.

On the other hand, the more the *Vinegar* is diluted immediately before diftillation, the lefs danger there is of burning: And if the thick remaining mafs, when the thinner part is diftilled from it, be again diluted with water, it may, by a fecond diftillation, be brought to afford an acetous fubftance; though this latter be by no means comparable to this former volatile part. This Vigani juftly fufpects to be a thing known but to very few. And even when the *Vinegar* it diftilled with the utmoft labour and care, it ftill has this effect in a higher degree, and contains an immenfe quantity of phlegm, in proportion to its acid falt.

In this cafe, the method of condenfation by freezing is of the utmoft fervice; firft of all feparating the more aqueous part, and in the next place, that which is fomewhat acetous, tho' not comparable to what remains behind; fo that, by this means, a moft concentrated and fubtle fpirituous diftilled *Vinegar* may be produced, *viz.* by freezing the whole parcel of diftilled phlegm and diftilled *Vinegar* together, a thing of great moment to the curious in the *chemia fublimior*, and particularly to thofe who underftand Hollandus. And when the *Vinegar* is froze without diftillation, by this means you have a noble rob, or a rich concentrated *Vinegar*, freed from its diftillating aqueous and ufelefs part. *Vigani*, Medull. Chem.

Vinegar, when applied to fores in animal bodies, ftimulates and refifts putrefaction. When weak, it alfo enjoys the virtues of water; when ftrong, approaches in its effects to thofe of falts and acid fpirits. Med. Eff. Ed. vol. 5. art. 24. See the articles SALT and SPIRIT.

Portable VINEGAR, a name given by the chemifts to a fort of *Vinegar*-powder, or *Vinegar* in a dry form. It is a preparation of tartar with *Vinegar*, and is made in this manner: Take white tartar, half a pound; let it be carefully wafhed, then dried and powdered; infufe this powder in the ftrongeft wine-*Vinegar*, then dry it, and infufe it again, repeating this operation ten times. After this the dry powder is to be kept for ufe; at any time a fort of extemporaneous *Vinegar* may be made by diffolving a fmall quantity of this powder in any proper liquor.

Eels in VINEGAR. The common opinion, from the difcovery of eels in *Vinegar*, that its fharpnefs to the tafte was occafioned by thefe animals, occafioned the accurate Lewenhoek to attempt a careful examination of it by the microfcope.

Some of the ftrongeft and fharpeft *Vinegar*, after having been expofed for fome hours to the air, and afterwards examined by the microfcope, entertains the fight with a number of corpufcles, called the falts of *Vinegar*, which are acute at both extremities, and have many of them in the middle an oblong figure of a brownifh colour, and others were altogether clear, pellucid, and bright as cryftal. Others of thefe particles appeared of an oval figure, and fome of the half of fuch a figure, hollowed like a fmall boat, or the half of a nut-fhell. The more perfect figures, pointed at both ends, and pellucid, are fo very minute, that fome thoufands of them are comprehended in a fmall drop.

Thefe feem to be what affect the tongue with the acid fharpnefs, when we tafte of *Vinegar*; and it is very probable, that befide thefe, minute as they are, there are multitudes of others equally pointed, and infinitely fmaller than thefe.

If *Vinegar* be placed in an open glafs, and fuffered to remain fome weeks, the furface of it will be found, on examination with good glaffes, to be full of the fame figures, double-pointed, and very pellucid; and in thefe, very often, there may be cavities plainly difcovered; but examining the liquor a little deeper down, there are found numbers of minute eels; yet thefe, though minute, are prodigioufly larger than the falt particles, and can never be fuppofed to be the occafion of the fharpnefs of *Vinegar* to the tafte, by any who rightly confider, fince it is not all *Vinegar* that contains them; nay, the much greater part of *Vinegar* is wholly without them, and in winter they all die; yet *Vinegar* is not lefs fharp at that feafon, than in the fummer.

If *Vinegar* be impregnated with crabs-eyes, or any other alkaline fubftance, which blunts, and in a great meafure deftroys its acidity, thefe double-pointed figures are no longer found in it, on a microfcopical infpection; but in their places we find others with an oblong quadrangular bafe, from which they fhoot up into pyramids, and appear like polifhed diamonds. Thefe are alfo fo very minute, that fix thoufand of them are computed to be contained in a drop of the liquor, no larger than two corns of barley. And thefe will be ufually found all of the fame fize, or very nearly fo, which is by no means the cafe with the other falts of *Vinegar* in its natural ftate.

Mr. Mentzelius was fo lucky as to fee thefe undergo their laft metamorphofis, and change into fmall flies: And though this is a fingle inftance, in regard to the microfcopical world of animalcules, yet it is highly probable that the whole race of thofe, whofe appearance in medicated fluids we have been fo long puzzled to account for, may, like thefe, be the worm ftate of fome winged aerial infect, and have owed their origin, where we fee them, to the eggs of parent flies, too fmall for our fight. *Reaum.* Hift. Inf. vol. 4. p. 404.

VINNET, in our ftatutes, is ufed for a flower or border, which printers ufe to ornament printed leaves of books. Stat. 14 Car. 2. c. 33. *Blount.*

VINOUS (*Cycl.*)—VINOUS *Liquors.* All forts of *vinous* and fermented liquors, both before and after the fermentation, confift not of fimilar, but heterogeneous parts, which are joined together in one certain and determinate order; thus the action of fermentation being a feparation and deftruction of the former connection of the fubject, and tranfpofing its parts anew, there muft of neceffity have been a kind of firm or durable texture in the fubject fo disjoined, feparated, and new-ranged.

For example: Grapes being laid upon dry ftraw, in a cold place, will, for fome time after they are feparated from the vine, preferve that texture, which gives them their faline, unctuous, and flimy fweetnefs; which the juice alfo retains after preffing, and becomes a clear and tranfparent muft, without feparating itfelf into parts, but continuing regularly and uniformly mixed, fo as to preferve the different matters it confifts of, intimately connected among themfelves. In this firmly connected ftate they may be kept many months, if a cafk be filled with this juice, and fet in a cool place, as we evidently fee in ftum. *Shaw's* Effay on concentrating Wines.

Wine, in the precife chemical or philofophical notion of it, is a faline clammy oleaginous matter, diluted with a large proportion of water, whereby 'tis expanded, or fet at a diftance from itfelf, while the faline parts are faturated with, and interfperfed among the fubtile earthy ones that make the flimynefs; thus they together imbibe, detain, and hold the groffer parts, befide which there are other oily parts vaftly more fubtile, which, by means of the highly attenuated faline portion adhering clofely to them, remain as much connected with the water as the reft; and thefe are what we call the fpirituous parts; but the connection of them all together is fo ftrong and durable, that they move for a long time as one body, without feparating, if carefully preferved. An acquaintance with the true nature, hiftory, and effects of *vinous* fermentation, will fully explain and juftify thefe pofitions.

If the fpirituous part be once feparated and drawn away from the wine by diftillation, though it were immediately to be returned back to the remaining mafs from whence it came, and ever fo well fhook again with it, the whole by no means retains its former tafte, odour, and durability, but turns to a confufed turbid mixture, of a different and naufeous tafte, and a difagreeable fmell; and, on the whole, approaches nearly to a

a ſtate of vapidity. The only objection to this general rule, is, that if a new fermentation, or even but a fret be raiſed, when the ſpirit is newly joined to the remainder in the ſtill, the ſpirit may be thus re-inſtated, and the wine rendered perfect. The proceſs is different and uncertain; but a nice management, and a proper intermedium, will bring it about.

If an inflammable ſpirit diſtilled from the ſame, or any other *Wine*, be put to a parcel of *Wine* which is too ſaline, or not ſufficiently ſpirituous, the bare addition, or tumultuous admixture thereof, very far from giving the fine and intimate ſoftneſs of a good *Wine*, will rather manifeſt its own burning acrimony and nidorous flavour to the ſmell and taſte, and will add a nauſeous bitterneſs to the former tartneſs or acidity. This is an obſervation of Stahl's, and is allowed by Dr. Shaw to be true in general; but he obſerves, that, under a nice and proper management, a fine and taſteleſs ſpirit may be prepared and introduced into *Wines*, and will, after a time, become intimately mixed with their other part, and remain abſolutely undiſcoverable to the taſte or ſmell, unleſs by the excellency and the ſtrength it gives. *Stahl's* Schediaſma de concentrat. Vini. See the article WINES, SPIRIT, &c.

VINUM *Aloeticum Alkalinum*, a form of medicine in the late London Diſpenſatory, intended to ſtand in the place of Helmont's elixir proprietatis: It is prepared in this manner: Take of bay fixed alkaline ſalt eight ounces, aloes, myrrh, and ſaffron, of each an ounce, purified ſal armoniac ſix drams, white wine a quart; infuſe them together without heat for a week, or longer, and then filtre the wine through paper for uſe. *Pemberton's* London Diſpen. p. 262.

VINUM *chalybeatum*, *Chalybeate Wine*, is thus prepared: Take filings of iron four ounces, cinnamon and mace, of each half an ounce, of Rheniſh *Wine*, two quarts; infuſe a month without heat, often ſhaking the veſſel; then filtre it off for uſe. This is the preſcription of the new London Diſpenſatory, and is vaſtly preferable to that of the former, where only ſaffron was ordered.

This *Wine* is an excellent ſtomachic and aperient; it may be drank a moderate glaſs once or twice a day, or mixed in apozems of the aperient vegetables.

VINUM *Eſſatum*, in chymiſtry, a term uſed by Paracelſus, and ſome others, to expreſs *Wine* concentrated by freezing, after a long and low heat; the method of making it was this: They ſet the *Wine* in horſe-dung three months in a glaſs, hermetically ſealed, and then expoſed it to the froſty air for a month, after which they threw away the ice, and ſaved the unfrozen liquor.

This was their *Vinum Eſſatum*, called alſo eſſence of *Wine*; and ſpirit of *Wine*, and it is in this ſenſe, that Paracelſus ſays, ſpirit of *Wine* is a not-inflammable liquor, a paſſage that very few have underſtood.

Moſt of the antient chemical philoſophers profeſs, that they uſed ſpirit of *Wine* for the diſſolving of gold. We know very well, that what we call ſpirit of *Wine* has no ſuch power; and if we may judge from Rolfink, the emperor Rudolphus employed the *Vinum Eſſatum*, or concentrated *Wine* of Paracelſus, for that purpoſe. *Vigain*, in his *Medulla Chemiæ*, has ſaid a great deal of the virtues of the ſpirit of *Wine*, ſome of which deſerve to be carefully enquired into; the others are evidently idle and imaginary. What Paracelſus delivers on the ſame ſubject, deſerves alſo to be conſidered. *Vigain* Medul. Chem. *Paracelſ.* de Archidoxis.

Stahl, who has written a great deal on the concentration of *Wine* by freezing, concludes his eſſay, by telling us, that he who has this ſecret, by means of a little dry powdry body of turning water into wine, will not perhaps eaſily divulge the capital uſe he may make of ſuch a ſecret.

Dr. Shaw obſerves, that the author of this treatiſe intimates ſomewhat conciſely, but candidly and philoſophically enough, the poſſibility of doing wonders with a thing that is not difficult to be had with us: the myſtery lies in the words, little, dry, and powdery; and Dr. Shaw, tho' he does not perfectly explain himſelf upon the ſubject, ſays, that the body is common, and that England abounds with it; that it is totally and tranſparently ſoluble in water, fermentable, perfectly white, and ſweet as ſugar; the other goes not ſo far as this, nor is it certain that this is his meaning; but if not, it is at leaſt a very remarkable fact, and comes atteſted by a very good hand. Whatever may be the uſes of concentrated *Wine* in chemiſtry, it is plain, that it may be of the greateſt ſervice in the common affairs of life, as it may be eaſy to have it prepared in ſufficient qantities in the *Wine* countries, and imported hither, where a very ſmall portion of it will render the loweſt and worſt of our *Wines* very rich. *Shaw's* Chem. Eſſay.

VINUM *extemporaneum*, a name given by Dr. Shaw and others, to a ſort of extemporaneous vinous liquor, made without fermentation, from the melaſſes ſpirit, lemons, water, and ſugar, in the following manner: Some good ſound lemons are to be cut into ſlices, rind and all, and put into a quantity of pure and fine melaſſes ſpirit; when they have ſtood in infuſion three or four days, the liquor is to be ſtrained clear off, and filter'd; and having before prepared a very thin ſyrup of the fineſt ſugar diſſolved in ſpring-water; the two liquors are to be mixed together. The proportions of this mixture can only be hit by repeated trials, but when once found, it will be eaſy to continue them; and a vinous liquor will thus be prepared not inferior to many foreign wines.

VINI *Oleum*, *oil of wine*, a very precious liquid, kept as a ſecret in the hands of ſome dealers in ſpirits, and uſed to give the brandy flavour to ſpirits of leſs price. It is certain, that all the ſpirits we uſe take their flavour from the eſſential oil of the ſubſtance they are made from, that of malt is very nauſeous and offenſive, and renders the ſpirit horribly diſagreeable, if not carefully kept back in the diſtillation of it; that of the grape, on the other hand, is extremely agreeable, and is what gives the delicious flavour to French brandy: this therefore is to be carefully brought over among the ſpirit in diſtillation.

This is that *oil of Wine* ſo much celebrated among our diſtillers, and is for their uſe made ſeparate, and is of ſuch effect, that half an ounce of it will determine a pure and clear malt ſpirit to be French brandy, ſo as to ſtand the teſt of the niceſt palate; and all the trials that can be invented, provided the oil and the ſpirit have both been carefully made.

The manner of making the oil is this: They take ſome cakes of dry wine lees, ſuch as are uſed by our hatters, and diſſolving them in ſix or eight times their weight of water, they diſtil the liquor with a ſlow fire, and ſeparate the oil by the ſeparating pot, reſerving for this nice uſe only that which comes over firſt, the oil that follows being coarſer, and more reſinous. To render this buſineſs perfectly ſucceſsful, there muſt be ſeveral things obſerved: 1. The lee muſt be of the right kind, that is, of the ſame nature with the French brandy propoſed to be imitated. 2. The malt ſpirit muſt be extremely pure. 3. The doſe of the oil muſt be very well proportioned: and, 4. The whole muſt be artificially united into one ſimple and homogene liquor. Theſe cautions all regard only the taſte, and beſide theſe, in order to come up to a nice counterfeit, ſeveral other particulars muſt be attended to; ſuch as the colour, proof, tenacity, ſoftneſs, and the like; ſo that, in ſhort, the operation has too much nicety in it to be hit of by every ordinary dealer. When this fine *Oil of wine* is procured, it may be mixed into a quinteſſence, with pure diſtilled alcohol, or the totally inflammable ſpirit of wine, to prevent its growing diſtaſteful, rancid, or reſinous; and thus it may be long preſerved in full poſſeſſion of its flavour and virtues.

The ſtill bottoms, of remaining matter after the diſtillation of this oil, will yield many productions to advantage, particularly tartar, and ſalt of tartar, as alſo an empyreumatic oil, and a volatile ſalt, like that of animals. Some kinds of lees afford all theſe in much greater quantity than others; the lees of canary and mountain wines yield very little of them, and indeed, ſcare any tartar, or fixed ſalt at all; but the white French lees of thoſe thin wines, that afford the ordinary brandies, yield them all very copiouſly, inſomuch, that ſometimes a ſingle hogſhead of dry and cloſe-preſſed lees will afford by this proceſs, three gallons of brandy, forty pounds of clean tartar, a large proportion of empyreumatic oil, and volatile ſalt, beſide full four pounds of good ſalt of tartar. It is not to be expected, however, that every parcel of this lee ſhould yield fully in this proportion. *Shaw's* Eſſay on Diſtillery.

Chium VINUM. See the article CHIUM *Vinum*.

VIOLA, the *Violet*, in botany, the name of a genus of plants; the characters of which are theſe: The flower is of the polypetalous, anomalous kind, much reſembling the papilionaceous ones. The piſtil ariſes from the cup, and finally becomes a ſeed veſſel, uſually of a trigonal form, which opens in three places when ripe, and contains roundiſh ſeeds.

The ſpecies of *Violet*, enumerated by Mr. *Tournefort*, are theſe: 1, The common purple ſweet-ſcented *Violet*. 2. The ſweet-ſcented garden purple *Violet*, with large leaves. 3. The common wild ſcentleſs *Violet*, with larger and rounder leaves. 4. The common wild ſcentleſs *Violet*, with longer, narrower, and more pointed leaves. 5. The common white *Violet*. 6. The blue flowered *Violet*, with ſmaller flowers, and ſmaller leaves. 7. The double purple *Violet*. 8. The double red *Violet*. 9. The double white *Violet*. 10. The double variegated red and white *Violet*. 11. The greyiſh flowered double *Violet*. 12. The double *Violet*, with very large flowers. 13. The double *Violet*, with very deep purple ſmall flowers. 14. The round-leaved marſh *Violet*. 15. The mountain *Violet*, with leaves divided into many ſegments. 16. The purple alpine *Violet*, with very ſmall leaves. 17. The round-leaved yellow flowered alpine violet. 18. The leſſer round-leaved yellow flowered alpine *Violet*. 19. The dwarf narrow-leaved mountain *Violet*, with ſnow-white ſcentleſs flowers. 20. The purple-tree *Violet*. 21. The tree *Violet*, with blue and white flowers. 22. The yellow-flowered tree *Violet*. 23. The ſweet-ſcented three-coloured mountain *Violet*, or heart's-eaſe. 24. The great flowered yellow mountain *Violet*. 25. The great flowered white mountain *Violet*. 26. The yellow mountain *Violet*, with roundiſh crenated leaves. 27. The blue three coloured mountain *Violet*, with roundiſh crenated leaves. 28. The great flowered blue mountain *Violet*. 29. The yellow mountain *Violet*, with leaves not crenated. 30. The mountain three coloured *Violet*, or panſie, with variegated flowers. 31. The common creeping garden panſie. 32. The creeping garden panſie, with yellow and white flowers. 33. The creeping garden panſie, with white and blue flowers. 34. The

The creeping garden panſie, with purple and yellow flowers. 35. The creeping garden panſie, with plain white flowers. 36. The creeping garden panſie, with *violaceous* velvety flowers, of a deep purple and gold yellow. 37. The creeping garden panſie, with a large blackiſh purple flower. 38. The creeping garden panſie, with a pale velvety flower. 39. The creeping garden panſie, with a gold, yellow, and ſtraw-coloured velvety flower. 40. The two coloured, or white and yellow field *Violet*. 41. The two coloured field *Violet*, with blue and yellow flowers. 42. The two coloured field *Violet*, with blue and white flowers. 43. The field *Violet*, with wholly yellow flowers. 44. The field *Violet*, with wholly white flowers. 45. The long leaved ſhrubby Spaniſh *Violet*. 46. The American *Violet*, with paſſion-flower leaves. 47. The Teucrium leav'd Pyrenean *Violet*, with a long tail to the flower. 48. The rock *Violet*, with a thick, crenated, leaf, like that of baſil, and a large ſcentleſs flower, of a blue colour with white ſtreaks. 49. The purple ſcentleſs *Violet* without a ſtalk, and with leaves like the panſie, but ſcarce at all ferrated. 50. The ſmall hairy-branched erect two coloured *Violet*. 51. The ſmalleſt alpine *Violet*, with leaves like *nummularia*. 52. The great hairy cucumber leav'd Virginian *Violet*, with blue flowers. 53. The great hairy cucumber leaved Virginian *Violet*, with yellow flowers. *Tourn.* Inſt. p. 420.

Violet flowers, freſh gathered, are emollient, and gently purgative. They are greatly recommended by authors in fevers, head-achs, pleuriſies, and peripneumonies. A ſyrup of them made in a ſtrong infuſion in water, is the only preparation kept in the ſhops: it is given to children as a gentle evacuant, and ſerves as a teſt to diſtinguiſh acids from alkali's, the former turning it immediately red, and the latter green.

VIOLA, in ichthyography, a name by which ſome authors have called the ſmelt, from its ſweet ſmell, which has been ſuppoſed to reſemble that of the *Violets*. *Willughby*'s Hiſt. Piſc. p. 202. See the article EPERLANUS.

VIOLA *ſerotina*, the *late Violet*, a name given by the antiens to a garden-flower, not properly of the *Violet* kind, but to which we, as well as they, have connected the name *Violet*, though with a diſtinctive epithet, we call it *Viola matronalis*, or dames *Violet*.

Pliny is very expreſs in this diſtinction, but is not ſufficiently attended to in it; and by this means is miſunderſtood in ſome other parts of his works, where he alludes to this flower in his deſcription of the colour called by the Romans *conchylius*, or *conchyliaceus color*; he ſays, that the deepeſt degree of it was that of the flower of the *Viola ſerotina*. The commentators on his works have generally explained this into his ſaying, That the deepeſt colour of this name was a blue purple, like that of the *Violet*; but he only means that it is of a deeper red than the colour of the mallow flower, and with a proportionate mixture of purple, as there is in that flower. See the article CONCHYLIACEUS *color*.

VIOLARIS *Lapis*, in natural hiſtory, a foſſile body, called by the Germans *Violſtein*, and by many authors, *Lapis odore Violarum*, from its having a ſweet ſmell when freſh broken, which has been ſuppoſed to reſemble that of the *Violet*.

The Germans have many ſtones, which have more or leſs of a ſweet ſmell when freſh broken, as they have many which ſtink very ſtrangely; the latter of theſe they call all by the common name of *ſwine-ſtone*, and the former, all by that of *Violet ſtone*. The ſubſtance, however, which poſſeſſes this quality in the higheſt degree of all others, and is therefore moſt proper to be called diſtinctly by this name, is a ſpecies of talc, of the genus of the bractearia, called by Dr. Hill *brактearium niveum lucidiſſimum bracteis undulatis*, or the ſnow-white ſhining bractearium, with undulated ſcales. This is found in maſſes of an extremely rude and irregular ſtructure, but very compact and firm, uſually of a roundiſh, or oblong figure: theſe are of various ſizes, from an inch or two, to a foot in diameter, and are compoſed of almoſt an infinite number of thin extremely beautiful and ſnow-white plates, which are all broad, thin, and flaky, and of various ſizes, and perfectly irregular in ſhape and figure, and are naturally waved, bent, and curled: its ſmell, when broken, is not like that of any of the known perfumes, but is a ſort of mixed one, reſembling that of roſes and *Violets* together: it is very heavy, and will neither give fire with ſteel, nor ferment with acid menſtruums. It is common on the ſhores of rivers in Italy, and in the mountains in Germany. *Hill*'s Hiſt. of Foſſ. p. 83.

VIOLET, *Viola*, in botany. See the article VIOLA.

VIOLONCELLO. See the article VIOLIN, *Cycl.*

VIOLONE. See the article VIOLIN, *Cycl.*

VIPER, *Vipera*, (*Cycl.*) a poiſonous ſpecies of ſerpent, well known in moſt parts of the world.

Its ſize is uſually two foot and a half in length; its upper part is of a duſky colour, with an admixture of a reddiſh tawney; and in the females with a great deal of whitiſhneſs. Along the middle of the back there runs a broad dentated black line, or a long ſeries of conjunct rhomboidal ſpots, reaching from the head to the tail. A little below this, there is on each ſide a ſeries of ſmall black ſpots; and in the lower part of each ſide there runs a continued line, made by a ſeries of white ſpots, which are very ſmall; then another of larger black ones, and next to this another of ſmall white ones; again, the belly is covered with long black ſcales placed tranſverſely.

This ſeems the general diſpoſition of the colours of the *Viper*, but it is by no means fixed and unalterable; for there are *Vipers* whoſe back is wholly black. The belly however ſeems to be black in all, and the tail does not run to more than a fifth part of the length of the body beyond the anus, and is terminated in a very ſharp point. Wormius ſays, the *Viper* feeds on herbs; but this aſſuredly is not its only diet, ſince there are frequently found in its ſtomach, mice, beetles, ſmall birds, and the like; many of which are often found whole: And it is ſurpriſing to conceive how they were ſwallowed, ſince they are often three times as thick as the whole neck of the ſerpent.

The canine teeth of the *Viper* are only two, and thoſe hollow from the apex to the root; and theſe are not poiſonous in themſelves, but ſerve to make the wound by means of which the poiſon they contain is mingled with the blood. This poiſon ſeems to be a matter ſecreted like ſaliva, by peculiar glands placed in the bags at the roots of theſe dog-teeth. *Ray*'s Syn. Quad. & Serp. p. 285.

By Mr. Boyle's experiments made upon *Vipers in vacuo*, it appeared, that on the withdrawing the air from the veſſel where the *Viper* was put, ſhe began to ſwell, and after ſome time ſhe opened her mouth very wide, and frequently; but on continuing two hours and a half in the receiver, ſhe did not appear to be quite dead. The gaping of the jaws was attended with a loſs of the ſwelling, obſerved at firſt in her whole body; but after every time cloſing them ſhe ſwelled again, and thus became lank and plump reciprocally many times in an hour. During the firſt moments this creature crawled about, as if in ſearch of air, and afterwards foamed at the mouth.

The neck and body continued ſwelled longer, in a ſecond experiment with another *Viper*, and a bliſter appeared on the back. This creature lived an hour and a half. The mouth remained vaſtly diſtended after death, and the internal parts of it were much diſtorted, and thruſt forwards. After the admitting the air the mouth cloſed, and opened again after a time; and in fine, on pinching the tail there was ſome motion perceived in the body, that ſeemed to argue life. The common ſnake bears the exhauſted receiver better than the *Viper*, and after many hours remaining in it, and ſeeming dead, will give ſigns of life on being warmed by bringing the glaſs to the fire; but a longer continuance in the rarified air abſolutely kills it, as it does all other creatures. Phil. Tranſ. N°. 62.

The ſtory of the rattleſnake's charming its prey has been laughed at by many, and by others the effects of the animal's fear have been ſuppoſed the reſult of a previous bite; but we have a great deal of reaſon to believe, that this ſort of faſcination is juſt what it is related to be, from an experiment mentioned in the Philoſophical Tranſactions, of a like thing in regard to a *Viper*. It is well known, that no *Viper* will feed while in confinement, except a female which is with young, but that ſuch a one will. A *Viper*-catcher, who had more than ſixty living *Vipers* in a cheſt, put a living mouſe in among them; there happened to be one female big with young among theſe, none of the others at all regarded the mouſe, but ſhe raiſed up her head a little, and looked furiouſly at it. The mouſe was terrified, and ſtood ſtill for a conſiderable time, though the *Viper* continued rolled up in a ſpiral, only raiſing up its head and looking at it, and vibrating its tongue; the mouſe at length recovered of its fright, and began to move, but without running away, only walking in a terrified manner round and round the *Viper*, and often ſqueaking; at length ſhe came before the head of the creature, which was ſtill raiſed, and the mouth open. The mouſe, after ſome time, went up to the creature, and crept into its mouth, where ſhe was gradually ſwallowed without the *Viper*'s altering its poſture.

The poiſon of *Vipers* is neither in their teeth, their tail, nor their gall, but in two veſicles or bladders which cover their teeth, and which upon compreſſion when the *Vipers* bite, emit a certain yellowiſh liquor, that runs along the teeth and infects the wound.

The poiſon of the *Viper* is only noxious when immediately conveyed into the blood. Nor is it mortal to eat the fleſh of creatures killed by *Vipers*, or to drink the wine in which they have been drowned, or to ſuck the parts they have wounded. On the contrary, Signior Redi ſays, ſucking the wound is a ſovereign remedy againſt the bite of *Vipers*. This author denies, what had been affirmed by Ariſtotle and Galen, that the ſpittle of a faſting perſon kills *Vipers*. Phil. Tranſ. N°. 9. p. 160.

Vipers are viviparous. Phil. Tranſ. N°. 84. p. 138.

The bite of the *Viper* having been ſuppoſed certainly curable by oil of olives alone, and a *Viper*-catcher in England having ſuffered himſelf to be bitten by one of theſe creatures, and having recovered after many dangerous ſymptoms; and the cure being attributed to the oil alone, though other medicines were given him internally; Meſſieurs Geoffroy and Hunauld of the Royal Academy of Sciences at Paris, made a number

of experiments; by which it appeared that this oil was not the great remedy that was pretended. (See the article OIL *of Olives*.) And added to their accounts, some others of persons bitten, in which all the dreadful consequences of that poison are shewn, and the remedies by which they were cured are mentioned. Philos. Trans. N°. 443, 444, 445.

Their first instance is in the case of Mr. Piron, who was bitten at the end of the fore-finger by an enraged *Viper*; there immediately issued a drop of blood from the wound; and the first application made to it was the covering up the whole finger with a quantity of Venice-treacle; the finger, however, swelled violently, and was scarified in several places, and the patient was made to eat the body of the *Viper* boiled, and drank after it a glass of wine with some Venice-treacle, and with a few drops of the volatile spirit of *Vipers*; and the finger was wrapped round with compresses and bandages, wetted in aqua vitæ. Soon after this the patient began to have inclinations to vomit, he vomited very plentifully, the swelling increased, and his arm, which was now very much distended, was scarified in twenty places, and compresses of linnen dipped in aqua vitæ laid on the wounds; he afterwards took volatile salt of *Vipers* in repeated doses, had more scarifications made on his arm, and he drank in the space of an afternoon and evening a quart of strong wine. He slept very sound after this, and the symptoms all disappeared, he was almost recovered by six o'clock the next morning, only the scarifications took two months to heal, and after that time he enjoyed a perfect state of health.

A second instance, is that of a young lad of a robust constitution bitten by a *Viper*, enraged and kept for some time in a very hot place near the fire; he felt a pain like that of oil of vitriol dropped on a wound, but without delay he cut off the head of the *Viper*, bruised it, and applied it to the wound, and tied the finger on which he was bitten very tight round with a binder: He after this had some scarifications made, and rubbed into them a quantity of the fat of the *Viper*; he killed four *Vipers*, and used all their fat, and took three drams of Venice-treacle in some wine. His whole arm swelled, he perceived a violent heat over his whole body, and the other hand was so swelled at length that he could scarce shut it: On this he took a large dose of Venice-treacle, camphor, volatile salt of *Vipers*, of amber and of sal-armoniac, and a dram of volatile spirit of sal-armoniac, and sal volatile oleosum; this he repeated at some distance of time, he was blooded in the opposite arm, the patient vomited violently, and an incision being made all along the finger, there followed no blood. The hand, arm, and breast were embrocated with a mixture of spirit of lavender, camphor, Venice-treacle, and the fat of *Vipers*. After having vomited plentifully, and been embrocated with this warm mixture, he found himself much easier, at eight o'clock at night he took another dose of his volatile medicines, and slept till four in the morning, he then took a large glass of wine and slept till six, and at seven eat a part of a chicken with a good appetite. The surgeons would have made more scarifications on the arm, but he would not suffer it; and three days afterwards an erisipelas appeared, to which he applied a mixture of aqua vitæ and ointment of marshmallows, and finally was perfectly recovered.

These are two instances in which the symptoms of the bite appeared in much the same manner with those of the man who suffered himself to be bitten in England, in order to be cured by the oil. The sleep came on in all in the same circumstances, and they were all cured, as well he who used no unctuous application at all, as he who used the fat of the *Vipers*, or the Englishman who depended upon the oil. The internal medicines given to them all were of much the same kind; and all that can be concluded from the whole, is, that either these bites would not have proved mortal in themselves, or that the cordial medicines, which they took internally were the remedies that prevented the mischief that would have ensued; and these seem to have acted not as specifics against the bite of this animal, but merely as medicines that would stop the spreading of a gangrene; the unprevented increase of which is the thing that proves fatal from this creature's bite.

The dissections of the animals which had died by the bite of the *Viper*, whether they had or had not been rubbed with oil, afforded all the same appearances. The limb which had received the wound was in all swelled and livid, and these symptoms usually were carried along the thigh to the belly, and sometimes up to the breast. Incisions made along these parts always discovered the cellules of the membrana adiposa full of a bloody-coloured water, and the membrane itself was swelled, blackish, and gangrened. And this appeared always more plainly in the belly, than in any other part; the membrana adiposa in all other parts of the body was in its natural state. The injured parts often had a cadaverous smell; the muscles of the wounded limb were also found of a brownish colour, and their fibres had lost their consistence, and seemed ready to give way to the approaching gangrene. Nor is this effect confined to the external parts alone; a goose that had been bitten had three gangrenous spots on its heart, and all the indications of a beginning gangrene in other parts of it; the concave side of the liver was also gangrened, and had wholy lost its consistence; and the lungs of a fowl that had been bitten on the wing, were found in part gangrened. The effects however were different in degree, from the bites of the several *Vipers*; and there seems no reason to doubt, but that the bites of different animals, though of the same species, under different circumstances, either in regard to the creature wounding, or the creature wounded, may be followed with very different consequences; so that remedies are not to be depended on from their success in one or two trials. Mem. Acad. Scienc. Par. 1737.

VIPERA, *Viper*, in zoology. See the article VIPER.

VIPERA *Pileata*, or *Vittata*, in zoology, a name by which some authors have called a remarkable species of Indian serpent, more usually known by the name of *Cobra de Capella*. See the article COBRA *de Capella*.

VIPERARIA, in botany, a name given by some authors to the *Scorzonera*, or vipers-grass. *Dale's* Pharm. p. 83.

VIRGA (*Cycl.*)—VIRGA *Aurea*, *golden Rod*, in botany, the name of a genus of plants; the characters of which are these. The flower is of the radiated kind; its disk is composed of floscules, and its outer circle of semi-floscules. These all are placed upon the embryo fruits, and are contained in a common scaly cup: These embryos finally ripen into seeds, winged with down. To this it is also to be added, that the flowers usually stand in long series towards the tops of the stalks.

The species of *Golden-rod*, enumerated by Mr. Tournefort, are these: 1. The broad-leaved *Golden-rod*, with serrated leaves, called the saracens consound. 2. The broad-leaved *Golden-rod*, with serrated leaves, variegated with white. 3. The common broad-leaved *Golden-rod*. 4. The white-flowered *Golden-rod*, with narrower and less serrated leaves. 5. The mountain *Golden-rod*, with broad smooth leaves. 6. The mountain *Golden-rod*, with broad hairy leaves. 7. The alpine *Golden-rod*, with rigid bay-like leaves. 8. The alpine *Golden-rod*, with long soft and sharp-pointed leaves. 9. The narrow-leaved Canada *Golden-rod*, with a specious panicle. 10. The narrow-leaved hairy Canada *Golden-rod*, with a less specious panicle. 11. The sea lavender-leaved *Golden-rod*, with the flowers all placed on one side the stalks. 12. The large flowered dwarf *Golden-rod*. 13. The annual white-flowered toad-flax-leaved acrid *Golden-rod*, called acrid annual fleabane. 14. The great *Golden-rod*, with viscous and strong-scented leaves. 15. The great *Golden-rod*, with viscous and strong-scented leaves, and with excrescences like galls. 16. The lesser *Golden-rod*, with viscid and strong-scented leaves. 17. The shrubby Portugal *Golden-rod*, with long, narrow, and viscous leaves. 18. The pale purple-flowered *Golden-rod*, with broad auriculated leaves. 19. The purple-flowered *Golden-rod*, with broad and not auriculated leaves. 20. The broad-leaved *Virga-aurea*, with deep violet-coloured flowers. 21. The broad and undulated leaved *Golden-rod*, with pale purple flowers. 22. The Tripolium-flowered *Golden-rod*. 23. The Canada *Golden-rod*, with smooth, roundish, and serrated leaves. 24. The Canada *Golden-rod*, with extremely broad smooth leaves. 25. The tall Canada *Golden-rod*, with leaves hoary underneath. 26. The New-England *Golden-rod*, with broad rigid leaves. 27. The dwarf Canada *Golden-rod*, with toad-flax leaves. 28. The dwarf Canada *Golden-rod*, with the leaves of the smaller willows. 29. The great flowered American *Golden-rod*, with asphodel roots. *Tourn.* Inst. p. 483.

The common *Golden-rod* is an astringent, and its root is given in powder with great success in diarrhœas, dysenteries, and in hæmorrhages of all kinds; particularly in spittings of blood.

VIRGA *Pastoris*, in botany, a name given by some authors to Dipsacus. Vid. *Lemery* & *Miller* in voc *Dipsacus*; also *Tournef.* Inst. Bot. p. 466.

Where the name *Virga pastoris* occurs in the translation of the Arabian writers, it is not to be supposed to mean the plant we call *Virga pastoris*.

It is indeed the literal translation of the hassalelrheir of Serapion and Avisenna; but they called the common horsetail by this name, when they applied the adjective female to it; and when they added male, they meant by it the common knot-grass.

Both these plants possessed the common virtues of astringents and agglutinants, and were for that reason placed together by the old Greek writers, and were both called *Polygonum* by them, having both an equal title to that name, as it expresses no other than a plant that has many joints; and they distinguished the knot-grass by the name of the male *Polygonum*, and the horse-tail by the name of the female; as the Arabians did by the names male and female *Virga pastoris*.

VIRGA *Sanguinea*, in botany, a name given by Mathiolus, and some other authors, to the cornus fœmina, or dogberry-bush, common in our hedges. *Ger.* Emac. Ind. 2.

VIRGÆ *Lateralis Minimus*, in anatomy, a name given by some writers to a muscle, called by others *levator ani parvus*, and by some *transversus ani*. It is called by Albinus the *transversus perinæi*, and by some *transversalis penis*.

VIRGATA *Sutura*, a term used by some anatomists for the sagittal suture of the cranium.

VIRGILIAN *Husbandry*. See the article HUSBANDRY.

VIRGINALE *Claustrum*, a term used by some writers to express the hymen.

VIRGINS-*Bower*, *Clematitis*, in botany, the name of a genus of plants; the characters of which are these: The flower is of the rosaceous kind, and usually consists of four leaves arranged in a circular form, and without a cup. The pistil arises from the center of the flower, and finally becomes a fruit composed of several seeds arranged into a sort of head, and each ending in a long plume.

The species of *Clematitis*, enumerated by Mr. Tournefort, are these: 1. The common broad-leaved wild *Clematitis*, with leaves indented. 2. The broad-leaved wild *Clematitis*, with leaves not indented at the edges. 3. The pear-tree-leaved indented *Clematitis*. 4. The creeping *Clematitis*, called by many authors flammula. 5. The creeping sea *Clematitis*. 6. The white flowered upright *Clematitis*. 7. The early red-stalked upright *Clematitis*. 8. The geranium-leaved alpine *Clematitis*. 9. The blue-flowered upright *Clematitis*. 10. The white-flowered upright *Clematitis*. 11. The blue-flowered procumbent *Clematitis*. 12. The purple procumbent *Clematitis*. 13. The double blue flowered *Clematitis*. 14. The double purplish-blue *Clematitis*. 15. The double pale-red *Clematitis*. 16. The upright dwarf Spanish *Clematitis*, with white flowers. 17. The narrow-leaved Portugal *Clematitis*, with small blue flowers.

Authors have added to this genus, the *Clematitis* trifolia flore roseo, which is properly a granadilla; and the *Clematitis* Daphnoides, which is a pervinca. *Tourn.* Inst. p. 293.

The several species of this plant make a very fine ornament in the quarters of gardens allotted to flowering shrubs. They are all propagated, by laying down their branches in spring, as is practised in vines and other such shrubs; and in a year's time they will have taken sufficient root, and may be taken up and removed to the places where they are to remain. This should be done in spring, and a little mulch must be laid about their roots, and they must be watered in dry weather. In two years after planting they will make very strong shoots, which are to be trained up to stakes, that they may not trail upon the ground. After this, they require no farther care, than to cut out their dead branches every year, and in the spring to shorten such branches as are too long and rambling.

They may also be raised from seeds, sown either as soon as ripe, or in the spring; but this is a more tedious way, as they lie six or twelve months in the ground before they appear, and after that require two years care in a nursery-bed before they are fit to be planted out where they are to stand.

VIRIDELLUS, a word used by some medical writers, to express the epilepsy; and by some of the chemical ones, as a name for the common green vitriol.

VIRILIS *Testis Musculus*, in anatomy, a name given by Vesalius, and others, to the muscle generally known by the name of the *Cremaster*.

VIRITES, a name by which the writers of the middle ages have called the Pyrites.

VISCAGO, in botany, the name of a genus of plants, described by Dillenius, and since called by Linnæus *Silene*. *Dillen.* Hort. Elth. p. 309. See the article SILENE.

VISCAGO is also used by some pharmaceutic writers, to express a mucilage.

VISCERA (*Cycl.*)—*Wounds of the* VISCERA. If any of the *Viscera* situated in the abdomen, as the liver, spleen, or kidney, has received a wound from a sharp instrument, at the first dressing the wound must be filled as tenderly as possible with lint well saturated with highly rectified spirit of wine, or spirit of turpentine, securing the dressings with compresses and a bandage; by this means the hæmorrhage will be stopped, if no large vessel is divided. When this part is gained, the wound must be treated in the common manner, and the patient kept very low; bleeding him, if of a plethoric habit, and giving daily two or three doses of Lucatellus's balsam; for balsams of this kind are of great service in healing internal wounds. This is the method to be taken with wounds of the *Viscera*, which may be discovered by the eye or touch. But in such of them as are hidden, and not to be thus discovered, all that can be done is to inject vulnerary decoctions, and keep a passage open for the evacuation of sordes, or grumous blood. *Heister*'s Surg. p. 68.

VISCERALIA, a term used by physicians, to denote such medicines as impart strength and firmness to the sanguineous *Viscera*, such as the liver, spleen, &c.

VISCERATIONES, among the Romans, a feast consisting of the intrails of animals, given to the people at the burial of great men in Rome. *Danet.* in voc.

VISCUM, *Misletoe*, in botany, the name of a genus of plants; the characters of which are these: The flower consists of one leaf, hollowed into the shape of a bason, and usually divided into four segments at the edge, and sprinkled over with apices in the form of little protuberances. The embryo fruits do not succeed there, but appear on other plants of the same species, and are surrounded with four little leaves; these finally become round berries full of a glutinous juice, and containing flatted and heart-fashioned seeds.

The species of *Misletoe*, enumerated by Mr. Tournefort, are these: 1. The common, or white-berry'd *Misletoe*; and 2. The *Misletoe* with red berries. *Tourn.* Inst. p. 609. See the article MISLETOE.

VISCUM is also used for *Birdlime*. This was esteemed a poison among the antient Greeks, and is seldom omitted under the class of deleterious things enumerated in their writings.

It is called by these authors *Ixias*; but this word has occasioned great errors in late writers, the word *Ixias* having been applied for the white camelion thistle, not because of any poisonous quality it had; for they all declare it to be innocent, but because of its yielding a viscous, or clammy juice. The black chamæleon thistle was always esteemed poisonous among them; and hence some have supposed the word *Ixias* to be applied to that, and the poison *Ixias*, mentioned by the Greeks, to be the root of that plant. Paulus Ægineta indeed seems to have understood it so, the poison *Ixias* being by him placed among the roots; but Galen, who calls it a slow poison, and says, that it kills by stopping up and glewing together the intestines, plainly enough means *Birdlime*, not the root of any plant.

VISCUM *Caryophylloides*, a name given by Sir Hans Sloane, and many other authors, to a genus of plants of a very peculiar kind. They are called *Viscum* from their growing upon other trees, in the manner that the misletoe does with us; and *Caryophylloides*, from their leaves, in some degree resembling those of our pinks or carnations; but the plant itself, in all its species, is wholly different, both from the misletoe and pink, in all other respects.

The several species of these plants differ greatly also from one another; the most fragrant species in Jamaica is a very large one called by the common people, the wild pine. The root of this plant is composed of a great number of brown filaments, which encompass the whole branch of the tree on which it grows; these are very different from the roots of our misletoe, for they enter into the solid substance of the tree, but the roots of the misletoe are expanded over its surface, and are often confusedly interwoven one with another. The roots of *Viscum* give a very firm basis for the plant, and from these there arise the rudiments of the leaves, which at length grow to the likeness of those of leeks, or of the leaves of some of the aloes, being folded one within another; they in some sort also resemble those of the pine-apple, or ananas, and it is on this account that the plant is called the wild pine. These leaves are between two and three foot long, and are three inches broad at the base, from whence they run tapering all the way, till they terminate in a point; they are very round or convex on the outside, and very hollow within; by means of this shape of the leaves is formed a very fine reservatory of water in every plant of this kind.

All the leaves being thus hollow within, and standing in a circle at the bottom, form a round hollow mass, which swells out into a sort of bulb, looking like a turnep, except in colour, and very large; they afterwards draw nearer to the stalk, and form by that a sort of neck to this bottle cavity, which is close and firm on all sides: in the rains, the trees on which these plants grow, drop off vast quantities of water from their leaves, and this is in great plenty catched by one or other of the long leaves of this plant; each of which is a sort of hollow pipe, conveying all that it receives into the bottle, or reservoir at the bottom; this soon runs over, but in consequence of this, it is at last left full, and this water it retains a long time, by means of the narrow neck they form above, which prevents the evaporation that would otherwise naturally happen by the sun's heat: this water gives a continual supply of juices to the leaves, which are of a pale green in the bottle part, and as green as a leek above.

In the midst of these leaves rises a smooth branched and succulent stalk of about three foot long; this, when wounded, yields a white mucilaginous juice; the flowers are numerous, and consist each of three leaves, standing in a three-leaved green cup; after these come three corner'd capsules; at the base of this are three small and short leaves, and within it are contained several seeds, of an oblong, pyramidal form, small in themselves, but winged with a very long and fine down. The plant is very common in woods and forests, and grows usually to the branches, but sometimes to the trunks of the trees, especially when they are somewhat decayed, their bark then more easily receiving the seed, and giving a free passage to the roots. Phil. Trans. N°. 252. p. 114. See the article SOWING.

VISION (*Cycl.*)—*Distinct* VISION, that by which an object is seen distinctly. An object is said to be seen distinctly, when its outlines appear clear and well defined, and the several parts of it, if not too small, are plainly distinguishable, so that we can easily compare them one with another, in respect to their figure, size, and colour. Dr. *Jurin*'s Ess. on dist. and indist. Vision.

In order to such *distinct Vision*, it has hitherto been commonly thought, that all the rays of a pencil, flowing from a physical point of an object, must be exactly united in a physical, or at least, in a sensible point of the retina. But it seems certain,

certain, from the experiment mentioned by Dr. Jurin, that fuch an exact union of rays is not always neceffary to *diftinct Vifion*.

Hence the doctor divides *diftinct Vifion* into two fpecies, *viz.* into *Vifion perfectly diftinct*, or *perfect Vifion*, and *Vifion imperfectly diftinct*; which he calls fimply by the name of *diftinct Vifion*. The former, is that in which the rays of each pencil are collected into a fingle phyfical, or fenfible point of the retina; the other fpecies, is that in which thofe rays occupy fome larger fpace upon the retina, yet fo far as the object is diftinctly perceived.

Perfect *Vifion* in a given eye, and a given difpofition of that eye, depends only upon the diftance of the object; it has no dependance upon the magnitude of the object; but diftinct *Vifion*, in a given eye, and a given difpofition of the eye, depends upon the diftance and magnitude of the object jointly.

There appearing therefore a real difference between perfect *Vifion*, and what we call *diftinct Vifion*, the learned doctor has enquired very particularly into the reafon why an object may be feen diftinctly without perfect *Vifion*; for which we refer to his effay at the end of Dr. *Smith*'s Opticks.

VISITATION (*Cycl.*) — The *Vifitation* of the Virgin Mary is a feaft inftituted firft by pope Urban IV. in the year 1389. and ordained to be kept on the fecond of July. *Hofm.* Lex. in voc.

VISITATION is likewife an order of monks founded by Francis de Sales and his mother Chantalia. Id. ibid.

VISPELLIONES, among the Romans, were flaves who could not be manumitted. *Pitifc.*

VISTAMENTE, in the Italian mufic, is ufed to give notice to play, or fing, quick, brifkly, &c.

VISTE, in botany, a name given by fome authors to the common white mountain coralloides: it is the Lapland name for the fame plant; the rain-deer, and many other creatures feeding on it when all other vegetables are deftroyed.

VITA (*Cycl.*)— VITA *longa*, a name given by fome botanical authors to the *piper Æthiopicum*, or Æthiopian pepper. Gen. Herb. p. 1335.

VITALBA, in botany, a name given by fome authors to the viorna, or traveller's joy, a tall climbing plant with white flowers, common in the hedges. *Ger.* Emac. Ind. 2.

VITALIA, a name given by fome authors to the cardiac medicines.

VITALIS, in botany, a name given by fome authors to the common telephium, called in Englifh *Orpine*, and live-long, from its quality of living and flourifhing a long time after it is taken from the root. *Ger.* Emac. Ind. 2.

VITEX, the *chafte Tree*, in botany, the name of a genus of trees; the characters of which are thefe: The flower confifts of one leaf, and is, as it were, bilabiated, and tubular behind; the piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower; this finally becomes a roundifh fruit, divided into four cells, each containing oblong feeds.

The fpecies of *Vitex*, enumerated by Mr. Tournefort, are thefe: 1. The *Vitex*, with broad ferrated leaves. 2. The *Vitex*, with narrower leaves, difpofed in the manner of thofe of hemp. 3. The narrow hemp-like leaved *Vitex*, with bluifh flowers. 4. The white flowered *Vitex*: and 5. The *Vitex*, with extremely narrow leaves. *Tournef.* Inft. p. 603. See the article AGNUS *Caftus*.

VITIFERA, in zoology, a name by which many have called the common œnanthe, a bird well known in England by the name of the wheat-ear; and called in fome places the fallow-finch and white-tail. See the article WHEAT-*Ear*.

VITILIGO, a difeafe frequent among the Arabians: it is the fame with what is otherwife called *Alphos*. *Hofm.* Lex. in voc. See the article ALPHOS, *Cycl.* & *Suppl.*

VITIS, the *Vine*, the name of a genus of plants; the characters of which are thefe: The flower is of the rofaceous kind, and is compofed of feveral petals, arranged in a circular form; from the middle of the flower there arifes a piftil, which is furrounded by a number of ftamina; this finally becomes a round, fucculent, or juicy berry, containing ufually four pear-fafhioned feeds. See the article VINE.

The fpecies of *Vine* enumerated by Mr. Tournefort, are thefe: 1. The common, or wild *Vine*. 2. The Corinthian, or currant *Vine*. 3. The parfley *Vine*, or *Vine* with deeply laciniated leaves. 4. The early *Vine*. 5. The damafk *Vine*. 6. The mufkatel, or Apian *Vine*. 7. The Pergulane *Vine*, with fruit of the fize and fhape of plums. 8. The African *Vine*. 9. The Allobrogic *Vine*. 10. The large bunched *Vine*, with white fweet and firm grapes. 11. The large bunched *Vine*, with redifh, or blackifh fweet grapes. 12. The large bunched, with whitifh oval grapes. 13. The hairy *Vine*. 14. The climbing five-leaved Canada vine. 15. The maple-leaved Canada *Vine*. 16. The abutilon-leaved Canada *Vine*, with purple grapes. 17. The American *Vine*, with ferrated ivy-like leaves. 18. The round leaved American *Vine*, with blue cluftered grapes. 19. The great, trifoliate, American *Vine*, with fmall round grapes in large clufters. 20. The fmaller trifoliate American *Vine*, with larger turbinated grapes difpofed in clufters. 21. The fow-bread leaved American *Vine*, with racemofe corymbi of black grapes. *Tourn.* Inft. p. 613. See the article VINE.

VITIS *Idæa*, the *Whortle*, in botany, the name of a genus of plants; the characters of which are thefe: The flower confifts of one leaf, and is of the globofe campaniform kind. The piftil arifes from the cup, and is fixed in the manner of a nail to the hinder part of the flower; the cup finally becomes a foft umbilicated berry, juicy, and containing fmall feeds.

The fpecies of *Vitis Idæa*, enumerated by Mr. *Tournefort*, are thefe: 1. The *Whortle*, with oblong crenated leaves, and black fruit. 2. The *Whortle*, with roundifh, and not crenated leaves, and with red fruit. 3. The long leaved white berry'd *Whortle*. 4. The great round leaved *Whortle*. 5. The fweet-fcented *Whortle* of Ceylon. 6. The pyrola-leaved Canada *Whortle*: and 7. The myrtle-leaved Canada *Whortle*. *Tourn.* Inft. p. 608.

VITISALTUS, a word ufed by fome medical writers for the *Chorea fancti Viti*. See the article VITUS's *Dance*.

VITRAGO, in botany, a fpecies of plants, refembling that of which the glafs is made. It is otherwife called *Helxine*. *Hofm.* Lex. in voc. See the article HELXINE.

VITREA *Tabula*, a name given by fome authors to the internal table of the cranium.

VITREUS *Humor*, the *vitreous humour* of the eye. See the article EYE.

VITRIOL (*Cycl.*)—The manner of making the common green *Vitriol*, or copperas, at Bricklefy in Effex, is this: They gather the pyrites, or copperas ftone on the fhores of Shepey-Ifland, and in other places; and this they lay upon a large bed, or floor prepared in the open air, underneath which there are gutters, or troughs difperfed to receive and carry away the liquor impregnated with the mineral, to a ciftern where it is kept till worked.

The air and weather diffolves, and breaks thefe ftones; and the rain falling on them, wafhes gradually out all the *Vitriol*; which is thus feparated from it: they boil the liquor in large leaden pans, putting in a great quantity of old iron, and when fufficiently evaporated, they let it out into troughs, where the *Vitriol* feparates itfelf, and cryftalizes, fticking to the fides of the troughs, and to fticks and bars placed acrofs them. The remaining liquor they call the mother of *Vitriol*, and fave it to be afterwards boiled and evaporated again. *Ray*'s Englifh Words, p. 139.

There is contained in the original liquor, of which *Vitriol* is made from the pyrites, a white, acrid, and pungent falt. This is feparated from the mother liquor, or brine, when no more *Vitriol* will fhoot; and is called by the chemifts, the faline principle of *Vitriol*.

Common green *Vitriol*, when diffolved in water, and feparated from its metalline, and ochreous, or earthy particles, by zink, or any other of the imperfect metals, added in filings to the folution, is then much of the nature of this white falt, called the faline principle: it is white, not green, more unctuous than the common *Vitriol*, and has a grain rather appearing like nitre than like *Vitriol*.

The native white *Vitriol* of Goffelaer has alfo fomewhat of this nature in it, having lefs metal, and much lefs mineral fulphur than the common green, or blue *Vitriols*. The common *Vitriol*, thus feparated from its earthy and metalline parts, will yield its fpirit eafily, and with the gentle heat of a fand furnace; as the white falt extracted from the mother liquor of *Vitriol* will: whereas, in the common *Vitriol*, the metalline part fo detains the faline, that it cannot be driven off in form of vapour, till that compages is broken, by a very intenfe and violent heat; what remains in the retort after the diftillation of either this or the other falt, is not red like colcothar of *Vitriol*, but is white and fpungy, and rather refembles burnt alum, than any other fubftance, in its appearance. It is infipid when firft taken out of the veffel; but on being expofed to the air, it receives ftrange impreffions and alterations. Phil. Tranf. N°. 103. See the article SALINE *Principle*.

There is great reafon to believe, that *Vitriols* are no other than metals of different kinds, penetrated and reduced into a new form by fulphur. If thin plates of copper be cemented with beds of brimftone between, and the operation repeated four or five times with frefh brimftone every time, moft of the copper will be converted into *Vitriol*; and this diffolved in water, filtrated and cryftallized, will afford elegant rhomboidal blue cryftals, no way diftinguifhable from common blue *Vitriol*.

The fame procefs may be repeated with iron inftead of copper, and the *Vitriol* will then be the common green kind, or copperas; or if the acid liquor, called fpirit, or oil of fulphur by the bell, be rubbed on plates of iron or copper, and fuffered to dry away in the air, or over a gentle heat, and this repeated three or four times, the metal being afterwards put into water, will be fo far corroded and diffolved by it, that there will be a liquor produced, which will yield, on a proper evaporation, blue or green cryftals, according as iron or copper have been ufed. This fhews evidently, that the metal thus corroded by the acid of *Vitriol*, is foluble in water, fo far as it has been fo corroded; and that this folution affords true *Vitriol*. Such may be the formation of *Vitriol* about the copper mines in many countries, and fuch the formation of the common green *Vi-*

triol or copperas in the pyrites with us in England. That stone is well known to contain sulphur and iron, both in large quantity; and the combination of these in the earth, or in the air, where moisture enough can get at them, may very well be understood to form *Vitriol*, which is the natural result of such a solution. Phil. Transf. N°. 104.

It is observable, that before metallic *Vitriols* are dissolved in water, they cannot be perfectly dried without changing their nature; and when dissolved, they constantly let fall much ochre to the bottom; so that by repeated solution and crystallization of *Vitriol* in water, all the *Vitriol* is at length turned into ochre, and an unctuous liquor, that cannot easily be dried. Whence the easier, the quicker, and with the less water, some salts are dissolved, the more easily they retain their water.

There is also something particular in the solution of metals by water, for certain salts are required to dissolve them; and when they are dissolved into crystals of *Vitriol*, they then readily and easily dissolve in water, so long as these crystals retain that salt which is the solvent of the metal; but when this saline solvent is wanting in the *Vitriols*, water will scarce dissolve them at all, but suffers the metallic part to precipitate; but when the metal is previously dissolved by its own solvent salt, it readily yields to water, and may thus, by a gentle evaporation, be reduced to crystals, wherein the metal, its solvent, and water always concur in a certain proportion. By this method metals are made potable, and act in the body as well, according to the acid solvent, as to the nature of the metal dissolved. The action of all *Vitriols* depends thus upon these two principles united with water; and of this kind are the *Vitriols* of gold, silver, copper, iron, lead, and tin.

This rule does not extend, however, to all the *Vitriols*; for those of the semi-metals, though they are first dissolved by their acid solvents, so as to appear in a saline form, cannot therefore be diluted with water like the salts of the true metals; Thus pure regulus of antimony, perfectly dissolved in spirit of sea-salt, adhering to the mercury sublimate, in the distillation of the butter of antimony, is a true *Vitriol* composed of antimony, dissolved in spirit of sea-salt: Whence one might suspect, that it would dissolve in water; but, on the contrary, as soon as water touches it, the acid solvent quits the regulus, mixes with the water, and lets fall the metallic calx entire. *Boerhaave*, Chem. part 1. p. 451.

Liquamen Pyriticum, or mother of *Vitriol*, is of an acrid and firey taste, very different from that of *Vitriol*, and has been proved by some late experiments, to contain a salt very different from the *Vitriol*. The method of separating this pure, is to evaporate a quantity of the water, impregnated with *Vitriol*, and received from the beds of the pyrites; this being evaporated to a pellicle, the *Vitriol* will shoot in the cold, and a quantity of ochre will be precipitated. After this, succeeding evaporations will yield more *Vitriol* and more ochre, to the fifth time; but if the experiment be continued after this, the first succeeding shooting of the liquor yields, instead of *Vitriol*, a yellow salt.

This contains the last portion of the ochre remaining in the liquor. After this, the matter yielding no more *Vitriol*, is called the wash, or *Liquamen of Vitriol*. It tastes acrid and firey, and the quantity left from a gallon of the well impregnated liquor from the bed, is about a pound. From this may be procured a white pungent salt, by subsequent evaporations. This is the saline principle of *Vitriol*, according to the chemists, and is contained in so large a quantity, that near thirteen ounces of it may be separated from a pound of the liquor; the remaining liquor, after this, is what is called *Liquamen Vitrioli* by some chemists, but not properly. It will never coagulate into salt, but is very firy and acrid to the taste, and extremely ponderous, not less so than oil of *Vitriol*, nor less pungent; and is the strongest liquor any way obtained from a natural substance without distillation. This liquor being exposed to the air in a vessel not closed, will in a little time attract double its weight of water from it. All corrosive and saline liquors have somewhat of this property of imbibing moisture from the air, and weakening themselves by it; but this liquor attracts it faster and in greater quantity than any other. This liquor receives most moisture, and inceases most quickly in wet weather, less so in dry; and this may have given occasion to that error so common among the chemists, that several preparations of *Vitriol* derive moisture from the moon, and have more or less of it, according to her different phases. The changes of the constitution of the air have effected what, in this case, they supposed to be done by the different phases of the moon. Phil. Transf. N°. 103.

Vitriol *of Copper*. The glass-makers have a method of making this without corrosives, which was originally practised by Neri, and with which they make some very fine colours in glass, particularly a fine sea-green.

The method of making the preparation is this: Take little thin pieces of brass, and lay them *stratum super stratum* in a crucible, with powder of brimstone. When the vessel is full, set it luted and covered in an open wind furnace, with burning coals over it, and let it stand two hours; then let the furnace cool of itself, and take out the crucible, the mass within will be of an obscure blackish purple; powder and sift it fine, and then mixing with every pound of it six ounces of powdered brimstone, take a round vessel of earth, that will bear the fire, place it upon iron bars set across in an open wind furnace, fill it with coals, and then put in the powder; keep it burning and stirring about till all the brimstone is burnt up; then take out the pan, and powder the calcined mass again; sift it fine, and proceed with it thrice as before; the last time let it stand on the fire till it become red. Put a pound of this calcined copper into a glass body, with six pints of water; evaporate two pints or thereabout in a sand heat; the water is then of a fine blue, and must be poured off clear; then filtrate it. Evaporate the water from the remaining sediment of copper left in the glass, and with new sulphur calcine it again and again; repeat this five or six times, and extract the blue tincture with water as before; filtrate all the waters, and put them together. Evaporate all to a fifth part or thereabouts, and set it in a cool place, and fine pointed crystals will be formed, resembling emeralds; separate these crystals, and evaporate the water again, till all the crystals be procured. Then put a pound of them into a glass retort, well luted and fitted to a capacious receiver; let the joints be well closed, and make a moderate fire for four hours; then make it violent for twenty hours, or till no more white fumes arise. The next day open the receiver, and separate the liquor into a glass, where it must be kept carefully sealed up. *Neri*'s Art of Glass, p. 50.

Very great things are to be done in the glass art by means of this liquor; the remainder in the retort exposed to the air for a few days, will acquire a blue colour, and this, mixed with zaffer, will give glass a fine sea-green.

White Vitriol. It has been disputed whether *white Vitriol* is any thing else than green *Vitriol* calcined. But it seems that *white Vitriol* is of a quite different species from either the green or the blue *Vitriols*. See *Geoffroy*, Mat. Med. Tom. 1. p. 124.

In the condition in which *white Vitriol* is usually bought, it contains somewhat both of copper and iron; but, being purified by solution, filtration and crystallization, it is freed from both these metals, and appears to be a native *Vitriol sui generis*. See *Cramer*, Elem. Art. Docim. vol. 1. p. 302. ed. 2. Med. Ess. Edinb. Abr. vol. 2. p. 472.

If four ounces of alum be put in concoction with two parts of *cadmia fossilis* pulverized, the earth of the alum precipitates, and its acid takes hold of the earth of zinc, so that a true *white Vitriol* is the result.

This *Vitriol* being precipitated by an alkaline lye, and dried, after its salts are separated in water, and then mixed with charcoal-dust, it will give zinc, in the manner mentioned under the article Zinc.

The same thing happens in mixing *Vitriol* of iron with two or three parts of lapis calaminaris; but the operation is easier with alum and *Vitriol* of copper. *Marggraf.* in Mem. de l'Acad. de Berlin, 1746.

Blue Vitriol is made by evaporating ziment-water to a proper standard; after which it is let out into coolers, where it shoots into regular and beautiful crystals of a rhomboidal form, and composed of ten planes. These have the same qualities with the water; and being dissolved in common water, they make a ziment liquor, undistinguishable from the native kind. See the article Ziment-*Water*.

Blue Vitriol is also contained in sory or rusma, and many of the pyritæ and marcasites or mundics, but seldom pure. There are also some earths which contain it, but they principally owe it to ziment-waters passing through them.

Blue Vitriol has copper for its basis, and is never used internally, but only in external applications. There are several preparations of it recommended in dispensatories, the most valuable of which seems to be the *aqua Vitriolica cerulea*. See the article Aqua.

Vitriol *of Quicksilver*, the name of a chemical preparation of quicksilver, with acid spirits, the process of which is this: Let so rich a solution of quicksilver be made in spirit of nitre, or aqua-fortis, that no more can be contained; let this solution be made by the assistance of heat, and the liquor immediately afterwards poured off into a clean and cold glass. There will, on this, spontaneously shoot on the bottom of the glass a saline white transparent matter, from which the liquor being poured, it is found to be a sharp moist saline substance, or true *Vitriol* of mercury, soluble in water, and not safe to be touched: If the liquor, poured off from this, be evaporated half away, and the remainder set in a cool place, more crystals of the same nature with the first will shoot.

Another method of making the *Vitriol* of mercury, is this: Reduce to powder some decrepitated sea-salt, and with two parts of this mix one part of crude mercury; distil the whole in a glass body, with a strong fire, continued for five or six hours; when the vessels are cold, break them, and there will be found a solid dry mercury, sublimed to the top and sides of the body, in form of *Vitriol*: Nay, Boerhaave affirms, that the common mercury sublimate is a true *Vitriol* of mercury, though semi-volatile. *Boerh.* Chem. part 2. p. 301.

Preparations of Vitriol are, 1. The acid spirit, or oil of *Vitriol*. 2. Colcothar, or calcined *Vitriol*. 3 *Tartarum Vitriolatum*. 4. *Spiritus Vitrioli dulcis*. 5. The compound

triolatum.

ſpirit of *Vitriol*. See the articles SPIRIT, COLCOTHAR, &c. *Cycl.* and *Suppl.*

Oil of VITRIOL. Mr. Boyle informs us, that if the caput mortuum, after the diſtillation of the *oil of Vitriol*, be ſuffered to lie a conſiderable time in the air, it will be ſo impregnated with new ſaline particles, as to be worth a ſecond diſtillation. Works abr. vol. I. p. 142.

This ſtrong acid, when expoſed to the air, attracts the moiſture from it in very great quantity, increaſing in weight gradually to more than three times what it was when firſt expoſed, and gradually diminiſhing in ſtrength. The quantity of water it attracts from the air, in any given time, is not, however, in proportion to its own quantity, but to its ſurface; and Mr. Boyle has found by experiment, that if the ſame quantities be expoſed to the ſame air in glaſſes, in the one of which the ſurface is nine times greater than the other, that with the larger ſurface will gain eighteen grains addition in weight, while the other gains only two grains; and ſo in proportion for any longer time.

When the oil of *Vitriol* is fully ſatiated in the moiſteſt air, or wetteſt weather, it afterwards retains or loſes its acquired weight, as the air proves more or leſs moiſt. It may therefore be very practicable to make it a means to eſtimate the moiſture and dryneſs of the air. A very eaſy machine may be contrived to anſwer this purpoſe; for even a common pair of ſcales will do very well; and by a ſcale, on which the tongue of the balance ſhould move, would mark out the ſmalleſt changes in the moſt nice and accurate manner.

If a quantity of *oil of Vitriol* be expoſed in a wide-mouthed glaſs, till thoroughly ſated with the moiſture of the air, and then put into a ſcale, and in the moiſteſt weather exactly poiſed with a weight in the oppoſite ſcale, it will only continue exactly poiſed ſo long as the weather continues in that moiſt ſtate; but as the air becomes gradually more and more dry, it will weigh leſs and leſs, and mount, while the ſcale with the weights preponderates and ſinks.

The tongue of a ballance of but an inch and half long, thus deſcribes an arch of the third of an inch, by the different riſing and falling of the ſcale in which the *oil of Vitriol* is; and conſequently if the tongue were a foot long, it would deſcribe an arch of near three inches, which would be a ſufficient ſpace to mark a ſcale of degrees very nicely upon; and, as the tongue is pointed to theſe, it would be an excellent hygrometer.

This ballance may be contrived two ways, either ſuch whoſe pin ſhould be in the middle of the beam, with a very ſlender tapering tongue, of a foot or a foot and half long, pointed to the diviſions on a broad arched place fixed above; or elſe the ſcale with the liquor may be hung to a point of the beam, very near the pin, and the other extreme made ſo long as to mark a large arch on a board, placed conveniently for that purpoſe; and the ſcale, in either caſe, may very conveniently be a concave glaſs of four or five inches in diameter. On the diviſion of the arches ſhould be inſcribed the different temperature of the air ſhewn by the liquor. Phil. Tranſ. N°. 157.

The oil of *Vitriol*, being a cauſtic of an oppoſite nature to *lapis infernalis*, has been known to remove the pain occaſioned by the application of the latter. See the article OPPOSITE *Cauſtics*.

VITRIOLIC (*Cycl*) —VITRIOLIC *Minerals* are compound foſſile ſubſtances, formed of various ſtony and earthy particles, mixed with others of iron and copper, and that either ſeparately or conjunctly; ſo that, in effect, they are ores of *Vitriols*.

The different kinds of theſe minerals are, 1. The chalcites. 2. The miſy. 3 Sory or ruſma. 4. Melanteria. 5. Pyrites, or fire-ſtone. 6. Marcaſites. See the articles CHALCITIS, MISY, &c. *Cycl.* and *Suppl.*

In Europe the only uſe made of chalcitis is as an ingredient of Venice-treacle, and even here its place is generally ſupplied with common green *Vitriol* calcined to a redneſs. The antient Greeks uſed it externally in hæmorrhages and collyriums for the eyes; alſo for the herpes and eryſipelas; but never ventured to give it internally.

The antients uſed *miſy* for the ſame purpoſes as *chalcitis*, being eſteemed milder than this laſt.

At preſent it is no where put to any uſe, nor indeed does it merit it, as containing no other virtues than thoſe of green *Vitriol*, though we are not ſure what pernicious ſubſtance it may be mixed with.

VITRIOLIC *Waters*. The countries which abound with mines of copper and iron uſually afford a great many *vitriolic* waters.

One of the moſt remarkable ſprings of this kind, of which we have an account, is that near Padderborn in Germany: This is a ſort of treble ſpring, having three openings, and all three yielding very different waters. Two of theſe openings are not more than a foot and half diſtant from one another, and yet of ſo different qualities, that the one is limpid, bluiſh, milk-warm, and bubbling, and contains ſal armoniac, ochre, iron, vitriol, alum, ſulphur, nitre and orpiment; all theſe ſubſtances having been ſeparated in its analyſis. The other is cold as ice, and is turbid, whitiſh, and much heavier, and ſtronger to the taſte than the other. This holds much orpiment, with ſome ſalt, alum, nitre, ſal armoniac, and vitriol. The firſt of theſe waters is taken by the people in the neighbourhood, againſt worms, and diſorders of the ſpleen, as alſo againſt epilepſies; the other is poiſonous to birds, all that drink of it dying in a very little time. The experiment has been tried on common hens, with the water brought from the ſprings into other places, and given them to drink.

Thoſe to which ſalt is given, after the ſwallowing this poiſonous water, ſtruggle longer before they die by it; and vinegar is found to ſave them very often from death, after drinking largely of it; but in this caſe they are ſickly for ſeven or eight days after it, and have the pip, as the good women expreſs it.

In the diſſecting thoſe birds which have died by drinking this water, the lungs are always found quite ſhrivelled up.

The people of the country have not been deterred by this bad effect of the water, from uſing it in medicine; they take ſmall quantities of it diluted in water, to deſtroy the worms, and it performs this very well; but gives them a grievous ſickneſs while it operates.

The third ſtream, or opening of this remarkable ſpring, is about twenty paces diſtant from the others; the water is here very clear, of a greeniſh colour, and of a ſour, but not very diſagreeable taſte. It is of a middle weight, and of middle qualities between the other two, and is evidently formed of the joining of thoſe two ſprings with ſome other freſh water in the way; for a liquor exactly reſembling this third kind may be prepared, by mixing equal quantities of the other two with a ſufficient quantity of commom well-water. Phil. Tranſ. N°. 8.

There is a ſpring in Baſil diſcharging its water through the tanners-ſtreet, or gerber-gaſſe, which is of a bluiſh colour, and ſomewhat turbid. This holds blue vitriol, that is, copper, in the form of a ſalt, and with it bitumen and antimony; but a much larger proportion of the firſt ingredient, than of either of the others. The analyſis of it ſhews, that it contains three parts copper to one of bitumen, and two of antimony. It ſerves the tanners of the place to good purpoſe, their ſkins receiving one of their preparations from this native water.

The ſame town affords ſeveral other ſprings of peculiar qualities, all owing to the veins of metalline ores, with which the earth of the place abounds. The one of theſe is called *Bandulph's-well*, and affords a water of great uſe in medicine, ſeveral being regularly and perfectly cured of hydropical diſtempers by it. And another very remarkable one contains, as is found by its analyſis, ſulphur, nitre, and ſome gold. Theſe, however, are in ſuch ſmall quantity in it, as not to prevent its being fit for the common uſes of life. It is very ageeable to the taſte, and is much eſteemed for drinking, and ſent for all over the town.

Another *vitriolic* water runs out of a cavern near Gelſbach in Alſace. It is a fattiſh and oily liquor, and is uſed by the country-people for greaſing their wheels; but it is fit for much better purpoſes. If it be boiled to the evaporation of a third part, there will remain very little water, but a fatty bituminous ſubſtance, like tar, will ſubſide to the bottom, and there will ſwim at the top a yellow, thin, and limpid liquor, very much reſembling linſeed oil; and this, diſtilled in a ſand heat, yields an oily and watry liquor; the firſt very good for external uſes, for burns and ſcalds; and the other a good internal medicine, in conſumptions, and other diſeaſes of the lungs. Id. Ibid.

Some time ago there was a water diſcovered in England, that gave, on many experiments, an appearance of containing natural and perfect vitriol. This water was found near Eglingham in Cumberland; and being examined, by adding galls to it, it became abſolute ink, much deeper than any of the atramentous waters ever do: When one half the quantity was ſlowly evaporated, the remainder retained this quality to a higher degree than before; and, on evaporating it yet farther, there concreted in it fair cryſtals of pure and genuine vitriol.

This was an appearance wholly new in England, and not eaſily accounted for, as we have no mineral, except the common pyrites, which contains vitriol; and it is very well known, that there requires a fermentation in the air, before the vitriol, contained in that ſtone, will be diſintangled from its other principles, ſo as to be capable of appearing in its own form; and as this ſtone, lying under water, can never impregnate that water with its vitriol, it did not ſeem eaſy to conceive in what manner a genuine vitriol ſhould be communicated to water, where there was no other ſubſtance which could give it.

The ſuſpicions that theſe thoughts gave the gentleman who examined this water, occaſioned his making a viſit to the place where it was produced, when he found that the ſuppoſed *vitriolic* ſpring was no other than an old drift made for the draining the water from ſome old wrought coal-pits; the people who had worked in theſe, remembered to have ſeen great quantity of pyrites there. This drift was ſometimes dry for a conſiderable time together, and ſometimes run in a plentiful ſtream; and there is no doubt but that, in theſe dry ſeaſons, the air acted upon the pyrites, and cauſed it to ſhoot its vitriol, which the next tide of water waſhed away, and it came off diſſolved in it, and highly impregnating it.

This proved therefore no better a medicinal ſpring than ſome of a like kind, deſcribed by Mr. Leigh in his natural hiſtory of

of Lancafhire; and all thefe are very little better than the difcovery of a medicated water in Oldftreet, from the remains of an old colour-fhop, or Kircher's reckoning the common fhores of Rome among the medicated fprings of Italy.

The *vitriolic* fpring which has been fo much talked of near Haigh in Lancafhire, is no other than an accidental impregnation of common water, in the fame manner, it being only the runnings of an old drift, or drain, made to carry off the water from fome pits of cannel-coal; and this, like the other, as it fometimes has water, and at other times is dry, gives time for the pyrites to let go its vitriol while dry, and then imparts it to the waters that pafs that way afterwards. Thefe are not to be accounted medicated fprings, fince neither natural nor continual, and fuch may be any day made at home, by laying the common pyritæ of our clay, or coal-pits, out to moulder in the air, and then pouring water upon it, and after a fhort time ftanding, taking it off again. Phil. Tranf. N°. 245. p. 380.

VITRUM, in botany, a name given by fome of the old writers to the plant we now call *glaftum* or *woad*.

This plant has always been a native of England, and was in ufe among the favage inhabitants of this ifland, for painting their bodies. Thofe who have not underftood this to be the name of that plant, have been ftrangely perplexed to account for thefe people's painting their bodies with *Vitrum*, glafs, as they underftood it: But the whole meaning of this plant obtaining the name of *Vitrum*, feems to have been its ftaining the fkin to a pale blue colour, or, as it was called by many, a glafs-colour.

VITRUM, *Glafs*. As impenetrable as glafs is to the common menftruums, we find it eaten by the air in length of time, when expofed in old windows; but the effects of its being kept in a fubterraneous place are much more ftrange. Borrichius tells us, that at the time when he was at Rome, there was dug up a whole houfe from under the kitchen-garden of a citizen. The houfe had been buried there ten ages, and there were found in it feveral glafs urns, or lachrymatories. The glafs of thefe had no holes made in it, as our old glafs in chamber-windows has, but ftill retained its fmooth furface and tranfparence; but it was fplit into a vaft number of thin laminæ, which were as pellucid and fine as Mufcovy glafs; and in fome places were tinged with all the beautiful colours that art could have given. We are not acquainted perfectly with the antient way of working their glafs; but it is not probable there could be any thing particular in the formation of the veffel, to determine it to fplit thus into flakes; but that glafs of the fame kind, in any form, would have done the fame. *Borrich.* de Ortu Chemiæ.

VITRUM *Antimonii Ceratum*, in pharmacy, is thus prepared: Take glafs of antimony in powder, one ounce, bees wax one dram; melt the wax in an iron ladle, then add the powder; fet them on a flow fire without flame, for the fpace of half an hour, continually ftirring them with a fpatula; then take it from the fire; pour it upon a piece of clean white paper, powder it, and keep it for ufe.

The glafs melts in the wax with a very flow fire. After the materials have been about twenty minutes on the fire, they begin to change colour, and in ten more come to the colour of fnuff; which is a mark of the medicine's being fufficiently prepared.

The ordinary dofe for adults is ten or twelve grains; but it is fafeft to begin with fix grains. The quantity of a fcruple has been given to a ftrong man, which wrought gently.

This medicine has for fome time been held a fpecific in dyfenteries; but the preparation and manner of giving it have been kept a fecret, till Dr. Young generoufly made it public. Dr. John Pringle fays, he tried it in a dyfentery of four years ftanding, with furprizing fuccefs. See Med. Eff. Edinb. vol. 5. art. 15.

It has been given in dyfenteries, with or without a fever, whether epidemic or otherwife, and whether bleeding and vomits have been premifed, or not. In its operation, it fometimes makes the patient fick, and vomits him; it purges almoft every perfon; but it has been known to cure without any evacuation or ficknefs. It is to be given with an empty ftomach, for then it operates moft mildly. Nothing is to be drank after it for three hours, unlefs the patient is very fick, and difpofed to vomit; in which cafe warm water may be given, as in other vomits.

This medicine fhould not be given for diarrhœas in the end of confumptions. Other diarrhœas have been cured with large dofes of it; but in fuch cafes it fails oftner than in dyfenteries. During the ufe of this powder, fermented liquors fhould be abftained from, and a milk diet is proper. See Medic. Eff. Edinb. ibid.

This preparation has alfo been found fuccefsful in uterine hæmorrhages, both in young and old.

It has alfo been tried in colic pains, from vifcidities in the inteftines, and found a fafe and eafy purgative, and fometimes a gentle emetic.

The method of giving it is in a bolus, with conferve of rofes, diafcordium, or theriaca Edinenfis. An opiate, after the operation, is proper. See Medic. Eff. or the Abridgment, vol. 1. p. 193. feq.

VITRUM *Morrhinum*, *Morrhine*, or *Myrrhine Glafs*, a name given by Pliny, and fome of the antients, to a fort of manufacture made in Egypt, which though truly no other than a kind of glafs divefted of its tranfparency, yet was made fo nicely to imitate the *myrra* or *morra* of the Indies, fo famous among the Romans, under the form of cups and veffels, called *murrhina vafa*, that it was called by fome, *murrha altera*, another fort of *murrha*, and the cups made of it honoured with the name of *murrhine veffels*. This ferves to fhew, that the *myrrhina vafa*, properly fo called, were not of any precious ftone, as vulgarly fuppofed, but of a fort of porcelain. See the article MORRINA.

VITTA, among the Romans, a fillet with which the women in Rome bound their hair. The matrons wore a double one, to diftinguifh them from the virgins, whofe *Vittæ* were fingle.

Vittæ were alfo worn by priefts and poets; in which cafe they were made of branches of olive or laurel; the ftatues of the gods were likewife adorned with *Vittæ*, as were altars, the doors of temples, victims and fupplicants. *Pitifc.* in voc.

VITTA *Cærulea*, in conchyliology, a fpecies of *dolium*. See the article DOLIUM.

VITTA, in ichthyology, a name given by Gaza, and fome others, to the fifh called by others, *tænia*, and by the Italians, *cepole*. See the articles TÆNIA and CEPOLE.

VITULUS *Marinus*, the *fea-calf*, in zoology. See the article PHOCA.

VITULUS, *Calf*, in zoology. See the article CALF.

VITULI *Aquatici*, in the hiftory of infects, a name given by the German writers to thofe flender and long worms found in waters, and refembling horfe-hairs, and which are fuppofed by the vulgar to be no other than real hairs, animated by lying in the water. We are not yet perfectly informed of all parts of their hiftory; but Dr. Lifter has found them in the bodies of feveral of the common beetles.

VITUS's *Dance*, or ST. VITUS's *Dance*, in medicine, the name of a peculiar fort of convulfion, to which young women are principally fubject, toward the time of the firft eruption of the menfes.

It feems to have had its name from the account which Horftius gives of fome women who once every year paid a vifit to the chapel of *St. Vitus* near Ulm, and there exercifed themfelves day and night in dancing, being difordered in mind, till they fell down like people in an extafy: By this means they were always reftored to health for a whole year, till the return of May, at which time they were again feized with a reftleffnefs, and diforderly motions of their limbs, fo as to be obliged, at the anniverfary of *St. Vitus*, to repair again to the faid chapel, for the fake of dancing. *Horftius*, Ep. Med. S. 7.

It is the moft frequent with girls, yet not peculiar to them, attacking boys alfo, from the age of ten to fourteen. It firft fhews itfelf by a fort of lamenefs, or rather unfteadinefs of one of the legs, which the patient draws after him like an idiot, and afterwards affects the hand on the fame fide; which being brought to the breaft, or any other part, can by no means be held in the fame pofture for a moment, but is diftorted or ftretched by a fort of convulfion to a different pofture and place, notwithftanding all poffible efforts to the contrary.

If a glafs of liquor be put into the patient's hand to drink, before he can get it to his mouth, he makes a hundred odd grimaces and geftures, for not being able to carry it ftrait, becaufe his hand is drawn different ways by the convulfion, as foon as it has reached his lips, he throws it fuddenly into his mouth, and drinks it very haftily, as if he meant only to divert the fpectators.

As this diforder appears to proceed from fome fharp humours thrown upon the nerves, which, by their irritation, excite preternatural motions, it feems that the curative indications are to be directed firft to leffen thofe humours by bleeding and purging, and fecondly, to ftrengthen the nervous fyftem. Dr. Sydenham therefore propofes the following method: Firft to take from the arm feven or eight ounces of blood, more or lefs, according to the ftrength of the patient. The next day let him take a gentle purge of rhubarb, fena, manna, &c. In the evening of this day, let him take a draught, with a fcruple of Venice-treacle, and eight drops of liquid laudanum mixed in honey and milk-water. This purging and opiate draught is to be repeated at fome days diftance, and the bleeding is alfo to be repeated to the fourth time; and in the intermediate days, a cordial and nervous electuary is to be given, compofed of the conferves of rofemary, orange-peel, and Roman wormwood, with Venice-treacle, candied nutmeg and candied ginger; of this the bignefs of a nutmeg may be given every morning and afternoon, drinking after it a decoction of piony, mafter-wort, and elecampane, and angelica-roots, the leaves of rue, fage, betony, and other cephalic plants, with orange-peel, and juniper-berries.

Spirit of harts-horn may alfo be given every night in fmall dofes, in a nervous julep, and plafters of gum caranna may be applied to the foles of the feet. According as the cure advances, the patient recovers the ufe of his hand and foot, and his amendment may always be difcovered by letting him attempt to bring a glafs of any liquor to his mouth in a ftrait line; though the bleeding fhould not be repeated beyond the fourth time,

time, yet the alterative and purging medicines ſhould be continued till the patient is quite well; and as people are ſubject to relapſes in this diſorder, it is proper to give the ſame medicines, and to bleed at the return of that ſeaſon of the year.

The firſt ſymptoms in this diſeaſe are often perceived to come on at the hips and os ſacrum, or extremity of the back-bone; from thence a pain extends itſelf acroſs the navel, and thence the pain runs up to the top of the head: as ſoon as this happens the convulſions uſually begin; theſe often firſt appear in the belly, and are ſo violent, that two or three perſons can ſcarce hold the patient, and are forced to lie upon the bed to prevent him from raiſing up his belly in a ſtrange manner.

After this, in ſome caſes, the nerves of the lungs become affected, and the patient will imitate the barking of a dog, or the ſnarling and howling of that animal when hurt: after this, the nerves of the jaws generally ſuffer, and the teeth are ſnapped violently together, and the mouth foams; perſons have ſometimes beaten out their teeth with the violence of ſnapping them together in theſe agonies.

There is, in the Philoſophical Tranſactions, an account of a caſe of this kind following a fever, in which the patient attempted to bite every body about him, and would have even gnawed his own fleſh, if he had not been prevented; but, though the people about him thought, from all theſe ſymptoms, that he had been bitten by a mad dog, and that this was madneſs, yet, on offering him water, he drank, or rather lapped it greedily; which proved it could be no effect of that bite, becauſe the great ſymptom of ſuch diſorders, the dread of liquids, did not ſhew itſelf in him. Theſe were merely the effect of this *Chorea Sancti Viti*, and were attended with twitching of the arms and legs, which conſtitute that diſtemper; his noiſes alſo were not confined to thoſe of a dog, but in different fits, he repreſented the ſounds of different animals, as the roaring of a bull, the grunting of a hog, and the noiſe of a gooſe.

Theſe were not premeditated, or meant by the patient, as imitably of ſuch ſounds, but merely proceeded from the forcing out the air from the lungs in different manners, according to the different power of the convulſion, which affected their nerves. The patient in this caſe was ſpeechleſs, not only in the time of the fits, but for a week together; and the country people fell into the common error of ſuppoſing that he was bewitched, but the phyſician cured them of that belief, by the curing the patient of his diſtemper by the common means, as they were convinced, that a diabolical ſpirit could not be caſt out by a regular courſe of phyſick. Phil. Tranſ. N°. 287. p. 1480.

VIVACE, VIVACEMENTE, or VIVAMENTE, in the Italian muſic, ſignifies to play with life and ſpirit. It requires a degree of movement between *largo* and *allegro*, but neareſt *allegro*. See the articles LARGO and ALLEGRO.

VIVACISSIMO, in the Italian muſic, denotes a degree or two quicker than *Vivace*, and is much the ſame with *allegro*. See the article ALLEGRO.

VIVERRA, in zoology, the name by which authors call the *Ferret*; called by ſome alſo *muſtela ſylveſtris*, *furo*, and *furunculus*.

The uſe we make of this creature, is the ſending it into rabbet holes to drive them out; but we are obliged to faſten up their mouths, that they may not tear the rabbets to pieces; but it ſtill is able to annoy them with its claws, and ſoon drives them out. It feeds on milk, ſmall birds, and the fleſh of animals, and is a creature eaſily kept tame, and will breed and bring up its young in that ſtate; and theſe will naturally hunt the rabbet, in the ſame manner as their parents.

It is of a middle ſize, between the weaſel and polecat; its head is ſmall and flattiſh; its ears ſhort, erect, and very wide; its noſe, or ſnout, long, like that of a hog; and its eyes ſmall and red; its colour is a pale, yellowiſh white; the back and ſides a little darker than the belly; and its feet have all five claws each: it breeds very well with us, but is ſaid not to be a native here, but brought from Africa. *Ray*'s Syn. Quad. p. 198.

VIVERRA *Indica*, the Indian *Ferret*, a name by which ſome have called the animal known in America by the name of *quirpele* and *quil*. See the article QUIRPELE.

VIVES, a name given by our farriers to a diſeaſe of horſes, which conſiſts in the growth of certain flattiſh kernels in cluſters, like bunches of grapes, beginning from the ears, and creeping downwards, between the chap and the neck of the horſe toward the throat.

When they are inflamed they ſwell, and become not only painful to the creature, but are even mortal, ſtopping his wind unleſs a ſpeedy courſe be taken for their cure. The difficulty of breathing, which they occaſion in their progreſs toward this higheſt degree, occaſions many ſymptoms, which being miſunderſtood by the farriers not being well acquainted with the nature of this diſeaſe, are often treated as peculiar diſtempers themſelves, and the creature periſhes by the treatment of them in an improper manner.

The horſe will often lie down, and ſtart up again, and tumble about in a ſtrange manner, and be ſuppoſed to have convulſions, when he has really no other complaint but the difficulty of taking his breath.

The common cauſe of this diſtemper, is the drinking cold water after any violent heat: It is alſo ſometimes ſaid to ariſe from the eating too much bad corn. The method of cure is to be varied according to the progreſs and ſtate of the diſeaſe, and the immediate danger.

If the tumors be not grown ſo large as to put the horſe in abſolute danger of ſuffocation, the farrier uſually attempts to rot them away, by taking hold of each gently with a pair of pincers, and beating them gently with the handle of a ſhoeing-hammer, or bruiſing them with the hand alone, till they grow ſoft; this will often make them diſappear; but this method is only to be uſed when they are nearly ripe; for otherwiſe they will return after a time; their being in a proper ſtate for this, is known by the ſeparation of the hair, which eaſily comes off on the taking hold of it between the fingers. If the caſe be more deſperate, and the horſe likely to be immediately ſuffocated, it is beſt to open them with an inſtrument. Whether this, or the other method be taken, the horſe ſhould immediately after be blooded under the tongue, and afterwards in the flanks, and his mouth waſhed with ſalt and vinegar, and ſome of the ſame mixture ſhould be put into his ears, rubbing and ſqueezing them hard to make it penetrate: this will wonderfully aſſwage the pain. After this, the horſe is to take a quart of white wine, with two handfuls of hempſeed bruiſed, two nutmegs ſcraped, and the yolks of ſix eggs, all thoroughly mixed in it. About an hour after this draught, he is to have the following glyſter: Boil an ounce and half of ſal polycreſtum, finely powdered, in five pints of beer; when this is taken off the fire, two ounces of oil of bays is to be put to it; and the whole is to be thrown up blood-warm. This is a regular method, and ſeldom fails of a cure; but ſome, who are not willing to have ſo much trouble and expence, only cut holes where the kernels are, and pick them out at theſe with a wire; they then fill the hole with ſalt, and at the end of three days it will run; after this they waſh the wound ſome days with the juice of ſage, and heal it with the common green ointment, or with a mixture of honey, butter, and tar.

VIVIPAROUS (*Cycl.*) — The females of all the quadruped claſs are *viviparous*, and thoſe of the bird claſs are all *oviparous*.

The laws of nature in the larger animals, are therefore, in a great meaſure, fixed and certain; but it is not ſo in the inſect tribes, nor in the fiſhes; for of theſe ſome are *viviparous*, and others *oviparous*; and thoſe of genera nearly allied to one another.

Among inſects, the much greater number are *oviparous*; but there are many which are not ſo, as the pucerous, progallinſects, cochineal, &c. The millepedes and ſcorpions are alſo well known to be ſo; all the females of the butterfly, and of ſome other claſſes, lay only eggs; but the moſt ſingular and remarkable inconſtancy in nature, if we may be allowed the expreſſion, is that in the fly kingdom; the ſame claſs of inſects, and even the ſame genus, will furniſh us with ſome which are *viviparous*, and others which are *oviparous*; the two-winged flies give us inſtances of this; but theſe are not ſingle in that reſpect; for among the reptile world, there are other creatures which are ſubject to the ſame varieties; and Swammerdam has obſerved a viviparous ſnail. The two-winged *viviparous* flies bring forth worms, in all reſpects the ſame with thoſe hatched from their eggs in the other ſpecies.

Many authors having obſerved the flies in general to lay eggs, have too haſtily declared flies to be oviparous; and, on the contrary, ſome having ſeen them produce living worms, were of opinion, that they were all *viviparous*. Redi very juſtly blames both ſides for making general inferences from particular facts, and then propoſes a queſtion, whether the ſame fly, in different circumſtances, may not depoſit eggs, or living animals, and whether external cauſes, as the heat of the air, &c. may not make thoſe eggs, naturally ordained to have been laid in that form, hatch in the creature's body, and thence appear in form of a living offspring: but as there is no probability of a chicken being in the body of the hen, though it may eaſily happen that an egg may be detained there, ſo neither is there any probability of that which nature ordained to be produced in the egg ſtate by the fly, ſhould by any accident be made to hatch into a young one, in the body of the mother.

The ſpecies of *viviparous* two-winged flies, are much more rare than the oviparous; and among the four-winged claſs, they are yet more uncommon. It is not certain, that any of the latter, beſide the winged pucerons, are of this kind; but among the former, there are ſix or ſeven ſpecies which are known always to produce living worms, and probably many more will be diſcovered, by a more cloſe attention than has hitherto been given them, to be ſo too. When we ſee the eggs of a fly depoſited in great numbers on food, excrements, or other ſubſtances, it is eaſy to follow the changes of the creature produced from thoſe eggs; and when one has it in the fly ſtate, there is a ſufficient proof that this ſpecies of fly is oviparous: but it is much otherwiſe in reſpect to the *viviparous*

rous kinds; fince when we fee the multitudes of fmall fly-worms already living on any of thefe fubftances, it is not to be known from all their fucceeding changes, whether they were produced from the body of the parent-fly in that ftate, or as eggs.

To diftinguifh with certainty, whether a fly be oviparous or *viviparous*, the beft means is certainly to obferve it in the inftant of its producing its eggs, or young ones, which ever they are; but as that is a moment not eafily feized, its place may be fupplied either by opening the body of a female fly, diftended and full of eggs or young, and the arrangement and form of the bodies contained, will eafily determine the obferver, whether he is to look on them as eggs, or embryo-animals: But a yet more certain way is to take a fly which appears ready to depofit its future progeny, and fqueezing its body, force out in a part of what would naturally have been thrown out in a little time, and it will be eafy to fee whether thefe are eggs or worms.

It is eafy to find about our houfes one of thefe fpecies of *viviparous* flies; the creature is always buzzing about the places where meat is kept, and loves to depofit her young as the common blue flefh-fly does its eggs, on meat. Its way of carrying its wings is the fame with that of the blue fly, and its antennæ are of the fame form. It at leaft equals the blue fly in length, but its body is lefs thick, and is a little bent at the hinder part; its colour is grey. On the corcelet this colour arifes from a feries of long but irregular afh-coloured lines ranged on a brown ground: A fimilar colour is alfo feen on the upper part of the rings of the body; but the grey fpots here are much fhorter than on the corcelet, and almoft fquare, and the colour between thefe is a fhining brown, which, in fome lights, has a caft of blue. Its legs are black; its petty wings whitifh; and its reticular eyes reddifh.

When a female of this fpecies is taken on meat, and has not too flat a body, one may always expect the fuccefs of an attempt to find that fhe is big with living young. Taking a fly of this kind, and in this ftate, between ones fingers, and obferving its hinder part, one fhall ufually fee a fmall and fomewhat cylindric oblong body thruft itfelf out, and move from fide to fide, and fometimes make many finuofities; this will be found to become more and more long, as it is more and more difengaged from the body of the fly, and is indeed no other than a worm now firft appearing, and endeavouring to difengage itfelf from the body of its parent; a few moments now fets it at liberty; and it is no fooner fallen off, than the end of another like worm appears at the fame apperture, and in a few moments gets its liberty, as the former did; this is fucceeded by another, and fo on for ten, twenty, or fometimes many more; and when the creature feems to have done producing them, the flighteft preffure on the belly will fend out numbers more, and fometimes two or three are, by this means, forced out at the paffage together. The aperture is naturally large, through which they are to pafs, and is, befide this, capable of great extenfion.

It is ufually the head of the worm that firft makes its appearance; but this is not always the cafe; and efpecially where external preffure has been ufed, 'tis not uncommon for the hinder part of the worm to appear firft; and when many of them have, by this means, been forced out together, and the paffage by this means is become enlarged, 'tis no uncommon thing for a number of them coming out together, to bring with them a part of the membrane in which they had been enclofed, while in the body of the parent-fly.

The confideration, however, of the many animals of the infect clafs, which are often found to breed and nourifh in their bodies worms, not their own offspring, but that of the eggs of other infects lodged in their flefh, and eating them up alive, might lead one to doubt whether thefe worms, inftead of being the genuine offspring of the fly, were not a fet of cruel enemies which had been long devouring and preying on its entrails; and what might fomething favour this opinion, is, that the fly ufually dies foon after it has finifhed its depofiting them. But there needs no more to refute this error, than to give thefe new-born worms fome meat; the eagernefs with which they bury themfelves in it, is a proof of their being in a condition to eat, and that greedily; whereas the worms bred in the bodies of infects, from the eggs of other creatures, when they leave the body of the creature, have no farther occafion for food, but have nothing to do but to prepare for their transformation. On the other hand, if one continues to obferve thefe worms produced from the fly, one fhall find that they behave in all refpects like thofe produced from the eggs of the blue flefh-flies; they eat the meat to a certain time; then having obtained their full growth, they leave the fubftance they had fed on, and run into the earth, where they are afterwards found in form of nymphs, enclofed in a fhell made of their own fkin; and, at proper diftances of time, there are produced from thefe, flies male and female; the latter, in all refpects perfectly like the parent-fly, from whofe body the worms had been feen to come.

There are, befide this fpecies, two other of the *viviparous* flies, which are not uncommon. Both thefe, in a great meafure, refemble the former; but their bodies are fhorter; and, in the whole, they much more than the other approach to the form of the blue flefh-fly. They are alfo fmaller than the former fpecies; the one of them, however, on the whole, is not much fo, and, though fhorter, yet is much thicker both in the corcelet and body. : They are both, though fmaller than that kind, yet tolerably large flies, and are bigger than the common horfe-fly.

On the leaves of ivy alfo there are often feen, about autumn, two other fpecies of *viviparous* flies, which are eafily diftinguifhed from all the others. Thofe of one of thefe fpecies are larger than the great blue flefh-fly, and have a fhorter and thicker body than that kind. The manner of carrying the wings is alfo the fame in both; but though both have antennæ of the battledore kind, yet they are evidently diftinguifhed by this, that the extremities of the one are lenticular, and thofe of the others prifmatic. Near the origin of each wing thefe have a brownifh fpot, as have thofe oviparous flies which ufually have in their body only two large eggs at a time, and which are produced of the yellow worms, fo common in cow-dung. But thefe *viviparous* ones differ from thofe flies, in that they are larger, and of a deep, but dead brown; whereas the others are black, or nearly fo.

The other fpecies is not much unlike this in form, but is fmaller, being not more than of the bignefs of the blue flefh-fly, and of a bluifh black; fo that it might eafily be miftaken for one of the common flefh-flies, were it not for the two brown fpots at the infertion of the wings; and both this and the former fpecies are plainly diftinguifhed from the cow-dung-fly before defcribed, by their wanting the gold-coloured down which that has on the fore-part of its head. *Reaumur*, Hift. Infect. vol. 4. p. 405. feq.

ULCER (*Cycl.*)—*Callous* Ulcers. The cure of callous *Ulcers* is attended with very great difficulties, and indeed no cure is to be expected, till the callus is perfectly extirpated. This is to be done three ways; the mildeft of thefe, which is fuited to recent callufes, and fuch as are not yet become very hard, is by means of corrofive medicines, and of thefe the milder kinds are often fufficient; burnt alum either rubbed on the parts alone, or applied with an equal part either of the common digeftive or bafilicon, will fometimes anfwer this purpofe in thefe cafes, as will alfo the Ægyptian ointment, to which a fmall quantity of red precipitate may be added occafionally. If the callus will not yield to thefe remedies, it muft be attacked with the common cauftic, or with butter of antimony, or with a folution of quickfilver in fpirit of nitre.

Another mild method of extirpating callofities we are alfo taught by Le Dran. This author advifes to apply, for four or five days, a plafter made of the diachylon with the gums, and the mercurial plafter, with a quadruple proportion of mercury, mixed in equal quantities; this is to be renewed morning and night, in order to foften the callous lips as much as poffible; after this he makes numerous incifions, fo deep as to pafs quite through the fubftance of the callus, and ftops the blood which flows from thefe with dry lint; then the fame plafter is again applied, and fo laid on, that it may touch the naked incifed lips. After about four days of this treatment, the fcarifications are again repeated, and this to a third or fourth time, if the callofity be not before deftroyed.

If callous *Ulcers* are attended with fiftulous finufes, thefe muft always be laid open, before we can attempt to deftroy the callus, with any probability of fuccefs; after this they may be cured as before directed; or, if the ufe of the knife be not fafe, or the patient dreads it too much, it will be proper to form tents, and thruft them up the finus, firft anointing them with the Ægyptian, or with Wurtz's brown ointment. By thefe methods a callus, that is not of long ftanding, may be extirpated; if the ends of the tents, laft mentioned, be touched with butter of antimony, red precipitate, or the infernal ftone, the bufinefs, in that method, will be the more eafily effected; and, in cafes of this kind, where the callus cannot be reached by the corrofive end of the tent, it is a very good method to inject into the finus either the phagedenic-water, or a folution of the Ægyptian or brown ointment in fpirit of wine. The opening of the finus fhould be then clofed, to keep in the injection as long as may be, and the operation frequently repeated.

Sometimes, however, it is found abfolutely neceffary to ufe the knife, as in callous *Ulcers*, or fiftulæ, that are of very long ftanding, and that have formed variety of finufes, and when either nothing can be done by corrofive medicines, or elfe that they tear and corrode the nerves, and bring on convulfions, and other bad fymptoms, before they affect the callus. In thefe cafes the beft and fafeft way is to lay open the finus, taking care not to wound the nerves, tendons, and arteries; and, after that, all the callufes may be eafily deftroyed by the common methods. Finally, if even this method fhould not have the defired effect; and if the patient has a confiderable fhare both of ftrength and courage, and the fituation of the nerves and arteries is favourable, the callus parts muft be all either entirely cut out with the knife, or burned away by the actual cautery. This operation, though a very painful one, is attended with this great good confequence, that it will reduce the moft inveterate callous *Ulcer* to the ftate of a frefh wound; and unlefs a caries, or bad habit of body, or the pox,

scurvy, or dropsy, or some other constitutional complaint, be in the way, it may be cured as easily as a fresh wound. *Heister*'s Surgery," p. 251.

Cutaneous ULCERS. Such of these as attack the skin of the face, both in infants and adults, approach very much to the nature of the truly phagedenic *Ulcers*; for they, like those, arise from an acrimony of the blood, and are very apt to spread abroad.

In both these cases therefore purging medicines, with such as sweeten the blood, will always prove of service. Decoctions of the woods, or of the sharp-pointed dock root, or the herb fumitory, should be drank on these occasions, half a pint at a draught, as hot as can well be borne, three or four times a day. And some of these draughts should be taken in bed, and a gentle sweating be promoted for some time afterwards. And absorbent and sweetening powders; as those prepared from antimony and flower of brimstone, should be taken at the same time. When this case happens to infants at the breast, they can only take some slight doses of medicines to open the bowels; but the mothers or nurses ought to be enjoined the regimen just mentioned.

In regard to the external applications, oil of tartar per deliquium will be found of great service; a pencil or feather is to be dipped in this, and rubbed over the parts three or four times a day. This may either be thus used alone, or else mixed with oil of eggs and wax, and a plaster laid over it, or the de minio, or any other of the lead plasters, or one of sperma ceti and camphor.

If the whole face be affected, which in infants is not unfrequently the case, a plaster would prove highly troublesome; but, in this case, the proper ingredients may be spread in a softer form over a linnen mask. Lime-water is a medicine of great power and value also in these cases, as is likewise the water used in the washing diaphoretic antimony. The *Ulcers* may very properly be washed with either of these, and the litharge or pompholyx ointment afterwards applied; to which, in very stubborn cases, a little crude mercury may be added; and sometimes a small admixture of red precipitate is found necessary; and finally, if these *Ulcers* are attended with a large and foul discharge, it will be proper to sprinkle them with some of the absorbent powders, as tutty, lapis calaminaris, cerus, chalk, or the like, mixed up occasionally with a little native cinnabar, or red precipitate; or, if it be found more convenient, these powders may conveniently enough be made into an ointment with cream. *Heister*'s Surgery, p. 247.

Fistulous ULCERS. When it is discovered, either by the eye or probe, that *Ulcers* are become fistulous, though the fistulæ or sinuses are not yet become callous, the readiest way of curing them is by laying them open, if that can be conveniently done, down to the bottom with the knife, and after this they may be cleansed and healed. As patients, however, are always averse to the knife, the cure of these may be attempted by injecting them with the decoctions of vulnerary herbs, such as agrimony, birth-wort, or ladies mantle, and dressing them with digestive ointments or lint. Many surgeons are, in these cases, fond of thrusting their dressings to the bottom of the sinus with tents; but they are very apt to do mischief by their hardness, and too great length, often bringing on a callus, inflammation, or too great flux of humours on the part. They ought therefore either wholly to be laid aside, in these cases, or else to be made as soft and as short as the nature of the case will admit. The next particular, in the cure of these fistulous sinuses, is to press the fundus as near to the mouth or opening as possible; and when the wound is cleansed, and the proper dressings applied, a small compress, or a slip of plaster, doubled up in the form of a small compress, must be laid on the part where the fundus, or bottom of the fistula, is judged to be seated, securing all on by a larger compress, and the proper bandages. In rolling up, in these cases, the proper method is always to place the beginning of the roller upon the fundus of the fistula, or at least to make the pressure tight upon that part; the continuation of this will urge the contained matter up toward the opening, and the fundus, or bottom of the sinus, will naturally be the first part that heals. When these sinuses penetrate so deep, that there is no coming at their bottoms with the dressings, vulnerary injections must be frequently used; and, of these, none are more serviceable in these cases, than the following: Take of the common digestive, prepared with turpentine, dissolved in the yolk of an egg, an ounce and half; honey, either simple, or the honey of roses, or of celandine, an ounce; common-proof spirit, nine ounces; mix these together for an injection. Or take of a decoction of scordium, or else of southern-wood or agrimony, eight ounces; common-proof spirit, three ounces; elixir proprietatis, or essence of myrrh and aloes, one ounce; honey of roses, two ounces; mix all together. These are to be injected at every dressing, and the opening of the fistula must afterwards be kept closed, to keep them in its cavity for some time, which will much hasten the agglutination of the part. If this method of cure does not succeed, recourse must at last be had to the knife; and, indeed, in very many of these cases, there is no great probability of relief from any other means, particularly where the fundus lies directly downward, or where the fistula takes such an irregular course, that the fundus of it cannot, with any success, be pressed toward the opening. In this case there is no relief to be had, but by laying it open to the bottom. To do this, a grooved probe, or director, should be gently passed down the fistula, and then directing the knife along the groove, the flesh, and common integuments, are to be laid open, as far as is safe and necessary; a free passage is, by this means, given to the corrupted matter, and the part may be come at with the proper dressings. If the opening is attended with a large discharge of blood, as is frequently the case, the wound must be, at the first dressing, filled with dry lint, and afterwards it is to be dressed with the common digestive, with a small mixture of the Ægyptian ointment, or with a little red precipitate, till the wound is perfectly cleansed, and it may then be easily healed in the common way. *Heister*'s Surgery, p. 244.

Putrid ULCERS. When *Ulcers* become putrid or fetid, this accident arises either from a very bad habit of body in the patient, or else from the negligence and unskilfulness of the surgeon.

The acrimony of the blood is by all possible means to be taken off in these cases, and the *Ulcer* to be frequently dressed, and every time thoroughly cleansed. When wounds are dressed but seldom, as will be the case after the sharp engagements in an army, where great numbers have been wounded, it cannot happen, but that the injured parts, in many patients, will be annoyed with heat, putrefaction, and worms.

To prevent and remedy these, the wounds must be dressed with the Ægyptian ointment, mixed with Wurtz's brown ointment, or the phagedenic water may be used with great success, as also red precipitate, either alone, or mixed with burnt alum, or with the common digestive. These applications are to be continued till the fungous flesh separates from the bottom of the *Ulcer*; and while this is doing, it will be very proper to cover the part with lint, dipped in spirit of wine, which is a very powerful remedy against putrefaction.

When the putrid parts are cast off, the cure will be perfected by the common means used in *Ulcers*; and where there are worms bred in the *Ulcer*, no particular cautions need be given against them, since the same applications answer the purpose, whatever resists putrefaction, will also be found to destroy worms. *Ulcers* sometimes prove, however, so very malign and obstinate, that they will give way to none of these remedies; and in these cases, though there be nothing venereal at the bottom, yet the only relief seems from a salivation. *Heister*'s Surgery, p. 248.

Running ULCERS. When stubborn *Ulcers* are attended with a large discharge, there is reason to apprehend that the blood abounds with too large a quantity of a thin acrimonious serum. This cannot be drawn off any way more properly than by cathartic medicines; these and diuretics are to be repeated as often as the strength of the patient will conveniently permit, and he must be particularly cautioned against drinking too freely.

Millepedes, in any form, are very properly prescribed to be taken internally in these cases, as are also the essence of amber, myrrh, balsam of Peru, tincture of salt of tartar, tartarized tincture of antimony, and the like; large and frequent draughts of small liquors are frequently the cause of these disorders, and are therefore most carefully to be avoided; strong ale, or old wine, should be drank sparingly at meals, and nothing between them.

Such meats are best, on these occasions, as have fewest juices in them, and are very well roasted, and the external medicines must be those which have the greatest reputation as dryers.

The principal of these are lime-water, lapis calaminaris, tutty, chalk, mastic, frankinsence, colophony, and native cinnabar; when any of these have been sprinkled in fine powder upon the *Ulcer*, a plaster of diapompholygos, or the like, is to be laid over it. *Heister*'s Surgery, p. 246.

Venereal ULCERS. These are almost always situated either in the groins, after the suppuration of venereal bubo's, or else in the prepuce, frænum, or glans penis, which is usually termed a *chancre*. In females they are frequently situated in the vagina, or labia pudendi, and in either sex sometimes in the nose, palate, lips, fauces, tongue, and uvula; and sometimes the os frontis, and other bones both of the head, and other parts of the body, are subject to them.

The great intention, in these cases, is to expel the venereal poison by proper remedies; for one *Ulcer* of this kind, if neglected or ill-treated, will produce an universal pox. The internal medicines are principally calomel, mixed with purging medicines; and in the intermediate times, decoctions of the woods, with tincture of antimony, and the like; these last are to be taken before rising in the morning, to bring on a gentle sweat, and may be repeated afterwards many times in the day. A strict regimen of diet ought also to be observed; wine, and all vinous or spirituous liquors, are to be forbidden, and all aromatics, spices, salt, and acrimonious or acid things, are poison to persons in these cases: If such a regimen, and a course of these medicines, will not effect a cure, such quantities of mercury must be sent into the blood, as will raise a salivation, by which both the *Ulcers* and the pox, which was the cause of them, will be cured at the same time. When the

 Ulcers

Ulcers are ſituated in the mouth, uvula, fauces, or tongue, the patient ſhould frequently uſe a gargle, made of decoctions of the woods, and ſweetened with honey of roſes, and the *ulcerated* part ſhould be frequently touched with honey of roſes, acidulated with ſpirit of vitriol, and, after this, they may be healed with eſſence of myrrh, amber, or with oil of myrrh made per deliquium.

When the *Ulcers* are on the external parts, they muſt be dreſſed either with the common digeſtive, or with baſilicon, with red precipitate mixed in them; and theſe dreſſings are to be covered, and kept on by a mercurial plaſter; and when they are thoroughly cleanſed, they may be healed in the ordinary way.

Another excellent medicine for cleanſing theſe *Ulcers*, is the phagedenic-water, or, in its place, lime-water, impregnated with calomel; either of theſe may be applied every day many times, and the parts may be, when neceſſary, touched with the cauſtic; and when they are thoroughly cleanſed, they may very ſucceſsfully be healed, either with an ointment made only of crude mercury mixed with turpentine, or with the following: Take of the diapompholygos ointment, and crude mercury, killed with a ſmall quantity of Venice-turpentine, of each equal quantities; mix them in a glaſs mortar into an ointment, or take of the amalgama of lead and tin an ounce, of bole armenic two ounces; mix theſe, and make them into an ointment, by mixing with them a ſufficient quantity of ointment of roſes, or any other ſimple ointment, in a glaſs mortar. If there be at the ſame time a caries of the bone, which is indeed too frequently the caſe, that is to be dreſſed with euphorbium, oil of cloves, phagedenic-water, or ſpirit of nitre with quickſilver diſſolved in it; or, if it can conveniently and ſafely be done, the actual cautery is of ſignal ſervice.

Sometimes, when theſe *Ulcers* fall on a ſoft part of the body, as the groin, they throw out continually ſo large a quantity of lymph, that all the medicines that can be invented or applied, are of no conſequence to ſtop it. This accident is occaſioned either by the rupture or eroſion of ſome of the lymphatic veſſels. In this caſe the ſurgeon ought to try what can be done by proper compreſſes, and a tight bandage; but when theſe, and the other milder applications are of no ſervice, the actual cautery muſt be employed, but with great care and caution to the vitiated parts.

If venereal *Ulcers* of the penis and glans are negligently or unſkilfully treated, an univerſal pox is very frequently the conſequence; the urethra will, in theſe caſes, be often perforated in various places, and the urine will be diſcharged through it, as through a ſieve; and ſometimes the whole glans, or penis itſelf, will be either totally eaten off, or ſo miſerably affected with ſchirruſes and cancers, that the ſurgeon is obliged to extirpate them with a knife. When the noſe is affected by theſe *Ulcers*, it is very frequently entirely demoliſhed by them; ſometimes the palate, with its bones, are ſo eroded and perforated, that an open communication is made between the mouth and noſtrils, and the fluid part of the aliment, in eating, is thrown out by the noſtrils. Theſe paſſages can ſcarce ever be perfectly covered again by fleſh; but when the extremities and edges of them are healed, they may be cloſed with a ſmall plate of ſilver or gold. The tonſils alſo, the external coat of the uvula, and frequently the whole uvula itſelf, are alſo deſtroyed by the virulence of theſe ulcers: And laſtly, the cranium itſelf, particularly the frontal bone, is frequently ſo eroded and perforated by a caries, that the brain lies bare, and the motion of the pulſation of the arteries may plainly be ſeen. 'Tis no wonder if the worſt of ſymptoms, and even death itſelf, follow this, if neglected, or improperly treated. *Heiſter*'s Surgery, p. 249.

ULCERS *of the Head*. See the article HEAD.

ULCERS *in the Leg*. See the article LEG.

ULEX, in botany, the name by which Linnæus calls the plants named by Tournefort and other botaniſts, *geniſta ſpartium*. *Linnæi* Gen. Plant. p. 348. See the article GENISTA *Spartium*.

ULMARIA, *Meadow-Sweet*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the roſaceous kind, conſiſting of ſeveral petals, diſpoſed in a circular form. From the cup there ariſes a piſtil, which finally becomes a fruit, compoſed of ſeveral ſmall capſules arranged together in form of a head, each of a crooked ſhape, and each containing one ſmall ſeed.

Mr. Tournefort allows no other ſpecies of this genus, beſide the common *Ulmaria*. *Tourn.* Inſt. p. 265.

ULMUS, the *Elm*, in botany, the name of a genus of trees, the characters of which are theſe: The flower is of the campaniform kind, conſiſting of one leaf, and containing a great number of ſtamina. The piſtil ariſes from the bottom of the flower, and finally becomes a membranaceous or foliaceous fruit, of a heart-like ſhape, in the center of which there is placed a pear-faſhioned capſule, which is alſo of a membranaceous ſtructure, and contains a pear-faſhioned ſeed.

The ſpecies of *Elm*, enumerated by Mr. Tournefort, are theſe: 1. The common *Elm*. 2. The broad and rough-leaved *Elm*. 3. The leſſer *Elm*, with narrow and rough leaves. And 4. The ſmooth-leaved *Elm*. *Tourn.* Inſt. p. 601. See the article ELM.

ULNA (*Cycl.*)—*Cartilages of the* ULNA. The two ſigmoide cavities, in the upper extremity of the *Ulna*, are covered by a cartilage common to both, which is a little interrupted about the middle of the edges of the cavities, by the tranſverſe notches in this part of this bone. The inferior extremity, or ſmaller head of the *Ulna*, is cruſted over by a cartilage round its cylindric border, in the notch near the ſtyloide apophyſis, and for ſome ſpace on the apophyſis itſelf. The cartilage which covers the head of the radius, is alſo ſtretched over the cylindric border thereof, and the lateral portion of the muſcular tuberoſity immediately below the neck, is alſo covered by a thin ſhining cartilage. The lateral half-grooves or channels, at the baſis of this bone, appear likewiſe to be cruſted over with a cartilaginous matter: But this may poſſibly be only from portions of the annular ligaments. *Winſlow*'s Anatomy, p. 140.

ULNARIS *Externus*, (*Cycl.*) a long muſcle, lying on the outſide of the fore-arm, fleſhy toward the os humeri, and tendinous toward the carpus.

It is fixed above to the external condyle of the os humeri, being there united to the anconæus minor, to the annular ligament of the head of the radius, and to the upper half of the external angle of the *Ulna*; from thence it advances and forms a tendon, which paſſes through the external notch, at the lower extremity of this bone, on one ſide of the ſtyloide apophyſis. The tendon, after having paſſed under a particular ligament, ſituated near the os cuneiforme of the carpus, is inſerted in the outſide of the baſis of the fourth metacarpal bone; ſending ſome tendinous filaments to the baſis of the little finger; it is likewiſe often fixed in the baſis of the third metacarpal bone. *Winſlow*'s Anatomy, p. 192.

This muſcle is alſo called *cubitalis externus*, and it is named by Cowper, *extenſor carpi ulnaris*.

ULNARIS *Gracilis*, a muſcle called by ſome, *palmaris longus*. It is a ſmall muſcle, lying between the os humeri and the carpus, on the inſide of the fore arm.

Its body is ſmall and ſlender, and its tendon very long and flat. It is fixed by its fleſhy portion in the ſmall cryſta of the inner condyle of the os humeri, ſometimes cloſely united to the *ulnaris internus*; from thence it runs down fleſhy for ſome ſpace, turning a little obliquely toward the middle of the fore-arm, and ends in a long narrow thin tendon. This tendon paſſes down the middle of the fore-arm, over all the other muſcles, to which it ſlightly adheres, and advancing over the large internal annular or tranſverſe ligament of the carpus, is inſerted in the ſurface thereof, ſending off ſome radiated filaments to the aponeuroſis palmaris. This muſcle is ſometimes fixed to the condyle of the os humeri, by a tendon about a finger's breadth in length, to which the fleſhy body joins toward the middle of the fore-arm. The inferior tendon is alſo ſometimes inſerted in the os ſcaphoides of the carpus, without communicating with the large annular ligament; and ſometimes the aponeuroſis palmaris ariſes from this ligament. From all which variations it may reaſonably be concluded, that that aponeuroſis has no eſſential dependance on this muſcle; and ſometimes this muſcle appears to be only a production from the *ulnaris internus*. *Winſlow*'s Anatomy, p. 193.

ULNARIS *Internus*, a long muſcle, fleſhy at its upper extremity, and tendinous at the other, ſituated on the outer part of the *Ulna*. It is fixed in its upper part, in the backſide of the long or internal condyle of the os humeri, in that part of the olecranium which is next the condyle, along the upper half of the *Ulna* very nearly, and to the middle common tendon of the neighbouring muſcle, commonly termed the *profundus*. It runs in the direction of the external angle of the *Ulna*, and ends by a long tendon in the os piſiforme, or orbiculare of the carpus, reaching likewiſe to the os unciforme, being united to the ligament common to theſe two bones. *Winſlow*'s Anatomy, p. 191.

This muſcle is alſo called *cubitalis internus*, and is named *flexor cubiti ulnaris* by Cowper.

ULOPHONUS, in botany, a name given by the antients to a poiſonous plant, ſince called the *chamæleon thiſtle*, and even at that time known to Dioſcorides, Galen, and others, under the name of the *black chamæleon thiſtle*. The white plant of the ſame name, or the *ixias chamæleon*, ſo called from its yielding a gum like maſtic, but of a viſcous texture while moiſt and freſh, was an eſculent plant.

The antients have taken great care, in all their writings, to expreſs which of the two chamæleon thiſtles they mean, when they uſe the word; but the giving it an abſolutely diſtinct name, or preſerving to it the name chamæleon, and giving to the black kind an appellation wholly different, ſuch as this of *Ulophonus*, mentioned by Pliny, ſeems much better than the diſtinguiſhing them by epithets, which we find, however well underſtood at the time when they were uſed, never proved ſufficient to prevent errors and confuſion in after-writers. See the article IXIAS.

ULPHA, a term uſed by ſome authors to expreſs the muddy ſubſtance which falls off from whetſtones, grindſtones, and the like, which is ſometimes ordered in medicines among the chemical

chemical writers, and is only the communicated particles of the stone, with a very small portion of iron abraded from the things ground on them.

ULPICUM, in botany, a name by which Columella, and some other authors have called the *allium*, or garlick. *Ger.* Emac. Ind. 2.

ULRACH, a name given by some writers to the *sanguis draconis*, or dragon's blood.

ULVA, a name given by some botanical authors to a genus of imperfect plants, consisting of the common oyster-green, the sea-chitterling, and the like, which have been since called by Dillenius, *tremellæ*. See the article TREMELLÆ.

The word *Ulva* is frequent in Latin authors; but its signification has been much controverted. Some have been of opinion that it expressed the Cyprus grasses, others the cat's-tail, and others other particular plants; but it rather seems that the antients used it as a word expressive of all plants that grew by river or water-sides; Pliny, having called the sagitta, or water-arrow-head, one of the *Ulvæ*; and others, having expressed the bur-reed, rushes, and many of the common water plants, very different from one another, by the same name. Bauhine makes the *Ulva* a purple sea-moss allied to the alga. *Dillen.* Hist. Musc. p. 4.

It is supposed by some, that *Ulva* is a name used by the antients for the hop; but it happens only in one author, that is, Cato[a], and there is certainly owing to an error of the press, not to any intention of the author. He mentions the hop as a plant climbing upon the willows, and by its branches affording a good sort of litter for cattle; and this by the name of *Ulva*; but as the word appears in no other author, it is reasonable to suppose, that it is an error of the copists for *upulus*, which was the old name for the hop, the adding of the initial L being only of later times. Pliny, in the same manner, calls the hop *lupus*, by a like error of the transcriber.—[a *Cato* de Re Rust. c. 38.]

ULULA, in zoology, the name of the grey owl, called also *strix cinerea*. It is a very light bird for its size, being very thick covered with feathers, and has a ridged circle of feathers, composed of two rows, round its face. And there is, within this, another greyish circle, composed of slenderer and more distant plumes, which surround the eyes. It is of a mottled colour, mixed of a grey and brown, and is feathered nearly to the feet. It has also several long black streaks on the breast, and the inner circle of the face is variegated with no other colours than brown and white. *Ray's* Ornithol. p. 66.

UMBER (*Cycl.*)—UMBER, or OMBER, in zoology, an English name for a fish of the truttaceous kind, more commonly called the *greyling*, and by the authors in ichthyography, *thymallus*, a fresh-water fish of a very fine taste. *Willughby's* Hist. Pisc. p. 187. See the article THYMALLUS.

UMBER, in natural history, an earth of the ochre kind, used in painting. It is found in Ægypt, Italy, Spain, and Germany; but what we have brought into England is principally from different parts of the Turkish dominions. But it might be found in considerable plenty also in England and Ireland, if properly looked after, several large masses of it having been thrown up in digging on Mendip-hills in Somersetshire, and in the county of Wexford in Ireland.

The characters by which it is known from other earths, are these: It never constitutes a stratum of itself, as the generality of other earths do, but is found sometimes in small lumps among gravel, and other loose matter, and sometimes in the perpendicular fissures of the solid strata. It is of a close compact texture, yet very light, of a smooth surface, and of an elegant pale brown, in different degrees. It is smooth and soft to the touch, and adheres firmly to the tongue, breaks easily between the fingers, and stains at all stains the hands, and makes no fermentation with acids. *Hill's* Hist. of Fossils, p. 63.

UMBILICAL (*Cycl.*)—UMBILICAL *Vein*. Dr. Trew asserts contrary to Casserius, that the *umbilical* vein enters the liver towards the left part of it; and that there is but one *umbilical* vein, which empties itself into the left extremity of the *sinus venæ portarum*, and sends no branches to the liver. See Phil. Trans. N°. 457. Sect. 7.

Dr. Trew endeavours to shew how, after birth, the *umbilical* veins and arteries, separating from the navel, gradually retract within their sheaths, which they have from the peritoneum; and leave the sides of the sheath to grow together, as the sides of the remains of the vessels also do. Hence he infers, that the hæmorrhages, which sometimes happen at the navels of adults, must not be from the *umbilical* vessels, but from some other. Commerc. Norimb. 1737. Hebd. 13 §. 1.

UMBILICUS *Marinus*, a name given to a small oval body of a shelly matter, from its resemblance to the human navel. It is properly the operculum of a shell-fish, serving to close up the aperture of the shell in the buccinum, and other turbinated shells; and to that purpose it is fixed to the anterior extremity of the body of the animal; so that when it retracts its body into the shell, this naturally fills up the mouth of it: it is convex on one side, and flat on the other; the convex side is plain and white; the flat side is yellowish or reddish, and marked with a spiral line.

It is said by authors to have great virtues as an absorbent and astringent; but is not used at present in the shops, though it holds a place in the catalogues of the materia medica, as well of our own as other nations. *Pitisc.*

UMBINUS, among the antients, a kind of coin current in Gallia Narbonensis.

UMBLA, or, as some write it, UMBRA, in zoology, the name of a fish of the truttaceous kind, and nearly allied to the salmon. There are four species of this fish mentioned among naturalists; but the *Umbla prior* and *Umbla altera* of Rondeletius, which are two of them, seem only to be the different sexes of the same fish. These are considerably large, very like the common salmon, but have blue backs and yellow bellies. The third is the fish commonly called the *salvelin*. See the article SALVELIN. And the fourth is the red charre. *Willughby's* Hist. Pisc p. 198. See the article CHARRE.

UMBO, in antiquity, the round protuberant part of a shield. See the article SHIELD, *Cycl.*

UMBRA (*Cycl.*)—UMBRA, in ichthyography, the name of a sea-fish caught in the Mediterranean, and brought to the markets in Italy and other places; called by some *chromis*, and by the Venetians *corvo*.

Its usual size at market is about twelve or fourteen inches in length; but it grows to sixty pound weight, and to the length of five or six feet. It is of a somewhat flatted figure, and its back is ridged, and rises up from the head. It something resembles the carp in its general figure, but is broader. It is very elegantly coloured, for there are a number of long oblique lines covering its whole sides, which are alternately of a fine pale blue, and a beautiful yellow. Its scales are moderately large, and its coverings of the gills, and great part of its very head, as well as its body, are covered with these. Its head is moderately large, but its mouth small, and it has a single beard hanging down from its chin. *Rondelet.* de Pisc. p. 182.

UMBRATILIS *Pugna*, the fighting with ones own shadow. This was one of the kinds of exercise much recommended by the antient physicians; they ordered the persons who used it, not only to box, but wrestle, with his shadow; that is, not only to use his arms, but his legs also; and often to put themselves into a leaping posture, and throw their bodies violently forward, and often to retreat hastily backwards. The custom seems to have been of antient date; Plato expresly mentions it; and St. Paul seems to allude to it in that passage where, glorying in the reality of his conflicts, he says, he does not fight as one who beats the air. The physicians greatly recommended this exercise to people of sedentary lives, and to those who had weak nerves, and were afflicted with tremors. They esteemed it useful also in diseases of the kidneys, and of the thorax.

UMBRINO, in zoology, a name used by some authors for the *coracinus*, or *umbra*, as some call it. The *Umbrino* has by some been esteemed a distinct species of fish from the coracinus; but they seem to differ no other way than as the one is the older, the other the younger fish. *Willughby's* Hist. Pisc. p. 330.

UMBUNCULUS, in natural history, a name given by antient authors to the small prominences in the surface of certain stones. It was originally derived from the word *umbo*, which expresses the prominent knob, or round lump in the center of a shield; and its first use that we find in the naturalists, is, in expressing a very similar thing; that is, the prominent part of the zmilampis. This was a stone of the nature of what we call *oculus beli*, or *bellocchio*, and was of a white ground, and roundish figure, somewhat resembling an eye. It was found in the Euphrates, and other rivers, and had always an *Umbunculus* of a glaucous or bluish colour. This *Umbunculus* was a prominent round spot, such as we see in our *oculi beli*, and and call the *pupil*. It was afterwards used to express the inequalities on the surfaces of flints and agates, which frequently are roundish and obtuse, and represent a kind of umbones.

UMPLE, in our statutes, signifies fine linnen. 3 Ed. 4. c. 5. *Blount.*

UNANNEALED *Bottles*, or BOLOGNA *Bottles*, a kind of *unannealed* glass bottles made at Bologna, and many other places, in the year 1742, which, though appearing very strong, yet are to be broken by a fragment of flint, scarce larger than a grain of sand, thrown into them. Acta Eruditor. 1745. p. 81. See the article *Unannealed* GLASS.

UNAROTA, among the antients, a carriage with only one wheel. *Pitisc.* in voc.

UNCATA, in botany, a name given by some authors to the stramonium or thorn-apple. *Ger.* Emac. Ind. 2.

UNCEASESATH, in our old writers, an obsolete word, used where one killed a thief, and made oath that he did it as he was flying for the fact, and thereupon *parentibus ipsius occisi juret* unceasath, *viz.* that his kindred would not revenge his death; or they swore, that there should be no contention about it. Leg. Ino. c. 37. *Blount.*

Du Cange derives the word from the negative particle *un*, and the Saxon *ceath*; which last signifies the same with *assithment* in the law of Scotland See the article ASSITHMENT.

UNCERTAIN, in the manege. We call a horse *uncertain*, that is naturally restless and turbulent; and is confounded in the manege he is put to; so that he works with trouble and uncertainty.

UNCIFORME *Os*, in the carpus, is the fourth bone in the fecond row; it has its name from the Latin *uncus*, a hook, and is compofed of a body, and a hooked or uniform apophyfis. This apophyfis, which is one of the four eminences on the concave or inner furface of the carpus, is flat, and the hollow fide of its curvature is turned toward the os magnum. The outer furface of its body is rough, and in fome meafure triangular; it compleats the convex fide of the carpus, and, toward the ulna, terminates in a fmall tuberofity, which is all the cubical fide of this bone.

It has three articular or cartilaginous fides, one radial, one brachial, and one digital. The radial fide is double, anfwering to the cubital fide of the os magnum. The brachial fide is very oblique, fome part of it being gently concave, the reft gently convex, anfwering to the digital fide of the os cuneiforme. The digital fide is double, or diftinguifhed into two halves, by a figmoide angular line, for its articulation with the two laft bones of the metacarpus. *Winflow*'s Anatomy, p. 84.

UNCINUS, in furgery, the name of a fmall hooked inftrument ferving to many purpofes.

UNCTUARIUM, a room in the antient baths, where people were anointed before they went away.

UNCTORES, among the Romans, fervants whofe employment it was to anoint their mafter when he bathed. *Pitifc.* Lex. Antiq. in voc.

UNCUS, among the Romans, an inftrument ufed in torturing criminals. It was a kind of club bent and inclined to one fide. *Pitifc.* Lex. Antiq. in voc.

UNDE *Nihil Habet*, a writ of dower. *Blount, Cowel.* See the article DOTE *Unde nihil habet*.

UNDERWOOD, (*Cycl.*)—In the cutting the *Underwood* of coppices, when the ftubs are great, they fhould be ftubbed up, for they only take up a great deal of room, and fend up few fhoots, their cracks and holes letting in water, and ufually half killing them. The taking up thefe fhould be performed in winter, and the fpaces they leave will be foon occupied by young trees, if not, a long branch of fome neighbouring tree may be laid down, and will foon fend up a fufficient fupply of fuckers for the place.

In felling the *Underwood*, it is always proper to leave young trees enough. The worft of thefe may be taken down the next fall, efpecially if any of them grow near a great tree that will be fit to fell the next feafon, becaufe they may be fpoiled by its fall. When trees are at their full growth, there are feveral figns of their decay, as the withering or drying of their top branches; their taking in water at fome of their knots, their being hollow or difcoloured, and their making but fmall fhoots. If wood-peckers make holes in the body, it is a bad fign, and according to the appearance of one or more of thefe fymptoms, it is very proper to cut down the tree before it decays farther. Large and fpreading trees in coppices are often of more mifchief than advantage, as they fpoil a great deal of the *Underwood* by their droppings.

The owner of a coppice muft be very careful when he fells the wood ftanding, by the acre, to mark beforehand what ftandards are to be left, elfe the purchafer feldom fails to cheat him, by felling fome of them. *Mortimer*'s Hufbandry, vol. 2. p. 69.

UNDETERMINED, in mathematics, is fometimes ufed for indeterminate. *Maclaur.* Algeb. p. 298. See the article INDETERMINATE, *Cycl.*

UNDIMIA, in furgery, the name of a kind of an œdematous tumour, the matter contained in which is glutinous and ropy, like the white of an egg.

UNDULAGO, in natural hiftory, a name given by Mr. Lhuyd to a fpecies of fungites found foffile, and ufually of a fort of undulated figure. See the article FUNGITES.

UNDULATED *Leaf*, among botanifts. See the article LEAF.

UNDULATION, (*Cycl.*) in medicine, the term ufed by fome to exprefs an uneafy fenfation in the heart, of an undulatory motion, which may fometimes be perceived externally.

UNDULATION is alfo a word ufed by fome authors to exprefs the rifing of the water of the furface of the fea into waves. See the article WAVE.

UNDY, in heraldry. See the article WAVED, *Cycl.* and *Suppl.*

UNEDO, in natural hiftory, a name ufed by the antients for a fruit which they recommend as cooling and fub-aftringent. The generality of the world are lead into a common error of believing this to be the fruit of the arbutus or ftrawberry-tree. Pliny has given occafion to this error, by faying exprefsly that the *Unedo* is the fruit of the arbutus; but we find this to be contrary to the practice of all the antient Latin writers, who have always called the fruit by the fame name with the tree, not by a different one. Varro de re Ruftica, fpeaking of gathering the autumn fruits, calls them all by the name of the trees; and among them, mentioning the fruit of the arbutus, he expreffes it in the fame manner, not by the word *Unedo*, *decerpendo arbutum mora pomaque*: And both Galen and Paulus Ægineta deny the *Unedo* to be the name of the fruit of the arbutus or ftrawberry-tree, and make it the fruit of the epimelis. Servius explains the word *Unedo* by the fruit of the ftrawberry-tree; but in this he too rafhly follows Pliny's opinion, and plainly errs from the truth. See the article EPIMELIS.

UNGUENT (*Cycl.*)—UNGUENTUM *Album*, the white ointment, a medicinal preparation, well known by name, and much ufed in families.

The late London difpenfatory has made very great alterations in it, and indeed given a new ointment under this name; it is there ordered to be made thus: Take oil-olive a pint, white wax four ounces, fperma ceti three ounces, melt all together with a gentle heat, and ftir them very brifkly without ceafing, till they are fully cold.

The ointment, formerly known by this name, had cerufs, or white lead, for its principal ingredient; but as this is principally intended for frettings of the fkin, that ingredient was judged dangerous. *Pemberton*'s Lond. Difp. p. 363.

UNGUENTUM *Bafilicum Viride*, a form of medicine prefcribed in the late London pharmacopœia. It is ordered to be made thus: Take of yellow bafilicon eight ounces, oil of olives three ounces, verdegreafe in fine powder one ounce, mix the whole into an ointment. *Pemberton*'s London Difp p. 366.

UNGUENTUM *Nardinum*. See the article NARDINUM *Unguentum*.

UNGUENTUM *e Pice*, *Tar Ointment*, a form of medicine prefcribed in the late London Pharmacopœia, and ordered to be made in the following manner: Take of tar, and of tried mutton-fewet, each equal quantities, melt them together, and and ftrain the whole while it is hot. *Pemberton*'s Lond. Difp. p. 368.

UNGUENTUM *Saturninum*, a form of medicine prefcribed in the late London Pharmacopœia, and ordered to be made in this manner: Take of oil-olive half a pint, white wax an ounce and half, fugar of lead, firft brought to a very fubtile powd r, with fome part of the oil; then add this to the reft of the oil, with the wax melted in it, and ftir the whole till it is cold. *Pemberton*'s Lond. Difp. p. 369.

UNGUENTUM *Simplex*, a name given in the London Difpenfatory, to the compofition commonly called *pomatum*; the manner of making which, is according to the method now univerfally practifed, delivered there in the following manner: Take of tried hogs-lard two pounds, of rofe-water three ounces; pound the lard with the rofe-water, till they are well mixed; then melt the lard with a very gentle fire, and fet it by awhile, that the water may fubfide, afterwards pour out the lard, and leave the water; then ftir and beat the lard without ceafing, while it is growing cold, that it may be broke into as light and yielding a mafs as may be; and then add as much effence of lemons as will give it an agreeable fcent. *Pemberton*'s London Difp. p. 362.

UNGUENTUM *e Sulphure*, *Sulphur-Ointment*. Take of fimple ointment half a pound, of flower of fulphur unwafhed two ounces, effence of lemons a fcruple. This is the preparation ordered in the late London Difpenfatory, and expected to be kept ready mixed in the fhops. *Pemberton*'s London Difp. p. 370.

UNGUENTUM *Veficatorium*, *Bliftering Ointment*, a form of medicine prefcribed in the late London Pharmacopœia, and no other than bliftering plafter in a fofter form. It is made by equal quantities of hogs-lard and blifter-plafter, with a very gentle heat, ftirring them till they are cold. *Pemberton*'s Lond. Difp. p. 371.

UNGUENTUM *Viride*, the *Green Ointment*, a form of medicine prefcribed in the late London Pharmacopœia, and ordered to be made by melting ten ounces of yellow wax in three pounds of the *oleum viride*, or green-oil, of the fame pharmacopœia. *Pemberton*'s Lond. Difp. p. 371.

UNGUICULI, in botany, is ufed for the ends of the petals of rofes, or other flowers, where they adhere to the plant.

UNGUIN, in botany, a name given by the people of Guinea to a plant, of which they are very fond, for its medicinal virtues: They boil it in water, and give the decoction in large draughts for pains in the back. The leaves of this plant grow alternately on pedicles of an inch long, and have the exact fhape and fize of thofe of the common bay-tree; but they have neither its tafte nor fmell, nor any thing approaching to either. Phil. Tranf. N°. 232.

UNGUIS (*Cycl.*)—The nails both of the fingers and toes are fubject to very great diftemperatures in their growth. We have, in the Philofophical Tranfactions, an account of a young fellow, whofe finger ends were, as it were, armed with horns inftead of nails; they grew to a very amazing length, but then would wear away, or drop off at the ends. The horny excrefcence on the thumb was the longeft on each hand, and next to it was that of the middle finger, the reft being gradually fhorter; his feet were well armed with the fame fort of weapons, only that the two little toes had none of them.

Thefe horns feemed to owe their origin to a thickening of the body of the nails, which, inftead of growing out in length in the common way, elevated themfelves in height from the back; and when they had rifen to a certain height in this direction, they turned downward, and became crooked, fo as to reprefent a bird's claw, only that it was not taper and fharp, but all of the fame thicknefs, and blunt at the end. The upper or convex part of each was marked with a great many chaps, but the concave or under part was fmooth. The

The lad had no fenfe in thofe parts of the horns which were at a diftance from his fingers; but they might be cut or pulled any way, without giving him pain; when they were moved near the roots, where they joined the finger, the pain was very great. The back of his hand was full of horny fubftances, of a like texture with thefe, but not elevated above the fkin; they had the appearance of broad and flat warts, but were much larger and harder. The difeafe feized the lad after the fmall-pox. The common length of thefe horns on his fingers was between three and five inches. Phil. Tranf. N°. 229.

UNGUIS *Odoratus*, in the materia medica, a thin flat teftaceous fubftance, of an oval or oblong figure; rounded at both ends, and marked on the furface with three or four concentric circles, or oval lines. Its colour is a dufky brown, with fome admixture of the orange, fometimes of a purplifh tinge. Its ufual fize is that of a full grown nail of a man's thumb; and its thicknefs rather lefs than that of the nail. It is tough, flexile, and elaftic; and has no peculiar fmell or tafte.

The want of fmell might feem to argue this to be a different fubftance from the *Unguis odoratus* of the antients; but the truth is, that theirs owed all its fweet flavour to its being brought over among aromatic drugs.

There were two kinds of it, the largeft of which they had from the red-fea, and the other from Babylon; and both were the opercula of two fpecies of murex-fhells. See the article MUREX.

Diofcorides tells us that this *Unguis* was the operculum or poma of the fhell, which ftopped the mouth at pleafure, and from under which the creature thruft out its tongue to feed; and he adds, that the fhell-fifh to which it belonged was taken in the marfhes of India, when the waters were dried away; and that the Indian fpikenard growing in great abundance in thefe marfhes, the creature became fweet-fcented in every part, by feeding on it. But in the latter part of his account he feems to forget the beginning; for he concludes with telling us, that there were only two kinds brought into Greece in his time, the one from the Red Sea, the other from Babylon.

The truth is, that fpikenard grows neither in the Red Sea, nor any where about Babylon, but only in India beyond the Ganges, or about its banks. The fpikenard alfo does not grow in the water, but only in marfhy places, and therefore can never be in the way of feeding fhell-fifh. Nay, this very author, in his defcription of the fpikenard, tells us, that it grows on mountains, and that the fpikenard which grows in wet places, is another kind, and not the fine aromatic fpikenard fo valued in the fhops; even the laft kind, however, could not ferve for the feeding the fifh neither; for he fays, that it grows in wet or moift grounds, but not in the water.

From this, and fome other fuch paffages, it appears that Diofcorides was an author too much of Pliny's ftamp, and collected his accounts of things from different authors, and that without a fufficient knowledge of the fubject; fo that he often contradicts himfelf. As to the Indian fpikenard, Garcias tells us, that it is not produced wild, but is a cultivated plant, raifed by fowing the feeds in gardens, not under water. Avifenna feems to have feen this abfurdity in Diofcorides, about the fhell-fifh feeding under water on the fpikenard, and though he tranflates the account of his *Unguis odoratus*, or *adfer althaib*, *verbatim* from Diofcorides in other parts, yet he here alters the fenfe, and fays, that the fhell-fifh was found in an ifland in the Indies, on which ifland the fpikenard alfo grew in great abundance.

This, however, is but avoiding one error by another; for though, by this, he gets over the abfurdity of the fpikenard's growing under water; yet he falls into a much worfe, which is, of the fhell-fifh to which the *Unguis odoratus* belongs, being found on dry land.

It is very certain that no fhell-fifh, living in the water, can fubfift, without fome means of clofing up its cavity, fo as to keep out the water at pleafure; this is done in the bivalve kinds, by clofing the two valves; but in the ftromboide ones, by drawing down this operculum, which is the *Unguis odoratus*, to the mouth of the fhell. A land-fhell therefore can have no occafion for fuch a part as the poma or operculum, and no fuch drug as the *Unguis odoratus* can be found about it. But it is to be obferved, that Avifenna did not know that the *Unguis odoratus* was a covering or operculum of the mouth of a fhell, but thought that it was only a fragment cut or broken indeterminately from any part of the fhell. This therefore might appear no abfurdity to him, and the thin and flat *Ungues* he faw might appear fragments artificially cut from fome of the thin-fhelled kind of land fnails.

UNGUIS *Offa*, in anatomy, are two bones which help to compleat the internal fides of the orbit of the eye, to cover the fore-part of the labyrinth of the nofe, and form the lachrymal duct.

They have their name from the Latin *Unguis*, a nail of the hand, and are alfo, by fome authors, from their office in forming the lachrymal duct, called *offa lachrymalia*.

They are each fituated in the orbit of the lower part of the internal angle; they are the leaft bones of the face, and are very thin and tranfparent. They are in fhape fomewhat longer than broad, and not unaptly refemble the figure of the finger nails, efpecially while in their natural places; for, being taken out of the fhell, their figure becomes fomewhat more irregular. Each of them is divided, by anatomifts, into two fides, the one external, the greateft part of which appears in the orbit in an entire fkull; the other internal, which is hid; two extremities, the one upper, the other lower; and two edges, one anterior, the other pofterior. The outfide is fmooth, and a little concave; toward the anterior edge is a groove full of fmall holes like a fieve, called the lachrymal groove. It begins at the upper extremity, and runs down lower on this fide than any other part of the bone, the lower extremity of it being hid by the os maxillare. It is diftinguifhed from the reft of the outfide by a very fharp prominent edge. The infide is rough and unequally convex, with a perpendicular depreffion anfwering to the fharp prominence on the outfide. On the upper part of this infide, fmall portions of cellulous laminæ are fometimes obfervable, which communicate with the entry of the frontal finus; and there are likewife fome about the middle, which compleat the anterior ethmoidal cells; and others toward the lower end, which communicate with the rugged portions of the upper border of the finus maxillaris: thefe, however, often vary, and are fometimes wanting.

Thefe bones are altogether without diploe; they are connected with the os frontis, and with the os ethmoides, covering a part of the cells in that bone, with the nafal apophyfes of the os maxillare, and with the groove of that bone in fuch a manner, that the two grooves, joined together, form an entire tube, called the lachrymal duct; they alfo cover a little the opening of the maxillary finufes, and join the inferior conchæ of the nares, of which they appear to be only a continuation in advanced age. *Winflow*'s Anatomy, p. 36.

UNGUIS *of a Flower*, among botanifts. See the article PETAL.

UNGUIS, in natural hiftory, a name given by authors to a genus of fhells, called more ufually *folenes*. See the article SOLEN.

UNGULA *Oculi*, the name given by fome to a difeafe of the eye, called by others *pterygion*.

UNGULUS, in antiquity, a remarkable kind of bracelet. *Hofm.* in voc. See the article BRACELET.

UNHALTER, in the manege. A horfe is faid to *unhalter* himfelf, that turns off his halter. See the article HALTER.

UNICORN (*Cycl.*)—*Sea* UNICORN, in natural hiftory, the name of a fifh of the whale kind, remarkable for having a horn growing out at its nofe, in the manner of the fuppofed *Unicorn*'s horn, as defcribed by many too credulous authors.

This fifh feeds on flefh, or other fifh, and is not only found in the main fea, but fometimes gets up into large rivers. In the year 1636 there was a large one caught in the river Ofte, near its difcharging itfelf into the Elbe, in the duchy of Bremen; this place is four German miles from the fea. The fkin of this fifh was fpotted with dark brown fpots upon a white ground, the epidermis was tranfparent, and under it was another fkin very thin and fpotted; but the true fkin was brown, and near an inch in thicknefs. On the top of the head there is only a femilunar hole, as in the porpoifes; this hole opens into the two channels, which run through the fkull to the palate, and are called the ductus hydrogogi. The people who examined this creature, were not able to find any aperture in the body for the difcharge of the excrements; whence it has been generally believed, that the creature voids them through this paffage in the head.

Authors have differed in the name of the procefs iffuing from the head, fome calling it a horn, others a tooth; fome are of opinion that it ferves it to break the ice with for air; but others pretend that it is an offenfive weapon, with which it wounds the common whale, and other large fifh; and that when it has plunged it up to the head in the whale's body, it fucks the juices of that animal. See Tab. of Fifhes, N°. 1.

The fifh was near twenty foot long, and about four foot in diameter. The horn ftood on the fore-part of the head, juft above the mouth, and was fix foot long, white like ivory, and curioufly wreathed or twifted. The body was fmooth and flippery, like that of an eel; the head, in proportion to the body, was fmall, not exceeding fixteen inches in length; the eyes not larger than a fix-pence. It had, on each fide of the neck, two black fins, one above, another at a fmall diftance; thefe were two foot long, of the breadth of a hand, and about half an inch in thicknefs. Phil. Tranf. N°. 447. p. 149.

Unicorn's horn has been fo common in the Danifh and neighbouring feas, that there was a magnificent throne built only of them in that kingdom; the horns are from ten to fifteen foot in length, and are all white, and furrowed with a fpiral line. They are the horns of that kind of whale called *narwal*, or the fea-*Unicorn*. *Brown*'s Travels.

Unicorn's horn has the fame medicinal virtues with hart's-horn and ivory; but at prefent is only kept as an ornament to druggift's fhops.

Sea-UNICORN is alfo a name given to two forts of fmall fifhes caught in the American feas, and known among authors under the name of *monoceros pifcis*. See the article MONOCEROS.

UNICORNU *Foffile*, *Foffile Unicorn's Horn*, the name of a fubftance much ufed in medicine in fome parts of the world, but which feems to have been very little underftood by many who have written of it. Dr. Hill, from the examination of the

ſeveral varieties of ſhapes it is found in, and trying it by the ſeveral teſts which fix the criterions of foſſils, has determined it to be no other than a terrene cruſtaceous ſpar, not very different from the oſteocolla, and other bodies of that genus, which he has called the *cibdeloplacia*; and has diſtinguiſhed this peculiar ſpecies by the name *cibdeloplacium albido-ſubcineteum, friabile ſuperficie lævi*, or the whitiſh-grey friable cruſtaceous ſpar, with a ſmooth ſurface.

It differs principally from the oſteocolla in its ſoftneſs and the ſmoothneſs of its ſurface; but from its having, like many other of the cruſtaceous terrene ſpars, the property of encruſting, and ſometimes even permeating the pores of bodies, and in a manner petrifying them, it has obtained the names of the things it thus lodges itſelf in and about, which being uſually bone, and ſome of them bones of an extraordinary ſize and figure, have been taken for the bones and horns of *Unicorns*; and the name and nature of the body itſelf wholly loſt and neglected, and that of the horn, with that of its imaginary animal, only preſerved.

They are, however, now ſenſible in Germany, that it is not the horn, but this ſubſtance which is lodged about it, which is the medicine; for they never uſe the foſſile bones, which are petrified in the common way, but only ſuch as are impregnated with this ſparry ſubſtance; and even uſe all ſubſtances whatever, which are impregnated with this, whether bones or wood, under the ſame name, calling the natural tubular pieces of it, which are very common, and alſo the pieces of branches of tree impregnated with it, by the common name of *Unicorn's horn*, while they allow plain bones, petrified in the common way, no ſuch name. So that the word is now become a mere technical term, and ſignifies either this ſpar in its pure ſtate, or any ſubſtance whatever which is impregnated with it.

It is a lax and ſpongy terrene ſpar, and is naturally of a regular form, in ſome degree like that of the oſteocolla, being always found, where it has concreted pure and not been in the way of any extraneous ſubſtance, an oblong and moderately thick cylindric tubular body, frequently narrower at one end than the other, and approaching to a conic form. Uſually its hollow is empty, but ſometimes it is found filled up with a ſubſtance of the ſame nature with itſelf, only compoſed of a larger proportion of earth with leſs ſpar, and therefore more crumbly and ſoft. Theſe are found of various ſizes, from an inch to three feet long. The larger ſpecimens are moſt frequent. And it is very probable, that the ignorance of the firſt ages, which brought it into uſe in medicine, might take theſe natural concretions for *Unicorns horns*.

It is found in other parts of the world beſide Germany, and is in great eſteem in many places as a ſudorific and aſtringent; and is given in fevers, attended with diarrhœas, with great ſucceſs. *Hill's* Hiſt. of Foſſ. p. 361.

UNIFORM (*Cycl.*)—UNIFORM *Matter*, in natural philoſophy, that which is all of the ſame kind and texture.

UNILOCULAR *Capſule*, among botaniſts. See the article CAPSULE.

UNISETA, in natural hiſtory, the name of a ſpecies of fly, found frequently ſitting on the ammi or biſhops-weed, and inguiſhed by having one long hair or briſtle growing out at its tail. See the article HENOTHRIX.

UNITE, in the manege. A horſe is ſaid to *unite*, or walk in union, when, in galloping, the hind quarters follow and keep time with the fore. See the article SINEW.

UNITY (*Cycl.*)—It is to be obſerved in algebra, that *Unity* itſelf has three different expreſſions of its cube root, one real, and the other two impoſſible or imaginary. Thus the three cube roots of 1, are 1, $\frac{-1+\sqrt{-3}}{2}$ and $\frac{-1-\sqrt{-3}}{2}$.

This is ſometimes of uſe in finding the cube roots of quantities, appearing under impoſſible expreſſions. See *Maclaurin's* Algebra, p. 128. ſeq.

The two impoſſible expreſſions of $\sqrt[3]{1}$ may be thus found: Let $x=1$ then $x^3=1$ or $x^3-1=0$ and $x-1=0$. Divide x^3-1 by $x-1$ the quotient is $xx+x+1=0$. Or $xx+x=-1$ reſolve this quadratic equation, by adding $\frac{1}{4}$ to both ſides. Then $xx+x+\frac{1}{4}=-\frac{3}{4}$, and extracting the ſquare root, $x+\frac{1}{2}=\sqrt{-\frac{3}{4}}=\frac{\sqrt{-3}}{2}$. Therefore $x=-\frac{1}{2}\pm\sqrt{-\frac{3}{4}}=\frac{-1\pm\sqrt{-3}}{2}$. That is, $x=\frac{-1+\sqrt{-3}}{2}$ and $x=\frac{-1-\sqrt{-3}}{2}$. See *Maclaurin*, lib. cit. p. 226.

UNIVALVE *Shells*, in natural hiſtory, a term uſed to expreſs one of the three general claſſes of ſhell-fiſh; the other two are the bivalves and multivalves. The *univalve* ſhells are thoſe which conſiſt only of one piece, not of two or more joined together. Of theſe *univalve* ſhells, nature affords a very great variety; ſo that they are aptly diſtributed by a late French author into fifteen diſtinct genera. Theſe are, 1. The *patellæ*, or limpets. 2. The *patellæ planæ*, called alſo *auris marina*, the ear-ſhell. 3. The *canales*, or *tubuli marini*, the ſea-tubes. 4. The lunar cochleæ, or round-mouthed ſnails. 5. The *cochleæ ſemilunares*, or ſnails with ſemicircular mouths. 6. The *cochleæ ore depreſſo*, or flat-mouthed ſnails. 7. The *naviculæ* or boat-ſhells, commonly called *nautili* or *nautilus*. 8. The *buccina*, or trumpet-ſhells. 9. The *turbines*. 10. The *volutæ*. 11. The *rhombi*. 12. The *murices*. 13. The *purpuræ*. 14. The *conchæ globoſæ*. And 15. The *porcellanæ*, each of which ſee under its proper head, PATELLA, AURIS *Marina*, &c. Hiſt. Nat. Eclairc. part 2. p. 235.

UNIVERSAL (*Cycl.*)—UNIVERSAL *Equinoctial Dial*. See the article RING-*Dial*, *Cycl*.

UNIVERSAL *Problem*. See the article INDETERMINED *Problem*, *Cycl*.

UN POCO, in the Italian muſic, is often put before the terms *allegro*, *adagio*, *preſto*, *piano*, &c. Where it ſhews that the movement, with their direction, is ſomething leſs than it would otherwiſe have been, had this word been omitted. Thus *allegro* ſhews that the movement is to be made in a briſk and gay manner; and *Un poco allegro* the ſame, only in an inferior degree, and ſo of the reſt.

But if *piu* is put between *Un poco*, and the above-mentioned terms, then their uſual ſignification is a little increaſed, as *Un poco piu allegro* ſignifies a little more briſkly than *allegro* alone requires. The contrary of this happens if, inſtead of *piu*, the word *men*, or *meno*, be uſed, as *Un poco meno allegro*, i. e. a little leſs gayly than if *allegro* were alone. See the articles ALLEGRO, ADAGIO, PRESTO, &c.

VOARCHADUMIA, a kind of cabala, or ænigmatic art, relative to metals, which propoſes the exultation of gold by cementations, and other methods; among which charms made of the Hebrew letters have their place.

VOCA, in ichthyology, a name given by Gaza, and ſome other writers, to the fiſh called *boops* by the generality of writers. It is a ſpecies of the ſpari, and is diſtinguiſhed from the reſt by having four longitudinal parallel lines, of a bright yellow and white colour, reſembling gold and ſilver on its ſides. See the article SPARUS.

VOCATORES, among the Romans, were ſervants whoſe buſineſs it was to call the gueſts, receive them, and aſſign every one a place according to his dignity. *Pitiſc.* in voc.

VOCE *Sola*, in the Italian muſic, denotes a piece compoſed for a ſingle voice, generally accompanied with a thorough baſs on the harpſichord or organ, without other inſtruments. But if beſides that it is to be accompanied by other inſtruments, they add, *con violini*, with violins; *due violini*, *e violoncello*, *e baſſo per l'organo*, i. e. with two violins, a baſs violin, and a thorough baſs on the organ; *con violini o ſtromenti*, i. e. with violins, or inſtruments; *parti*, *con parti ſenza violini*, i. e. part with, part without violins, &c.

VIOLATICA, in medicine, a name given by authors to a ſort of wandering pain, attended with a tumor, and affecting, at different times, different parts of the body; it is by ſome accounted a ſpecies of the ſcurvy; by others, of the leproſy.

VOLATILE *Salts*. It is the opinion of many of the greateſt chemiſts, that our diſtinction of ſalts into fixed and *volatile*, is far from juſt, for that there are in nature no ſuch thing as fixed ſalts.

Tartar is generally allowed to contain as much fixed ſalt as any thing, yet this ſubſtance, treated by fermentation, in Langelot's method, yields all in *volatile* ſalt that it would otherwiſe have yielded in fixed, and leaves ſcarce any fixt at all. The ſame proceſs will have the ſame effect on the ſuppoſed fixed ſalts of moſt other ſubſtances; and upon this, and many other conſiderations, it appears highly probable, that our diviſion of ſalts into fixed and *volatile* is unknown to nature; there not being to be formally found in any body, before calcination, any fixed ſalt; but ſalts are in themſelves all *volatile*, though by the action of the fire they are apt to be colliquated among themſelves, and blended with the earthy parts, and by that means rendered fixed.

The diviſion of ſalts into acids and alkalis has much more reaſon for its foundation: Theſe are differences which really exiſt in them, and by means of theſe all fermentations, and all motions in natural things begin. Both theſe ſalts appear to be in their own nature volatile, and therefore eaſily reſoluble by the ſupervening ſalt of the air.

It appears that all vegetables, eſpecially the aromatic claſs, if they are any conſiderable time expoſed to the air, loſe their ſalts. The soundeſt wood, loſing its ſalts in proceſs of time, in the ſame manner moulders away.

Theſe are proofs that the ſalts of theſe bodies are in themſelves volatile, though they are all liable to be rendered fixed by the action of fire, by which means the acid and the alkali are blended together, and the mixture becomes fixed.

There is an old axiom among the chemiſts, that things volatile are rendered fixed by ſuch things as are fixed; and thoſe fixed are rendered volatile by ſuch as are volatile; but it appears from theſe proceſſes, when rightly underſtood, that this is an erroneous maxim, that two volatile things may fix one another; and two fixed things may become volatile together, according to the nature of the proceſſes by which they are treated. The common traders in timber are well acquainted with theſe properties of the ſalts of wood, though they know not the reaſons of them; and as the air or fire may alter or drive off the ſalts of timber, and ſo render it leſs firm and ſtrong, they ſink ſuch pieces under water as they would

preserve a long time. When they are to place the ends of posts in the ground, they, on the same principle, burn them a little, that the volatile salts, which would easily be consumed by the moisture of the earth, may be, in some degree, liquated and blended together by the heat, and be rendered so much the more fixed, as to be less easily affected by external accidents. Ship-builders, in some places, for the same reason, burn slightly all the timber that is to make the bottom of the vessel, or such part of it as is to be under water.

Another very familiar instance of the blending the two *volatile* salts, naturally given to all vegetables, is in the formation of soot. When wood is burning, there ascends from it a smoak; in this smoak the two *volatile* salts of the wood are contained, and they coagulate one another into that body which we call soot, and from which they may be again separated by art, and rendered visible distinctly. These salts continue ascending, and forming soot, till the wood is reduced to ashes; and what remain of them toward this conclusion of the operation of the fire, are blended together by it, and make what we call the common fixed alkali, a salt easily washed out by water.

The formation of the fixed salt being thus owing to the mixing together of the two *volatile* ones found in the plant, it is easy to conceive why we obtain more of it from sound wood, than from such as is rotten, and more from fresh plants, than from such as have been dried. If the fixed salt existed as a fixed body in the vegetable, it could not be affected by the evaporation of the water in drying, or by the evaporating of whatever else evaporates in the decaying of wood. But as the salt itself, or its two constituent parts, though called fixed by us, and rendered so by fire, are really *volatile* while in the plants, it is no wonder that, being resoluble by the salt of the air, they are carried off in the drying, and much more so in the decaying of wood; for the air, in this case, evidently penetrates all its parts; and hence it is, that as dry plants yield less fixed salt than fresh ones, so the same wood, which, while sound, would have yielded a very large quantity of salt, yet being rotten, yields scarce any at all, though the same process is observed in burning it.

We are indebted to the pains of Dr. Cox for a method of procuring a *volatile* salt from plants, a thing of considerable use in medicine, though so much out of the common road of the chemical analysises that it was not discovered till about eighty years ago, and soon after reduced to practice, in a regular manner, by that physician.

The method is this: A quantity of the leaves of any plant are to be carefully stripped from the stalks in summer, in dry weather; lay them in a heap, pressed hard together, and they will soon ferment and heat, and will be reduced to a pulpy substance. This is to be rolled into little balls, and put into a retort, and distilled; it will yield a thick liquor, of a strong smell, and a large quantity of a black oil, of a balsamic consistence. The liquor is to be separated from the oil, and distilled over again in a tall glass cucurbit; a *volatile* spirit arises; this is to be rectified two or three times more, and then is not to be distinguished from the spirit of harts-horn, urine, or other animal substances, by any trials. Philos. Trans. N°. 101. p. 4.

All plants that have ever been tried in this manner, yield this *volatile* salt dissolved into the form of a spirit; and the very lowest class of plants, the mosses, and common grass, yield it as well as any other. And it is remarkable, that the vessels in which these operations are performed, have afterwards a smell like musk, which all the cleansing in the world, and even the exposing them to the air, does not well clear them of. The caput mortuum left in the vessels is much less in quantity than in the common distillations of a like quantity of the same plant; and if the plants have not been sufficiently fermented before the distillation, there remains, after the first rectification of the spirituous liquor, a sour water.

The *volatile* salt, thus obtained, is considerably more in quantity than the essential or the incinerated salt would have been in the common ways of preparing them; but those plants which yield most fixed salt, always yield most *volatile* salt this way. And these volatile salts, when well rectified, do not differ from one another, though made from ever so different plants; but this is not wonderful, since the fixed salts also, and the vinous spirits of all plants are alike, when reduced to the same degree of perfection and purity. The herb, as it ferments, affords its natural smell at first very strongly; after that it yields a mixed smell, between its own natural scent and an urinous one; and at the end, when it is nearly ready for distillation, the smell becomes urinous. In this operation, the urinous spirit and salt come over chiefly toward the end of the distillation, and are seen in form of white clouds, issuing very fast out of the neck of the retort, and condensing on the sides of the receiver into little rivulets, or winding streams of water.

Sage, winter savory, and some other of the aromatic plants, yield thin *volatile* salt, on the first distillation, in a dry form, coating over the inside of the receiver on the upper part, and clogging the neck of the retort; and saffron, in digestion with spirit of wine, has been found to yield its salt in the same dry form.

The oils procured in this manner from fermented plants partake nothing of the nature of the peculiar plant, but are alike from all; they are thick as tar, and foetid. If the plant be not well fermented, indeed, the oil will be clear, and leave the smell and virtues of the plants: But this is an error in the process, and this oil comes at first; whereas the proper oil of this process comes not till the last, with the salt. Those plants which, in the common way of distillation, yield most essential oil, yield also most of this black thick oil in this process.

The fatty, moist, and insipid herbs, ferment much quicker than the other kinds: They become extremely hot in this fermentation, and lose their peculiar qualities in it; the spurge loses its milkyness, and the celandine its tinging quality; and the juices of those which are naturally the most acrid and sharp, become little more so than those of others. The stinking plants, such as the atriplex olida, are as sweet in this process as any other; and it is particular, that the monk's rhubard, and some others, which are as inodorous as any plant can be, in their natural state, are as foetid as human excrements, under this treatment: And it is remarkable, that the very greatest heat of the fermentation of these plants, does not prevent their being stored with a sort of maggots, which swarm in great numbers in those parts of the fermented mass, where the heat is so great, that a person cannot bear his hand in it.

It is to be considered, whether these animals may not afford the *volatile* salt attributed to the plants. The doctor does not seem to have considered this; but as they are said to be very numerous in the mass, it will be very necessary to try the effect of a distillation of some of this fermented matter, without these insects; which might be done by covering the whole from the access of flies: For though the Doctor seems to think they are equivocally generated there, it is certain that they owe their origin entirely and only to the eggs of flies. The Doctor seems to think they will of themselves yield no *volatile* salt or spirit; but this is so different from the nature of animal bodies in general, that it may be this opinion was founded on too slight a trial. If the external air be excluded from plants, they will not ferment, and if they are put into a long-necked glass, and left open, they will, in a few weeks, become of a mucilaginous nature; and after standing a year in this manner, they will yield a large quantity of urinous salt or spirit, but not a drop of oil.

Some mosses, and other of the plants usually called imperfect, yield a *volatile* salt on distillation, without previous putrefaction; and some seeds, though in themselves insipid to the taste, have the same quality.

All these spirits and salts have the same properties and effects with the spirits of harts-horn and urine. They change syrup of violets, and many other vegetable tinctures green. They are diaphoretic, diuretic, and deobstruent, and contrary in their nature to acids. They precipitate all metals dissolved in acids, by breaking the force of those acids, and when highly rectified, and mixed with spirit of wine as highly rectified, they make the offa alba of Helmont like all other *volatile* alkali spirits; they unite with acids, and thereby become armoniac or neutral salts. Phil. Trans. N°. 101. p. 7.

Chemical experiments abundantly prove that *volatile* salts are obtainable from all kinds of land animals, the amamphibious and subterraneous tribes, birds, fish, and reptiles, from alkaline vegetables also without putrefaction, and from all other vegetables, after putrefaction, as also from soot, horns, hoofs, and all refuse animal and vegetable matters, such as the pith of horns, urine, the blood of slaughter-houses, &c. and these as pure and perfect as from harts-horn; and this affords a hint for the making *volatile* alkalies and sal armoniac cheap in England. *Shaw's* Lectures, p. 168.

The shootings of *volatile* salts are not limited like those of the fixed and common salts, to any determinate figures, but, by various accidents are thrown into a great variety of pleasing forms. Fanciful people have supposed the shootings of salt of hartshorn, in the tops of the vessels used in subliming it, to resemble the horns of the deers; and that of vipers, to assume the figure of little crawling serpents; but all this is imaginary, and the things from which the salts are obtained have no power to determine their forms, which are governed by more vague principles; such as the peculiar degree of heat, the temperature of the external air, and many other the like uncertain principles.

We have, in the Philosophical Transactions, an account of a whole forest of most elegant trees painted in perspective, in the head of a vessel, by these bodies. The substances employed were sal armoniac and pot-ashes; these were mixed in equal quantities, and put into a tall glass body, which being placed in sand, immediately on the approach of the heat, a large quantity of the salt was sublimed in flowers in the common way; this was a process from which nothing particular could be expected; but after some time the sublimed salt began to assume a regular form, and the head of the cucurbit, which was very large, was filled with the representations of trees so perfect and elegant, that a forest, delineated by the ablest hand, could scarce come up to it.

The figures, though externally numerous, yet were very regular, and all reducible to three kinds; the pine, the fir, and one

one other tree. These, though very exact and beautiful, could have no analogy with the substances out of which the salts were formed, the fir and pine kind yielding so little fixed salt, that they are never employed for this purpose, and the sal armoniac belonging to no vegetable production at all. The same process repeated several times afterward, both with the same salts, and with others of the same nature, never arrived at this perfection; and the whole beauty of this was lost while the spectators were gazing on it, by the sublimation of more of the salt, which filled up all the interstices, and destroyed the figure. Phil. Transf. N°. 105.

The curious in these researches, who would extend the use of these salts to the composing sal armoniac, and many other purposes, for the use of dyers, braziers, apothecaries, chemists, &c. may consult Boerhaave's history of vegetable putrefaction, and his account of sal armoniac, and compare with them the papers of Lemery and Geoffroy, in the memoirs of the Paris academy, on the subject of the preparation of sal armoniac in the Levant, and the imitation of it in other countries.

VOLCANO (*Cycl.*)—Dr. Lister is of opinion, that all the *Volcanoes* in the world are owing to that inflammable mineral called *pyrites*, or *mundic*, a substance consisting of sulphur and iron, and found in great plenty in all those mountains where the *Volcanoes* are found to break out.

The quantities of sulphur continually sublimed in these mountains, in the same manner as the common sulphur is separated by artificial fire from the pyrites in Germany, seems to prove this; and what farther evinces it, is, that the black or purple cinders thrown out of these *Volcanoes* in their most violent eruptions, and wholly differing from the calcined stones or pumice, will be attracted by the magnet, and shew that the whole is very much the same with that caput mortuum of the common pyrites, out of which we have extracted or burnt away the sulphur.

That these *Volcanoes* were all kindled of themselves, at or near the time of the creation, is probable; because there is at present but a certain number of them known, and these have all continued burning at all times, from the earliest history, and none of them have ever been extinguished wholly, or probably ever can be, any other way than by the submersion of the whole into the sea. That they originally kindled of themselves, by means of the pyrites they contain, is very probable, because we find that the pyrites will kindle of itself, and there is no other apparent cause for their kindling; for if we suppose the sun to have done it, the mountain Hecla should have been excused, as standing in a northerly and colder climate; yet this, by all history, seems to have burnt as long as the others.

That they were at first fired my man, is not probable, because it would not be easy to conceive how that should be effected, if attempted; and they are in places the least likely ever to have been the habitations of man, being in the tops of the highest mountains. If we attribute the kindling them to lightnings, or earthquakes, we favour the Doctor's system as much as in his own way; for all these he deduces also from the breath or exhalations of the same mineral, the pyrites, which when fired under ground make earthquakes, when in the air lightnings.

No subject in the whole mineral kingdom is so proper for the keeping up a fire for the many ages these mountains have been burning, as the pyrites. Nothing is so lasting a fuel, and, in general, other fuels become more or less lasting, as they partake more or less of its nature. Scotch coals have more of the bitumen in them, and less of the pyrites than others, and therefore they burn away quickly, and leave only white ashes, without any remains of the pyrites. The common Newcastle coal burns more slowly away, because it contains a far larger portion of the pyrites mixed with its bitumen, as is found by the sulphureous smell it yields in burning; and the Sunderland coal, which contains most of all of this mineral, burns with a more sulphureous smell indeed, but so slowly, that it is said proverbially to make three fires. This burns to a heavy reddish cinder, much resembling the caput mortuum of the pyrites, or the flags cast out of the burning mountains, and contains so much iron, that it is freely attracted by the magnet.

There is, in Ireland, a sort of coal more rich in the pyrites than all these, and seeming indeed to consist in great part of it. This, consequently, keeps up a greatly more durable fire than any of the others, and will remain twenty-four hours red-hot in the fire, without changing its shape. The rise of the breath or effluvia of these pyrites into the air, and their taking fire there, may very naturally cause lightning and thunder there; and it is remarkable, that even the seemingly miraculous accounts of storms of throwing down iron-dust or iron-stones, instead of hail or rain, does not wholly discredit this system; for iron being one part of the constituent matter of the pyrites, it is possible it may have been raised in a vapour with it, and when the sulphureous part was fired and burnt away, it may have again concreted into a solid form, and in that form have falllen to the earth again. Phil. Transf. N°. 157.

The necessity of a subterranean fire is argued from various instances, and from various phænomena.

The places to which this fire is brought up to our view, are generally the tops of mountains; where it may have its free course through their cavities, and burn a length of time, without doing injury to any body.

The subterranean fire could not exist without a communication with the external air; and these *Volcanoes* in the mountains are the spiracles or air holes at which it receives the necessary supplies of it, and by which it communicates with it as much as is necessary for its support. By these the necessary magazines of fire are kept in a due state, and by these they discharge the smoak and foulnesses with which they would otherwise be choaked up and extinguished.

Europe affords five principal openings of this kind. Of these, the chief is Ætna, in the island of Sicily, a *Volcano* famous in all histories. The next to this is Vesuvius, near Naples; then the Strongylus, and some others of less note in the Liparine islands; Hecla in the frozen region of Iceland, and the Chimæra in Greece. The *Volcanoes* of Asia are not less numerous; there are several in the mountains of Persia, and in the island of Ormuz. The pic of Adam, in the island of Ceylon, also burns at certain times: But the principal *Volcanoes* of this part of the world are in the Philippine and Molucca islands. Java and Sumatra also furnish some in the center of their largest mountains. The island of Ternate affords also a *Volcano* on the top of a mountain very difficult of access, but opening with a vast mouth, and very terrible when it burns.

The several violent eruptions of this mountain have given it, within the mouth or Crater, the appearance of an amphitheatre, formed for holding people at the time of some public shew, several circles appearing in it one above another, found with a sort of regularity that is surprising. In Japan there are very numerous instances of the use that mountains serve to on this occasion, many of the higher mountains of that island burning almost continually; and the little islands which lie scattered about in the same sea have also many of them spiracles of the same kind in the tops of the mountains, seen principally in the night, when the absence of the sun's rays gives their faint fire leave to appear.

Whatever may be the number of these *Volcanoes* in Asia, there is no part of the word that yields so many as America. In the kingdom of Chili alone there are fourteen very considerable *Volcanoes*, all placed in a regular order one by the other; and not a less number in Peru; these all burst forth from the summits of those vast mountains the Andes. In New Spain there are three very formidable for the fierceness of their burning.

The most extreme parts of the northern world are not free from these store-houses of fire. Authors tell us of no less than four of them in the most northern parts of Tartary; and we know that Greenland, and all the neighbouring country, has them. The *Volcanoes* of the Terra del Fuego are very well known, and it is indeed the general opinion, that farther north than we have yet penetrated there may be very many undiscovered ones; and some authors have gone so far as to declare, that, were the cold no prevention, we should not be able to come much nearer than we do to the southern pole, for the number and fierceness of the burning mountains.

People who see but a little way into the œconomy of the universe, are apt to blame the author of nature for placing so many of these *Volcanoes* in the habitable parts of the world, and exposing so many of the human species to perish by them; but when the system of nature is more clearly seen into, we find all the reason in the world to admire and adore the goodness of providence in the disposition of these very things.

When it proved necessary to the ends of the creation of the world, that a fire should be kept up within it, where could that be so well kept from doing us injury, as deep in the central parts; and when it was necessary that this fire should have spiracles, or air-vents; where could they be placed more out of our way, than in the tops of the highest mountains, as we constantly and regularly find they are. The smoak, cinders, and other recrements of the fuel that supports the subterranean fire, are by this means discharged far above the heads of the inhabitants, and out of the way of doing them any harm; whereas, had these openings been on plain ground, the whole air the neighbouring nations breathed would have been infected with the stench, and sickness bred with it, beside the danger of firing their houses and towns, and spoiling their cultivated lands with the vast quantities of cinders, ashes, and other matters thrown up, which, as it is, falling on the barren sides of the mountains, do no harm to any thing. The provident placing of these mountains near the sea, either in islands, or on the coasts of continents, is also a great benefit to mankind, as the redundant matter discharged is thrown into the sea, and as there are, in general, higher winds nearer the sea than farther from it, by which the smoak, and with it the malignant vapours of the burnt minerals, are dispersed in the upper region of the air, and never descend in such quantities as to do harm to the neighbouring inhabitants.

This giving vent to the subterranean pyrophylacia, seems one of the great ends of the origin of mountains, and the

other is their ferving, as hydrophylacia or magazines of water. This is feen throughout the world, the rivers that water all the countries inhabited or habitable arifing from chains of mountains placed in their middle, feemingly with this fole intent; the Rhine, the Rhone, and the Danube, all arife from the Alps, the great refervoirs of waters in Europe. The mountains of the moon, placed in the burning fands of Africa, give rife to the Nile and Niger, and other rivers large enough to fupply that vaft and fcorched country; and in the fame manner the river of the Amazons, and the other immenfe beds of water neceffary to fupply the vaft continent of South America, take their origin from the mountains called the Andes. *Kircher's* Mund. Subter. p. 75. feq. See the article MOUNTAIN.

We have an account of mount Vefuvius, and of the eruption from it in 1737, by the prince of Caffano, in the Philofophical Tranfactions, N°. 455. Sect. 1.

The matter thrown out flowed like melted lead, and moved about half a mile in an hour, which was an unufual velocity. The trees, touched by this matter, immediately took fire, and fell. Glafs in houfes was melted into a pafle.

The academy of fciences of Naples made an analyfis of the matter thrown out in this eruption. From which it appears, that this matter contains iron; that it is fpongy at top, and denfe toward the bottom; and, after growing hard, it retained part of its heat above a month. Damps were afterwards feen to arife in divers parts of the mountains. An ammoniacal falt, which gave an extraordinary coldnefs to water in diffolving, was alfo found here. Ibid. See alfo Sect. 2. of the faid Number.

VOLKAMERIA, in botany, the name of a genus of plants, called by Houfton, *duglaffia*, and *paliuro affinis* by Sloane. The characters are thefe: The cup is a one-leaved perianthium, of a turbinated form, very fmall, and lightly indented in four or five places at the end. The flower is one-leaved, and of the gaping kind. The tube is cylindric, and of double the length of the cup. The limb is plain, and divided into five fegments, which are turned toward each fide, but gape principally one way. The ftamina are four very long capillary filaments; the antheræ are fimple. The germen of the piftil is quadrangular. The ftyle is capillary, and of the length of the ftamina, or nearly fo; and the ftigma is bifid. The fruit is a roundifh bilocular capfule, and in this is enclofed a fingle bilocular nut. *Linnæi* Gen. Plant. p. 305. *Houfton*, A. A. *Sloan*, Hift. vol. 2. f. 23.

VOLONES, among the Romans, the antient name of thofe afterwards called *evocati*. See the article EVOCATI.

VOLT (*Cycl.*)—VOLT, in the manege. See the article VAULT, or VOLTE, *Cycl.*

VOLTA, in the Italian mufic, fhews that the part is to be repeated one, two, or more times, according to the numeral adjective joined with it; thus *fi replica una Volta* intimates to play that part once over again.

VOLTA is alfo a fort of dance of Italian origin, in which the man turns the woman feveral times, and then affifts her to make a leap or jump; it is a fpecies of *galliard*. *Broffard*.

VOLTURNALIA, among the Romans, a feftival kept in honour of the god Volturnus, on the fixth of the calends of September, or twenty-fixth of Auguft. *Pitifc.* in voc.

VOLVA, among botanifts, a membranous matter furrounding the bafes of many of the fungi; and in many of them, of very fingular figure and ftructure.

VOLVA is alfo a word ufed by Scribonius Largus, and fome other authors, to exprefs the central part, or, as we call it, the core of the apple, in which the feeds are placed. He prefcribes this in weakneffes of the ftomach, and reachings to vomit.

VOLUBLE *Stalk*. See the article STALK.

VOLVENS *Oculi*, in anatomy, a name given by Spigelius, and fome others, to one of the mufcles of the eye, called by Cowper and Albinus, *obliquus inferior*.

VOLUNTARY (*Cycl.*)—VOLUNTARY, in mufic, a piece played by a mufician extempore, according to his fancy. This is often ufed before he begins to fet himfelf to play any particular compofition, to try the inftrument, and to lead him into the key of the piece he intends to perform.

In the Philofophical Tranfactions, N°. 483. Sect. 2. we have a method of writing down extempore *Voluntaries*, or other pieces of mufic, as faft as any mafter can play them on the organ, or harpfichord; and that in a manner expreffive of all the varieties thofe inftruments are capable of. This is performed by a cylinder, turning equally upon its axis, under the keys of an organ, and by having points under the heads of the keys. Hence, when they are preffed down, they will make a fcratch or mark on the cylinder, which may fhew the duration of the note, and the fituation of this mark on the cylinder will fhew what note was touched. For farther particulars we refer the curious to the tranfaction itfelf.

VOLUNTEERS, in the military art, perfons who of their own accord ferve in the army, and at their own expence.

VOLUTA, the *Volute*, in natural hiftory, the name of a genus of fhells, the characters of which are thefe: They are univalve fhells, and have an oblong mouth, with a clavicle fometimes erect, fometimes depreffed; and they are fometimes coronated at the top. See Tab. of Shells, N°. 10. This genus of fhells is generally confounded by authors with that of the cylindri. There is indeed a general external refemblance between thefe two kinds of fhells at firft fight; but when they are a little examined, they will be found very different. The *Volutæ* are of a conic figure. One of their extremities is of a pyramidal figure, and the other formed into high ribs, which conftitute a depreffed clavicle, or a dentated crown; on the contrary, the cylinder is nearly of an equal fize at both ends. And it is not neceffary to have recourfe to the form of the mouth of this fhell, in order to fix its generical character. Its figure, which is lengthened out into a point in the lower end, fufficiently characterifes this genus; and to this may be added another very remarkable character, which is, that the head is feparated from the body of the fhell by a high rib.

The *Volutæ* are called by many authors, *rhombi*, which is a very ill chofen name, as the word expreffes the figure of a lozenge, a figure very different from that of the fhell. It has been called *Voluta* from the *volute* in architecture, the *volutes* of a capital diminifhing in diameter all the way to the center, which is called the head or eye of the *volute*. See the article VOLUTE, *Cycl.*

The moft remarkable fpecific character in this genus is in the fhape of the clavicle, fome fpecies having it very much elevated, and others very flat or depreffed. The corona imperialis, which is a fhell of this genus, is fingular in the dentated crown, which terminates its head.

The *Volutæ* make the moft rich and beautiful fhells of the whole body of fea productions. Rumphius calls them *eximiæ*; and the admiral and vice-admiral fhells, fo famous among the curious, and held at fo great a price, are both of this genus. The brightnefs of the colours, the perfect white of the enamel, and the elegant fhape of thefe fhells, would make them the firft in efteem among this clafs of bodies, even were they common; but it happens that their fcarcity adds immenfely to their value. There is one of thefe fhells now in Holland, which coft the poffeffor five hundred florins. It is from the bands and fafciæ of thefe fhells, which refemble the colours of fhips, that they have obtained the names of admiral and vice-admiral.

Some of the Hollanders give to another fhell of this kind the name of extra-admiral; this refembles the admiral, but has its colours arranged without divifions of the white enamel. It is a very fcarce fhell, but is lefs beautiful than either of the two others.

The family of the *Volutæ* being numerous, the fpecies may be aptly ranged under three general heads. 1. Thofe with an exerted clavicle. 2. Thofe with a depreffed clavicle. And 3. Thofe with a coronated clavicle.

Of the firft kind we have the following fpecies: 1. The grand *admiral*, or *archithalaffus primus*. 2. The *archithalaffus fecundus*, or the *vice-admiral*. 3. The *archithalaffus araufcanus*, or the *orange-admiral*. 4. The navel or baftard *admiral*. 5. The fpectre-fhell, or *concha fpectrorum*. 6. The brown lineated *Volute*. 7. The flame-coloured *Volute*. 8. The Guinea-fhell, or fpeculation *Volute*. 9. The reddifh ftriated and fafciated *Volute*. 10. The punctulated *Volute*. 11. The Hebrew *Volute*. 12. The brown *Volute*, with two elegant white zones. 13. The Ifabella *Volute*. 14. The *vexillum*. 15. The *Volute*, variegated with two reticulated zones. 16. The bat *Volute*. 17. The white *Volute*, with yellow fpots and lines.

Of the fecond kind, or thofe with depreffed clavicles, we have the following fpecies: 1. The black leopard *Volute*. 2. The yellow leopard *Volute*. 3. The reddifh leopard *Volute*. 4. The chequered *Volute*. 5. The blue fpotted *Volute*. 6. The fafciated *Volute*, with yellow and white fpots. 7. The butter-tub *Volute*. 8. The agate-coloured ftriped *Volute*. 9. The yellow *Volute*, with a white circle. 10. The onyx *volute*. This, when its outer coat is taken off, is of a true onyx colour, and it is in this ftate that it is ufually met with in the cabinets of collectors. 11. The butterfly-wing *Volute*. 12. The green fpotted *Volute*, with two variegated fafciæ.

Of the third kind of *Volutæ*, the head of which is coronated, we have the following fpecies: 1. The *crown imperial*. 2. The lefs fafciated *crown imperial*. 3. The *crown imperial*, variegated with brown. 4. The black marbled *crown imperial*. And 5. The *crown imperial*, called in French the *moire*; this feems of the texture of the web of a filkworm, only more clofely woven together. Hift. Nat. Eclair. p. 279.

VOLVULA, in natural hiftory, the name of an extraneous foffile body, nearly allied to the entrochus, being compofed of the fame fubftance, and being like that of a cylindric column, made up of feveral joints; the commiffures of the joints are, however, much lefs vifible in the *Volvulæ* than in the entrochi, and they are not ftriated, as in the entrochus, from the center to the circumference.

The *Volvulæ* are of various figures, fome refemble in fhape a little bottle, and are called *Volvulæ utriculatæ*, and of thefe fome have, and others have not, a ftar marked on their bottom; others of them fwell out in the middle, and taper a little toward each end; and thefe, from their refemblance in fhape to

to a little barrel, are called *dolioli*, or *Volutæ doliatæ*. There is great reason, from the analogy these bear to the entrochi, and other fossils which owe their form to animal remains, to suppose these of the same origin; but we yet know not to what animal it is that they have belonged. *Hill's* Hist. Foss. p. 653.

VOLVULUS, in botany, a name given by Daleschamp, and some others, to the upright narrow leaved or toad-flax-leaved bind-weed. See the article CONVOLVULUS.

VOMER (*Cycl.*)—The situation of this bone is perpendicular between the two nasal fossæ backward. It is in figure nearly of an oblique square. Anatomists divide it into the right and left side, both of which are unequally flat; and four edges, the superior, inferior, anterior, and posterior; the upper edge is an horizontal groove, which receives the sharp process or rostrum of the os sphenoides. The anterior edge is oblique, and very unequal; its posterior part is small and thin, and supports the perpendicular lamina of the os ethmoides; the anterior is larger, with a pretty deep groove, continued from the canal in the upper edge, which sustains the cartilaginous septum of the nares. The lower edge is likewise unequal; and near its anterior extremity is an angle, which divides it into two parts; one anterior, very short, which is set in the crista narium; the other posterior, and much longer, set in the common groove of the ossa maxillaria and palate. The angle by which this edge is divided, lies in the notch formed by the crista narium, and the groove of the maxillary bones. The posterior edge is oblique and sharp, becoming insensibly more obtuse as it approaches to the larger groove in the edge. This bone has but very little diploe; it is connected with the os sphenoides, os ethmoides, ossa maxillaria, and ossa palati; its use is to form the posterior part of the septum narium. *Winslow's* Anatomy, p. 38.

VOMICA (*Cycl.*)—VOMICA, in natural history, a word used by the antients to express one of the blemishes to which crystals and the precious stones are subject. This is a dusky foulness lying deep in the stone, and giving a dusky colour and tinge to the whole. Both the lustre and transparence of the stone is much hurt by this accident. When the *Vomica* was of a bluish or blackish colour, the Romans expressed it by the word *plumbago*. See the article PLUMBAGO.

VOMICA *Pulmonum*, in medicine, the name of a disease which is a sanious collection of matter, or an apostem formed in the lungs, and included in its own proper membrane; this sometimes seizes one lobe, sometimes the other; and sometimes lies deep in the substance, sometimes near the surface. It finally breaks, and then discovers itself by a discharge of purulent matter from the lungs.

The signs of this disease are at first very distinct; it generally begins from a hard node, which, by slow degrees, ripens into a collection of matter. A hectic fever is a constant attendant on it, and there is always a dry cough attending it; but this is not very violent. Toward the ripening of the matter, there is a difficulty of breathing, and often the patient complains of a dull heavy pain, sometimes of a very acute one, in some particular part of the breast. The face is irregularly red, and a languor grows upon the whole body. The appetite is irregular, and finally a fever comes on; and during this the swelling breaks, and the matter is thrown up in such large quantities, as to endanger suffocation.

The most fatal diseases are usually the most rare, and this is of that number, seldom being met with, and when it is, too often fatal. The causes of it, are stagnation of the blood in plethoric habits, in the vesicles of the lungs; and these are usually owing to the suppression of natural habitual evacuations, or the omission of artificial ones, as habitual bleedings and the like; to these are to be added, external injuries from falls, blows, or wounds of the breast; violent running till out of breath, and a sudden cooling of the breast while the body is hot.

The usual causes of the breaking of a *Vomica*, when formed, are violent succussions of the body, loud speaking or calling, violent coughing or sneezing, and the falling of any substance in eating into the windpipe.

Prognostics in it. The more slowly this disease advances to its height, the more difficultly it is discovered; and the deeper it lies in the substance of the lungs, the greater is the danger of it; though, when most superficial, it is of no small danger; for, breaking externally on the lungs, it discharges its matter into the cavity of the thorax, and thus makes an empyema, a distemper little less fatal than the other, unless the matter be immediately let out by the paracentesis. When the matter has lain deep, there is great danger of the person's being suffocated either at the first discharge of it, or at the succeeding ones, if they are large, and he be already wore down by a hectic, as is usually the case; and even if he escapes this, the apostem degenerates into an ulcer, and so brings on a phthisis.

In general, the smaller the quantity of matter thrown up, the less is the danger.

Method of Cure. The same general medicines are to be used as in a phthisis. The apostem is to be cleansed and absterged, which is done by pectorals mixed with discutients; such are liquorice, hyssop, and the seeds of carduus mariæ. Then the solution of continuity is, if possible, to be repaired. This is to be attempted by balsamics, such as comfrey, plantain, ground ivy, and the like. The febrile heat is to be allayed by mixtures of nitre and diaphoretic antimony; and the violence of the cough abated by the use of gentle opiates, such as storax pill, and the like, in small doses.

The bowels are to be kept open by clysters and gentle purges; revulsion is to be made by bleeding in the foot, and after this, the pectorals, &c. are to be relied on. And during the whole course a light diet, and tranquillity of body and mind are to be prescribed. *Junker's* Consp. Med. p. 173. seq.

VOMIT. The effects of *Vomits*, on the motion of the blood, appear by the following experiments: By observing the pulse of several men, after taking a *Vomit*, it has been found, that so soon as a man begins to grow sick, his pulse becomes low, quick, and irregular, and, in the action of *Vomiting*, is often so low as not to be felt; that in the intervals, between the *Vomits*, the pulse is still low and quick, but not near so low and quick as in the action of *vomiting*; and that, after the operation is over, the pulse rises gradually, and in the space of half an hour, or an hour, becomes fuller than it was before the *Vomit* was taken. Hence we see the effects of *Vomits* on the motion of the blood, they lessen that motion during the whole time of their operation, and almost quite stop it in the very act of *vomiting*; and after the whole operation is over, they increase the motion of the blood, so as to make it greater than it was before.

From these effects of *Vomits* on the motion of the blood, we discover their great usefulness in the cure of many diseases. For instance, *Vomits* stop hæmorrhages from small vessels. For when a blood-vessel is opened, the blood flows faster thro' that vessel, and slower through all the rest of the vessels, than it did before. And therefore, all that is necessary to stop a hæmorrhage from a small vessel, is to stop the motion of the blood in that vessel, and increase its motion in all the other vessels; and both these are done by *Vomits*, as appears by the foregoing experiments.

The increasing the motion of the blood in all the other vessels, will lessen the motion in the vessel supplying the hæmorrhage, and thereby effectually prevent a return of the discharge. For the same reason, *Vomits* lessen immoderate discharges of the glands, and ulcers; for they lessen the motion of the blood and humours in the parts affected, by increasing their motion in all the other parts. By increasing the blood's motion, repeated *Vomits*, with a proper diet, has been found to be of great service in dispersing scrophulous tumours; which may be allowed, when it is considered that these tumours are most incident to children and young bodies, the motion of whose blood is slow; and that they often disappear of themselves, when bodies are grown up, and their blood has acquired a stronger motion.

When obstructions arise from too lanquid a motion of the blood, *Vomits* are generally of use in removing them. And when the motion of the blood is too great, and the obstructions are formed by cold, *Vomits*, after large bleeding, will be of great service in removing them. In short, *Vomits*, repeated according to the nature and obstinacy of the disorder, are generally of service in all irregularities, and disproportions of the motions of the blood, and other fluids, in different parts of the body. The safety, as well as usefulness of frequently repeated *Vomits*, is evidently seen in persons at sea, and in women with child. Persons at sea, who are sick, and *vomit* much, are commonly the better for it; and frequent *vomiting* in women with child, is of service, and prevents abortion. As all muscles grow stronger by exercise, so the muscular coat of the stomach grows stronger by *vomiting*. Dr. *Br. Robinson*, of the Food and Discharge of Human Bodies. See the article VOMITING, *Cycl.* and *Suppl.*

Some have pretended to give rules for ascertaining the doses of *Vomits*. See the article PURGATIVE.

Mustard VOMIT. See the article MUSTARD.

VOMITING (*Cycl.*)—The causes of *Vomiting* are very different, and the treatment of it as a disease, must therefore be also various, according to those differences.

Critical *Vomitings*, by which humours of various kinds are discharged by the operation of nature alone, are salutary, and scarce require any care as to their cure; but are, in many cases, to be promoted: whereas symptomatical *Vomitings*, which are less sufficient, or less accommodated to the removing the cause, are more carefully to be treated, in order to their cure.

The two principal curative indications to be observed are, first, to quiet and compose the convulsive and unruly motion of the stomach; and secondly, to oppose and subdue the material causes of the disorder.

The first intention is answered by corroborating and antispasmodic medicines, such as saffron and castor, with the testaceous powders, as coral, crabs-claws, and oister-shells; powders composed of cinnamon, the leaves of mint, nutmeg, orange-peel, calamus aromaticus, and other such simples, are also of great service. And if anodynes are found necessary, the storax pill, or Sydenham's laudanum, are to be given.

While these medicines are taken internally, there may also be applied outwardly to the region of the stomach, such things as

as have power to reprefs its diforderly motions; of this kind are the oil of mint, nutmeg, and the like, with balfam of Peru: thefe oils may be reduced to a proper confiftence, with this balfam, for the fpreading on leather, and lying on for fome time. Hungary-water, and other the like fpirits, are of great ufe alfo, rubbed on with the hand; and to thefe may be added yeaft, and the ftrongeft wine-vinegar applied hot to the part. Finally, an excellent application is balfam of Peru alone, reduced to the confiftence of a cataplafm, with crumb of bread.

The methods to be ufed to remove the material caufes of the *Vomiting*, are next to be confidered: If it be of the pituitous kind, and owing to crudities in the primæ viæ, and a vifcid mucus fticking to them, it is beft cured by an emetic: if the *vomiting* of itfelf be found not fufficient to carry off the fordes which occafioned it, and the patient continues, after the fits of *vomiting*, afflicted with a naufea and heart-burn; in this cafe, a large quantity of warm water, with a little butter, may ferve the purpofe; or if this be found infufficient, a dofe of ipecacuanha is to be given. *Hoffm.* Oper. T. 3.

When infants are afflicted with *vomiting*, from milk coagulated upon their tender ftomachs, which is a very frequent cafe, the beft medicine is a mixture of oxymel of fquills, and fyrup of rhubarb. See the article INFANT.

In cafes of bilious *Vomitings*, which arife from a weakened digeftion, and have their fomes in the duodenum, the cure is to be begun with the abforbent and teftaceous powders; after thefe, gentle purges of rhubarb and manna are to be given; and finally, the cure is to be perfected by reftoring the ftrength of the ftomach and inteftines.

In *Vomitings* which arife from an acrid matter adhering to the nerves of the ftomach, from the retropulfion of the gout, an erifipelas, or other fuch diforder, the mild fedatives are to be given, and with them fuch medicines as promote the expulfion of the matter; and all means are to be ufed to remove it to the furface of the fkin, or to the extremities again. All fweating medicines are good in this intention, as they carry the matter to the furface. Camphor, taken internally in moderate dofes, is alfo of great fervice; and warm baths for the feet often prove highly ufeful. In *Vomitings* excited by poifonous fubftances, nothing gives fuch immediate relief as the taking large quantities of warm milk, and pinguious liquors; for by means of thefe the fpicula of the poifon are blunted, and afterwards *vomited* up with the liquors. And hence in contagious and peftilential cafes, where there is no inflammation of the ftomach, many phyficians have very fuccefsfully given *vomits* of ipecacuanha, and after thefe acid liquors with diaphoretics.

Acrid, acid, and bilious fordes falling upon the inteftines, often occafion a *vomiting*, attended with colic pains; in this cafe, fmall dofes of oil of fweet almonds and manna, with large draughts of barley-water between the dofes, are found of great fervice; and fmall dofes of laudanum, at proper times, ferve to compleat the cure. In perfons of hot habits, fpirit of vitriol, and mild laxatives, are found of moft certain relief.

The too frequent method of attempting to ftop a *Vomiting* by aftringents and anodynes, before the peccant matter is removed, is highly blameable; for when the fpafmodic motions are allayed, which nature ufed to free herfelf from this matter, and that yet remains behind, there muft follow worfe fymptoms. Thefe remedies which affect the motion only, and not the matter, are only to be ufed when the motion fubfifts, after the matter is difcharged, or when the motion is very violent, and the matter to be thrown off but very fmall in quantity.

Hence in *Vomitings* exited by the chin-cough in children, fedatives and anodynes are very proper, fuch as the fyrup of red poppies, or diacodium, and a little oil of fweet almonds.

The *Vomitings* of pregnant women, arifing from a regurgitation of the blood to the ftomach, which is alfo obferved in women afflicted with a retention of the menfes, and in men who have a ftoppage of habitual hæmorrhoidal difcharges, are beft removed by temperating medicines, mild laxatives, emollient clyfters; and beft of all, by bleeding, or recalling the natural fecretions of blood, in the two latter cafes. On fuch occafions it is highly improper to give emetics, for they fometimes bring on a *Vomiting* of blood, and fometimes an inflammation of the ftomach.

In cafes of efforts to *vomit*, or actual *Vomitings*, in the morning, which frequently happen to thofe who ufe too much ftrong liquors over night, the teftaceous powders are to be given, and all other things which will abforb acidities; and after thefe the grateful ftomachics, fuch as candied orange-peel, and the like.

Chronical *Vomitings* fometimes affect perfons who have been in a long continued ftate of grief; in this cafe the beft relief is found in analeptics, and the ufe of cinnamon-water, impregnated with quinces, and of the generous wines.

In *Vomitings*, which are a fymptom of fevers coming on, the ufe of a gentle emetic, fuch as the ipecacuanha is very proper. In the fmall pox, the *Vomiting* ufually ceafes fpontaneoufly after the eruption of the puftules, and in thefe and many other cafes, great relief is to be obtained in *Vomitings*, by a mixture of falt of wormwood and juice of lemons.

In *Vomitings* arifing from fits of the ftone, the fpiritus nitri dulcis often proves of great fervice; and oily glyfters, and oil of fweet-almonds, taken internally, are alfo of great fervice. The *Vomiting* of perfons in hernias, or the iliaca-paffio, rarely remits till the caufe ceafes. Reft, and lying in bed, contribute greatly to the ftopping immoderate *Vomitings*, for all motion of the body excites in thefe cafes a frefh tendency to *vomiting*. In the beginnings of eryfipelas's, and the like diforders, *Vomitings* often happen, and thefe are by no means to be checked; but the appearance of the difeafe externally is to be forwarded by diaphoretics; for as foon as the eruptions appear, the *Vomiting* ftops of itfelf.

The obftinate *Vomitings* of hyfterical patients are not to be ftopped by opiates or aftringents; for the confequence of this is ufually violent convulfions in the limbs, and anxieties and pain in the præcordia; all which fymptoms difappear again, as foon as the *Vomiting* returns.

The immoderate and long-continued *Vomitings* of pregnant women, which principally happen in the firft months of the time, efpecially in thofe who indulge themfelves too much in venery, and are plethoric, are by no means to be cured by aftringents, opiates, or fpirituous medicines; but are to be removed by repeated bleeding in the ankle, reft of the body, and tranquillity of the mind. And when *Vomiting* of this kind is fo violent as to threaten abortion, it is often ftopped more effectually by the drinking cold water, than by any medicine whatfoever. When an analeptic is neceffary, one fpoonful of cinnamon-water, taken after meals, is fufficient. *Hoffman*, Op. T. 3.

VOMITINGS *in Infants*. See the article INFANT.

VOMITING *of Blood*, *Vomitus Cruentus*, a very dangerous kind of hæmorrhage, confifting in a bringing up by *Vomit* of pure and unmixed blood from the ftomach, and being a method, ufed by nature to throw off a portion of the blood, which molefts the whole in the vena porta, and by that means to facilitate the circulation of the reft of the mafs.

This diftemper fometimes arifes from internal caufes, and is regularly periodical, obferving the ftated times of the eruptions of the menfes, or other natural difcharges; fometimes it arifes from accidents, fuch as the giving of violent purging or emetic medicines, or corrofive ones.

Preceding Signs of it. Among thefe are to be reckoned a fenfation of ftraitnefs and anxiety in the præcordia, with tenfion, and involuntary fighs; with a naufea or ficknefs of the ftomach, and a ftraining to vomit; which is more violent than in vomiting on any other occafion; after this the blood is thrown up pure, and the *Vomiting* then ceafes, till, after a plain fenfation of more blood being collected in the ftomach, the efforts to difcharge it in the fame manner are again renewed. The quicker the blood is thrown up, after its being difcharged into the ftomach, the more fluid and more florid it appears; the longer it is detained there, the blacker and thicker it appears.

Perfons moft fubject to it. A *vomiting* of blood is but an uncommon diforder. It more frequently attacks women than men; among the female fex it is principally feen in thofe whom the menfes have left too early in life, or who have had violent fuppreffions of them for a long time. In men, this diftemper feldom feizes any but thofe who have been ufed to periodical difcharges from the hæmorrhoidal veffels, and who have had them fuddenly ftopped; and they are then ufually firft attacked with violent pains in the left hypochondrium. People of fcorbutic habits, and fuch as have had quartan agues of long ftanding, have been fometimes thus affected. And, befide thefe natural caufes, people of all ages and fexes may vomit blood, from external injuries.

Prognoftics from it. A *Vomiting* of blood is ever a dangerous diforder; for tho' the quantity of blood thrown up is feldom fo great as to occafion immediate death, yet it generally degenerates into a tabes in men, and into a cachectic habit in women. It is lefs dangerous to young women, than to any other perfons; and when it is periodical, efpecially when it obferves the times of the menftrual difcharges, is much lefs dangerous than under any other circumftances.

Method of Cure. During the paroxyfm, the proper medicines are powders of nitre, cinnabar, and the abforbent fubftances, fuch as crab's-eyes, or the like, and afterwards bleeding, cupping, and gentle purges, and diaphoretics are to be given for fome time. *Junker*'s Confp. Med. 35.

VORTEX (*Cycl.*)—We have, in the Philofophical Tranfactions, a phyfico-mathematical demonftration [a] of the impoffibility and infufficiency of *Vortices* to account for the cœleftial phænomena.—[[a] By Monf. de *Sigorne*. See N°. 457. Sect. 6. p. 409. feq.]

This author endeavours to fhew, that the mechanical generation of a *Vortex* is impoffible; that it has only an axifugal, and not a centrifugal and centripetal force; that it is not fufficient for explaining gravity and its properties; that it deftroys Kepler's aftronomical laws; and therefore concludes with Sir

Isaac Newton, that the hypothesis of *Vortices* is fitter to disturb than explain the cœlestial motions. We must refer to the dissertation itself for the proof of these assertions.

VOTE (*Cycl.*)—In elections of members of the house of commons, such *Votes* shall be deemed legal, which have been so declared by the last determination in the house of commons; which last determination concerning any county, shire, city, borough, cinque port, or place, shall be final to all intents and purposes. Stat. 2. Geo. 2. c. 24.

UPLAND (*Cycl.*)—The *Uplands* lie either on the tops of hills, or on their sides, or on the slopes of rising grounds. They sometimes have a sandy soil, sometimes a rocky, gravelly, or loamy one, and sometimes they consist of tough clay, or a black mould. They are used by the farmers either for grazing or corn, as they happen to be more moist or more dry; and this difference depends upon their situation and nature.

Those lands which lie flat upon the tops of hills, are usually the driest, and those which form the slopes or sides, are usually the moistest, because of the wet that is continually oozing through them. The chalky, and especially the clayey sods in these places, are most of all subject to be wet, especially in winter, because they retain the moisture a long time; though they have also the inconveniencies of the sandy and rocky lands in the same situations, chapping in summer. The black mould, and the hazely loams in these places, are the best for corn, as well as for pasture, especially if the latter escapes the common misfortune of being full of worms. These lands neither are washy in winter, nor parched up in summer.

The *Upland* meadows have some disadvantages, as they often need mending or feeding, which those that lie lower do not; but then they make amends for this in their hay, which is always much finer and sweeter than that of the low-lands.

UPLOPER, a name given to one particular species of pigeon, called by Moore, *columba gutturosa saliens*.

It was first brought to England from Holland, and much resembles that kind of pigeon called the English Powter, but that it is smaller. Its crop is very round, and in this it buries its bill. Its legs are very small and slender, and its toes are short, and close together, on which it treads so nicely, that, when moving, any small thing might be put under the ball of its foot. The pigeons of this species are generally all blue, all black, or all white; seldom or never pyed. They are very scarce in England, and in Holland have been valued at five and twenty guineas a pair.

They have their name from the Dutch word *Oplopen*, which signifies to leap up, and it was thus named from its manner of approaching the hen, which is always by leaping upon her. *Moore's* Columbarium, p. 37.

UPRIGHT (*Cycl.*)—UPRIGHT *South Dial.* See the article PRIME *Vertical*, *Cycl.*

UPULUS, in botany, the old Latin name for the *lupulus*, or hop. This word *lupulus* is not old Latin, but a more modern name, formed on the word *Upulus*.

The original word *Upulus* also was formerly written *opulus*, being a climbing plant. The word was also applied to other climbing plants, such as the white and black bryony. Some of the antients called the hop *upulus salictarius*, because of its twining about willow-trees. Pliny mentions it under this name. The words indeed stand *lupus salictarius*; but this is a very plain error, since the *salictarius* is joined to the word *Upulus* by Cato, Varro, and most of the other writers of antiquity; but by no body to the word *lupus*. Cato in one place calls it *ulva*; but this is evidently an error of the copy. The word *ulva* is the name of a sea-plant growing without stalks, composed only of tender leaves; and it is here called a tall plant, climbing upon the willows. There is no doubt from this, and from the same author's ordering it to be strewed under cattle, by way of litter, that it was the *Upulus* or *lupulus*. See the article LUPULUS.

UPUPA, the *Hoopoe*, in the Linnæan system of zoology, makes a distinct genus of birds, the characteristic of which is, the having a double crown of feathers on the head. *Linnæi* Syftem. Nat. p. 45.

These birds are common in Germany, and sometimes seen in England, though but rarely. Its general weight is about three ounces. The beak is black, slender, sharp, and a little hooked; its head is adorned with an extremely beautiful and elegant crest, rising two fingers high, and composed of two series of feathers, reaching from the insertion of the beak to the back part of the head; and these can be raised or depressed by the bird at pleasure. The tips of these feathers are ornamented with black and white, the rest is of a chesnut colour. Its neck is of a pale reddish brown; its breast white, variegated with longitudinal streaks, which disappear in the middle as the bird grows older; the tail is four fingers breadth long; it is composed of ten feathers, and is black; but has a large white spot in it, of a lunated figure, the points standing towards the extremity of the tail. Its wings, when folded, do not reach to the end of the tail; and are streaked across with white; it feeds on beetles, worms, ants, &c. and is said also to eat berries, and other vegetables. *Ray's* Ornith. p. 100.

Æschylus, Aristotle, and many of the other old Greek writers tell us, that the cuckow, when it has sung all the summer, acquires a plume of feathers on its head, and loses its voice for the winter season, and is in this state called the *Upupa* or *Hoopoe*; but there is no truth in this story, though the general opinion of those times.

In the same manner they supposed the *ficedula* and *melancoryphos*, or black cap, to change into one another; because the one appeared at that time of the year when the other went away. We have in this bird also another proof of the ignorance of those times in natural knowledge: they tell us, that the callais or turquoise, which we call the *Turkey-stone*, was found in the melancoryphus only, because the eggs of that bird are of the same beautiful pale blue colour with that gem.

URACHUS (*Cycl.*—The use of the *Urachus* is not yet discovered, according to Dr. Trew. Phil. Trans. N°. 457. Sect. 7. See the articles ALLANTOIS and FOETUS.

URANOSCOPUS, in zoology, the name of a fish of the cuculus kind, called in English the *star-gazer*; and by some authors, *callyonymus*.

It is usually caught of about seven or eight inches in length, but sometimes it grows to a foot; its head is very large, bony, and rough, and of a sort of square figure; its body is long and rounded; its upper part is all of an ash-colour; its belly white; its scales are very small and thin, insomuch that many have supposed it had none. These are dispofed in oblique ranges across the body of the fish, running toward the tail. The side-lines are arched, and rise to the back fin, which is a great singularity. Its face is flat, and seems turned upwards, and its eyes are small and prominent, and are so placed in the upper part of its head, as naturally to look up to the heavens, whence it has its name. Many of the flat fish have their eyes placed as those of this fish; but the pupils in all these look sideways; in this only they are turned strait upward. Its mouth is very large, and opens perpendicularly downward, being placed in the same direction with the eyes in the upper part of the head. It has a beard under its chin, like that of a man, and its jaws are furnished with very sharp teeth, as are also the inner parts of its mouth. Its whole head is covered with rough tubercles, and it has two fins on the back, and two on its breast. It is frequently caught in the Mediterranean, and is by some said to be a well-tasted fish. *Gesner*, de Aquat. p. 159.

The reason of the situation of the eyes of the *Uranoscopus*, is the providence of nature for a fish which, always keeping at the bottom, has no where to look for prey but in the water above it. But if other fish had been well examined, this peculiar name would never have been given to this. The eyes of the *rana piscatrix* are placed in the same manner, and those of a great number of other fish, whose custom it is to keep at the bottom, are more or less also thus situated.

According to the new system of Artedi, this is a species of the *trachinus*, and is distinguished from the others of that genus, by the name of the *trachinus* with many beards on the lower jaw. The fish described by Willughby and others under the names of the *sea-dragon* and *sea-spider*, the *draco-marinus* and *araneus-marinus*, are of this genus. They are properly indeed only the same species in different states, and are distinguished from the *star-gazer* by the name of the *trachinus* with the lower jaw longer than the upper, and with no beards hanging from it. *Artedi* Gen. Pisc. 73. See Tab. of Fishes, N°. 48. and the article TRACHINUS.

URCEOLUS, in ecclesiastical writers. See the article AQUÆ *Manilis*.

URCEUS, in antiquity, the name of a measure of liquids, which in different places was of different capacity; its most usual standard seems to have been between twelve and sixteen ounces.

URCHIN, a common name given to the hedge-hog. See the article ERINACEUS.

Sea-URCHIN, in ichthyology. The *echinus marinus* of authors is, in some parts of England, called the *sea-egg*, and in others the *sea-urchin*, or *hedge-hog*. It is a genus of fish, of which there are a great number of species.

The manner of these creatures moving at the bottom of the sea, has been disputed among naturalists; the general opinion of the world has been, that they did it by means of their spines or prickles, which served them by way of legs; but some of late, particularly Mr. Gandolphe, pretend that the spines of the *Urchins* are of no use to them on this occasion, but that they move by means of certain legs, like the legs of the star-fish, which they occasionally put out when they walk, and at other times retract them into their body. The world was readily falling into this system, particularly as Mr. Gandolphe affirmed, that he had been often an eye-witness to it; but the indefatigable Mr. Reaumur tried the experiment himself, and often made himself an eye-witness of the contrary fact, having frequently seen them walk at the bottom of a shallow bason of sea-water, with no other assistance than that of their spines, and even having made them perform the same motion, by the same means, upon his hand.

This curious enquirer into nature did not, however, stop here; but took occasion from hence to enquire accurately into every circumstance of their progression, which is performed by so uncommon means.

It is certain that the *sea-Urchin* does throw out at the lower

aperture of its shell, when it pleases, certain bodies which resemble not a little the legs of star-fish; but these serve not at all to its motion; but, on the contrary, their real use is to keep the creature still, and fixed in the same position; and, to describe them more exactly, they very aptly resemble the horns of snails; whence Mr. Reaumur has chosen rather to call them horns than legs. The use the *Urchin* makes of these horns, while it is in motion, is to feel about, and try the ground on which it marches; and they serve the creature as a staff does a blind man in his walking, to touch and try every thing that lies in the way; and to make them serve to this purpose, it is continually extending or retracting them during the time it is moving. These horns are not only placed about the orifice of the shell, but they are every where dispersed among the spines, all over the surface of the shell.

To understand properly the position of these horns, it will be necessary to consider the figure of the *sea-Urchin* shell, as we usually see it, that is, stripped both of its spines and its horns. In this state it appears a very beautiful piece of workmanship. It is a hard body, the figure of which approaches to that of a segment of a sphere, or a mould of a button hollowed within; it has an aperture at the very summit of the shell, and another at the base, just opposite to it; this is the case in the common kind; for there are great varieties in the place of these holes, in the different species: at this lower aperture is placed the mouth of the animal; the upper is supposed to serve it to discharge the excrements by. The whole external surface is covered with protuberances of different sizes, but all disposed in a beautiful and regular order; they divide the whole surface, as it were, into ten spheric isosceles triangles, all which have their summit at the upper aperture, and their base at the lower. Of these there are five large and five small; but all the large ones, and all the small ones, are regularly of the same size one with another. There is a small band, which is less rough than the other parts, which separates every larger from every smaller triangle; these bands are also in themselves so many triangles; but the calling them by this name, will better serve to distinguish them from the others. As the triangles, both large and small, are all covered with eminences or protuberances, these bands are, on the contrary, all pierced with small holes; these run quite through the shell, and their apertures are more sensible on the inside than on the out. These holes are beautifully distinguished, on holding the shell against the light, and are arranged in a very beautiful order, and in regular series on every band. There are two sorts of ranges of these upon every band, one sort containing two holes all the way, and the other four; these are placed in a regular alternate order; first, a range of two, then a range of four, then another of two again, and so on to the extreme edge of the band.

The space contained in every triangle is also in the same manner divided into several parts by a number of lines, which begin at the upper aperture of the shell, and terminate at the lower; but as these lines in the bands are marked by little perforations, they are, in the triangles, made of those eminences which render the surface of the shell rough and uneven; those eminences which are in the middle of every line, are larger than those which come towards one or the other end; and the several different lines are made up of these eminences of different sizes one from another, so that, on the whole, there is every where a great variety of them. Every one of these eminences resembles a sort of teat or nipple, with a portion of the breast; or, to give a more determinate idea of them, each is a portion of a sphere, the summit of the convexity of which is crowned with another portion of a much smaller sphere. These are the parts on which the base of every spine of the *Urchin* is fixed; and as this base is hollow, it naturally envelopes the small portion of a sphere at the summit of each eminence, and is able to move and turn any way upon it, in the manner of the ball and socket articulations. The smaller eminences sustain the smaller spines, and the larger the great ones; the number of these eminences, or, in other words, the number of the spines on one fish, is surprizing; many of them are so small, that it is not easy to count them regularly; but Mr. Reaumur found, in general, that there were considerably more than two thousand on every fish; nor is the number of the perforations before-mentioned less to be wondered at; they take up but a very small space on the shell, in proportion to the spines, yet Mr. Reaumur observes, that their general number in every shell cannot be less than thirteen hundred. From knowing the number of these perforations, we are able to determine that of the horns; for every horn has its origin from one of these. The horns are never seen all together, they are only visible when the creature is in the water, and even then it only exerts some of them at a time, so that it is not to be expected that they should all be seen together. When it is in motion, it only shews those which are placed on that side of the shell which is to move forwards in the journey; and when it is at rest, we only can see those which it thrusts out, and fastens to stones or other bodies, to fix itself by. These serve by way of anchors to the creature, it glews them fast down to the stones, *&c.* and if the creature be forcibly removed, they are generally, in part, if not entirely, broken and destroyed by it. When the creature is taken out of the water, they are no more to be discerned, they are bent and folded together, and are in a flaccid state, so that nothing but their ends can be at all perceived, and these no body can tell what to make of, who has not before seen them in their exerted state in the water.

The spines are all capable of assisting the creature in its motions, but those it principally employs are such as are placed near its mouth, as these can turn upon their balls every way with equal facility, the creature finds it equally easy to move on any side; and when it has determined which way it will move, those spines which stand directly toward that point, and those which are directly opposite, are of equal service to it; it draws itself forward by means of the first, and pushes itself on with the others; to do this, it first thrusts out the foremost ones as far as possible, and pressing them against the bottom, it draws on its body by them; and this is succeeded by its drawing up the hinder ones close to its shell, and then fixing them against the bottom, it pushes itself forward by them. This is the manner of this little creature's marching in the common way with its mouth downward; but it has this strange singularity, that it is not confined to this posture alone in marching, but can, with equal ease, walk with its mouth upwards, or run along sideways in the manner of a wheel; or in any direction between these. The legs and the horns cover all parts of it, and are in every part of it equally able to move it every way. What a prodigious number of muscles must this little creature have to be able to move separately thirteen hundred horns, and more than two thousand spines, which serve for legs. Mem. Acad. Par. 1712.

UREDO, a word used by some of the chemical writers to express the virtues of metals communicated to them from the sun. Pliny uses the same word to express the smut affecting fruits; and some medical writers have expressed by it a very violent and excruciating pain in the head. See the articles SMUT and BLASTS.

URENA, in botany, a name given by Dillenius to a genus of plants, the characters of which, according to Linnæus, are these: The cup is a double perianthium; the external one is composed only of one leaf, divided slightly into five broad segments; the inner one is composed of five narrow and angular leaves. The flower is composed of five oblong petals, which are broadest at the apex, and end in an obtuse point, and at their bases are narrow and grow together. The stamina are numerous filaments, which at their bases grow together into a cylinder, but stand free at the tops. The apices are roundish. The germen of the pistil is roundish; but it is formed into five angular prominences. The style is simple, and of the length of the stamina, and is crowned with ten stigmata, which are headed, reflex, and hairy. The fruit is a roundish pentangular echinated capsule, being composed of five valves, and containing five cells. The seeds are single and roundish, and at their ends somewhat compressed. *Linnæi* Gen. Plant. p. 329. *Dillen.* Hort. Eltham. p. 319.

URETHRA (*Cycl.*)—The hard knots which are sometimes formed in the corpus cavernosum *Urethræ*, after venereal virulency, are very difficult to cure. Till the pocky matter is all extirpated, it is in vain to attempt the cure of these knots, and even then they do not yield to mercury in any shape, but are resolved by embrocations of the waters of Bareges. See Mem. de l'Acad. de Chirurg. Tom. 1.

Mr. le Cat has given us the figure of the canal of the *Urethra*, determined by solid injections. See Phil. Transf. N°. 460. Sect. 5. p. 684.

URETHRÆ *Depressor*, in anatomy, a name given by Santorini to a muscle of the pudenda in women, the same with that which he calls in men the *elevator Urethræ* and *ejaculator*. Winslow, and the generality of the French anatomists, call it the *prostatique inferieur*. And Albinus, who has given to the *transversalis penis* the name of the *transversus perinæi*, calls this also the *transversus alter perinæi*.

URETHRÆ *Elevator*, in anatomy, a name given by Santorini to a muscle of the penis, which he calls also the *ejaculator*; it is called by Albinus the *transversalis alter perinæi*, to distinguish it from the muscle commonly called the *transversus penis*; but which he calls the *transversus perinæi*. The same muscle in women is called the *depressor Urethræ* by the same Santorini.

URETHRAM *Dilatans*, in anatomy, a name given by De Graef to a muscle of the penis called the *Urethram trahens* by Spigelius, and by the later writers, the *accelerator penis*. See the article ACCELERATOR.

URETHRAM *Trahens*, in anatomy, a name given by Spigelius and others to a muscle now generally called the *accelerator*. See the article ACCELERATOR.

URETHRÆ *Triangularis*, in anatomy, the name of a supposed muscle of the penis, called also *dilatator penis*, and *dilatator Urethræ*; it is properly only a process of the sphincter ani continued into the perinæum.

URIBACO, in zoology, the name of a Brasilian sea-fish, esteemed a very well tasted and wholsome one. It is somewhat of the figure of the pearch; its back is ridged, and its belly somewhat protuberant. It grows to ten or twelve inches long. Its teeth are small and sharp, and the ends of its gills terminate in a triangular point. Its gill-fins end in a triangular

triangular point; its belly-fins are sustained by a very rigid and strong spine. Its long fin, behind the anus, is all the way supported by flexile and short spines, and has one very strong and rigid one before it; and it has only one fin on the back, which reaches nearly to the tail, and is all the way of an equal breadth, and supported by rigid and prickly rays. Its tail is very deeply forked. Its scales are all of a fine silvery white, with some faint cast of a pale but bright red; its belly-fins are white, and its back-fin and tail are reddish. Its side-lines are broad, and of a fine red; and over these, and under them, near the tail, there is on each side a large black spot. *Marggrave's* Hist. Brasil. *Ray's* Ichthyogr. p. 338.

URINARIA, in botany, a name given by some authors to the common dandelion. *Ger.* Emac. Ind. 2.

URINE (*Cycl.*)—The secretion of *Urine*, as also that of perspiration, is considerably influenced by the passions. See the article PERSPIRATION.

Dr. Rega mentions the opinion of some modern authors, who imagine that our drink passes through the coats of the stomach and bladder, *&c.* when it is so quickly evacuated by *Urine*, as it is observed to be after drinking several mineral waters and other liquors. He endeavours to prove, by an easy calculation of the quantity of *Urine* secreted in the kidneys, that they are capable of furnishing all the quantity observed at any time. And lastly, he mentions the fullness and great frequency of the pulse, after drinking these liquors, as a proof of their being mixed with the blood. Med. Eff. Edinb.

The specific gravity of the human *Urine*, made in the night-time, has been found greater than that made in the day. Hence Dr. Bryan Robinson [b] infers, that *Urine* draws off more contents from the blood in sleep, than when bodies are awake; and consequently that natural sleep is a very good sign in fevers, in which the blood abounds more with contents than it does in health.—[[b] Of the Food and discharges of Human Bodies, p. 85.]

The *Urine* of phthisical people is said to be always specifically heavier than that of people in health, or in any other disease.

We have frequent instances of peoples voiding by *Urine* much greater quantities of liquids than they take into the stomach in the time; but this, though a seeming paradox, is easily explained, by considering how very small a part only of what we call solids, is really solid. Chemistry shews us that the far greater part of our food may be procured in a fluid form by distillation; and on this principle alone, so long as the quantity of *Urine* voided is not more than that of the meat and drink together, the miracle ceases. There are, however, instances of the quantity of *Urine* greatly exceeding that of both. Dr. Wittie, in this case, supposes the converting of air into water to make up the over-proportion; but it is more rationally accounted for by the decrease of the patient's flesh all the time. Our own bodies, as well as the foods we take in for their support, are composed of a greater proportion of fluids; and the real solid matter is so very little, that when, by the course of a disease, those fluids, which should remain locked up in the texture of the solids, and increase their bulk, are drained and separated from them, it is no wonder that the discharge be vastly disproportioned to the supplies, when the body itself goes off with them. We have indeed accounts not easily soluble on these principles, nor any way but by the scheme of converting air into water before-mentioned; but till we are certain that the quantities and proportions are accurately noted in them, it will be rash to conclude any thing from them.

Among accounts of this kind, we have these recorded in the Philosophical Transactions from Dr. Wittie and others. A person at Hull, in a diabetes, voided twenty-four pints of *Urine* every eight and forty hours, for many weeks together, during which time his muscular parts were all in a manner dissolved into *Urine*; and the weight of the *Urine*, voided in these weeks, according to the Doctor's computation, greatly exceeded the whole weight of his body, and of all that he had eaten or drank in the time. Sir Kenelm Digby tells us a thing, which, if we may credit it, calls for a supply greater than any thing but the converting a great part of the air taken-in in respiration could give: This is of a nun, who voided two hundred pints of water as from her bladder every twenty-four hours, for some weeks together. There is another relation of a sick maid in Italy, who voided thirty-six pints of *Urine* every twenty-four hours, for the space of sixty days, till at the length the whole quantity voided amounted to one thousand seven hundred and forty pounds; a weight greatly superior to that of her own body, and of all that had been received into it in the time. The whole credit of these relations lies on the character of their authors; and we are to remember, that the strongest of them comes from an author who, in another part of his works, has given a receipt for creation; a method, as he expresses it, of making live crawfish. Philos. Transf. N°. 52. See the articles SOLID and FLUID.

In order to the preparing the phosphorus, and indeed most of the other preparations of *Urine*, the first step is to reduce that liquor to the consistence of a rob or thick extract; those who have worked on this subject sufficiently know, how abominably nauseous and disagreeable a task this is. The operator alone is not the person who is almost poisoned by it, but the whole neighbourhood is affected; and it is well known, that our Godfrey, who used to prepare large quantities of this substance, was always obliged to keep a house in the fields to perform this part of the process in.

There is an easy and excellent method proposed by Stahl for the performing this troublesome business, by means of condensation by cold or freezing. There needs no more than to expose the proper quantity of *Urine* to some frosty nights in winter; or at any time of the year to our Ice-houses, or other places where ice is preserved all the year round. The frost will, in this case, affect a large part of the *Urine*, but not the whole; and the liquid part being separated from the solid ice, it will be found that the watery parts alone have suffered the freezing, and that all the unctuous and saline ones are left behind in the unfrozen part, which is, by repeated freezings of its yet remaining aqueous part, at length reduced to that sort of rob which is required for all the purposes of distillation, and that without any trouble or offensiveness, either to the operator or any body else. The power of condensation by freezing in this manner, extends to wine, vinegar, and all fermented liquors; but it operates differently on the several different ones, and is to be regulated according to their natures. The natural cold of our climate is seldom too great for any of the liquors we desire to condense; that is, it is never so great as to condense the whole into ice. It often is not sufficiently great to condense the aqueous part, even after ever so many repetitions. In this case, it may be proper to bring in the use of the common freezing mixtures, made with ice, or snow and salt. To suit the artificial degree of cold, in these cases, requires care and experience, and is almost as nice a point as the suiting the degrees of heat in the operations of chemistry. *Stahl* de Concentr. Vin. *Shaw's* Chemical Essays.

When *Urine* has been reduced to a rob by condensation by freezing, it is found to vary very remarkably, according as it was taken, either fresh, or half putrified, to make the operation. That which was made fresh remains in this state tolerably clear, and of a dull yellow colour, and almost without smell; but that which was taken half putrified, remains of a colour between brown and red, or somewhat deeper, like the brown strong beer, and becomes intolerably fœtid, if set for any time in a warm place; but that which was condensed fresh, is not liable to this accident, but may be kept two or three years in the state of rob, and will never grow fœtid, nor smell much like *Urine*. *Stahl* de Concentration.

Glauber has taught the world to believe, that there is nothing so destructive to vegetables of all kinds as *Urine*, which, he says, by means of the sal armoniac that it contains, burns up all the roots. This is certainly true of *Urine*, and of dung too, when laid on in too great quantities; but it is certain that *Urine* is as safe as dung, and as profitable, when laid on in a sparing and proper manner. Dung is of no use to land, but by its fermentation; but the best of all things to hasten and perfect that fermentation is *Urine*. The Dutch are perfectly sensible of this, and are as careful to preserve the *Urine* of their cattle as the dung. *Mortimer's* Husbandry.

Bloody URINE, *Mictus Cruentus*, in medicine, the name of a very troublesome and often dangerous disease; it is a voiding of pure blood by the urinary passages, and takes its origin from a congestion of blood in the emulgents, and is the method (tho' an unhappy one) taken by nature to discharge the load of a plethora, and give the mass of blood freer room to circulate. This is the natural or simple *Mictus Cruentus*; but, beside this, there is another accidental one, arising from an injury of the vessels from a rough stone in the kidney. This, however, is a much less frequent case than is vulgarly imagined; for there are great numbers of nephritic patients who have very large stones in the kidneys, yet void no blood, and in many cases, where this is a symptom, it will be more just to attribute it to the effect of the sharp nephritic medicines, than to the action of the stone.

Signs of it. When a *Mictus Cruentus* is natural, it usually comes on tacitly, and without any previous symptoms, or if there be any, they are only some sensations of a weight and pressure upon the loins: but when this is brought on by accidents, as by the rubbing of a stone, or the like, it is always preceded by violent pains. The blood voided with the *Urine* is florid, and, after a time, subsides perfectly from among it; but when there is an exulceration of the kidneys, the blood is altered in its texture and appearance, and shews itself like worms.

Persons most subject to it. These are old men of plethoric habits; but even with these it is a rare distemper. When young men, or even middle-aged ones, are affected with it, we are to seek for its origin in violent and preternatural causes. Men are also, in general, more subject to it than women; but these are not wholly free from it.

Causes of it. These are usually a plethora, and an unnatural derivation of the hæmorrhoidal blood to the kidneys, where the vessels burst; for it is very rarely, and never but from some preternatural causes, that they burst in the bladder. The common violent and preternatural causes of this disease, are the use of the hot diuretics, of balsam of sulphur, of oil of amber, and, above all, of cantharides. Long riding on horse-

horfeback, or blows on the region of the loins. In old men, an over ufe of venery may alfo bring it on, as alfo violent paffions of the mind, a fpirituous diet, an exulceration of, or a ftone in, the kidneys; and finally, an omiffion of habitual difcharges of blood, whether they have been artificial by bleeding, or natural by the hæmorrhoids, or the like.

Prognoftics from it. It is a diftemperature that never can prove of benefit in any cafe, but is often very dangerous. Old men who are afflicted with it, rarely live long after it, efpecially if the difcharges are not regularly made; and if it be rafhly fuppreffed by the ufe of aftringents, in any cafe, it brings on inflammations, fevers, and often dropfies. Ulcers in the kidneys are another very frequent effect of this; and under thefe, blood and purulent matter are voided together, and appear like clouds in the *Urine*.

Method of Cure. In the time of the fit, the violent emotion of the blood is to be reftrained by nitre, cinnabar, and fome of the abforbent powders, and if thefe are found infufficient, the milder aftringents are to be joined with them; coral, crocus martis, and vitriol of iron; and if thefe fail, the aftringent tinctures of fteel, and the terra Japonica, are to be given. Some alfo recommend as fpecifics, the juice of nettles, a decoction of the equifetum or horfe-tail, and a tea made of afparagus-roots. The bowels muft be kept gently open by clyfters, or the milder purgatives; and after the fit the fame methods are to be continued, to prevent a return. After this, bleeding in the foot is of great fervice, and old perfons are not to be excufed from it on account of their age. It is finally to be confidered, whether an obftruction of the menfes, or of the hæmorrhoidal difcharges, have occafioned the difeafe; and if fo, they are to be regulated with all due care for the future; and for the firft the proper medicines are to be given; for the latter, leeches are to be applied to the hæmorrhoidal veffels. *Junker's* Confp. Med. p. 39—44.

In cafes of *bloody Urine*, fpirit of vitriol, mixed with the patients drink, has been found ferviceable. See Medic. Eff. Edinb. abrig. vol. I. p. 68.

Incontinence of URINE. This is a term ufed by medical writers to exprefs an involuntary excretion of this liquor, whether it be inceffantly, or in larger quantities at different intervals.

This is of two kinds; in the one it is only in the night, in the time of fleep; and this arifes merely from carelefsnefs, and a bad habit; in the other, it depends on a paralytic affection of the fphincter of the bladder; and in this cafe it drops away continually from the patient; and this is therefore called by fome a *ftillicidium*.

Authors alfo divide an *incontinence of Urine* into the idiopathic and fymptomatic: The idiopathic is a difeafe in itfelf, and depends upon the preceding caufes; the fymptomatic happens to different perfons on different occafions, as a fymptom of other complaints. It is common to dying perfons; it is alfo very frequent to women who are very big with child, and fometimes happens from violent fneezing, coughing, or laughing.

Perfons fubject to it. The voiding of the *Urine* involuntarily, and in the fleep, in infants, is not to be accounted a difeafe; but when this cuftom continues with them as they grow up, from idlenefs, or ill habit, it is at length to be confidered as a difeafe, as they are by no means able to help it. Women who have fuffered much in child-birth are often fubject to an *incontinence of Urine* afterwards, efpecially perfons who have had their firft child at an advanced age. People in years, who are fubject to paralytic complaints, are alfo often afflicted with this troublefome complaint; and many who have been cut for the ftone by perfons not fufficiently fkilled in the operation. Perfons fubject to the piles alfo fometimes fall into it, from the fuppreffions of their ufual difcharges, and fometimes from the tumors becoming fiftulous, and reaching to the neck of the bladder. Impofthumes of the bladder will alfo occafion it, and violent external injuries.

Prognoftics in it. An *incontinence of Urine*, which happens only in the night, and is merely caufed by a bad habit, and not of long ftanding, ufually admits of a cure; but the ftillicidiums of *Urine*, from paralytic diforders of the fphincter of the bladder, are very rarely cured, efpecially when they have been fixed fome time upon the perfon.

Method of Cure. The involuntary voiding the *Urine* in the night, in children, is to be cured, in a great meafure, with punifhment for the neglect, and by denying them much liquids after dinner-time; by a proper diet; the avoiding all diuretics, and the making water immediately before going to bed; and when it has gone fo far, that the tone of the parts is injured, the ufual ftrengthening medicines are to be given, as in the following cafes.

When the *incontinence of Urine* is occafioned by a paralytic weaknefs of the fphincter, nervous and ftrengthening medicines are the proper method of curing; in this cafe, maftic, amber, nutmeg, and cinnabar, are found to be of great fervice, and pills or powders compounded of them, are an excellent general remedy to be given in fmall dofes, two or three times a day. Externally, it is very proper to ufe by way of fomentation, decoctions of rofemary, fage, ferpyllum, marjoram, and the like warm herbs in red wine.

When the difeafe is occafioned by an impofthume or ulcer in the neck of the bladder, balfamics are to be given, as maftic, gum juniper, and boiled turpentine; but when it is owing to injuries received in child-birth, the manual operation of the furgeon is ufually to be preferred to all internal medicines. *Junker's* Confp. Med. p. 538.

Suppreffion of URINE. See the article SUPPRESSION *of Urine*.

URINE *of a Cow.* This difagreeable potion having been much recommended as a medicine both in England and France, Mr. Lemery was at the pains of inquiring how far it might reafonably be fuppofed to poffefs the virtues afcribed to it.

He obferves, that *Urine* in general is a ferous liquor, impregnated with a volatile falt and oil, both which it has taken up from the blood, in the courfe of its circulation with it. It is eafy to conceive, that principles fo active as thefe may give it virtues, and thofe very great ones. We find that recent human *Urine* purges, when taken in a proper quantity; but for all medicinal purpofes, it muft be much more proper to take the *Urine* of fome animal which feeds only on vegetables, that being a fort of extract of the more fubtle faline parts of the herbs on which the creature feeds.

Tho' the *Urine* of any of thefe animals feems equally to be recommended; yet that of the cow has, in all times, been preferred to others, from the quantities of it eafily obtained, and the tame and pacific nature of the animal, which has been fuppofed fo far to influence it, as to occafion its *Urine* to be lefs acrid than in other beafts.

The fpring feafon is the propereft for the ufe of this remedy, and the method of taking it is to drink two or three large glaffes in a morning fafting, a quarter of an hour after one another: Thus taken, it purges both by ftool and *Urine*; the perfon is to walk about, after taking it; and it has been found, in this manner, to do great fervice in jaundices, dropfies, rheumatifms, and afthmas, as alfo in fciaticas, and vapours.

Mr. Lemery gives feveral inftances of cures performed by it, under his own direction, and afterwards proceeds to give its analyfis.

This *Urine* is ufually fomewhat turbid, and when it has been fuffered to ftand by a little, depofits a fediment; it is of a pale yellow colour, and of a faint fmell, greatly different from the *Urine* of the generality of other animals, and refembling the fmell of the dung of the fame creature, only lefs ftrong, and with fome mixture of the fmell of new milk.

The tafte is faline, acrid, and bitter; cows kept in cities often have their *Urine* very acrid; but thofe in the fields frequently have it with only a flight bitternefs at firft, and not fhewing its faline or acrid properties till after it has been made fome hours. It always readily ferments with acids.

Mr. Lemery put into a cucurbit fixteen pounds of *Urine of a cow*, kept in the country, and which had been made two days; This being diftilled in a cucurbit, purged with lefs violence than before. The purging virtue plainly confifts in a volatile falt, which the *Urine* carries up with it in vapour; for it taftes fomewhat acrid and faline after diftillation.

The diftillation being continued in the ordinary way, there arifes a large quantity of volatile falt and oil, in nothing differing from thofe of the human *Urine*; and the remainder, in the bottom of the veffel is a black, light, and fpongy coal, weighing four ounces: this, being calcined in an unglazed earthen veffel, over an open fire, and treated in the common way of elixiviation, affords three ounces two drams and a half of a fixed acrid and highly alkaline falt, white, and without fmell. Mem. Acad. Par. 1707.

URN (*Cycl.*)—*Roman* URNS. Thefe veffels are frequent in many parts of this kingdom, where there have been Roman ftations, and are of very various kinds and manner of workmanfhip.

Dr. Lifter, who was very fortunate in his refearches into the ftructure and differences of thefe remains of antiquity, obferved, that in Yorkfhire, where there are great numbers found, there were met with three very different kinds, as to their matter and tempers.

1. A bluifh-grey fort, which had a great quantity of coarfe fand wrought in among the clay. 2. A fort of the fame bluifh colour, but containing a fand of a much finer kind, and full of mica, and probably made of a clay naturally fandy, or a fine fmooth and ftiff loam. And 3. A red fort, made of a fine pure clay, with little or no mixture of fand. Thefe are throughout of a fine red colour like bole, and many of them are elegantly adorned with figures in *baffo relievo*; and ufually thefe have on the bottom, or elfe on the cover, the name of the workman, which fome have miftaken for the name of the perfon whofe afhes they inclofe; but this muft be an error, fince great number of pots and urns are found with the fame name. Thefe are varnifhed all over, both infide and out, with a varnifh of a bright red colour.

The feveral matters of thefe *Urns* informed this ingenious inquirer of the place where they were made; which he found to

to be in the same county on sand-hills, now never used as potteries; but, as he well observes, the difference is very great between the potteries of those days and of ours, since we, who use great quantities of clay, and but little sand, erect these works where there is much clay, and bring the small quantity of sand we use to it; whereas the Romans, on the other hand, who used much sand and but little clay, naturally established their works where there was plenty of sand, and brought their clay to it.

The *Roman Urns* differ from the earthen-ware made at this time in several particulars: 1. They have no lead-glazing, which seems a modern invention, and is, in many respects a very bad one. See the article GLAZING. 2. They are composed of a far larger quantity of sand than clay. And 3. they are baked not in an open fire, as our common earthen-ware, but have been inclosed in large earthen vessels, to defend them from the immediate contact of the flames; and hence it is, that the natural colour of the clay they are made of is not altered in them.

The red *Urns* seem to have been the master-piece of the workmen, and to have employed their greatest art; the embossed work upon them is often very beautiful, and their coral-like glazing is more beautiful than any thing of the modern times, and seems to have been done by dipping them all over in some appropriated liquor, and afterwards baking them in the close manner before described. This has certainly been the method they used, since the fragments of these large coffins, or cases, are found near all the Roman potteries. *Hook*'s Philosophical Collections, p. 87.

The Romans, and most other nations, contented themselves to make their funeral *Urns* of potters ware, or baked earth; but we find there have been some people who have made them of gold, on particular occasions. In the year 1685, as a peasant of the island of Funen was ploughing a piece of land, which had before lain barren, he turned up no less than six golden sepulchral *Urns*. They were all full of a greyish substance, which some took to be a grey earth; but it was much more probably ashes.

These are all preserved at this time in the musæum of the king of Denmark at Copenhagen; the largest of them weighs two ounces and a half, and the others about two ounces and one dram each. Wormius, and some others, give accounts, that it was an antient custom among the northern nations to burn their dead, and when they were great persons, to collect their ashes and bury them in golden *Urns*; and the finding these seems an evident proof of the truth of that account.

These *Urns* were very thin, and each had three rings of gold about their necks, and several circles, one within another, with one common center carved on the outside round the body of the *Urn*. They held about five ounces of liquids apiece, or a little more than that; one near six ounces.

Sepulchral *Urns* of crystal were also not uncommon; the same musæum has some of these: they are of a conic figure, and have usually a gold wire wound round them. *Urns* of this kind have been found buried in some parts of Norway. Another kind of *Urns* were those which they called *lachrymales*, or the *tear-Urns*: These were contrived to receive the tears of the friends of the deceased, which were afterwards mingled with the ashes of the burnt corpse: These were made of various materials, and of various shapes and sizes, according to the fancy of particular people. Phil. Transf. N°. 285.

UROGALLUS, in zoology, the name of a bird of the gallinaceous kind, called also *tetrao*, and in English the *cock of the wood* or *mountain*. See Tab. of Birds, N°. 25.

In shape it resembles the turkey, and approaches to it in size. Its legs are feathered down to the toes before, and naked behind. Its breast is of a pale reddish brown; the ends of the feathers white; and the whole variegated with transverse black streaks. Its belly is greyish, and its back elegantly variegated with black, reddish-brown, and grey. The ends of the feathers are all spotted with small specks, unless on the head, where they are of a fine plain black; but with a glow of purple intermixed. The tail is of a reddish brown, variegated with transverse black streaks, and is white at the tip or end. It is common on the Alps, and in some parts of Italy, and is said to be found also in the mountainous parts of Ireland. Its flesh is very delicate.

UROGALLUS *Minor*, in zoology, the name of a large bird common in some counties of England, and called the *black game*, or *grouse*, and by some authors, *tetrao minor*. *Ray*'s Ornithology, p. 123. See Tab. of Birds, N°. 26. and the article GROUSE.

UROMASTIX, in zoology, a name used by some authors for that sort of lizzard called *cordylus*. *Grew*'s Muf. p. 45. See the article CORDYLUS.

VROW-*Fish*, in zoology, the name of a fresh-water fish of the malacostomous kind, or, as we call it, the leather-mouthed kind, caught in the lakes and rivers of Germany, and esteemed a very delicate fish.

It is something like the English rudd or finscale, but its body is somewhat longer, in proportion to its breadth; its back is brown, and its belly yellow; the belly-fins near the anus are a little reddish, but all the rest are brown; the scales are large and silvery, and the irises of the eyes have each, in their lower part, a blood-coloured spot; the tail is forked; and its usual size is about seven or eight inches, though it is sometimes caught considerably larger. *Willughby*'s Hist. Pisc. p. 253.

URRY, in natural history, a name given by the people of Cheshire, and some other counties of England, to a black fat earth found in coal pits, lying immediately over the stratum of coal. It is found to be an excellent manure for land, particularly in cold clayey soils. *Mortimer*'s Husbandry.

URSUB, a name by which some of the chemical writers have called lead.

URTICA, *Nettle*, in botany, the name of a genus of plants, the characters of which are these: The flower is of the apetalous kind, being composed only of a number of stamina placed in a cup. These are barren, and the seeds grow on other plants of the same species, which have no flowers, and are contained either in round globules, or bivalve capsules, or in long tufts.

The species of *Nettle*, enumerated by Mr. Tournefort, are these: 1. The great stinging *Nettle*. 2. The great stinging *Nettle*, with red stalks. 3. The common less sharp *Nettle*. 4. The common small *Nettle*. 5. The stinging *Nettle*, with round balls, and seeds shaped like linseed. 6. The pellitory-leaved *Nettle*, with round balls. 7. The great Canada racemose *Nettle*. 8. The Canada *Nettle*, with leaves like the myrrhis. And 9. The racemose American *Nettle*, with large hazel-like leaves. *Tourn.* Inst. p. 334.

The roots of the common *Nettle* are much recommended in medicine; they are powerful diuretics, and are said to have great virtues against the stone and gravel. They cleanse the blood, and are said to be of great service in hæmorrhages of all kinds, particularly in spittings of blood, and overflowings of the menses. Authors add to this, that they are specifics, by way of antidote against the poison of henbane and hemlock; but this we are not so well assured of. The young shoots of the plant are eaten in the spring, as good against scorbutic complaints. *Dale*, Pharm.

The antients seem to have despised this plant, from its being common, and, though possessed of great virtues in medicine, neither the Greeks nor Latins have said much about it; nor have the Arabians, who abound in the imaginary virtues of plants, thought the real ones of this herb worth their consideration.

It has, however, been more honoured lately, and notwithstanding its being now the most vile and abject plant among us, as well as the least regarded by the antients, Johannes Francus, an author of considerable fame, has published a treatise solely upon it; in this he has treated at large on its history and virtues. He describes its stings in a very judicious manner, according to the present doctrine of the microscope, and gives the history of certain worms of singular kinds which feed upon it; and adds its use in our own foods as a wholesome and agreeable pot-herb; in our drink as a substitute for hops, being as well capable of preserving it as those, and its great service to the farmer in fattening hens.

John Melchiore Dreschler, in the year 1717, sustained also a thesis on the virtues and uses of this plant, which has been since printed, ornamented with several cuts. In these two authors we find the whole account of the several uses this common plant has been put to, and may be put to in our manufactures, our domestick and medicinal uses; and, if what they say be true, we must wonder to see so much value overlooked in an herb, only because it is common.

URTICA *Errans*, in zoology, the name of a sea-animal, of the nature of the common *Urtica marina* in many particulars; but as that is always fixed down to the rocks, this species is always found loose.

It has been supposed that these creatures affected the skin with a pain like that of the stinging of nettles on touching them, and even the eyes of those who only look attentively on them; but Mr. Reaumur, who saw prodigious numbers of them on the coasts of Poictou, declares that he found no such property in any of them, any more than in those fixed to the rocks.

These in substance so much resemble a stiff jelly, that if they were called sea-jellies, there would want but a short additional description to make them understood. Their flesh, if it may be so called, appears of the colour as well as the consistence of a common jelly; and if a piece of one of them be taken up, the mere heat of the hand is sufficient to make it melt away into plain water. These are notwithstanding true and perfect animals; and those who have been of a contrary opinion, have not examined them with sufficient attention. There are very different figures among them; but this is owing to their being of different species, for all those of the same species are ever exactly of the same figure. One great reason of people's supposing them unorganized bodies, is, that what is seen of them about the shores is very often a fragment of a dead animal, not the whole of a living one; and no wonder if all the

neceſſary parts of an animal could not be found in ſuch a piece of one

Though the generality of theſe animals are of the ſimple colour of a jelly, there are ſome of a greeniſh caſt, and others which have a broad band of a beautiful purple round their extremity; and ſome are beautifully ſpotted with brown. Their figure is very well expreſſed by that of the head of a large muſhroom; their upper ſurface is convex in the ſame manner, and this convexity is greater or leſs in the different kinds, as it is in the different ſpecies of muſhrooms; all that is to be obſerved on this convex ſurface, is, that it has ſeveral little protuberances on it, ſhaped like ſo many nipples, and placed in an irregular manner: theſe are of the ſame colour with the reſt of the body; but though there is nothing more to be ſeen on this ſurface, the under, or concave one, gives proof enough of a regularly organized body. The edge is very thin, and cut in ſeveral places; and juſt within that there appears a great number of concentric circles, which cover the reſt of the ſurface. Theſe are not all complete; however, thoſe which are near the center, are divided into ſixteen arcs, and thoſe more diſtant into eight. Theſe ſeparations in the circles are made by certain tubes, which are always full of water, which they can, at pleaſure of the animal, communicate to other very ſmall and fine tubes, placed between the circumferences of ſome two of the circles. Theſe ſmall tubes are of great conſequence to the well-being of the animal, and they are known to be tubes by their figure, when full, and are eaſily proved to have communication with theſe other reſervoirs, by the preſſing the larger, which always ſends the water into theſe ſmaller ones. The large veſſels, which go from the center to the circumference, and theſe ſmall circular ones ſeem, in ſome meaſure, to reſemble in their office the veſſels of larger animal bodies; and this water contained within them, to be a liquor elaborated there, and analogous to blood, which fills out and diſtends the very fine and ſmall ſolid parts, of which this animal's body is compoſed. If one of theſe animals be dried in the ſun in hot weather, there remains nothing of it but a ſubſtance like a thin parchment; but if one of them be boiled in water, it does not diſſolve away as might have been expected, but only regularly decreaſes in ſize; and when it has become of about one fourth of its natural bigneſs, it there ſtops the decreaſe, and continues nearly of that ſize, and after that will not melt away upon the hand.

Near the end of the ſtrait tubes, all the animals of this ſpecies are divided into four parts, by four bands or columns, for they are round in ſome, and flat in others. Theſe are ſometimes raiſed almoſt perpendicularly on the baſe; ſometimes they make an acute angle, and they all join at length to a round trunk of about their own length; this trunk is of a cylindric figure, and is divided into eight branches. In the ſpace contained under the four columns, there is a large canal formed by a thick membrane, which ſeems the only ſolid ſubſtance in the animal; this membrane is folded into a ſort of purſe, and forms a ſort of canal, which becoming round near the baſe of the columns, takes the ſame figure which a ribband would have, if turned round the four arms of a large and regularly ſhaped croſs. This large canal is full of a yellowiſh glutinous liquor, and it uſually gives one or two branches to each of the columns. Theſe four columns terminate, as before obſerved, in a trunk, which then divides into eight branches, and their route may be further traced through the whole body of the animal, as they contain the ſame yellowiſh liquor with this large veſſel, which is every where diſtinctly ſeen, as being very different from the reſt of the body in colour.

All the creatures of this ſpecies, which we ſee thrown upon the ſhores, are found lifeleſs and without motion; but there is nothing wonderful in that, becauſe the violent ſhocks and blows which they muſt have received, in being daſhed againſt the rocks or ſands by the waves, are enough to kill ſo tender an animal. One proof that theſe animals once lived, is, that all thoſe which we find about the ſhores are heavier than the water, and ſink to the bottom, whereas all thoſe ſeen out at ſea, ſwim upon the ſurface; and this could not be the caſe in regard to any ſubſtance heavier than water, unleſs kept up by ſome voluntary motion. This motion Mr. Reaumur has obſerved to be a reciprocal contraction and dilatation of the whole body, in the manner of a ſyſtole and diaſtole. In the contraction it elevates the convexity of the body, and in the dilatation it makes it more flat, and by continually repeating theſe motions, it keeps above water as a man does by ſwimming. Mem. Acad. Par. 1710.

URTICA *Marina*, the *Sea-Nettle*, in botany. See the articles LAMIUM and ARCHANGEL.

URTICA *Marina*, in zoology, the name of a remarkable genus of fiſhes, ſo called from their affecting the ſkin on touching them, with a painful ſenſation like that of the ſtinging of nettles. Theſe are an animal of the loweſt claſs, and have by many been reckoned among thoſe creatures called *zoophytes*, or plant animals, as ſuppoſed to partake of the nature of vegetables and of animals. Some of the ſpecies of this fiſh are found looſe upon the ſmooth ſhores, and ſome fixed to the rocks which are always covered with water. This has given birth to a diſtinction of them into two claſſes, which is as old as Ariſtotle; thoſe of the one being ſuch as move in the open ſea, and thoſe of the others ſuch as are fixed to rocks, and were ſuppoſed always to remain immoveably in the ſame place. The accurate Mr. Reaumur has obſerved, however, that even theſe laſt have a power of a progreſſive motion, and are not doomed to an eternal reſidence on the ſame ſpot. The motion of theſe creatures is ſo ſlow, that it might eaſily paſs unobſerved by leſs accurate obſervers; this gentleman comparing it to that of the hour-hand of a clock, and adding, that a journey of an inch takes them up commonly between one and two hours. He obſerves alſo, that many of the ſpecies have no property of ſtinging, or cauſing any painful ſenſation on the fleſh. Ariſtotle and Pliny, who were both inclined to make theſe creatures of a middle nature between plants and animals, yet differ in their accounts of them; the former affirming that they have no anus or exit for their excrements, and the other allowing them an extremely fine tube or pipe for that purpoſe. What Pliny ſeems to mean by this pipe, muſt be one of the horns of the creature; but the matter it diſcharges from that, has nothing of the appearance of excrements, being mere clean water. Senſation, a power of eating and digeſting food, and locomotion, being certainly ſufficient characters of animal life, and this creature being evidently poſſeſſed of them all, there is no room to doubt its being as truly and properly an animal, as a whale or an elephant.

Theſe creatures occaſionally change their bodies into ſo many different forms, that there is no giving any deſcription of their figure. The moſt natural and general ſhape, ſeems that of a truncated cone, the baſe of which is applied to the rock; but this baſe is often round, often elliptic, and often of a perfectly irregular figure. This baſe is alſo ſometimes perpendicular to the ſummit; but very often it is oblique; and in changing the figure and extenſion of this, the animal alters its own whole ſhape at pleaſure; for the ſmaller this baſe is, the more elevated is the top; and, on the contrary, the broader it is, the flatter and lower is the whole fiſh. The ſurface of the top of the cone is not flat, but convex, and has in its center an aperture, which the creature makes larger or ſmaller at pleaſure. In ſome poſitions the whole fiſh not unaptly reſembles a purſe, only with this difference, that the body is not drawn up into any folds or wrinkles by the cloſing the aperture or mouth. In the middle of this purſe, as we call it, is placed the body of the fiſh, touching this outer covering at the bottom on every ſide, and of a conic figure, as that is. At its top, however, it is looſe, and ſtands every way free from its covering; the ſides are more or leſs diſtant from this free or looſe part of the body, as the aperture at the top of the cone is more or leſs open; when it is nearly ſhut up, very little of the body of the animal can be ſeen; but when it opens it to different widths, more or leſs of the body becomes viſible, and when it is at the wideſt, every part of it, and all the horns, are ſeen perfectly diſtinct. Theſe horns reſemble in appearance thoſe of the common ſnail; but in their uſe they ſeem much more allied to the pipes or proboſcides of the chamæ kind, the fiſh generally throwing out water at them on being touched. They are placed in three ranges on the internal ſurface of the covering, and are very numerous, their whole number not being leſs than 150.

The creature very often not only opens the outer covering or purſe to the utmoſt width it is capable of, but at the ſame time turns back its extremities; in this caſe the internal part, or body of the fiſh, becomes viſible on the ſurface, and at the ſame time all the horns being, by this bending back of the ſkin on which they grow, thrown into the poſture of ſo many rays; the whole makes a very remarkable figure, and not unaptly reſembles an anemony, or ſome other ſuch flower, when fully open. Very often alſo there is a great addition to the beauty of this appearance, by ſeveral round veſicles of water, which appear blue, or of ſome other lively colour. The general colour of the different ſpecies of this fiſh, or indeed of the ſame ſpecies in different circumſtances, is as variable as the ſhape; ſometimes they are ſeen pellucid and colourleſs, ſometimes white, often yellowiſh, ſometimes of a roſe colour; at other times they are of a beautiful green, and often of various ſhades of brown. In ſome theſe colours are equally diffuſed through every part; in others they are only ſeen in form of ſpots and clouds or variegations; ſometimes theſe are irregularly diſpoſed, ſometimes more regularly; but always with great beauty. The green ones have uſually a broad line of blue all round their baſe. The colours nor ſhapes of theſe animals can be no marks of different ſpecies; but the firmneſs of their fleſh may; in this they remarkably differ one from another, and this is a difference the more obvious, as their fleſh is always open to the touch, there being no ſhell, nor any other hard ſubſtance to cover it.

However ſlow the progreſſive motion of this fiſh is, when examined it is found to depend on a very remarkable mechaniſm, to underſtand which we muſt attentively conſider what is obvious to the eye in the ſtructure of the creature, and remember the compariſon of the whole fiſh to a purſe. We find that what reſembles the bottom of that purſe is flat, and is fixed to the rock, while the body of the fiſh is

contained

contained in the reft of the purfe, but never fills it, unlefs when the mouth of the purfe or covering is clofe drawn together. The whole covering is a collection of mufcles which are all tubular. The bafe of the fifh never appears to us, becaufe always fixed down to the rock; but when the creature is raifed from that pofition, and the bafe examined, it appears compofed of a vaft number of tubes placed one behind another, and running from the center to the circumference. Thefe tubes are often filled with an aqueous liquor, which may be forced out on preffing them. Befides thefe tubes, there are alfo to be feen many circular ones, which furround one another, and have for their common center that of the bafe. The conic part of the covering is in the fame manner compofed of a number of circular tubes, which are placed very clofe to one another, and all run parallel with the round verge of the bafe, and terminate at the upper circle or rim of the cone. Under thefe there is another feries of ftrait tubes, which all run from the bafe to the top of the cone. It is remarkable that the circular and ftrait mufcles are never feen together in the fame place; whether it be that the extending of the one fet makes the others flaccid, or only that the lefs extended ones are hid by thofe which are more fo. Sometimes there are only the circular ones vifible, fometimes only the ftrait ones, and often only a few of the circular ones appear, refembling fo many bands, between which it is eafy to fee the parts of the ftrait ones which lie under them. The creature feems capable of making all thefe changes at pleafure, filling fuch as it will with an aqueous liquor, which is the caufe of their becoming more vifible, and which is let out, if they are pricked with the point of a pin. The inflation of different parts of thefe ranges of ftrait and circular tubes, is what makes all the differences in the fhape of the fifh, and ferves alfo to the purpofe of its progreffive motion; and it feems probable that the aqueous liquor which ferves to diftend them, is, at the pleafure of the creature, conveyed to them from the horns, and from them back to the horns again. The progreffive motion feems thus performed: When the creature has determined which way it will march, it diftends all thofe longitudinal tubes which are on that fide of its body which is placed toward the point it would move to; this, from its round fhape at the bafe, gives it an oblong one; that is, it throws the fore-part fomewhat forward upon the rock; and, at the fame time, if the longitudinal tubes on the oppofite fide of the body be all left empty, and the circular ones diftended, thefe naturally draw the whole body toward the fore-part, and thus a fmall advance is made and preferved, and this, often repeated, is the flow progreffion of this animal. All this is, however, performed fo very flowly, that though there is a continual change going on in the creature, both as to fhape and place, yet if the eye is kept continually on the object, neither is perceived; but, if taken off for fome time, and the place and figure both kept in mind, both will be found to be altered on viewing again.

There is a fpecies of this fifh alfo which moves by means of its horns; this is known from the reft by the length of the horns, and their being covered with a glutinous moifture. This fpecies lives in the cavities and holes of rocks; and when it has a mind to move, it turns itfelf bottom upwards, and crawls flowly on by means of its horns, which then touch the rock.

The food of the *Urtica-marina* is not lefs wonderful than its ftructure and motions. It fhould feem very ftrange that an animal, foft like this creature, with no feet, no inftrument of that kind to help itfelf with, fhould be able to feed on the flefh of mufcles, fea-fnails, and other fhell-fifh; yet thefe are its conftant food. They find means to take in the fhell-fifh whole into the body, and then clofe the aperture faft upon it, fo that it is not to be feen that they have any fuch thing within them; they keep them here as long as they pleafe, and afterwards throw out the empty fhells by the fame aperture, which they can, as before obferved, widen and contract at pleafure. By what means the *Urtica* is able to get out the body of thefe fifh, is not known, as it all paffes in the body; but it very often fails, and the creature is obliged to throw out the fhell fifh alive again; and fometimes, when it has greedily gorged too large a morfel, and it is got into a wrong pofition to be thrown out the fame way, it is obliged to let it through the bafe, where there is no natural aperture, and where its paffage muft be attended with a terrible wound. The manner in which the larger fhells are thrown out by the mouth, is by opening it extremely wide, and turning it back, fo that the infide appears outward for a little way down; and this motion is alfo ufed on another very neceffary occafion, the excluding the young ones, for thefe animals are viviparous. Mem. Acad. Par. 1710.

It has been found that this creature has the remarkable property of the polype, in re-producing fuch parts as it had loft. Mr. Reaumur tried many experiments on the various fpecies of this, and of the ftar-fifh kind, and found that whatever parts were cut off, the wound foon healed; and Mr. de Villars had opportunities of watching the whole progrefs of the growth of the animals afterwards, and found that they not only feemed alive and well after cutting, their wounds foon cicatrifing, but that they, in a very little time, regained what had been cut off, and became as perfect as before.

URUS, in natural hiftory, the name of a fpecies of wild bull, of a very remarkable fize and ftrength. Cæfar, in his commentaries, has defcribed them as little inferior to elephants in fize, and refembling the bull in fhape, figure, and colour. He adds, that they were very fwift and fierce, and had horns very much larger, and very different from thofe of the common bull. And Mentzelius tells us, that it is a vaft and terrible fpecies of wild bull, common in Livonia, *&c.* and that when killed, its brain is found fcented like mufk. Mr. Ray wifhes very much, that fome one, who has an opportunity of feeing this creature, would give a more accurate and perfect account than thofe we already have of it. *Ray*'s Syn. Quad p. 70.

USNEA, (*Cycl.*) in botany, the name of a genus of moffes, the characters of which are thefe: They are wholly deftitute of leaves, and are compofed only of long flender filaments or ftalks, which are ufually folid, rigid, and of a cylindric figure. The extremities, or other parts of thefe, are at times furnifhed with a fort of orbicular bodies, dry and deftitute of ufe, but feeming to fupply the place of flowers. Thefe are hollow, in form of cups, but have no rim. The whole plants are fixed in the manner of miffetoe to the barks of trees. Micheli has given accounts of flowers and feeds in thefe plants; but Dillenius fufpects the accuracy of the obfervation, and adds, that if there are fuch, they are too minute to be of any fervice in the general diftinctions of the plants. *Dillen.* Hift. Mufc. p. 68.

Of this genus of plants there are nineteen known fpecies. 1. The ftringy-tree mofs, or common *Ufnea* of the fhops. This confifts of long and varioufly implicated threads, which are branched out into feveral divifions; this grows on old oaks, and other trees, in thick woods. 2. The wide-forked tree *Ufnea*, with finer points, defcribed by Micheli, and in its feveral varieties, by him called of three fpecies. It is compofed of thicker branches than the former, and they are only dichotomoufly divided, having no fmall branches but at the points or ends. 3. The wide forked *Ufnea*, with thicker points; this and the two former are of a grey colour, and this compofed of rough rufhy branches. It grows on old fir-trees. 4. The capillaceous knotty tree *Ufnea*, called the *long beaded Ufnea*, or *necklace mofs*. This is of a bluifh-grey colour, and hangs down from the branches of old trees. 5. The flat Alpine *Ufnea*. This is fofter than the others, and has long and flatted branches, and commonly is found on the larch-tree. 6. The beard *Ufnea*. This is compofed of thin and fibrous branches, and is ufually more or lefs knotty. It is of a pale grey colour, and grows on old beech, and other trees. 7. The black mane *Ufnea*. This grows in great plenty in the Hartz Foreft, and in fome parts of England. It is rigid, and of a rufty black. 8. The black, hard, woolly *Ufnea*. This grows on rocks and ftones, and refembles flocks of black wool, but is more rigid. 9. The black tufted *Ufnea*. This alfo grows on ftones; it is fmall and flender, but ufually ftands in thick tufts. 10. The hard and rigid tree *Ufnea*, with branches expanded every way. This is of a greenifh grey, and grows on oaks, and fometimes on rotten pofts and old boards. 11. The horfehair *Ufnea*. This is black, and compofed of flender filaments, fcarce at all branched, refembling horfe-hairs. It is common on the barks of trees in Patagonia. 12. The common fmall *Ufnea*, without rundles or cups. This is a very common mofs on old trees and boards; it is very much branched, and does not hang in long ftrings, like the others, but is of a fomewhat fhrubby appearance. 13. The common fmaller *Ufnea* with rundles. This is not lefs common than the former, and much refembles it; but the lateral branches are more rigid. 14. The true *Ufnea* of the Arabian phyficians. This is of a whitifh colour and fmooth furface, and is divided in the manner of a ftag's horns, and of a very agreeable fmell. The branches are partly cylindric, but a little compreffed, and are ufually crooked, and divided into many filaments. It is not a native of England, but is very common in the Eaft Indies, and in many other parts of the world. Bellonius fays, that it is commonly fold in Conftantinople. 15. The orange-coloured forked *Ufnea*. This is of a deep yellow, and confifts of flatted branches, dichotomoufly divided, and terminating in fine flender filaments. It is often found of a foot in length, and is common in the Canaries. 16. The brafs wire *Ufnea*. This is of a fine gold yellow; its branches are cylindric and rigid, and it grows up in the form of a fmall fhrub. 17. The fmaller yellowifh tree *Ufnea*, with coronated rundles. This is fmaller, and of a paler yellow than the other, and its branches are thicker. 18. The fmall hairy black *Ufnea*. This grows on ftones and rocks, and is very fhort and rigid. 19. The fmalleft of all the *Ufneas*. This is of a black colour, and grows on the barks of old trees, but is fo fmall as to be fcarce vifible. *Dillen.* Hift. Mufc. p. 70.

USNEN, in botany, a name given by Avifenna and Serapion to the plant Kali, of which the alkali falt called *pot-afhes*, and ufed in the compounding our foap, is made. There are alfo feveral other things called by this name, and, in general, all that were

were used in the scouring or cleaning of clothes. The dung of sparrows was used by some people for this purpose, as the dung of hogs is at this time, and this was therefore called by some *Usnen*. Hyssop, a plant famous for its cleansing virtue, was also called by the same name; and some have also applied it to the soldanella, or sea bind-weed.

Wherever, in the Arabian writers, the word *Usnen* is used in any of these latter senses, there is something added to distinguish which of the things before expressed is meant by it; but whenever it stands alone and unexplained, it is to be understood as meaning the *kali*.

USSAC, in the materia medica of the Arabians, a name given by Serapio to the gum ammoniacum of the Greek writers. It seems no other than a false spelling of the word *assac*, which is the common name of the gum in Avisenna, and other of the writers of that nation; but this does not seem to be the same drug which we call gum ammoniacum at this time.

USTRINA, among the Romans, the place where they burnt the bodies of the dead. It was commonly in the Campus Martius, or some other place in the suburbs, and sometimes in the city for persons of quality; and for the common people on the Esquiline mount. *Danet.* in voc. See the article Bustum.

USTULATION, *Ustulatio*, a word used by pharmaceutic writers to express the roasting or torrefying of humid or moist substances over a gentle fire, so as to render them fit for powdering. The same word is also used by some for what we call burning of wine.

UTAMANIA, in zoology, the name of a bird of the web-footed kind, wanting the hinder toe. It is common about the island of Crete, and is very expert at diving. It is of the size of a teal, and has its head and back black, and its belly white. Its feathers are soft and slender, and rather resemble down than plumage; but they are very firmly affixed to the skin. Its beak is sharp at the edges, and is covered in a great part with down. Bellonius, who describes the bird, supposes it to be the only web-footed one that wants the hinder toe; but in this he is mistaken: his description and figure comes also so near the common beak or razor-bill, that it is pretty certain the bird is nearly allied to that, if at all essentially different. *Bellonius* de Avib. *Aldrovand.* de Avib. T. 3. p. 240.

UTAS, *Octava*, in our statutes, the eighth day following any feast or term; as the *Utas of St. Michael*, &c. And any day between the feast and the octave is said to be within the *Utas*. The use of this is in the return of writs, as appears by Stat 51 Hen 3. *Blount*, *Cowel.*

UTERINE (*Cycl.*)—Uterine *Hæmorrhages*. In this dangerous disorder the styptic powder of Helvetius is much recommended: and the stybium ceratum has also been tried with great success. See the articles Styptic *Powders* and Vitrum *Antimonii Ceratum.*

UTERINUS *Lapis*, in natural history, a name given by some authors to a stone found in New Spain, and in some other parts of America; it is very hard and heavy, of a beautiful black, and capable of a very elegant polish. The natives cut it into various shapes, and apply it to the navel in diseases of the womb, and pretend that it possesses very great virtues.

UTERUS (*Cycl.*)—Authors have differed as to the thickness of the *Uterus* of a woman with child. In an account of a dissection of a woman dead in labour, mentioned in the Medical Essays, vol. 4. art. 33, it is said, the *Uterus* was found at least half an inch thick in the thinnest part, and a good deal more at the fundus.

Uterus *of Fishes.*—Among the fish kinds, all those which are oviparous have no *Uterus*; but, on the contrary, all the viviparous fishes have this part. The whales, and all the cetaceous kinds, as also many of the cartilaginous ones, have the *Uterus* very fair. It is probable that the eel kind also have it; but this is less certain, the generation of those fishes being yet somewhat obscure. The *Uterus* in the cetaceous fishes is always divided into two processes or horns; but in the cartilaginous ones it is divided into two glandulous bodies, which are pervious, and, according to the opinion of Needham, discharge a whitish liquor into the womb, and are of great use in gravidation.

UTFANGTHEF, in our old law-books. See the article Outfangthef, *Cycl.*

UT Queant Laxis, *&c.* in antient modern music, a hymn to *St. John the Baptist*, composed about the year 770, in the time of Charlemagne, according to Possevin, by Paulus Diaconus of Aquileia. It is very famous in music, because the syllables whereby the musical sounds are distinguished, were taken by Guido Aretine from the first strophe thereof.

UTRAQUISTÆ, in church history, an appellation given by way of reproach, to those in Bohemia who communicate under both species, bread and wine. *Hofm.* Lex Univ. in voc.

UTRICULARIA, in botany, the name of a plant used by Linnæus for what other authors have called *lentibularia*, or hooded water milfoil. This, in his system of botany, is also a distinct genus of plants, the characters of which are, that the cup is a two-leaved perianthium; its leaves being very small, of an oval figure, hollow, and falling with the flower. The flower is labiated, and consists of one petal; the upper lip is plain, obtuse, and erect; the lower is large, plain, and undivided; between the two there is a heart-fashioned palate, standing a little out; the nectarium is corniculated, is shorter than the petal, and is produced from its base. The stamina are two short and crooked filaments; the antheræ are small, and cohere together; the pistillum has a round germen, a thread-like style of the length of the cup, and a conic stigma. The fruit is a large conic capsule, containing only one cavity. The seeds are very numerous.

UTRICULI *Foliorum*, a name given by the writers on the anatomy of plants to a number of small and fine vessels, which fill up the interstices between the several ramifications of the surculi, or minutest divisions of the branches of the middle rib.

These are to be examined by good microscopes, in order to obtain any idea of their structure. This is found to be composed of a reticular plexus of fine white and flat filaments, whose interstices are again filled up with other smaller *Utriculi*; so that nature seems but forming new bodies, by making congeries of the same, but in a more minute state. When the largest of these are opened by a fine instrument, they are found to consist only of a white skin, containing a greenish matter, composed of particles so fine, that the best glasses are used in vain to distinguish their figure.

Accident sometimes offers what all the art in the world would attempt in vain; and the leaves of trees, whose cuticle has been eat off on one side by small insects, sometimes afford views of these *Utriculi*, which no art could have laid open in so nice a manner, or in such various views. Act. Erudit. Ann. 1722. p. 28.

UVA, *Grape*. See the article Grape.

Uva *Gruina*, in the materia medica, the name of the fruit of the great American *vitis idæa*, or crane-berries. *Dale*, Pharm. p. 173.

Uva *Lupina*, *Wolf-Berries*, in botany, a name given by some authors to the common water-elder, and by others to the *herba Paris*, or herb true-love. *Ger.* Emac. Ind. 2.

Uva *Marina*, in botany, the name given by many authors to the *ephedra*, the sea-grape, or shrub sea horse-tail. *J. Bauhin.* vol. 1. p. 406.

Uva *Quercus*, in natural history, a name given to certain accidental productions of the oak, a tree famous for producing many such, beside its common fruit: The best account we have of this in particular, is from Mr. Marchant. He observed a vast quantity of this production upon an oak of about twelve foot high; this tree had no acorns, but there hung from almost all the branches a great number of greyish threads, of two inches or more in length, and of a silky flexible matter; to several parts of these there were fixed certain round red berries, sometimes two or three, sometimes ten or twelve on a thread; these were of the size of a half-ripe red gooseberry, but they had no umbilicus, nor any appearance of fibres; they were hard, and not hollow, but filled with a cottony matter, very closely compacted. The threads on which these berries were produced all grew out of the alæ of the leaves, in the very places where the beds for the rudiments of young branches should have come; and over these filaments there were often a few small leaves, of the regular shape of the oak-leaf.

It is generally asserted, that there are eggs of insects lodged in all these extraordinary productions of the oak, which are supposed to be produced by a wrong derivation of the juices, occasioned by the puncture of the fly which leaves those eggs; but the most accurate search could not discover the least appearance of any animal remains in any part of these productions, neither in the berries, nor in the threads that support them.

There is another species of this remarkable production, differing from the former, by not having the long threads on which the berries of that are supported; this, however, has been confounded by the generality of naturalists under the same name, and of this Mr. Marchant has given an equally accurate description. In the month of October he observed a young oak of about six foot high, in a coppice-wood, in a very flourishing condition, very full of branches and leaves, but without fruit. The young branches of this oak were loaded with clusters of red berries, of the shape and size of common red gooseberries; they stood principally at or near the extremities of the branches, and were of a very polished and shining surface, and of a spongy and tender substance. They stood in clusters of three, four, and five together, and each grew immediately to the branch, without any pedicle; they had some appearance of fibres, but not the least mark of an umbilicus, as in the regular fruits. On opening these berries, they were found full of a mucilaginous and viscous juice, of a red colour, tolerably fluid, and having some fibres intermingled with it; the taste of this juice was acrid, and its smell disagreeable, and like that of rotten wood; but there appeared not in these, any more than in the other species, any

any the leaſt appearance of any thing belonging to an animal, no egg, no worm, no fly, nor indeed any foreign body of any ſort whatever.

Theſe berries, though ſo large and ſucculent, are but of a very ſhort duration, for Mr. Marchant going three days after he had ſeen them in the greateſt perfection, to gather ſome of them, with intent to try their juice on different liquors, found they were all become flaccid and withered; and returning again three days after this, they were ſo entirely periſhed and gone, that there remained only a few veſtiges of thin ſkins on the places where they had been fixed to the tree, and ſome few fallen ones among the buſhes, that grew under the tree; and upon inquiring of the people who lived thereabout, to know whether theſe berries were a regular annual production of the tree, they told him that they never remembered to have ſeen any thing of the kind before.

It may not be eaſy perhaps to account regularly for theſe fortuitous productions; for they ſeem merely of the nature of monſters among animals, and it may be allowed no improbable conjecture in regard to them, that the root of theſe ſmall trees having taken in more nouriſhment than they could circulate, when it came to load the tender extremities of the young branches, may have made its way through their laxer texture, and being retained yet in ſome of their membranes, may have ſwelled out more and more, by the addition of freſh matter, and finally have been maturated by the ſun's heat into theſe ſeemingly regular productions. Mem. Acad. Par. 1692.

Uva *Urſi*, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the globoſe bell-ſhaped kind, conſiſting only of one leaf. The piſtil ariſes from the cup, and is fixed in the manner of a nail into the hinder part of the flower. This finally becomes a round ſoft fruit or herry, containing little ſtony ſeeds, which are gibboſe on one ſide, and flat on the other.

There is only one known ſpecies of the *Uva Urſi*, which is the plant called by ſome *idæa radix*, and by others the *whortle-berry*, with thick, fleſhy, and, as it were, punctated leaves. *Tourn.* Inſt. p. 599.

Uva *Vulpis*, a name given by ſome authors to the common nightſhade. *Ger.* Emac. Ind. 2.

VUBARANA, in zoology, the name of a harengiform fiſh, caught in the American ſeas.

It reſembles in figure our river trout. Its body is very nearly of the ſame thickneſs all the way, but is elevated a little on the back, and ſomewhat ſlender juſt near the tail. It grows to a foot in length, and to ſix inches in thickneſs. Its head is ſmall, and pointed; its mouth not large, and having no teeth; and its tongue long. It has but one fin on the back, and its tail is long and forked. Its ſcales are very ſmall, and are diſpoſed ſo evenly, and laid ſo cloſely down, that it ſeems ſmooth to the touch. Its back is of a bluiſh white, and the reſt of its body appears either of an olive colour, or of a ſilvery white, according to the light in which it is viewed. The belly is ſomewhat flat, and perfectly white, and the coverings of the gills ſeem plates of ſilver, their whiteneſs and luſtre are ſo elegant. It is a very well taſted fiſh, and is generally dreſſed with the ſcales on, they being not offenſive in eating. *Marggrave*'s Hiſtory of Braſil.

UVEA (*Cycl.*)—Mr. Ferren demonſtrated to the academy of ſciences at Paris, the lymphatic veſſels of the *Uvea* of the human eye. Hiſt. de l'Acad. des Sciences, 1738.

VULCANALIA, among the Romans, a feſtival in honour of Vulcan, which was kept from the twenty-third to the twenty-ninth of Auguſt. On this occaſion the people uſed to throw animals into the fire. *Pitiſc.* in voc.

VULGAGO, a name given by ſome botanical authors to the aſarum or aſarabacca, whoſe leaves and root are uſed in medicine. *Ger.* Emac. Ind. 2.

VULNERARIA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the papilionaceous kind, and from its cup, which is of a tubular form and turgid, there ariſes a piſtil, which finally becomes a ſhort pod, containing roundiſh ſeeds; and being contained in a membranaceous bladder, which was before the cup of the flower.

The ſpecies of *Vulneraria*, enumerated by Mr. Tournefort, are theſe: 1. The common yellow-flowered *Vulneraria*, called *kidney-vetch*, and *ladies finger*. 2. The white-flowered *Vulneraria*. 3. The purple-flowered *Vulneraria*. 4. The five-leaved *Vulneraria*, called by many the *bladder lotus*. *Tourn.* Inſt. p. 391.

VULPANSER, in zoology, a name given by ſome authors to the ſhell-drake, or burrow-duck, a very beautiful ſpecies of duck, common on ſome of our coaſts, and called by the generality of authors *tadoma*. See the article Tadoma.

VULPECULA, in ichthyology, a name given by Bellonius and Geſner to the fiſh called by the generality of authors *centrine*.

It is a ſpecies of the ſqualus, diſtinguiſhed by Artedi under the name of the *triangular-bodied ſqualus, with no pinna ani*. The Italians call this *peſce porco*. See the article Squalus.

VULPES, the *Fox*. This creature has been long famed for its cunning, and is plainly of the dog-kind.

It differs, however, from the common dog in the length, denſe diſpoſition, and ſoftneſs of its hairs, eſpecially thoſe about its tail, and in its ſmell, which is peculiarly rank and diſagreeable. Its uſual colour is a reddiſh tawney, though it is ſometimes found white, and ſometimes black. Its manner of digging itſelf a hole in the earth, is alſo a cuſtom wholly different from all the dog kind, and it is far from the tameneſs of that animal, being with difficulty made to loſe its fierceneſs. Its internal parts, in general, are very like thoſe of a dog. *Ray*'s Syn. Quad. p. 177.

Vulpes *Marina*, or *Alopecias*, in natural hiſtory, the name given by authors to a large fiſh, called the *ſea-fox* by us.

It is ſaid by many authors to have naturally the rank ſmell of the fox, and to be one of the worſt-taſted fiſhes in the world; but this does not appear to be true, on a ſtrict inquiry; for its ſmell ſeems very little different from that of other fiſhes, and its fleſh is well-taſted; ſo that theſe things ſeem only to have been ſaid, in order to ſtrengthen the reſemblance with the fox; a name which ſeems, upon the whole, to have been given it only from the length of its tail; and even that, though very long for a fiſh of this kind, has no reſemblance with the tail of a fox. The length of this fiſh is about nine foot, and its breadth, in the broadeſt part of the belly, fourteen inches. Its tail is nearly as long as the whole body beſide, and is of the ſhapé of a ſcythe, and is bent downwards. Near the origin of the tail, it has a ſingle fin below, and the ſpine is more moveable up and down in this part, than in any other; ſo that the tail is, by this means, eaſily elevated or depreſſed. It has two eminences on the back, one large one near the middle, and the other a ſmall one near the tail: And it has three fins on each ſide; the pair that ſtand near the head are large, and reſemble the wings of a bird; the others are ſmaller. The ſkin is ſmooth, and without ſcales; and the fins and eminences on the back are compoſed of a ſort of ribs, held together by a tough and ſtrong membrane. The tongue adheres inſeparably to the lower jaw, and is compoſed of a great number of bones, articulated together by a fleſhy ſubſtance of a fibroſe texture, and covered with a membrane beſet with ſeveral prominences, which make it feel very ſmooth when the hand is drawn from the point towards the root; but very rough when it is drawn the contrary way. Theſe prominences, when viewed by the microſcope, appear as pellucid as the fineſt cryſtal. Its throat and ſtomach are remarkably large; and authors ſay, that when in a fright it will ſwallow its young ones into its ſtomach, and afterwards caſt them up again when the danger is over. Others who ſpeak largely of its cunning, ſay, that when it has ſwallowed a bait at a hook, it will take in the whole line, till it comes to a weak place, where it can bite it aſunder. This is a tale very well calculated for the carrying on a reſemblance with the fox in cunning; but it is very ill adapted to this fiſh, which has no teeth with which it can bite any thing aſunder. The heart of this fiſh is remarkably ſmall, nothing larger than a hen's egg; it is alſo much of the ſame ſhape, and has no pericardium; but the aorta for a little way is covered with a membrane analogous to a pericardium. The head ſeems a mere lump of fleſh, being covered with muſcles, of which ſome are four inches thick; and though the head is ſo large, the ſkull is not bigger than a man's fiſt; it is thick, and is divided within into three cavities, each of which contains a ſmall quantity of a mucous matter mixed with blood; ſo that the fiſh ſeems ſcarce to have any brain at all, what little matter of it there is being quite ſoft, and having very few windings. The eyes are as large as thoſe of an ox, and are only hemiſpheric in figure, being flat before, ſo that they appear of a very ſingular ſhape. Mem. pour Hiſt. Anim. p. 114.

The guts of this fiſh have a very peculiar ſtructure. In the upper part of them, inſtead of the ordinary circumvolutions of the guts of animals, the cavity is diſtinguiſhed by many tranſverſe ſeparations compoſed of the membranes of the inteſtine turned inwards: Theſe ſeparations ſtand at about half an inch diſtance from one another, and turn helically like a ſnail-ſhell. The conſequence of this is, that the food is detained a long time in its paſſage, though the way it has to go be very ſhort. This creature feeds both on other fiſh, and on ſea-plants; and it is very remarkable, that the fiſh it has devoured are ſometimes found in its ſtomach without the head, ſcales, ſkin, and bowels, the muſcular fleſh remaining entire, while all theſe harder and tougher parts are diſſolved. Ouvrage adoptez de l'Acad. Par. vol. 1.

VULTURIUS, among the Romans, a throw of the *tali*, otherwiſe called *canis*. *Pitiſc.* in voc. See the articles Canis and Talarius *Ludus*.

VULTURIUS *Lapis*, a name given by many to the ftone called *quandros*. See the article QUANDROS.

VULTURNALIA. See the article VOLTURNALIA.

VUNENA, a name given by the people of Guinea to a kind of catch-fly, or lychnis, common in that part of the world, and much ufed by them in a decoction to cure fwellings of the legs. Petiver has called it *lychnis Guineenfis fructu caryophylloide foliis roris marini, hirfutis, anguftioribus*. Phil. Tranf. N°. 232.

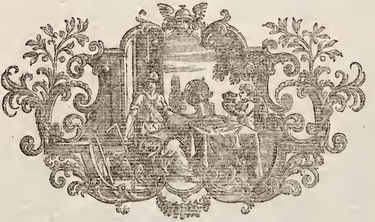
UVULA, (*Cycl.*) in anatomy, is alfo called *columella, gargareon*, γαργαρ, *gurgulio, uva, uvigena, uvigera, epiglottis*, and *cion*. *Blancard* in voc. *Cion*.

The cutting out of the *Uvula*, when fwelled and hanging down, is commonly practifed in Scotland, and no other remedy applied than a piece of bread and cheefe. The furgeon, who is fome neighbouring peafant, ufes alfo no other inftrument than his knife; and yet all fucceeds very well.

UVULÆ *Prolapfus*. See the article PROLAPSUS.

UVULARIA, in the materia medica, the name given by authors to the plant called *hypogloffum*, or double-tongue. *Dale*, Pharmac. p. 169.

UXOR, in the language of the chemifts, the mercury of metals. This is the wife they fay, and fulphur is the hufband. See the article MARITUS.



W.

WADD (*Cycl.*)—WADD-*Hook*, or WORM, a small iron turned serpent-wise like a screw, and put upon the end of a long staff, to draw out the *Wad* of a gun, when it is to be unloaded.

WAGE, in the law of England, is used for the giving security for the performance of any thing. Terms de Ley. in voc.

Thus we say, to *wage law*, to *wage deliverance*. See the article GAGE.

None *wages* law against the king. *Brook*, Abr. Tit. chose en Action. 6.

WAGGEL, in zoology, a name given by the people of Cornwall to a species of the *larus*, or sea-gull, known among authors by the name of *martinozzo*. See the article MARTINOZZO.

WAGGON (*Cycl.*)—WAGGON-*Master-General*, in the military art, is he who has the ordering and marching of the baggage of the army. On a day of march he meets the baggage at the place appointed in the orders, and marshals it according to the rank of the brigade or regiment each *Waggon* belongs to, which is sometimes in one column, sometimes in two; sometimes after the artillery; and sometimes the baggage of each column follows their respective column.

WAIN, a vehicle or carriage drawn by oxen. See the article CART.

WAKE-*Robin*, *Arum*, a medicinal plant. See the article ARUM.

WALDRAPP, in zoology, a name given by some to the wood-raven, or *corvus sylvaticus* of Gesner, a bird of the size of a hen, of a glossy black, and adorned with a crest on its head. See the article CORVUS.

WALE, or WAIL, in a ship, those outermost timbers in a ship's side, on which men set their feet when they clamber up a ship's side. They are reckoned from the water, and called her *first*, *second*, or *third Wale*, or *bend*.

WALE-*Knot*, aboard a ship, a round knot or knob made with three strands of a rope, so that it cannot slip, by which the *tacks*, *top-sail-sheets*, and *stoppers*, are made fast, as also some other ropes.

WALE-*reared*, on board a ship, a name the seamen give to a ship, which, after she comes to her bearing, is not narrow in her upper work, nor *housed in*, as their word is, but is built strait up; which way of building, though it does not look well, nor is, as they say, *ship-shapen*, yet it hath this advantage, that a ship is thereby more roomy within board, that is, she is larger within, and also becomes thereby a wholsome ship in the sea, especially if her bearing be well laid out.

WALINGHURU, in botany, a name by which some authors have called the plant, of which the medicinal zerumbeth is the root. *Herm.* Mus. Zeylon, p. 51.

WALK (*Cycl.*)—WALK, in the manege, is the slowest and least raised of all a horse's goings. The Duke of Newcastle says, that this motion is performed with two legs, diametrically opposite in the air, and two upon the ground at the same time, in form of a saint Andrew's cross: but this, in reality, is the motion of a trot; and accordingly all the later writers agree, that this author is mistaken, and that the *Walk* is performed, as any one may observe, by the horse's lifting up its two legs on a side, the one after the other, beginning with the hind-leg first. Thus, if he leads with the legs of the right side, then the right foot he lifts is the far hind-foot, and in the time he is setting it down (which in a step is always short of the tread of his fore-foot on the same side) he lifts his far fore-foot, and sets it down before his near fore-foot. Again, just as he is setting down his far fore-foot, he lifts up his near hind-foot, and sets it down again just short of his near fore-foot, and just as he is setting it down, he lifts his near fore-foot, and sets it down beyond his far fore-foot.

This is the true motion of a horse's legs in a *Walk*; and this is the pace in which many things are best taught. For instance, when the horse is to be taught to turn to the right and left, or from one hand to another, he is first to be taught it on the *Walk*, then on the trot, and finally on the gallop.

Grass WALKS. See the article GRASS.

Gravel WALKS. See the article GRAVEL.

WALKÆPETHIGA, in botany, a name by which some authors have called the tree, on which the gum lacca of the shops is usually found. *Herm.* Mus. Zeyl. p. 34.

WALL (*Cycl.*)—Of all the materials for building *Walls* for ripening fruit, brick is generally the best, as it reflects a great deal of heat, retains its warmth a great while, and affords, by the smallness of the joints, the convenience of fastening up the trees with small nails. If these *Walls* are coped with free-stone, and have stone pillasters at proper distances, to break the force of the winds, and shelter the fruit-trees, they make the most advantageous, as well as the most beautiful of all *Walls*.

It is sometimes an advantageous thing to build these *Walls* upon arches, that the roots of the trees may have room to spread under, and to the other side of them. This is necessary when the soil is a hard gravel; for without this, when the roots of peaches, &c. have reached the gravel, they find not sufficient nourishment, and the trees canker and die. But though Mr. Fairchild had found great advantages from this way of building *Walls*, Mr. Miller disapproves it. Some also have proposed the building slanting *Walls*; but the same author gives many reasons why the perpendicular are preferable, and seems to think that if *Walls* could be easily contrived to slope a little forward, they would be even preferable to these. *Miller*'s Gardener's Dict.

WALL *of Severus*. See the article AGGER.

WALL-*Flower*, in botany. See the article LEUCOIUM.

WALL-*Moss*, *Bryum*, in botany, the name of a genus of mosses, the characters of which are these: They produce membranaceous capsules, covered with a calyptra or hood, and standing on pedicles more or less long. In all this they agree with the hypnums; but they differ from them in that this pedicle has no covering round its base, but in the place of it has a node or tubercle. These pedicles also usually arise from the tops of the branches, or from those of the last years, which were then the tallest, though now nearer the roots. To this it is to be added, that the stalks are usually erect, less branched than in the hypnums, and not creeping. The calyptræ in some species stand strait, in others obliquely on the capsules; and the opercula, when the dusty matter within the head has arrived at its maturity, fall off transversely, sometimes with a smooth, sometimes with a jagged eye.

The family of the *bryums* being very numerous, they are divided into several orders and series. The first order comprehends those which have erect heads, and of these those of the first series have rounded, bellied, and turbinated heads.

Of this series the following are the know species: 1. The hair-leaved globe *Bryum*. This is called by some the *apple-headed moss*; it is a very beautiful species; the stalks are about an inch long, and stand in tufts, and the heads are round and placed on long pedicles; the leaves are of a dark green. It is common on ditch-banks. 2. The slender star-topped marsh *Bryum*, with round heads. This is another very beautiful kind. The leaves composing the starry tops of the branches are more rigid and stiff than the rest. It is common in wet places. 3. The narrow-leaved *Bryum*, with transparent thyme-like leaves, and heads shaped like cruets. This also is a beautiful species. It grows in wet mossy places, but is not very common. 4. the wide-necked cruet *Bryum*, with transparent mother-of-thyme leaves. This is found in boggy places in the west of England. 5. The narrow-leaved slender cruet *Bryum*. This is a beautiful plant, it grows to four inches in height, and is usually found on heaths about cow-dung. 6. The pear-headed *Bryum*, with transparent mother-of-thyme leaves. This is very common in February about hedges, and in shady places. *Dillen.* Hist. Musc. p. 336.

The second series of this order of *Bryums* contains those which have oblong, oval, and rounded heads. Of these the first division comprehends those which have broad leaves. Of these the following are the known species: 1. The small thyme-leaved *Bryum*, with thick-set rusty heads. This is very common on ditch-banks, and by way-sides, and produces a great number of heads. 2. The lesser extinguisher *Bryum*. The calyptra of this species exactly resembles an extinguisher. It grows in thick tufts, and its leaves are pellucid, and somewhat like those of the serpyllum. 3. The larger extinguisher *Bryum*. This is larger than the former, and somewhat branched; it grows also in thick tufts. 4. The awl-headed *Bryum*. The leaves of this are of a pale green, oblong, and hollowed in the middle; the pedicles of the heads are long, and moderately thick. It is common on ditch banks in January and February. 5. The transparent *Bryum*, with leaves leaning all one way. The leaves are obtuse and pellucid;

lucid; the pedicles of the heads about an inch long, and the heads themfelves flender. It grows in fandy places in Virginia. 6. The hoary branched country *Bryum*, with coloured heads. This grows in thick tufts, and is very common in country villages on the trunks of trees, walls, and houfes. 7. The fmooth *Bryum*, refembling the former kind. The leaves of thefe are fmaller than thofe of the other, and fmooth, and the whole plant lefs. It grows in Patagonia. 8. The common dwarf hoary wall *Bryum*. This is a very fmall fpecies, extremely common on old walls, and the tiles of houfes. 9. The common dwarf tranfparent *Bryum*, with green, not hoary leaves. This refembles the former in figure, but its leaves are broader, thinner, and more pellucid. It grows in many places on ditch-banks. *Dillen.* Hift. Mufc. p. 354.

The fecond divifion of this order of the *Bryums*, comprehends thofe with narrower leaves, of which fome are remarkably longer than others: Of thefe the following are the known fpecies: 1. The fickle-leaved bending befom *Bryum*. This is a large and erect fpecies, very common in thick tufts about hedges. 2. The red-ftalked, tranfparent, graffy-leaved *Bryum*. The ftalks are flender; the leaves of a pale green; it grows in many parts of Germany, but has not yet been obferved in England. 3. The tranfparent, hart's-tongue-leaved curled *Bryum*, with crooked heads. This is a very common fpecies. It grows to two or three inches high, and its leaves are long, narrow, and alated. 4. The juniper-leaved curled *Bryum*, with ftraiter heads. The leaves of this are narrower than thofe of the former, and lefs curled; it is very common in Virginia. 5. The larger brittle whitifh *Bryum*, with ftrait leaves, and fhort pedicles. This is a very common fpecies in wet places on heaths. It grows in very thick tufts, and imbibes and retains a great quantity of water. 6. The dwarf white larix-leaved *Bryum*. This grows in fmall and fhort tufts, and is a native of North America. *Dillen.* Hift. Mufc. p. 360.

The fecond fubdivifion of the narrow-leaved *Bryums* contains thofe of the fhort-leaved kind; of thefe the following are the known fpecies: 1. The white brittle *Bryum*, with crooked leaves. This is much like the common white heath *Bryum*; but the leaves are bent, and the pedicles of the capfules grow out of the fame parts of the ftalks, whereas in that they grow from the tops. 2. The tranfparent bog *Bryum*, with crooked fhort leaves and heads. This is common in marfhy places; it grows to two or three inches high, and ufually in very thick tufts. 3. The fhort-headed *Bryum*, with drooping leaves. This is of a yellowifh-green, and grows on wet places in the Welch mountains. 4. The fharp-headed *Bryum*, with leaves leaning one way. This grows to two inches high, and is not uncommon in the northern parts of England. The hypnum-like water *Bryum*, with pointed black calyptræ. 5. This is a very fingular fpecies; it grows in water, and lies upon ftones; but does not properly creep or root itfelf on them. It is found in rivulets in mountainous places. *Dillen.* Hift. Mufc. p. 366.

The third divifion of the firft order of *Bryums* comprehends thofe with extremely narrow, or capillaceous leaves. Of thefe fome refemble the hypnums, and many of thefe have their leaves terminated by long hairs. Of thefe the following are the known fpecies: 1. The common hoary hypnum-like *Bryum*. This is of a yellowifh green, and when dry becomes whitifh. It is confiderably branched, and is found on Hampftead-Heath, and in the like places. 2. The green cluftery Alpine *Bryum*. This is of a greenifh yellow colour, but wants the hairs which terminate the leaves of the former kind. It is common in the mountainous parts of Wales and Yorkfhire. 3. The fmall-headed hypnum-like Alpine *Bryum*. This is a fmall mofs, but much branched; the leaves are very narrow. It grows in the mountains of Wales and Yorkfhire, and is fometimes found quite black, both in leaves and ftalks. 4. The hypnum-like Alpine *Bryum*, with obtufe calyptræ. The branches of this are hairy, the leaves very numerous and very fmall, and of an obfcure brownifh green. It grows on the hills in Wales and Yorkfhire. 5. The heath-like Alpine *Bryum*, with bearded heads. The ftalks of this are lefs branched than in the former, and the leaves fhorter; it grows in mountainous places in Yorkfhire. 6. The many-headed, hoary, hypnum-like mountain *Bryum*. The ftalks of this are rigid, and are four or five inches long, fometimes fingle, fometimes branched. The leaves are narrow, and end in fine fmall hairs. It is found in the mountainous parts of Yorkfhire. *Dillen.* Hift. Mufc. p. 370.

The fecond fubdivifion of thefe *Bryums* contains fuch as are hairy, and have capillaceous leaves; but differ from the hypnums in their proper figure, and general appearance. Of thefe the following are the known fpecies: 1. The foft-hair pencil *Bryum*, with crooked fhanks. This is a very minute mofs, but very beautiful; its leaves terminate in fine hairs, and its heads are fmall. It is not unfrequent in the woods of Germany, but is not common in England. 2. The bright green, pointed fphagnum-like *Bryum*. This grows an inch or two high, and its branches are ufually divided into two or three at the ends. It grows on the mountains of Yorkfhire. 3. The whorled-hair *Bryum*. This grows in very thick tufts. The ftalks are flender, and about an inch long. The leaves are capillaceous, and the heads fmall and roundifh. It is found on the trunks of trees, and on the ground in the northern parts of England not unfrequently. 4. The conferva-like bog *Bryum*. This is very fmall, and compofed of extremely flender branches, which entangle with one another, and are furnifhed with fmall leaves placed alternately, and not fet very clofe; it grows in wet places. 5. The bending hair-pencil *Bryum*. This is a very elegant little mofs. It grows in thick tufts on ditch-banks, and is not above half an inch in height. The leaves are long and capillaceous; the heads very fmall and reddifh. 6. The cluftery crooked-leaved hair *Bryum*. This is a fmall mofs, the ftalks fometimes fimple, fometimes branched; the capfules are very flender, and their pedicles reddifh. This grows on the mountains of Wales. 7. The black-headed bog *Bryum*, with fhort leaves. The ftalks of this are flender, and feldom branched; the heads are fmall and of a blackifh brown, and the pedicles fhort. It is common in Yorkfhire. *Dillen.* Hift. Mufc. p. 376.

The third fubdivifion comprehends fuch of thefe *Bryums* as have curled leaves, or leaves that become varioufly undulated as they dry. Of thefe the following are the known fpecies: 1. The long-fhanked frizzled *Bryum*. The ftalks of this grow to near two inches high; the leaves ftand very thick, and always curl up in the drying. It is found in mountainous places. 2. The fhort-fhanked, many-headed frizzled *Bryum*. This has fhorter ftalks than the former, and the leaves ftand in clufters on the tops; it is found on the mountains of Wales and Yorkfhire. 3. The fine ftar-topped *Bryum*, which curls up its leaves in drying. This grows in thick tufts, and its leaves are of a beautiful green; it is common on heaths, and under hedges. 4. The fhort pale green hair *Bryum*, with oval heads. This is a very fmall mofs, but it grows in thick tufts; the leaves, while frefh and vigorous, are expanded, and form ftellar tops to the branches; but, in drying, they curl up and wither. It is very common on ditch-banks. 5. The neat pale green *Bryum*, with ftarry tops, and flender heads. This is a very fmall fpecies; but its ftalks are divided into fome branches. Its leaves form ftarry tops to the branches, while frefh; but they curl up and lofe their figure in drying. 7. The fmall red ftar-topped bog *Bryum*. The ftalks of this are moderately long and branched; the leaves alfo are long. It is found in the mountains of Wales. 8. The fmooth and flender pale-fhanked *Bryum*, with thick-fet leaves. This is frequent at the bottoms of old walls. *Dillen.* Hift. Mufc. p. 379.

The fourth fubdivifion of thefe *Bryums* comprehends thofe which have roftrated calyptræ and pointed capfules, afterwards becoming of the fhape of bottles, from the rim of which there grow up feveral oblong bodies, in form of a beard. Of this kind are the following fpecies: 1. The thick-topped bearded birds-claw *Bryum*. The ftalks of this are fhort, fometimes branched, fometimes not; the leaves fmall, ftrait, carinated, and of a lively green. It is common on old walls. 2. The fmall ftar-topped *Bryum*, with clawed and bearded heads. The ftalks of this are fhort; the leaves ftellate at the tops; the pedicles of the heads grow not from the fummits, but from the laft year's top of the ftalk. It grows on the ground, and is found in Germany, and in fome parts of England. 3. The flender-bearded *Bryum*, with narrow and thin-fet leaves. The ftalks of this are very flender, and fend up their pedicles from the fummit. It is common on the earth in dry places, and fometimes on old *Walls*. *Dillen.* Hift. Mufc. p. 381.

The fifth fubdivifion of thefe *Bryums* comprehends thofe which have a fhorter operculum, and whofe capfules appear ftriated when fully ripe. Of this kind are the following fpecies: 1. The fmall forked *Bryum* with twin heads. The ftalks of this are fhort, and ufually fend up two pedicles from each fummit, each carrying its capfule. The leaves are fmall, and of a dark green. 2. The ftarry-topped red-fhanked *Bryum*. This grows in clufters or tufts; the ftalks are divided fometimes into two, fometimes into three branches. It is very common by way-fides, and is eafily known by the rednefs of the pedicles. 3. The fine-leaved bog-*Bryum*, with long and fhining-red pedicles. This grows in the manner of the former; but the leaves are longer, and more pointed, and the pedicles are long, and grow feveral together from one ftalk. It is common in Wales. *Dillen.* Hift. Mufc. p. 387.

The fixth fubdivifion of thefe *Bryums* takes in thofe which have either no ftalks, or at the utmoft only very fhort ones. Of this kind are the following fpecies: 1. The leaft dwarf hair *Bryum*, with fhort heads and pedicles. This has extremely narrow leaves, of a deep green; it grows in marfhy places. 2. The fmall black, hair *Bryum*, with longifh heads and pedicles. The heads of this are large, and their pedicles are confiderably long. 3. The dwarf fine-leaved heath-like *Bryum*. The leaves of this fpecies are very rigid, and greatly refemble thofe of the fine-leaved heath. It grows on rocks and ftones in the weftern parts of England. 4. The dwarf tufted *Bryum*, with fine foft leaves, and conic heads. The leaves of this are very narrow and carinated, and of a deep green. It grows by the fides of rivers in Virginia, Penfylvania, and other parts of America. 5. The dwarf long-fhanked *Bryum*, with hairy leaves, all leaning one way. This

This also is common in Virginia. 6. The golden long-shanked hair *Bryum*, with upright crooked heads. The stalks of this are very short, and sometimes a little branched. It is a summer-moss, and is frequent in Germany.

The second order of the *Bryums* comprehends those which have capsules, hanging downward from the bending of the pedicles. The calyptræ in these species quickly fall off; and the opercula are usually obtuse.

The first series of these comprehends those which have extremely narrow leaves. Of this series the following are the known species. 1. The short-shanked hair *Bryum*, with red stooping heads. The capsules of this seem in a middle state between the erect and pendent ones. It grows in moist grassy places, but is not very common. 2. The golden-hair *Bryum*, with pear-like bowing heads. The stalks of this are low, and rather may be called creeping fibres; the leaves of a pleasant green, and very narrow; the pedicles are an inch high, and the heads yellow when ripe. It is found in many parts of England in moist places. 3. The lovely green hair *Bryum*, with pendulous heads. The capsules of this are oblong and drooping, the leaves are extremely narrow. It grows in wet places on Woolwich-Heath. *Dillen.* Hist. Musc. p. 386.

The second series of these *Bryums* contains those which have leaves a little broader, and though narrow, not capillaceous. The first division of these contains those which have equal and cylindric branches. Of these the following are the known species: 1. The catkin-stemmed silver *Bryum*. This is a very small moss; but it grows in extremely large tufts, and is very common on the tiles of houses; its silvery look distinguishes it from all the others at first sight. 2. The round-stemmed green *Bryum*, with pendulous heads. The capsules of this are of an oval figure; it grows on walls. 3. The hypnum-like *Bryum*, with elegant blackish-red heads. This is found on the Welch mountains. *Dillen.* Hist. Musc. p. 393.

The second division of these comprehends those which have unequal and irregularly-shaped branches. Of these the following are the known species: 1. The hoary round-tufted tile *Bryum*, with pendulous heads. This is an extremely small moss, and grows usually on little round tufts; the heads are not seen till the plant is closely examined; they stand on very short stalks. This is one of the most frequent of all the mosses on old *Walls* and the tiles of houses. 2. The tufted red and yellow-shanked *Bryum*. The leaves of this are broader, membranaceous, and of a pleasant green. It is common on old walls. 3. The transparent and larger tufted *Bryum*, with long pendulous heads. This is common on heaths; it is of a pleasant green, and grows to two inches high. 4. The transparent-leaved *Bryum*, with long pendulous heads. This is common in moist shady places. 5. The lancet-leaved *Bryum*, with round flesh-coloured pendulous heads. This is found in the summer months on Black-Heath, and in many other places about London. 6. The tender, lancet, and grass-leaved pendulous *Bryum*. The stalks of this are red; they do not exceed half an inch in height, and are not branched; the pedicles are of a pale red, and grow from the summits of the stalks. It grows in tufts in Wales. 7. The swans-neck *Bryum*. This is a very elegant species, it grows in woods, in somewhat moist places, and is an inch or two, sometimes more, in height. The leaves are large, and of a beautiful green, and the pedicle bends with the capsule, so as to represent the head and neck of a swan. It is common in our woods. 8. The pendulous and swoln-headed bog *Bryum*. This grows to three or four inches high; the leaves are like those of serpyllum, and are pellucid, and of a lively green. It grows in boggy places on heaths, &c. 9. The long-shanked bog *Bryum*, with long pendulous heads. This is not unfrequent with us in damp places, in woods, and under shady hedges. 10. The red bog *Bryum*, with plated leaves, and pear-shaped pendulous heads. This is found in many parts of England on mountainous boggy grounds. *Dillen.* Hist. Musc. p. 397.

The third series of these *Bryums* comprehends such as have broad leaves. Of this kind the following are the known species: 1. The golden bulbed *Bryum*, with pear-fashioned bowing heads. This is called by some *little goldilocks*, or *golden maidenhair*. It is a very common moss, and grows on the ground. 2. The many-headed pendulous shrub *Bryum*, with pellucid leaves, resembling those of the hart's-tongue. This is a very common moss; it creeps at the root, and spreads very fast; it grows in woods, and under hedges. 3. The larger starry rose *Bryum*, with pendulous oval heads. The stalks of this are naked near the ground; but on their upper part they have many small leaves. It grows in moist and shady places. 4. The lesser starry rose *Bryum*, with long pedicles, and long heads. The leaves of this are very short. It is not uncommon under shady hedges. 5. The pendulous oval headed *Bryum*, with various transparent leaves. The stalks of this are about half an inch high, and the leaves obtuse, and short toward the bottom, and longer and narrower at the top. It is very common in wet places on heaths and woods. 6. The long transparent serpyllum-leaved *Bryum*, with sharp stooping heads. This grows in marshy places. 7. The round transparent mother-of-thyme-leaved *Bryum*, with pendulous oval heads. This has but small leaves, and grows always in boggy places; the heads are of a pale green while young, and of a pale yellow when ripe. *Dillen.* Hist. Musc. p. 415.

WALLA, the name of an officer in the eastern nations. The Arabs have the care of the country round about the city of Cairo in Egypt, and a *Walla* is obliged to patrole continually about there, especially in the night.

His business is to take up all persons who are committing any disorders, or who cannot give an account of themselves, or are found abroad at irregular hours; and he often has their heads cut off upon the spot. As this officer is naturally the terror of rogues, so for presents made to him he often becomes their protector. Without this they are sure, one time or other, to fall a sacrifice to his resentment; and to him the great people send for any villains who have rendered themselves obnoxious to them, and are sure to have them delivered up. *Pocock*'s Egypt. p. 165.

WALLING *of Brick.* See the article BRICK.

WALNUT, in botany. See the article NUX.

The effluvia of *Walnut-trees* are said to be hurtful to the head. Mr. Boyle assures us they caused the head-ach in himself. Works abr. vol. 1. p. 436.

WALRUS, in zoology, the name by which some authors call the morse, or sea-horse, called also by others, *rosmarus*, a creature very different from the *hippopotamus*, or river-horse. See the article MORSE.

WALT, at sea, is applied to a ship, when she hath not her due ballast, *i. e.* not enough to enable her to bear her sails.

WALTHERIA, in botany, the name of a genus of plants, the characters of which are these: The perianthium consists of one leaf, and is of the shape of a cup, lightly divided into five segments, and remains after the flower is fallen. The flower consists of five petals, which are cordated at the top, and stand expanded. The stamina are five filaments, growing together into a cylinder. The antheræ are simple, and stand free. The germen of the pistil is oval. The style is simple, somewhat longer than the stamina; and the stigma is bifid. The fruit is a capsule of an oval figure at the top, composed of two valves, but containing only one cell. The seed is single, obtuse, and broad. *Linnæi* Gen. Plant. p. 327.

WAMPUM, a sort of shells, several of which being strung upon threads, are used as money among the Indians.

It is made of a shell, formed into small cylinders, of about one quarter of an inch long, and a fifth of an inch over, and being bored as beads, is strung in great numbers upon long strings. In this state it passes among the Indians in their usual commerce, as silver and gold among us; but being loose, it is not so current.

It is both white and black; and the meanest is in single strings, of which the white goes at five shillings a fathom, and the black at ten; or by number, the white at six a penny, the black at three. The next in value to the single strings, is that which is wove into bracelets of about three quarters of a yard long, black and white, in stripes, and six pieces in a row, the warp consisting of leather thongs, and the woof of thread: these the gentlewomen among them wear, wound twice or oftener about their wrists.

The most valuable of all is that woven into girdles. These are composed of many rows, and the black and white pieces woven into squares or other figures. These girdles are sometimes worn as their richest ornaments; but they are oftener used in their great payments, and make their noblest presents, and are laid up as their treasure. *Grew*'s Museum, p. 370.

WANDSU, in zoology, the name of a species of monkey found in the island of Ceylon. It is all over of a fine deep black; but has a long white beard hanging from its chin.

WANHOM, in the materia medica, a name by which Kæmpfer has called the plant, of which the great galangal of the shops is the root. *Kæmpf.* Amæn. Exot. p. 901.

WANT, in zoology, a name given by many to the mole. See the article TALPA.

WANTI. See the article GLOVE.

WAPP, in a ship, that rope wherewith the shrowds are set taught with wale-knots, one end is made fast to the shrowds, and to the other are brought the lanniards.

WAPPER, in zoology, a name given by some to the smaller species of the river-gudgeon. *Ray*'s Ichthyogr. p. 264. See the article GOBIO *Fluviatilis.*

WAR (*Cycl.*)—WAR-*Horse.* The proper rules for the choosing a horse for service in *War*, are these: He should be tall in stature, with a comely head, and out-swelling forehead. His eye should be bright and sparkling, and the white part of it covered by the eye-brow. The ears should be small, thin, short, and pricking; or, if long, they should be moveable with ease, and well carried. The neck should be deep, and the breast large and swelling. The ribs bending, the chine broad and strait, and the buttocks round and full. The tail should be high and broad, neither too thick, nor too thin; the thigh swelling; the leg broad and flat, and the pastern short. When such a horse is chosen, he must be kept high during the time of his teaching, that he may be full of vigour. His food must be sweet hay, and good clean oats, or two parts of oats, and one part of beans or peas, well dried and hardened. The quantity should be half a peck in the morning,

ing, and the ſame quantity at noon, and in the evening. Upon his reſting-days he is to be dreſſed between five and ſix in the morning, and watered at ſeven or eight. In the evening he is to be dreſſed at four, and watered about five, and he muſt always have provender given him after watering; he muſt be littered about eight, and then muſt have food given him for all night.

The night before he is ridden, all his hay is to be taken away about nine o'clock, and he muſt have a handful or two of oats about four in the morning, when he has eaten theſe, he is to be turned upon the ſnaffle, and rubbed very well with dry cloths; then ſaddled, and made fit for his exerciſe. When he has performed this, he is to be brought ſweating into the ſtable, and rubbed down with dry wiſps. When this has been done, the ſaddle is to be taken off, and he is to be rubbed down with dry cloths; the houſing cloth is then to be laid on, and the ſaddle being again laid on, he is to be walked gently about till thoroughly cool. After this, he muſt ſtand without meat two or three hours, then he muſt be fed; and in the afternoon he is to be rubbed and dreſſed as before, and watered in the uſual manner.

WARD's *Pill.* Some have conjectured that this medicine, which had ſo great a run, and to which a diminution of the numbers in the bills of Mortality, one year after it happened to come in vogue, was ſaid in a public advertiſement to be owing; it has been conjectured, I ſay, that this medicine was made of butter of antimony; others think it the glaſs of antimony, and cinnabar of Antimony amaſſed with gum tragacanth. See *Ward's Pill* diſſected, and Med. Eſſ. Edinb. abr. vol. 2. p. 434 and 470.

Mr. Clutton mentions ſome caſes where they did ſervice; but relates the hiſtories of fifty caſes where they did great miſchief.

To diſcover the compoſition of theſe pills, he diſſolved the ſeveral ſorts of them, and then viewing with a microſcope the powder which precipitated, he ſaw three different coloured powders remaining of the blue pill; to wit, a yellow, red, and white powder; the yellow and red agreed exactly with the glaſs of antimony, and the white one appeared to be common arſenic. *Ward's Pill* being incloſed in copper, and expoſed to a ſtrong heat, made the copper white, and as hard as iron, which arſenic always does. He alſo obſerved in this blue pill another powder, which he judged to be zaffre, that is, calcined cobalt, incorporated with flints. He thinks the proportion of the ingredients in this blue pill to be, one third glaſs of antimony, near two thirds of arſenic, and a very ſmall part of cobalt, or zaffre, with ſome powder of blue.

The red pill appeared to be much the ſame compoſition as the blue, only red arſenic was made uſe of inſtead of the white, and that the colouring of blue powder was left out.

The purple pills tinged glaſs blue, which cobalt or zaffre does, and therefore Mr. Clutton thinks them principally compoſed of cobalt, with a little glaſs of antimony, which left a yellowiſh border upon the glaſs. See *True and candid Relation of the good and bad Effects of* Ward's *Pill and Drop*, and Med. Eſſ. Edinb. abr. vol. 2. p. 470, 471.

WARNAS, a name by which ſome of the chemical writers expreſs what others of them call the *acetum philoſophorum*, or vinegar of the philoſophers.

WARNING (*Cycl.*)—WARNING-*Piece*, in the military art, is the gun which is fired every night about ſun-ſet, to give notice to the drums and trumpets of the army to beat and ſound a retreat or tattou, which is likewiſe called, ſetting the watch. See the article RETREAT.

WARNOTH, in our old writers, an antient cuſtom by which if a tenant, holding of the caſtle of Dover, failed in paying his rent at the day, he was to forfeit double; and for the ſecond failure, treble: and the lands ſo held were called *terris cultis*, and *terris de Warnoth*. *Blount.*

WARPS (*Cycl.*)—WARP, in a ſhip, a rope uſed to hale a ſhip into, or out of a harbour.

WARRANT, (*Cycl.*) in the manege. A jocky that ſells a horſe is, by cuſtom, in ſome countries, obliged to *warrant* him, that is, to refund the money that was given for him, and re-deliver the horſe in nine days after the firſt delivery, in caſe he ſold him when under ſuch infirmities as may eſcape the view of the buyer, and as are not obviouſly diſcovered. Theſe infirmities are purſiveneſs, the glanders, and unſoundneſs, hot and cold: But he does not *warrant* him clear of ſuch infirmities as may be diſcerned. Not only jockeys or horſe-merchants, but alſo perſons of what quality or condition ſoever, are obliged to take back the horſe, and repay the money, if he is affected with the ſaid diſorders. But the rule of the law of England is, *caveat emptor*, unleſs the ſeller expreſly *warrants*.

Dividend WARRANTS. See the article DIVIDEND.

WARREN (*Cycl.*)—The word *Warren* is now generally applied to a piece of ground ſet apart for the breeding and preſerving of rabbets.

In the ſetting up a *Warren*, great caution is to be uſed for the fixing upon a proper place, and a right ſituation. It ſhould always be upon a ſmall aſcent, and expoſed to the eaſt or the ſouth. The ſoil that is moſt ſuitable, is that which is ſandy; for when the ſoil is clayey or tough, the rabbets find vaſtly more difficulty in making their burrows, and never do it ſo well; and if the ſoil be boggy or mooriſh, there would be very little advantage from the *Warren*; for wet is very deſtructive of theſe animals.

All due precautions muſt be taken, that the *Warren* be ſo contrived, that the rabbets may habituate themſelves to it with eaſe. Many would have it that *Warrens* ſhould be encloſed with walls; but this is a very expenſive method, and ſeems not neceſſary nor adviſeable; for we find but very few that are ſo, and thoſe do not ſucceed at all the better for it.

Mr. Chomel's opinion is, that it ought to be ſurrounded with a ditch. This indeed is no fence to prevent the rabbets from going out, unleſs there be water in it; but it marks the intended bounds of the *Warren*, and the rabbets generally confine themſelves within its circumference, though not neceſſarily compelled to do ſo. The ſpace proper for a *Warren* has no limits but the owner's pleaſure; but, in general, the larger it is, the more profitable it alſo proves: and the rabbets, when once accuſtomed to the place, will keep within its bounds, though they are neither hemmed in with walls nor ditches, nor any other fence whatever.

Some have preſcribed the making deep ditches, and conſtantly keeping them ſupplied with water in the ſummer as well as winter ſeaſon, that they may ſerve as fences to the rabbets; but as it is not found neceſſary to fence them in at all, it is extremely injudicious to do it, by means of a thing known to be ſo very prejudicial to theſe creatures, as water is. If the perſon who has ſet up a *Warren* has but few rabbets to ſtock it with, the more patience he muſt have as to the profit of it; but the beſt method of getting quickly into the ſcheme of profit in it, is the buying at firſt a large number of doe-rabbets, all big with young. Theſe being unweildy and heavy, will naturally ſtay in the place, and the young ones will be habituated to it as their native place, and will never run from it. Theſe young ones will ſoon breed again, and the *Warren* will begin quickly to be ſtocked with inhabitants, almoſt all natives of the place. They ſhould not be hunted at all the two firſt years, and but very moderately the third. After this they will increaſe ſo faſt, that ſcarce any body can conceive the numbers that may be taken, and the profit that may be annually made without hurting it.

The *Warren* is the next franchiſe in degree to the park, and when ſpoken of in law, the terms uſed are, the liberty and franchiſe of a free *Warren*.

The beaſts and fowls of a *Warren* are underſtood to be four, the rabbet, the hare, the partridge, and the pheaſant, and no other. Theſe were eſteemed the proper game to be taken by the long-winged hawk.

A foreſt, which is in dignity the higheſt and greateſt franchiſe, comprehends in it a chace, a park, and a free *Warren*; for which reaſon the beaſts of the park, and the beaſts and fowls of the free *Warren*, are as much privileged within the foreſt, as the beaſts of the foreſt itſelf are.

WARTS (*Cycl.*)—There are a thouſand ſuperſtitious remedies for *Warts*, but none of them are of the leaſt conſequence. The ſurgeon's aſſiſtance is the only true method of getting rid of them. There are ſeveral ways of deſtroying them in his hands, as by ligature, extirpation, evulſion, the cauſtic, and the actual cautery. The cure by ligature, is by means of a looſe hair, or a piece of fine and ſtrong ſilk, tied very tight about the root of the *Wart*; and by this means the nutricious veſſels being compreſſed, the excreſcence withers and decays.

The method by extirpation, is to take them up with a pair of plyers, and cut them cloſe off with ſciſſars, dreſſing the wound with the common cauſtic, to remove the roots, if there be any, which would give riſe to a new tubercle.

The cure by cauſtics is beſt performed by cutting off the hard upper part of the *Wart* with a razor or ſciſſars, and then ſurrounding its bottom with a circle of wax, to prevent the ſpreading of the remedies, to touch it daily with oil of tartar, ſpirit of ſalt, aqua-fortis, or butter of antimony.

The cure by cautery is performed by chooſing a cautery of a proper ſize, and with that burning down to the root of the *Wart*. This is the moſt painful of all the methods of extirpating theſe excreſcences; but the pain is but for a moment, and the *Warts* extirpated this way never return again.

The cure by evulſion is performed by anointing them with ſoftening ointment, and then ſeizing them artfully between the thumb and the fore-finger, and forcibly wrenching them out. This is a mountebank method, and a bad one; for it is not only very painful, but the *Warts* commonly grow up again.

Cancerous WARTS. It is no uncommon thing to find on the face, lips, and about the eyes, *Warts* which look blue and livid; theſe are always to be let alone entirely; for when irritated, they frequently degenerate into a cancer, and miſerably torment the parts where they are ſituated. *Heiſter's* Surgery, p. 32.

WART, in the manege, is an excreſcence, or ſuperfluity of ſpongy fleſh, that riſes in the hinder paſterns of coach-horſes, almoſt as big as a walnut. It ſuppurates, and voids red ſtinking matter, and does not cure but for a time, for it returns again.

WARTH,

WARTH, in our old writers, seems to be the same with *ward-peny*, being a customary payment for some castle-guard. *Blount*'s Tenur. 60. *Blount*.

WASH, the distillers name for the fermentable liquor, made by dissolving the proper subject for fermentation and distillation in common water.

With respect to the proper workings of this liquor, great regard is to be had to the containing vessel. Its purity, and the provision for its occasional closeness, are the things to be principally considered. Though it is necessary that the vessel be perfectly clean, yet in the cleansing it great care must be taken that no soap, or other unctuous body, be used, for this would check the fermentation in it; and for the same reason all strong alkaline lixiviums are to be avoided. Lime-water, or even the turbid solution of quick lime, however, may be safely used for this purpose; and this is indeed particularly proper to destroy a prevailing acid, which is very apt to be generated about the sides and bottoms of these vessels, if the warm air has access to them, and thus prevents the order of the fermentation. All strong alkaline lixiviums have as bad an effect on the contrary, and a special care must be had that no corrupt or putrified yeast, nor any remains of former fermented matters, hang about the sides of the vessels, for this would infect whatever should be afterwards put into them. Foulnesses of this kind, when of long standing, are of all others the most difficult to be cured, and often are of great damage to the distiller.

The occasional closeness of the vessel may be provided for by having covers very well adapted to it, in the large way of business, and by the use of valves in the smaller, where common light casks will serve the purpose, while the valve occasionally gives the necessary vent to preserve the vessel, and otherwise it remains perfectly close, and impervious to the air but at discretion.

It is a very prejudicial mistake, in the business of fermenting the *Wash*, to suppose that the free concourse or admission of the external air is necessary to the operation. The express contrary is the truth, and a great advantage will be found in practising upon this supposition. A constant influx of the open air, if it does not carry off some part of the already formed spirit; yet it certainly catches up and dissipates the fine subtle oleaginous and saline particles, of which the spirit is formed, and thus considerably lessens the quantity to be procured. This inconvenience is wholly avoided by the way of close fermentation, by which all air, except that which is contained in the vessel, is kept out. The great secret, in this process, is to have a proper space for the reception of this air, at the top of the vessel, over the surface of the liquor; and when such a space is left, as soon as the fermentation is fairly set on foot, the vessel is to be close bunged down, and left to itself, no more fresh air being left in but what is admitted by the valve. No new air is necessary, when the space unoccupied by the liquor is more than one tenth part of the gage, the artificial air generated in the operation being very seldom of force, to endanger the bursting of the cask, or any other mischief.

This method of close fermentation is practicable to good advantage in the small way of business; but it requires such a considerable time, that it will never be liked by the large dealers, who are in a manner forced to admit the free air, and thus sustain a very considerable loss in the spirit, only to get the operation over in a proper time. Excepting for the necessity of expedition of this kind among the large dealers, it is certain that this slow and imperceptible vinous fermentation is greatly preferable, on all accounts, to the other. During the whole course of this operation, the vessel is to be kept from all external cold and external heat that is considerable, it being necessary that it should be kept in an equable uniform and temperate state, so as not to be cognizable to the senses, either as heat or cold. In the winter a stove-room, such as are common in Germany, would be fittest for this purpose, the vessel being placed at a proper distance from the stove; but at other seasons no particular cautions are necessary with us, provided that the place be well sheltered from the violent heat of the sun, and from the bleak northerly winds.

The operation is known to be over in this close way of fermentation, as soon as the hissing noise ceases, and can no longer be heard on applying the ear to the vessel; and when, on opening it, the liquor is found to be clear, and of a vinous pungent taste; when it is arrived at this state, it should be set by for a time in a cooler place than that in which it was fermented; in this manner it will thoroughly purge itself of its lees, and will become perfectly clear, vinous, and pungent; in this state it should be drawn clear off from the lee, and immediately committed to the still; and by this method a perfectly pure vinous spirit will be procured, greatly better than that which can be obtained by the common way, which those who work large quantities fall into for the sake of expedition.

The action of fermentation works such a change in the body of the tincture or solution, called the *Wash*, as to render it separable by the action of fire, into parcels of matter that are specifically different, and of a nature entirely foreign to what the same liquor would have yielded without the fermentation. The still being charged and luted, and brought to work with a soft boiling heat, there first comes over a quantity of intensely pungent aromatic and nidorous liquor, which, if received into a large quantity of cold water, throws off a copious essential acrid or aromatic oil, though the original subject, before the fermentation, were ever so cooling, mild, or contrary to a spicy nature. This essential oil is found to be the principal thing that gives the predominant or peculiar taste to the spirits, according to the several substances from which they are made; and the spirits are, from the flavour they receive from this, distinguished into malt spirit, melasses spirit, cyder spirit, wine spirit, arrac, and the like. The finest, most subtle, and most efficacious part of this essential oil is what comes first, the portions that come after being gradually more and more viscous and nauseous, and the spirit running in a continued thread from the end of the worm, will be found to change its nature oftener than could be imagined, if tasted at different intervals. Beside this essential oil, the spirit of the first running contains only an acid, more or less in quantity, and more or less pungent and volatile, or sensible to the nose, in proportion as the fermentation has been more or less continued; or according to the degree of acidity acquired in the operation. This acid, and the aqueous part that rises with it, may be kept back by a proper rectification; though where the acid is very volatile, some part of it is apt always to rise along with the totally inflammable spirit, so as to give it a flavour like that of a very much diluted spiritus nitri dulcis. *Shaw*'s Essay on Distillery.

The *Wash* of the malt distiller ought to be about the strength of the ten shilling small-beer; and if the spirit be expected fine, it had better be too thin than too thick. It is only made by mixing the water hot with the malt ground into meal. If the water be too hot, the mixture will become gluey; and if too cool, a part of the virtue of the malt will be lost. Under the right application of the water is to be considered the proper manner of agitating the mass, so that all the parts of the aqueous fluid may come fully and freely in contact with the soluble particles of the subject. When once the water is well saturated by standing on the malt a proper time, it must be drawn off, and fresh poured on, till at length the whole virtue, or all the sugary sweetness of the malt is extracted, and nothing but a fixed husky matter remains behind, uncapable of being farther dissolved by the action of hot or boiling water, or of being advantageously washed or rinsed out by the bare affusion of cold. This artificial and external agitation or stirring about of the mass, is necessary not only in the common way of brewing for the malt distillery, but also in that more expeditious way, now in use with some, of reducing the operations of brewing and fermenting to one, and grinding the malt to a fine meal, which is to be kept in the *Wash* during the whole time, and even put into the still with it, and worked together. The stirring may be repeated to great advantage more than once in each operation, as at the affusion of every parcel of fresh water, in the common way, and at any shortly distant times in the short way, in which it is of greater service. *Shaw*'s Essay on Distillery.

The difference of seasons is found to require some alteration in the direction and management of the business of brewing for the malt-distillery. The water must always be used colder in summer than in winter, and the tincture must be cooled suddenly in close sultry weather, to prevent it from becoming eager or sour. The summer season also gives malt an overforward disposition to ferment, and this impairs the quantity of spirit, and is to be checked by the addition of a quantity of unmalted meal, which being much less disposed to ferment than the malted meal, will restrain and moderate its impetuosity, so as to render the operation suitable and effectual to the production of spirit, a great quantity of which would be otherwise dissipated, and thrown off by a too hasty fermentation, and that especially when the warm air is suffered freely to come at the fermenting liquor. Some of our malt-distillers have a custom of using rye-meal for this purpose; but though this answers the end in moderating the fermentation, as well as the other, yet it gives the spirit a nauseous flavour, which is not easy to be got off or altered to advantage by any known method of rectification. Some of the malt-distillers, the better to prepare their malt, sprinkle it before the grinding with a solution of nitre, or common salt, in fair water, and some, instead of these solutions, use lime-water; but this is not so well adapted to the design of the thing, which, beside the preventing the flying away of the finer part of the flowers in the grinding, is to promote the fermentation, and to increase the quantity of spirit, or add to its pungent acid vinosity.

It has also been judged by some to be of service either in general, or especially at some particular seasons, to acidulate the water employed in brewing, with a small proportion of some vegetable or light mineral, and which is supposed to curb and regulate the fermentation of the tincture, improve the acid vinosity of the spirit, and occasion some small increase of its quantity; and with the same view, tartar, as well as common salt and nitre, have been used in the same manner.

The particular intention of the operator may render also various other additions necessary; thus some, to dispose the *Wash* to yield more spirit, or to give the spirit a greater degree of pungency, and a better flavour, add to it the strong and

and pungent aromatics: the cheapest chosen for this purpose, and the most used, are, the cortex winteranus, ginger, and grains of paradise. *Shaw's* Essay on Distilling.

In the common way, these additions, however, do very little, though by a proper artifice in the management they may be made of considerable use. Upon this foundation, stands a very instructive method used abroad, of making geneva *ab origine*, by mixing the bruised juniper berries among the malt, and brewing the whole together; by this means a compound tincture, or *Wash*, is prepared, which, by fermentation and distillation, affords a spirit much more intimately and homogeneously impregnated with the essence of the berry, than that prepared by our distillers, in the common way of adding the berry to the malt spirit, and distilling it from them again. The inconveniencies that attend the brewing directly with malt, are very considerable, the malt being of a very large bulk, in proportion to the saccharine part, which it can alone impart to the water, and in which its virtues, as yielding a spirit, wholly consist. On this account numerous large vessels, much labour, and great expence, are required to conduct and manage such a business in the large way. The remedy in this, as in many other cases, may be much more easily started, than effectually applied; however the foundation for it seems to consist in the practically reducing the perplexed business of the malt distiller, to the simple business of the fine stiller, or, in other words, in the reducing malt to treacle.

It is very certain, that the thing here proposed, may be effected to perfection by the common processes of infusion and evaporation: but the people concerned in this branch of trade are the only proper persons to try it in the large way, and calculate that advantage and expence, and by that means regularly find whether or not it will be worth while to introduce it as a common method of business.

The experiment may be tried in this manner: When a parcel of wort is brewed in the common manner, and is become fine by standing, let it be decanted clear off, and immediately boiled away in a common copper, till it begins to inspissate, and acquires a dusky brown colour: at this time it must be taken out of the copper, and poured into a balneum mariæ, where the remainder of the evaporation may be made without any danger of burning, and the whole may be reduced to the consistence of treacle; in which form it will keep a long time, and be always ready for use, when occasion requires it. The continuing the evaporation to the end, in the copper over a naked fire, would not only be liable to give it an empyreumatic taste, from the burning, which would remain so strongly in the spirit, as to spoil it; but the violence of the heat acting immediately upon it, would dissipate much of its active part, and there would be a much smaller quantity of spirit procured from it; but if the operation be dexterously and carefully performed, as here directed, the extract, or saccharine matter, though of as full a body, will be abundantly paler than treacle, a little more glutinous, very sweet, and pleasant to the taste, and will have a fine agreeable bitterness, as the flavour goes off, though no hops are used in the preparation. In this manner it may be kept, or transported to other countries, and will always be reducible to the state of wort again, only by mixing common water with it; and this wort will ferment as freely and as fully as that made in the common way, and will yield its spirit in the manner of treacle. *Shaw's* Essay on Distilling.

Glauber and Becher were both convinced of the utility of this scheme, and both laboured hard at the bringing it to bear: Glauber seems to have succeeded tolerably in it; but Becher, who had it in his thoughts to extend the practice to the wines as well as the malt liquors, after a whole year spent in the attempt, declares, that he can scarce believe what Glauber says of it, and so candidly owns himself not possessed of the secret of doing it, that he offers a handsome reward to any body that will inform him of it. What these chemists seem not to have hit on, the way or the best way of doing, seems however, from experiments in small quantities, perfectly practicable; and if it may be brought to bear in the large way, plentiful years, convenient situations, and other helps may be pitched upon, for setting up a new trade of treacle, making at least enough for the distillers use, if it shall not be found practicable to convert this new sort of treacle into potable liquors, or into sugars.

It is possible, that on this plan something may be set on foot at home of the nature of the sugar-worts in our American plantations, which may turn to as good account, and yet be managed with much less labour and expence than we find it possible to do that. When malting in particular cases could not be practised, substitutes of various kinds might be invented to supply its place on this plan: thus, such grain or pulse as cannot be made into malt in the common way, may be boiled in water, instead of being brewed, and an extract made of their clear decoctions, evaporated into a treacle in the same way as the other. The Indians in this manner dissolve their rice into a thin pap, or jelly, by boiling it in water; and afterwards they ferment this into a potable liquor, or a sort of wine, which they preserve under-ground for many years successively. And it may be tried whether this method of malting the Indian corn or maize, or that by putting it in the ground till it sprouts, will be the most serviceable in the article of distillery. Most of the English grains may be easily malted in the common way, and their extract thus made into a sort of treacle, with little trouble, and to very great advantage. It remains to try whether the buck-wheat may be malted in the common way, and put to this use? and whether, by some variation introduced in the way of malting, the nauseous flavour of our rye may not be taken off? All the other vegetable substances intended for brewing, should as much as possible have their fermentable parts reduced to the state of a treacle, sugar, or inspissated juice, not only for the sake of preserving them perfect, but for the greater ease and convenience of working them. Thus the juices of the birch, the sycamore, and many other trees, which bleed freely on being tapped in spring, are readily boiled up to this sort of consistence; and in the same manner, wherever it is worth while, the juices of canes, fruits, and sweet roots may be thickened and preserved.

When once the fermentable parts of vegetables are thus concentrated, and brought together into a small compass, the business of brewing, whether, for the distillers use, or for the making potable liquors, will be very easy and short, the whole being no more than mixing or dissolving the inspissated juice in a sufficient quantity of warm water; and this solution, either alone, or with some trifling additions, will be perfectly fitted for fermentation. *Shaw's* Essay on Distillery.

Wash being of a mucilaginous, or somewhat glutinous nature, requires a particular management to prevent its scorching, and make it work kindly in the still: If it should happen to be burnt in the operation, the spirit will have a most disagreeable flavour, and such as can never be got off again, without very great labour, and a particular treatment, not known to every body. To prevent this ill effect, there must be three things observed; the liquor, or *Wash*, must be made dilute, the fire must be well regulated, and the whole kept in a constant agitation. The manner of making the *Wash* dilute, has been long known among the more judicious distillers in this branch, and they have always found their spirit the purer for it. The fire is easily kept regular, by a constant attendance, and avoiding hasty stirring it, or throwing on new fuel; and the stirring the liquor in the still is to be effected by means of a paddle, or bar kept in the liquor, till it just begins to boil, which is the time for luting on the head; and after which there is no great danger, but from the improper management of the fire: this is the common way, but it is hard to hit the exact time, when to lute down the head; and the doing it either too soon, or too late, is attended with great inconvenience, so that many have found out the other methods, of either putting some moveable solid bodies into the still with the *Wash*, or placing some proper matter at the bottom and sides of the still, which are the places where the fire acts strongest.

The use of the paddle would be better than either of these ways, could it be continued while the still is working; and this it may be by the following method: Let a short tube of iron or copper be soldered in the center of the still-head, and let a cross-bar be placed below in the same head, with a hole in the middle, corresponding to that at the top; through both these let an iron pipe be carried deep down into the still, and let an iron rod be passed through this with wooden sweeps at its end; this rod may be continually worked by a winch at the still-head, and the sweeps will continually keep the bottom and sides scraped clean, the interstices of the tubes being all the time well crammed with tow, to prevent any evaporation of the spirit at them. *Shaw's* Essay on Chemistry.

The same effect, may, in a great measure, be produced a less laborious way, that is, by placing a parcel of cylindrical sticks lengthwise, so as to cover the whole bottom of the still, or else by throwing in a parcel of loose faggot sticks at a venture; for thus the action of the fire below moving the liquor, at the same time gives motion to the sticks, and makes them act continually like a parcel of stirrers upon the bottom and sides of the still, which might, if necessary, be furnished with buttons, or loops, to prevent them from starting. Some also use a parcel of fine hay laid upon the loose sticks, and secured down by two cross poles, laid from side to side, and in the same manner fastened down with loops. Care is to be taken in this case not to press the hay against the sides of the still; for that would scorch almost as soon as the *Wash* itself; but the sticks never will: these are simple but effectual contrivances, and, in point of elegance, they may be improved at pleasure.

There is another inconvenience attending the distilling of malt spirit, which is, when all the bottoms, or gross mealy fæculence is put into the still along with the liquor, the thinner part of the *Wash* going off in form of spirit, the mealy mass grows by degrees more and more stiff, so as to scorch toward the latter part of the operation. The method to remedy this, is to have a pipe with a stop-cock, leading from the upper part of the worm-tub into the still; so that, upon a half, or quarter turn, it may continually supply a little stream of hot water, in the same proportion as the spirit runs off, by which means the fear of scorching is taken away, and the operation at the same time not at all retarded. In Holland, the malt distillers work all their *Wash* thick, with the whole body of the meal among it; yet they are so careful in the keeping their stills clean, and so regular and nice in the management of their fires, that, tho' they use no artifice at all on this head, only to charge the still while

while it is hot and moift, they very rarely have the misfortune to fcorch, except now and then in the depth of winter. When fuch an accident has once happened in a ftill, they are extremely folicitous and careful to fcrape, fcrub, and fcour off the remains of the burnt matter, otherwife they find the fame accident very liable to happen again in the fame place. But beyond all the other methods in ufe on this occafion, would be the working the ftills not by a dry heat, but in a balneum mariæ, which might poffibly be fo contrived by the bafon being large, and capable of working a great many ftills at once, as to be extremely worth the proprietor's while in all refpects. *Shaw*'s Effay on Diftillery. See the article MALT-*Diftillery.*

WASH is alfo ufed for the fhallow part of a river, or arm of the fea, as the *Wafhes* in Lincolnfhire. *Blount.*

WASHING (*Cycl.*) WASHING *of Ores*, the purifying an ore of any metal by means of water, from earths and ftones, which would otherwife render it difficult of fufion.

The method of doing it is this: Break the ore to a coarfe powder in an iron mortar, weigh twenty or thirty docimaftical centners of it, put them into the *Wafhing*-trough, and pour fome water upon them, that the ore may be thoroughly moift; then have a veffel full of water, the diameter of which muft be a little larger than the length of the trough; take the trough with the left-hand by the top of the hinder part, and dipping it horizontally into the water, move it gently with the right-hand from the fore part of the trough, which is always to be made the fhallower part of it, toward the hinder part, which is deeper, then take out the trough, and incline it a little on the fore-part that the water may run out, and the heavier metallic part remain at the bottom; repeat this feveral times till the remains at the bottom of the trough are quite pure. If the ftone in which ore is lodged be too hard for powdering in its natural ftate, as the flinty and debafed cryftalline ones commonly are; the whole muft be calcined, and quenched in cold water feveral times over, and afterwards powdered and wafhed in this manner: when it is thus wafhed, affay a centner of it, and from the bead of metal this yields, it will be eafy to eftimate the value of the ore. *Cramer*'s Art of Affaying, p. 244.

WASP. The *Wafp* has four wings and fix feet; his body is yellow, with black triangular fpots: the common *Wafp* breeds in the ground. There is another kind much more fierce, but very rare: thefe breed in woods and mountains; they are larger, and have broader bodies, and much more black about them; their fting is fo large, that it feems difproportioned to the fize of their bodies.

To thefe are to be added the *Ichneumon-wafps*, which are fmaller than the others, and have very flender bodies, but of the fame colours with the common kind: thefe ufually live in the holes of mud-walls, and make a fort of porch of mud before the doors of their habitations.

There is alfo another *Wafp* common about Vienna; this is three times as large as the common kind, and feems of two different fpecies, the one having rough antennæ, and the other fmooth: they are both variegated with black and a bright yellow. *Mouffet*'s Hift. Infect. p. 6.

The *Wafps* conftruct regular combs, and rear their young in the cells of thefe combs in the manner of bees: wherever there is a young worm in a cell, the old *Wafps* frequently thruft their heads into it, and caft up the food for the young one out of their mouths: their cells are hexagonal; and when they have a mind to enlarge their habitation, and make more or bigger combs in them, they are feen very bufily coming out of the mouth of the hole, every one loaded with a parcel of earth, till they have carried out as much as is neceffary for the intended enlargement.

They fupport their combs one over another by crofs pieces of about an inch long, fo that there is ample room for the *Wafps* to pafs in their feveral bufineffes. Thofe cells which ftand in the center of a comb, are always perpendicular; the others all ftand more or lefs obliquely; and in the center, the comb is fomewhat hollowed and depreffed on the face, and convex on the back; and in this part is inferted the principal crofs piece that ferves for a fupport. *Ray*'s Hift. of Infects, p. 250.

The eggs of the *Wafp* are of an oblong form, and refemble thofe of the common fly, but they are larger; they are always faftened to the angles of a cell, never to the fides of it. They are ufually placed fingle; it is very rare to find two in one cell; and if they are laid fo, it feems that one only fucceeds; for there is never found more than one worm in a cell. The egg is always fixed to that angle of the cell which is neareft the center of the comb, and always near the bottom, not in the middle of the cell; and when there are two eggs in one cell, they are never fixed to the fame angle, but ftand at the fame height from the bottom, in the two neareft angles to the center of the comb. The heads of the nymphs are at firft round and pellucid; but foon afterwards the fkull and the forcipes become reddifh. The heads of all the nymphs are turned toward the center of the comb, and their tails go obliquely downward towards the bafe of the cell. They are continually feen opening their mouths, and moving their forcipes, feeming ever hungry, and impatiently waiting for food from their parents. The cells are left open, till the nymph is at its full growth; then the *Wafps* cover it over with a thin lid, under which the worm undergoes its transformation; and as foon as it is arrived at the *Wafp* ftate, it eats its way through this thin cover, and comes to work with the reft.

Mr. Ray mentions a peculiar fpecies of *Wafp*, which builds a much fmaller neft. This is ufually fixed to a beam of fome old building, and has only one aperture, which is about half an inch wide, and ferves for the *Wafps* to go in and out at. This aperture is always exactly oppofite to that part of the hive, where it adheres to the beam. The hive or neft is covered with a thin membranaceous fubftance refembling paper, of a brown colour, with ftreaks of white, difpofed in regular circles. The whole neft is about three inches in diameter, and is ufually compofed of about nine crufts; when thefe are cut away, there appears a round comb in the center, and a fmaller above it, fixed up by a pedicle arifing from the center of each. In every one of thefe cells, which are hexagonal as thofe of the common *Wafp*, is reared one worm, which, in fine, becomes a *Wafp*.

The fpecies of *Wafp* which builds in this manner, differs from the common *Wafp*, in that it is fomewhat larger; it is fmoother alfo, and has rings of a deeper yellow on the back: the black fpots are not fo regular in this, as in the common *Wafp*; and the forehead in this is of a perfect yellow, without any fpots. Thefe marks, with the difference of hanging a fmall neft againft a beam, and building a large one in the ground, are fufficient to diftinguifh this as an abfolutely different fpecies. Befide thefe two, Mr. Ray mentions four other fpecies of *Wafps*: 1. The long and narrow-winged *Wafp*, with long antennæ, and a broad line of black in the middle of the belly. 2. The long and flender black *Wafp*, with three yellowifh-white ftreaks on the belly. 3. The broad and fhort-bodied *Wafp*, with rings of yellow and red. This much refembles the common *Wafp* in fhape. 4. The fharp-tailed *Wafp*, with a black body, variegated with yellow rings. This fpecies is found about old walls, and is furnifhed with but a very weak fting. All the others are found wild in our fields. *Ray*'s Hift. Infect. p. 251.

We have an account in the Philofophical Tranfactions, N°. 476, of fome *Wafp*-nefts made of clay in Penfilvania. Thefe are of two kinds, one plain, fabricated by a fmall black *Wafp*, the figure of which is delineated in tab. 3, of that number. The other is a wreathed tubulated clay neft; and thefe are built by a purplifh black *Wafp*, of the figure there reprefented. When thefe *Wafps* have laid their eggs, it is faid they go and catch fpiders, and cram the cells full of them; and what is remarkable, they do not kill the fpiders, but only difable them, as if they intended to prevent their crawling away, and yet keep them alive.

Mr. Reaumur, in his hiftory of infects, vol. 6. mentions clay nefts from St. Domingo, fomewhat different from thefe.

Ichneumon-WASP. See the article ICHNEUMON.

WASP-*Fly*, in natural hiftory, a fpecies of fly having very much the external figure of a *Wafp*, but harmlefs, without a fting, and with only two wings.

It is black and yellow on the body, and marked exactly as the *Wafp*, and is produced from a fpecies of the rat-tailed flyworms. See the article DRONE-*Fly*.

But befide thefe there is another fmall fly produced of the puceron-eaters, which has extremely the appearance of a fmall *Wafp*; but it is perfectly harmlefs, and has only two wings. *Reaumur*, Hift. Inf. vol. 4. p. 486.

WASP-*Tipula*, in natural hiftory, the name of an infect defcribed by Mr. Reaumur, and being properly a tipula, or long-legs, though greatly refembling a *Wafp*.

This is produced of a worm found in the earth, lodged in the cavities of old trees; the worm has no legs, but has a regularly figured fcaly head. The fly produced from it has the long legs and the mouth of the tipula, with the remarkable double beard which covers it, and which makes the great character of this clafs of infects; but then the body is fhort and thick, whereas the bodies of the common kinds are very bony and thin. This, as alfo the breaft, is variegated with ftreaks of black and yellow, in the manner of the *Wafp*; and its antennæ are very beautifully feathered, and bearded like thofe of the males of many of the gnat-kind. The head is black, and the legs are yellowifh. The wings have a yellowifh caft, and near their end have each a large fpot of brown. The body of the female of this fpecies is always much thicker than that of the male; and the fexes are eafily diftinguifhed by this. *Reaumur*'s Hift. Inf. vol. 9. p. 19.

WASTE-*Cloths*, in a fhip of war, the cloths hung up on the uppermoft work of a fhip's hull, to fhade the men from an enemy in the fight; and therefore by fome are called *fights*.

WASTE-*Trees*, in a fhip, are thofe timbers which lie in her *Wafte*.

WASTORS, in our ftatutes, a kind of thieves fo called, and mentioned among robbers, draw-latches, &c. Stat. 4. c. 27. *Blount*, *Cowel*.

WATCH (*Cycl.*)—The movement of thefe machines will be ftopped with great cold; and therefore in very cold climates, it is proper to keep them in one's fob by day, and in the bed by night. See Phil. Tranf. N°. 465. Sect. 2.

WATCH-*Glafs*. Mr. Boyle informs us, that to fafhion glaffes for *Watches*, or the like purpofe, into a convex or concave figure,

figure, there is no neceffity for grinding: For, a fmooth and flat piece of glafs, of a competent thicknefs, being carefully laid upon a fhallow concave cylinder of iron, fo that the edges of both touch, the heat of a fire, warily applied, will foften the glafs, and fuffer it to fink into the form required. See Works abr. vol. I. p. 135.

WATCH-*Glafs*, aboard a fhip, runs four hours, and is ufed to fhift or change their *Watches* by. There are alfo *half-watches*, *hour-glaffes*, *minute*, and *half-minute-glaffes*; by which laft they count the knots when they heave the log, in order to find the fhip's way.

WATER, (*Cycl.*) in natural hiftory. See the Appendix.

WATER-*Bomb*, a name given by our chemift Godfrey to a machine he invented on the plan of Greyl's difcovery, for the extinguifhing accidental fires in houfes. He confidered firft, that the unmanageable fize of Greyl's engine was a very great objection; and on this plan contrived a medicated liquor, which was fuch an enemy to fire, that a very fmall quantity would extinguifh as much as a greatly larger of common water; and this liquor had the farther advantage, that it might be kept ever fo long without corrupting, and by that means the veffels containing it would remain always fit for ufe; whereas in Greyl's method they muft have been rotted by the corrupting and fermenting of the water, after a few years.

The author of this invention tried it twice in public with us, and both times with all the fuccefs that could be wifhed: but the ftructure of the veffel was fo much the fame with that of Greyl's, that Godfrey cannot be allowed any farther merit, as an inventor, than that of contriving the medicated liquor inftead of common water. The machine is a wooden veffel, made very firm and ftrong, that the liquor, when once put in, cannot leak out any where; in the center of this is an oblong cylindric veffel, which is filled with gun-powder; a tube is brought from this to the head of the barrel, and this being filled with combuftible matter, and the inner cafe with powder, and both made of plate-iron, that no water may get in, the veffel is then filled with the medicated liquor. The top of the tube is then covered, and the thing fet by for ufe.

When there is occafion for it, it is only neceffary to uncover the tube, and fetting fire to the matter in it, it is conveyed to the veffel containing the powder, and the whole machine being thrown into the place where the fire is, is torn to pieces by the explofion, and the extinguifhing liquor fcattered every way about, on which the fire is quenched in an inftant.

The contriver of thefe things propofed the making three kinds of them, the one containing five gallons of the liquor; this was the largeft fize, and contrived for the largeft rooms, and moft urgent neceffities. The fecond kind contained three gallons; and the fmalleft, which was meant for a clofet, or other little room, contained only two gallons. The fmaller kind alfo had fometimes a peculiar difference in their ftructure, the powder-veffel being placed not in the center, but at the bottom: the intent of this was to fit them for chimneys, when on fire, as by this means the liquor, not being wanted to be fcattered on all fides, was carried moftly upwards. Thefe were fixed on the end of a long pole, and by this means thruft to a proper height up the chimney; and the tube that communicated the fire was placed downward.

The manner of ufing the machines for rooms on fire, is this: the perfon who has the care of them is to throw them as nearly as may be into the middle of the room, and then to retire to a little diftance: As foon as he hears the explofion, he may fafely enter the room, and with a cloth, or any thing of that kind, put out any remaining fparks of fire that there may be in particular places. If the room be fo large that one of the machines cannot difperfe the liquor to every part of it, two are to be ufed, one being laid at each end; and if feveral rooms are on fire at once, as many of the machines are to be ufed, one being thrown into each room. If a whole houfe is on fire, the lower rooms are firft to be taken care of, and after thefe the upper, as they afcend. Our Godfrey had fcarce better fuccefs than his predeceffor Greyl; for while he was making his public experiments, one Povey, collecting fome of the fragments of his broken veffels, found out the ingredient ufed in the medicated liquor, and made and fold the things in the fame place where he had proved his right to them. It is probable that the medicated liquor was no other than common water, with a large quantity of fal armoniac, that falt having this virtue of extinguifhing fire in a very remarkable degree; But it is greatly to be wondered at, that while all the world were convinced by experiments of the ufe of the machine, the author made but little advantage of it, and it is now difufed. Act. Erudit. Ann. 1724. p. 183.

WATER-*Dog*. The fportfmen generally efteem the black *Water*-fpaniels above thofe of any other colour, they being generally the moft hardy. If there be any farther judgment to be made from the colour, it is, that the fpotted or pied are generally the quickeft at fcent, and the fimple liver-coloured the quickeft at fwimming. Thefe, however, are but very uncertain rules to judge by, and the things principally to be regarded are the dogs being of a good breed, and well taught. As to the fhape, the head of a good *Water*-dog is generally round, and the hair curling, the ears large and broad, and hanging down; the eyes full and lively, the nofe fhort, and the lips like a hound's. The neck fhould be thick and fhort, the fhoulders broad, the legs ftrait, and the chine fquare. The buttocks fhould be round, and the thighs brawney. The pafterns ftrong, and the fore-feet round. The hair in general fhould be long and curled, not loofe and fhaggy.

As to the training up a dog for fporting, the mafter of him cannot begin when he is too young, the principal thing to be taught being obedience, and that being beft taught while the creature is young. As foon as he can lap, he fhould be taught to couch and lie clofe at command, and not to dare to ftir from that pofture till he is ordered; he will foon be brought to this by beating when he difobeys, and encouraging him when he does right. He fhould always be taught before the times of his eating, and never have his food given him, but when he has done fomething to deferve it. This will teach him always to do well, for the fake of the expected victuals. No perfon fhould ever interfere in the teaching, for two mafters breed a confufion, and the creature never will learn well from them.

The teacher muft be careful always to ufe the fame words in his leffons; thofe words are to be chofen which are the moft plain in their founds, and the moft diftinct from one another; and when thefe are once fixed upon, they muft never be altered; for the dog, being guided wholly by the found, not at all by the fenfe, any alteration of them, though the change be into words of the fame fenfe, quite confounds the creature. The word *down* is fhort and expreffive, and no other need be ufed when he is ordered to couch; but this being once given him, is never to be varied afterwards. The next found he fhould be taught after this, is the word of correction, for no leffon can be given but faults will be committed, and no fault fhould pafs without correction or blame; in this cafe the word *firrah*, fpoke angrily, will always be underftood: This, at firft, fhould be ufed with a lafh or a blow, and after a time he will know it as a word of difpleafure, and it will do for fmall faults without the blow. Certain words of cherifhing and encouragement muft alfo be taught him at the fame time, as *good boy*, or the like, ufing always with them actions and looks of chearfulnefs and pleafure, as clapping him on the back, and the like. After thefe, he muft be taught the meaning of fome words of advice, to put him in mind of his bufinefs, when he is out upon the fport, fuch as *take heed*, or the like. Thefe will not only fet him upon the watch, and make him diligent; but he will alfo be careful and cunning, and at the fame time chearful and pleafed in himfelf, at knowing that he is doing his mafter a pleafure.

When the young dog is thus far inftructed, and knows the meaning of the words of inftruction, correction, encouragement, and advice, and will couch and lie down at his mafter's feet, how and when he pleafes, and that with the fignal of a word, or a look only; he is then to be taught to follow clofe at his mafter's heels, by leading him by a line tied to his collar; he is to be carefully taught this, fo that when taken out to the fport, he muft neither run under the legs, nor hang too far back; this alfo will tend to the making him the more obedient. When he has been thus taught to follow with a line, he muft be taught to follow in the fame manner, loofe, and without a line, and always to be at his mafter's heels.

The next leffon he is to be taught, is to fetch and carry any thing he is commanded; this muft be taught him by way of fport, as a diverfion, by fhaking a glove at his head, and teaching him to fnatch it, and afterwards to catch it when thrown from the hand, and bring it back again; this he is to be encouraged in with cherifhing words, and all other means.

The beft method of perfecting the creature in this, is by letting him have no food, but what he earns by doing well, always feeding him when he does as he fhould do. If he carry the glove away, or play wantonly with it, and refufe to bring it back, his mafter is to ufe the word of inftruction, as *take heed*: If this does not bring him to, he is to ufe the word of correction; and if he does not bring it back at this, he muft proceed to blows; and on many other trials he muft have nothing given him to eat, till he has done as he ought, and has it by way of reward. When by this means he is taught fo well, that he will bring back the glove, wherever it is thrown, and carry it only to his mafter, though he is in company with other perfons, who all call him, he is then to be cherifhed and encouraged, and taught to bring back any thing elfe that is thrown, whether fticks, ftones, or any thing whatever. After this, he is to be taught to carry dead fowl, and finally live ones, and this with fo tender a mouth, as not to hurt them: thus he will be taught at length to bring the fowl that his mafter fhoots, without tearing them or hurting a feather.

The next leffon is to be taught by taking him out in the field, and dropping fomething unknown to him; after he is come to fome diftance from the place, he is to be fent back to feek for it, and if he bring it back, he is to be encouraged. If he bring back a wrong thing, he is to be encouraged for the attempt, and fent back again: By repeating this at different diftances

diftances, he will be taught to go back ever fo far in fearch of any thing; and if he fails in the leffons, he is to be chid, beaten, or kept fafting, for it, according to the offence.

When he has been perfected in all thefe leffons, he muft be taught his bufinefs of hunting; he is to be firft taught with tame fowl, which his mafter is to affift him in taking, and reward and encourage him when he has done. After this, he is to be fent in without affiftance to take the fowl alone, and if he fucceeds, he is to be encouraged and rewarded, and corrected if he fails. By this practice he will foon become mafter of his game; but great care is to be taken in the teaching him, when he has caught it, to bring it back to the fhore, without biting or hurting it.

The next thing to this, is the training him to the gun; to this purpofe he muft be taught to follow ftep by ftep behind his mafter, and under covert of his fhadow, till he has fhot, or, when there is occafion, to couch and lie clofe, never daring to ftir till the gun has gone off; and then, upon the leaft notice or beckoning, to come and do what he is commanded.

Many of thefe dogs are fo expert, that they will have their eye upon the game as foon as their mafter, and the moment the gun is gone off, they will, without bidding, go and fetch it; but this is being too forward, and if he is ufed afterwards with nets or lime-twigs, he will do great mifchief, by rufhing on the birds as foon as they are taken, and tearing the nets, or fpoiling the twigs. Obedience is the beft quality in this fort of dog, and it is better he fhould wait for command, than know his bufinefs without it.

The fportfmen, who know the time of birds moulting, make a very great ufe of this fort of dog, taking him with them without gun, net, or any other affiftance. The common moulting-time of *Water*-fowl is from June to Auguft; in this time they are not able to fly well, and in fome part of it, when their old wing-feathers are off, and the new ones are grown fcarce at all, the dog is then to be taken to the fides of rivers, and other waters, and fet to hunt about the clofe places, among which they hide themfelves at this time; the dog, being fet to hunt, will eafily find them in thefe retreats, and will take them either by leaping fuddenly upon them, or fairly purfuing fuch of them as have not the ufe of their wings.

There is alfo another great ufe of the dog in driving them without catching them. This is practifed only in moorifh and fenny countries, where they are very numerous. In thefe countries a proper place is to be fought for, where the birds retire to, and thefe are planted with nets; then the dog is fent into the *Waters* and places of covert, where they are fuppofed to be, and this at the moulting-time, when they cannot fly away from him. The alarm he puts them into which he firft attacks, foon calls many others together, and there is a large body of them formed, which the dog drives before him like a flock of fheep, and being directed by the fportfmen, frightens directly into the places of their retreat, where the nets are placed before-hand to receive them.

WATER-*Fowl.* We are apt to fuppofe that thefe birds have fomething more peculiar in their ftructure than they really have, to enable them to live without the benefit of refpiration a confiderable time. It was fuppofed that they could fubfift without air a long time, till Mr. Boyle found by his experiments with the air pump, that they could not bear the exhaufted receiver any longer than other birds, a full grown duck being killed in two minutes in it. But what is more obfervable is, that their power of remaining under *Water* is for a much more limited time than is imagined. On tying a weight to the legs of a duck, and finking her in a tub of water, it was found that two minutes immerfion proved very troublefome to her, and occafioned great efforts for rifing; that after this the air-bubbles were difcharged in plenty from the mouth and noftrils, and finally the beak was wide opened, the *Water* admitted, and the creature abfolutely drowned, fo as to be irrecoverably dead in fix minutes. A young duckling put into the *Water* in the fame manner, died at the end of the fourth minute, after difcharging many air-bubbles both from the noftrils and mouth, and yet more from the upper part of the head, a little behind the eyes. Phil. Tranf. N°. 62.

Water-fowl may be taken in great abundance by nets properly managed. The net for this purpofe fhould be always made of the fmalleft and ftrongeft packthread that can be got. The mefhes may be large, but the nets fhould be lined on both fides with other fmaller nets, every mefh of which is to be about an inch and half fquare each way, that as the fowl ftrike either through them or againft them, the fmaller may pafs through the great mefhes, and fo ftreighten and entangle the fowl.

Thefe nets are to be pitched for every evening flight of fowl, about an hour before fun-fet, ftaking them on each fide of the river, about half a foot within the water, the lower fide of the net being fo plummed, that it may fink fo far and no farther; place the upper fide of the net flantwife, fhoaling againft the *Water*, but not touching it by near two foot; and let the ftrings which fupport this upper fide of the net be faftened to fmall yielding fticks fet in the bank; thefe, as the fowl ftrikes, will give the net liberty to play, and to entangle them. Several of thefe nets fhould be placed at once over different parts of the river, at about twelve-fcore fathom diftance one from another; and if any fowl come that way, the fportfman will have a fhare of them. It is a good method, when the nets are fet to go to places fufficiently diftant from them with a gun, to fright them toward the places where the nets are; and wherever any of the fowl are ftarted from, it may not be amifs to plant fome nets alfo there to take them as they return. The nets are to be left thus placed all night, and in the morning the fportfman is to go and fee what is caught; he fhould vifit the river firft, and take up what are caught there, and, frightening the reft away to the other places where his nets are, he is next to vifit them, and take what are there fecured.

WATER-*Gavel*, in our old writers, a rent paid for fifhing in, or other benefits received from, fome river. *Blount.*

WATER-*Horehound.* See the article LYCOPUS.

WATER-*Salamander.* See the article SALAMANDRA.

High WATER is when the tide is at the higheft. See the article TIDE, *Cycl.*

Low WATER is when the tide is at the loweft.

WATERING, (*Cycl.*)—WATERING *of Horfes.* All the while that a perfon is on a journey, the horfe fhould always be fuffered to drink of the firft good water he comes to after feven o' clock in the morning in fummer, and after nine or ten in the winter. Moderately pure water is to be preferred, that being beft of all which is neither too clear and penetrating, nor muddy and ftinking.

Though it is the cuftom in England to run and gallop horfes after drinking, which we call *Watering*-courfes, and which we fuppofe brings them into wind, yet Sollyfel, and many other of the beft judges of horfes, tell us, that it is one of the worft and moft pernicious practices that we can be guilty of; there can no good accrue from it, and many horfes are rendered purfy by it.

While a horfe is drinking, the rider fhould draw up his head five or fix times, making him move a little between every draught. The rider need not be afraid of giving him water, with proper moderation, even in almoft any circumftances. If he be warm and fweat very much, yet if he is not quite out of breath, and there are four or five miles to ride, he will be better after drinking a little, than if he had drank none at all; only obferving, that if the horfe were very warm at his going into the water, his pace muft not be lefs than a moderate trot when he comes out, that he may not be chilled.

In the time of a journey the horfe ought to be fuffered to drink in this manner, of the waters that come in the way, as often as may be; for if the rider happens to bait when he is hot and fweaty, he muft not be fuffered to drink of a long time, as it would endanger his life; and if he has not been *watered* in this manner on the road, his exceffive thirft will often prevent his eating, and he will not be able to touch any fort of food of an hour or two, which is ufually more time than the rider can ftay, and yet without eating at baiting-times he will not have ftrength to go on. The giving him water on the road will, on the contrary, keep him ready for food whenever it is offered him, and the rider need ftay no longer than his own refrefhment requires, the horfe eating immediately, and being readily qualified to go on again.

If there be any fhallow water in the way, a little before the coming to the inn where the horfe is to reft all night, it is always proper to ride him in, and not only give him a little drink, but ride him about feveral times, not quite up to the belly; this will clean his legs, and prevent humours from falling down into them. If the horfe be very warm, and there has been no convenience of *Watering* him upon the road, the oats that are given him fhould be firft fteeped a while in ale; this will induce him to eat, though he could not have touched any that were wholly dry.

Many are of opinion, that horfes are fometimes fpoiled by giving them oats before their water; but Mr. Sollyfel affirms, that though it be not the cuftom to give oats till afterwards, yet it never does any harm to feed the horfe with them both before and after drinking; and that it is often proper and neceffary, efpecially when the horfe has been hard rid, and is warm.

WATRY *Sores*, in the manege, called in French *mauvaifes eaux*, are a fuppuration of ftinking and malignant humours, which iffue from the paftern and fetlock joints of a horfe, and that from the hinder rather than the fore-legs.

WAVE (*Cycl.*)—This motion of the fea-water depends greatly on the winds, and on the fituation of mountains, in regard to the fea; for the winds are driven back from thefe with great impetuofity; and in fome places this occafions a great and very irregular undulation, befide that which is produced by the immediate action of the winds on the furface of the water, in their own direct courfe.

Waves are to be confidered as of two kinds, and thefe may be diftinguifhed from one another by the names of natural and accidental *Waves*.

The natural *Waves* are thofe which are regularly proportioned in fize to the ftrength of the wind, whofe blowing gives origin to them. The accidental *Waves* are thofe occafioned by the wind's reacting upon itfelf by repercuffion from hills and mountains, or high fhores, and by the wafhing of the *Waves* themfelves, otherwife of the natural kind, againft rocks and fhoals;

ſhoals; all theſe caſes give the *Waves* an elevation, which they can never have in their natural ſtate.

The great Mr. Boyle has proved by numerous experiments, that the moſt violent wind never penetrates deeper than ſix foot into the water; and it ſhould ſeem a natural conſequence of this, that the water moved by it can only be elevated to the ſame height of ſix foot from the level of the ſurface in a calm; and this ſix feet of elevation being added to the ſix of excavation, in the part whence that water ſo elevated was raiſed, ſhould give twelve foot for the utmoſt elevation of a *Wave*. This is a calculation that does great honour to its author; for Count Marſigli meaſured carefully the elevations of the *Waves* near Provence, and found that, in a very violent tempeſt, they aroſe only to ſeven foot above the natural level of the ſea, and this additional foot in height he eaſily reſolved into the accidental ſhocks of the water againſt the bottom, which was, In the place he meaſured them in, not ſo deep as to be out of the way of affecting the *Waves*; and he allows that the addition of one ſixth of the height of a *Wave*, from ſuch a diſturbance from the bottom, is a very moderate alteration from what would have been its height in a deep ſea, and concludes, that Mr. Boyle's calculation holds perfectly right in deep ſeas, where the *Waves* are purely natural, and have no accidental cauſes to render them larger than their juſt proportion

In deep water, under the high ſhores of the ſame part of France, this author found the natural elevation of the *Waves* to be only five foot; but he found alſo that their breaking againſt rocks, and other accidents to which they were liable in this place, often raiſed them to eight foot high.

We are not to ſuppoſe, from this calculation, that no *Wave* of the ſea can riſe more than ſix foot above its natural level in open and deep water, for *Waves* immenſely higher than theſe are formed in violent tempeſts in the great ſeas. Theſe, however, are not to be accounted *Waves* in their natural ſtate, but they are ſingle *Waves* formed of many others; for in theſe wide plains of water, when one *Wave* is raiſed by the wind, and would elevate itſelf up to the exact height of ſix foot, and no more, the motion of the water is ſo great, and the ſucceſſion of *Waves* ſo quick, that, during the time this is riſing, it receives into it ſeveral other *Waves*, each of which would have been at the ſame height with itſelf; theſe run into the firſt *Wave* one after another, as it is riſing; by this means its riſe is continued much longer than it naturally would have been, and it becomes terribly great. A number of theſe complex *Waves* ariſing together, and being continued in a long ſucceſſion by the continuation of the ſtorm, make the *Waves* ſo dangerous to ſhips, which the ſailors in their phraſe call mountains high. *Marſigli*, Hiſt. Phyſ. de la Mer.

WAVE-*Offering*, among the Jews, a ſacrifice offered by agitation or *waving* towards the four cardinal points. See the article AGITATION.

WAVED, or WAVEY, (*Cycl.*) in heraldry, denotes that the firſt of the family in whoſe arms it ſtands, acquired his honours for ſea ſervices, and has this peculiar commemoration of it ordered in his arms. *Niſbet*'s Heraldry.

WAX (*Cycl.*)—Before it is poſſible to underſtand the accounts authors give of the manner in which the bee collects its *Wax* and honey, and forms the cells to depoſit the laſt fluid in, it is neceſſary to underſtand the true ſtructure, and know the ſeveral parts of this little creature.

The anterior part of the head of a bee is triangular, and ſomewhat flat; it goes tapering from the baſe to the extremity, and the reticular eyes are placed at the ſides; theſe are of an oval figure, one point or end being much larger than the other. The narrower end of each eye is on the lower part of the head, and reaches almoſt to the origin of the teeth; there is a large ſpace between the eyes, and this is full of little irregularities. The antennæ are placed at the two ſides of an eminence in this part, coming near the eyes; they are of no very ſingular ſtructure, but are compoſed of ſeveral joints, and ſeem of the nature of horn; they are ſo made that they may be eaſily folded in two, and they are always found to be ſo in dead bees. The head is not very thick, but appears ſomewhat broad; and at the upper part there are placed three ſmall ſhining eyes in a triangular ſituation, as is the caſe in many other of the winged inſects.

The bee has a trunk and teeth, and the ſituation of theſe, at the extremity of the head, has a great ſhare in giving that part a triangular figure. The teeth, when they are not in action, meet in a point at their extremities, and form an angle which projects out from the cruſtaceous lips. Theſe teeth are a very eſſential part of the creature, and are not only intended for the common purpoſes of eating, but ſerve alſo to the great purpoſes of erecting the works within the hive. Theſe teeth are properly a ſort of grinders, one of which has its origin on one ſide of the head, and the other at the ſame height on the other; they are ſmaller near their origin than in any other part, and thence grow larger to the extremity, where they are cut off obliquely in ſuch a manner, that when their two ends are applied one againſt the other, they make a ſort of angular pair of pincers, which are able to lay very faſt hold of any thing; they are not only capable of meeting in this manner, but they can, upon occaſion, croſs one over the other; and this is the poſition they are uſually found in when the bee is dead. The truncated ends of the teeth have each a ſemicircular cavity, ſurrounded with hairs; theſe meeting, when the teeth are cloſed, form a regular cavity, capable of receiving whatever is ground to pieces by the ſides of the teeth. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 357.

The head of the bee is faſtened by a ſhort, flexile, and fleſhy neck to the breaſt; the hinder part of the head receives the end of the neck, and near the inſertion of this is placed the origin of the trunk; this goes ſtrait forward from this place as far as the angle made by the teeth, and thence returns in a curved form to fall over the breaſt. On the ſides and upper part of the breaſt are the origin of the four wings, and on its under part the four legs are inſerted. There are alſo on the breaſt the four principal ſtigmata, which are ſituated as in other flies. In the ordinary poſition of the parts, the poſterior end of the corcelet is placed cloſely upon the firſt ring of the body, ſo that they ſeem joined together by their whole ſurfaces. But the true ſtate of theſe parts is, that they are only joined by a ligament; this ligament is placed on the lower part of the corcelet and body, and, being very ſhort, is often not at all ſeen. The poſterior part of the corcelet alſo has a convexity, and the anterior part of the firſt ring of the body a cavity that receives it; whence theſe parts, in their common ſtate, appear joined together in a great extent, in which they really only touch. The body is compoſed of ſix rings, which are covered with very ſtrong ſcales; theſe are very neceſſary to them, for they often fight, and were it not that there was ſuch a defence againſt one anothers ſtings, they would unqueſtionably often periſh.

The body of the bee appears in ſeveral places ſpotted with a reddiſh colour; all theſe parts are ſo many hairy ſpots, and owe their colour to the reddiſh hue of the hair. The body, breaſt, and head of the bee, are alſo covered in many places with longer and more diſtinguiſhable hairs. In examining the creature in this view, it is proper to uſe a microſcope, for tho' the naked eye ſhews many hairs, this inſtrument ſhews vaſt numbers more, and thoſe in places where they could not have been ſuſpected to grow; the very eyes are not exempt from them, the large reticulated ones being as thick ſet with ſhort and fine hairs, as almoſt any other part of the body.

Theſe hairs, when ſeen through the microſcope, do not appear in form of ſingle filaments, but they repreſent ſo many buſhes or beds of moſs, every filament, or as it appears to the naked eye, ſingle hair, being thus ſeen to be branched and beſet with ſhort prominences reſembling leaves of a plant. *Reaumur*'s Hiſt. Inſ. vol. 9. p. 361.

Many have ſuſpected what are called the reticulated eyes of flies not to be real eyes, and theſe growing hairs upon them has ſeemed a convincing proof of their not being ſo, ſince it has been ſuppoſed that they could ſerve to no other purpoſe than to impede viſion. Mr. Hook and others have ſaid a great many things in favour of the opinion of their being eyes; but Mr. Reaumur has proved it beyond all doubt; he choſe to this purpoſe the eyes of the bee for his experiment, as they were the moſt hairy of thoſe of any known inſect, and therefore the leaſt qualified to act as eyes, according to the common opinion. The bee is known to ſee very well; and this author determined to try whether ſhe would do ſo without the aſſiſtance of theſe reticulated ſubſtances; he to this purpoſe covered over the reticulated parts of the head of three or four bees of the common kind, and then incloſed them with twenty others in a wooden box. When they had been there ſome time, he opened the lid of the box; thoſe which were not varniſhed immediately flew out, and went directly to their hive; the others, whoſe eyes were thus cloſed up, continued in the box a long time, and when diſturbed, in order to ſend them out, flew in various directions againſt the ſides of the box; and in fine, when in the air, ſeemed to know nothing of their way to the hive, but flew up into the air till out of ſight.

This experiment ſeems to have wholly determined the point, ſince if the creature be rendered blind by the covering the reticulated ſubſtances on the head, it muſt be allowed that thoſe reticulated ſubſtances are the eyes. The hairs which grow on them do not take their origin from the pupils or lenſes, of which they are compoſed, but from the ſubſtance which ſeparates or makes cells for them; and though theſe hairs appear to ſome to be greatly injurious to viſion, it may very poſſibly be, that they ſerve only as our eye-laſhes, to break the too violent light to which the eyes are ſometimes expoſed. It is to be obſerved, that the hairs which grow upon the reticular eyes of the bee are not branched or foliated in the manner of thoſe of the body, but are only ſingle, ſhort, and ſtrait filaments, perfectly reſembling the hairs of large animals. When Mr. Reaumur had thus proved the uſe of the reticulated eyes of the bee, he was determined to try the uſe alſo of the three ſmall and ſhining eyes, which ſtand on a triangle on the back part of the head; to this purpoſe he covered theſe eyes with the ſame varniſh with which he had before covered the reticulated ones, but leaving theſe bare: he did this with ſeveral bees, and afterwards placing them at a few yards diſtance from the hive, he left them at liberty. Not one of them found the way to the hive, or ſeemed able to direct its flight towards it; but they all flew directly to the flowers that were

neareft them, to which they perfectly faw the way. Thefe did not fly upwards, as all the others did.

The hairs of the bee are of different ufe from that of the hairs of other animals, and therefore all this varied ftructure was neceffary. See the article HONEY.

The legs of the bee are fix; the two anterior pairs are of the fame length; but the two hinder legs, or pofterior pair, are confiderably longer than the others. Each leg is compofed of five principal pieces; of thefe, that next the origin is thicker and fhorter than any of the others. This is a fort of conic button, to the end of which the fecond piece is articulated; this is much longer and thicker in the middle, and thinner at each end; the third piece of the leg in the hinder pair is different from that of the others; it is flat and of a triangular figure, and is called by Reaumur and other French authors, *palette triangulaire*. This is articulated with the fecond piece by its point, and with the fourth by its broad part. This third piece in the fecond pair of legs is much lefs flat and triangular than in the hinder pair; and in the firft pair it is fcarce at all fo. The fourth piece in the two hinder pairs of legs is alfo broad and flat; but it is not triangular, but of a fquare figure. The French writers call this the *broffe*. This is much larger and broader on the hinder pair of legs than on the fecond, and in the firft it is not at all of this flatted or fquare figure, but is cylindric and flender. The fifth piece of each leg is what may be called the foot. It is an extremely fine part, and is compofed of five joints, placed clofe to one another. The four anterior pieces are a fort of truncated cones, a little flatted, and are joined by the bafe of the firft to the head of the fecond, and fo on. The laft piece is long, flender, and cylindric, and is terminated by two hooks refembling the claws of a bird. One of thefe is twice as long as the other, and between thefe two claws there is placed a flefhy protuberance covered with hairs, of the nature of that of the feet of the flies; by means of which they are able to climb upon glafs, or other fmooth bodies. *Reaumur's* Hift. Inf. vol. 9. p. 368.

The firft joint of all the legs of the bee is covered with the foliated hairs before-mentioned; the fecond piece has ftrait hairs, and the third piece, or palette on the hinder pair, is fo befet with large and ftiff hairs all round its edges, and fo hollowed in its anterior part near the bottom, that it refembles a fort of bafket, and it is made for that very purpofe, ferving the creature as a fort of bafket to carry home its *Wax* in.

The third joint of the firft and fecond pair of legs has no ftructure like this; and we find that it is not in thofe legs ufed to the fame purpofes, it being only on the laft pair of legs that the lumps of *Wax* are feen, when the bee is loaded with them. The fourth piece of the two hinder pair of legs, which the French call the *broffe*, or the brufh, and which is of a fquare figure, ferves the creature in the place of a brufh, and is in reality formed fomewhat like one. The outer furface of this is convex and fmooth, the inner is concave and hairy, and the hairs on this part do not ftand fingly, but are placed in little tufts, wider at the extremity than at their origin, and exactly refembling the tufts of hair in our clothes-brufhes. *Reaumur*, Hift. Inf. vol. 9. p. 369.

The feveral authors who have treated ever fo largely on the arts and induftry of bees, and defcribed the manner of forming their waxen ftructures or combs for the reception of their honey, have yet omitted to clear up the material point of what that *Wax* is, what it is originally compofed of, and by what artifice the bee works it out of its rough ftate, in the plant in which it is found, into the fubftance which we call *Wax*.

It is very certain that the farina fœcundans of the flowers of plants, contained in their apices, is the matter of which the bees form their *Wax*; they either diflodge this from its cells with their teeth, or elfe merely by rubbing their bodies among the ftamina and apices, load themfelves with the globules of it, which their hairs keep fticking upon their body, and which they afterwards brufh off with their legs, and, by degrees, collect into balls or lumps, which they depofit upon the flat and triangular piece, which makes the third joint of the hinder pair of their legs.

The lumps of *Wax* with which we fee them loaded in this part, and carrying to their hives, is only the farina of flowers worked up and compreffed into a mafs or fort of cake. The ftamina of the flowers therefore fuftain certain cafes, containing a powder, which is the matter of bees *Wax*. This powder, thus collected into lumps on the legs of the bees, is called rough *Wax*, and is probably *Wax* to all intents and purpofes, only wanting a little beating together. *Wax*, therefore, fo long efteemed an animal fubftance, will appear to be a native vegetable production. We know very well, that different fpecies of trees yield us the feveral gums and refins ufed in medicine and mechanics, in the fame perfect form in which we fee and ufe them; and there is a fpecies of fhrub, very well known in America, and called the *candle-berry-tree*, the berries of which yield a *Wax* perfect in all refpects, and fit for the making candles, *&c.* without having paffed through the manufacture of the bee at all.

In the fame manner it feems that all our common plants produce *Wax* in their flowers, but that this is in fuch very fmall quantities, that thefe little animals alone are able to collect and work it into a ftate fit for our ufe: but this does not abfolutely hold good; for if we examine what we call rough *Wax*, that is, the balls of *waxey* matter on the legs of the bees, we fhall find that it is not yet bees *Wax*. It is an eafy matter to catch a few bees as they return in a morning loaded to the hive, and on feparating the *waxey* matter from their legs, and preffing it between the thumb and a finger, it will be found to differ greatly from perfect *Wax*. This would, in a like cafe, foften of itfelf, and form a regular and uniform flat cake; whereas, on the contrary, the matter from the bees legs is friable, not ductile, will not foften itfelf between the fingers; and when preffed a little to a flatnefs, it is feen to be ftill compofed of regular globules, which all retain their priftine form, not mixing or blending among one another, and hanging together only by means of fome humidity which hangs about their furfaces. If it be tried by a greater warmth, it will be found in the fame manner to differ from *Wax*, in the want of fome of its effential qualities. If a piece of it be put into a filver fpoon, and held over lighted charcoal, it will not melt as *Wax* would do, but will take fire and burn regularly into a cinder: and finally, if it be carefully worked into a long thread, and the end of it put to the flame of a candle, it will take fire as readily as *Wax* would do, but it will not run or melt like it, but burn like a piece of dry wood. Water alfo gives as evident a proof of the difference between the rough *Wax* and the perfect, as fire. If a piece of this rough *Wax*, as taken from the legs of the bee, be thrown into water, it finks to the bottom; whereas perfect *Wax* will always fwim upon the top: This might feem owing to the great humidity of the rough *Wax*, while loaded with the juices of the plant; but it is proved by experiment that this is not the cafe; for if the rough *Wax* be kept till ever fo perfectly dry, it ftill preferves its own nature, and will fink in water as readily as at firft. *Reaumur's* Hift. Inf. vol. 10. p. 39.

From the whole then it is evident, that the bee does fomething to the matter of which *Wax* is made, in order to the reducing it into perfect *Wax*. It might be fuppofed that the feveral globules of this matter were fo many facks containing the true *Wax*; and that the bee need only break or open thofe facks, to get at the true and genuine *Wax* within; but this does not appear to be the cafe upon experiment, fince if this matter be ever fo nicely and carefully pounded and broke to pieces, it does not become any more *Wax* for this treatment, nor is any more fufible or ductile than before. The opinion of Swammerdam and Maraldi was, that the bee added fome other matter to the rough *Wax*, in order to reduce it to this proper ftate. And as there is no fubftance fo ready for the bee as honey, they fuppofed that fhe mixed honey with this matter, and fo made *Wax* of the compound; but experiment is alfo wholly againft this, fince if honey, and this matter collected from the bees, be mixed in any proportions, the compound has no more the properties of *Wax* than it had before, but ftill remains a quite different fubftance. Swammerdam afterwards fell into another opinion, in regard to the matter mixed with the rough *Wax*, in order to render it perfect; this was, that the bee mixed with it the venomous liquor, of which fhe has a bag full near the tail, in order to poifon the wounds made by her fting. He made fome experiments on this plan, which he thought favoured his fyftem, and endeavours to ftrengthen the probability, by obferving, that as the fting of a bee comes but very little into ufe, it would not have been neceffary that the creature fhould have been thus conftantly fupplied with a large bag of this matter, if nature had not allotted to it fome other ufe befide that regarding the fting. This opinion prevailed among the learned, till Mr. Reaumur of late proved by experiments, that this liquor had no effect on the matter found on the thighs of the bee, as to the turning it into *Wax*; and alfo, that feveral creatures which make no true genuine *Wax*, fuch as the humble-bee, the wafp, and the hornet, whofe combs are made of a fort of paper, yet have all this bag of liquor near their fting.

It is moft probable, that the method in which the bees turn the farina of flowers into *Wax*, is a very fimple one; and moft likely it confifts only in a fort of beating the quantities of them, which they collect, till they are very thoroughly united. We have never been able yet to difcover their manner of doing it; but this appears moft like the courfe of nature, in the operations of other infects; if this be the cafe, it would be poffible, perhaps, for us to imitate their method, and procure for ourfelves *Wax* out of the ftamina of flowers; this would be a difcovery of the utmoft importance: For though at prefent the bees which work it for us coft us nothing in keeping, yet it is to be obferved, that they are too few in number to collect fo much as we might wifh. Doubtlefs it is not one thoufandth part of the waxey matter, produced only by a few plants, that the bees of a whole province collect, while the reft all falls to the ground, and is loft. If we could arrive at the way of converting the farina of flowers into *Wax*, without the affiftance of the bee, we might have it in infinitely larger quantities; fince children might be taught to beat off, or fhake down, the farina from numbers of plants, which, when in full flower, would yield a much greater quantity than could be expected by thofe who are not converfant in thefe ftudies.

The

The probability of succefs in an attempt of this kind, has engaged the French naturalifts in the following trials.

Mr. Geoffroy, in his account of the farina of plants, obferves, that they preferve their figure a long time when immerfed in feveral liquors, but that they impart a tincture to thofe liquors. This induced Mr. Reaumur, to try the experiment of what different fluids were able to extract from them. For this purpofe he collected a confiderable quantity of the rough matter from the legs of the bees of one of his hives, and dividing it into three parts, he poured upon one fome common water, upon the other fpirit of wine, and upon the third oil of turpentine.

When thefe had all ftood three months, often renewing the liquors, he evaporated the water, which was coloured of a deep and dufky brown, to a perfect drynefs. When this was done, there remained at the bottom of the fpoon in which the evaporation was made, a fmall quantity of a perfect gum, which had all the properties of the common vegetable gums, and was as eafily foluble in water as any other of them.

The impregnated fpirit of turpentine was next evaporated; but the refiduum was not great in quantity, and was in fo much owing to the liquor itfelf, that little could be judged from it. In trials made after this, by boiling the rough *Wax* in frefh oil of turpentine, this appeared to be but a very poor menftruum for it, the *Wax* rather hardening than foftening in it.

The fpirit of wine impregnated with the tincture of the farina was next evaporated; as the liquor grew thick toward the end of the evaporation, it fent out a ftrong fmell of *Wax*, and, when wholly evaporated, it left on the fpoon a cake of yellowifh matter, having perfectly the fmell and external appearance of *Wax*. We may learn from this, that the fubftance of *Wax* is in the farina of flowers, and that this menftruum is capable of extracting its finer parts. The quantity of extract remaining from this operation was a fcruple. This carried all the external appearances of *Wax*, and fome of its properties. It was of the fame colour and confiftence with the common yellow *Wax*; its fmell was wholly the fame, and it would fufe or run into a liquid matter at the fire, and might be moulded between the fingers, being as ductile as common *Wax*.

With all thefe properties there was great reafon to fuppofe it to be perfect *Wax*; but this appeared not to be the cafe when it was held a little time in the mouth, for it there broke to pieces, and diffolved in the manner of the common lozenges, which have fugar for their bafis. The evident refult of this experiment was, that the matter of *Wax* was contained in this fubftance, collected on the legs of the bees, and owing its origin to the farina of flowers; but that it was as yet mixed with fome other fubftance, and the fpirit of wine had extracted them both together.

The moft likely extraneous matter to be mixed with the *waxey* fubftance, was fome falt; this was eafily proved to be the cafe by another operation; for if this refiduum was dried to a perfect hardnefs over the fire, it would become fo moift again, on being expofed to the air, that in an hour's time the fingers would ftick to it; this imbibing humidity from the air is fo known a property of falts, and fo uncommon in other things, that there is little room to doubt but that this was the cafe in this refiduum.

It is evident, however, from this experiment, that a part, at leaft, of the matter of which *Wax* is made, is contained in the ftamineous powder, or farina of plants, and that the fpirit of wine extracts this, and with it fome portion of heterogene matters. It is probable, that if we knew the proper diffolvent of *Wax* in its perfect ftate, which is a thing not yet known, we fhould be able, by means of that, to extract the *Wax* pure and alone, either from the ftamina of flowers, or from the matter lodged on the legs of the bees; but that till we are acquainted with fuch a diffolvent, we are not to wonder that we cannot extract pure and perfect *Wax*, either from the farina in its natural ftate on the plant, or when lodged on the legs of the bee.

Laftly, fpirit of wine digefted upon real *Wax*, and the tincture evaporated, does not diffolve the whole fubftance of the *Wax*, but the refiduum of the evaporation is the fame with that from the farina itfelf; a fubftance of the confiftence of butter, of a yellow colour, having the fmell of *Wax*, and fome of its properties, but being foluble in water. *Reaumur*, Hift. Inf. vol. 10. p. 48.

The falt which is extracted from perfect *Wax*, as well as from the farina of plants, by digeftion in fpirits of wine, is of the nature of fugar or honey, being the effential falt of fome peculiar juices of the plant. This is contained in much larger quantity in the virgin *Wax*, of which the firft combs of bees are made, than in fuch common *Wax* as has been melted and run into cakes; this is proved by extracting a tincture from fuch virgin *Wax*, which always has a plainly faccharine or honey-like tafte.

The difficulty in the way of the making *Wax* from the fubftance from which the bees make it, is the poffibility of its being converted into *Wax* within the body of the animal: If this is the cafe, notwithftanding that we perfectly know the matter of which *Wax* is made, we are not to wonder that we are not able to make it, any more than that we are not able to make chyle or blood out of the feveral fubftances ufed by us as food, and out of which we well know that it is made within our bodies.

Crude or rough WAX, called by the French *cire brute*, in natural hiftory, a name given to a fubftance called by the antients *erithace*, *fandarac*, and *ambrofia*.

We feem to have no name for it in Englifh, but may call it after the name of the French, *rough-Wax*.

The Dutch call it the food of the bees, and that perhaps very properly, there appearing many reafons to think that the bees eat it.

It is the yellow fubftance found on the hinder legs of bees in fmall lumps, and is the fubftance of which *Wax* is made by this infect. See the article WAX, *fupra*.

Manner of collecting the crude WAX. If we examine a bee juft entering a flower, which is well opened, and in its perfect ftate, we fhall ufually fee her body very clean and neat; but if we examine her when fhe comes out, fhe is ufually found covered over with a fine duft: It is very eafy to determine that the creature has got this duft from fome part of the flower; and obfervations equally eafy will alfo prove, that this powder is the matter of which the bee makes its *Wax*.

People who have not examined flowers as botanifts have, yet often obferve, that in a tulip or a lilly there are certain filaments which duft over the fingers in touching them. Thefe filaments are by authors called the ftamina or threads of flowers, and they always contain a large quantity of this duft. Tournefort, and many other great writers, have fuppofed this duft to be only a fort of excrement fecreted from the abundant juices of the plant by thefe filaments, which they have fuppofed to be organs deftined only for that purpofe; but later obfervers have allotted a more noble ufe to this duft; they have called it the *farina fœcundans*, and have proved that all the fœcundity of plants is owing to it, the feeds never growing if they are not properly impregnated with the particles of this duft, any more than the eggs of animals will be hatched into young ones, if not impregnated by the male femen. This farina is not to be fuppofed an irregular duft, in the manner of our common powders; but the farina of the fame plant is always compofed of particles of the fame fhape, and that different from the fhape of the globules of the farina of other plants. *Reaumur*, Hift. Inf. vol. 9. p. 371.

It is of this powder or farina that the bees prepare their *Wax*. When one of thefe infects goes into a flower, fhe always fhakes thefe ftamina, and difcharges all their globules or duft upon her body, while fhe is fucking the honey with her trunk. It is on this occafion that the hairs, with which the bee is covered, are of fervice to her. Thefe round globules would all roll off from her fmooth body and legs; but they are entangled in great numbers among this foreft of branched and foliated hairs, and the creature carries them off for her fervice. Thus when the bee comes out of a flower, fhe is always feen to be dufted over with a yellow, a red, or a white powder, according to the colour of the farina of that fpecies of plant. In fome places the bees return to their hives, at certain feafons, fo covered with thefe powders, that the owners have thought they were, at certain times of the year, poffeffed of yellow or white bees.

Some bees carry their duft thus on their body to the hive; others take the pains to clean themfelves firft, by brufhing their bodies, and collecting the whole together into a body, or fmall lump: This is done by means of the fquare brufhes, which make the fourth pieces of the four hinder legs; thefe are befet with tufts of hairs, in the manner of a common brufh ufed for cloaths, and thefe they are able to move to every part of the body. The hairy parts of the anterior pair of legs ferve to brufh the head, and parts about it, as clean as the brufhes on the other legs do the body; and the duft, which is to them a very precious matter, is by this means collected into two parcels or lumps, one of which they place in the triangular bafket, with which nature has furnifhed them on the third joint of the hinder legs. See the article BEE. *Reaumur*, Hift. Inf. vol. 9. p. 374.

This lump on each leg is formed into a fort of round figure, and they fix it down in the cavity of this triangular piece, and the ftrong and large hairs with which all the edges of this piece are furnifhed, very well keep it in till the creature gets to the hive.

The quantity of powder received from a fingle flower, when thus collected into two lumps, feldom forms them fo large as a fmall pin's head; but as the creature inceffantly flies into frefh flowers, the new matter collected from each, and added to the reft, ftill increafes the heap, till, when the bee is ready to return to the hive, each ball often is as large as a pepper-corn, and refembles it in fhape, only that it is fomewhat flatted. Many perfons have obferved the bees thus bufying themfelves, and forming the powder with which they are covered into balls; but the motion of their limbs, on this occafion, is fo fwift, that we can only fee the brufhing, and the effect of it in the balls; but our eye can never trace the manner of the operation. There are fome circumftances alfo in which the bee may be feen to make an immediate collection of *Wax* from the flowers, to the place on the hinder legs, where it is received

received in a lump, without ever going on the body at all. This is very happily obferved in the flowers of the apple and pear-tree in the fpring-feafon.

It is but of a very late time that men have found out that the little buttons on the fummits of the filaments of the flowers of plants contained this powder or farina fæcundans; but the bees feem to have known it from all time; and before thefe little buttons or cafes of the farina burft open, is the time when the bee can furnifh herfelf the moft completely with the farina from them. If the bloffoms of an apple-tree be obferved when juft opened, and the apices or buttons of the ftamina ripe, but not yet burft, a bee that comes into fuch a flower, tries one of thefe apices with her teeth; if fhe finds it is not ripe, fhe goes to another; but if it be, fhe burfts it open with her teeth, and wiping all the duft clean out of it with her fore-leg on this fide, fhe paffes the powder, thus received, to the fecond leg, and thence to the third, where it is immediately lodged in a lump in the proper receptacle on the triangular piece, which makes the third joint of that leg. This being at a feafon of the year when the weather is cold, and the bees not very brifk, their operations are feen better than at other times; but even here it is but imperfectly that they are traced, the motion of the legs, in delivering the treafure from one to another, is too quick to be feen.

There is, however, another occafion in which thefe motions are to be feen much more diftinctly than in any other of thefe operations; this is when the bees are employed, as they fometimes are, in collecting a reddifh glutinous matter inftead of *Wax*: This matter is of the confiftence of a refin while foft; it is pliable, and fticks to whatever it touches, fo that the creature is troubled enough to deliver it from part to part, and the motions by which it performs this are confequently much flower than thofe by which it manages its *Wax*. The method of this procefs is thus: the bee bites off a fmall piece of the refinous matter from the vegetable, with its teeth; it then holds this piece between the teeth, till it has fafhiond it into a fmall round globule; as foon as this is done, the laft joint of the anterior leg, which may be called the foot, receives it from the teeth; this foot is compofed of five joints, and has a power of bending and clofing in the manner of our fingers; this feizes upon the little globule while it is held between the teeth, and with fome difficulty difengages it. It then delivers it to the foot of the fecond leg of the fame fide, which feizes it, and flowly delivers it from its adherences to the foot of the firft leg; when perfectly freed, this places it on the triangular joint of the third leg, and then beats it down into the cavity by repeated ftrokes, at once working it into a proper confiftence, and driving it into the mould, as the labourers ufe the foft clay of which they make bricks. This is doubtlefs the procefs in the depofiting and working the common *Wax* into form; but that being a lefs vifcid and tenacious fubftance, the whole motion is performed too quick to be obferved diftinctly; whereas in this, the tenacity of the fubftance making the parts ftick to it, the motions are flower, and confequently are more eafily feen. *Reaumur*'s Hift. Inf. vol. 9. p. 378.

All the bees do not return loaded in the fame degree with *Wax* to the hive; fome perhaps are better workers than others, and probably fome have the happinefs to meet with flowers that yield more honey than others. When the lump is fmall, it is contained within the verge of the palette, or flat part of the leg; but when it is larger, it hangs over the fides, and entangling among the hairs, forces them outward; but thefe hairs are at the fame time greatly affiftant in retaining it in its place.

When the bee meets with a flower whofe apices are not fo ripe as to burft open on the touch, fhe is obliged to bite every one of them with her teeth, and then collects the matter of the *Wax*, as in the inftance of the apple-bloffoms; but when the apices are fo perfectly ripe as to burft of themfelves on being touched, fhe has nothing to do but to introduce herfelf among them, and then fhaking them thoroughly about, their powder is difcharged all over her body, and is to be brufhed off, and collected into lumps by a more tedious procefs, every particle of it being probably obliged to come into the reach of the feet of the anterior legs, and when worked into lumps in them, to be delivered to the feet of the next pair, and by them depofited on and preffed down into the palette or third joint of the laft pair of legs.

If the bees are obferved when returning to the hive loaded with their lumps of *Wax* on their thighs, thefe lumps on fome will be found to be white, on others yellow, on others red, and on fome greenifh: This is owing to the different colours of the farina, yielded by the different plants they have been at work upon. The manufacture of the bee in moulding this into a lump, has not yet been able to alter the colour of the farina, nor even its figure; for if the lumps be examined by the microfcope, they will all be found to confift of globules of a rounded or oval figure, or of whatever other fhape they had when on the plant. The bees returning to their hives after their morning excurfions in the fpring, are always found to contain in the cells of their palettes large lumps of *Wax*; but thofe which go out in the heat of the day, return with little or none; the reafon of this is, that the humidity of the farina, by means of the dew, makes it eafily formed into a lump or mafs, its particles naturally fticking together; whereas in the heat of the day this powder is too dry to be formed thus into a compact mafs, and therefore cannot be carried home by the bee. *Reaumur*, Hift. Inf. vol. 9. p. 382.

Chemical Analyfis of WAX. Tho' bees-*Wax* be of fo firm and folid a fubftance as we fee, yet it is very remarkable that it contains no earth, but rifes wholly in the fire in the common way of diftillation by the retort, without leaving a refiduum. Another fingular obfervation in this procefs, is, that the more fluid matter there comes over into the receiver, the thinner the remaining matter in the retort becomes, not as might naturally be expected the thicker.

When the fpirit of *Wax* (which is a phlegm with fome acid particles fufpended in it) is all driven over by the fire, the refiduum is a foft fatty fubftance, commonly called the butter of *Wax*; and if this butter be rectified, that is, if more acid and more phlegm be driven from it by the force of fire, the refiduum of this procefs is yet thinner than before, remaining in form of a clear liquor like oil, It appears therefore, on this analyfis, that *Wax* is compofed of two parts, an aqueous fubftance, with fome acid particles blended in it, and an oil; thefe two liquors have, by their union, formed this concrete, and acquired a hardnefs; but in the feparating them from one another, they become fluid again.

The proportion of the ingredients in this fubftance is alfo a very fingular thing, for all the care in the world cannot feparate quite one fourth part of the weight of the *Wax* in form of oil, the remainder then is all phlegm and acid. Mr. Homberg advanced, that oils only became inflammable by means of the acid they contained, and this feems a proof of it; but when we confider that *Wax* all burns away, it is an odd obfervation, though a very certain one, that three fourths of what is burning is water. Mem. Acad. Par. 1708.

To imitate Fruit in WAX. Take the fruit, and bury it half-way in clay; oil its edges, and the extant half of the fruit, then nimbly throw on it tempered alabafter, or plafter of Paris, to a confiderable thicknefs. When this is concreted, it makes the half mould, the fecond half of which may be obtained in the fame way. The two parts of the mould being joined together, a little coloured *Wax*, melted, and brought to a due heat, being poured through a hole made in any convenient part of the mould, and prefently fhook every way therein, will reprefent the original fruit. *Boyle*'s Works abr. vol. 1. p. 136.

WAY (*Cycl.*)—WAY *aftward on*, or *foreward on*, in a fhip, is the fame with her run or rake. See the article RAKE and RUN.

WAYED *Horfe*, in the manege, is one that is already backed, fuppled and broken, and fhews a difpofition to the manege.

WEACHIN, in botany, the name given by the Indians of America to the maiz, or Indian corn, which they cultivated for bread before we knew them.

WEAK (*Cycl.*)—WEAK, or *eafy branch*, in the manege. See the articles BANQUET and BANQUET-*Line*.

WEALD (*Cycl.*)—WEALD, or WALD, in the beginning of names of places, fignifies a fituation near woods; and the woody parts of the counties of Kent and Suffex are called the *Wealds*, though mifprinted *wildes*, in the ftatute 14 Car. 2. c. 6.

The word *Weald* in Saxon fignifying a wood.

WEALREAF, in our old writers, fignifies the robbing of a dead man in his grave. *Leg. Ethelred.* c. 21. *Blount.*

The word comes from the Saxon *Weal*, ftrages, and *reaf*, fpoliatio.

WEASEL, in zoology. See the article MUSTELA.

WEATHER (*Cycl.*)—We have feveral fchemes for keeping journals or diaries of the weather, extant in the Philofophical Tranfactions, the medical Effays of Edinburgh, and in other books. The *Ephemerides Ultrajectinæ* may alfo be confulted.

The inftruments requifite for fuch a journal, are a barometer, thermometer, hygrometer, anemofcope, and ombrometer, which fee in their proper places in the Cyclopædia or Supplement.

WEATHER-*Cord*, is an hygrometer of a very antient invention, and, if properly conftrued, may be ufed with good fuccefs, to fhew the alterations of the atmofphere, with refpect to moifture and drinefs; but as commonly made, * it never rifes or falls fufficiently to point out fuch changes as the curious would be defirous to know. But thefe rifings and fallings may be made very fenfible, by means of a long index, moveable round a center, and pointing to a divided arch. We have a conftruction and figure of an improved *Weather-cord* in the Philofophical Tranfactions. N°. 479. p. 170. fig. 5.

WEATHER-*Quoil*, or *Coile*, in the fea language, is the turning the fhip's head about, fo as to lie that way which her ftern did before, without loofing any fail, but only by bearing up the helm.

WEAVER'*s Alarm*. This contrivance is only a weight faftened to a packthread, which is placed horizontally, fo that in a certain time a candle may burn down to it. Then the flame of the candle fetting fire to the thread, the weight falls, and awakens the fleeping perfon. See Phil. Tranf. N°. 477. Sect. 14. where we have a figure to explain the invention, which got its name from being in frequent ufe among the *Weavers*.

WEEDS (*Cycl.*)—This term is uſed by our huſbandmen to expreſs ſuch plants as come up in their lands, and are different from the crop ſown there.

No plants are uſeleſs in themſelves; but in reſpect to the farmer they are both uſeleſs and hurtful, when they come in this manner, and devour the nouriſhment deſtined for the crop of what was ſown.

All *Weeds* are pernicious; but ſome much more ſo than others: Some are very miſchievous, but eaſily killed; ſome leſs hurtful, but more difficultly rooted out; and ſome have both qualities together. The hardeſt to kill are thoſe which grow readily from ſeed, and have roots, every part of which is qualified for the becoming a ſtout plant in a ſmall time; the worſt are couch-graſs, colts-foot, melilot, fern, and ſome others of the like kind.

Some of theſe pernicious plants only affect the crop by ſtarving, and leſſening its increaſe; but there are others which add to this miſchief, that of ſpoiling what they leave; theſe infect the crop with their own nauſeous ſmell, ſuch as melilot, garlic, and ſome others. It is ſuppoſed by ſome, that *Weeds* ſtarve the ſown plants, by taking up the room they ſhould poſſeſs; but this is an error, and the real way in which they prejudice them, is, the devouring the nouriſhment that they ſhould imbibe.

This is eaſily proved by the following experiment. Let three beds of the ſame ſoil, equal in ſize, and equally prepared, be ſown with the ſame corn; let the firſt of theſe be kept clear from *Weeds*; in the ſecond, let the *Weeds* be ſuffered to grow up among the corn; and in the third, ſtick up a quantity of dead ſticks, greater in bulk than the *Weeds*. It will be found that the produce in the third bed will be equal to that of the firſt, though as much and even more room is taken up by the ſticks, than by the *Weeds* in the ſecond; but the quantity in the ſecond bed will be leſs, in proportion to the *Weeds*, than in any other. The quantity of nouriſhment loſt, is not proportioned to the quantity of the *Weeds* that exhauſt it; for theſe being of different ſpecies, ſome are greatly more miſchievous and devouring than others.

The farmer finds it impoſſible ever wholly to deſtroy the *Weeds* in his lands; and the reaſon ſeems to be, that in many kinds the ſeeds will lie many years in the ground, and ſucceſſively grow, ſome one year, ſome another; ſo that the deſtroying the crop entirely for one year, does not kill them for ſucceeding ones. The ſeed of red poppy will lie twenty years in the ground, in a land all that time occupied by ſaintfoin; and if it be, after that, ploughed for corn, they will all grow, and fill the field.

The ſeeds of theſe plants will never all come up in one year, becauſe they muſt have their exact degrees of depth, moiſture, and covering; the ſeeds which want any of theſe one year, lie to grow up another. The beſt defence the farmer has hitherto found againſt theſe enemies, is to endeavour their deſtruction by a ſummer fallow. This, if the weather be propitious, does make ſome havock among them, but it never deſtroys them entirely. If the ſeeds lie ſo high that the ſummer's heat parches them up, or ſo deep that it cannot reach them, they do not germinate, and are by that means ſaved for another year. And another thing, which ſaves a very great number of them, is their being able to bear the heat and moiſture of a whole year without growing. Wild oats, and many other ſeeds of *Weeds* are of this kind. If you gather theſe when ripe, and ſow them in the moſt careful manner, watering them at times, and taking all the care of them that is neceſſary to the moſt tender plants, they will not grow till the ſpring come twelve-month after they were ſowed, and ſometimes not till the ſpring after that; that is, two years and a half after the time of putting them into the ground. It is plain from this, that no art can deſtroy theſe by fallowing, or other means, in one year.

The common way of *weeding* among the young corn, turns out to very little good; if this is done while the *Weeds* are young, the greateſt part of them are only cut or broken off near the ground; this, inſtead of deſtroying them, gives them new vigour, and they ſhoot up with many heads in the place of one, and draw more nouriſhment than at firſt: if, on the other hand, it is done when they are grown up, the relief comes after the diſeaſe; for by that time they have robbed the corn of all the nouriſhment, or nearly all, they could. Hand-*weeders* alſo frequently do more harm in the corn, by treading it down, than they do good by taking out the *Weeds*. This operation ſometimes coſts the farmer twelve ſhillings an acre, beſide the miſchief done, and yet there remain *Weeds* enough for a crop the next year from ſeeds.

The method of horſe-hoeing is a very excellent way of curing lands of this diſeaſe, ſo long as it is carefully practiſed; one of the greateſt advantages it will bring the farmer, is, that no *Weeds* will grow up but thoſe whoſe ſeeds are brought in the air, and theſe are but very few in compariſon of the other kinds.

WEEDS, in mining, a term uſed by our Engliſh diggers to expreſs any ſort of unprofitable ſubſtance found among the ores of metals. They ſeem to have borrowed the phraſe from the gardeners; and as every thing with them is a *Weed*, except what they have planted, and expect to gather, ſo every thing is a *Weed* with the miners, except the thing they are ſinking for. See the articles DIGGING and MINING.

The principal ſubſtances known in our mines under the names of *Weeds*, are mundic or marcaſite; this is of three ſorts, white, yellow, and green; daze, a kind of glittering talcy ſtone, of the telaugium kind, which endures the fire, and is of various colours and hardneſſes; iron-moulds, or pyritæ; caul, which is browniſh and ſpongy; and gliſter, which is a ſort of talc. Phil. Tranſ. N°. 69.

Hair-WEED. See the article HAIR.

WEEK (*Cycl.*)—WEEK-*Fiſh*, in zoology, a name given by ſome to a very delicate fiſh, caught on the Eaſt Indian ſhores, and called by the Dutch there the *wit viſch*. *Ray*'s Ichthyography, append. p. 6. See the article WIT-*Fiſh*.

WEEVER, in ichthyology, the Engliſh name for the fiſh called by Willughby and other authors, the *draco-marinus*, or ſea-dragon, and the *araneus-marinus*, or ſea-ſpider. Some alſo have called it *trachurus*.

It is properly, according to the Artedian ſyſtem, a ſpecies of the *trachinus*, and is diſtinguiſhed by that author by the name of the *trachinus* without beards, and with the lower jaw longeſt. See the articles DRACO-*Marinus* and TRACHINUS.

It is to be obſerved that Willughby and Geſner have deſcribed what they call two other ſpecies of this fiſh; but theſe are all found, on a cloſe obſervation, to be the ſame fiſh, differing only in reſpect of age and ſize, or other accidental variations, owing to the like natural cauſes.

WEEVIL, in natural hiſtory, the name of a ſmall inſect which does great damage in magazines of corn, by eating into the ſeveral grains, and deſtroying their whole ſubſtance.

This creature is ſomewhat bigger than a large louſe, and is of the ſcarab kind, having two pretty, jointed, tufted horns, and a trunk or piercer, projecting from the forepart of its head: at the end of this trunk, which is very long in proportion to its body, there are a ſort of forceps, or ſharp teeth, with which it gnaws its way into the heart of the grain, either to ſeek its food, or to depoſit its eggs there.

By keeping theſe creatures alive in glaſs tubes, with a few grains of wheat, their copulation and manner of generation have been diſcovered. The female perforates a grain of wheat, and therein depoſits a ſingle egg, or, at the utmoſt, two eggs; and this ſhe does to five or ſix grains every day for ſeveral days together. Theſe eggs, which are not larger than a grain of ſand, in about a week produce as odd a ſort of white maggot, which wriggles its body very much about, but is very little able to move from place to place: this, in about a fortnight, turns to an aurelia, from which is produced the perfect *Weevil*. This deſtructive creature is itſelf very ſubject to be deſtroyed, and when in the egg or aurelia ſtate, is very ſubject to be eaten by mites. *Baker*'s Microſ. p. 221. *Lewenhoeck*.

WEIGHT (*Cycl.*)—In the Philoſophical Tranſactions [a] we have an account of the analogy betwixt Engliſh *Weights* and meaſures by Mr. Barlow. He advances that antiently a cubic foot of water was aſſumed as a general ſtandard for liquids, and weighed 62 pounds and a half. And, in effect, we find [b] the *Weight* of a foot of pump-water to be 62 pounds 8 oz.—[[a] N°. 458. Sect. 1. [b] Phil. Tranſ. N°. 169.]

This cubic foot multiplied by 32, gives two thouſand, the *Weight* of a ton. And hence 8 cubic feet of water made a hogſhead, and four hogſheads a ton, in capacity and denomination, as well as *Weight*.

Dry meaſures were raiſed on the ſame model. A buſhel of wheat, aſſumed as a general ſtandard for all ſorts of grain, alſo weighed 62 pounds and a half. Eight of theſe buſhels made a quarter, and 4 quarters a ton weight. See the article BUSHEL.

Coals were ſold by the chaldron, ſuppoſed to weigh a ton, or 2000 pounds. See the article CHALDRON, *Cycl.*

Hence a ton in *Weight* is the common ſtandard for liquids, wheat, and coals. Had this analogy been kept up, it would have prevented the confuſion now complained of.

It may be reaſonably ſuppoſed that corn and other commodities, both dry and liquid, were firſt ſold by *Weight*, and that meaſures, for convenience, were afterwards introduced, bearing ſome analogy to the weight before uſed.

Mr. Barlow's ſcheme ſhews the reaſon why the word *ton* is applied both to *Weight* and liquid meaſure, *viz.* becauſe the ſame quantity of liquor is a ton both in *Weight* and meaſure. Hence the word *quarter* may alſo be explained. Biſhop Fleetwood [a] gueſſed that it ſignified the fourth part of ſome *Weight*, and not of any meaſure. And it ſeems plainly to ſignify the fourth part of a ton, or 2000 pounds [b].—[[a] Chron. Pret. p. 72. [b] Phil. Tranſ. ibid.]

WEIGHT *of the Human Body*. It is to be obſerved, that the heat and dryneſs of the air both leſſen the *Weight* of the body, and the cold and moiſtneſs of the air both increaſe this *Weight*. See the article MOISTURE *of the Air*.

Much ſleep, much food, and little exerciſe, are the principal things which increaſe the *Weight* of the body, and make animals grow fat. Conſequently, if the weight of the body be too great for good and uninterrupted health, it may be leſſened by diminiſhing ſleep and food, and by increaſing exerciſe.

cife. On the contrary, if the *Weight* of the body be too little for good health, it may be increafed by adding to food and fleep, and by leffening exercife; and the food muft be increafed chiefly by increafing drink and liquid nourifhment. For the difcharges are commonly lefs from drink and liquid nourifhment, than from dry and folid food. Dr. *Bryan Robinfon* of the Food and Difcharge of Hum. Bod. p. 89, 90.

There is but one *Weight* under which a body can enjoy the beft and uninterrupted health, and that *Weight* muft be fuch, that perfpiration and urine may be nearly equal at all feafons of the year; for by this means the body will be uniformly drained of its moifture: the inward parts by urine, and the more fuperficial parts by perfpiration, without any irregular and unnatural difcharges, and its moving *Weight* will continue nearly the fame at all feafons of the year. Dr. Bryan Robinfon thinks this *Weight* may be fettled, by his obfervations in his treatife on the food and difcharges of human bodies.

A quick increafe of *Weight* in human bodies often produces diftempers; the beft way to prevent this increafe is either by fafting or exercife. But amidft a variety of difturbing caufes, nothing fo effectually prevents fuch an increafe of *Weight* as a very exact and regular diet, which may prevent the difcharges from running into irregularities and difproportions to one another. See Dr. *Bryan Robinfon* of the Food and Difcharges of Human Bodies, p. 82. feq.

Men and other animals of extraordinary *Weight*, are often recorded in the writings of the learned. We have lately had two inftances of uncommon bulk and *Weight* in men near Halifax in Yorkfhire. One weighed 35 ftone and fome odd pounds, which is about 500 lb. And his brother weighed 34 ftone odd pounds; between them they make 70 ftone, or 980 pounds. Phil. Tranf. N°. 479. p. 102.

Athletic WEIGHT, in the animal œconomy, that *Weight* of the body under which an animal has the greateft ftrength and activity. Dr. Robinfon thinks this happens when the *Weight* of the heart, and the proportion of the *Weight* of the heart to the *Weight* of the body, are greateft. For the ftrength of an animal is meafured by the ftrength of its mufcles, and the ftrength of the mufcles is meafured by the ftrength of the heart. Alfo the activity of an animal is meafured by the *Weight* of the heart, in proportion to the *Weight* of the body. See Differt. on the Food and Difcharges of Human Bodies. p. 117, 118.

If the *Weight* of the body of an animal be greater than its athletic *Weight*, it may be reduced to that *Weight* by evacuations, dry food, and exercife. Thefe leffen the *Weight* of the body by wafting its fat, and leffening its liver, and they increafe the *Weight* of the heart, by increafing the quantity and motion of the blood; fo that by leffening the *Weight* of the body, and by increafing that of the heart, they will foon reduce the animal to its *athletic Weight*. Thus a game cock, in ten days, is reduced to its *athletic Weight*, and prepared for fighting. If the food which, with the evacuations and exercife, reduced the cock to his *athletic Weight* in ten days, be continued any longer, the cock will lofe his ftrength and activity.

It is known by experience, that a cock cannot ftand above 24 hours at his *athletic Weight*, and that he has even changed for the worfe in 12 hours. When he is at the top of his condition, his head is of a glowing red colour, his neck thick, and his thigh thick and firm; the day after, his complexion is lefs glowing, his neck thinner, and his thigh fofter; and the third day his thigh will be very foft and flaccid. Four game cocks, reduced to their *athletic Weight*, were killed, and found to be very full of blood, with large hearts, large mufcles, and no fat.

It is to be obferved, that the *athletic Weight* of an animal is a very dangerous *Weight*. Fevers and apoplexies are the diforders which commonly happen to animals under or near their *athletic Weights*. Hence, horfes fed upon dry food are much more fubject to fevers and apoplexies, than horfes fed upon grafs. Dr. *Robinfon*, ibid.

WELD, (*Cycl.*) the name by which our farmers commonly call the *luteola*, or dyers weed.

This is a very rich commodity among the dyers, and is the more advantageous to the farmer, as it may be raifed on very poor land, and at a very fmall expence. Moderately fertile land does beft for it; but it will grow upon the moft barren; and if this be but dry and warm, it will require no tillage. The feed may be fown with barley or oats, and only harrowed in with brufh or furze, or rolled down with a wooden roller. It is a very fmall feed, and the greateft difficulty about it is the fowing it even. It is a flow grower; a gallon of feed is fufficient for an acre; and though it makes but little progrefs the firft fummer, it begins to grow after the corn is cut, and the next year yields a good crop.

There is a great nicety required in the time for gathering it; for this fhould be when the ftalk is full ripe, and the feeds not fo ripe as to fall out; it is to be pulled up by the hand, and made up into little bundles to dry. The feed may be either thrafhed out as foon as it is houfed, or in the fpring following; but the plant muft be carefully kept dry.

The feed fells at about ten fhillings the bufhel, and the dyers ufe it for deep lemon colour, and bright yellows. It is more cultivated in Kent than in any other part of England, and it there yields the farmer from forty fhillings to ten pound an acre. *Mortimer's* Hufbandry, p. 165.

WELL (*Cycl.*)—In Scotland they have a *Well*, which Sibbald has mentioned as foretelling ftorms. It is a deep and large *Well* near Edinburgh, and from the noifes heard in it at certain times, is called by the people the *routing Well*. They go to this to liften after the prefages of weather, and it is faid that ftorms are particularly foretold by it; and that noifes are not only heard in it before ftorms happen, but that they are always heard determinately and diftinctly on that fide whence the ftorm will come. *Sibbald's* Prod. Hift. Scot.

In the Philofophical Tranfactions we have an account of a boiling *Well*. See the article SPRING.

WELLE *Corondc, fandy cinnamon*, a name given by the Ceylonefe to a fpecies of cinnamon which feels hard and gritty between the teeth, as if it were full of particles of fand, tho' in reality there is no fand among it.

The bark of this tree comes off very eafily; but it is not fo fit to roll up into quills as the right cinnamon, for it is more rigid and ftubborn, and apt to burft open. It is of a fharp but bitterifh tafte. The roots of all the cinnamon-trees yield more or lefs camphor, but this as fmall a quantity as any of them. Philof. Tranf. N°. 409.

WENDING, at fea, a term for bringing a fhip's head about, and feems only to be a corruption from *winding*. They fay, *how wends the fhip?*

WEPOLON, in zoology, the Ceylonefe name of an Eaft Indian ferpent, of a very long and flender body, and in fome degree refembling a piece of cane.

WERST, or WURST, a Ruffian meafure equal to 3500 Englifh feet. A degree of a great circle of the earth contains about 104 *Werfts* and a half. Phil. Tranf. N°. 445. Sect. 7.

WEST-ASHTON *Water* is a chalybeat water, refembling that of Holt. See Phil. Tranf. N°. 461. Sect. 20.

WESTERWALD *Earth*, a kind of earth mentioned by Agricola, of a whitifh yellow colour, of a like nature to the terra Silefiaca, but preferable to it, as yielding more falt. He tells us that it diffolves filver fo much better than other menftrua, as to render it potable, and parable into a ufeful medicine in cephalic cafes. *Boyle's* Works, vol. 1. p. 501.

WESTING, in navigation, the fame with departure. See the article DEPARTURE, *Cycl.*

WET (*Cycl.*)—WET *Air*. See the article MOISTURE *of the Air*.

WET *Couch*, a term ufed by the maltfters for one of the principal articles of malt-making.

In the making malt, the ufual way is to foak the grain in water two or three days, till it becomes plump and fwelled, and the water is brown; the water is then drained away, and the barley is removed to a floor, where it is thrown into a *wet couch*, that is, an even heap of about two foot thick.

In this heap the barley fpontaneoufly heats, and begins to grow, fhooting out firft the radicle, and, if fuffered to continue growing, foon after the blade; but at the eruption of the radicle, the procefs is to be ftopped fhort, by fpreading the *wet couch* thin over the floor, and turning it once every four or five hours for two days, laying it thicker each time; after this it is thrown into a large heap, and there fuffered to grow hot of itfelf, and afterwards fpread abroad again and cooled, and then thrown upon the kiln to be dried crifp without fcorching. *Shaw's* Lectures, p. 186.

WHALE (*Cycl.*)—The *Whale*-fifhery of the Caroline iflands is the moft eafy and agreeable of that of all other places, and, befide the great profit, affords a pleafant fpectacle to multitudes of people on the fhores.

There are ten or twelve of thefe ifles difpofed in form of a circle, fo that they make a fort of port, in which the fea is perpetually calm and pleafant.

When a *Whale* appears in this gulf, the people all get into their canoes, and rowing toward the fea, keep between the creature and its retreat, and drive him forwards towards the ifles at the bottom of the port. They drive him in this manner before them into the fhallows, where they plunge into the water themfelves, and fome get ropes and chains about him, while others dart him with their fpears. Their agility and addrefs is wonderful in this. The creature can never get away when they have once got him faftened, but is foon killed, and got to the fhore.

The anatomy of the bones of the *Whale* has been fo little underftood, that there have been many very great errors in regard to fuch of them as have been at times found foffile, or buried in the earth among the teeth of elephants, and the remains of teftaceous and other animals. The moft frequent and moft ridiculous of all the wrong opinions about thefe, is their having originally belonged to creatures of the human fpecies; yet many, even among the more intelligent part of the world, have taken them for the remains of giants. The vertebræ of a *Whale* have been miftaken for thofe of a giant, and a part of its fins for a hand, and fo of the reft. While the world, more ready to fpread the marvel, than to inquire into the truth, have made computations of the height of the man to whom bones of that fize muft have belonged, and from their propor-

tion

tion in regard to thofe of the common human fize, have found the giant who poffeffed them muft have been ninety or an hundred foot high; while much lefs pains in comparative anatomy would have taught them, that they never could have belonged to any human body at all. Mem. Acad. Par. 1727.

Toothed WHALE, *Cetus Dentatus*, a name given to a peculiar kind of *Whale*, called by Johnfton, and many other writers, by the too general name of *balæna*.

This is diftinguifhed from the common *Whale* which yields the *Whale*-bone, by having white and ftrong teeth in the lower jaw, which that fifh has not. This is the fpecies of *Whale* from which the fperma ceti was originally taken. It was firft of all difcovered on the coaft of New England, being thrown on the fhore there, and fperma ceti formed by the fun and air out of the oil of its head; but it is far from being peculiar to that place; the northern feas afford it, and it is not unfrequently taken on the weftern coafts of Ireland. One caught there about fifty years fince, meafured feventy-one foot in length, which is nineteen foot more than the length Clufius allows to this fifh.

The fperma ceti originally ufed in medicine was only a part of the oil or liquid fat of this fpecies of *Whale*. This, in its firft confufed appearance, as drawn from the animal, appears of a whitifh colour like milk, and in this ftate is put into large veffels, in which a clear yellowifh oil feparates itfelf to the bottom; the fperma ceti, as it is called, fwims at top in white flakes or fcales; thefe foon after precipitatate themfelves to the bottom of the veffel, where they candy together, and form large lumps of fperma ceti; there requires fome care and trouble to feparate and purify this thoroughly from the ftinking oil that is apt to ftick to it, but the price of the drug very well allows it.

The fat of the body affords the fame fubftance, but it is obtained in larger quantities from that about the head. Several hundred weight of this may be got from one *Whale*: But our common practice at prefent is to make it from the lees and fettlements of common train oil. Philof. Tranf. N°. 227. p. 508.

WHAME, in natural hiftory, the name given by the people of fome parts of England to the burrel-fly or wringle-tail, a fpecies of bee-fly very troublefome to horfes. See the article WRINGLE-*Tail*.

WHEAT (*Cycl.*)—It has been very juftly obferved by the antients, as well as moderns, that *Wheat* will grow in almoft any part of the world, and that, as it is the plant moft neceffary to mankind, fo it is the moft general and the moft fruitful. It grows well not only in the temperate climates, but in the very hot and very cold ones; and when fown in places where it never grew fpontaneoufly, fucceeds as well as where it has been always common.

The fuccefs of our crops of *Wheat* in America plainly prove this: And in Peru and Chili in particular, where thofe countries were very well inhabited, it never was known till the Europeans brought it in, it produces as large crops as in any part of England. *Deflandes*, Trait. Phyf.

When *Wheat* is planted early, lefs feed is required to an acre than when it is planted late, becaufe lefs of it will die; and poor land fhould always be allowed more feed than rich, becaufe a greater number of the plants will perifh on this land than on the other. The leaft quantity of all of feed is neceffary for rich land, that is planted early, for in this cafe very few of the feeds will fail to produce a plant that will live and flourifh. The ufe of the hoe caufes every plant to fend out a great number of ftalks from the fame root, and in thefe, more than in the number of plants, confifts the richnefs of a crop, as the ears on thefe are always largeft and fulleft.

Another thing to be confidered, in order to find the proper quantity of feed to plant, is, that fome *Wheat* of the fame fpecies has its grains twice as large as others: in this cafe a bufhel, containing but half the number of grains that it does in the fmall-grained *Wheat*, one bufhel of the fmall-grained will plant juft as much as two bufhels of this; not the meafure of the feeds, but the number of the grains being the thing to be confidered in regard to the fowing. *Tull's* Horfehoeing Hufbandry.

It is a very natural thing to fuppofe that a large-grained *Wheat* will produce larger and finer plants, and larger grain than a fmall-grained one; but experiments have proved, that there is nothing in this; for the fmalleft-grained *Wheat* produces fully as large plants as the largeft, and thofe with as great ears, and as big feeds; but the young plants appear fmaller and poorer.

Six gallons of middle-fized feed is the ufual quantity drilled upon an acre; but on rich lands, planted early, four gallons will fuffice; becaufe then the *Wheat* will have roots at the top of the ground before winter, and tiller very much, without danger of the worms, and many other accidents, which the late planted *Wheat* is liable to.

If it be drilled too thin, it will be in danger of falling, and if too thick, it may happen to tiller fo late in the fpring, that fome of the ears may be blighted; a medium therefore is beft. The depth to plant it at is from half an inch to three inches; for if planted too deep, there is more danger of its being eaten off by worms between the grain and the blade. A *Wheat*-plant that was not fown early, fends out no root above the grain, before the fpring, and is nourifhed all the winter by a fingle thread, proceeding from the grain up to the furface of the ground: this is the thread of life to the plant during the winter, and the longer that is, the greater danger there is of the worm, that creature much more eafily finding a thread that extends by its length to five or fix inches deep, than one which reaches but one inch; befide, the worms in winter do not inhabit very near the furface of the ground, and therefore they never naturally come in the way of the fhort threads, though the long ones are always in their reach.

It is very neceffary to take care againft the rooks, juft at the time when the *Wheat* is fhooting up. Thefe mifchievous birds perceive it beginning to fprout, before the farmer can fee any thing of it, and are led by the fhoot to pick it up; they muft be carefully kept off the ground for a week or ten days at this feafon; for at the end of that time the blade will be grown up, and the grain fo exhaufted of its flour, that it will be of no value to them, nor will they give themfelves any trouble about ftealing it.

The rooks never moleft fuch *Wheat* as is fown about Michaelmas time; for at this feafon there is fo much grain of the late harveft fcattered about the fields where it has grown, that they find it much more worth their while to pick it up there, than to fearch under ground for it in the fown crops, which therefore efcape till too far grown for this animal. *Tull's* Horfehoeing Hufbandry.

Many experiments have been tried to the great purpofe of multiplying grain, fome of which are commemorated, with an account of their different fuccefs, in the Philofophical Tranfactions. Digby mentions a plant of barley, all rifing from one corn, which, by fteeping in water in which was a fmall quantity of falt-petre, and afterwards being watered every day with the fame water, brought forth two hundred and forty-fix ftalks, and above eighteen thoufand grains: And the laft edition of Cambden mentions a thing very obfervable of this kind, though from another caufe; which is, that the corn fown in a field in Cornwall, where a battle had a little time before been fought in the civil wars, brought forth four or five ears upon every ftalk.

Mr. de da Prince has fairly tried the common and many other methods, which though they have not had fuch immenfe products for their fuccefs as thefe related above, yet may fet the world right as to what they have to expect from the different ingredients generally ufed, and which of them promife moft fairly for fuccefs.

The experiments are thefe: On the 22d of March there were laid to fteep a pea, a barley-corn, a *Wheat*-corn, and an oat-corn, in brimftone-water. Thefe were alfo fteeped in alum-water, in a folution of falt of tartar, in the folution of the caput mo tuum of fal armoniac, in common urine, in a folution of the common nitrum murale or falt of old walls, in a folution of falt-petre in water; and, finally, in the noftoc or ftar-jelly.

When thefe had all ftood fteeping in this manner in their feveral liquors five days and five nights, they were fet in a good foil, in a garden, under a wall, directly facing the fun. They were fet in the morning after a rainy night, and there were fet with them a pea, a *Wheat*-corn, a barley-corn, and an oat-corn, unfteeped, and in the common way. This was on the twenty-feventh of March, and on the tenth of April following, fome of them were come up, others did not appear. Thofe which had been fteeped in the brimftone-water, all came up together. Of thofe fteeped in alum-water, the three grains were fprouted; but the pea, though very much fwelled, had made no attempt to fhoot. Of thofe made in the folution of falt of tartar, the barley and oat were aboveground, and the pea had fprouted a little, and the barley fcarce at all. Thofe fteeped in the folution of the caput mortuum of fal armoniac, in urine, as alfo thofe in the folution of the falt of walls, were all come up. Of thofe fteeped in the folution of falt-petre, the oat and barley were quite up, the others had fprouted a little. Thofe which were fteeped in the noftoc or ftar-jelly, were none of them come up, and fcarce had made any attempt to fprout. The barley and oat fteeped in urine had juft come up; but the *Wheat* and pea had fcarce fo much as fprouted; and finally, thofe which had not been fteeped at all, were all come up as foon, and appeared as vigorous as thefe, except the *Wheat*, which appeared a little lefs forward than the reft.

All thefe fhoots or young plants were fet about a finger deep in the ground, and they had a fine favourable feafon to grow in.

It appears from the whole, that alum-water is particularly bad for peas, tho' it agrees well enough with *Wheat* and barley, and with oats. That falt of tartar does very well with oats and barley, but is hurtful to peas, and to *Wheat*. That falt-petre does not appear to have that virtue which has been fo long given it, of promoting the growth of plants; and in fine, that all thefe fteepings did no vifible fervice to the grain; but that many of them evidently hurt the feveral kinds.

All thefe young plants were digged up, except three of the fhoots of barley; and thefe increafed fo very much, on ftanding

ing in a good foil and afpect, and at the diftance of two foot afunder, that they had fixty, fixty-four, and fixty-feven ftalks, from their fingle grain and root. Each of thefe ftalks had an ear, and, one with another, there were about forty corns in each ear. New fhoots were continually iffuing from the roots; and as the Eaft Indian trees afford leaves, bloffoms, and ripe fruit at the fame time, fo if the fun's heat had continued, there would have been young fhoots, young ears, and ripe ears on the fame plant, at the fame time, all the year round.

It feems very plain, from the whole of thefe experiments, that the multiplying of *Wheat* and other grain is rather to be expected from the fowing it on a good foil, and at a proper diftance, than from any of thefe liquors contrived to fteep the feed-grain in. As moft of the liquors contrived for this purpofe are, however, harmlefs, it will be worth the farmers while to try them at times, and in a regular manner, fowing the different parts of the fame field with fteeped and unfteeped grain, in the fame proportion.

The experiment of the fteeping the grain in the offals of animal fubftances, carries with it evident fuccefs; but we are to remember, that only a third part of the quantity of feed is to be ufed to the fame quantity of ground in that method, as is in the common way; and it is more than poffible that the increafe which attends this method, may be owing to this diftance of the plants, rather than to the good done by the water. Philof. Tranf. N°. 281. p. 1212.

It is evident from experience, that the multiplication of *Wheat*, that is, the quantity of *Wheat* produced from every grain, is very different in different places, and according to various accidents. It has been often attempted to arrive at the art of caufing every grain of *Wheat* to yield its utmoft poffible increafe; and if this could be brought about on eafy terms in the large way, fo as to affect whole fields, it is evident that the advantage would be very confiderable. This has been attempted by Vallemont in feveral different ways, but with moft fuccefs in thefe following: Let there be collected together as large a quantity as may be of the bones, fkins, feathers, and other parts of animals, which are thrown away as refufe, together with the refufe of foods and wearing apparel, fuch as old fhoes, gloves, or whatever elfe of this kind comes in the way, though horns and hoofs of all animals are excellent; and, in fhort, let every thing be collected that abounds with falts: when a large parcel of thefe things is got together, let them be feparated into two or three heaps, according to their different natures; the hardeft kinds into one heap, the fofteft into another, and fo on. Let each of thefe parcels be put into a large wooden veffel, and a fufficient quantity of rain or river-water be poured on them, that they may fwim at liberty in it. When the water has ftood fo long, that it ftinks very much; ftrain it off, and keep it in veffels for ufe. The fofteft bodies will give the water this ftink in five days; the moderately hard ones in feven days; and the hardeft of all in nine days. Thefe laft are to be broken to pieces before they are put into the water. The liquor prepared from thefe is called the *prepared water*.

Let a quantity of plants of any kind, no matter what, be burnt with their flowers and feeds, and let a lixivial falt be made from the afhes in the common way. Then take as many pounds of falt-petre as there are acres of land to be employed, and let each pound be diffolved in twelve quarts of water, and to this folution add a fmall quantity of the lixivial falt of the plant. This liquor the author calls the *univerfal matter of vegetation*. When both the liquors are thus made, mix together an equal quantity of each of them; that is, of the prepared water, and of the univerfal matter; and let the whole quantity be fo much as will ferve thoroughly to wet and foak the quantity of corn that is to be fown; this is to be fo much, that it ftands two fingers breadth above the grain. When the grain and the liquor are thus mixed, the light grains, which will not grow, will fwim at the top, and may be fkimmed off and feparated from the reft. The grain at the bottom of the veffel is to be ftirred up and turned every two hours: in this manner, the grain is to be foaked twelve hours, and after this the water is to be poured off, and the grain dried, by laying on a fieve, or thin fpread on the floor; and after two or three hours it is to be fown in the common way.

The quantity of feed neceffary for an acre of ground, when thus fteeped, is only one third of the quantity commonly ufed, and this will produce infinitely more grain, and is as much as the land can bear. The liquor poured off from the foaking of this quantity of grain, is not to be thrown away, but muft be faved, for it will ferve as well for feveral more parcels as it did for this.

This was tried in the year 1706, which was the year after the book came out, in feveral parts of France, and that with fo much fuccefs, that the author got great reputation, and his book was tranflated into the German, and fome other languages. Whether the method was found afterwards not to fucceed fo well, or whether it was dropped through mere inadvertence, the thing has not been regarded fince that time; but the procefs is at once fo cheap and fo eafy, that it fhould feem extremely worth while to bring it into trial again. *Vallemont.* Curiof. de Vegetat.

There are four ways of augmenting the crops of *Wheat*, not in the number of the plants, but in the ftalks, ears, and grains.

The firft is by increafing the number of ftalks from one, two, or three, to thirty or forty in each plant, in ordinary field land; and the crop is augmented by bringing up all thefe ftalks into ear, which is the fecond way; for if it be diligently obferved, it will be found that not one half of the ftalks of *Wheat* fown in the common way, ever come to ear at all: Nay, if a fquare yard of fown *Wheat* be marked out, and the ftalks thereon numbered in the fpring, it will be found that no lefs than nine parts in ten of them are wanting at the harveft-time.

An experiment of the advantage of this augmentation was made by Mr. Tull in rows of *Wheat* that were equally poor; one of thefe rows was increafed fo much, as to produce more grains than ten of the other, by bringing up more of its ftalks into ears, and alfo by augmenting the ears to a much greater bignefs, which is the third way; for it is very certain that the ears will be much larger or much fmaller, according to the quantity of nourifhment that is given them.

The fourth and laft way of increafing the crops of *Wheat*, is by caufing the grain to be much larger in the ears. This can no way be done fo effectually as by late hoeing, efpecially if it be done juft after the *Wheat* is gone out of the bloffom; by this means the grains will weigh twice as much as thofe produced in the fame fort of *Wheat*, when this late hoeing has been omitted; their number, at the fame time, is the fame in the ear; and as the *Wheat* is fold not by tale, but by meafure, the farmers gain is double in this cafe, the *Wheat* meafuring juft twice as much as it would otherwife have done.

Thus by increafing the number of the ftalks, bringing more of them up into the ear, making the ears larger, and the grains larger, plumper, and fuller in every ear; the method of horfe-hoeing, by which alone this can be effected, makes a larger crop out of the tenth part of the number of plants, than in the common way: but all thefe advantages will be loft by thofe who, though they give into the horfe-hoeing way, yet will not allow the fix foot intervals between the rows; for it is owing to this great fpace of ground alone, that as much nourifhment may be given to the *Wheat* as the farmer pleafes.

In the method by thefe wide intervals, we can raife a larger crop of *Wheat* with lefs labour, lefs feed, no dung, and no fallowing; but not without a competent quantity of earth, which is the cheapeft thing given to corn. The earth of a whole good acre being but about the tenth part of the expence, and of indifferent land but about a twentieth.

The crop enjoys all the earth, for between the laft hoeing and the harveft, there remains nothing but a fpace of empty mould in the middle of the intervals. Farmers do not grudge the price of three or four pounds in the buying and carriage of dung for an acre; but they think themfelves undone if they afford an extraordinary eighteen-pennyworth of earth to the wide intervals of an acre, not confidering that earth is at once the beft and the cheapeft entertainment that can be given to plants; for at five and fixpence rent, which is common to fome land in many parts of the kingdom, the whole earth belonging to each of the rows cofts only fixpence; that is, a penny for a foot broad and fix hundred and fixty foot long, that being the fixty-fixth part of an acre. But the vulgar count this expence of a foot breadth of ground not as they ought, only as part of the rent, but as an eleventh part of their own ufual charges added to the rent.

If the intervals are narrower in deep land, there might be earth enough in them; but there would not be room enough to pulverize it.

The horfe-hoe, well applied, fupplies the ufe of dung and fallow; but it cannot fupply the ufe of the earth, though it can infinitely increafe the virtue of it, where there is any reafonable quantity.

The mean price of *Wheat*, between dear and cheap, is reckoned five fhillings a bufhel; and therefore an acre of land that fhould produce every year eight bufhels, without any expence, would be accounted a very profitable one. Now an acre of land drilled with *Wheat*, and horfe-hoed, will produce fixteen bufhels of *Wheat* eafily, with the expence only of ten or fifteen fhillings, and this is a third part more profitable.

It is commonly computed that the farmer cannot live, if the *Wheat* he fold under five fhillings a bufhel; he muft therefore keep his *Wheat* when it is fold cheaper than that in the markets; and the common method is to keep it in the ftraw, taking care to keep away the mice. The fecureft method of all is to dry the *Wheat* in the grain; but this many are afraid to practife.

Some people, who have known this fecret, have made great profit by buying up the *Wheat*, when under three fhillings a bufhel in the markets, and then preferving it in this manner till a dearer time. The method is to dry it in a malt-kiln, but with no other fuel than *Wheat*-ftraw, never fuffering it to have any ftronger heat than that of the fun. The longeft time the *Wheat* need lie in this heat, is twelve hours; but fometimes four hours is fufficient; according to its dampnefs when bought, and the time it is intended to be kept, it requires a longer or fhorter drying. The only thing that caufes the

the decay of *Wheat*, and gives way to that devouring animal the weevil in it, is its too great dampnefs; this is carried off in this manner, by a heat no greater than that which the fun might have given to the grain. The vegetating power therefore is not deftroyed by this; and the bakers have acknowledged that the flour of this *Wheat* does rather better for the working into bread, than that of frefh *Wheat*.

Though all forts of vegetables may have great benefit from the hoe, becaufe it fupplies them with plenty of food at the time of their greateft need; yet they do not all equally require hoeing; but the plant that lives longeft fhould always have the greateft ftock of nourifhment provided for it, and fhould therefore be moft frequently hoed of any plant. *Wheat* generally lives, or ought to live, longer than any other corn; for if it be not fown before fpring, its grain will be thin, and will have but little flour in it; and when it is fown late in the winter, it is in great danger of being killed by the frofts, while weak and tender.

To prevent thefe inconveniencies, *Wheat* is generally fown in autumn; and by this means, having thrice the time to be maintained that fpring corn hath, it requires a larger fupply of nourifhment, in proportion to that longer time; not that the *Wheat* in its infancy confumes the ftock of food that it afterwards does, but becaufe, during that long interval between winter and the fpring feed-times, moft of the artificial pafture or benefit from former tillage, is loft both in light and ftrong lands.

This is the reafon why all that extraordinary pains in fallowing and dunging of the foil is neceffary for *Wheat*; and yet all this trouble and expence is fo far loft, that if a part of the fame field unfallowed and undunged be fown in April, after good plowing, it will raife as fair a crop in all refpects as the other, only that the flour will be in lefs quantity, by wanting time in the ground for filling the grains.

Poor light land, in the common way of hufbandry, muft be extremely well manured, in order to the maintaining *Wheat* a year, which is the ufual time that it is in it; and if it be fown late, the greater part of it ufually perifhes, not being able to furvive the winter while fo poor, and on fuch land; and if it be fown very early on ftrong land, though rich, well tilled, and dunged, the crop will be worfe than on poor light land fown early. The new method of horfe hoeing gives both to ftrong and to light land all the advantages neceffary, and takes off all the difadvantages of both. By this method the ftrong land may be planted with *Wheat* as early as the light, if plowed dry; and the hoe-plough, if rightly applied, will be able to give it nourifhment equal to that of dung in both forts of land.

The tops of the ridges for the drilling of *Wheat* muft not be left quite fo narrow and fharp as they are for drilling of turneps, *Wheat* being generally to be fowed in treble rows, and the turnep only in fingle ones. In reaping the *Wheat* thus fown, it is to be cut as near to the ground as poffible, and this is eafier done in this than in *Wheat* fown in the common way, becaufe in this drilled method the ftalks all ftand clofe together. When the *Wheat* is cut thus low in the reaping, the ftubble is no great impediment to the preparing the land for the fucceeding crops.

As foon as conveniently may be, after the carrying off a crop of *Wheat*, if the trench in the middle of each wide interval be left deep enough by the laft hoeing, the farmer is to go as near as he can to the ftubble with a common plough, and turn two large furrows into the middle of the intervals, which will make a ridge over the place where the trench was; but if the trench be not deep enough, it is beft to go firft in the middle of it with one furrow, this, with two more taken from the ridges, will be three furrows in each interval; this plowing is to be continued as long as the dry weather lafts, and then the whole is to be finifhed by turning the partitions on which the laft *Wheat* grew up to new ridges, which is ufually done at two great furrows; thefe laft furrows, which complete the ridges, may be plowed in wet weather. By this fort of management, the *Wheat* being planted in rows, at fix foot intervals, the fame piece of ground will produce every year a new crop of *Wheat* in the intervals, without any fallowing or manure, only by means of the fufficiently breaking the furface with plowing and horfe-hoeing.

It is a general rule, that all forts of grain profper beft where they are fown at a time when the ground is fo dry that it is broken to a fort of powder by the plough. *Wheat* alone is an exception to this rule; and the reafon of this is, that as *Wheat* is to endure the feverities of a whole winter, after it is fown, it therefore fucceeds beft by being fown in wetter weather, when the ground is not to be broken fo very fmall, and is preffed down clofe upon the feeds, and covers them better. If *Wheat* were as hardy as rye, and its roots were as hardy and patient of the cold, it might be fown in as dry a feafon as the rye, and would profit as much by it; but, on the contrary, it requires fo much covering, that it is a very good practice of fome farmers to turn on their fheep over very light land, as foon as it is fown with *Wheat*, in order to tread the furface of it hard, and then the cold of winter cannot fo eafily kill or penetrate the roots. And as *Wheat* requires to have the earth lie harder on and about it in the winter, fo it alfo requires more dung, or fomewhat elfe, to diffolve the earth about its roots, after the cold weather is paft, than the rye does, whofe roots were not fo confined by the preffing of the earth about them.

It is another general rule, that all vegetables thrive beft when fown on frefh tilled ground, immediately after it is plowed; but *Wheat* is alfo an exception to this rule, for the beft way for it is to plow the ground when very dry, and then to let it lie even, though it be many weeks till fome rain come to moiften it, and then drill the *Wheat*. The harrows and the drill, in this cafe, will move a fufficient part of the ground, which will ftick together for the defence of the fmall roots during the winter, the reft of the mould lying open, and divided underneath until fpring, to moiften them and nourifh them.

There is a fort of binding fand, which requires not only to be plowed dry, but to be fowed dry alfo, or elfe the *Wheat* will dwindle in the fpring, and fail of being a good crop. What is meant here by dry plowing, is not, however, that the ground fhould be fo dry that the duft fhould fly; but it muft not be fo wet as to ftick together in lumps; neither fhould the ground be drilled when it is as wet as pap: it fuffices that it is moift; only the lighter lands ought to be more moift than the ftrong.

Strong land plowed wet in November, will be harder in the fpring than if plowed dry in Auguft, though it would then have three months longer to lie. *Tull's* Horfe-hoeing Hufbandry.

Buck-Wheat. This is a plant very advantageous to the farmers of England, who have barren lands in poffeffion. It is to be fown in May. One bufhel of feed will fow an acre, and it will grow on any foil. It ripens late in autumn, and, when mowed, it muft lie upon the ground till the ftalks, which are naturally hard, grow foft; it will not fhed the feed in lying, nor will it get any damage by the rain. It yields a very confiderable increafe, and if the land be tolerable, fometimes no lefs than fifty or fixty bufhels from an acre.

It is excellent food for hogs, poultry, and other animals. The flour of it is very white, and, mixed with *Wheat*-flour, is ufed for food by the country people in fome places. The ftraw is good fodder for cattle, and the grain is good to give to horfes among their oats; but it muft be broken in a mill, otherwife it will pafs through them whole.

Buck-Wheat makes a very good lay for *Wheat* or rye, efpecially if not mowed, but plowed in; but the beft way is, juft before it bloffoms, to feed it with cattle, efpecially with milch cows, which it caufes to yield a great deal of milk, and that fuch as yields very good cheefe and butter. It is food for the cattle in the very dryeft time, when all the common grafs in paftures is burnt up; and proves a very great improvement for the land. For this purpofe they fow it thicker than for others, fometimes three or four bufhels on an acre. *Mortimer's* Hufbandry, p. 137.

White-Cone-Wheat, a term ufed by our hufbandmen to exprefs a peculiar kind of *Wheat*, which is very ftrong, and has a large ear.

It is the beft kind for fowing in fields fubject to the blight; for the ftalks of it being, for the moft part, folid or full of pith like a rufh, not hollow like thofe of common *Wheat*; the infects that caufe the blight fiezing on the ftalks of other *Wheat*, does this no injury, even though they fhould attack it; the ftalks of this kind being often found full of the black fpecks, which are always the marks of that infect having been there, and yet the ear full, and the grain good.

This *Wheat* makes very good bread, if the miller does not grind it too fmall, or the baker make his dough too hard, it requiring to be fomewhat larger than other *Wheat*-flour, and fomewhat fofter in the dough. A bufhel of *white-cone-Wheat* will make confiderably more bread than a bufhel of Lammas *Wheat*; but it gives it a fomewhat yellowifh caft. *Tull's* Horfe-hoeing Hufbandry.

Smyrna Wheat, a peculiar kind of *Wheat* that has an extremely large ear, with many leffer or collateral ears coming all round the bottom of the great one.

As this is the largeft of all forts of *Wheat*, fo it will difpenfe with the nourifhment of a garden, without being overfed, and requires more nourifhment than common hufbandry in the large way can give it. In the common way its ears grow not much larger than thofe of our common *Wheat*.

This fort of *Wheat* feems, of all others, the moft proper for the new method of horfe-hoeing hufbandry, as that method feems capable of giving as much nourifhment as the farmer pleafes, by often repeating the hoieng. Next to this, the *white-cone-Wheat* is beft for this fort of hufbandry; then the grey-cone-*Wheat*.

Wheat-*Bird*, a name given by the people of Virginia to a fpecies of bird, which, after the time of the fowing the *Wheat* in that country, made its appearance annually at the feafon of its beginning to ripen, and was never feen there before. See the article *Birds of* Passage.

Wheat-*Ear*, in zoology, the Englifh name of the common œnanthe, called alfo the *white-tail*, and the *fallow-finch*. See Tab. of Birds, N°. 33.

It is fomething larger than the common fparrow; its head and back are of a greyifh colour, with fome admixture of red-

rednefs; and the female has fometimes a confiderable caft of green; the rump is white, whence the bird has its name of the *white-tail*; tho' this is fometimes not the cafe, the rump being of the fame colour with the reft of the back. The belly is whitifh, with a glow of red; the breaft and throat are redder than the belly: And in the male birds the belly is fometimes yellowifh. There is on each fide of the head a long white line running above the eyes, and under them a fhorter of black, which laft is wanting alfo in the female. The wing-feathers are black, except their extremities, which are edged with a reddifh brown, with a caft of whitifh; the tail is very beautifully variegated with black and white. Its beak is black, flender, and ftrait. Its mouth black within, and opening very wide. It feeds on beetles, and other infects, and builds in the deferted burrows of rabbits, &c. They are extremely plentiful in Suffex, and fome other counties of England, after harveft-time, when they are extremely fat, and very much efteemed at table. *Ray*'s Ornithol. p. 168.

WHEEL (*Cycl.*)—WHEEL-*Animal*, a name given by the writers on microfcopical difcoveries, to a fpecies of minute animalcule, which appears in a fort of fheath or cafe, the end of which it faftens to the roots of water-plants, or whatever elfe is in its way. See Tab. of Microfcopical Objects, Clafs 1. This little creature has two feeming *Wheels*, with a great many teeth or notches coming from its head, and turning round, as it were, upon an axis. This little creature, on the leaft touch, draws in its *Wheel* into its body, and its body into the fheath; but as foon as all is quiet, it throws them out, and works them again.

In order to find thefe animalcules, choofe fuch roots of duckweed as are long, and proceed from ftrong old plants, for the young roots feldom afford any; they fhould not be covered with that rough matter which is frequently found about them, nor any way tending to decay, as they will often be.

In the water found remaining in the leaden pipes, or gutters, on the tops of houfes, there are alfo found great numbers of thefe *Wheel-Animals*. Thefe are of a different fpecies from the former; and when the water dries away they contract their bodies into a globular or oval figure, and are then of a reddifh colour, and remain mixed with the dirt, growing together into a lump as hard as clay. This, whenever it is put in water, in half an hour's time difcovers the animals living again, and as brifk as ever; and they have been found to be living in this manner, after the matter had been kept dry twenty months.

It fhould feem from this, that as the water dries up, their pores become fhut in the manner of thofe of fuch animals as remain torpid for the winter; and that when they find water come on again from rain, they then unfold themfelves, and live and feed as long as it lafts. *Baker*'s Microfcope, p. 91.

WHEELER, among brick-makers. See the article BRICK.

WHEEZING, a name given by our farriers to a diftemperature in horfes, in which they draw their breath with difficulty and noife.

The generality of people make this and purfinefs, in horfes, the fame diftemper; but the more judicious always diftinguifh it, as wholly different from that. Purfinefs proceeds always from a ftuffing or oppreffion of the lungs; but this *Wheezing* is only owing to the narrownefs of the paffages between the bones and griftles of the nofe.

The horfes that are moft of all afflicted with this diftemper, do not want wind; for notwithftanding that they *wheeze* exceffively when they are exercifed, yet all the time their flanks are not moved, but keep in the fame condition that they were while the creature ftood ftill. The dealers call thefe fort of horfes *blowers*, and though there is no real harm in the thing, it is a difagreeable quality, and few people will choofe them, that have much fervice for them.

There are fome horfes that have a natural defect in their breathing, which makes it at all times attended with fome difficulty, but not with the *Wheezing* before-mentioned; thefe are called thick-winded horfes.

People who are careful in the buying horfes, will purchafe neither of thefe kinds; but there is this caution to be obferved in regard to this defect, that it often feems to be in horfes where it really is not. When a horfe has been kept a long time in the ftable without exercife, he will at the firft riding be out of breath, and fetch it in a difficult and painful manner, though he be neither a blower nor thick-winded; but all this will go off with a little exercife.

There are fome temporary *Wheezers* and *blowers* among horfes: thefe at times rattle, and make a great noife through their nofes in taking breath; but the complaint goes off and returns. This is only occafioned by a great quantity of phlegm, for their flanks do not redouble with it at the worft of times, nor have they any cough with it; fo that there is no danger of their being purfy.

WHELPS. Nothing is more effential to the having a good pack of hounds, than a proper care of the *Whelps*, and of the parents from which they are to be bred.

The bitches, in particular, fhould be carefully chofen, and fhould be fuch as are the ftrongeft and beft proportioned; they muft alfo have large ribs and flanks.

The beft feafon for the coupling of hounds is in January, February, or March, for then they will litter in a good time of the year, that is, in fpring; fo that they will be fit to enter in due courfe, without lofs of time, or of the feafon; for if bitches litter in winter, it is very difficult to bring up the *Whelps*, the cold killing them if there is not great care taken of them.

The dogs that line the bitches muft not be above five years old; for if they are older than this, the young ones will be dull and heavy. Care fhould be taken to have a proper dog ready the firft time of the bitches going proud; for it is affirmed by many, who fay they have experience for it, that whatever kind of dog lines a bitch the firft time, there will be one puppy at leaft in all her fucceeding litters that will have fome refemblance of him.

The firft litter of puppies that a bitch brings, are never efteemed fo good as the fecond or third. When a bitch has been lined, and grows big with *Whelps*, fhe is not to be fuffered to hunt among the pack, nor to take any other violent exercife; for that would endanger her cafting her *Whelps*; fhe fhould be kept up, and fed well, and a good place fhould be provided for her to litter in.

As foon as fhe has littered, thofe which are intended to be kept fhould be felected out, and the reft immediately drowned. There is great difficulty in choofing the beft at this early time; but the general opinion gives it for thofe which are the lighteft, that they will be the fwifteft and beft as they grow up.

Others take all the *Whelps* away, and having determined what number they will keep, they fettle the choice on thofe which the bitch carries back firft to the place where fhe littered; but all this feems very uncertain.

The *Whelps* muft have good frefh ftraw to lie in, and it muft be often changed. They are to be kept in a place where neither the rain nor fun-fhine can be troublefome to them, and once a week it will be proper to anoint them all over with a little nut-oil, with fome faffron infufed in it. This will prevent the flies from annoying them fo much as they otherwife would, and will kill worms of all kinds. When they are fifteen days old, it is the cuftom to worm them, and a week after one joint of their ftern fhould be twifted off. As foon as they can fee, they fhould have milk given them to lap, and at two months old they muft be weaned, keeping them wholly from the bitch. They muft at this time be well kept, but not too high fed: And it is proper to put fome cummin feed into their food, to keep the wind out of their bellies.

Many let the *Whelps* of their hounds fuck three months, and then fend them away to villages to be bred up till they are ten months old, cautioning thofe people who have the care of them, not to let them eat carrion, nor frequent warrens.

Rye bread is a very common food for young hounds, and is particularly recommended by many, but wrongly, for it foon paffes through them, and gives them very little nourifhment. When they are fed conftantly with this, in the time of their growing up, they always become narrow backed; and this is a great fault in this fort of dog, a broad back being one of the greateft recommendations in a hound. *Wheat* bread is greatly preferable on all accounts for the food of the young hound, giving him ftrength and firmnefs.

At ten months old they are to be taken home, and put into the company of the others, to live as they do: and after a few weeks keeping company with the reft, they are to be coupled, and to go out to hunt. Five or fix days practice will, at this time, do a great deal toward the inftructing them; and, if they are apt to run aftray, or to open unfeafonably, they muft be made to feel the fmart of the whip: This, and the example of the reft, will foon learn them to run and open in a proper and regular manner.

WHELPS, in a fhip, the feamens term for thofe brackets which are fet up on the capftan, clofe under the bars; they give the fweep to it; and are fo contrived, that the cable, winding about them, may not furge fo much as it might otherwife do, if the body of the capftan were quite round and fmooth.

WHERN, in natural hiftory, a name given by fome of our miners to a kind of ftone found in ftrata; but of the hardnefs and finenefs of flint. It is called alfo *chert* and *nicomia*.

WHEWER, a name ufed in fome parts of England for the common wigeon. See the article PENELOPE.

WHEY (*Cycl.*)—In many diforders of the human body, where the ftomach will not bear milk; or when it is not proper, for other reafons, *Whey* may be given with great fuccefs.

We have a differtation of Fred. Hoffman on this fubject. *De faluberrima feri lactis virtute*. Oper. Tom. 6. p. 9. This author recommends a particular kind of ferum or *Whey*, made by evaporating milk to a drynefs, and mixing the refiduum with water. See the article MILK.

There are various methods of making *Whey* vulgarly known. That with oranges is very agreeable, and much recommended by Dr. Cheyne in his *Nat. Meth. of curing Difeafes*.

Alum WHEY, *Serum Aluminofum*, a *Whey* made with alum. Two drams of alum to one pint of cow's milk boiled. See Lond. Difp. It is a good aftringent.

WHINCHAT, in zoology, the Engliſh name of a ſpecies of *œnanthe*, or fallow-finch, called by Aldrovand and ſome other authors, *anthus* and *florus*.

It is of the ſize of the common water-wagtail. Its head, neck and back, are of a reddiſh brown, with regular rows of black ſpots. Each feather has a black ſtreak along its middle, and a browniſh one on each ſide. The belly is whitiſh, with a ſlight tinge of a reddiſh brown. The upper part of the breaſt and the ſides are of a browniſh yellow. Its wing-feathers are brown, with yellowiſh edges. The tail is part black and part white. The beak is ſtrait, ſlender, and black. The male has much of a white variegation on his wings, which the female has not. It lives about ditch banks, and the like places, and feeds on beetles and other inſects.

The colours are very uncertain in this bird, and it often much reſembles the ſtone-chatter; but may always, by an accurate obſerver, be diſtinguiſhed from that bird by the white ſpots in its wings, by the whiteneſs of the under part of its tail, and the white lines on its head. *Ray*'s Ornithol. p. 169.

WHIPLADE, in huſbandry, a term uſed by the farmers in ſome places for a particular ſort of cart, whoſe hinder part is made up of boards, after the manner of a dung-cart, having alſo a head of boards, and ſhambles over the thills; this head being made ſo as either to be taken out or left in. The cart may be indifferently uſed to carry dung or other things; dung when the head is in, and corn, &c. when it is taken out. *Plot*'s Oxfordſhire, p. 262.

WHIRL-*Pool* (*Cycl.*)—Theſe in rivers are very common, from various accidents, and are uſually very trivial, and of little conſequence. In the ſea they are more rare, but more dangerous. Sibbald has related the effects of a very remarkable marine *Whirlpool* among the Orcades, which would prove very dangerous to ſtrangers, though it is of no conſequence to the people who are uſed to it. This is not fixed to any particular place, but appears in various parts of the limits of the ſea among thoſe iſlands. Wherever it appears it is very furious, and boats, &c. would inevitably be drawn in and periſh with it; but the people who navigate them are prepared for it, and always carry an empty veſſel, a log of wood, or large bundle of ſtraw, or ſome ſuch thing, in the boat with them; as ſoon as they perceive the *Whirlpool*, they toſs this within its vortex, keeping themſelves out; this ſubſtance, whatever it be, is immediately received into the center, and carried under water; and as ſoon as this is done, the ſurface of the place where the *Whirlpool* was, becomes ſmooth, and they row over it with ſafety; and in about an hour they ſee the vortex begin again in ſome other place, uſually at about a mile diſtance from the firſt. *Sibbald*'s Prodr. Hiſt. Scot.

WHISTLE *Fiſh*, a name given by the people of Cornwall to a ſpecies of gadus, with only two fins on the back, otherwiſe called *muſtela fluviatilis*. See the articles GADUS and MUSTELA.

WHITE (*Cycl.*)—WHITE-*Face*, or BLAZE, in the manege, is a *white* mark upon a horſe, deſcending from the forehead almoſt to the noſe. It is called in French *chanfrin blanc*. See the article CHANFRIN.

WHITE-*Foot*, in the manege, called in French *Balzane*, is a *white* mark that happens in the feet of a great many horſes, both before and behind, from the fetlock to the coffin. The horſes thus marked are either tramelled, croſs-tramelled, or *white* all four. Some horſemen place an unlucky fatality in the white of the far foot behind. See the articles CHAUSSE *trop haut*, and TRAMELLED.

WHITE-*Hart-Silver*, in our old cuſtoms, a mulct on certain lands in or near the foreſt of *White-hart*, paid yearly into the exchequer, impoſed by King Hen. 3. upon Thomas de la Linde for killing a beautiful *White-hart*, which the King before had ſpared in hunting. *Cambd. Brit.* 150. *Blount*, *Cowel.*

WHITE-*Horſe-Fiſh*, a common Engliſh name for a thorn-back, called by Willughby the *raia aſpera noſtras*, and ſuppoſed by moſt authors to be the *fullonica* of Rondeletius.

It has a long and pointed noſe, and is covered with prickles upon the back. When it is of a yellowiſh colour, its belly is perfectly white, without ſpot or ſtain, whence it has its name. *Willughby*'s Hiſt. Piſc. p. 78.

WHITE *Land*, in agriculture, a tough clayey ſoil, naturally of a ſomewhat whitiſh hue when dry, eſpecially when it has lain ſome time untilled, but becoming blackiſh after rain; this appears of a light greyiſh colour, when turned up by the plough, and ſlides off from the plough-ſhare with eaſe, and with a ſmooth gloſſy ſurface.

It has often a yellowiſh hue with the grey, and is often veined with large parcels of a blue marly earth. *Moreton*'s North. p. 43.

WHITE *Swelling*. We have ſeveral examples of ſucceſsful cures of *White Swellings* of the joints, or tumors from inſpiſſated lymph, by a ſmall ſtream of warm water falling from a height on them.

When the water is impregnated with penetrating medicines, or natural minerals, its virtues are greater. The application of bladders, containing warm water, to the parts affected, is alſo recommended. See *Le Dran*, Obſ. Chirurg. Tom. 2. Obſ. 93, 94.

WHITE-*Tail*, in zoology, an Engliſh name for the common œnanthe, more frequently called the *fallow-finch*, or wheatear. See the article WHEAT-*Ear*.

WHITE-*Throat*, in zoology, the name of a ſmall bird, very common in our gardens and hedges, and ſeeming to have been deſcribed under the name of *ſpipola* by Aldrovandus and ſome others, though moſt approaching to the *ficedula* claſs.

Its beak is black above, and whitiſh below; its feet of a yellowiſh brown; its neck and back are of a browniſh-grey; its head more grey than either, and upper part of the throat *white*, the reſt reddiſh; its breaſt and belly are alſo a little reddiſh; but in the female the breaſt is perfectly white. The edges of the long-wing feathers are ſome whitiſh and others browniſh, and the tail is variegated with black and white, and ſome grey or aſh-colour intermixed. It is extremely common in our gardens and orchards, and feeds on flies, ſpiders, and other inſects. It builds in buſhes, at a ſmall height from the ground, with ſtubble and horſe-hair, and lays five browniſh-green eggs, with black ſpots. *Ray*'s Ornithology, p. 171.

WHITE *upon White*, in the porcelain manufactory, a name given by the Engliſh merchants to a particular China-ware, which is formed of three different *white* ſubſtances, the body being of one, the flowers of another, and the varniſh which covers theſe of a third.

The principal art in the making this ſort of China, is the finding the proper degree of dryneſs in the veſſels for receiving the pencilling or upper coats. It is a fine art, and the principal colour is made of an earth called *hoache*, which is much of the nature of our *ſteatites*. See the articles HOACHE and STEATITES.

WHITES, the popular name of a diſorder incident to women. See the article FLUOR-*Albus*.

WHITENING *of Bones*, for a ſkeleton. See the article BONE.

WHITING, in zoology, the Engliſh name of a common fiſh of the aſellus kind, commonly diſtinguiſhed by the writers in ichthyography by the name of *aſellus mollis*, though by ſome called *aſellus albus* and *merlangus*.

The *Whiting* is diſtinguiſhed from the other ſpecies of the cod kind by theſe characters: It is of a ſmall ſize, ſeldom much exceeding a foot in length, and is thin and ſlender in proportion to its length, particularly about the tail. Its ſcales are very ſmall, and its colour much more pale and whitiſh than in any other fiſh of the cod kind, whence it has its Engliſh name. The belly is white, and the belly-fins behind the tail are ſpotted with ſmall black dots. It has no beard. Its eyes are large, and its upper jaw longer than its under; ſo that its teeth, which are large and crooked, fall over, and are uncovered when the mouth is ſhut; and the inner part of this jaw is armed alſo with very ſmall teeth. Its belly, or rather its breaſt-fins, are nearer the head than in any other ſpecies. It is common in the Engliſh ſeas and elſewhere. *Willughby*'s Hiſt. Piſc. p. 170.

According to the Artedian ſyſtem of ichthyology, the *Whiting* is one of the *gadi*, diſtinguiſhed by that author by the name of the *gadus* with three fins on the back, without beards, with a white body, and with the upper jaw longer than the under. See its deſcription and hiſtory under the article ASELLUS. See alſo the articles GADUS and MERLANGUS.

WHITING-*Pollack*, a fiſh of the cod kind. See the article HUITINGO *Pollachius*.

WHITLOW-*Graſs*, in botany, the Engliſh name of a genus of plants. See the article PARONYCHIA.

WHOLSOME *Ship*, in the ſea language, one that will try, hull, and ride well, without rolling, or labouring in the ſea. A long ſhip that draws much water, may try, hull, and ride well; but if ſhe draws little water, ſhe may try and ride well, but never hull well; and a ſhort ſhip, that draws much water, may hull well, but neither ride nor try well; and ſuch is called an *unwholſome* ſhip.

WICKER *Tree*, a name given by the Engliſh to a tree common in China, and deſcribed by Kircher and others. It is, as it were, a rope twiſted by nature, about an inch thick, and creeps along the earth often for above a hundred paces together, much embarraſſing the way, but ſerving for cables of ſhips, ſeats, hurdles, beds, mats, and various other neceſſary uſes. It endures no vermin, and is much valued for being cool and refreſhing in the hot ſeaſons. *Kircher*'s China illuſt.

WICRANGLE, in zoology, an Engliſh name for the mattageſs, or greater butcher-bird, the *lanius cinereus major* of authors. *Ray*'s Ornithol. p. 53. See the articles LANIUS and MATTAGESS.

WICRANTUM, in natural hiſtory, a name given by the people of the Eaſt-Indies to certain foſſile bodies, of the nature of the pyrites, of the ſize of peas, and formed into variouſly angular figures.

They look black and gloſſy, and much of the nature of blende, or mock lead; but when put into the fire, they ſhew us by their ſmell that they contain ſulphur. They are found in the diamond mines.

The natives firſt powder them; and then mixing them with the juices of certain plants, they dry them, and then calcine them again. Theſe proceſſes they repeat at leaſt ſixty times; but the firſt calcinations are made with a mixture of divers urines, as that of the horſe, the camel, the cow, and the like.

After this tedious preparation, they are given in coughs and colds, and are faid to be a remedy even in confumptions.

WIDE-*eared* in the manege, is applied to a horfe, when the root, or lower part of his ear is placed too low, and the ear itfelf is too large. The French ufe the term *Oreillard* for fuch a horfe.

WIDOW (*Cycl.*)—Mr. Kerfeboom has given us a table, fhewing how long 432 *Widows* lived, and finds, that, at a medium, each lived fourteen years. Phil. Tranf. N°. 468. fect. 3.

Among the antient Greeks, *Widows* had the Care of the eternal fire of *Vefta* committed to them; which charge, among the Romans, could be performed by virgins only, who from their office were called veftals. *Hofm.* Lex. Univ. in voc. *Vidua*. See the article VESTAL, *Cycl.*

King's WIDOW. See the article DOTE.

WIDURIS, in natural hiftory, the name of a ftone found in Java, Malabar, and fome other places, and defcribed by Rumphius. Some fpecies of this are all over of a fine white; others are of a dufky colour, with ftreaks of white; the fimply white ones are femi-pellucid, and look very like the white of an egg. Some alfo have called this the *Hyalops*, or *Achates vitreæ perfpicuitatis*.

WILD *Oat*. See the article OAT.

WILD-*Goofe Chace*. See the article CHACE.

WILDERNESS, (*Cycl.*) in gardening. There is nothing fo great an ornament to a large garden as a *Wildernefs*, when properly contrived, and judicioufly planted.

The *Wildernefs* fhould always be proportioned to the fize of the garden, and fhould never be fituated too near the houfe; becaufe the trees perfpire fo large a quantity of watery vapours, as make the air very unwholfome. The *Wildernefs* fhould never be fo placed as to block up a good profpect; but where the view naturally ends with the verge of the garden, or little more, nothing terminates it fo well as a fine plantation of trees. The fize of the trees fhould be confidered, and tall growing ones fhould be planted in larger places; fmaller, in lefs extenfive; ever-greens alfo fhould be kept by themfelves, and placed moft in fight, not mingled confufedly among the trees which caft their leaves. The walks fhould be large and not numerous; the large walk is beft made ferpentine, and this fhould not be entered upon the grand walks of the garden, but by fome private walk.

It is too common a method to difpofe the trees in *Wildernefſes* in form of regular fquares, triangles, *&c.* but this is faulty; for as nature fhould be ftudied in thefe works of fancy, the moft irregular is the moft pleafing plantation. The walks for the fame reafon are much more pleafing when they run in wild meanders, than when they interfect one another in ftudied and regular angles. The winding walks fhould be made to lead to an open circular piece of grafs, with a ftatue, an obelifk, or a fountain; or, if an opening large enough for a banquetting-houfe be contrived in the middle, it will afford a very pleafing fcene. The trees fhould gradually rife from the fides of the walks and openings, one above another to the middle of the quarters, where the largeft trees fhould ftand, by which means the heads of all the trees will appear in view, but their ftems will not appear in fight.

Not only the growth of trees is to be confidered in the planting of a *Wildernefs*, but their nakedneffes are to be confidered and hid. The larger growing trees are allowed a proportionable diftance, and their ftems hid by honeyfuckles, rofes, fpireas, and other low flowering fhrubs. Thefe may alfo be planted next all the walks and openings; and at the foot of thefe, near the walks, may be fet rows of primrofes, violets, and daffodils, with other the like flowers; behind the firft rank of lower flowering fhrubs fhould be planted thofe of a fomewhat higher ftature, as the *althæa frutices*, the cytifufes and gelderrofes; and behind thefe may be rows of the talleft flowering fhrubs, as the lilacs, laburnums, and the like; and behind thefe, the heads only of the lower growing trees will appear, which fhould be backed gradually with thofe of higher growth, to the center of the quarter; from whence the heads of the trees fhould defcend every way to the walks, or openings.

The grand walks and openings fhould always be laid with turff, and kept well mowed; but, befide thefe, there ought to be fmaller ferpentine walks through the feveral quarters, where perfons may retire for privacy: thefe fhould be left with the bare earth, only kept clear of weeds, and laid fmooth.

Thefe walks fhould be made as winding as poffible, and a few wood-flowers planted along their fides will have a very good effect. The ever-greens fhould be allotted a peculiar part of the *Wildernefs*, and fuch as fronts the houfe; and, in the planting thefe, the fame regard is to be had to their growth, that the talleft trees be planted hindmoft, and their ftems hid by fhorter ones, and fo on, down to the verge: as in the firft row may be planted laurultines, boxes, fpurge laurels, junipers, and favins; behind thefe, laurels, hollies, and arbutuffes; next behind thefe, yews, alaternuffes, phillereys, cypreffes, and Virginian cedars; behind thefe, Norway and filver firs, and the true pine; and finally, behind thefe, the Scotch pine and pinafter. Thefe will have a very beautiful appearance, as their tops will only be feen, and make a fheet of green, which may alfo be very beautifully varied, from the artful admixtures of the feveral fhades of green which the various plants have.

In all thefe plantations, the trees, however, fhould not be fet in formal ftiff rows, but in a loofe variety, proportioned to their manner of growth. *Miller's* Gardener's Dict.

WILDS, a term ufed by our farmers to exprefs that part of a plough by which the whole is drawn forwards.

The *Wilds* are of iron, and are of the form of a gallows, whence they are by fome called the *Gallows* of the plough, but improperly, the gallows of the plough being properly that part formed by the crow-ftaves, and the tranfverfe piece into which they are mortifed at the top.

The *Wilds* confift of two legs, and a tranfverfe top-piece: one of the legs, and the top-piece, are all of one piece of iron, and the other leg, which is loofe, has a hole in the top, into which the end of the tranfverfe piece is received; both thefe legs pafs through the box of the plough, which is that tranfverfe timber through which the fpindles of the wheels run: thefe legs are pinned in behind the box with iron pins: the holes through the box at which thefe legs pafs, are not made at right angles, but flanting upwards, fo that the fore-part of the *Wilds* is higher than the hinder part; were it not for this, the upper part of the crow-ftaves would lean quite back when the plough is drawn.

The ufe of the notches in the *Wilds* is to give the plough a broader or narrower furrow; if the links are moved to the notches on the right-hand, it brings the wheels toward the left, which gives a greater furrow; and, on the contrary, a fmaller furrow is made when the links are moved to the notches on the left. The legs of the *Wilds* fhould be nineteen inches, and their diftance eight inches and a half; they muft be made ftrong, and the links muft be placed in different notches, that the front of the plough may be kept fteady, and the wheels not be drawn one before the other. Thefe links are of iron alfo, and are each fix inches and a half long, and to thefe are faftened the chains of the harnefs, by which the whole plough is drawn along. *Tull's* Hufbandry. See the articles PLOUGH and GALLOWS.

WILLOW, in botany. See the article SALIX.

Our common *Willows*, in the fpring feafon, when they are in flower, produce a quantity of cottony matter, which might be put to fome ufe.

The Chinefe are induftrious enough to collect this cotton as it falls from their *Willows*; and the women and children, among the poorer people, card it, and pick out the feeds, and render it fit for many ufes in the place of cotton.

The poor people, in fome parts of the Indies, make a fort of liquor of the flowers of the *Willow* before they are opened, which intoxicates them very fuddenly; and the dry hufks of the fame tree, remaining after the flowers and feeds are fallen, are wholfome as food, people in times of famine having lived upon them, boiled in water.

The ignorance of the Chinefe in natural hiftory, has occafioned two very ftrange ftories, about the downy or cottony matter of the *Willow*, to be recorded in their books, and firmly believed among them.

The one is, that if this down fall upon the water, it is in one night's time converted into the plant called duck-weed, and if it falls upon any of their fur garments, it becomes a fort of moth, or worm, that eats them to pieces. The common people are fo fully perfuaded of this, that they will never let any garment of this kind he expofed to the air at this time of the year. There is fome probability, that the down of this tree may contain the eggs of certain infects, but then it does not change into them; and thefe can only be the eggs of thofe butterflies which frequent that tree; the confequence of which muft be, that they will produce caterpillars whofe food is the *Willow* leaves, not any other fubftance.

The other error may probably be owing to the water-plant ufually making its firft appearance at the fame feafon when the *Willows* are in flower, fo that it feems produced of them.

A like error we have among the common people of England, in regard to the yellow *rattle*, or *crifta galli lutea*. This plant appears in our meadows juft at the time when the cowflips have done flowering, and is thence vulgarly fuppofed to be the fame plant in a different ftate, or that the cowflip at a certain time changes into this plant.

The wood of the *Willow*, though in itfelf very light and fpongy, is yet of a nature to bear the injuries of wet better than almoft any other kind. It is ufed by the Chinefe on this occafion, in the making their wells, and on all other occafions where wood is to ftand under water, and fucceeds perfectly well. Obferv. fur les Coutumes de l'Afie.

WILLOW-*Galls*, in natural hiftory, the name given by authors to certain protuberances found very frequently on the leaves of the feveral fpecies of *Willow*, which are properly galls, each containing the worm of a fly, and owing its exiftence to that infect.

The galls are ufually of a roundifh or oblong figure, and are equally protuberant on each fide of the leaf: They are of a pale green at firft; but they afterwards become yellowifh, and finally reddifh. The furface of thefe is feldom perfectly even, but ufually has feveral little prominences and cavities in it. When this gall is opened, there is found in it a worm much refembling a caterpillar in figure, having a fmooth an-

 nulated

nulated body, and a hard brown head. This, however, is not a caterpillar, the utmoft number of legs in that genus of animals being found to be fixteen, and this worm having twenty.

It is one of thofe creatures which Reaumur, from their refemblance to the caterpillar kinds, has called falfe or baftard-caterpillars. This creature, when the gall is young, is blue; it afterwards becomes greenifh; and finally, when the gall becomes red, it is white. It is in this ftate that Redi has figured and defcribed the gall, and he therefore naturally defcribes the worm as white. This infect feems to eat in its prifon more voracioufly than any other gall-infect whatever; for while the gall grows in fize, it becomes alfo thinner in every part; fo that the creature, at the proper time, has but little difficulty to get out. *Reaumur's* Hift. Infect. vol. 6. p. 211.

Thefe galls fometimes ftand fingly on the leaves; but more frequently there are three or four on a leaf; not unfrequently there are great numbers, and particularly on the leaves of the ozier: thefe being very narrow, the galls are beautifully arranged on them, ftanding ufually in two rows, one on each fide the middle rib; and thefe fo clofely fet together, that they refemble the beads of a lady's necklace. The inner furface of moft other galls is fmooth, and the animal lodged in a polifhed cavern; but that is not the cafe in thefe galls, the animal eats too faft to eat with fo much regularity; and, in fine, before it arrives at its full growth, it ufually eats its way through the fides of it, and feeds on the fubftance of the leaf in other parts, retiring at pleafure again into its cell. This is a very fingular thing, no other infect of this kind being known to do it. Vallifnieri is the perfon who affirms it of this, and fays, that he has feen the fact.

When the time of the laft change of this infect draws nigh, it leaves the tree, and defcending to the earth, makes its way into it in a proper place, and then becomes a nymph, out of which, at a proper time, iffues a four-winged fly. This is alfo the laft ftate of all the baftard-caterpillars that have yet been traced through their feveral changes.

The obfervation of this change, however, is not fo eafy as that of feveral other fpecies, fince the creature does not undergo it in the gall, but under the earth, and there can be no certainty in expecting the infect out of the ground.

Redi, who was very curious in thefe particulars, could never arrive at the fight of the winged animal. His method of attempting it was by putting a great number of the galls into boxes, and expecting their changes there; but thefe creatures all died for want of the proper nidus for the chryfalis. Vallifnieri fucceeded better, by means of putting a large quantity of a moift friable earth, of the fandy kind, into the boxes with the galls. The confequence of this was, that he foon faw fuch of the infects as were arrived at a ftate proper for their change, creep out of the galls, and bury themfelves in the earth at the bottom of the boxes. On tracing them farther, he found that each of them fpun itfelf a cafe of filk, like the filk-worm's web, under the cover of which it lay in the earth all the winter, and in the fpring following, about the middle of April, it came up in the form of a fmall four-winged fly, of no very fingular beauty. This is alfo obferved of all the other baftard-caterpillars, none of them producing flies of any beauty, though fome of very fingular figures. *Reaumur*, Hift. Inf. vol. 6. p. 213.

The flies which are thus produced in April, copulate almoft as foon as freed from their exuviæ of the chryfalis ftate, and the females foon after lodge their eggs in the leaves of the *Willows*. This is all done before the end of April, and the young ones hatched of thefe eggs, live but a fhort time before they pafs into the chryfalis ftate, and living flies are hatched from thefe in June. It is this brood whofe young ones pafs their chryfalis ftate in the earth, and appear not during the whole winter, till the fpring fun enlivens them again. There are, befide thefe, another kind of galls of the *Willow* leaves, which are of the clafs of thofe, each of which contains feveral cells; in each cell of thefe there is found a fmall white maggot, the offspring of the egg of a two-winged fly, which, after paffing the chryfalis ftate in the earth, alfo comes out in the form of its winged parent. The cells in the galls are different in number in the feveral galls, and are from four or five to twenty: They have no communication with one another, but each worm lives in its own cell.

Befide thefe there is alfo fometimes found in thefe galls a worm of a brownifh white colour, having two hooks in its head, and no legs at all. This has all the appearance of a carnivorous animal, and probably was depofited there in the egg-ftate by its parent, not to feed on the gall, but on its defencelefs inhabitant. This worm finally becomes a fmall bluifh beetle, and is often found alone in the cavity of the gall, often in company with its proper inhabitant, fucking its juices as it feeds on thofe of the plant. There feem to be feveral fpecies of thefe devourers common to thefe galls; fince Vallifnieri obferved, in the boxes where he kept thefe galls to produce the animals from thence, many fpecies of fmall beetles, and feveral diftinct kinds of flies, which were probably the laft ftate of feveral kinds of carnivorous worms, which had preyed upon the proper inhabitant of the galls. *Vallifnieri*, Dialog. des Infect.

WILLOW *Herb*, in botany, the Englifh name of the *lyfimachia*. See the article LYSIMACHIA.

WIMBREL, in zoology, the Englifh name of a bird of the curlew-kind, and known among authors by the name of *arquata minor*, or the leffer curlew, and called in the Venetian markets *taraniola*.

It is very much of the fhape of the common curlew, but is not more than half its fize. Its beak is about three fingers breadth long. Its feet are greenifh, and its wings fpotted with large femicircular fpots; and its general colour is a dufky brown.

WINCRANTUM, in natural hiftory, a name given by the people of the Eaft Indies to a foffile fubftance refembling, in fome degree, the plated lead ores of Europe, but containing very little of that metal; it is properly a fpecies of blende, or mock lead, of a talcy appearance; it is confiderably hard, and is ufualy found in other ftones. It is given in medicine in the Indies as a provocative to venery, being firft calcined and beat to powder.

WIND (*Cycl.*)—*Wind* has been, by many authors, made the bafis of many different difeafes: among others, Dr. Reyn has given it as his opinion, in a treatife on the gout, that flatufes, or *Wind* inclofed between the periofteum and the bone, are the true caufe of that difeafe; and accordingly, that all the method of cure ought to tend to the expelling that *Wind*. He fuppofes this *Wind* to be of a dry, cold, and malignant nature, conveyed by the arteries to the place affected, where forcibly feparating that fenfible membrane the periofteum, and diftending it, the pain muft needs be very great.

He is alfo of opinion, that head-achs, palpitations of the heart, tooth-ach, pleurify, convulfions, colics, and many other difeafes, are originally owing to the fame caufe, and only differ in regard to the place affected, and to the various motions and determinations of the *Wind*. The moveablenefs of the pain in gouty perfons from one part to another, he looks on as a proof of this, and thinks that the curing the gout by burning moxa, or the cotton of the mugwort leaves, upon it, is owing to its giving way to the *Wind* in the part to evaporate itfelf.

That thefe *Winds* are cold, appears from the fhivering fits which generally precede a paroxyfm of the gout, and the fhiverings in the beginnings of fevers, and before all fits of agues, are owing to the fame caufe, is fuppofed by this author a natural conclufion from the former obfervations.

The *Winds*, according to this author and Fienus, are a fort of halituous fpirits, raifed by the improper degree of our native heat, or out of our meat and drink; or, finally, out of an abundance of black choler.

Their differences, he fays, principally proceed from the various ferments producing in us a variety of humours; which acting upon one another, do in their effervefcences create *Winds* of various effects, and denominate difeafes from the places which are the fcenes of their action. It is on this account that the acupunctura, or pricking with long needles, among the Chinefe, is of ufe. The Japonefe, and other neighbouring nations, having no other cure for moft difeafes than the pricking with the needle, and the burning the moxa on the part. *Reyn* de Arthritid.

The hufbandman often fuffers extremely by high *Winds*, in many different refpects. Plantations of trees at a fmall diftance from the barns and houfes, are the beft fafeguard againft their fuffering by *Winds*; but they muft not be planted fo near as that their fall, if it fhould happen, would endanger them. Yews grow very flowly, otherwife they are the beft of all trees for this defenfive plantation. Trees fuffer by *Winds*, being either broken or blown down by them; but this may be in a great meafure prevented by cutting off great part of the heads and branches of them, in places where they ftand moft expofed.

Hops are the moft fubject to be injured by *Winds* of any crop; but this may be in a great meafure prevented by a high pale, or very thick thorn hedge; this will both keep off the fpring *Wind*, which nips the young buds, and be a great fafeguard againft other *Winds* that would tear the plants from their poles. The poles fhould always be very firm in the ground; and the beft fecurity to be added to this, is a row of tall trees all round the ground.

Winds, attended with rain, do vaft injury to the corn, by laying it flat to the ground. The beft method of preventing this, is to keep up good enclofures; and if the accident happens, the corn fhould be cut immediately, for it never grows at all afterwards. It fhould be left on the ground, in this cafe, fome time after the cutting, to harden the grain in the ear. *Mortimer's* Hufbandry, p. 302.

Large WIND, in the fea-language; to fail with a *large Wind*, is the fame as with a *fair Wind*.

Quarter WIND, at fea. See the article QUARTER.

Tropic WINDS. See the article TROPIC.

Side WIND, at fea, that which blows on the fide of the fhip.

WIND, in the manege. A horfe that carries in the *Wind*, is one that toffes his nofe as high as his ears, and does not carry handfomely.

The

The difference between carrying in the *Wind*, and beating upon the hand, is, that a horſe who beats upon the hand, ſhakes his head, and reſiſts the bridle; but he who carries in the *Wind*, puts up his head without ſhaking, and only ſometimes beats upon the hand. The oppoſite to carrying in the *Wind*, is arming and carrying low.

WIND-*Flower*, in botany, the Engliſh name of the *anemone*. See the article ANEMONE.

The proper ſoil and culture of the many varieties of this beautiful flower are theſe: For the ſoil, take a quantity of freſh light ſandy loam, or hazel earth from a common, or dry paſture, not dug above eight or ten inches deep; mix this with a third part its quantity of rotten cow-dung, and lay it up in a heap; turn this over at leaſt once a month, and every time pick out the ſtones, and break the clods. After this mixture has been twelve months made, it will be fit for uſe.

The beds of this earth muſt be prepared in September, and ſhould be made eight inches deep, if it be in a wet ſoil; but if in a dry one, three or four inches will be ſufficient; three weeks after this has been laid in, ſtir it for ſix inches deep with a ſpade, and then with a ſtick draw lines each way of the bed, at four inches diſtance, ſo that the whole may be in ſquares; then make a hole three inches deep in the center of each ſquare, and plant a root in each; and when all are planted, rake the earth of the whole bed ſmooth, ſo as to cover the roots two inches thick. The ſeaſon of planting theſe roots fur forward flowers, is the middle of September, and for the later in October: this is beſt done at a time when there are gentle rains. Some roots ſhould alſo be ſaved to be planted after Chriſtmas, for fear of accidents to the former from very hard weather.

Theſe uſually flower three weeks after thoſe planted in autumn. In the beginning of April the early planted roots will begin to flower, and they will keep in flower near a month, if the weather prove favourable, and they are properly ſhaded with matts, laid over hoops in the greateſt heat of the day: the ſecond, and laſt planted ones, will follow theſe; and, in the whole, there will be at leaſt two months fine flowering.

Toward the latter end of May the firſt planted roots will loſe all their leaves, and they muſt be then taken up and waſhed clean, and laid to dry on mats in the ſhade; after which they are to be put up in paper bags, and hung up till the time of planting them comes on again. The later planted ones are to be taken up alſo as ſoon as their leaves are decayed, and not ſuffered to remain to make new ſhoots; for then it is too late to remove them.

They are propagated two ways, either by dividing the roots, or by ſowing. The roots are to be divided as ſoon as they are taken up out of the ground: they will ſucceed if broken into as many parts as there are eyes or buds in them; but they flower moſt ſtrongly, if not parted too ſmall.

The way, by ſowing, is this: Chooſe firſt ſome good kinds of *Anemones*, plant theſe early, and they will produce ripe ſeed three weeks after the flower firſt blows. This muſt be carefully gathered, and in Auguſt it ſhould be ſowed in pots or tubs, or a very well prepared bed of light earth, rubbing it between the hands with a little dry ſand, to prevent ſeveral of the ſeeds from clinging together, and ſpreading them as even as poſſible all over the bed; after this a light hair bruſh ſhould be drawn many times over the ſurface of the bed, to pull aſunder any lumps of ſeed that may yet have fallen together; obſerving not to bruſh off the ſeed, and as much as poſſible not to bruſh it into heaps. When this is done, ſome light earth, about a quarter of an inch deep, ſhould be ſifted over the bed. If the weather be hot, the bed muſt be at times covered with mats laid hollow, and gently watered.

In about two months after ſowing, the plants will appear, if the ſeaſon has been favourable, and they are to be carefully defended from the hard froſts by proper covering, and from the heat of the ſun afterwards by a moveable reed fence. As the ſpring advances, if the weather be dry, they muſt be gently watered, and when their green leaves decay, there muſt be a quarter of an inch more earth ſifted over them, and the like again at Michaelmas; and the bed muſt be kept clear from weeds, and the following ſpring they will flower. *Miller's* Gardener's Dict.

WIND-*Gall*, a name given by our farriers to a diſtemperature of horſes. In this caſe there are bladders full of a corrupt jelly, which, when let out, is thick, and of the colour of the yolk of an egg.

They vary in ſize, but are more uſually ſmall than large. Their place is about the fetloc-joint, and they grow indifferently on all four legs, and are often ſo painful, eſpecially in the ſummer-ſeaſon, when the weather is hot, and the ground dry and hard, that they make the creature frequently ſtumble, or fall abſolutely down.

The general method of cure is to open the ſwelling about the length of a bean, and to preſs out the jelly: when this is done, they apply a mixture of the oil of bays, and the white of an egg, covering it with tow.

Another method is, after the jelly is all ſqueezed out, to wrap round the part a wet woollen cloath, and then applying a taylor's hot iron, this is to be rubbed over till all the moiſture is carried away; it is then to be daubed all over with pitch, maſtic, and reſin, boiled together, laying tow in plenty over all.

The *Wind-galls* that are ſituated near the ſinews, are much the moſt painful of all, and ſooneſt make the horſe lame.

The general cauſe of *Wind-galls* is ſuppoſed to be extreme work or exerciſe in very hot weather; but it is to be obſerved, that thoſe horſes, which have long joints, will be *Wind-galled* if they work never ſo little. The worſt *Wind-galls* are thoſe of the hinder legs; all the above-mentioned will frequently miſs of ſucceſs in theſe, and nothing but fire will cure them.

WIND-*Hatch*, in mining, a term uſed to expreſs the place at which the ore is taken out of the mines.

The word *hatch* is the general term uſed by the miners to expreſs an opening from the ſurface into the mine, or in the attempting to find a mine.

Thus the word *eſſay-hatches* ſignifies the openings made in ſearch of the trains of ſhoad-ſtones; and the *tin-hatch* in Cornwall is the name of the opening by which they deſcend into a tin-mine.

The word *Wind-hatch* ſeems to be a corruption of *winder-hatch*; for at theſe places they have a *winder* conveying two buckets, the one conſtantly up, the other conſtantly down; the man below fills the bucket that deſcends; and when that which aſcends full is emptied at the mouth of the hatch, the perſon who has the care of that part of the work, delivers it empty to go down again. Phil. Tranſ. N°. 69.

WIND-*Sails*, in a ſhip, are made of the common ſail-cloth, and are uſually between twenty-five and thirty foot long, according to the ſize of the ſhip, and are of the form of a cone ending obtuſely: when they are made uſe of, they are hoiſed by ropes to about two thirds or more of their height, with their baſis diſtended circularly by hoops, and their apex hanging downwards in the hatch-ways of the ſhip; above each of theſe, one of the common ſails is ſo diſpoſed, that the greateſt part of the air, ruſhing againſt it, is directed into the *Wind-ſail*, and conveyed, as through a funnel, into the upper parts of the body of the ſhip. Phil. Tranſ. N°. 463. p. 65.

WIND-*Shock*, a name given by our farmers to a diſtemperature to which fruit-trees, and ſometimes timber-trees, are ſubject.

It is a ſort of bruiſe and ſhiver throughout the whole ſubſtance of the tree; but the bark being often not affected by it, it is not ſeen on the outſide, while the inſide is twiſted round, and greatly injured.

It is by ſome ſuppoſed to be occaſioned by high *Winds*; but others attribute it to lightening. Thoſe trees are moſt uſually affected by it, whoſe boughs grow more out on one ſide than on the other.

The beſt way of preventing this in valuable trees, is to take care, in the plantation, that they are ſheltered well, and to cut them frequently in a regular manner, while young.

The *Winds* not only twiſt trees in this manner; but they often throw them wholly down: in this caſe, the common method is to cut up the tree for firing, or other uſes; but if it be a tree that is worth preſerving, and it be not broken, but only torn up by the roots, it may be proper to raiſe it again by the following method: Let a hole be dug deep enough to receive its roots, in the place where they before were; let the ſtraggling roots be cut off, and ſome of the branches, and part of the head of the tree; then let it be raiſed; and when the torn-up roots are replaced in the earth in their natural ſituation, let them be well covered, and the hole filled up with rammed earth; the tree will, in this caſe, grow as well, and perhaps better, than before. If nature be left to herſelf, and the tree be not very large, the pulling off the roots will raiſe it. *Mortimer's* Huſbandry, vol. 2. p. 79.

WIND-*Thruſh*, in zoology, a name given by ſome to the redwing, and ſuppoſed to be given from their generally firſt appearing with us in windy ſeaſons; but it appears more probably to be derived from the German name *wint-troſſel*, or vine-thruſh, from its doing great miſchief there in the vineyards, by eating and deſtroying the grapes. *Ray's* Ornithology, p. 139. See the article RED-*Wing*.

WIND-*Hover*, in zoology, the name of a ſpecies of hawk, called alſo by ſome the *ſtannel*, but more uſually the *keſtrel*, and known among authors by the names of the *tinnunculus* and *cenchris*. *Ray's* Ornithol. p. 50. See the article TINNUNCULUS.

WIND-*Ward*, (*Cycl.*) in the ſea language, denotes any thing towards that point from whence the wind blows, in reſpect of a ſhip.

WINDAGE *of a Gun* is the difference between the diameter of the bore, and the diameter of the ball.

WINDER-*Meb*, in zoology, the name of a bird of the larus or gull-kind, moderately large, and deſcribed by Aldrovand under the name of *larus major*.

Its head is remarkably large and thick, and is of a mottled colour of white and grey; its breaſt and belly are alſo variegated with the ſame colour, but they are ſomewhat paler. Its beak is thick and ſtrong, of a yellow colour, and very ſharp; and the opening of its mouth very wide. Its wings are variegated with white, grey, and cheſnut-colour; and both theſe

 and

and the tail have much black in them. The feet are webbed and yellow, the claws are fharp, and the hinder toe larger than in moft birds of this kind. *Ray's* Zoology, p. 267.

WINDING-*Tackle*, in a fhip. See the article TACKLE.

WINDOW (*Cycl.*)—Before glafs *Windows* came into ufe, the *Window* cafements were commonly made of a tranfparent ftone called *fpecularis lapis*, and thence called *fpecularia*; and before the *fpecularia*, veds were the only defence they had againft the weather. *Pitifc.* Lex. Antiq. in voc. *Specularia.*

WINDY *Tumors*. See the article *Windy* TUMORS.

WINE (*Cycl.*)—The method of converting white *Wines* into red, fo much practifed by the modern *Wine*-coopers, is this: Put four ounces of turnefole rags into an earthen veffel, and pour upon them a pint of boiling water; cover the veffel clofe, and leave it to cool; ftrain off the liquor, which will be of a fine deep red, inclining to purple. A fmall proportion of this colours a large quantity of *Wine*. This tincture might be either made in brandy, or mixed with it, or elfe made into a fyrup with fugar for keeping. A common way with the *Wine*-coopers is to infufe the rags cold in *Wine* for a night or more, and then wring them out with their hands; but the inconveniency of this method is, that it gives the *Wine* a difagreeable tafte; or, what is commonly called the tafte of the rag; whence the *Wines*, thus coloured, ufually pafs among judges, for preffed *Wines*, which have all this tafte from the canvas rags in which the lees are preffed.

The way of extracting the tincture, as here directed, is not attended with this inconvenience; but it loads the *Wine* with water; and if made into a fyrup, or mixed in brandy, it would load the *Wine* with things not wanted, fince the colour alone is required. Hence the colouring of *Wines* has always its inconveniencies. In thofe countries which do not afford the tinging grape, which affords a blood-red juice, wherewith the *Wines* of France are often ftained, in defect of this, the juice of elder-berries is ufed, and fometimes logwood is ufed at Oporto.

The colour afforded by the method here propofed, gives *Wine* the tinge of the Bourdeaux red, not the Port; whence the foreign coopers are often diftreffed for want of a proper colouring for red *Wines* in bad years. This might perhaps be fupplied by an extract made by boiling ftick-lack in water. The fkins of tinging grapes might alfo be ufed, and the matter of the turnefole procured in a folid form, not imbibed in rags. *Shaw's* Lectures, p. 211.

Any confiderable heat, or even a degree of fimmering, or tepidity, will, by its inteftine and fubtile agitation, that barely difturbs the fine faline and fpirituous parts, which are very fufceptible of heat, thereby disjoin them from the reft, and occafion an alteration in the tafte, tranfparency and durability of the *Wine*, as much as if the fpirit had been drawn off by diftillation, and afterwards poured in again, in which cafe the whole ceafes to be *Wine*, though it is poffible to bring it to *Wine* again, by bringing on a new fermentation.

It is a common accident, and a difeafe in *Wines*, to be kept too hot, and is not eafy to cure when it has been of any long continuance, otherwife it may be cured by introducing a fmall artificial fermentation, that new ranges the parts of the *Wine*, or rather recovers their former texture: but the actual expofing of *Wine* to the fire, or the fun, prefently difpofes it to turn eager; and the making it boiling hot, is one of the quickeft ways of expediting the procefs of making of vinegar.

On the other hand, *Wine* kept in a cool vault, and well fecured from the external air, will preferve its texture entire in all the conftituent parts, and fufficiently ftrong for many years, as appears not only from old *Wines*, but other foreign fermented liquors, particularly thofe of China, prepared from a decoction of rice, which being well clofed down in the veffel, and buried deep under ground, will continue, for a long feries of years, rich, generous, and good, as the hiftories of that country univerfally agree in affuring us.

The fame is to be underftood of vinegar which has once thrown off the fuper-abundant earthy parts, and many of the oily ones which prefided in it while it was *Wine*; whence the faline ones now get the afcendant, and as it were fubdue and prefide over the fpirituous ones. In this ftate it will continue perfect a long time; good and ftrong vinegar, well ftopped down, and placed in a cool place, preferving itfelf unaltered for a long feries of years: but if it be left open, fo that its fine vapour exhales, or its fubtile part be drawn from it, and again poured back; in either cafe it lofes its uniform confiftence, and particularly its durability, and immediately hurries into vapidity and corruption.

If either by fraud or accident a larger portion of water is mixed with *Wine* than is proper for its confiftence, and no way neceffary or effential, this fuperfluous water does not only deprave the tafte, and fpoil the excellence of the *Wine*, but alfo renders it lefs durable; for humidity in general, and much more a fuperfluous aqueous humidity, is the primary and reftlefs inftrument of all the changes that are brought on by fermentation. It may doubtlefs therefore be ufeful, and fometimes abfolutely neceffary, to take away this fuperfluous water from the other part which ftrictly and properly conftitutes the *Wine*. This has been agreed upon on all hands as a thing proper; but the manner of doing it has not been well agreed on; fome have propofed the effecting it by means of heat and evaporation, others by percolation, and others by various other methods, all found unfuccefsful when brought to the trial; but the way propofed by Dr. Shaw from Stahl, is the moft certain and commodious; this is done by a concentration of the *Wine*, not by means of heat, but of cold. *Stahl's* Schediafm. de Concentratione Vini. See the next article.

Condenfing of WINES; a phrafe ufed by Stahl, and fome other writers, to exprefs what is more ufually called the concentrating them, that is, the freeing them from what fuperfluous humidity they contain, and by that means rendering them more rich and noble, freeing them from their taftelefs part, reducing them to a fmaller bulk, and by that means making them fitter for tranfportation, and finally rendering them more durable in their perfect ftate, and much lefs fubject to the various accidents that make them decay.

Various methods have been attempted for the effecting of this, and great objections found in the way of all of them, except the lateft, brought into ufe by *Stahl*, and fince recommended greatly to the world by Dr. Shaw in his chemical effays.

If any kind of *Wine*, but particularly fuch as has never been adulterated, be in a fufficient quantity, as that of a gallon or more, expofed to a fufficient degree of cold in frofty weather, or be put into any place where ice continues all the year, as in our ice-houfes, and there fuffered to freeze, the fuperfluous water that was originally contained in the *Wine*, will be frozen into ice, and will leave the proper and truly effential part of the *Wine* unfrozen, unlefs the degree of cold fhould be very intenfe, or the *Wine* but weak and poor. This is the principle on which Stahl founds his whole fyftem of condenfing *Wines* by cold.

When the froft is moderate, the experiment has no difficulty, becaufe not above a third or a fourth part of the fuperfluous water will be froze in a whole night; but if the cold be very intenfe, the beft way is, at the end of a few hours, when a tolerable quantity of ice is formed, to pour out the remaining fluid liquor, and fet it in another veffel to freeze again by itfelf: this is proper, for two reafons; firft, becaufe the quantity of ice growing large, more of the concentrated *Wine* will be apt to lodge in it than fhould, and it will require a longer time to drain and clear away from the ice. The making the experiment will fufficiently explain this to any body; for, without breaking the ice, the unfrozen part will, barely by inclining the veffel, find its own way out, and drain clear from the watery part, which is now converted into ice; fo that if the draining be perfect, the ice of the moft perfectly red Bourdeaux claret will become nearly as clear and pale as water, and will refolve by heat into an almoft entirely colourlefs phlegm. This is no fmall curiofity attending this experiment, and at the fame time affords a criterion of its exact performance.

If the veffel, that thus by degrees receives the feveral parcels of the condenfed *Wine* be fuffered to ftand in the cold freezing place where the operation is performed, the quantity lying thin in the pouring out, or otherwife, will be very apt to freeze anew; and if it be fet in a warm place, fome of this aqueous part thaws again, and fo weakens the reft. The condenfed *Wine* therefore fhould be emptied in fome place of a moderate degree as to cold or heat, where neither the ice may diffolve, nor the vinous fubftance mixed among it be congealed. But the beft expedient of all is to perform the operation with a large quantity of *Wine*, or that of feveral gallons, where the utmoft exactnefs, or the danger of a trifling wafte, needs not be regarded.

By this method, when properly performed, there firft freezes about one third part of the whole liquor, and this is properly the more purely aqueous part of it, infomuch that when all the vinous fluid is poured off, to be again expofed to a concentration, the ice remaining behind, from this firft freezing, being fet to thaw in a warm place, diffolves into a pure and taftelefs water.

If the *Wine*, now once concentrated, fhould, by a long continuance in the freezing cold, be again congealed to the utmoft (unlefs the cold were very fevere indeed) and then again be drained from its ice, there, foon after this, falls to the bottom of the veffel, a pure white powder or tartar, and even the icy part afterwards depofits alfo a little of the fame fubftance after thawing; and after the ftanding two or three days, there is always more and more of this tartar precipitated, and that conftantly the more in proportion as the *Wine* was more auftere, or lefs adulterated with fugar brandy, or the like, for thefe things contain no tartar.

The ice of the fecond operation on a quantity of *Wine*, differs in nothing from that of the firft, provided only that the *Wine* was poured clear off from it, before the ice is fet to melt, by which means it diffolves into a clear phlegm. This fhews the excellency of the operation, as it lofes not its efficacy upon repetition, but brings away mere water as well at laft as at firft, without robbing the *Wine* of any of its genuine or truly valuable parts. The remaining liquor, which has efcaped being

ing frozen in these two operations, is a real concentrated *Wine*, as appears by its colour, consistence, taste, and smell; for it now has all these properties in a much larger degree, than while it contained so much superfluous moisture of a merely aqueous kind. It therefore becomes a nobler and richer *Wine*, than could any way be procured without such a contrivance. For as, by this means, two thirds of the quantity are taken away in the better sorts of *Wine*, and three fourths in the weaker, what remains must needs possess three or four times the strength and virtues of the same quantity of the crude *Wine*.

This operation, though it be perfect in regard to *Wines*, yet does not succeed so well in regard to the malt liquors. The experiment has been fairly tried by Stahl on a gallon of strong malt drink, and the success was as follows: The ice separated in the first operation, when thawed by heat, resolved into a liquor of the colour and taste of small beer; and the second concentration afforded an ice of much the same kind, which might have passed for ordinary small beer, but for a flashy watery taste that manifestly predominated in it. The liquor unfrozen was but a pint and half by measure, but it was extremely rich and thick, and seemed very strong and spirituous, and perfectly aromatic, or highly flavoured. The consistence was somewhat like that of a thin syrup, and it had a pleasing softness that sheathed the acrimony of the spirit, and covered the bitter taste of the hop.

The mucilaginous nature which is predominant in all malt liquors, occasions a great inaccuracy in this experiment, as not suffering the water to run clear, or be separated from the richer tincture of the malt, nor letting the condensed liquor be obtained clean from the ice; but as the loss occasioned by this is not great, and the liquor is much cheaper than *Wine*, if this should ever come into use in the large way, the thawed liquor of the ice might be used again in a new brewing, and so the loss of that part of the strength which was carried away by the freezing be recovered.

The phlegm of *Wine*, separated by this operation, when it has not succeeded perfectly well, carries off something also of the flavour and taste of the *Wine*; and this need not be supposed all lost, for this liquor alone will, if strong enough, serve excellently to make vinegar, or if not so much impregnated as to do for that purpose, it will serve the vinegar-makers instead of other water, and be of so much advantage in the process, as fully to make up for the quantity of *Wine* lost.

The frozen part, or ice, consists only of the watery part of the *Wine*, and may be thrown away, and the liquid part retains all the strength, and is to be preserved. This will never grow sour, musty, or mouldy afterwards, and may at any time be reduced to *Wine* of the common kind again, by adding to it as much water as will make it up to the quantity that it was before.

Wines in general may by this method be reduced to any degree of vinosity or perfection. Thus, for example, if a *Wine* of a moderate strength have a third part of its water taken away, in form of ice by congelation, the remaining part will thereby be doubled in strength and goodness: for if we allow, in the better sorts of *Wine*, that one third part, which is near the truth, is truly good or vinous, and two third parts are nothing but water, one third part of the good *Wine* being blended among the two third parts of water, of no strength nor value; it follows, that if one of these third parts of water be taken away, and all the *Wine* left, that which was before but one third *Wine*, is now one half *Wine*, no way reduced in its strength, and therefore the whole must be stronger in that proportion.

But if this operation of congelation be carried to the utmost, and be practised on a large quantity of *Wine*, and with a very intense cold, and the ice taken away several times, and the *Wine*, thus freed from a part of its water, again and again exposed, it will be found that good *Wines* will be reduced to one sixth part of their original quantity; and the vintner will easily find out the use of this remaining sixth part, which is a true quintessence of *Wine*, and will be of the utmost benefit, by mixing in small quantities with poor and low-flavoured *Wines*, to meliorate and improve them; and even to convert the low-flavoured and least valuable ones into those very *Wines* from which this condensed part was procured.

Glauber laboured hard at bringing this sort of thing to bear, and attempted it with what he called the quintessence or essential oil of *Wine*; but this, though prepared ever so curiously from the very finest *Wines*, was never found to answer well on the trial, but retained a nidorous and disagreeable flavour, different from that of the *Wine*. Glauber's method, therefore, which was excellent in theory, is by this method of congelation reduced to practice, and that with little trouble, and the greatest advantage.

The benefit and advantage of this method of congelation, if reduced to practice in the large way, in the *Wine* countries, must be evident to every body. Concentrated *Wines*, in this manner, might be sent into foreign countries, instead of *Wine* and water, which is what is usually now sent, the *Wines* they export being loaded, and in danger of being spoiled by three or four times their own quantity of unnecessary, superfluous, and prejudicial water.

The business is, how to perform the operation, for *Wine*-countries being in general hot countries, the business of freezing will not be so easily carried on there as in the cold ones: but this is an objection easily solved by observing, that in most of the *Wine* countries that we are acquainted with, there are hills and mountains, the tops of which are covered with snow all the year round; and all who are acquainted with natural philosophy, very well know, that where there is snow to be had, there will be no difficulty about freezing.

The difficulty rests therefore not in the matter of freezing, but in the reducing the *Wines*, when thus concentrated, to their due and natural state again; for though the addition of water alone does this in a tolerable manner, yet better means may certainly be found on farther trials. The way of using poor *Wines*, and such as in themselves are of little use or value, is always a good one, and is sufficiently advantageous; because what there is in the price of these above water, is made up to the proprietor in the quantity of the final produce; water could only give the same quantity of the *Wine* that there was originally, and before the condensation; but these *Wines* will bear to be mixed in so much larger a quantity, that the produce will warrant the gaining by the practice.

This method is not practicable to advantage in the *Wine* countries alone. Dr. Shaw assures us, that he has himself experimented it here, and with the use of proper freezing mixtures, has reduced *Wines* in England to a much smaller quantity, in proportion to the whole, than in the strongest of Stahl's experiments. It is evident that, by how much the quantity is smaller, by so much it is richer and stronger, provided that the operation has been properly performed. The Doctor assures us, the noble essence or rob, thus prepared, is capable of working almost miracles, by turning water into *Wine*, and the like; but that, in order to its succeeding well, there requires great care in the operator, when the congelation is repeated the last times. *Shaw*'s Chemical Essays. *Stahl*'s Concentrat. Vin.

Diseases of Wines. All *Wines*, malt liquors, and vinegars, which are well made, and perfect in their kind, will grow fine of themselves, barely by standing; so that if they do not thus grow fine in a reasonable time, it is a sign that they labour under some disease; that is, they are too aqueous, too acid, too alkaline, or they tend to putrefaction, or the like. In all these cases, which may properly enough be called the *diseases of Wines*, suitable remedies are required before the *Wines* will grow fine. The most general remedy hitherto known for all the diseases of *Wines*, is a prudent use of tartarized spirit of *Wine*, which not only enriches, but disposes all ordinary *Wines* to grow fine. *Shaw*'s Lectures, p. 209.

Extemporaneous Wine. A hundred weight of good treacle will produce, according to the art of the distiller, from four to seven gallons of pure alcohol; that is, from eight to fourteen gallons of the common-proof melasses spirit. The still-bottoms have many uses. The distillers scald and recover their musty casks with them, and they may be used for all those purposes of cleansing where argol is required. Mr. Boyle's acid spirit of *Wine*, or a spirit very like it, may also be procured from them, and a matter analogous to what Becher calls the *media substantia vini*. This liquor gives a durable *extemporaneous Wine*.

Fining of Wines. See the article Fining.

Low Wines, in the distillery, the term for the spirituous liquor distilled immediately from the fermented matter, and continued running so long, that the last of it was not at all inflammable. This liquor is afterwards rectified to a proof-spirit of the strength of brandy, and thence to a rectified spirit, called *alcohol*, or spirit of *Wine*. *Shaw*'s Lectures, p. 216.

Wine *Lees*. The distillation of *Wine lees* into spirit is conducted very much in the same manner with that of the malt-wash, when distilled with the mealy part in it: The principal difference is on this account, that the oil of the malt being very nauseous and disagreeable, the utmost care is to be used to keep it back in all the processes of primary distillation, and of rectification; whereas, on the other hand, the oil of the *Wine* lees being a very agreeable and pleasant one, as much care as possible is to be taken to bring it over with the spirit. Glauber has written a peculiar treatise on this subject, in which, without touching upon the most advantageous production of all, he has proved the work to be so very profitable, that the whole usually passes for one of his wild flights, rather than a solid business.

The method of distilling a liquid lee for its spirit, is a thing very universally known; but the advantageous thing, on this basis, is the distilling a dry lee pressed and preserved, and the managing the business in such a manner as at first or last to procure and separate all its valuable parts. The solid lee, here mentioned, is that usually sold to the hatters in England, and is the same thing that in France and other *Wine* countries the vinegar-makers dispose of in cakes, after they have pressed out all the *Wine*, and which is afterwards burnt, and makes what Lemery and others call *cineres clavellati*; and the English, *gravelled ashes*, a fixed alkali salt-like pot-ash.

This lee, when to be used for distilling, should be that of the French *Wines*, and either such as is newly pressed, or has been well secured by packing in a close manner in tight casks, with some proper contrivance of dry sand, or the like, to keep its

its external surface from the contact of the air, which is very apt to corrupt or putrify it.

If this lee is intended to be kept many months, it will be very proper to secure it by sprinkling the layers as they are packed up with a little brandy. The expence of this is nothing, for the brandy is recovered again in the operation.

The essential oil of any fermented substance is always found preserved in great quantity in the lee or sediment of the fermented liquor, and in regard to the distilling of these dry *Wine* lees, the great article is the separating this oil to advantage.

In order to this, the solid lee must be set to steep in six or eight times its own weight of water, stirring the whole well together at times; in this manner the liquor will take up all the lighter and better part of the lee, and will become thick and muddy, the coarser part of the cakes, which is of less value, subsiding to the bottom. The thick liquor, without these lumps, is to be put into the common still, and the liquor worked off, as in the common way, by the chemists, to obtain the essential oils of plants. The still must be made hot and dewy before the liquor is put in, and the fire afterwards kept well regulated, otherwise there will be danger of burning; but the better way to secure it is to put some loose sticks at the bottom of the still.

The oil is thus brought over with the liquor, and is to be separated in the common way, by means of a separating pot placed under the nose of the worm; but if this oil is desired to be obtained fine, the pot must be shifted soon, for, after a time, a gross, resinous, and much less agreeable oil, will mix itself with it, and cannot be separated again without great trouble, and a second distillation, and that will not succeed without great care. *Shaw's* Essay on Distillery.

Philosophic Spirit of Wine, in the writings of some chemists and physicians, a phrase that often occurs as the name of a liquid prepared from *Wine*, and endued with very remarkable properties.

It is generally supposed that this was the same sort of liquor which we at this time call by the name of *Spirit of Wine*; but this is a very erroneous opinion, and has led many into errors, about the operations in which it was concerned. It was truly no distilled liquor, but the spirituous parts of *Wine* condensed and concentrated by the freezing of the more aqueous part. See the article *Concentrating of* Wine, supra.

Pricked Wines. An easy method of recovering *pricked Wines* may be learned from the following experiment: Take a bottle of red port that is pricked, add to it half an ounce of tartarized spirit of *Wine*, shake the liquor well together, and set it by for a few days, and it will be found very remarkably altered for the better.

This experiment depends upon the useful doctrine of acids and alkalies. All perfect *Wines* have naturally some acidity, and when this acidity prevails too much, the *Wine* is said to be pricked, which is truly a state of the *Wine*, tending to vinegar: But the introduction of a fine alkaline salt, such as that of tartar, imbibed by spirit of *Wine*, has a direct power of taking off the acidity, and the spirit of *Wine* also contributes to this, as a great preservative in general of *Wines*. If this operation be dexterously performed, pricked *Wines* may be absolutely recovered by it, and remain saleable for some time: And the same method may be used to malt liquors just turned sour. *Shaw's* Lectures, p. 214.

Saffron Wine, *Vinum Crocatum*. See the article Saffron.

Wine-*Spirit*, a term used by our distillers, and which may seem to mean the same thing with the phrase *spirit of Wine*; but they are taken in very different senses in the trade.

Spirit of Wine is the name given to the common malt spirit, when reduced to an alcohol, or totally inflammable state; but the phrase *Wine-spirit* is used to express a very clean and fine spirit, of the ordinary proof strength, and made in England from *Wines* of foreign growth.

The way of producing it is by simple distillation, and it is never rectified any higher than common bubble proof. The several *Wines* of different natures, yield very different proportions of spirit; but, in general, the strongest yield one fourth, the weakest in spirits one eighth part of proof-spirit; that is, they contain from a sixteenth to an eighth part of their quantity of pure alcohol.

Wines that are a little sour, serve not at all the worse for the purposes of the distiller, they rather give a greater vinosity to the produce. This vinosity is a thing of great use in the *Wine-spirit*, whose principal use is to mix with another that is tartarized, or with a malt-spirit, rendered alkaline by the common method of rectification. All the *Wine-spirits* made in England, even those from the French *Wines*, appear very greatly different from the common French brandy; and this has given our distillers a notion that there is some secret art practised in France, for the giving the agreeable flavour to that spirit; but this is without foundation. See the article Spirit.

When we distil Sicilian or Spanish *Wines*, we do not produce Sicilian or Spanish brandies; and the true reason of this is, that the *Wines* which they distil on the spot into brandy, are very different from those which they export as *Wines*.

Those they distil are so poor and thin, that they will not keep many months, nor can possibly bear exportation. If we had in England those poor *Wines* they distil into brandy near Bourdeaux, Cognac, or up the Loire, there is no doubt but the spirit we made from them would be universally allowed to be French brandy. We have proof of this from some of the Scotch distilleries, where they, with no peculiar art, or secret method, procure from some of the poor pricked and damaged *Wines* received there, brandy so nearly resembling that of France, that a good judge will scarce be able to make the distinction. *Wine-spirits* and brandies therefore are the same thing, only with this difference, that the former is the product of a rich *Wine*, and the latter of a poor one; or, at the utmost, they differ only as our two home products, the cyder-spirit and the crab-spirit do.

The *Wine-spirit*, distilled in England, is not easy to be had pure and unmixed at our distillers, nor under a price almost equal to that of French brandy; so that if it ever be required out of the trade, it is as well to use the French brandy, which will, in all cases, serve the same purposes, unless where a high flavour or a copious essential oil are required. All other spirits are carefully divested of their oil in the rectifications; but the *Wine-spirit* is coveted only for its oil, and all that can be obtained is preserved in this, its principal use being to give a flavour to a worse spirit, and to cover the taste of a disagreeable oil in it.

When a cask of *Wine* chances to turn sour in private hands, it is worth while to distil it for the spirit. The lees also, if in any considerable quantity, will yield such a proportion of the same sort of spirit, as to render it worth while; and as the high flavour is not required in this intent, it will be best to draw off the spirit very gently, either by the cold or hot still, and afterwards it may be rectified without any addition, and reduced to the standard strength of proof. It thus makes a very clean and pleasant spirit, though very different from the brandy from the same country whence the *Wine* came. *Shaw's* Essay on Distillery. See the article Spirit.

Wine-*Fly*, in natural history, the name of a small black fly, found in empty *Wine*-casks, and about *Wine*-lees, and called by the Latins, *bibio*.

It is produced of a small red worm, very common in the sediment of *Wine*. See the article Bibio.

The drippings of *Wine* or beer-vessels, the pressings of the *Wine* or cyder-press, the pots in which honey has been kept, and in which a little remains sticking to the sides, and turning sour, all afford vast numbers of a small species of worm or maggot. This is of a white colour, and has two hooks placed near the head; in short, it resembles, in all the parts, the maggot of the common flesh-fly. Multitudes of these small creatures live and move very brisky about in these substances for several weeks together; but at the end of that time, when they have arrived at their full growth, they enter into the nymph state under a covering or case made of their own skin, which dries, and becomes of a brown colour. After eight or nine days in this state, the case is opened by the falling off of a small piece at the end, and the fly makes its way out. The fly is extremely small when its wings are not extended.

It does not exceed the size of the head of a middling pin; it is however very beautiful; the breast and body are yellow, the reticulated eyes are red, and the wings have all the rainbow-colours. The best way of procuring these little flies, which make a very beautiful microscopic object, is to keep the matter, in which the worms are placed, in a glass, covered down with a paper; as soon as the cover is taken off, at the time of their being in the fly-state, they rise up at once in the form of a cloud; enough of them for observation will however remain about the sides of the vessel. When examined, they are found to have all the regular parts of the larger flies; their antennæ are oval and flatted, and their legs, and every other part, are as elegantly perfect, as they are seen to be in the most elegant large fly.

It is not known whether they are oviparous or viviparous; but this is to be observed, that they give us great light into the origin of animalcules in different fluids. These are a species of winged insect, so small as scarce to be visible as they fly, and to these we owe the worms in the four substances before-described, though we know not how or when they deposit them there. These maggots or worms are of the number of those animals, supposed by the vulgar to be produced of corruption. Snce we see in these the evident course of nature in their origin, what prevents but that there may be numbers of flies yet smaller than these, whose eggs may be deposited in the fluids in which we find our microscopic animalcules. *Reaumur's* Hist. Inf. vol. 9. p. 81.

WING, (*Cycl.*)—*Wings*, among the fly-class, afford several subordinate distinctions of the genera of those animals, under the antient general classes.

Several species of flies, while they are in a state of rest, or only walking, shew several regularly distinct manners of carrying their *Wings*. The much greater number, however, carry them in a parallel or plain position. Among those who carry them thus, some have them in form of a sort of oars, their direction being perpendicular to the length of the body, which is not at all covered by them. This is the case in many of the libellæ, and of the tipulæ.

Others carry their *Wings* in this manner, so as that they cover a part of the body, without at all covering one another. Among

Among the two-winged flies, the great blue fleſh-fly, and the common fly about houſes, give us inſtances of this.

The *Wings* of others croſs one another on the body of the creature, and the degrees in which they cover one another, give occaſion to ſeveral other ſub-diſtinctions; for ſome of them over-hang on each ſide the body of the animal, while others croſs one another, in ſuch a manner as not to cover the body of the fly entirely, but leave a rim of it viſible and uncovered on each ſide of them. Some of the flies bred of water-worms have their *Wings* in this manner.

Others have their *Wings* thus diſpoſed, but croſſing one another only in a part of their ſurface, and that at their extremities; ſo that though they there cover the body of the fly, they leave a portion of the anterior part of the body naked.

The *Wings* of other flies not only croſs one another on the body of the animal, but they round themſelves there; theſe are not exactly parallel in their ſituation, but the upper *Wing* is more elevated on the middle of the body than on the ſides.

Some flies have their *Wings* placed upon their backs, and applied againſt one another. Theſe are in a perpendicular poſition; and ſeveral of the ſmaller ſpecies of libellæ, and winged pucerons, are of this ſort; as are alſo the ephemerous, or day-flies.

The *Wings* of other flies are applied obliquely againſt their ſides, and meet above the body by their inner edges; theſe form, by their junction above, a kind of hollow roof, under which the body is placed. The flies produced from the puceron-eater, and the formica-leo, are of this kind. *Reaumur's* Hiſt. Inſ. Tom. 4. p. 136.

Other flies have their *Wings* thus applied to their ſides, and, inſtead of riſing erect, bending themſelves at their meeting upon the creature's back, and forming a flat depreſſed roof over the body. Of this kind are the *Wings* of many of the flies produced from water-worms. Ibid. p. 137.

And finally, there are ſome of the flies which carry their *Wings* in an oblique direction, but have them meeting under their bellies. Theſe are placed exactly contrary to thoſe which form a kind of high roof over the creature's back; and of this kind are the *Wings* of that elegant fly which is produced from the cherry-worm.

The ſtructure of the *Wings* of different flies might alſo furniſh matter of farther diſtinctions. The greater part of them are of a fine ſtructure, and repreſent the fineſt gauſe, and are equally tranſparent, or nearly ſo in all parts. Some flies, however, have *Wings* of a leſs degree of tranſparence, and ſome even opake ones [a]. Others of the four-winged flies have obſcure ſpots alſo diſtributed near their very tranſparent texture; ſuch are the wings of the ſcorpion-fly; and ſome of the two-winged flies have *Wings* partly opake, partly pellucid, the opake ſpots being ſeparated by tranſparent lines [b].—[[a] Ibid. p. 137. [b] Ibid. p. 138.]

Wings *of Butterflies*. The beautiful *Wings* of this genus of inſects, are diſtinguiſhed from thoſe of the fly-kind, by their not being thin and tranſparent, like them, but thicker and opake. This opacity in them is owing only to the duſt which comes off of them, and ſticks to the fingers in handling them, and it is alſo to this duſt that they owe all their beautiful variety of colours. The earlier naturaliſts, for this reaſon, diſtinguiſhed theſe inſects by the appellation of ſuch as had farinaceous *Wings*. *Reaumur's* Hiſt. Inſ. vol. 1. P. 1. p. 282.

The uſe of the microſcope has taught us, that this duſt is not the reſult of ſome other ſubſtance broken into fragments; but every particle of it is a regularly figured body, made for the place and order it has in the covering of the *Wing*.

The ſeveral ſpecies of butterflies, and even the different parts of the ſame *Wing*, afford theſe bodies of different ſhapes and figures. Moſt of the authors who have written of microſcopic objects, have given the figures of the principal varieties of theſe; but no one has given ſo many as Bonani in his Micrographia, in which work the figures of the various kinds take up four quarto plates.

It has been the general cuſtom of authors to call theſe feathers; but they are by Mr. Reaumur, with much greater juſtice, called ſcales. Their ſtructure has no reſemblance to that of feathers, for they are little flat and thin bodies, of more or leſs length, and always having a ſhort pedicle which enters into the ſubſtance of the *Wing*. That part of the ſcale from which this pedicle is propagated, is rounded in moſt caſes, and very frequently the other end is rounded alſo. The whole ſcale therefore in theſe becomes of an oval figure. Others have a little dent in the middle of the end, oppoſite to the pedicle, by which they are made to reſemble the ſhape of a heart at cards, and many of them are not abſolutely flat, but are more or leſs hollowed on the under ſide: And the ends, which are in ſome plain and ſtrait at the edges, are in others indented or jagged, and in ſome cut into ſmall and elegant ſegments.

The indentings of ſome are but few in number, and theſe reſemble the fingers of a hand ſpread open, the body of the ſcale repreſenting the palm; in ſome, theſe fingers terminate in ſharp points, in others they are more obtuſe, and in ſome there are only three of theſe to each ſcale; in others there are as far as eight; ſome are regular triangular blades, and have their baſe very ſhort, in compariſon to the length of the ſides; but this is variouſly cut and indented in all the manners before ſpoken of. In ſome theſe jags at the end ſeem propagated all along the ſcale, and form in it ſo many ridges, elevated above the reſt of the ſurface on the upper ſide, and hollowed on the under. Thoſe which have theſe elongated ridges, have uſually alſo a rib running down the middle through their whole length, as the leaves of plants have, and the pedicle is in theſe ſcales as in the leaves of vegetables, only an elongation of this middle rib.

Beſide theſe, which are the more uſual figures of the feathers or ſcales of the *Wings* of butterflies, there are ſome others extremely different, and which neither Bonani, nor any other author has given the figures of till Reaumur. Theſe have leſs title to the appellation of ſcales than any of the others, and at firſt ſight might ſeem indeed to have none at all. Their pedicle is ſo long and ſlender, that they might be miſtaken for hairs; but that each of them is terminated by a ſmall flat plate, which is ſplit a little way down the middle, and in all reſpects reſembles the ſcales before deſcribed, which adhere to their ſhort pedicles. There are, however, ſome of this laſt kind, which can by no means be called ſcales. What, in thoſe deſcribed above, is a flat plate placed at the end of a very long and ſlender pedicle, is, in theſe, only a diviſion of the extremity of the long capillary pedicle, into four or five parts, which have not breadth enough to entitle them to the name of ſcales. *Reaumur's* Hiſt. Inſ. vol. 1. P. 1. p. 255.

The diſtinction in names in theſe matters, is abſolutely neceſſary, and the calling theſe bodies, uſually termed feathers, ſcales, cannot well be avoided by an accurate obſerver, becauſe there are, in ſome of the butterflies, ſome parts which are covered with real feathers, ſome other parts have only hairs, and ſome others ſcales; all theſe have been called feathers by ſome; but they are ſo different in themſelves, that they well deſerve different denominations. Beſide all theſe, ſome parts of ſome of theſe creatures are beſet with real prickles, and ſometimes even the ſame part, in the ſame animal, is jointly covered with all theſe ſeveral ſorts of inveſtures.

When the *Wing* of a butterfly is viewed by a microſcope, the arrangement of theſe ſeveral bodies in it is ſeen to be extremely beautiful and regular. The ſcales lie as regularly and evenly one over another, as the tiles on a houſe, or the ſcales on the fiſh-kind, every ſeries of them covering a ſmall part of that ſeries which runs below it. The upper and under part of the *Wing* are equally furniſhed with theſe, and there is no ſpecies of this creature, in every *Wing* of which there are not ſeveral figures of theſe ſcales in ſeveral parts: But the greater part of the ſurface, a little diſtant from the edges, has only one ſort in moſt ſpecies. But this kind is different in the ſeveral ſpecies; in ſome we only find the plain oval ones, in others the cordated, and in others thoſe which are divided at the end, in the manner of the fingers of a hand. In other ſpecies the *Wings* make a leſs elegant appearance, though more loaded with theſe ſcales; for the ſeveral ſeries of the beautiful ſorts of ſcales which have been before deſcribed, are in theſe buried under other very thick ſeries of thoſe which have long capillary ſtems, and appear only like ſo many hairs. The extremities of the *Wings* of theſe inſects appear to the naked eye as if bordered with a ſort of fringe; but, when examined by the microſcope, this fringe appears to be compoſed of a number of oblong ſcales, of the nature of thoſe triangular ones before-deſcribed, which have very narrow ends, in proportion to the length of the ſides, and theſe ends are variouſly fingered.

The ſtructure of the *Wing* itſelf, which ſupports theſe ſeveral ſcales, hairs, *&c.* is very worthy our attention. In order to examine this, it is neceſſary to rub off all the duſt or ſcales. We then find that the *Wing* itſelf is framed of ſeveral large and ſtrong ribs, which all take their origin at that part where the *Wing* is fixed to the body, and thence extend themſelves along the ſeveral ſides of the *Wing*. The largeſt and thickeſt of theſe ſurrounds the outer edge of the *Wing*, the largeſt next to this extends itſelf round the interior edge, and the others direct their courſe along the middle of the *Wing*, and then divaricate and become ramified in the manner of the ribs in the leaves of plants. The ſubſtance which connects and fills up the ſpaces between theſe ribs, is of ſo peculiar a nature, that it is not eaſy to find any name to deſign it by, at leaſt there is no ſubſtance that enters the compoſition of the bodies of the larger animals, that is at all analogous to it: It is a white ſubſtance, tranſparent and friable, and ſeems indeed to differ in nothing from that of the large and thick ribs, but in that it is extended into thin plates; but this is ſaying but little toward the determining what it really is, ſince we are as much at a loſs to know by what name to call the ſubſtance they are compoſed of. Malpighi indeed calls them bones; but though they do ſerve in the place of bones, rendering the *Wing* firm and ſtrong, without making it heavy, and are, when cut tranſverſely, found to be hollow; yet, when ſtrictly examined, they do not appear to have any thing of the ſtructure of bones, but appear rather of the ſubſtance of ſcales, or of that ſort of imperfect ſcales, of which the covering of thoſe inſects which we call cruſtaceous is compoſed. *Reaumur's* Hiſt. Inſ. vol. 1. P. 1. p. 259.

Be this ſubſtance however what it will, it admirably ſerves the office nature ſeems to have intended it for, making the *Wings* at once very light and very firm; and the millions of ſmall

and

and flat fcales which cover them, fcarce at all increafe the weight, and yet make an admirable defence for the middle part, where it is extended into thin plates between the ribs. In examining this part more narrowly, we find that it is traverfed in all parts by a number of furrows or lines running from rib to rib, each marked with a vaft number of dufky-coloured points or fpots. Mr. Reaumur compares thefe to the ridges and holes in the common papers on which pins are kept, and obferves, that thefe little dufky fpots are the holes which receive the ftems or pedicles of the feveral feries of fcales. This is diftinctly feen by the microfcope, as the *Wing* is never wholly cleared of the fcales; and the few which remain fingly in their places, always fill up fome of the holes or obfcure points in thefe feveral feries.

The *Wings* of butterflies, thus large, and thus light, are very well able to fuftain them a long time in the air, and thus might be expected to fly better than moft other infects; but many people have obferved the irregular manner in which thefe infects ufually fly, which is not ftrait forward, but up and down, and to one fide and the other: this has been fuppofed owing to fome imperfection of the *Wings*; but, in reality, it is their great perfection that enables the creature to do this, and this manner of flying is abfolutely neceffary to the preferving their life, as birds of many kinds are continually after them while they are on the *Wing*; and it is a pleafant fight to obferve, in what manner this fort of dodging motion in the butterfly difappoints the bird that flies ftrait at it, and often preferves it fafely for a long way together.

All the beautiful variety of colours, which we fee on the *Wings* of thefe infects, is owing to the fcales and feathers. The fubftance of the *Wing* is tranfparent, and of one uniform and dufky-whitifh colour; this however is wholly hid by the fcales planted on it, and is like the earth in a meadow, covered with a profufion of flowers of various forts and colours. Certain parts of the *Wings* of fome fpecies have only blue fcales, other parts only purple, and others only yellow, and fo on, in the different fpecies of different colours, a fine deep black and a pearly white being two very common colours in them, and capable of producing a fine variety in the fhadowing: And as thefe arrangements of coloured fcales are difpofed with a beautiful regularity, they give us all the appearances of clouded veins and eyes that we fee. *Reaumur's* Hift. Inf. vol. 1. P. 1. p. 260.

WINGS *of Gnats*. Thefe are of a very curious ftructure, and well worthy the ufe of the microfcope, to fee them diftinctly.

It is well known, that on touching the *Wings* of butterflies, a coloured powder is left on the fingers, which, though to the naked eye it appear a mere fhapelefs duft, yet when examined by the microfcope, it is found to be very regularly figured beautiful bodies, in form of feathers and fcales: Thefe are of various figures, and all of them very elegant. The generality of flies have nothing of this kind; but the clofe examination of the *Wings* of the gnat will fhew, that they are not wholly deftitute of them; they are much more fparingly beftowed indeed upon the gnat than on the butterfly; but then they are arranged with great regularity. *Reaumur's* Hift. Inf. vol. 4. p. 577.

The *Wings* of the gnat, like thofe of moft other infects, are of a cartilaginous fubftance; friable, and tranfparent as a flake of talc, and the circumference, and many parts of the inner ftructure of the *Wing* are ftrengthened by flender but firm ribs, which are divaricated into feveral ramifications. Thefe appear to us to be mere ftrait fibres; but they are probably hollow, and perform the office of veffels, for carrying the fluids or air neceffary to the fupport of the *Wing*, as well as to ftrengthen it. In the *Wings* of butterflies there are fimilar ribs, but they are there all hid by the fcales; but it is not fo in the gnat, for in its *Wings*, as in thofe of the other flies, thefe ribs feem naked.

The affiftance of the microfcope fhews, however, that they are not abfolutely fo in the *Wings* of gnats; but thefe nerves or ribs, with their feveral ramifications, look like fo many ftalks of a plant covered with fmall oblong leaves. The feveral fcales that are attached to thefe ribs, make acute angles with them, and are directed toward the end of the *Wing*.

The number of thefe fcales is very fmall in comparifon with that of the butterfly-clafs; but they make a flighter and more elegant ornament. There are fome fpecies which have the intermediate fpaces of the *Wing* adorned alfo with thefe fcales; but they are in thefe but thinly fcattered. The intermediate fpaces of the *Wings*, when they have no fcales, are finely wrought and pointed, and the innner edge of the *Wings* is always bordered with a row of fcales in form of a fringe, which, in fome fpecies, is compofed of fcales all of the fame equal fize, and in others is made up of many of very various lengths; and the exterior edge of the *Wing*, which is furrounded by a rib much thicker and ftronger than the interior, is not fringed with a feries of fcales, but is befet, at certain diftances, with a fort of long prickles. Ibid. p. 578.

The ordinary fhape of the fcales of the gnats *Wings*, is that of an oblong battledoor, one end of which is broader, and the other more pointed. The narrower end is that from which goes the ftalk by which it adheres to the rib. The other end is fometimes more, fometimes lefs round, and is fometimes a little hollowed in the middle. Some of thefe fcales are much longer in proportion to their breadth than others, and fome of them have their extremity formed into an open crefcent. All have a number of fine lines running longitudinally through the whole fcale. Ibid. p. 579.

Goofe-WING, at fea. See the article GOOSE-*Wing*.

WINTER (*Cycl.*)—WINTER-*Heyning*, in our ftatutes, a feafon between the eleventh day of November, and the three-and twentieth of April, which is excepted from the liberty of commoning in the foreft of Dean, &c. Stat. 20 Car. 2. c. 3. *Blount*.

WINTERANUS *Cortex*, in botany, a name given to the wild cinnamon-tree, the characters of which are thefe: The trunk is about the thicknefs of one's thigh, rifing to about twenty or thirty foot high, having many branches and twigs hanging downwards, making a very comely top. The bark confifts of two parts, *viz.* outward and inward. The outward bark is thin as a milled fhilling, of a whitifh-afh or grey colour, with fome white fpots here and there on it, and feveral fhallow furrows of a darker colour, running varioufly through it, and making it rough; its tafte is aromatic. The inward bark is much thicker than cinnamon, being equal in thicknefs to a milled crown-piece, fmooth, of a whiter colour than the outward, of a much more biting and aromatic tafte, fomething like that of cloves, and not glutinous like cinnamon, but dry and crumbling between the teeth. The leaves come out near the ends of the twigs, without any order, ftanding on inch-long foot-ftalks; they are each of them two inches long, and one inch broad near the end where broadeft, and roundifh, being narrow at the beginning, and thence increafing in breadth to near its end, of a yellowifh green colour, fhining and fmooth, without any inciffures about its edges, and fomewhat refembling the leaves of bay or *laurocerafus*. The ends of the twigs are branched into bunches of flowers, ftanding fomething like umbels, each of which has a foot-ftalk, on the top of which is a calyx made up of fome foliola, within which ftand five fcarlet or purple petala, and within them is a large ftylus. To thefe follow fo many cauliculated berries, of the bignefs of a large pea, roundifh, green, and containing within a mucilaginous pale green, thin pulp, four black fhining feeds, or acini, of an irregular figure.

All the parts of this tree, when frefh, are very hot, aromatic, and biting to the tafte, which is fo troublefome as fometimes to need a remedy from fair water. It grows in the low-land, or Savanna-woods in Jamaica, Antigua, and the other Caribbee Iflands.

The bark of this tree is what is chiefly in ufe, both in the plantations of the Englifh between the tropics, in the Weft Indies, and in Europe, and is, without any difficulty, cured by only cutting off the bark, and letting it dry in the fhade.

The people of the Weft Indies ufe it inftead of all other fpices, being thought very good to confume the immoderate humidities of the ftomach, help digeftion, expel wind, &c.

It is likewife, as well there as in Europe, thought a very good remedy againft the fcurvy, and to cleanfe and invigorate the blood, being, among the apothecaries and druggifts of London, ufed for thofe purpofes under this name, though differing from the true *Cortex Winteranus*, as may appear from the defcriptions of both; but may very well fupply its place. Phil. Tranf. N°. 192. See the article CORTEX, *Cycl.*

WIOCHIST, among the Indian natives of Virginia, is their prieft, who is alfo generally their phyfician; and is the perfon in the greateft honour amongft them, next to their king, or great war captain. Phil. Tranf. N°. 454. Sect. 1.

WIRE (*Cycl.*)—Iron *Wire* is made from fmall bars of iron, which are called *ofleom iron*, which are firft drawn out to a greater length, and to about the thicknefs of ones little finger, at a furnace, with a hammer gently moved by water. Thefe thinner pieces are bored round, and put into a furnace to aneal for twelve hours. A pretty ftrong fire is ufed in this operation.

After this they are laid under water for three or four months, the longer the better; then they are delivered to the workmen, called *rippers*, who draw them into *Wire* through two or three holes. After this they aneal them again for fix hours, and water them a fecond time for about a week, and they are then delivered again to the rippers, who draw them into *Wire* of the thicknefs of a large packthread. They are then anealed a third time, and then watered for a week longer, and delivered to the fmall *Wire*-drawers, called *overhoufe-men*.

In the mill where this work is performed, there are feveral barrels hooped with iron, which have two hooks on their upper fides, on each whereof hang two links, which ftand acrofs, and are faftened to the two ends of the tongs, which catch hold of the *Wire*, and draw it through the hole. The axis on which the barrel moves does not run through the center, but is placed on one fide, which is that on which the hooks are placed; and underneath there is faftened to the barrel a fpoke of wood, which they call a *fwingle*, which is drawn back a good way by the cogs in the axis of the wheel, and draws back the barrel, which falls to again by its own weight. The tongs hanging on the hooks of the barrel are by the workmen faftened to the end of the *Wire*, and by the force of the wheel, the

the hooks being pulled back, draw the *Wire* through the holes.

The plate in which the holes are is iron on the outfide, and fteel on the infide; and the *Wire* is anointed with train oil, to make it run the eafier. *Ray*'s Englifh Words, p. 133.

WIRES *of Afteriæ*, in natural hiftory, a name given by authors to a fort of extraneous foffil belonging to the Afteriæ, and being a fort of branches from the body of that column. See the article ASTERIA.

WIRE *of Lapland*. The favage inhabitants of Lapland have a fort of fhining flender fubftance in ufe among them on feveral occafions, which is much of the thicknefs and appearance of our filver *Wire*, and is therefore called by thofe who do not examine its ftructure or fubftance, *Lapland wire*.

The people of this miferable country find many ufes in every thing nature has afforded them, and, among the reft, that fpecies of ftag called the rein-deer, which is the moft frequent animal among them, is not only ferviceable in furnifhing them with meat, cloaths, houfes, and the means of carriage and travelling; but its bones make many of their moft neceffary utenfils; and the finews, which are all carefully feparated in the eating, are, by the women, after foaking in water, and beating, fpun into a fort of thread, which is of admirable finenefs and ftrength, when wrought to the fmalleft filaments; but when larger, is very ftrong, and fit for the purpofes of ftrength and force. Their *Wire*, as it is called, is made of the fineft of thefe threads, covered with tin. The women do this bufinefs, and the way they take is to melt a piece of tin, and placing at the edge of it a horn with a hole through it, they draw thefe finewy threads, covered with the tin, through the hole, which prevents their coming out too thick covered. This drawing is performed with their teeth, and there is a fmall piece of bone placed at the top of the hole, where the *Wire* is made flat, fo that we always find it rounded on all fides but one, where it is flat.

This *Wire* they ufe in embroidering their cloaths as we do with gold and filver; and they often fell it to ftrangers, under the notion of its having certain magical virtues. *Scheffer*, Hift. Lapland.

WIT-*Fifh*, in zoology, a name given by the Dutch in the Eaft Indies to a fifh common on thofe coafts, and feeming to be of the tænia kind. It is of the fize of our common whiting. Its back is ftrait and even, and its belly prominent. Its fnout is pointed fomewhat upwards, and its tail forked. It has one fingle fpine or prickle on its back, and has a long belly-fin reaching from the head to near the tail. Its whole body is ftriated, and it has two long filaments or beards hanging from its fnout, and is a very fine and delicate fifh. *Ray*'s Ichthyography, Append. p. 6.

WIT-*Fifh* is alfo the name given by the Dutch to an Eaft Indian fifh, of the herring kind, caught in great plenty near the fhores in many places, and called by Mr. Ray, *albula-Indica*. *Ray*'s Ichthyogr. Append. p. 3. See the article ALBULA-*Indica*.

WITCHES *Butter*, a name given by the common people of England to a fort of tremella growing on the bark of old trees, in form of a corrugated membrane. See the article TREMELLA.

WITCH-*Craft* (*Cycl.*)—The old laws made in England and Scotland againft conjuration and *Witch-craft* are repealed by a late ftatute, and no perfon is to be profecuted for any fuch crime, 9 Geo. 2. c. 5. Sect. 1, 2, & 3.

But pretenders to *Witch-craft*, or to tell fortunes, or to any crafty or occult fcience to difcover ftolen goods, may be imprifoned for a year, put in the pillory, and bound over to their good behaviour. Ibid. Sect. 4.

WITHERS, (*Cycl.*) that part of a horfe where the mane ends, being joined to and ending at the tip of the fhoulder-blades.

Thefe parts fhould be well raifed and pretty ftrong, for this is a fign of ftrength and goodnefs in the horfe. They keep the faddle from coming forward upon the horfes fhoulders and neck, which immediately galls and fpoils him. A hurt in this part is very difficult to cure, and, for this reafon, they fhould be lean rather than flefhy, as they are then lefs fubject to be bruifed and hurt by the faddle.

When there are fores on the *Withers*, the caufe muft be looked to, in order to determine a proper cure, and prevent a return. If the hurt be caufed by the largenefs of the faddle-bands, provided that it be not too great, it may eafily be cured by the following remedy: Take the whites of fix eggs, beat them with a piece of alum as big as an egg for a quarter of an hour, or till the whole is reduced to a thick fcum or froth; let the fwelling be rubbed well with this mixture, and then covered over with more of the froth; this is to be left to dry on, and the application is to be repeated every ten or twelve hours; notwithftanding that the heat and fwelling remains, this, by degrees, will take place, though not at firft.

If the hurt be great, recourfe muft be had to bleeding; and this may be repeated after two days, if the fwelling and inflammation continue.

If a tumour, with great inflammation, follow a bruife with the faddle-bows, the part affected is to be rubbed with lime-water, and covered with a lamb's fkin, the woolly part next the back: after the wafhing, the ointment, well known among our farriers by the name of the *Duke's ointment*, is to be applied; and if the tumour inclines to fuppurate, the ointment muft be wafhed off with a mixture of vinegar and water warmed, mixed with a handful of falt to every quart of it: an ointment is then to be made of half a pound of populeon, and a quarter of a pound of black foap, and as much honey: thefe are to be thinned with a large glafs of fpirit of wine, and the part is to be well rubbed with fome of this three or four times a day, covering it afterwards with a lamb's-fkin. Some ufe, inftead of this ointment, a pultice made of powder of cummin-feed, linfeed-oil, and pigeons-dung, which does as well.

WITHERS *of the Bow of a Saddle*, in the manege. See the article BOW.

WITHER-*Band*, in the manege, a band or piece of iron laid underneath a faddle, about four fingers above the withers of the horfe, to keep tight the two pieces of wood that form the bow.

WITHER-*Wrung*, in the manege. A horfe is faid to be *Wither-wrung*, when he has got a hurt in the *Withers*; which fort of hurts are very hard to cure. See the article WITHERS, *fupra*.

WITTENA-*Gemot* (*Cycl.*)—In the Saxon times this was the chief court of the kingdom, where all matters, both civil and criminal, and thofe relating to the revenue, were determined. In civil and criminal matters, it was a court, in the firft inftance only, for facts arifing in the county where it fat; but it heard and determined caufes from all other counties, by way of appeal. *Lambard*, Archaionom. 57, 239, 245. Mirror, c. 5. Sect. 1.

To this court were fummoned the earls of each county, and the lords of each leet, as alfo the reprefentatives of towns, who were chofen by their burgeffes. *Lambard*, Archaionom. 239.

WITWALL, a common Englifh name for the great fpotted wood-pecker, the *picus varius major* of authors. See the article PICUS.

WOAD, *Ifatis*, in botany. See the article ISATIS.

This ufeful plant makes a very confiderable article in trade, and is in many parts of the kingdom propagated to very great advantage.

It requires a dry and warm foil, which fhould have lain quiet for fome time before. The land it is fown on muft be laid very even, and all the clods and large ftones taken away. It is to be fown in the latter end of July, foon after the feed is ripe. It will come up in Auguft, and muft then be houghed, leaving the plants about ten or twelve inches afunder, that they may be ftrong, and produce the larger leaves. It is never fown more than two years upon the fame land, becaufe it robs it greatly. It is ripe for the cutting at different feafons, according to the drynefs or moifture of the weather; but when the leaf is full grown, and of a fine green colour, it is known to be fit for ufe, and is to be cut immediately, left it fhould turn pale by ftanding.

Good *Woad* will yield five or fix crops in a plentiful year, and very feldom gives lefs than three or four. The two crops firft cut are always the beft, and thefe are not to be mixed among the after-cuttings.

An acre of ground ufually yields, one year with another, about a ton, which fells, according to its goodnefs, for from fix pounds to thirty. *Miller*'s Gardeners Dict.

According to Mortimer, the proper foil for this ufeful plant is a warm and rich land, and the longer it has lain unploughed the better, for the *Woad* requires a great deal of nourifhment. It will do very well on fandy and gravelly foils, if they are of a good depth, and have rich mould among them.

When land is too rank for corn, nothing can prepare it for this crop better than *Woad*, abating the too great fertility of it. The land where it is to be fowed muft be laid very level, and the clods all broken. The time of fowing it is from the beginning to the middle of February. It muft be kept conftantly weeded; but if it come up ftrong, it will need the lefs trouble of this kind, as it will kill the weeds of itfelf. The plant muft be gathered when the leaves are fully grown, and have not yet loft their colour. What grows in winter is of no ufe as *Woad* for the dyers, but it is an excellent food for fheep. If the ground be dry, it muft be watered for a day or two before the feed is fown, otherwife it does not fucceed well.

It is remarkable of *Woad*, that it requires a peculiarity of climate to bring it to its perfection, and make it fit for the dyers ufe; and that in many places where it feems to grow vigoroufly, it yet never ripens this juice, which is its only value, to any degree of colour.

The French cultivate this herb in as large quantities as we do in England, and have tried in many provinces; but they find it fail in feveral of them. In upper Languedoc it arrives at a very great degree of perfection, and its leaves are very large and fucculent, and furnifh a blue colour, very ufeful in dying ftuffs of all kinds; but in Normandy, where there is much land proper to cultivate it on, it has been often tried with all the advantages of manure and hufbandry; but the want of a fufficient degree of heat will not fuffer it to arrive at perfection. Its leaves, tho' as large as thofe of the Languedoc *Woad*, are never fo thick or fucculent, and the colour they afford is fmall

ſmall in quantity, and of a duſky-browniſh hue, that renders it little regarded. Trait. Phyl. de *Deſlandes*.

Though *Woad* gives a blue dye, yet it is uſed to prepare cloth for green and many other colours, when they are deſigned to be permanent, and not to fade. *Boyle*'s Works abr. vol. I. p. 169.

Beſide the plant properly ſignified by the name *Woad*, which dyes a blue colour, we have two others known in our Engliſh herbals under this name, as alſo that of *wold* or *weld*. Theſe are both called by the common people *dyer's weed*, and are the *luteola* and the *geniſta tinctoria*.

The antients confounded all theſe three plants alſo under the ſame names. Paulus Ægineta ſeems to make them all the ſame plant; and Neophytus, ſpeaking of the *iſatis*, or our *Woad*, properly ſo called, ſays, that it was called by the Latins, *lutum*. This *lutum* has been by ſome underſtood to mean the *luteola*, and by others the *geniſta tinctoria*; but the latter opinion only is right, for it is deſcribed to us by the antients as having leaves like the *linum*, or flax, and flowers like the broom.

WOLF, *Lupus*, in zoology. See the article LUPUS.

WOLF, in the hiſtory of inſects, the name of a ſmall white worm or maggot, which infeſts granaries, and does very great damage there.

It is in this ſtate of the worm that it does the miſchief; but this is not its perfect form, for it is afterwards transformed into a ſmall moth, with white wings ſpotted with black.

This little maggot has ſix legs, and as it creeps along, there iſſues from its mouth an extremely fine thread or web, by which it faſtens itſelf to every thing it touches, ſo that it cannot fall. Its mouth is furniſhed with a pair of reddiſh forceps, or biting inſtruments, by means of which it gnaws its way not only into wheat and other grain, but perforates even beams of wood, boxes, books, and every thing it meets with.

Toward the end of ſummer this pernicious inſect may be ſeen crawling up the walls of corn-chambers, infeſted with them, in great numbers; they are then ſearching a proper place where they may abide in ſafety during their aurelia-ſtate; for when the time of their undergoing this change approaches, they forſake their food, and the little cells they had formed of hollowed grains of corn clotted together, by means of the web coming from their mouths. They now wander about till they find ſome wood, or other ſubſtance, to their mind, into which they gnaw holes with their phangs, capable of concealing them; and there enveloping themſelves in a covering of their own ſpinning, they ſoon become a dark coloured ſort of aurelia. They remain in this ſtate all the winter; but in April or May they come forth in their moth-ſhape, and are then ſeen in vaſt numbers taking ſhort flights, and creeping up the walls. In this ſtate they eat nothing; but they ſoon copulate and lay eggs, which are in the ſhape of a hen's egg, but no larger than a grain of ſand. Each female lays ſixty or ſeventy eggs, which ſhe depoſits in the little wrinkles of the grains of corn, where in about ſixteen days they hatch, and the minute maggots immediately perforate the grain, and eat out all its ſubſtance, and with the threads which come from their mouths cement other grains to it, which they, in the ſame manner, ſcoop out and deſtroy.

The watchful obſerver has two opportunities of deſtroying theſe devourers from among his corn. One is, when they forſake their food, and aſcend the walls, which they will ſometimes almoſt cover. The other, when they appear in the moth-ſtate. At both theſe times they may be cruſhed to death againſt the walls in great numbers, by clapping ſacks upon them: but they may be exterminated more effectually by cloſing up all the windows and doors, and burning brimſtone on a pan of charcoal, letting the room be full of the fumes of it for twenty-four hours. This certainly deſtroys the animals, and does no ſort of injury to the grain, not communicating the ſlighteſt ſcent to it. *Baker*'s Microſcope, p. 222.

WOLF-*Fly*. See the article LUPUS.

WOLF-*Spider*. See the article LUPUS.

WOLF-*Net*, a term uſed by the ſportſmen for a kind of net uſed in fiſhing, which takes great numbers, and has its name from the deſtruction it cauſes.

It is uſed both in rivers and ponds, and is of the nature of the rattle, excepting only the wanting the four *Wings*. The trunk or coffer conſiſts of ſeven feet, beſide the two gullets. It is ſupported by hoops, and is to be placed in ſome part where there is an abundance of ſedges, ruſhes, and water-graſs. There is to be a place made for the net here, by the uſe of a paring-knife, cutting away all the weeds and other matter, for the ſpace that will contain it; and when the net is placed, there are to be two allies cut or cleared in the ſame manner, one on each ſide of the net, that the fiſh may be invited into them, and by them into the net. There muſt be ſome ſtones or leaden weights uſed to ſink the net, and a long pole faſtened to the upper part of the mouth of it, by means of which, when it is well filled with fiſh, it may be lifted up and taken to the ſhore.

WOLF-*Tooth*, a term uſed by our dealers in horſes to expreſs an inconvenience that creature is ſubject to, in regard to its teeth.

There are uſually two of theſe *Wolves*-teeth, which are ſmall, and grow in the upper jaw, next to the great grinding teeth: theſe are ſo tender and painful, that the horſe cannot chew its meat, but is forced to let a great part of it fall out of his mouth, or to ſwallow it half chewed.

The remedy, in this caſe, is to tie up the horſe's head to ſome part of the rafter, and open his mouth with a cord, then with an inſtrument like a carpenter's gouge, and a mallet, the teeth that are thus troubleſome are to be knocked out, and the holes filled up with ſalt.

If the upper-jaw teeth hang over thoſe of the under jaw, and by that means cut the mouth, the ſame inſtrument is to be uſed, and the teeth are to be pared ſhorter by little and little. When they are ſufficiently pared down, they muſt be filed ſmooth, and the mouth waſhed with vinegar and ſalt, and the whole complaint will be thus removed.

WOLF'*s-Grapes*. See the article LYCOSTAPHYLÆ.

WOLF'*s-Peach*. See the article LYCOPERSICON.

WOMB (*Cycl.*)—It is the opinion of Boyle, that as in the earth, which is the frutful *Womb* of all the ſeeds of plants, ſo in the *Wombs* of all animals, while in a fit and proper ſtate for conception, there muſt concur three things; a benign heat to cheriſh, a due fermentation to agitate and dilate, and a due proportion of moiſture, ready to enter with eaſe into the pores opened by the fermentation.

To theſe qualities is owing, in all probability, the menſtrual diſcharge of women, the blood being agitated and rarified, in a part deſtined to theſe offices, for the uſe of an included fœtus; and when that is not there, this fluid ſwells, and opens the veſſels, ſo as to burſt out into a profluvium. It is remarkable that the *Womb* in the human, and one more ſpecies of animal beſide, that is, the monkey, diſcharges this blood regularly; all other animals, at the time of the effervеſcence in that part, which is at intervals of longer periods, diſcharging only a ſmall quantity of an aqueous matter, as is ſeen in mares, cows, *&c.* It is obſerved by the medical writers, that there is an evident conſent of many parts of the body with the *Womb*, that is, ſeveral parts which are always affected with it, and owe their being affected to ſome diſorder in that part, which it propagates and continues to them.

The antients had an opinion of ſympathy on this occaſion; but ſuch obſcure and unmeaning ſolutions are now thrown aſide; and we find that this joint affection of the ſeveral parts to the *Womb*, is owing only to the vicinity of the parts, or the communication and ſtructure of the veſſels, by which the vitiated liquors of the body being conveyed from one part to another, may there excite the ſame or different affections: but becauſe this way of ſympathiſing by veſſels has many conſiderable and unobvious varieties, theſe muſt be examined at large, in order to a perfect underſtanding of the effects they produce. The diverſity and various uſes of the veſſels in the bodies of the perfecter animals muſt be underſtood; and the neceſſity of motion and ſenſe depending from the brain, the animal ſpirits, and the ſyſtem of the nerves, conſidered: the nature and office of theſe being well underſtood, it will appear plainly, that they, being thus diſperſed through the whole body, cannot but produce a conſent of parts through the whole; but that this will be moſt ſenſible where the connections are greateſt, and leaſt ſo where leaſt. *Boyle*'s Diſſertationes Medicæ.

The *Womb* has been generally ſuppoſed ſo extremely tender a part, that the leaſt ſcratch or injury offered it, muſt cauſe an inflammation, of which death itſelf would be the conſequence. But the Paris academy affords, in their memoirs, an inſtance ſomething very different from this. A waſher-woman, of a robuſt habit of body, and about thirty years old, who was then ſix or ſeven months gone with child, accidentally fell down upon a ſtake of an old pale, which wounded her to two or three fingers breadth, and a conſiderable depth, a little below the navel: from that time ſhe never felt the child ſtir; but eight days after, ſhe voided, by the vagina, a large quantity of putrid blood, and this continued eight or ten days.

The external wound was healed in the common way, and the woman went to her uſual work, and continued well to her nine months end; ſhe now expected delivery, but no pains came on, and ſhe thus continued to the fifteenth month without much uneaſineſs; but then ſhe perceived a tumor to ariſe in that part of the belly where ſhe had been hurt. This, in fine, opened of itſelf, and after diſcharging a laudable matter for forty days, at the end of that time it healed up.

In the twenty-ſeventh month this tumor returned again, and became then much larger than before; in three days it became vehemently enraged, and, on opening it, there was diſcharged a quart of ſtinking matter, which greatly relieved her; after three more days dreſſing, there began to appear ſome bones, and, in fine, day by day ſome were diſcharged, till, on the whole, the compleat ſkeleton of a fœtus of between ſix and ſeven months was diſcharged.

In this caſe, there is no doubt but that the *Womb* itſelf was pierced through by the point of the ſtake, at the time of the fall, and the fœtus killed by the wound, and afterwards becoming putrid in the matrix, its parts were diſcharged one by one through the wound in that organ.

This ſeems wholly contradictory to that great tenderneſs ſuppoſed

pofed in the uterus; and fhews that, as no part is by anatomifts allowed more delicate, fo there is fcarce any cafe in which nature and good conftitution cannot make a cure.

It is to be obferved alfo, in regard to this woman, that in the fourteenth month after her fall, fhe found herfelf again with child; but this ended in a mifcarriage.

Several bundles of mufcular fibres enter the ftructure of the *Womb*. Ruyfch mentions an orbicular mufcle at its fundus; which, Mr. Monro fays, he has alfo feen. Vide Med. Eff. Edinb. vol. 2. p. 128. and *Ruyfch*, Epiftolæ de mufcul. in fund. Uteri.

The human uterus has numerous orifices of veffels opening into its cavities, to pour out liquors there.

Towards the fundus of the *Womb* efpecially, thefe orifices are found to be the extremities of canals that come out from larger cavities, lodged within the fubftance of the *Womb*. Thefe cavities are commonly called finufes. See the article SINUSES *of the Womb*.

It is a queftion among anatomifts and phyfiologifts, whence the cavity in the *Womb* is formed, which in the laft months contains the infant, the greateft part of the waters, and all the fecundines, except the placentia? As to which, the curious may confult the learned Dr. *Thomas Simpfon*'s Differtation in the Medic. Eff. Edinb. vol. 4. art. 13.

WOMEN (*Cycl.*)—*Lying-in* WOMEN. See the articles LYING-*In*, DELIVERY, LOCHIA, and MOLA.

Pregnant WOMEN. See the articles PREGNANCY and GRAVIDITAS.

WOOD (*Cycl.*)—The ftructure and organization of *Wood* is a fubject on which many have employed their thoughts; but perhaps none with greater fuccefs than the celebrated Monfieur Buffon, of the Royal Academy of Sciences at Paris.

This gentleman obferves that the organization of *Wood* is yet unknown in all its parts; and that though the world is greatly indebted to the obfervations of Grew, Malpighi, and Hales, yet, when he entered on the fubject, he found there was much more unknown than known, and determined to obferve, from its firft ftate, the growth of trees, and the formation of their woody part.

The feed of a tree, fuppofe an acorn, if put into the earth in the fpring feafon, produces, after a few weeks, a tender fhoot, of an herbaceous ftructure, which enlarges, extends itfelf, and hardens by degrees, and in the firft year's growth, has in it a flender filament of a *woody* fubftance. At the extremity of this young tree there is a little button formed, which opens the next year into leaves, and from which there is propagated a fecond fhoot, in all refpects like that of the firft year, except that it is more vigorous, grows fafter, and hardens much more confiderably. This is alfo terminated by a button like that of the precedent year, and in this is contained the fhoot of the third year; and in this manner is the growth of the tree carried on, till it has acquired its whole height.

Each of thefe buttons is a fort of feed, which contains the fhoot of the fucceeding year, juft as the feed itfelf did that of the firft: and the growth of a tree in height is carried on therefore by a feries of annual productions, exactly like one another, and the full-grown tree is, though perhaps a hundred foot high, compofed only of a number of fhort trees, joined end to end, the longeft of which is not above two foot in length. Thefe little trees of the feveral years never at all alter their height or length, or even their thicknefs; they remain even in a tree of a hundred years old, of their original length and diameter, and fuffer no change, but in becoming harder. This then is the manner in which trees grow in height; how they grow in thicknefs is next to be inquired into.

The button, which makes the fummit of the tree of the firft year, draws it nourifhment through the very fubftance of that little tree; but the principal tubes or veffels which ferve to convey the fap, are placed between the bark and the *woody* filament.

The action of this fap in moving, dilates and enlarges thefe veffels, while the button, in raifing itfelf up in growth, elongates them; the fap alfo, in continually paffing them, leaves behind it certain fixed parts, which augment the folidity. Thus the fecond year's little tree contains in its middle a *woody* filament in form of an elongated cone, which is the production of the *Wood* of a former year, and a *woody* bed for it, which is alfo of a conic fhape, and which furrounds the firft filament, and reaches beyond it in length; and this is the production of the fecond year. The third bed forms itfelf altogether like the fecond, and all the fucceeding ones are formed by the fame law, and in the fame order, and envelope one another in a continued fucceffion or feries, fo that a large tree is compofed of a number of *woody* cones, which enfold, cover, and envelop one another, as the tree increafes in thicknefs.

When the tree comes to be cut down, one eafily counts, in a tranfverfe fection of the trunk, the number of thefe cones, the fections of which make fo many concentric circles; and the age of the tree is known by the number of thefe circles, for they are diftinctly feparate from one another; in a vigorous and well-grown oak, thefe lines are each of a fixth of an inch or more in thicknefs, and the fubftance of thefe lines or circles is very hard and firm, but the fubftance of the *Wood*, which lies between, and unites thefe to each other, is much lefs fo. This intermediate matter is always the weak part of the *Wood*, and its ftructure and organization is perfectly different from that of the *woody* cones, and depends entirely on the manner in which thofe cones are united to one another. This is thus explained:

The veffels, which are longitudinally difpofed in the *Wood*, and convey the nourifhment to the button, not only are extended and hardened by the action of the fap in motion, and by the firm particles it depofits; but they are ever attempting alfo an extenfion of another kind; they are ramified all along as they go, and break into numberlefs extremely minute filaments, which iffue from them like fo many branches; thefe, on the one part, are deftined to the production of the bark of the tree; and on the other, are connected to the *Wood* of the preceding year, and form between the two *woody* beds a fort of fpungy reticular work, which, when cut tranfverfely, even to a great thicknefs, fhews numberlefs little cavities and holes, refembling a fort of lace-work. The *woody* beds are therefore united to one another by a fort of net-work; this net-work, however, does not occupy nearly the fpace of the *woody* circles which it feparated, and is ufually indeed but about a fixth part of their thicknefs. This thicknefs is much the fame in all the trees of the fame fpecies, whereas the *woody* beds vary in them very confiderably in thicknefs; in the oak they are found from a fixth to a four and twentieth part of an inch in thicknefs.

By this eafy expofition of the texture of *Wood*, it is eafy to difcover that the longitudinal coherence of the particles of it muft needs be vaftly greater than the tranfverfe: one fees alfo that, in little pieces of *Wood*, as in a bar of an inch thicknefs, if there are fourteen or fifteen of thefe *woody* beds, there will alfo be thirteen or fourteen of thefe intermediate fpaces; and confequently it will be much weaker than if there were but five or fix of thefe *woody* beds in it, and confequently but four or five of thefe intermediate fpaces.

It may alfo be obferved, that in thofe little bars of *Wood* there are two or three of the *woody* beds wounded, which is often the cafe; the ftrength of the bar muft be thence greatly impaired: but the greateft fault thefe fmall pieces of *Wood* are fubject to, is the different difpofition of thefe beds in the different parts of the fame tree; and this difference is fo great, that the force or ftrength of a large beam of any *Wood*, cannot be computed by proportion, from that of a fmall piece of the fame *Wood*; which, were it poffible, would make calculations of this kind extremely eafy. The ingenious author of this paper has from hence calculated the force and ftrength of timber ufed in building. Memoirs Acad. Par. 1740. See the article TIMBER.

All kinds of *Wood* are to be preferved from the worm, and from many other occafions of decay, by oily fubftances, particularly the effential oils of vegetables. Oil of fpike is excellent, and oil of juniper, turpentine, or any other of this kind, will ferve the purpofe; thefe will preferve tables, inftruments, &c. from being eaten to pieces by thefe vermin, and linfeed oil will ferve, in many cafes, to the fame purpofe; probably nut-oil will do alfo, and this is a fweeter oil, and a better varnifh for *Wood*. *Mortimer*'s Hufbandy, vol. 2. p. 105. See the article TIMBER.

Some of the Weft-Indian trees afford a fort of timber which, if it would anfwer in point of fize, would have great advantages over any of the European *Wood* in fhip-building for the merchant-fervice, no worm ever touching this timber. The acajou, or tree which produces the cafhew-nut, is of this kind; and there is a tree of Jamaica, known by the name of the *white-wood*, which has exactly the fame property, and fo have many other of their trees. Phil. Tranf. N°. 36.

To feafon *Wood* expeditioufly for fea-fervice, it has been ufual to bake it in ovens. *Boyle*'s Works abr. vol. 1. p. 135.

The art of moulding *Wood* is mentioned by Mr. Boyle [b] as a defideratum in the art of carving. He fays, he had been credibly informed of its having been practifed at the Hague; and fufpects that it might have been performed by fome menftruum that foftens the *Wood*, and afterwards allows it to harden again, in the manner that tortoife-fhell is moulded. Or, perhaps, by reducing the *Wood* into a powder, and then uniting it into a mafs with ftrong but thin glue. And he adds, that, having mixed faw-duft with a fine glue made of ifing-glafs [c], flightly ftraining out what was fuperfluous through a piece of linnen, the remainder formed into a ball and dried, became fo hard as to rebound when thrown againft the floor.—[[b] Works abridged, vol. 1. p. 130. [c] See the article GLUE.]

The people who work much in *Wood*, and that about fmall works, find a very furprifing difference in it, according to the different feafons at which the tree was cut down, and that not regularly the fame in regard to all fpecies, but different in regard to each. The button-mould-makers find that the *Wood* of the pear-tree, cut in fummer, works tougheft; holly, on the contrary, works tougheft when cut in winter; box is mellow eft when it has been cut in fummer, but hardeft when cut about Eafter; hawthorn works mellow when cut about October, and the fervice is always tough if cut in fummer. *Merret*'s Notes on Neri, p. 263.

It is a very well known quality of metals, to be longer and larger when

when hot, and fhorter and fmaller when cold: A thoufand experiments prove this, and the books of experimental philofophy have fufficiently expatiated upon it; on the contrary, it is found to be the property of *Wood*, that it is longeft in cold weather and fhorteft in hot; this change is owing to the remains of the fap yet in the *Wood*, which being condenfed by cold is enlarged in its furface, as all liquors are when frozen into ice; and fhrinks into a lefs fpace or bulk again, when liquated by heat.

It follows from this, that all *Wood* muft change its furface more or lefs, according as it contains more or lefs fap, and this may be made a teft of great ufe for the determining what kinds of *Wood* have moft, and what leaft fap. This would be a very valuable piece of knowledge, fince there are many ufes for which that fort of *Wood* muft always ferve beft, which has the fmalleft quantity of fap remaining in it. See the article HYGROSCOPE, *Cycl.* and *Suppl.*

Thus, in the great article of preferving of flour, no barrels are at prefent ufed, but thofe of feafoned dry oak; the whole advantage of this *Wood* is, that it contains lefs fap than others; for the fap in the *Wood* makes the flour damp, and it then becomes rancid, and breeds worms. So that if any other *Wood* can by this means be found out to contain lefs fap when dried in the common way than oak does, it will be fo much the better for this purpofe; or if a cheaper *Wood* fhould be found only to contain as little fap as the oak, it would do as well, and the price of oak would be faved in thefe veffels.

A proper way of trying when the fap was fufficiently exhaled out of trees, might alfo be found by this experiment, and much benefit would accrue from it; for our fhips, when made of timber not fufficiently dried, prove injurious to the healths of the people on board; and it has been remarked both by the French and ourfelves, that many more men in general die in the firft voyage of a new fhip, than in the fame time in an old one; and indeed the firft fix months are ufually obferved in this cafe to be moft fatal. The exhalation of the fap from the *Wood* of the veffel, is certainly the occafion of this, and if it could be contrived to have this fap properly exhaled before the timber was ufed, it would not only prevent this mortality among the men, but the veffel itfelf would be the founder, and the better for it. *Deflands*, Trait. de Phyf.

Wood ufed for fuel is required of various kinds, in regard to the various works to be performed by it.

Neri every where commends oak for the *Wood* to be burnt in the glafs-houfes, as the propereft *Wood* for making a ftrong and durable fire with a good flame.

Imperato, on the contrary, commends afh on the fame occafion; becaufe, as he fays, it gives a fubftantial, rather than a great flame: And Camerarius defervedly commends juniper *Wood*, as affording a lafting ftrong and fweet fire, could plenty of it be had. Among the antients, Pliny commends light dry *Wood*; and Plutarch, the tamerifk in particular, for making the glafs-houfe fires; but glafs-making requires fo great a fire, as cannot be eafily made from fuch *Wood*. Nor can afh be proper, becaufe though it gives a good fire, it foon decays. *Merret*'s Notes on Neri, p. 275.

Foffile WOOD. *Foffile Wood*, or whole trees or parts of them, are very frequently found buried in the earth, and that in different ftrata; fometimes in ftone, but more ufually in earth; and fometimes in fmall pieces loofe among gravel. Thefe, according to the time they have lain in the earth, or the matter they have lain among and in the way of, are found differently altered from their original ftate; fome of them having fuffered very little change, and others being fo highly impregnated with cryftalline, fparry, pyritical, or other extraneous matter, as to appear mere maffes of ftone or lumps of the common matter of the pyrites, *&c.* of the dimenfions, and more or lefs of the internal figure of the vegetable bodies into the pores of which they have made their way.

The *foffile Wood*, which we find at this day, may, according to thefe differences, be arranged into three kinds: 1. The lefs altered. 2. The pyritical. And, 3. the petrified.

Of the trees or parts of them lefs altered from their original ftate, the greateft ftore is found in digging to fmall depths in bogs, and among what is called peat or turf-earth, a fubftance ufed in many parts of the kingdom for fuel. In digging among this, ufually very near the furface, they find immenfe quantities of vegetable matter buried, and that of various kinds: In fome places there are whole trees fcarce altered, except in colour; the oaks in particular, being ufually turned to a jetty black; the pines and firs, which are alfo very frequent, are lefs altered, and are as inflammable as ever, and often contain between the bark and wood a plain refin. Large parts of trees have alfo been not unfrequently met with unaltered in beds of another kind, and at much greater depths, as in the ftrata of clay and loam, among gravel, and fometimes even in folid ftone. *Hill*'s Hift. of Foff. p. 638.

Befide thefe harder parts of trees, there are frequently found alfo in the peat-earth vaft quantities of the leaves and fruits and catkins of the hazel, and the like trees; thefe are ufually intermixed among the fedge and roots of grafs, and are fcarce at all altered from their ufual texture. The moft common of thefe are hazel nuts; but there are frequently found alfo the twigs and leaves of the white poplar; and a little deeper ufually there lies a cracked and fhattered *Wood*, the crevices of which are full of a bituminous black matter; and among this the ftones of plumbs and other ftone-fruits are fometimes found, but that more rarely.

In places where the fir and pine kinds are buried, the fmaller twigs, and the cones or fruit are frequently met with near the furface, the bodies of the trees being lodged deeper. The oaks are in many places fo found, that the *Wood* is little inferior in hardnefs to that cut out of the moft folid frefh tree. The foffile trees in our peat-earth and moors are often found entire, with their roots remaining fixed to them; but more frequently the bodies of the trees are broken off near the roots, and that and the tops of the branches with the fruit, which are often feparated alfo, are found at fmall diftances in the fame moor: Many of the larger branches are alfo found fevered from thefe trees, and lying at fome diftance; when the roots are torn up and lie in irregular directions, the extremities of thefe are alfo broken off. But very frequently the roots of trees remain in their natural pofition, and their larger roots and tap-root run ftrait down into the clay, or other folid ftratum which is the bottom of the bog; the ftump remaining above the furface, and the tree lying horizontally at a fmall diftance, buried at a greater or fmaller depth.

It is idle to imagine, that thefe have been thus buried either at the creation, or, as many are fond of believing, at the univerfal deluge: at the firft of thefe times the ftrata muft have been formed before trees were yet in being, and the peat *Wood* is fo far from being of antediluvian date, that much of it is well known to have been growing within thefe three hundred years, in the very places where it is now found buried.

In this ftate, that is little altered from their original condition, it is, that the fruits, and larger parts of trees are ufually found; what we find of them more altered, are fometimes large and long, fometimes fmaller and fhorter branches of trees; fometimes fmall fragments of branches, and more frequently fmall fhapelefs pieces of *Wood*. The larger and longer branches are ufually found bedded in the ftrata of ftone, and are more or lefs altered into the nature of the ftratum they lie in: The fhorter and fmaller branches are found in vaft variety in the ftrata of blue clay, ufed for making tiles in the neighbourhood of London; thefe are prodigioufly plentiful in all the clay-pits of this kind, and ufually carry the whole external refemblance of what they once were, but nothing of the inner ftructure; their pores being wholly filled, and undiftinguifhably clofed by the matter of the common vitriolic pyrites, fo as to appear mere fimple maffes of that matter. Thefe fall to pieces, on being long expofed to a moifture, and are fo pregnant in vitriol that they are what are principally ufed for making the green vitriol or copperas, at Deptford, and other places.

The irregular maffes or fragments of *Wood*, are principally of oak, and are moft ufually found among gravel; though fometimes in other ftrata. Thefe are varioufly altered by the infinuation of cryftalline and ftony particles, and make a very beautiful figure when cut and polifhed, as they ufually keep the regular grain of the *Wood*, and fhew exactly the feveral circles which mark the different years growth. Thefe, according to the different matter which has filled their pores, affume various colours, and the appearance of the various foffils that have impregnated them; fome are perfectly white, and but moderately hard; others of a brownifh black, or perfectly black, and much harder; others of a reddifh black, others yellowifh, and others greyifh, and fome of a ferrugineous colour. They are of different weights alfo and hardneffes, according to the nature and quantity of the ftony particles they contain: Of thefe fome pieces have been found with every pore filled with pure pellucid cryftal; and others in large maffes part of which is wholly petrified and feems mere ftone, while the reft is crumbly and is unaltered *Wood*.

That this alteration is made in *Wood* even at this time, is alfo abundantly proved by the inftances of *Wood* being put into the hollows of mines, as props and fupports to the roofs, which is found after a number of years as truly petrified as that which is dug up from the natural ftrata of the earth. In the pieces of petrified *Wood* found in Germany, there are frequently veins of fpar or of pure cryftal, fometimes of earthy fubftances, and often of the matter of the common pebbles: Thefe fragments of *Wood* fometimes have the appearance of parts of branches of trees in their natural ftate; but more frequently they refemble pieces of broken boards; thefe are ufually capable of a high and elegant polifh.

Many fubftances, it is certain, have been preferved in the cabinets of collectors, under the title of petrified *Wood*, which have very little right to that name. But where the whole outer figure of the *Wood*, the exact lineaments of the bark, or the fibrofe and fiftular texture of the ftriæ, and the veftiges

vestiges of the utriculi and tracheæ or air-vessels are yet remaining, and the several circles yet visible, which denoted the several years growth of the tree, none can deny such substances to be real *fossile Wood*. *Hill's* Hist. of Foss. p. 639. See the article *Fossile* PLANTS.

One of the most singular instances we have of the matter in which *fossile Wood* may be preserved, is in Razynski's history of Poland; he tells us, that when one of the kings of Poland went to visit the great salt-mines in that kingdom, the superintendant of the works shewed him by way of curiosity a vast mass of the hardest kind of the salt, in which was buried a piece of an arm of a tree; the salt was broken with proper instruments, and the *Wood* taken out; it proved to be beech, with the texture so plainly remaining that it was easily known, but its pores all filled with the matter of the salt in which it lay. It was of the thickness of the bone of a man's arm, and was as perfect and entire as when growing on the tree. It is the only instance we have of *Wood* preserved in this manner; and it would be well if we could by any means ascertain the time when it was deposited there. *Razynski's* Hist. of Poland.

Another remarkable instance of the change wrought on *Wood* by lying under the earth, is that of its having been found as it were converted into iron; that is, that the *Wood* has been as thoroughly impregnated with the particles of iron, as that which we usually call petrified *Wood* is with the particles of stone.

Mr. Liebknecht, professor of the mathematics at Giessen, was the first who ever observed this singular process of nature in the fossile world: He found in a mine, where there were many iron ores, a piece of ash-*Wood*, easily discoverable to be such by the course of its fibres; the cortical part or bark of which was petrified or turned into stone, as we usually express it in the common way, and its inner substance plainly turned into absolute iron. This part of the substance was of the colour of iron, and took a like polish; it gave the same sound with a piece of iron when struck, and bore the strokes of a hammer in the same manner without breaking.

Its specific gravity was also greater than that of any ore of iron. All these circumstances gave great probability of its being absolute iron, but there were others which gave absolute certainty of that. A piece of this and a piece of a rich iron ore were beaten to pieces separately, and washed in several waters; the iron ore was at first evidently lighter, and fouled the water, but the iron in the *Wood* sunk at once without throwing off any adventitious matter. After several washings, however, the ore being cleared of its earth, *&c.* became heavier than the iron of the *Wood*.

After roasting both in the fire, the iron in the *Wood* made a violent ebullition with oil of vitriol, and sent up a thick vapour; but the ore made very little ebullition, and sent up scarce any vapour. This is the more wonderful, as the finding native iron even in the richest pieces, is very uncommon; nor does it amount to certainty, from all these experiments, that this substance was really perfect iron. The author observes, that after melting with salt of tartar it was attracted by the magnet. Act. Erudit. Ann. 1710. See the article *Bog*-WOOD, *infra*.

Jamaica WOOD. See the article BRAZIL, *Cycl.*

Petrified WOOD, the opinions of the judicious part of the world have been very different in regard to the bodies preserved in the cabinets of the curious, under the name of *petrified Wood*; some affirming these bodies to have been only pebbles, or flints accidentally formed in this shape, and with veins resembling those of *Wood*; and others affirming, with equal warmth, that they have been really *Wood*, into which stony matter has been brought by water.

Many good arguments have been produced on both sides the question, but Mr. De la Hire has attempted to bring the dispute to a certain conclusion, by means of some peculiarly happy specimens, which were of the palm-tree petrified, found in the deserts of Africa: these on comparing them with pieces of the palm-tree cut out of the recent *Wood*, appeared to have every where the beautiful and regular veins of that *Wood*, and left no room to doubt, but that they certainly had been once the vegetating *Wood* of that tree, though now converted into hard stone; the petrified pieces were perfect stone, in all its qualities; they had its hardness, its sound when struck upon, and were, as many other stones are, opake in some places, and transparent in others; they were found on weighing them to be often of the specific gravity of recent pieces of the palm *Wood*, of the same dimensions. One of these pieces was two foot long, and four or five inches broad; this was part of the trunk of the tree stripped of its bark; in this all the fibres ran longitudinally, and wholly resembled those of the recent *Wood*; a certain portion of them being forked at their ends, as they are in the *Wood*; the fibres were all hollow, even in the stone as in the *Wood*, and the interstitial matter which had joined them together in the tree, appeared in the stone to have formed a very strong sort of cement, approaching to flint. The cavities in the once woody fibres appearing very large, Mr. De la Hire gave the following account of that phænomenon: He observed, that long soft and massy bodies, in drying, very often had their internal parts all drawn toward the circumference, and consequently from the center; and that the consequence of this often was, that when the body was perfectly dried, there appeared a more or less regular variety in the middle, in form of an empty pipe or canal. The smaller branches of many trees, he observes, usually dry so, and sometimes their larger arms and trunks; and this especially when the *Wood* has been of a softer nature; this he imagines to have been the case in the trunk of this palm-tree, and that its several fibres, being all long and soft, might in drying have had their several parts recede in this manner from the center to the circumference, so as to have at length formed every one of them a sort of long tube or pipe, and that if this happened to them while woody, it could not but be regularly preserved in them in their petrified state.

The other specimen was of the bottom of the trunk with a part of the roots: this was not only composed like the former of longitudinal fibres perfectly analogous to those of the recent *Wood*, but from its under part there grew several roots of the thickness of a finger, and three inches or more in length: these, which were covered with a thin bark, and had within them several fibres of an inconceivable fineness; composed the body of each root, as the longitudinal fibres of larger diameters had the *Wood* of the trunk and within these there was contained a firm substance of the nature of the heart in the roots of trees, which had within it a yet different substance resembling the pith of the inner part of the small roots of this tree. This being all exactly the state of the small recent roots of the palm-tree, it does not seem at all to be supposed that nature, though she might have imitated barely the longitudinal fibres of a plain piece of *Wood*, accidentally in stone, should imitate all the several parts of which these last roots are composed, all so different in themselves, and all disposed in such exact and nice order. The very colours of the several parts of these roots were different in the stone, some kind of stony matter having probably been fitter to enter the pores of the one part, and some other kind of the other. The several fine fibres which compose the body of each root being of a black glossy stone, of the nature of the common black flint; and the internal part or pith being supplied by a white and more soft stone. The pith having in drying observed the same law as was before mentioned, in regard to the fibres of the *Wood*, had become hollow like them in the drying, and consequently this white stone appears hollow, and in form of a tube or pipe in many places. The comparison of this petrifaction in this manner, with the recent *Wood* of the same tree, left not the least room to doubt of its true origin.

Father Duchat also, an author of unquestioned credit, affirms from his own personal knowledge, that in the kingdom of Ava there is a river, whose waters petrify recent *Wood* into flint; and that he has often seen trees standing in it, whose bottom part so far as covered with the water, has been true flint, while all above was mere dry *Wood*, and fit for firing. Mem. Acad. Par. 1692.

Shining WOOD. There are a great many things in which a piece of rotten *Wood* that shines in the dark, agrees with a burning coal; and there are also many things, in which they differ. They agree in these particulars: 1. They are both of them proper and true luminaries, having light residing in them, and are not like looking-glasses or white bodies, which are only luminous according to the quantity of light which falls upon them from other bodies, and which they reflect. 2. Both shining *Wood* and burning coals require the presence of the air to keep them shining, and both require also an air of a considerable density; and both having been deprived of their shining quality by the pumping out of the air, will recover it again on the admitting fresh air to them. 3. Both of them will easily be quenched by putting them into water, and many other liquors. And 4. As a live coal will not be extinguished by any coldness of the air, neither will the *shining Wood* be deprived of its light on any additional coldness in that element. Philos. Trans. Nº. 32.

These are the things in which they agree; those they differ in are the following: 1. A burning coal is easily put out by compression, the treading on it and squeezing it together readily divesting it of its light; on the other hand, compression or crushing of any kind seems not to have any effect upon the *shining Wood*; its bruised parts shining as brightly as its entire ones. If a piece of this *shining Wood* be squeezed between two glasses, this experiment will be most fairly tried; and in this case, though the contexture of the whole be evidently broken, and the parts separated, the light is as strong in them as while the piece was entire. 2. A burning coal extinguished by the drawing out the air, will, after a few minutes be irrecoverable, on the admission of air in any manner; but, on the contrary, the *shining Wood*, when thus extinguished and kept extinct for half an hour, will be immediately re-kindled on admitting the air to it. 3. A live coal included in a small glass, will continue

tinue shining but a few minutes; but a piece of *shining Wood*, in the same circumstances, will continue bright for several days. 4. The coal, while it burns, sends forth smoke and other exhalations; the rotten *Wood* sends out none, and consequently a coal all the while that it is shining wastes itself at a great rate; but the rotten *Wood* does not waste itself at all. And, finally, the burning coal is actually and vehemently hot; the rotten *Wood*, though it shines, is not so much as warm. Phil. Transf. N°. 32.

The light that is observed to proceed from rotten *Wood* under some particular circumstances, is found by experiment to require air to feed and keep it up: on putting a piece of this *shining Wood* into an exhausted receiver, the light soon goes wholly off, and the *Wood* remains as dark as a piece of a common stick; but immediately on letting in the air again the light is re-kindled, and a sudden flash of lightening seems to illuminate the *Wood*, and it continues bright as before.

In experiments of this kind, the effect of the air-pump is often much more strongly perceived a minute or two after it is worked, than during the time of the pumping; and that very degree of exhaustion which leaves these luminous bodies some light at first, will by degrees destroy it; thus, if the pumping be stopped soon after the light begins to grow faint, and the body examined to find its changes afterwards, it will be seen to grow every minute more and more faint, till it wholly disappears.

The light of shining flesh and fish when putrified, is wholly of the same nature with that of rotten *Wood*, as to its dependance on the air for its splendor; and in the same manner loses its light in the exhausted receiver, and regains it on the admission of the air into it again, in the same sudden manner. Phil. Transf. N°. 31.

Bog-Wood, or *Subterraneous* Wood, a name given by the inhabitants of many parts of this kingdom to such *Wood* as is found buried in the earth in boggy places, and which is found hard and strong at this time. See the article *Fossile* Wood, *supra*.

We have in the Philosophical Transactions an account of vast quantities of this sort of *Wood* found under ground in Hatfield chace. Infinite millions of the roots and bodies of trees are found there; they are of all growths, and are mostly such trees as are the growth of our own soil, such as oaks, firs, birch, beech, yew, holly, willow, ash, and the like. The roots of all these trees stand in their natural positions as when growing, and stand as thick together as they could grow in a forest. The bodies are usually broken off, and laid all along just by them.

The large trees are usually found fallen in a north-east direction, and the smaller ones lying always; the fir-tree or pitch-tree is more common than any other kind, and is found sometimes of twenty, thirty, and thirty-five yards long, and so found and firm that many of them have been sold to make masts for ships. Oaks have been found of the same length, though wanting some yards of their natural tops; these have been sold at ten or fifteen pounds apiece, and are as black as ebony, and very sound and lasting in whatever service they are put to. The ash-trees do not preserve their firmness in this manner, many of them are so soft that the workman's spade cuts through them; and when exposed to the air, they usually fall to pieces; but the willows, though a much softer wood than the ashes, preserve their texture, and are found very strong and firm. In some of the fir-trees it is very observable, that they have shot out side-branches after they were fallen, which have grown into large trees. Many of these fossile trees appear plainly to have been burnt; the fir-trees are particularly very common in this state; and of these some are burnt quite through, and others only on one side. Some of these also have been found with the plain marks of human work upon them; many with their branches chopt off, and their trunks cut into two or three pieces. Some squared, and others in part cleft, and the *wooden* wedges used in cleaving them are still found remaining in the cracks. Stones are found in some of them in the place of wooden wedges, but in none iron ones. The heads of axes are also sometimes found, they are of a strange form, and somewhat represent the sacrificing axes of the antients. These are found at such depths, that it is impossible they should have ever been lodged there since the time of this place's being a forest; nor ever could have been found, but by means of the ground's being drained by a late invention. The general opinion as to these trees is, that they were buried in this manner at the time of the universal deluge; but they are plainly of later origin, as fossils. The coins of some of the Roman emperors having been found buried under them. Phil. Transf. N°. 275. p. 983.

The earth of bogs is not the only soil that preserves these trees; for in the low parts of Lincolnshire between the towns of Burningham and Brumley, there are several large hills composed only of loose sand, and as this blows away there are continually discovered whole trees, or parts of trees, and particularly the roots and stumps of firs, and some other kinds, all with the marks of the ax upon them, and looking as fresh as if done but yesterday. Under these hills and in the bogs before-mentioned, not only the *Wood* of the fir-tree, but its cones are found in immense number; many bushels being often laid in a heap together. In cutting a drain for a river of a considerable depth, there were found at the very bottom several parcels of cut *Wood*, in poles, beams, and the like; the head of an ax was also found somewhat resembling the antient battle-ax, and a coin of the Roman emperor Vespasian; but what was yet more remarkable, was, that what they were now sunk to seemed to be the original surface, the ground not being loose like all above it, but found and firm, and lying in ridges and furrows, with the evident marks of having formerly been ploughed. So that all the bog-earth above seems plainly to have been added since; and that the fossile *Wood*, supposed of antediluvian origin, is but of the time of the antient Romans, or less than that.

All the bogs in this kingdom afford in like manner fossile-trees; and not only those, but other places, have at all times accidentally discovered them. Giraldus Cambrensis tells us, that so long since as in king Henry the second's time, the sands on the shores of Pembrokeshire were driven off by peculiar storms and tempests, and that deep under those sands there were then discovered great numbers of the roots and bodies of trees in their natural postures; and many of these had the strokes of the ax upon them, the marks at that time remaining as plain as when first made. Some of these resembled ebony; and many other such trees were discovered at Neugall in the same county, in the year 1590. Cambden tells us of such *Wood* found in the bogs in Somersetshire, Cheshire, Lancashire, Westmoreland, Yorkshire, Staffordshire, and Lincolnshire; and since his time, many other counties have been found to be as fruitful in it. Dr. Plot mentions them in many parts of his history of Staffordshire, and by their standing in their natural postures, as to the roots at least; and prudently concludes, that they certainly once grew there, and were not brought from elsewhere.

Dr. Leigh, in his history of Lancashire, gives an account of the same sort of trees found in the draining the boggy lands at Martin-Meer; and prudently determines them not to have been of the antient date many pretend, in referring them to the deluge.

He observes, that they are plainly of no older date than the time of the savage inhabitants of England, about the time of the Roman conquests; for in this place, beside the roots and bodies of trees and their fruit, there were found eight canoes, or small boats, such as the wild inhabitants used at that time. And in another moor, in the same county, a brass kettle, with a small mill-stone, and some beads of wrought amber. In the same place were also found several human bodies whole and entire, at least to outward appearance, and the whole head of a hippopotamus or river-horse. This is perhaps the hardest thing to be accounted for of the whole set, as to its coming there. The boggy places in Anglesea and the isle of Man, are all full of buried trees of the same kind; and the bogs of Ireland abound no less with them.

England, and its adjacent islands, are not the only places where this buried *Wood* is found; for Verstegan tells us, that the moors in the Netherlands abound with them; they all lie North-east, as ours do. Helmont also mentions the Peel there, a morass of eight or nine miles broad, which is full of them. The French naturalists tell us of fossile trees also, in their country; and in Swisserland and Savoy; but all in the low-grounds.

Ramazzini tells us, that in the territories of Modena, which are now a dry and fruitful country, yet in the time of the Cæsars were only a great lake, there are found at the depth of thirty, forty, and even fifty foot, the soil of a low marshy country, with sedges, water-grass, and other marsh-weeds; and under this there lie the trunks of trees, and their roots stand near them in a natural posture as when growing. Many old coins of the Roman emperors are also found there; as also several busts, wrought marble, and squared stones, evidently shewing the work of such tools as the Romans have been known to use. Some of the trees in these places stand upright. Phil. Transf. N°. 275. p. 986.

Gilding on Wood. See the article Gilding *on Wood*.

Wood-*Coppices*. In the first raising of *Coppices* two things are to be considered; first, the nature of the soil, that such trees may be planted in it as will thrive well there; and secondly, the uses that the *Wood* is intended to be sold for, that such kinds may be planted as will be most proper for those uses.

If the principal vent for *Wood* be for the fire, the best trees for *Fire-wood* must be planted, such as the oak, beech, hornbeam or other hard woods. These are the most profitable for felling as *Fire-wood*, and one or more of these will grow in any soil.

If there be a demand in the country where the *Coppice* is to be planted for hoops and hop-poles, then the ash, the chesnut, the oak, alder and hazel, are to be planted.

According to the profits of the *Underwood*, the thicknefs of the ftandard-trees are to be regulated, for as they ftand more or lefs thick, they more or lefs injure the *Underwood*. It is alfo to be confidered at what growth the *Underwood* is to be fold. The taller and larger the *Underwood* of a coppice in general is, the more profitable will it be for firing, and all other ufes, and the ftandards will be the better for its being left to grow to a proper height, for their bodies will be always, unlefs very great accidents occur, carried up ftrait as far as they are fhaded by the coppice-*Wood*.

A deep foil makes the fhrubs as well as trees grow more vigoroufly than any other, and they will be fooner fit for cutting in fuch places. The perfon who owns thefe *Woods* muft contrive to cut down only a certain quantity of them every year, and regulate this fo that he may have a conftant fucceffion of a like quantity; that part of the *Wood*, which was firft felled, may be grown up to its fize for felling again by that time the laft is cut. This is, in different places, to be calculated to all the various numbers between eight years and twenty or thirty.

The cutting *Wood* feldom yields the more and the better timber; but the cutting it oftener has greater advantages, in that it makes it grow thicker, and gives the feedlings time to come up. If many timber-trees grow in the coppice, and are to be cut down, they and the *Underwood* fhould be felled together, cutting off the ftumps as clofe to the ground as may be, in the trees, and in the fhrubs and *Underwood* the ftumps fhould be left about half a foot high, and cut flanting and very fmooth.

Sawing is the beft method of felling timber-trees; but it fometimes kills the root; and if this is obferved to be the cafe in the coppice, no new fhoots arifing from the root, then it is proper to ftub up the root, that it may not unneceffarily encumber the ground, that the other young plants may have the benefit of it.

In the firft raifing of coppices from feed, the ground muft be prepared by good tillage, as much as if it were intended for corn. The feeds of the feveral trees are to be fown in February, and if the foil be fhallow, the ground fhould be plowed into great ridges: this will make the foil lie the thicker upon the top of each ridge, by which means the roots will have more depth to run to for nourifhment, and in a few years the furrows will be filled up to the level of the reft with the dead leaves, and thefe, as they rot at the bottom, will make a kind of foil, through which the young roots will fpread, and be conducted from one ridge to another, and fo the whole ground will be occupied by them. If the coppice be to be raifed on the fide of a hill, plow the ridges crofs-way of the defcent of the hill, that the water may be detained among them, and not fuffered to run off, as it otherwife would, by the furrows; but if it happen that the ground be over-wet, which is more rarely the cafe, then the contrary method is to be obferved, and the furrows plowed deep and ftrait downwards, that all the water may be carried off by them, as by fo many trenches or drains.

Some fow a crop of corn along with the feeds of the *Underwood*, for the advantage of the firft year; but as the feafon of fowing the feeds of the trees, is too late for the fowing the corn, it feldom turns to much advantage. It is better to fow the trees alone, and keep them well weeded the two firft years; after which they are ftrong enough to take care of themfelves againft fuch enemies.

In very barren ground, where the young trees can hardly ftand the heat in fummer, it is proper, after fowing them, to fcatter a quantity of furze-feed over the land; the furze will grow quick, and over-top the trees at firft, but it will ferve as a guard to them at this time, defending them from injuries, and keeping the ground moift about their roots. In a few years the trees will grow up beyond thefe bufhes, and they will then foon deftroy them by their dropping.

In the raifing of coppices, the neareft diftance for the plantations ought to be five foot for the *Underwood*; but as to what number, and fcantlings of timber are to be left on each acre, the ftatutes in this cafe direct; but it is an ordinary coppice, which will not afford three or four firfts, fourteen feconds, twelve thirds, and eight wavers, according to which proportion the fizes of young trees in coppices are to fucceed one another. In coppice or *Underwood* felled at twenty-four years growth, there are to be left twelve ftore-oaks upon every acre, or, in defect of them, the fame number of elms, beech, or afh; thefe are to be ftrait-bodied trees, and are to be left till they are ten inches in diameter, at a yard from the ground; but it is better for the owner to have a much greater number of timber-trees, efpecially in places where *Underwood* is cheap; and as to the felling, it is always neceffary to begin regularly with one fide, that the carriages, neceffary to the taking off the *Wood*, may come on without injury to the reft: and in large *Woods*, a cart-way fhould always be left in the middle, quite through the *Wood*. The timber of the *Underwood* may be cut from the month of October to February; but the laft month is greatly the beft, in places where there is but a fmall quantity to be felled, and it can all be got down before the fpring is too much advanced. All the *Wood* fhould be carried out by midfummer, and made up by April at the lateft; for when the rows and brufh lie longer than this unmade up, and unbound, many of the fhoots and feedlings are fpoiled by them. It is always worth the owners while to inclofe the coppice well the winter before felling, to keep out the cattle, which would elfe greatly damage the fupply from the feedlings and young fhoots.

New-weaned calves are the leaft prejudicial to newly-cut *Woods* of any creatures, and may be put in where there is much grafs; the next in harmlefsnefs to thefe are young colts, which, at about a year old, may be put in to feed in the fame manner; but about May they muft all be put out.

If the *Woods* happen to be cropped by cattle, it is beft to cut them up, and they will make new fhoots; for that which has been bitten by the cattle, will not grow for feveral years in any degree.

If coppice-*Woods* are too thin, this is to be remedied by laying down the longeft and fmalleft fhoots of thofe fhrubs or trees which are the moft advantageous, in the place, or of fuch as are neareft the bare place; thefe will each fend forth a great number of fuckers, and the whole *Wood* will be thickened as much as defired in a very little time. *Mortimer's* Hufbandry, vol. 2. p. 64.

WOOD-*Caterpillars*, in natural hiftory, the name of a genus of caterpillars which does not live in the manner of others on leaves of trees or plants, or open to our obfervation, but is, as it were, buried alive under the bark, in the trunk and branches, and in the roots of trees, and fometimes in the body of fruits.

Thefe are eafily diftinguifhed from thofe worms and maggots which are found in roots and fruits, and owe their origin to flies of another kind; but they are fubject to be confounded with another fort of animals, called by Mr. Reaumur, *falfe* or *baftard caterpillars*, which carry a great refemblance in their figure to the real caterpillars, but which have more legs than any of the true ones have, and are finally transformed into four-winged flies, which are not true butterflies.

The butterflies, which are the parents of thofe caterpillars which live immured in trees or fruits, lay their eggs on the furface, and the young caterpillars, when hatched, eat their way in; and doubtlefs inftinct directs the parent to depofit its eggs only on fuch fubftances as will fupply a proper nutriment to the young. It is no wonder that we do not find, on the outfide of a fruit, the hole by which this creature has made its way in; it enters while fo fmall, that the orifice that admits it is fcarce vifible, and this probably afterwards clofes up.

What appears fomewhat furprifing, however, in this, is, that there ufually is only one caterpillar in a fruit, which is large enough to afford food to a large number; and if there are fometimes found two creatures within, one is ufually a caterpillar, the other a worm of fome other kind. The whole occafion of which is, that the operation of penetrating into the fruit, is fo difficult to the young animal, that it feldom fucceeds in it; and though the butterfly depofits many eggs on each fruit, and thefe all hatch, yet it is only here and there one on a fruit that can find the way into it.

Thefe creatures, when once lodged in their prifon, have nothing to do but to eat up the fubftances which inclofe them, leaving the outer hard fhell unhurt, which ftill ferves as a cafe for them; this is a very frequent cafe in the grains of corn, where the farinaceous fubftance ferves as aliment, and the hard outer fkin becomes a firm hollow cafe afterwards for the animal. The farinaceous fubftance in this cafe ufually proves enough for the animal in its caterpillar ftate; but if it does not, the creature has recourfe to a very fingular expedient; it eats again its own excrements, and finds its now ftronger ftomach able to feparate nourifhment from that very matter, which had before paffed off from its weaker ftomach undigefted.

Of thefe fpecies of caterpillars, fome go out of their prifon in order to change into their chryfalis, and thence into their butterfly-ftate; but the greater number remain there, and pafs through all their changes within.

The little caterpillar, which has eaten all the farinaceous fubftance of a grain of barley, and is to remain in the fhell to change into a chryfalis, covers over the whole inner cavity of the feed with a web of her own filk, and then feparates it by a divifion, made of the fame matter, into two cells of different fizes; the longeft of thefe is for itfelf in the chryfalis-ftate, and the fmaller for its excrements, which it takes great care to keep out of its own habitation: when it enters into the butterfly-ftate, it makes its way out of the prifon through a round hole, which is made through the rind of the grain, and is, till that time, ftopped with a nice valve.

This is a precaution the caterpillar takes while it is growing, that it may not die a prifoner when it arrives at its winged-ftate, in which it has no inftruments for making its way out.

It is always the deftruction of a grain of corn to have one of thefe creatures in it; and it fares not much better with the larger fruits: in thefe, though the caterpillar eats only a fmall part of the fruit, yet it deftroys the organization of the whole, and frequently fo entirely fpoils the courfe of its growth, that it falls off the tree.

Thefe caterpillars, like all the other kinds, have certain flefh-eating worms, whofe parents are of the fly-kind, for their terrible enemies and deftroyers; and it is not unfrequent, on opening one of thefe fpoiled fruits, inftead of the expected caterpillar,

terpillar, to find a fly juft ready to come out; this has been produced from the chryfalis of a worm, which had before found its way into the fruit, and eat up the caterpillar, which was the original poffeffor of the place. Memoirs Acad. Scienc. 1736.

Wood-*Cock*, in zoology. See the article Scolopax.

This is a bird of paffage, and comes into England about the middle of October, and goes away again in March.

During their ftay with us, they ramble about from place to place, never remaining above eight or ten days together in the fame *Wood* or meadow. They feldom or never fly in the day-time, unlefs difturbed by men, or by fome beaft. In whatever places they are put up, they always fly to the thickeft *Wood* that lies near, and there hide themfelves under the fturdieft and thickeft trees, where they remain all day fearching for earthworms, and other food, under the fallen leaves.

When night comes, they go out of the *Woods*, and generally refort to watery places, where they may wafh their bills, fouled with the taking their prey, and thrufting into the earth; here they remain all the night, and if there is tolerable fhelter, they ftay alfo all the day under it; but when there wants this, they fly away to the *Woods* in the morning. In their flight, they choofe the fhadieft places, and will coaft it away to a great diftance in fearch of the higheft *Woods* to retire to, that they may be the better fecured, and the more defended from the annoyance of the *Wind*. While they travel under fhelter, they always fly low; but when they come to any glade to crofs, they mount to a confiderable height; but as foon as they have paffed this, they fink again.

They hate flying high, and they are afraid to fly among trees, becaufe, like the hare, they fee but very badly ftrait before them; and it is owing to this imperfection in their fight, that they are fo eafily taken in nets fpread in their places of refort.

The draw-net, in countries which are very *woody*, is extremely profitable in this fport, it being no uncommon thing to take ten or a dozen *Wood-cocks* at a time in it.

The method of ufing it to advantage is this: There muft be chofen a proper place in fome thick *Wood*, where thefe birds are found to refort, and a place muft be cleared for them, and for the net. Suppofing the *Wood* about three hundred paces long, in this cafe, toward the middle there muft be cut a walk through it eight fathoms wide: near the end of this, two oppofite trees are to be pitched upon, proper to fupport the two fides of the net; the boughs of thefe are to be all cleared away, and the nets faftened by logs and pullies.

When the net is thus placed, the fportfman muft provide fome covert in which he may ftand concealed. This is eafily made by half a dozen boughs of trees with their leaves on; and the fportfman, when he has ftuck thefe down in the ground, and interwoven their boughs together, may either ftand behind it, or fit down on a bundle of dry fern, or any other fuch matter.

At three or four foot diftance from this ftand, toward the net, there is to be a ftrong ftake faftened into the ground, and on this the lines of the net are to be faftened when it is drawn up. When there comes a *Woodcock*, the net is to be let down as foon as ever he is taken, to entangle him the more, for, otherwife, in the ftruggling he may chance to make his efcape. The fportfman is then to run up, and break a wing, and crufh his head. The net is then to be refitted again as quick as poffible, for when one is caught, there is great reafon to fufpect that many more are coming the fame way, which will be all loft if the fportfman is flow at his work.

If a hare, or any other creature worth the taking, come along the walk, the net is not to be immediately let down upon it, for in that cafe it would certainly ftart back, or run forwards, and in either cafe would probably make its efcape: the net is to be drawn up five or fix foot, that he may pafs quietly under it without fufpicion: as foon as he is gone by, the fportfman is to make a great fhout, and let go the net; the creature will, on this noife, ftart back, and will thus be certainly taken in the net.

There are, in many places, great thoroughfares through fome open piece of ground, by which *Woodcocks* pafs in great numbers from one *Wood* to another. If there be in thefe two trees, naturally planted, fo as to fuftain the nets, they are by all means to be ufed; but if not, the fportfman will find it worth his while to be at the expence of planting two trees deep in the earth, at proper diftances, that they may ftand all weathers. Nets fpread between thefe, are the moft fatal of all others to thefe birds, for all that inhabit either one or the other of the *Woods* come this way at times, without fufpicion of any danger or difturbance. See the article Draw-*Net*.

There is another method of taking thefe birds in high *Woods*, with thofe nets called *hays*, of the nature of the rabbets-hays, only with fmaller mefhes. The *Woodcocks* are to be driven into thefe, and there fhould always be at leaft two or three of them planted together. When the fportfman has provided himfelf with nets, he is to take five or fix perfons into the *Wood* with him. The proper *Woods* for this purpofe are thofe of feven or eight years growth; and the people are to go into fome part of them, near the middle. The nets or hays are to be placed in the fame manner as they are for taking of rabbets, but two or three joining together at the end, and hanging over flopewife that way which the *Wood-cocks* are intended to be driven.

The nets being thus fixed, let the company go to the end of the *Wood*, placing themfelves at about ten rods diftance from one another; they muft all have fticks in their hands, and they are to move forward flowly toward the nets, making a noife by ftriking the fticks againft the trees and branches, and by holloeing with their voices; in this manner they are to move up to the net; and the *Wood-cocks* in that part of the *Wood* will all be terrified before them, but will not take wing, but run along upon the ground, and thus be driven along like a drove of beafts, fo that when the company come up, they will find almoft all of them in the net. When that part of the *Wood* is thus drove, the nets are to be turned the other way, and placed flopewife in the contrary direction, and the company retiring to the other end of the *Wood*, are to drive the *Wood-cocks* that are in that part with the fame noife, till they have fent them into the nets in the fame manner.

Thus all the *Wood-cocks* in the *Wood* may be taken with very little trouble, and this may be done equally at any time of the day.

Another way of taking this bird is by means of noofes or fprings. See the article Noose.

The *Wood-cock* and the fnipe are both eafily taken alfo with bird-lime, when their places of refort are known, but they are not fo eafily found as many other birds.

The cuftom of the *Woodcock* is ufually to be upon the banks under hedges, and by the fides of ditches toward the fun; and and they will fuffer the fportfman to come nearer them in the day-time after a moon-fhiny night, than after a dark one. The reafon of which is, that having fed well by moon-light, they are only fit for reft in the day following; but when the night has been dark, they are feeking food all day long.

The fnipes naturally lie by the fides of rivers, when the plafhes and ponds are frozen, and they always lie with their heads up or down the ftream, never tranfverfely.

In order to take either of thefe birds by bird-lime, the fportfman muft be provided with a large number of fmall and fmooth twigs, neatly and evenly covered with good bird-lime. Thefe muft be placed floping, fome one way, fome another, and the whole place about where they refort muft be covered with them. The fportfman then muft conceal himfelf very carefully, that the fight of him may not frighten away the game.

Wood-*Cock-Shell*, a name given by the Englifh naturalifts to a peculiar kind of the purpura. It is called in French, *becaffe*. See the article Becasse.

Wood-*Land*, in agriculture, a term ufed by the farmers of many counties of England, for a fort of foil, from its conftant humidity and dark colour, refembling the foil in *Woods*, which, of whatever nature it originally is, will always be made to appear thus from the continual dropping of trees, and the want of a free air and fun, together with the fall of leaves, deftroyed and wafhed to pieces by the wet.

This foil in the open countries has a confiderable quantity of clay in it, and holds the water a long time that once falls upon it: in wet weather it fticks firmly to the plough-fhare, and in dry is very apt to crack. In uncultivated places it ufually produces rufhes and rufh-grafs. A moift and dripping year is extremely detrimental to this fort of land. *Moreton's* North. p. 38.

Wood-*Lark*, in ornithology. See the article Alauda.

This is one of the fweeteft of our finging-birds, and is indeed very little inferior to the nightingale, when in good health, for we are not to judge by fuch as are made feeble by improper food, or want of cleanlinefs in their cages.

It is one of the tendereft birds we have, and yet it breeds the fooneft of any that we know of. They principally frequent gravelly grounds, and the fides of hills, that are expofed full to the fun, and if there be any ftumps of oaks in thefe places, they always refort to them. The females couple with the males in the beginning of February, at which time, and never before, they part with their laft year's brood; immediately after coupling, they betake themfelves to building their neft.

They generally build in lay, or grounds, where the grafs is rank, and is grown brown. The principal material they ufe is dry grafs, and they always choofe fome place fheltered by a good tuft for their neft, to defend themfelves from the cold winds, which are very fevere at that feafon. They feed their young principally with a fmall red worm; but it is very difficult to find this kind, to feed a neft of them under our care, and they will not do well without it; fo that they fcarce ever come to any thing this way.

The young branchers are taken in June, July, and Auguft. After this they may be taken in large numbers at the latter end of September, which is their general flight-feafon, and then from the beginning of January to the beginning of February, at which time they get together to couple for breeding. Thofe that are taken in the fummer-months, are ufually taken in nets, by the help of a hawk.

The fportfman is to go out in a dewy morning, and fixing on fome hill, he is to go to that fide of it which faces the rifing

rising sun, for this place they are sure to frequent. He is to take out a hawk and a small net at the end of a stick; when he espies a bird he is to shew the hawk, on which it will squat down, and on his approaching nearer and making the hawk flutter over the place the bird will only lie so much the closer, so that he may go up and lay the net over it, and thus take it without hurting it.

The best *Wood-larks* that are kept in cages have been caught in this manner. A better way of taking numbers of them is to prepare a net made in the same manner as the common net for taking partridges, only with the meshes much smaller; three or four persons are to go out with this, and one of them is to take out a hawk, which serves in the same manner for the larks as the setting-dog does for the partridges.

Where-ever a flock of these larks is seen together, as is very common, the whole flight keeping with the female till the next coupling season, the hawk is to be shewn, and on his hovering, they will all lie still, and the net may be easily drawn so compleatly over them, that not one can escape. The best time for taking this bird for the cage, is in July, or the preceding or following month; those that are put into the cage at this time sing presently, but their song time is not lasting, for they soon fall to moulting, in which state many die; but if they get over it, they commonly prove very healthful afterwards, and become very tame and familiar, and sing sweetly. Those which are taken in the latter end of September, are generally very strong and sprightly; but they do not sing till after Christmas. Those taken in January and February finally prove the best of all; they generally begin singing in two or three days, or at the utmost in a week after they are taken.

The method of keeping them in health in the cage, is this, there must be two pans of food, the one containing meat, the other oatmeal and hempseed. A very good food is the following; boil an egg very hard to the crumb of a halfpenny loaf, and as much hempseed; let the egg be chopped very small, and the hempseed bruised in a mortar; when these are mixed, the bread is to be crumbled in among the rest, and the whole is to be rolled together with a common rolling-pin, and kept for use.

There must be some fine small gravel strewed at the bottom of the cage, and renewed at farthest once in a week. This will prevent his feet from getting hurt by being clogged with the dung; and his basking in this will keep him also from growing lousy, after which few come to good. There must be a perch in the cage, and it must be either lined with green bays, or made of fine matting, which the lark is very fond of.

When the bird is first taken, some meat must be strewed upon the sand in the bottom of the cage, for the bird will be sometimes almost famished before he finds the meat in the pan.

The cock-bird of this kind is known from the hen by the loudness and length of his call, by his tallness as he walks about the cage, and by his doubling his notes in the evening, as if he was going with his mate to roost. A better rule than all others, however, is his singing strong; for the hen *Wood-lark* sings but very weakly.

Both the cock and hen of this kind are tender, and subject to many disorders; the principal of these are cramps, giddiness of the head, and breeding lice. Cleanliness is the best cure for the first and the last of these complaints, but we know of no cure for the other. A good strong bird however, will often last very well five or six years, and often improve all the time.

Wood-*Louse*. See the article Millepedes.

Wood-*Mite*, in natural history, the name of a little animal frequently made the subject of microscopical observations, and by some called the *Wood-louse*; though that less properly, as there is another larger animal generally known by that name.

The *Wood-mite* is in shape and colour very like a louse, and is frequently found running very nimbly, but always by starts and jumps, on old books and rotten wood. The eyes of this creature are of a fine gold colour, and can be thrust out or drawn in at pleasure; and when examined by the microscope the peristaltic motion of the guts is seen very distinctly, and beautifully; and what is more wonderful, there is observed a very distinct and regular motion in the brain.

This probably is the same animal with the pediculus pulsatorius, described by Mr. Derham, as one of the death-watches. *Baker*'s Microscope, p. 185.

Wood-*Pecker*, in zoology, the English name of a species of *Picus*. See the article Picus.

Wood-*Pucerons*, in natural history, a name given by Mr. Reaumur, to a small species of insect of the puceron kind, of a greyish colour, and distinguished by its two hollow horns on the hinder part of its body.

These animals very much resemble, both in shape and size, the pucerons of the alder; but as those live always on the surface of the stalk, these make their way deep into the wood of a tree.

Mr. Reaumur found large quantities of these lodged at a considerable depth in the wood of some elms, after they were cut down; the passages by which they had made their way in, were not to be found; but they were lodged in large and long holes, of the diameter of a goose-quil, and running many inches along the tree in a longitudinal direction.

All the pucerons found in these places, appear to be females, and none have wings; they all have vast numbers of young ones of different degrees of maturity within them, and these may be forced out by pressing their bodies. *Reaumur*'s Hist. Inf. V. 6. p. 61.

Wood-*Ruffe*, in botany. See the article Asperula.

Wood-*Sorrel*, in botany, the name of a small plant, common in our woods, and having the same sharp sour taste with sorrel; but agreeing with that plant in no other particulars. See the articles Oxys, and Sorrel.

Wood-*Spite*, in zoology, an English name given by many to the common green *Wood-pecker*, the *picus viridis* of authors. See the article Picus.

WOOFF, (*Cycl.*) a name given in some parts of England to the sea-wolf, or *lupus piscis*, called by Gesner *anarrhicas*. *Willughby*'s Hist. Pisc. p. 130. See the article Lupus *Marinus*.

WOOL (*Cycl.*)—Wool-*Balls*, in natural history, masses of *Wool* compacted into firm and hard balls, and found in the stomachs of sheep, as the hair-balls are in oxen and other animals.

These are doubtless formed in the same manner as those hair-balls, of the outer covering of the animal, but they are much more uncommon; they are found in numbers, three, four or five in the stomach of the same animal.

Their outside has commonly much of the appearance of a puff-ball, and is usually either in part or wholly covered with a very thin and soft blackish smooth skin; the inner substance is entirely *Wool*, but that wrought together as closely as the hatter does his furs in the making them into hats.

They are usually soft, smooth, and somewhat elastic, of a pale buff-colour, very light, and of irregular figures rather cubic than globular, and seldom of any great size, an inch in diameter being their common standard. *Moreton*'s Northampt. p. 451.

WOOLLY-*Pashnum*, in natural history, a name given by the East-Indians to a species of native red arsenic, or orpiment, found in that part of the world.

It is of a paler colour than the red orpiment of Germany. *Woodw.* Cat. Foss. V. 2. p. 23.

WORK (*Cycl.*)—Work, in the manege. To *work* a horse, is to exercise him at pace, trot, or gallop, and ride him at the manege.

To *work* a horse upon volts, or head and haunches in or between two heels, is to passage him, or make him go side-ways upon two parallel lines.

WORMS (*Cycl.*) in the Linnæan system of nature, a class of animals, whose distinguishing character is, that they have the muscles of their body in one part affixed to a solid basis. *Linnæi* Syst. Nat. p. 33.

Worms, in husbandry, are very prejudicial to corn-fields, eating up the roots of the young corn, and destroying great quantities of the crop.

Sea-salt is the best of all things for the destroying them. Sea-water is proper to sprinkle on the land where it can be had; where the salt-springs are, their water does as well; and where neither are at hand, a little common or bay salt melted in water does as well.

Soot will destroy them in some lands, but it is not to be depended upon, for it does not always succeed. Some farmers strew on their lands a mixture of chalk and lime; and others trust wholly to their winter fallowing to do it, if this is done in a wet season, when they come up to the surface of the ground, and some nails with sharp heads be driven into the bottom of the plough.

If they are troublesome in gardens, the refuse brine of salted meat will serve the purpose, or some wallnut leaves steeped in a cistern of water for a fortnight or three weeks, will give it such a bitterness that it will be a certain poison to them.

A decoction of wood-ashes, sprinkled on the ground, will answer the same purpose; and any particular plant may be secured both from worms and snails by strewing a mixture of lime and ashes about its roots. It is a general caution among the farmers to sow their corn as shallow as they can, where the field is very subject to worms. *Mortimer*'s Husbandry, p. 328.

Generation of Worms. See the article Generation.

Aquatic Worms. Of these there are some which transform themselves into flies, but which depart much from the manner in which the generality of the fly-worms effect this change.

These are of the third class of fly *Worms*, and have an invariable head, and have no teeth or hooks meeting one another. They are usually found in ponds, or in waters that have but a slow current. Their head is small, long, and scaly;

ſcaly; their body long, and ſomewhat flatted, and is compoſed of eleven rings; the laſt of which is leſs flatted, and longer than any of the reſt, and in one ſpecies of theſe *Worms* is as long as five or ſix of the other rings, though it is not ſo in others. *Reaumur*'s Hiſt. Inf. Vol. 4. pag. 310.

The firſt ring in theſe *Worms* is of a ſomewhat ſmaller diameter than the ſecond; this is of a ſmaller than the ſucceeding one; and the three laſt, or next the tail, are of a ſmaller diameter, but more length than the others. The ſkin of this *Worm* is conſiderably tough and ſtrong, though not cruſtaceous but pliable and flexile like a piece of parchment; and at the commiſſure of the rings, the anterior has a ſort of appendix which falls over that it joins to.

They ſomething differ from one another in colour, ſome are of a greeniſh brown, others of a clearer brown, and others of the greener kind are veined with brown, and of the browner with yellow; they have no legs, but have ſome cruſtaceous hooks in their places under their belly, and theſe ſo ſmall as not to be diſtinguiſhable unleſs carefully looked for, and then only at the junctions of the three laſt rings. Ibid. p. 311.

As one finds theſe *Worms* in the ſame ſtate and ſame readineſs to undergo their metamorphoſis, ſome only of ſeven or eight lines long, and others of three inches, there can be no doubt but theſe are of different ſpecies. Theſe are ſeldom extended to their full length in the water, nor have they much power of contracting themſelves, or making one ring enter into another; but they can bend their bodies upward and downward at the junctions of all the rings.

This is of the kind of *Worms* which have no teeth, properly ſo called, but many of its ſpecies have a conſiderable number of fleſhy hooks. Others have but a few, and beſide theſe they have a ſort of beards. The end of this beard is larger than any other part; and the inſect throws them out from the under part of its head, and draws them in again at pleaſure, with great ſwiftneſs; and when they are out, it moves them backward and forward with great ſwiftneſs: The ends of theſe examined by the microſcope, ſhew themſelves to be covered with cluſters of hairs. Ibid. p. 112.

There are in this ſpecies two ſpots, a little browner and more poliſhed than the reſt of the ſkin, placed one on each ſide the head, which have ſomewhat the appearance of eyes, at leaſt the creature does not appear to have any if theſe are not ſo. Ibid. p. 313.

At the extremity of the head there is a little fleſhy protuberance, which is probably either a mouth, or ſucker, by which it takes in its nouriſhment.

Notwithſtanding that this is naturally an aquatic animal, it is however neceſſary to its life, that it ſhould breathe. For this purpoſe, the laſt ring of the body of theſe *Worms* is open at the end, and ſerves them in the place of the poſterior ſtigmata, in others of the *Fly-worms*. The extremity of this ring is frequently to be ſeen on the ſurface of the water; and about it there is always ſeen a ſort of funnel made of a vaſt number of hairs that grow there, and diverge on this occaſion into this form.

Each of the hairs that forms this ſort of funnel, is itſelf a ſort of beard, furniſhed with numbers of ſhort hairs on each ſide; and the uſe of the whole is to prevent the water from getting in at the aperture made to admit the air. If any doubt could be had of the creature's reſpiring by this means, it would be extremely eaſily cleared by a ſimple and eaſy diſſection of the creature, ſeparating its belly from its back; for one then diſcovers two large veſſels running the whole length of the body, and filling up a great part of its ſpace; theſe are the two great tracheæ; they are inſerted near the head, where probably the anterior ſtigmata are placed, and running through the body join and are inſerted again at the tail. Ibid. p. 314.

It is ſtrange, that a creature like this, an inhabitant of the water, ſhould be deſtined in its ſucceeding ſtate to be an inhabitant of the air; but it is evidently ſo, this *Worm* transforming itſelf into a two-winged fly. When one knew however that this was to be the caſe, one would naturally imagine that ſome long-bodied fly of the libella kind, or ſome other ſuch ſhould be the laſt change of our long *Worm*; but, on the contrary, the production is a very ſhort-bodied fly; nor is this at all more wonderful than the caſe of thoſe libellæ, ſome of the longeſt bodied of which are immediately before their egreſs into that ſtate in the form of very ſhort *Worms*. Ibid. p. 317.

What is farther a great ſingularity in this creature, is that when it changes into the fly, and at any time before that ſtate, it undergoes no change in its exterior form, nor can the time of the change be at all foreſeen; and what is yet more ſingular, the creature when it has undergone its change, and is no more living but in the ſtate of a ſhell to the encloſed fly, is no way diſtinguiſhable by the eye from the living *Worms*, nor can be diſcovered but by the touch. The difference then indeed is eaſily perceived, as the living *Worms* are ſoft and flexile, theſe ſtiff and rigid, and incapable of moving themſelves. It is no uncommon thing for the laſt ring of the body to be turned up, and make an angle with the reſt, even in this ſtate; and often the ninth ring in the ſame ſtate makes an angle with the eighth, but in a contrary direction to the other. The *Worm* while living frequently makes alſo theſe angles, but then it changes them as it pleaſes; whereas, in this ſtate, they are become immoveable. Ibid. p. 318.

When therefore we find, among a number of theſe *Worms*, ſome that are ſtiff and rigid, we may determine that theſe have loſt their original form, and that their ſkin now only ſerves them as a ſhell for their transformation. When this is the caſe, there is no inſect which ſo ſoon accompliſhes its changes. Theſe *Worms* frequently within five or ſix days from the time of their firſt becoming ſtiff and rigid, are transformed into flies.

The nymphs of this fly takes up only a ſmall part of the ſhell made by the ſkin of the *Worm*, all the laſt rings, and part of the firſt remaining empty, the middle ones only being occupied by the nymph. It is not impoſſible, however, but that theſe vacant ſpaces may have their uſe, and may be neceſſary to give paſſage to the air, without which the embryo fly would periſh. Ibid. p. 319

Worms, called *Aſcarides*. The name *Aſcarides* is given by Mr. Reaumur, to a ſort of ſmall *Worms* or maggots, bred from the eggs of winged animals; which bury themſelves between the membranes of the leaves of plants, and there eat away the parenchymatous ſubſtance.

Theſe are a very minute ſpecies of animals, and the ſmall ſpace of the inſide of a leaf allotted for the place of their reſidence, is to them a vaſt extent of country; and they eat it away at various times, and in different manners; ſome eat very ſlowly, and only burrow themſelves a way in contorted holes or cells; theſe he calls *foſſores parvi*: Others eat more variouſly, devouring all that lies before and round about them, and not burrowing in different directions; theſe laſt are called *foſſores magni*.

Theſe differ greatly one from another, and indeed are the *Worms* of different animals; ſome afterwards changing into ſmall butterflies, others into ſmall flies of the common kind; but the manner of life is the ſame in all. The butterflies whoſe eggs produce theſe, are extremely beautiful, glittering with a multitude of gaudy colours, and with ſilver and gold among the reſt; but they are too minute to ſhew their beauties to the naked eye. Thoſe of the *Aſcarides*, which do not in fine become butterflies, are two-winged flies, or ſmall beetles, in their ultimate ſtate. As ſmall as theſe *Aſcarides* in general are, they do not fail to ſhew the proper characters, by which they may be reduced to regular claſſes: Thoſe which have had their origin from the eggs of butterflies, are truly and properly caterpillars in miniature; the others are maggots, from flies; and if from beetles, they are hexapode *Worms*. Of the little caterpillars, ſome have ſixteen feet, ſome only fourteen; and ſome of them are perfectly ſmooth and equal all over the body; others have a number of rings or annular diviſions, like the larger caterpillars, their ſeveral changes for the arriving at the fly-ſtate are the ſame with thoſe of the common ſilk *Worm*, and other ſpecies of large caterpillars.

The ovula of the parent butterfly are depoſited ſingly, only one being placed on a leaf; for the little caterpillar is of the nature of the ſolitary, not the gregarious animals. Theſe eggs are ſo ſmall, as to be ſcarce viſible, except to an obſerver ſo accurate as Mr. Reaumur; but he not only diſcovered them lying upon the leaves of plants, but traced them to the time of their hatching; and obſerved this curious particular, that the caterpillar never enjoys the light or free air, but as ſoon as ever it is hatched eats its way through the integument of the leaf; and, under the cover of its ſhell, buries itſelf among the parenchymatous matter, whence it never comes out again till it arrives at the fly ſtate.

The *Worms* which are hatched of the eggs of flies, make their way as ſpeedily into the ſubſtance of the leaf; but with this difference in the manner of doing it, that as the caterpillar eats its way through with its teeth, the *Worm* ſtrikes its head forcibly againſt it ſeveral times, and by repeated blows at length breaks a hole in it, large enough to admit its little body; and then feeds on the parenchyma of the leaf, in the ſame manner with the caterpillar. Theſe finally change into their chryſalis ſtate, within the covert of the membrane of the leaf.

The laſt kind of *Aſcarides* which are to become beetles, make their way into the ſubſtance of the leaf in the ſame manner; and when they have fed their deſtined time upon its parenchyma and juices, they ſometimes change in the covering of the membrane, and ſometimes come out of their holes and chooſe the ſurface of the leaf for the ſcene of this great cataſtrophe. *Reaumur*'s Hiſt. Inf. Tom. 1.

Bee-Worm, the name given by naturaliſts to the ſmall white *Worm*, found in the cells of the honey-comb, and afterwards changing into a bee, in the manner of the white maggots, found in meat, &c. which, after a certain change, into a ſtate of reſt, become transformed into flies, like thoſe to which their eggs owe their origin.

To trace these *Worms* of the bee to their origin, we are to observe that the female bee lays an egg at the bottom of each cell, and that this is not simply dropped into this place, but that the bee fixes it to a certain part; that is, either to the base of the cell, or to one of the angles, by its smaller end. The egg is of an oblong figure, and is larger at one end than at the other; it is covered with a thin flexible membrane instead of a shell, so that it may be bent double, and will, on taking off the force, return to its own shape again. *Reaumur*, Hist. Inf. vol. 10. p. 239.

These eggs appear perfectly smooth and glossy to the naked eye; but when viewed with powerful glasses, there is a scaly structure observed in them; though Mr. Reaumur suspects that this is not on the outside, but is seen through the transparent covering, and is, in reality, the structure of the *Worm* within.

Though it be the regular course of nature, that only one egg should be deposited in each cell, yet there are sometimes found two, three, or even four, in one place: the occasion of this usually is a female bee's being engaged in a small swarm, in which the working bees cannot erect combs fast enough, so that as she is under a necessity of depositing her eggs from day to day, she is compelled to put them two or three together: these, however, seldom come to any thing, such small swarms usually dispersing after a while, the female seeking admittance into some other hive, in which she may lay at her leisure. When the bees work in the common way, and the female is so pressed to deposit her eggs, that she cannot stay the necessary time, she often, in this case, places two or three eggs in a cell; but as the number of cells every day increases, the hive is not deserted on this occasion; but the swarm continues in it, and the female continues her laying as the workers make the cells; as it is impossible, however, for two or three *Worms* to live in one cell, the worm, when at full growth, and when in the nymph-state, entirely filling up the whole cavity, the bees foresee the event, and take care to remove the supernumerary eggs out of the cells, leaving only one in each. *Reaumur's* Hist. Insect. vol. 10. p. 244.

It has been a common opinion among authors, that after the eggs of the bees are thus deposited in the cells, they are set upon, in order to be hatched in the manner of those of birds. The generality of writers have given this office of sitting to the drones or male bees; but others, who have observed the swarms more narrowly, and found that there are no drones in the hives, except for about three months of the year, and that the eggs remain in the cells at times when they are not there, have declared, that the common working-bees do this necessary office; nay, some, who have written expresly on this subject, have gone so far as to give directions what should be done with such bees as were found sitting on the eggs, when the swarms were removed from one hive to another.

Mr. Maraldi, who could not give into this opinion of the bees sitting on the eggs, yet was for giving them some office in regard to their hatching, and consequently observes that the bees got on the tops of the cells which contains the eggs, and there fluttering their wings with great rapidity, excite a heat which occasions the young ones to be hatched. This, however, is not less erroneous than the other; for a strict observation always shews that the cells in which the eggs are, are wholly left and abandoned by the bees, and they never go near them, except when their road lies by them on their other necessary occasions. It is very probable indeed that the heat of the hive is a great agent in the hatching of the eggs; but the single bees never attempt to add to this, in regard to any particular cell, and without this the heat within is often equal to that of the eggs sat upon by a hen, and sometimes superior to it.

The eggs are hatched about three days after the bee deposits them, and all their changes are afterwards so swift, that it is necessary to watch them very attentively, in order to see them. In almost two days after the hatching, the *Worm* is found grown to so large a size, that it is scarce to be believed the same animal. The whole period of the life and changes of the *Worm* is contained in about seventeen days; for if a cell be observed in which an egg is just laid, and the same cell be examined twenty days afterwards, the young bee will be found just ready to appear out of the nymph of the *Worm*, and take its flight from the cell. The labouring season of the bees, in this respect, is when they are newly hived, and their industry, and the efforts of it at that time, are scarce credible.

Mr. Reaumur observed the whole process in a swarm which he put into a new hive on the twenty-fifth of May. They all immediately began to work upon their combs, and on the twenty-seventh, which was only two days after, there were a vast number of cells erected, in each of which the female, or queen, had deposited an egg; and on the seventeenth of June, these cells all furnished the hive with a new swarm, each producing its bee.

From the time that the *Worm* is hatched out of the egg, to its passing into the nymph-state, it always remains at the bottom of the cell, and lies rolled up in form of a ring, its head coming very near the tail. In this manner it lies very comfortably, there being under it a sort of bed of a soft and glutinous white matter, which prevents the hard matter of the cell from pressing against it. This matter has also another use yet more materially necessary to the animal, as it serves for its food.

The common working bees are destined to take care of the young brood, and the care they take to keep them supplied is surprising. The *Worm* is a feeble animal, not able to go out of its cell in search of food, nor is it by any means proper that it should, as the combs would be destroyed by the continual passing of a number of such creatures. When the bees are observed by means of a glass-hive, it is easily seen in what manner they prevent the necessity of this all the time that the *Worms* are alive in the cells: their chief business is their support, and there are numbers of them every moment seen plunging their heads into the cells, and depositing there a supply of this matter, which serves for the nourishment of the young brood. It is a pleasing sight to observe how carefully they come one after another to the same cell, till there is a sufficient quantity in it, and, after this, how others that come in on the same service, looking into that cell, and, finding it supplied, pass over it to others which want their help. *Reaumur's* Hist. Inf. vol. 10. p. 246.

When we see the bee in this employment, after plunging its head into the cell, remain in that posture some time before it draws it out again; it is easily conceived, that it is there disgorging what we find afterwards left in the cell. It is to be observed, that some have supposed this white matter which surrounds the *Worms* to be their excrements, not their food; but there are many reasons against this opinion. The *Worms* of winged insects in this state void little or no excrement; and if this matter of the bees cells was the excrement of the *Worms*, it must necessarily follow that it must be found in smallest quantity when the *Worm* was first hatched, and daily increasing afterwards; but just the contrary of this is the case, for the quantity of it is greatest of all while the *Worm* is very young, and there is none of it found by that time when the creature is full grown, and is ready to pass into the nymph-state.

Swammerdam, and other curious inquirers into the œconomy of bees, have wondered where the creatures produced this liquid substance, which is of a whitish colour, of the thickness of cream, and of an insipid taste like flour and water. Some have supposed it the extravasated juices of trees and plants, collected by the bees for this use; but it is much more probable, that it is the matter of the common food of these animals. The honey and rough wax which, after having passed their digestion, is reduced to a substance of this kind, analogous to the milk of animals, is in this state voided by the mouth by these animals, for the support of their young, while in a condition in which they cannot help themselves.

The bees seem yet farther careful of their offspring, and take the pains to bring them up by degrees from more insipid to less insipid food; for as they are to live on honey in their fly-state, they are to be by degrees brought to this diet while *Worms*. This will be found to be the case, on examining the cells in which they live at their different stages. In the first stage, or while the *Worms* are very young, the matter of their nourishment is found perfectly insipid, as before observed; but as they advance in growth, if it be tasted at different times, it becomes more and more sweet; and, in fine, what is brought for the nourishment of the *Worm*, when nearly arrived at the time of its change into the nymph-state, is little different from honey.

The bees therefore seem able to give this matter what sort of preparation they please, and it is evidently different at these different times, not only in taste but colour. At first it is white, but it afterwards becomes transparent and colourless, and after this greenish or yellowish, very often resembling in colour diluted honey. *Reaumur's* Hist. Inf. vol. 10. p. 247.

The *Worm* has no legs, as indeed it has no need of any, its whole life, in that state, being destined to be spent in that cell where it is first hatched: it is not easy to get one of them out of the cell without hurting it; but when it is carefully taken out, and laid on a paper, it is found to have no power of crawling, but only gives signs of life by turning its head a little about. There is very little difference in the growth; its colour only changes from a somewhat bluish-white, which it is at first, to a purer white, and the incisures between the rings become less deep, and in fine, almost wholly disappear when the creature is at its full growth.

The head of this *Worm* is somewhat harder than the rest of the body, and is of a regular figure, being flatted, and composed like the head of the caterpillar, of two lips, the under one divided into three parts, and the upper one being furnished with two hard substances in form of teeth, though much less solid and strong than those of the caterpillar, as this creature has nothing to do with solid food. In the full grown *Worms* there is always seen a yellow line or streak running directly along the middle of the back. This seems to be a streak on the surface of the skin, but it is, in reality, no other than the great canal of the intestines, which is easily seen through the transparent skin, as it is full of a yellowish matter, very much resembling honey.

Under the belly of this creature there is an appearance of certain

tain folds more white than the reft; thefe are difpofed parallel one to another, and all run in a tranfverfe direction. It is natural to fuppofe that thefe are the folds at which the *Worm* has a power of bending itfelf; but, when examined ftrictly, this does not appear to be the cafe, for they are found to be in reality fo many round veffels of a bright filvery whitenefs, placed under the fkin, and vifible through it, on account of that fuperior whitenefs. They may be eafily raifed with the point of a needle, and taken out of the body, and they are then found to be of the fame ftructure with the tracheæ of all other animals of this fmall kind; namely, they are extremely fine and fmall cartilaginous filaments, hollow within, and rolled into a clofe fpiral wreath.

The ftigmata of this *Worm* are eafily diftinguifhed, though they are extremely fmall. If one of the tranfverfe tracheæ of the belly be traced to its extremity at each end, it will be found to terminate at each in a ftigma. Thus all the reft of them may be found out, and they will be found to lie in a regular line along each fide, running along the two great tracheæ, which pafs longitudinally from the head to the tail on each fide of the *Worm*. From thefe there part fome fhort but thick tracheæ, which pafs toward the back, and there become divided into many branches; and on the under part of the body, near the head, there may be diftinguifhed feveral others beautifully undulated, which pafs from fide to fide, though not in a regular manner. The anus of the *Worm* is placed in the laft ring of the body, and is very fmall; it is deftined to give paffage but to a very fmall quantity of excrements. *Reaumur*, Hift. Inf. vol. 10. p. 257.

If the progrefs of the growth of the *Worm* be examined, it will be found that two days after the egg is laid it is hatched, and in fix days more it arrives at its full growth. When it is firft hatched it rolls itfelf up into a fort of circle, which is then however fo fmall, that it does not reach quite round the cell, and leaves a confiderable fpace within its center: this, however is foon filled up by the growth of the creature; as it becomes longer, its head is brought to meet the tail, and is forced beyond it as far as the laft ring but one of the body: in this time the body alfo fwells fo much in thicknefs, that there can no more be any fpace left in the center of the ring, nor any room for the head to be thruft farther forwards; as the *Worm* has much of its growth yet to come in this uncomfortable fituation, it naturally happens that the body lofes its round fhape, and becomes flatted, and in this manner rifes up fo high in the cell, as almoft to fill it up: when the cell is examined in this ftate, it feems to contain two *Worms* rolled up, and laid in it, one upon another, fince it is hard to conceive the body of one fo fafhioned as to fill it in this manner: when the *Worm* is however taken out, its fhape plainly fhews how it has filled it, and in what manner it has conformed itfelf to the place of its abode: when at liberty, it foon recovers the natural rounded fhape of its body.

It is very plain, that the *Worm* muft be very little at eafe in this fituation, and that it will be neceffary for it to change it, in order to its own neceffary transformations. When therefore the time of its firft change approaches, it ceafes to eat, and begins to unrol the circle its body makes, and to lay itfelf at its length in the cell. When this happens, the bees become fenfible that it has no occafion to eat any longer, and therefore they bring it no more food; but nature only requiring for this change a ftate of reft, and the exclufion of the external air, they perform their laft office to it in what might appear a very ftrange operation, if it were not known to be neceffary to the *Worm* in this ftate; this is the faftening up the top of the cell with a covering or lid of wax, fo that the *Worm* now finds itfelf fhut clofe up in a fort of box, hermetically fealed. The manner in which the bees make this covering, is by beginning a circle within the mouth of the cell with new wax, and fucceeding this by feveral others, each within the laft, till they leave only a vacant point in the center, which they fill with a lump of the fame wax, fo that the cover is compofed of a great number of concentric circles.

When this cover is finifhed, the *Worm* compleatly extends itfelf at length within, and as it is now to pafs into the ftate of a nymph, and the outer integument of that will be too thin and tender to bear the immediate contact of the wax of which the cell is compofed, it begins a new work, which is the fpinning a fort of filk in the manner of the filk-worm; with this it forms a web, completely covering all its parts, and in this fafe cafe it becomes a nymph. The web of filk which the *Worm* fpins, on this occafion is extremely fine, and is by degrees carried all round the cell, fo as to line it regularly throughout in the manner of a linnen hanging. This is not only applied thus clofely to the fides and bottom of the cell, but in the fame manner to the lid or top; and thefe are eafily feen on breaking open a cell which enclofes a nymph; for when the wax of one fide of the cell is broke, the *Worm* is then only feen through a thin and tranfparent reddifh web, which is this lining of the cell, and is found to be very flexile, yet very tough. The time when this is beft of all feen, is, however, when the combs of an old hive are broken; for, in this cafe, the webs within the cells which have been deftined to the raifing of young ones, are fo thick that they will not break; but may be eafily examined and pulled to pieces, and they are then found to be made of a great number of crufts, one within another. *Reaumur*, Hift. Inf. vol. 10. p. 261.

It is not to be fuppofed that one *Worm* could have formed thefe complex webs, as they are neither neceffary to it, nor to be fafhioned in the time that animal has to work in. It is very certain that one of thefe cells deftined to the breeding up of the young offspring, is not only allotted to one *Worm*, but to feveral fucceffively; and each of thefe having in its turn fpun its web, by this means the whole web is found compofed of fo many crufts or doubles, or is, in reality, a collection of fo many webs as there have been *Worms*.

As foon as ever one of thefe nymphs iffues out of the cell, in the bee-ftate, the working bees clean out the cell, and render it perfectly fit for the office of educating another young one; and as foon as that is done, the female bee lays another egg in it, and fo on; fo that almoft as long as the comb lafts, every three weeks there is a new *Worm* to inhabit it, and a new web fpun, and added to the former number. By feparating the crufts of one of thefe complex webs one from another, it becomes eafy to reckon how many bees have been hatched in each. The feveral crufts are fo very thin, that there may be a great number of them applied one over another, before they will fenfibly fill up or ftraiten the cavity within the cell, and, in other refpects, the cell is the better for it, every coat of this matter adding a lining to it, which is at leaft as ftrong as the fides of the cell.

The web that this *Worm* fpins is remarkably fine and delicate. Its threads are of a fmalnefs fcarce conceivable, and its workmanfhip worthy the materials; for they are wove in fo compact a manner, that it is not eafy to fee the ftructure; infomuch that Mr. Maraldi, a very accurate obferver of the bees in other refpects, fuppofes this lining of the cell to be formed of the fkin of the *Worm*, thrown off at its entering into the nymph-ftate. He is a little embarraffed to conceive in what manner the fkin becomes fo regularly and nicely applied to all the angles of the cell; but a clofer obfervation fhews the truth; for if the cells be opened when newly covered by the bees, the *Worm* within will be found to be yet in its own form, and will be detected in the act of fpinning its web; or if glaffes be called in to our affiftance afterwards, the web, whofe ftructure is imperceptible to the naked eye, will be feen to be compofed of fine threads regularly woven together like thofe of other fpinning animals.

The female bees are treated with a peculiar diftinction, even in this ftate of the *Worm*, as well as afterwards. We fee that the common cells ferve fucceffively to the hatching of feveral of the common *Worms*, and bringing them to perfection in the bee-ftate; but this is not the cafe in the females, each cell only ferves to raife one bee of this kind, and is never found covered within with any more than one web or filky lining. Indeed the bees always deftroy thefe royal cells as foon as ever the bee is hatched from them, or, at the moft they only leave the bottoms of them, to ferve as the bafe of other cells; and this indeed is wholly neceffary, in order to their carrying on their common work, and enlarging their combs. *Reaumur*, Hift. Inf. vol. 10. p. 263.

The fucceffive hatching of feveral bees in the fame common cell, is of great ufe to it, as the web left by every one within it, greatly ftrenghens the cell; but this is by no means neceffary, in regard to the royal cells, or thofe deftined to the producing the female bees, as the fides of thofe are always made fo thick, that they can require no additional ftrengthening.

When the common *Worm* of the bee has arrived at its growth, the labouring bees bring it no more food, fo that it eats up the whole of what remains, and the cell becomes dry and clean. It then extends itfelf at full length under the cover of the lid of the cell, and by giving itfelf feveral motions, it caufes the fkin of its back to fplit open with a fmall longitudinal fiffure. The internal motion of the creature foon enlarges this flit, and at length the body of the nymph appears in the fiffure, and by degrees makes its way compleatly out. The fkin left behind is then only a dry membrane, and this nymph is to be looked on as the animal: this is an oblong body of a delicate ftructure, but without any power of motion.

In this, if nicely examined, there may, however, be difcovered all the parts of the future bee, and it feems indeed no other than the perfect bee, with its limbs as yet all foft and tender, and concealed under a thin membrane, till they acquire a due ftrength and firmnefs. The rings of the back may be eafily traced on the back of the nymph, and when its belly is examined, the legs and horns, or antennæ, and the trunk, are all diftinctly feen extended lengthwife, and the wings are folded in fmall knobs, which are afterwards to be unfolded in a wonderful manner.

The drones, or male bees, which the common working bees fo unmercifully maffacre and deftroy in the month of July, or thereabouts, are not lefs taken care of in their worm-ftate, than thofe of the common kind. The *Worms* of thefe drones do not differ in any particular from thofe of the common working kind, except that they are larger, and are placed in larger cells.

The bees bring food to thefe *Worms* in the fame manner as to the others, and when the time of their change into the nymph-ftate approaches, they as regularly and carefully cover their cells

cells with a wax lid. It sometimes happens, that the *Worms* of these drones are lodged in cells no larger than those in which the *Worms* of the common bees are placed. The bees who have the care of the young brood always are able to distinguish these however, and when they come to make the cover of the cell they always give them room by making it of a different form; they do not extend a flat crust over the mouth of the cell in this case, but raise a hollowed and elevated covering. The cells of the drones are easily distinguished from the rest, by this; and a whole side of a comb is by this means often found to be the lodging of the drones only.

The eggs out of which the male bees are to be hatched, differ in nothing from the others, except that they are a little larger; and the bees produced of the *Worms* hatched from them, are proportionably larger, as are also the *Worms* themselves when at their full growth. It sometimes happens, however, that the male bees are no larger than the others; several hives having been found with the males of this small kind. It sometimes happens that the female bee is obliged to deposit two, three, or even four eggs in one cell, through a scarcity of cells at the time when it is necessary for her to lay; but as these can never grow to their full size in a third or fourth part of the room they should have, Mr. Reaumur is of opinion, that this is the cause of the smallness of these male bees; and that in whatever hives they are found, the eggs have been left three or four in a cell.

The love that the working bees have for the young *Worms* hatched in the combs of their own hives appears very great, and their care of them the most perfect in all their stages that could be conceived; but this love and tenderness does not extend to the young ones of another hive. Mr. Reaumur tried the experiment, by putting into one of his glass hives part of the comb from another hive, in which there were some eggs and some young *Worms*; but while the bees of this hive were perfectly careful of their own young, they were cruel in the greatest degree to these, tearing them out of their cells, and carrying them out of the hive, there leaving them to perish. *Reaumur's* Hist. Inf. V. 10. p. 267.

There are certain circumstances also, under which the bees are not less cruel, even to their own young: If it happen that a comb break, and a piece of it fall to the bottom of the hive, the bees immediately gather about this fallen piece, and kill all the *Worms* that are in the cells of it, in the same manner as they did the strangers, carrying them out of the hive. It should seem, that the creatures knew, that the want of the necessary heat which is found in the center of the hive would be the occasion of the death of these *Worms* before they could arrive at the bee state, and that in mercy to the creatures themselves they at once put a period to a life, that could only be miserable, and prevented a great deal of unnecessary trouble to themselves, in feeding a number of creatures which never could come to perfection. It sometimes happens also, that the bees kill and carry out of the hive the bodies of many of the *Worms*, while the combs all remain in their place, and no accident has happened to them. There are however very plain reasons which may justify this cruelty, so very different from the general care and tenderness they have for them. One of these may be, the necessity of making a provision for themselves against the winter.

If the fœcundity of the female bee continue so long, and be so great, that all the cells are filled with young ones, at a time when many of them must of necessity be filled with honey, for the sustenance and support of the hive in winter, it will be found absolutely necessary that many of the cells must be cleared of the *Worms*, in order to their being filled with the honey. The preservation of the republic being the first of all cares, this cruelty will be found justifiable, rather than by a foolish tenderness all should be left to perish with hunger. This slaughter is plainly very often owing to this cause, as it is seen to be made at such time as the winter is coming on; and when there is present a season admirably adapted to provide a supply for it, by affording great opportunities of collecting a great deal of honey in a little time.

There is also another occasion, on which a massacre of this kind may be justified on the principles of reason. If a female prove very prolific, and by any accident do not lay any eggs for the producing another female, or the egg or eggs of this kind which she does lay do not come to good, the young brood in this case cannot answer the general purpose of nature in their production, that is the forming a new swarm and taking care of a new offspring; and in this case, as they would live to no purpose, it is not wrong in the bees who have the care of the young to destroy all these, and make room by that means for a new brood born with happier circumstances.

It is very possible also, that the *Worms* may be liable to certain disorders, which we can have no knowledge of; but in consequence of which they could only produce very feeble and useless bees: in this case, which the bees who have the care of the young may easily perceive, it would be no improper method in them to destroy in the *Worm*-state what they foresaw would be of no use to the commonwealth in the bee-state. *Reaumur's* Hist. Inf. V. 10. p. 273.

Though the common bees refuse the care of such young ones as are taken out of other hives, and put into theirs, their rules however are not so strict as to the breeding no other young but those of their own hive; for it has been found by experiments, that if all the bees of two hives be forced to make a change, and each swarm to enter into the hive belonging to the other, they will in this case take as much care of the young *Worms* they find in the combs, as they would have done of their own.

If the common bees take all this care of the *Worms* which are to become working bees like themselves, and even of those which are to become drones which after a time they are to destroy, there is no wonder that they take greater pains to secure and bring up those *Worms* which are to become female bees; of which they are so very watchful and observant, that they feed these *Worms* with the utmost care; and when they have brought them up to that state when they are to eat no longer but are to pass their last change into the chrysalis or nymph-state, they close up the aperture of the cell with a lid of wax; in the making of which, they are not less prodigal of that choice and precious substance the wax, than they had before been in the constructing the cell. It takes as much wax to make one of the cells in which these females are to be brought up, as to make an hundred and fifty of the common cells; this may be found by weighing them against one another, and the cover or lid of the cell put on at the time of the transformation of the *Worm* bears the same proportion to the covers of the other cells. Every thing that regards these creatures is managed with profusion: In the common cells there is never found a drop of that liquid matter destined for the food of the *Worm*, when it is arrived to the nymph state, the bees never furnishing it with a drop more than is absolutely necessary; but they give so profusely to the *Worm* that is to become a female bee, that when it is changed into the nymph-state there is usually found in the cell with it a quantity of this food equal to its own bulk.

This food seems also more nicely prepared, than that which is intended for the nourishment of the other worms; for if it be tasted, it is found very sweet and luscious, but attempered with a sharpness like that of vinegar, and with a warmth like that of pepper, or some other spice.

It might be supposed from this food always found in the cell with the royal or female nymph, that the creature in that state took in nourishment; but this is not the case, the nymph of the female bee can no more eat than any of the others; but this mass of food is of no injury to it in that state, as it does not fill up the whole cell as the others do, but has a great deal of room, and there is always a void space between it and the mass of food. *Reaumur's* Hist. Inf. V. 10. p. 278.

The progress of the young bee from its *Worm*-state, is this: When the cover is fitted to the cell, the nymph makes its way out of the back of the skin of the *Worm*; it is at first perfectly white, but by degrees its eyes acquire a reddish colour, and afterwards the several parts of the body become more and more brown; by degrees they all acquire their due strength and solidity; and when that is done, the bee appears out of its case, by bursting the thin membrane that covered it. The next office then, is the getting out of the close cell, which is a prison to it; in order to render this easy, the head of the bee is always fixed by the position of the nymph just under the center of the lid or cover of the cell.

The first business of the new-hatched bee is therefore with its teeth to eat a way through this covering; this it does by slow degrees, first forcing a small aperture, and afterwards by degrees enlarging that to a proper size to let its head, and in fine its whole body, appear. This is, in favourable circumstances, that is when the day is favourable and the young bee vigorous and strong, the work of about three hours; but at other times, it is half a day's work; and in some cases is never perfected at all, the creature dying by that time it has made an aperture large enough to get its head out at, and perishing with the head out and the body within the cell.

Swammerdam supposed, that the bees which placed the covers upon the cells, took them off again at a proper time; but this is not at all consonant to reason and experience, since, were it so, we could never find bees dead in the position just described. But Swammerdam living before the invention of glass-hives, could only guess at what we can now see distinctly performed under our eyes.

As soon as the head and the fore-pair of legs are out, the disengaging the rest of the body is very easy, as these legs being fixed on the outside of the cell have sufficient force to pull up the rest.

When

When the creature is completely out, it ſtands on the ſurface of the comb near the cell out of which it is come, and its parts, which are yet very ſoft and moiſt, become hardened and dried by degrees.

While it ſtands thus, the reſt of the bees which are about the ſpot gather round it, and give evident marks of joy at its being produced; they ſtroke and make much of it, and often offer it honey out of their own mouths. While it ſtands in the midſt of theſe careſſes, its wings by degrees unfold themſelves, while ſome of the bees are thus welcoming the new inhabitant, others immediately ſet themſelves about clearing away the matters left in the cell, and fitting it for the reception of a new inhabitant.

The bee produced out of it, has neceſſarily left behind it two exuviæ; the ſkin of the *Worm* when it transformed itſelf into the nymph ſtate; and finally that of the nymph, out of which it is juſt come in form of a bee.

One of the working bees immediately enters this cell, head foremoſt, and taking up one of theſe exuviæ carries it out of the hive, and the moment ſhe has left the cell another enters it, and in the ſame manner carries out the other exuviæ; after her there enter ſeveral others, which carry out the fragments of wax that had fallen in while the *Worm* was gnawing its cover to pieces; and others, finally, put it perfectly in order, and render it fit for the reception of a new egg, which the female bee ſoon depoſits in it; inſomuch that Mr. Maraldi ſays, he has ſeen five bees produced in the ſame cell, in the ſpace of three months.

The young bees are eaſily diſtinguiſhed from the others, by their colour; they are grey, inſtead of the yellowiſh brown of the common bees. The reaſon of this is, that their body is black, and the hairs that grow upon it are white, from the mixture of which ſeen together reſults a grey; but this colour forms itſelf into a browniſh yellow by degrees, the rings of the body becoming by degrees more brown, and the hairs more and more yellow. The bee is no ſooner produced from the nymph, than it knows the whole buſineſs of its future life; it immediately goes out, and gathers wax and honey for the common ſtores. At the time that one bee hatches in this manner, as many others are alſo hatched as there were eggs depoſited by the female in the ſame day; this is often many hundreds: So that a few days of this kind render the hive too full of inhabitants, and the new-born brood are forced to go out in form of a ſwarm to find ſome other habitation, where they may employ themſelves in the ſame manner with thoſe to which they owed their origin. *Reaumur*'s Hiſt. Inſ. V. 10. p. 280. See the article SWARM.

Canker-WORM. See the article SCARABÆUS.

Churr-WORM. See the article GRYLLOTALPA.

Connough, or *Connaught*-WORM, in natural hiſtory, a name given by the common people of Ireland, to a kind of caterpillar found in many parts of that kingdom; and, from its ugly aſpect, reputed to be poiſonous.

It is ſaid to be the only poiſonous creature of that kingdom, and many miſchievous effects are attributed to its ſting, and to its poiſonous quality, when eaten by cattle.

As to the firſt of theſe opinions, it is evidently erroneous; the creature having no power to ſting at all. The other is not ſo eaſily proved falſe, but is much to be ſuſpected. The reaſons on which it is founded, are theſe: The cattle in Ireland are ſubject to a very terrible diſeaſe, which is moſt frequent in Autumn; about the time when theſe animals are in the greateſt plenty.

It is moſt frequent alſo among thoſe cattle which feed in low and marſhy grounds, where this creature lives and feeds; cows and hogs which feed in theſe places, are the only creatures ſubject to the diſtemper, and this is imputed to the cows eating by large mouthfuls, becauſe ſhe chews the cud a ſecond time; and the hogs feeding ſo foul and greedily, as to eat things which other creatures refuſe. Finally, the great cauſe of the aſſigning this diſeaſe to this creature is, that the *Worm* only appears in great numbers about once in ſeven years; and in theſe, and theſe years only it is, that the diſtemper among the cattle is common.

The ſymptoms by which this diſeaſe is diſtinguiſhed from all others, are, a great ſwelling of the head, and a falling down of the anus; the gut often hanging out to the length of ſix or ſeven inches. The common cure among the more intelligent people is a ſtrong decoction of the plant called bearſfoot, or great black hellebore, with ſome rue and garlic given with butter and beer; this is found to have great ſucceſs with the cows. The hogs are cured only by mixing reddle, or the common red ochre powdered, with buttermilk, and making them eat a large quantity of it.

The Iriſh peaſants have recourſe to many idle remedies; but theſe are found often of real ſervice. The caterpillar, ſuppoſed to occaſion this diſeaſe, feeds on the common ragwort, and is larger than moſt other creatures of this kind, being of the length and thickneſs of a man's finger; it is marked with two large ſpots behind the head, which are ſuppoſed by the vulgar to be the eyes, but are only round variegations, of the nature of thoſe common on other caterpillars; and what they take to be a ſting in the tail, is no other than a horn in that part; which is not peculiar to this caterpillar, but found on many others. That the common people are deceived in regard to the external parts of this creature, is evident; but experiments are required yet to prove, whether or not they are ſo, in regard to its poiſonous quality.

One trial is remarked by Mr. Molyneux to have been made on a dog, who eating the ſkin of only one of the creatures was found dead about three days after; another dog, which eat the juices expreſſed from that ſkin, received no hurt. The inſect is deſcribed in Liſter's edition, under the name of the elephant caterpillar. Phil. Tranſ. N°. 168. p. 880.

Flower-root-WORM. See the article FLOWER.

Fly-WORMS, in natural hiſtory, the *Worm* or maggot produced of the egg of a fly, and afterwards to be transformed into one.

Theſe *Worms* are to the fly, what the caterpillar is to the butterfly it produces. The cuſtom of the world has appropriated the term caterpillar to that one ſpecies of the flying inſects firſt ſtate; but we have unfortunately no term of diſtinction yet eſtabliſhed for any of the firſt ſtate of any of the other flying inſects, the creature produced by the egg of the fly ſcarce being indeterminately called *Worm*. Till more expreſſive names ſhall be invented for theſe, it may not be improper to diſtinguiſh thoſe of the different claſſes by the additional name of the inſect they are to be changed into, and to call that which is to become a beetle, the *Scarab-worm*, that which is to be hereafter a fly, the *Fly-worm*; and ſo of the reſt. *Reaumur*'s Hiſt. Inſ. V. 4. p. 161.

Thoſe which are to be hereafter winged creatures of the fly-claſs, are extremely different one from another in form and figure, and may very properly be arranged into ſeveral claſſes.

The moſt remarkable and ſtriking differences between the claſſes of theſe creatures, are thoſe of the form and ſhape of their heads. Many of them have heads which it is not eaſy to diſtinguiſh to be ſuch, as they carry no one mark of the head of an animal viſibly about them. We are accuſtomed to ſee in other animals a conſtant and regular form of the head, which is no way alterable during the life of the animal; but among theſe *Fly-worms* there are many, whoſe heads are variable at the pleaſure of the creature; and which at times are ſeen to be more or leſs long, more or leſs thick, more or leſs flat, more or leſs ſhortened at pleaſure by the animal, and eaſily bent and turned about in any direction.

The heads of theſe creatures are not only fleſhy, but compoſed of a very ſoft and flexible fleſh; as theſe creatures have no ſhell, it may occur to ſome to think they have no brain; but this would be a greater wonder than all the reſt. Be it as it will, the naturaliſt need make no heſitation to pronounce that the head of an animal, which is the anterior extremity of the creature, and is furniſhed with neceſſary organs for taking in the food, and conveying it into the body. Ibid. p. 162.

Though there are among the *Fly-worms* many whoſe heads are of this variable conſtruction, there are alſo others whoſe heads are hard, like thoſe of other animals; and which, like thoſe, always retain the ſame regular figure.

This grand diſtinction among theſe *Worms* may furniſh us with the firſt general arrangement of them, which may be into thoſe which have a variable, and thoſe which have an unchangeable head. Ibid. p. 163.

If we after this attend to the number, arrangement, diſpoſition, ſtructure, and form of the other parts of theſe little animals, we ſhall find ample matter for a ſufficient number of ſubordinate diſtinctions, which will alſo prove very extenſive.

Some *Worms* of this kind we ſhall find, which have not the leaſt appearance of legs; others we ſhall find, that have legs, but theſe merely membranous ones; others which have them merely ſcaly, or ſhelly; and others, which, like the caterpillars, have legs of two kinds, ſome ſhelly, and others membranous; but which have always more of the latter kind than the caterpillars have.

Other ſub-diſtinctions there will alſo be found, in the variable and unchangeable heads of divers of theſe *Worms*; and the whole form of the body in others will be found to be totally different. Some of them have a power of altering the figures of their bodies at pleaſure, being able to lengthen or ſhorten them, or to make them thicker or thinner at pleaſure. Some can alſo at the ſame time inflate, as it were, and ſwell out ſome particular parts of their body, while they make other parts thin and flat. And others have their body ſo rigid, as to be wholly incapable of theſe changes, and indeed of bending or turning otherwiſe than all together.

The external coat of ſome of them is alſo very thin, tender and membranous; whereas that of others is ſtrong, firm and ſcaly, or cruſtaceous. And finally, the different ſpecies themſelves will afford us ſufficient ultimate diſtinctions, by the poſition, number and figure of their organs of reſpiration. *Reaumur*'s Hiſt. Inſ. V. 4. p. 163.

*Genera of Fly-*Worms. The diſpoſition of the ſtigmata, or air-holes, at which the tracheæ of theſe animals terminate, will help us to the occaſions of ſeveral diſtinctions of genera among the *fly-Worms* of variable heads.

The *Worm* of the common fleſh-fly has in its ſtigmata ſix apertures, three in each, of an oblong figure, and reſembling button-holes; but, inſtead of theſe, the *Worms* of many other flies have them in the ſame part of their bodies, but have, inſtead of the three button-holes, only one ſmall eminence, reſembling a little button in each: Others have them cylindric and hollow, and ſtanding out from the hinder part of their bodies in form of horns. Some genera have only two of theſe horns, and others have three: The two in ſome are placed to a conſiderable diſtance from one another, and in others they are in a manner joined together. Some alſo carry theſe pipes or horns in an elevated poſition, others having them placed flat on their bodies; and beſide theſe varieties in the number, form, and ſituations of the ſtigmata, ſome diſtinctions of genera may be drawn from the parts which ſurround them, and are deſtined by nature for their defence.

The number, diſpoſition, and figure of the hooks, which ſerve theſe creatures in the place of teeth, may alſo ſerve for matter of diſtinction, as may alſo the differences of their legs. *Reaumur*, Hiſt. Inſ. vol. 4. p. 173.

The common *Worm* of the fleſh fly has two hooks, placed at a diſtance, in a parallel direction, and a dart between them. Others have theſe hooks, but have no dart; others have theſe hooks of very different ſize one from the other, and placed one over the other; others have only one ſingle hook; and others there are, which have nothing of this kind at all, or, at leaſt, which we can never make to ſhew any. Ibid.

The figure of the body in others, will alſo give matter of diſtinction. The hinder part of ſome is, as it were, cut off, and repreſents the truncated end of a cylinder. Some there are of a much ſhorter body than others; ſome have their anterior part as thick as the poſterior: ſome are more flat, and others more round. Ibid. p. 174.

Notwithſtanding that the *fly-Worms* of the firſt claſs have, properly ſpeaking, no legs, yet ſeveral of them are able, at pleaſure, to inflate themſelves, and to ſend out from the under part of the rings of their body, in that ſtate, certain membranaceous portions analogous to, and ſupplying the place of legs, and much variety is to be obſerved in the placing of theſe. Some have them arranged orderly as legs, two and two, one on each ſide of each ring; others have a ſingle range of them all along their belly, in a row down the middle. Each of theſe is ſometimes furcated or divided into two; and others have the under part of their bodies, at or near the junction of the rings, furniſhed with a ſort of hooks, very ſhort and fine, and commonly of a red colour; theſe are of great uſe to the creature in laying hold of the ſurface on which it moves itſelf. Ibid.

The differences of ſize and colour in theſe creatures, may alſo be made the baſis of farther diſtinctions; among other things, the nature and quality of the ſkins of the different kinds may alſo be conſidered, ſome being thin and tranſparent, others thick, rigid, and opake; ſome alſo being ſmooth, others rough and wrinkled, others adorned with long hairs, and finally others, as it were, armed with prickles.

Theſe are the marks and characters of the genera of the firſt claſs. Thoſe of the ſecond, which have variable heads, and differ from the former in that they have legs like thoſe of the caterpillar-claſs, have frequently a ſort of thorns or hooks faſtened to them, and though the head of the *Worms* of this claſs is truly of a variable figure, and is fleſhy, the mouth is ever ſo viſible in all its changes, that the head is eaſily known to be ſuch.

Another very obvious character there alſo is of the generality of the *Worms* of this claſs, which is, that they have a long fleſhy tail, which they can lengthen or ſhorten as their occaſions require; the reſemblance of this to the tail of a rat may probably give this genus the name of the *rat-tailed Worms*.

This tail is the principal organ of reſpiration in theſe *Worms*; its end is always open, and ſupplies the office of the ſtigmata of the other genera. Ibid.

The *fly-Worms* of the third claſs, which have their heads of a conſtant and invariable figure, and, like thoſe of other animals, have no moveable jaws, or any thing analogous to that organization; but ſuch of them as have any teeth or hooks, have all a power of drawing them into their heads on occaſion, and only throw them out when they would uſe them.

The *Worms* of this claſs have pointed heads, or ſuch as ſeem truncated, or with the end of the rays part cut off, they have no ſhelly or ſcaly legs. Theſe are a very numerous family both in the terreſtrial and aquatic kingdom, and all, as far as is hitherto known, furniſh two-winged flies.

The firſt genus of theſe may be eſtabliſhed of the ſcaly ſpecies, which have, as it were, ſcaly rings, and are rigid, and not incapable of flexion, though wholly ſo of contraction or dilatation; theſe *Worms* can turn about nimbly enough, but cannot at all lengthen or ſhorten their bodies, and thence may be properly enough called the *ſerpentine genus*.

The former genus are naturally inhabitants of the earth; thoſe of the waters give us a ſecond genus. Theſe have a merely membranaceous ſkin, and always an oblong head, and their poſterior extremity is terminated by a ſort of pipe, open at the end for reſpiration. The bodies of theſe are round, or approaching to that figure. Ibid. p. 178.

Another genus may well be eſtabliſhed of the *Worms* with heads like the former, but with flatter bodies. There are two ſpecies of this frequently found, the one in cow-dung, the other in the agarics of the ſycamore, and other trees. Theſe have their organs of reſpiration, like the reſt, in the hinder part of their bodies, and they might in many be miſtaken for the arms of the creature, by thoſe not converſant among the creatures of this claſs.

A fourth genus may be eſtabliſhed of the *Worms* of long and rounded bodies, which are ſmaller at each end than in the middle; theſe may be called the *tipulæ-Worms*, becauſe they all are transformed into flies of that claſs. The head of theſe *Worms* is ſcaly, and ſmall in proportion to the ſize of their body, and their ſtigmata are placed in the hinder part of their bodies, and ſurrounded with a fleſhy appendix. Ibid. p. 179.

There is another genus of *Worms* which transform themſelves into tipulæ, and perhaps merit a ſeparate claſs, rather than a ſubordinate genus. Theſe are altogether red, and of a bright lively colour: they have near their head two ſhort legs, which reſemble two ſtumps of arms; but the thing that, above all others, characteriſes theſe, is, that they have, near their hinder extremity, and on the under part of their bodies, four long fleſhy ſtrings, which having ſome reſemblance to the polype-fiſh, may well enough give theſe the name of the *polype-Worm*. Theſe have alſo, at the hinder part of their bodies, two cylindric pipes, which have much of the appearance of organs of reſpiration. Ibid. p. 180.

A ſixth genus may alſo be eſtabliſhed of the *water-Worms*, which are transformed into gnats. Theſe reſpire like the reſt, by means of the hinder extremity of their body, which is an open pipe; they have alſo, beſide this, another pipe, deſtined to give paſſage to the excrements, and placed under their body. Ibid.

A ſeventh genus may be eſtabliſhed of thoſe long *Worms*, reſembling the *Worms* of the tipulæ, and having a ſmall ſcaly head: Theſe live in the earth, and in cow-dung, and are covered with hairs, which give them much the appearance of caterpillars. Theſe have two ſtigmata placed in their hinder part, ſurrounded with fleſhy appendages.

An eighth genus may be eſtabliſhed of the long, white, and ſhining, but not ſcaly *Worms*, frequently found in and among muſhrooms. Theſe have their ſtigmata not placed behind, as the reſt of the *fly-Worms* have; but, like thoſe of the caterpillars, in every ring of their body.

The *Worms* of the fifth claſs, which uſually produce four-winged flies, have heads of a conſtant and invariable figure, and have two teeth, or two moveable jaws, always open and expoſed, and which are placed near the middle of the aperture of the mouth; they have no ſcaly legs. Ibid.

The ſtigmata of theſe *Worms* are placed on their ſides, and never on the hinder parts of their bodies. The flies produced from theſe are of very numerous genera, the bees, waſps, ichneumons, gall-flies, *&c.* are all of this ſort. Ibid. p. 182.

The ſixth claſs of theſe *Worms* is that of the hexapode, or ſix-legged kind, which are transformed into ſome ſpecies of the libellæ. Theſe have no mouth, but inſtead of one, have, in a manner, two, if the openings through which their aliments paſs, may be ſo called. Theſe are at the top of their antennæ, which are placed in the fore-part of their head.

The *fly-Worms* of this ſingular claſs, are but very few in number. The formica-leo, in the ſtate in which it is known by that name, is one, and the puceron-eaters are ſo many others. Ibid. p. 183.

The ſeventh claſs is of the *Worms* which have bodies long like the caterpillar-claſs, and have ſix legs; but their ſingular character is, that they have two other ſhort legs, or properly two hooks of a particular kind, placed near their hinder part, and aſſiſting them in fixing themſelves, and moving. The water-*Worms*, which make themſelves caſes of different materials, and are afterwards transformed into papilionaceous flies, are of this claſs.

Several ſmall green and yellow *Worms*, which feed on the apricock and pear-tree, and fold up the leaves of thoſe trees, tho' they much reſemble caterpillars, are alſo truly and properly of this claſs.

The eighth claſs is of thoſe *Worms* called *falſe* or *baſtard caterpillars*, becauſe the figure of their body might make them be miſtaken for caterpillars, rather than known for *fly-Worms*, by leſs curious obſervers.

Theſe have ſix cruſtaceous legs, as the caterpillars; but they have a greater number of the membranaceous ones than thoſe inſects; they have ſcarce ever leſs than ten, and often fourteen. Theſe alſo are not edged round with hooks, as thoſe of the caterpillars are; and they differ from the true caterpillars in this alſo, that their head is more round, and has only two eyes, one on each ſide; whereas the caterpillars have on each ſide five or ſix, diſpoſed in form of an arch. Ibid. p. 185.

All this claſs of *Worms*, ſo far as is yet known, change into four-winged flies; the females of which are armed with a ſaw behind. The number of the membranaceous legs being dif-

 ferent

ferent in different ſpecies of the falſe caterpillars, will very properly furniſh matter for the ſubordinate diſtinctions of the genera.

A firſt genus may be very properly eſtabliſhed of thoſe which have no more than eighteen legs in all; that is, ſix cruſtaceous, and twelve membranaceous.

A ſecond may be of thoſe which have in all twenty legs; and a third thoſe which have twenty-two legs.

The ſpecies may be ſufficiently diſtinguiſhed by their colours, and by their attitudes, which are very different in the different ſpecies, and very conſtant in the ſame: Some of them always carry the hinder part of their body elevated, others are continually rolled together; and finally, others always extended.

The greater part of the falſe caterpillars are ſmooth; but there are, however, ſome which have a very ſingular ſort of thorns, arranged with great ſymmetry.

It might perhaps not be improper to arrange the thorny ones into a diſtinct claſs, which, according to the figure and order of the thorns might be again ſubdivided into ſeveral genera. Ibid. p. 186.

Gally-Worm.	See the article	Gally-*Worm*.
Glow-Worm.		Glow-*Worm*.
Gnat-Worm.		Gnat.
Gooſeberry-Worm.		Gooseberry.
Hay-Worms.		Hay.
Horſe-Worms.		Horse.
Lyſimachia-Worms.		Lysimachia.
Muſhroom-Worm.		Mushroom.
Oyſter-Worm.		Oyster.
Pile-Worms.		Pile.
Sheep-Noſe-Worms.		Sheep.
Silk-Worm.		Silk.
Truffle-Worms.		Truffle.

Meal-Worm. There are two very different inſects found in our meal or flour; the one is ſo ſmall, that it is only to be ſeen by the microſcope; all that the naked eye can diſcover of it is, that ſomething is alive in the place, from the whole ſubſtance of the flour being in motion. See the article Flour.

The other *meal-Worm* is larger, and more frequently offers itſelf to our obſervation; it conſiſts of eleven rings, and has three pairs of legs. The mouth of this *Worm* is made into a kind of forceps, and from this ariſe, on each ſide, a great number of ſmall ſpinulæ; theſe ſerve inſtead of teeth, and the animal feeds by means of them. They are found ſometimes very ſoft and tender, ſometimes hard and firm, and at other ſeaſons they are very briſk and lively; at others they have ſcarce any life in them.

The moſt remarkable thing in regard to theſe *Worms*, is, that they are always exactly of the colour of the flour which they live among. Ray has obſerved, that the white flour breeds white ones; the coarſer flour breeds larger and greyer ones; and that flour which has the bran among it, breeds brown ones, of the ſame colour with itſelf. This is a proviſion of nature for the ſafety of the animal, ſince were it of a colour different from that of the flour, it muſt be eaſily diſcovered among it, and would be picked out and thrown away. The caterpillar tribe are thus preſerved, by being of the colour of the leaves they feed on; their green, uſually ſuiting itſelf exactly to that of the tree or plant. *Deſlandes*, Trait. Phyſ.

Worms *of the Sea*. The ſea-*Worms* are of the number of thoſe animals, which with the oyſter, and ſeveral other ſhell-fiſh, furniſh us an inſtance of animals which remain all their lives fixed in the manner of plants to one ſpot, whence there is no probability of their moving themſelves.

Theſe *Worms* are included in a ſort of caſes or pipes, and may be divided into two claſſes, according to the nature of thoſe caſes. In the one ſpecies theſe are only made of grains of ſand, fragments of ſhells, and the like, faſtened together by a viſcous humour; and in the other they are compoſed of a true ſhelly matter.

Thoſe *Worms* which have ſhelly caſes, are fixed ſometimes to the ſand at the bottom of the ſea, ſometimes to ſtones, or ſea plants, and ſometimes to the ſhells of other fiſhes; their ſhells are rounded, and, in ſome degree, conic, as they always gradually grow wider from their point or apex to the mouth; as to the reſt their ſhape is different in almoſt every individual, forming divers irregular curves, and often reſembling the ſhapes into which a common earth-*Worm* curls and twiſts itſelf in its various motions.

In order to know how theſe ſhells become ſo exactly faſtened to the bodies on which we find them, it will be neceſſary to conſider the manner in which they are formed.

The creature, when juſt produced, is covered with a ſhell; but this ſhell no longer covers its whole body; as it grows, a new ſhell is formed over this, from the condenſation of its own juices, and this fixes it down as it grows to the body, be that what it will, on which it is formed; and as the *Worm*, in its growth, twiſts itſelf variouſly about, it will be fixed down in that poſture by the new-formed ſhell which covers it, and which adheres as well to the body on which the *Worm* lies, as to the old ſhell.

The marine-*Worms* of the other kind, which are not regular ſhells, but whoſe caſes are made up of fragments of different bodies, and of grains of ſand, live in the ſame manner with the others, their whole lives in the ſame hole. Theſe creatures bury themſelves in the ſand of the ſea, as the common earth-*Worms* do in the earth; and the glutinous matter which eſcapes continually from their pores, not being either ſufficient in quantity, or of a nature to harden into a perfect ſhell of itſelf, yet ſerves to faſten together the ſeveral ſmall bodies that come into contact with it all about the body of the creature; and ſerve as a ſort of mortar to cement together a multitude of little ſtones, &c. and of this connected maſs to form a coarſe ſort of covering for the animal, which defends it from the common injuries.

The force of this viſcous or glutinous humour flowing from the bodies of theſe *Worms*, is very evidently ſeen in places inhabited by them, when left dry by the ebbing of the tide; the ſurface of the ſands, in theſe places, appears rough and ragged in a very ſingular manner. The pipes in which theſe *Worms* are lodged, are uſually placed in great numbers near one another, and their ends all ſtand out about an eighth of an inch above the ſurface of the ſand; and the reaſon of this is, that the whole ſand-bank was, when covered with the water, of a level with the mouths of theſe pipes; the ſea, in its receſs, has carried off about an eighth of an inch of the ſurface of the ſand with it; but though it has done this every where, where the ſand was looſe and free, it has not been able to do it where it was glued together by the viſcous juices of this animal, but has left ſuch part of it ſtanding out in form of pipes or caſes to the animal.

The ſtrength of this glue is alſo ſeen in the common accident of the ſeas waſhing off a piece of a ſand-bank, in which they dwell; in this caſe the fragment is found at ſome diſtance, with the interſticial ſand every where waſhed deep away from the ſurface, but with the caſes of the *Worms* remaining prominent, and being perfect and unhurt at full length, with all their convolutions.

Sometimes alſo theſe pipes or caſes are found perfectly detached from all ſandy matter, and lying looſe on the bottom of the ſea; in this caſe the glutinous juice, cementing the outer ſurface, being much weaker than that which keeps together the more internal part, much of the ſuperficial coat is often worn away; nay, ſometimes the caſes are not thicker than a piece of writing-paper, yet ſtill preſerving their whole figure. The internal ſurface of theſe pipes is always perfectly ſmooth, even, and poliſhed, which is wonderful, as they are compoſed of ſuch rugged particles as, one would think, could not eaſily furniſh a ſmooth ſurface; but doubtleſs the mucous or viſcous humour of the animal fills up the interſtices between the particles, and, by degrees, hardens ſo far as to make one even ſurface with their prominent ends.

The *Worm* which inhabits theſe caſes is of a very ſingular figure; it is about an inch long, and of the thickneſs of a large wheat ſtraw; its head is of a very odd ſtructure; it is rounded and flat, and is much broader than any other part of the body. At certain times the extremity of the head is of this round figure, and is divided into three parts; that in the middle is of an oval figure, and hollow; the next to this is a circular zone or band which ſurrounds this oval part; and the third part is another circular zone, extended behind this laſt; on both theſe zones there are a great number of lines marked, which ſeem a ſort of rays, running from the center to the circumference.

Though this is at ſome times the figure of the head; yet at others it is of a very different form, reſembling a creſcent or a horſe-ſhoe; for there is a certain part in the middle of the head, which the creature can open when it pleaſes.

A little below the head, it has three oblong ſlender bodies, which ſerve as oars on each ſide; its body approaches to a conic figure, and is terminated by a long tail; all along the body there are placed, at different diſtances, little fleſhy protuberances ſhaped like hooks, which bend toward the tail.

Theſe are placed in three ranges, and ſeem intended to ſerve the creature in the place of legs or arms, when it has a mind to move upward or downward in the ſhell.

When we conſider the effects of this glutinous juice iſſuing from the body of this animal, in faſtening together any looſe ſubſtances it meets with, ſo as to form a caſe for it, it may be eaſily ſuppoſed that the adheſion of the *balani-marini*, and other the like ſhells, which remain all their lives fixed to ſome one ſpot, is performed in the ſame manner. Mem. Acad. Par. 1711.

Water-Worms. There is a ſingular ſpecies of theſe creatures, which is found to be capable of reproduction or multiplication from cuttings, in the manner of the polype.

The diſcovery Mr. Trembley made of this ſtrange property in the polype, gave occaſion to the trying the experiment in regard to ſome other inſects. *Worms* were the moſt natural object of theſe experiments; and though they failed in many ſpecies, they yet ſucceeded in ſome, and proved, that nature has not given that amazing property of re-production of its moſt eſſential parts, to one only ſpecies of animals.

Mr. Bonet tried the experiment on a very nimble kind of *water-Worm*, by cutting it in two in the middle, and the ſucceſs perfectly anſwered the expectation; for the two pieces continued alive and vigorous, and in a little time became two complete *Worms*. The ſtructure of theſe *Worms*, though it appear ſimple to the naked eye, is very worthy the examina-

tion

tion of the microſcope, and when viewed with this aſſiſtance there are diſcovered in it parts extremely deſerving our attention. Phil. Tranſ. N°. 469. p. 470.

They are of a reddiſh brown colour, and of about two or three inches in length; their thickneſs is that of a common wire; they are compoſed of a ſeries of membranous rings, which continually decreaſe in thickneſs as they approach the extremities. Each of theſe rings has on its under part four, five, or ſix whitiſh ſpines, ſupplying the place of legs; and the clearneſs of the ſkin gives a happy opportunity of ſeeing the muſcular ſtructure of the body, every ring being compoſed of a great number of annular or circular muſcles, placed cloſe by one another.

The head is of no determinate figure, but the creature ſtretches or contracts it in length and breadth at pleaſure; and ſometimes it ſhews two ſmall round elevations, placed one on each ſide the head, which might be very eaſily taken for eyes; the extremity terminates in a point, that the creature may be the more eaſily able to pierce into the mud. The mouth is placed in that part where the head is largeſt, between the two elevations before-mentioned; this is terminated by two brown ſtrokes, and is of the figure of a creſcent. But when the mouth is opened, it appears an aperture of a circular figure, and is ſurrounded by a thick and ſtrong muſcle. This muſcle is of great ſervice to the animal alſo in its progreſſive motion, as it lays firmly hold of any ſmooth ſubſtance, and the animal is then able by means of its annular muſcles to draw up its whole body to that place: At the other extremity of the body, there is an oblong opening which ſerves as an anus.

There is nothing, however, more remarkable in this creature, than the great artery. This veſſel in caterpillars, and in many other inſects, runs all along the back; and is, by Malpighi, called a chain of hearts: But in this *Worm* it is folded in different degrees, in the different parts; and is in a manner only a long ſeries of folds, or doublings from one end to the other. Through theſe crooked paſſages there creeps along a liquor analogous to blood, and every moment a drop of it may be traced running up from the tail, and loſing itſelf in the brain; and it is eaſy to trace this moſt part of its way, by reaſon of the contraction and dilatation of the rings which follow one another ſucceſſively as it paſſes. Phil. Tranſ. N°. 469. p. 471.

It ſeems indeed that every portion of this artery, contained in the compaſs of one of the rings, is a true heart, which puſhes on to the next heart that drop of liquor which it had juſt before received from the preceding one; and the continual repetition of the ſyſtoles and diaſtoles in ſuch a ſucceſſive train of hearts, is an object that may be viewed a long time with pleaſure. It is beſt of all perceived in the middle of the body, where both the rings and the hearts are largeſt, and conſequently the motions moſt eaſily diſcernible. About the fifth or ſixth ring from the head this artery or chain of hearts becomes a ſmall and delicate filament, and from thence to the head diminiſhes in thickneſs, till it is wholly loſt near the mouth; but what is very obſervable, is the ſwiftneſs with which the blood is driven on in this part. Toward the tail the artery is alſo ſmall, and the alternate motion of the ſeveral portions of it confound themſelves together, ſo that the regular contractions and dilatations are not ſeen here, but only a ſort of undulatory motion of certain clouds of a fluid as it were ſucceſſively rolling one over another, but this with great regularity.

Under every junction of the rings there are to be ſeen ſmall veſſels dividing themſelves into numerous ramifications, all theſe ſeem to be branches propagated from the principal artery.

All along, and immediately under this artery, is extended the channel of the inteſtines; this would not be very viſible in itſelf, but the terreſtrial matter with which it is filled, uſually makes it eaſily diſtinguiſhable: This is furniſhed like the inteſtines of larger animals with different orders of muſcular fibres, which ſerve to protrude the remainder of the food; and this operation is alſo by means of the great tranſparency of the creature's ſkin, eaſily ſeen as it paſſes within the body.

It appears very evidently, from the contents of the ſtomach, and bowels of this animal, that it receives earth or mud into its body, and has its nouriſhment from it. Together with this earth it alſo ſometimes neceſſarily receives ſome bubbles of air; and as the air in the body of fiſhes ſerves them very greatly in raiſing and ſinking their bodies at pleaſure, ſo in the bodies of theſe *Worms* the air is not without its effect, but this is generally too powerful for the creature.

The bubbles of air are eaſily diſcerned in the body of the creature, and when they are in any great quantity they bring up the animal againſt its will, and all its ſtrength will not ſerve to carry it to the bottom; but it floats on the ſurface, till it has diſcharged a part of this troubleſome matter. This appears no eaſy thing for the creature to do, but there is often a great ſtruggle ſeen within its body, as it lies upon the ſurface of the water; the bubbles being driven toward the anus, and again forcing their way up to the head ſeveral times together.

Upon theſe *Worms* Mr. Bonet tried the experiment of cutting, in the manner of the operation on the polype, with ſucceſs. He divided one of them into two halves, and putting the ſeparated pieces into a glaſs of water; that half which had the head on it moved about, and ſeemed in all reſpects as well as before; but what was much more remarkable was, that the other half which had no head moved about and reſted occaſionally, and ſeemed to perform all its operations in the ſame manner as if it had one. It is obſerved of the pieces into which an eel is cut, or the tail of a ſerpent or lizzard, that they all move about a long time afterward; but their motion may always be ſeen to be irregular and convulſive; on the contrary, the motion of this part of the *Worm* ſeemed as regular as ever, and it made its way with tolerable ſwiftneſs, and that in a voluntary manner; the principle of life and motion ſeeming not to have been deſtroyed in it. If it met with any obſtacle in its way, it would ſtop and turn; and if ſet in the ſunſhine, it was plainly affected by the heat, and became more vigorous and moved more briſkly; and if a piece of ſtick was brought near it while it lay quiet, it would immediately ſtart and make its way as faſt as it could from it. Phil. Tranſ. N°. 469. p. 474.

On the third day ſome weeds and mud being added to the water, the half which had the head immediately plunged itſelf into the mud, but the other half only hid itſelf among the weeds; and at the cut end of this there was at this time very diſtinctly ſeen a tubercle, which looked like the knot of a branch of a tree; and at the end of a week each end was become perfect, and the two halves were two abſolutely perfect *Worms*. The new head of the one, and the new tail of the other, were perfectly the ſame with the old ones; and the ſtomach, the grand artery, and other parts had prolonged themſelves in a neceſſary manner.

After this experiment, the ſame obſerver cut other *Worms* of this ſpecies into four, eight, and as far as fourteen pieces; and moſt of theſe in a few days got new heads and tails, and became perfect animals. The ſeaſon of the year in which theſe experiments are made is of great conſequence, in regard to their ſucceſs; for in ſummer very few of the pieces fail of becoming perfect animals, even though one *Worm* be cut into near thirty pieces; but in winter many fail. Ibid. p. 475.

The ſecond or third day after the cutting produces the new heads and tails in ſummer, and in winter it is often ten or twelve days before they appear: The head always ſhews itſelf firſt, and lengthens itſelf continually for the firſt or ſecond week after its firſt appearance, and then it ceaſes to grow, having by that time arrived at a ninth part of an inch or thereabouts; this however is not, properly ſpeaking, the length of the head alone, but compriſes the rudiments of five or ſix rings which are annexed to it.

The tail does not begin to grow ſo ſoon as the head, nor does it ſtop its growth ſo ſoon, but continues increaſing in length from day to day for a long time; and in a few weeks the pieces of the middle part of a *Worm*, which were not originally above a ſixth part of an inch in length, will become perfect *Worms* of two inches.

Some of the pieces of the ſame *Worm* will grow longer and faſter than others; and, in general, the ſmalleſt or ſhorteſt pieces of the *Worm* do not grow ſo quick as the longer ones.

The ſeveral pieces cut from different parts of the ſame *Worm* alſo make a very different progreſs in their growth; but, in general it appears, that thoſe pieces which were cut off near the tail grow more ſlowly than thoſe from any other part. The laſt fragment, or that which contains the tail of the animal, grows the moſt ſlowly of all; and the head-end, which might be expected to grow as remarkably quick as this does ſlowly, does indeed exceed many of the parts in this particular, but is not always the very quickeſt of all.

There are ſeveral neceſſary circumſtances to be obſerved, in the progreſs of theſe operations; the moſt neceſſary of all is, the allowing the creatures food; as it appears plainly that they feed on mud, there ſhould always be a proper quantity of this added to the water in which the pieces are preſerved, for otherwiſe thoſe which ſeem to promiſe the faireſt for becoming perfect *Worms*, will often very ſoon periſh, merely for want of nouriſhment to ſubſiſt on, before they can grow to perfection.

Dr. Hales, in his vegetable ſtatics, relates a curious experiment, by which it is proved, that the bones of animals when they are oſſified to a certain degree, do not grow any longer, except at their extremities; and the caſe is the ſame, in regard to theſe *Worms*; for the old piece, which is the middle of the animal never lengthens itſelf, but the addition of new rings to each end make the increaſe of length in the *Worm*.

In all theſe pieces the liquor, which ſerves as blood to the animal, is found circulating from the tail-part towards the head, in the uſual way; and by this motion of the blood it is,

it is always eafy to know, even in the fmalleft pieces, which is the head and which the tail-end, and the new head and tail are always feen to come regularly from the proper ends. Phil. Tranf. N°. 469. p. 479.

Generation of WORMS. See the article GENERATION.

WORMS, in phyfiology. Many effects have been by the ignorant attributed to *Worms*, in which they have had no fhare; and many things called *Worms*, have no right to that name.

We to this day vulgarly call the little black prominent fpots in people's faces, *Worms*; but they are not fo, nor any thing living. We owe the true knowledge of thefe to the fagacious Mr. Lewenhoek, who, examining them by the microfcope after taken out of the face, found them only to be bundles of hairs or imperfect hairs in fmall portions enveloped in thin films; in fome, the fragments of hairs are evident, being ftrong and rigid; in others, they feem foft and pulpy.

Thefe *Worms*, as they are called, ufually appear as black fpecks, fometimes lying even with the reft of the furface of the fkin, fometimes rifing above it; the hairs in each of thefe are from twenty to forty, in number. Their roots ufually lie irregularly, one deeper than another; but their extremities ufually are even. The deeper the *Worms* lie, the more difficult they are to be got out, and the fewer hairs they contain; fo that they are beft obferved when taken from near the furface of the fkin, and when taken from people who have the blackeft hair, as they are moft diftinctly difcernible in thefe, from their ftrength and the difference of colour between them and their inveftient membranes.

It may always be known alfo when there are hairs in one of thefe *Worms* fit to be examined, for if there are, the *Worm* is rigid, and comes out ftrait; but if not, it comes out bent.

The make and conformation of thefe *Worms*, as they are called, is probably in this manner. When the root of a hair being deep in the fkin fupplies fo much nourifhment as to make the hair grow out and appear on the face, the upper part of the hair by rubbing, or fome other violence, comes to be broken off, the lower part of the trunk of it ftill remaining in the fkin, the nourifhment afterwards fupplied to this part for hairs does not tend to lengthen out the broken one, the fummit of that being ftill liable to the fame continual accidents; but new ones are propagated by its fide, which being alfo broke off when they come to the furface, new ones are again formed and grow to the fame length, till from the bafis of what nature intended for one hair we fee thirty or forty; but this is probably not foon effected, but is the bufinefs of feveral years, in all which time the clufter of hairs is fuppofed to be an animal, and the *Worm* is faid to be growing. The hairs growing on all parts of the body are fharp-pointed at their natural ends, but thofe fhort ones which make up thefe *Worms* are always blunt at the end.

WORMS, in medicine. There are a great variety of medicines given for deftroying the *Worms*, which breed in human bodies; but as they are of very different kinds, there is great caution required in felecting fuch as are moft proper for each peculiar cafe.

Acids, in general, are efteemed good in thefe cafes; and lemon-juice, vinegar, and other vegetable acids, fuch as pomgranate and currant-juice, and the like, are given; and fometimes the mineral ones, as the fpirit of vitriol, fulphur, and the like. All thefe are properly given when there is a preternatural heat, and feverifh difpofition; for they not only allay the heat, but refift putrefaction.

Bitters in general are alfo reckoned among the medicines good againft *Worms*; of this kind are wormwood, fmall centaury, rue, and the like; and to thefe are to be added the purging bitters, fuch as rhubarb, aloes, and coloquintida. Thefe medicines do not act merely as bitters; for it is well known, that many infects will endure the bittereft fubftances unhurt, and *Worms* will breed in the gall bladder; but they correct and alter the crude and vifcid matter in the inteftines by which thefe animals are nourifhed, and by ftimulating the fibres of the inteftines they often difcharge the noxious matter, and *Worms* themfelves with it. They alfo correct the inactivity of the bile, which in children and perfons of moift habits is the general caufe of the breeding and living of thefe infects.

Oily medicines of all kinds are by fome greatly extolled in cafes of *Worms*; and there feems this reafon for it, that all infects are deftroyed by being put into oil, and that flies and many other fmall animals, which, after feeming dead, on the being immerfed in other liquors, would come to life again, on being expofed to the folar rays, never revived again after being drowned in oil. To this it is to be added, that very good effects always follow the giving oils, in cafes of the greateft torment from *Worms*. It is not to be fuppofed however, that the oil acts by covering and drowning the *Worms*, fince to this purpofe there muft be as much fwallowed as would fill the whole inteftinal canal; but this cannot be. Oils therefore plainly act in this cafe on the fymptoms, not on the caufe; and relax the fpafmodically contracted coats of the inteftines, and as it were defend and line them with a fort of mucilage, in fuch a manner that the more acrid purging medicines neceffary to the utter deftruction of the animals themfelves, may be given with more fafety. Thus it is a very good method to give a child over night half an ounce or more of oil of fweet almonds, and in the morning following a brifk purge of the refin of jalap, mercurius dulcis, or any thing elfe of this kind.

Saline fubftances in general are alfo greatly celebrated by many in cafes of *Worms*, and they are indeed capable of acting in a double capacity againft them, at once deftroying the tender ftructure of many of them, and vellicating the inteftines fo as to promote the difcharging them. The common bitter purging falts, as the glaubers falt, and the natural falt contained in the purging waters of different places, which is indeed glaubers falt alfo in its origin as well as qualities, are the beft of all others for this purpofe; if the natural waters are drank, it fhould be in confiderable quantities; and if the factitious falt be taken, it fhould be diffolved in large portions of water.

Many people who live on the fea-coafts give their children fea-water, for the fame purpofe; and fome ufe the broth of recent oyfters with pepper and other fpices, and lemon-juice. Salts of the vitriolic kind have alfo long been celebrated as remedies for *Worms*; and the common falt of fteel, as alfo the Pyrmont waters, which are highly impregnated with particles of that metal, are found very ufeful in all cafes of this kind.

But if any diforder admits of fpecific remedies we might expect that this malady would; for thefe purpofes many extol fome of the gums, as affa-fœtida, galbanum, and myrrh, and the leaves of fome plants, as wormwood and tanfey. Onions and garlick are alfo greatly commended; and bitter almonds and wormfeed, have long been famous. All thefe are found peculiarly deftructive of *Worms*, and no method of cure fucceeds well in which one or other of thefe has not a fhare.

Among the minerals, we find alfo one remedy greater than all thefe, that is quickfilver; this has been given in many various forms, and found more or lefs fuccefsful in all. Water, in which crude quickfilver had been boiled, was firft given by Helmont, and that with great fuccefs; after this Meiboom infufed crude mercury in rhenifh wine, and found this more effectual than the former. But the moft fuccefsful method feems the giving proper dofes of mercurius dulcis, with fome purging medicines, as the refin of jalap.

Æthiops mineral, which is a mixture of quickfilver and fulphur, is found alfo of great ufe; and quickfilver rubbed to a mixture with fugar-candy, is preferred by Hoffman to all the other preparations. After a cure by thefe means, the patient fhould be prevented from a relapfe, by abftaining for a time from flefh and fifh; and, after this, from milk and cheefe. Acrid purgatives, or hot remedies are never to be given, where there is any febrile heat; and when there is caufe to fufpect that the duodenum is full of an acrid bile, then mercurials are to be avoided; as are all the draftic purges; for thefe medicines, in thefe circumftances, often bring on inflammations of the bowels.

Before the expelling the *Worms* from the fmall inteftines, it is proper to give glyfters of milk and honey, to allure all the worms together to that part. In cafes of the afcarides lodged in the inteftines, glyfters of milk with tanfey, garlick, and fcordium boiled in it, have great effects; and glyfters of brine, or falt and water with aloes added to it, are alfo found of great benefit; as thefe troublefome *Worms* are ufually lodged in the rectum, thefe glyfters take immediate effect.

It is proper alfo to give a vomit during the courfe of cure, to diflodge fuch *Worms* as may have got into the inteftinum cæcum, fince purging medicines cannot reach them while they remain there. External applications alfo of bulls gall, aloes, and coloquintida, are of fervice laid in form of a cataplafm to the belly. *Hoffman*. Oper. T. 4.

Tin is often recommended as a good remedy againft *Worms*, particularly of the flat kind. Dr. Alfton, in the Med. Eff. Edinb. Vol. 5. Art. 7. directs an ounce and an half of the powder of pewter-metal to be mixed in half a Scotch mutchin, or about half a pint Englifh meafure of treacle, for children; but to grown perfons, he gives two ounces of the powder of pure tin, put through the fineft hair-fieve, and mixed with eight ounces of treacle. As to the adminiftration of this medicine, the original receipt directs half of it to be taken the Friday before the change of the moon; the day after, half of the remainder; and the reft on Sunday. On the monday a purge is to be taken. The doctor thinks there is probably nothing in the particularities of the day; but fays, the medicine fucceeds well in feveral fpecies of *Worms*.

The Memoirs of the French Academy give a very remarkable account of an obftinate pain caufed by a *Worm*, in a place where few perfon, would have fufpected fuch an animal for the caufe of it.

A woman of thirty-fix years old, who had not in any part of her life been fubject to the head-ach in any particular degree,

gree, found at this time a very violent and intolerable pain feize her on the lower part of her forehead toward the right fide, and very near the top of the nofe. This held her a long time, and in the fpace of two years extended itfelf to the temples on the fame fide. It now became continual alfo, whereas before it had had intermiffions, and grew more and more violent; fo that, in fine, it was attended with convulfions, and with a great difordering of the patient's fenfes during its more terrible agonies.

Many medicines were tried, but all in vain; and after four years fpent in fruitlefs attempts for a cure, fhe left off all medicines, and only kept to a regular courfe of life, and to the taking much fnuff; from which fhe ufually found eafe. One morning, after taking fome fnuff, fhe fneezed violently, and threw out of her nofe a *Worm* wrapped up in a mafs of a pituitous matter, tinged with a little blood. She was frighted at the fight, but fhe found herfelf cured in a moment. The noftril on that fide bled a little for two or three days, and in that time her reafon which had been much difturbed, became perfectly calm and fettled as before.

The fize of this *Worm* was very extraordinary; it was thin, its utmoft breadth or thicknefs not being fo much as half a quarter of an inch: It ufually curled itfelf into feveral bendings; for it was difcharged alive, and feemingly hearty, and in this ftate was ufually about two inches long; but when it extended its body to its full length, it was not lefs than fix inches. It was fomething thicker in the middle than at either end, and was of a clear deep brown; its back was rounded or convex, and its belly flat; and it was covered all over, except on the head, with large and regular fcales; thefe were evenly difpofed, and from between thefe there grew on each fide fifty-fix legs; thefe were as fine as a hair, and about one twelfth of an inch long.

The creature feemed therefore of the centipes kind, and in examining the head there were eafily difcovered the two eyes, two horns, and a pair of forceps made up of four arms; and the tail was armed with two points, longer, thicker and fharper pointed than the legs. After examination it was put into an empty phial, where it remained alive eighteen hours; at the end of which time they poured fome fpirit upon it to preferve it, and it lived and crauled about in this two hours.

The feat of the pain fhews very plainly, that the *Worm* muft have lived in the cavity of the frontal finus. This finus is about two inches long, and three quarters of an inch broad, and therefore might very well contain a *Worm* of this fort in a bended pofture; and this feemed to have been accuftomed to that pofture, by its naturally bending and folding itfelf up, when at its liberty. There is between this finus and the noftril naturally a fmall hole, by which they communicate and by which the finus admits the air at every infpiration; and it is not impoffible, but that a ftrong fnuffing in the air at fome time might have carried into this finus with it the egg in which this little animal was inclofed.

It is poffible indeed, that the egg might be lodged here by the round of circulation, but this feems much lefs probable; and it feems very certain that, however it got in, it was by this paffage that it finally got out: It is true, that the cavity is naturally too fmall to have given fo large a creature paffage, but it is eafy to conceive that the creature might have gnawed it larger.

It is plain, that the egg when once received into the frontal finus, muft find there every requifite for its coming to perfection; warmth and humidity, there was very fufficient; and when the creature was hatched, the juices excreted there might ferve it abundantly for nourifhment, infomuch that it plainly grew much larger than it would have done if hatched on the earth in the common way, and lived a longer time than its fellows on earth ufually do, a life of four years free from accidents, and finely cherifhed.

This was its ftate; but what, alas! muft have been that of the patient? The membrane of the finus being continually wounded by the forceps; the points at the tail, and no lefs than an hundred and twelve legs probably almoft always in motion; every particular fibre of this membrane muft have had its wound, and the complaint could not but grow worfe as the creature increafed in fize, and as it was irritated by the frequent ufe of the fnuff; tobacco being a fmell hateful to almoft all animals.

From the fymptoms of this patient, it will be eafy to know any like accident that may hereafter happen, in which cafe it would be adviseable to ufe fnuff or tobacco in any fhape; to take internally fuch medicines as are known to deftroy *Worms*, and to fnuff ftrongly up the nofe fuch acrid and acid liquors as the patient could bear, and as might incommode the animal. Oil is a perfectly innocent medicine to us, yet is deftructive of moft animals; this therefore fnuffed up alone, might work a cure; but if all thefe means fail, it would be very eafy and very fafe for a furgeon to make an incifion into the part, and remove the noxious infect. Mem. Acad. Par. 1708.

We have accounts in the Acta Leipfienfia, of *Worms* not only voided by urine, but let out of the veins in blood-letting; but there want more teftimonies of fuch marvellous things to procure them a general belief.

WORM, in gunnery, is a fcrew of iron to be fixed on the end of a hammer, to pull out the wad of a firelock, carabine, or piftol; it is the fame with *wad-hook*, only the one is more proper for fmall fire-arms, and the other for cannon.

WORM-*Seed-green*, a name given by authors to a feed of the fantonicum kind, little known among us, but called by the generality of authors *chouan*.

WORM-*Tincture*, in chemiftry, a name given by many to a medicine prepared by Hoffman, from earth-*Worms*; and in many parts of Germany efteemed one of the greateft medicines in the world, though lefs known in other places.

The preparation is this: the *Worms* are to be collected in the fpring or fummer months, and the larger fort are the beft. They are to be carefully dried, and reduced to a fine powder; this powder is to be mixed up into the confiftence of a pultice, with oil of tartar per deliquium, and this is to ftand twenty-four hours; then fpirit of wine is to be poured on it, fo as to reach three fingers breadth above it, and a dram of faffron and half a dram of caftor, are to be added, and the whole is to ftand three days in infufion, and after this be filtred off for ufe Some add a fmall quantity of opium to the tincture, but as it is often wanted in cafes where opium is not proper, it is better to keep it feparate thus made; and when there is occafion to have it opiated, to add as many drops of laudanum as is judged neceffary.

The oil of tartar in this cafe penetrates the very innermoft ftructure of the *Worms*, and is a means of the extracting fuch a tincture from them, as no art could otherwife contrive to make; and the medicine becomes, according to Hoffman, much more an anodyne, from the admixture of the falt of tartar in the tincture.

When it is intended to be made with opium, it is always proper to add alfo fome of the hound's-tongue-root, which is found as an anodyne to emulate the virtues of opium.

This tincture, which ever way prepared, is excellent in abating the pains of difeafes, that do not admit a cure. The fits of the gout are rendered eafier by every dofe of it; and even in cancers, the pain is quieted in a wonderful manner by it, and life rendered much more fupportable. *Hoffman's* Act. Labarator. Chym.

WORM-*wood*, *Abfynthium*, in botany, the name of a genus of plants, the characters of which are thefe: The flowers are fmall, but of the flofculous kind, being compofed of feveral flofcules divided into many fegments at the edges, and ftanding upon the embryo-feeds, and contained in a fcaly cup. The embryos ripen finally into feeds, not winged with down.

The fpecies of *Wormwood*, enumerated by Mr. Tournefort, are thefe: 1. The broad-leaved tree *Wormwood*. 2. The Pontic *Wormwood*, or the Roman *Wormwood* of Diofcorides. 3. The mountain-Pontic *Wormwood*. 4. The Cretic *Wormwood*, of a pleafing fmell. 5. The fine-leaved hoary Pontic *Wormwood*. 6. The Pontic *Wormwood*, with purple ftalks, and finely divided leaves, green underneath. 7. The Auftrian fine-leaved Pontic *Wormwood*. 8. The procumbent or creeping Pontic *Wormwood*. 9. The infipid tafted *Wormwood*, refembling the common kind. 10. The fea *Wormwood*, with lavender leaves. 11. The fea *Wormwood*, with the upper leaves divided into fegments. 12. The German fea *Wormwood*. 13. The Dutch fea *Wormwood*. 14. The broad-leaved fea *Wormwood*, of an agreeable fmell. 15. The French fea *Wormwood*. 16. The French wormfeed *Wormwood*. 17. The white mountain *Wormwood*. 18. The hoary Alpine *Wormwood*. 19. The dwarf white Alpine *Wormwood*. 20. The annual corymbiferous *Wormwood*. 21. The long-flowered Spanifh white *Wormwood*. 22. The Spanifh fea *Wormwood*, with a rounder flower, and with the fmell of wormfeed. 23. The fweet-fmelling *Wormwood*, with an elegant fpike of flowers. 24. The African-tree *Wormwood*, with hoary vermiculated leaves. *Tournef.* Inft. Botan. p. 457.

The common *Wormwood* is one of the fineft medicines we know, as a ftomachic and hepatic. It greatly ftrengthens the ftomach, opens obftructions of the liver or fpleen, promotes an appetite, and deftroys worms.

The leaves and tops before the plant is in flower, are the parts of it moft ufed; they are to be dried and given in powder, or in a light infufion. Their virtues in the jaundice and dropfy, are very great. They are alfo given by fome in putrid fevers. Many naufeous infects are deftroyed, or driven away by the fmell of this plant; and it is no uncommon practice among the good women in the country, to preferve their cloaths from moths, by laying bundles of dried *Wormwood* among them.

The Roman and fea *Wormwood* have much the fame virtues with the common kind; but they are lefs naufeous to the tafte, and therefore are generally ufed inftead of it. The true Roman *Wormwood* is very fcarce among us. What we buy under its name, is ufually *abfynthium feriphium*, or common fea *Wormwood*.

Our brewers have fome of them a method of ufing *Wormwood* inftead of the hops, to give the bitter tafte to their malt-liquors, and to preferve them: It is found to anfwer the latter purpofe very well; but the tafte is fo difagreeable,

that

that it is much complained of. The reason of this is, that the people who use it do not understand the time of gathering it.

All plants are fullest of juice while in the shoot, but fullest of virtue when they have their seeds on them. This is the case with *Wormwood*, as well as a thousand others; and though it in the feeding-time produces much more flavour than when younger, yet it is without that nauseous bitter of the crude juice, which gives us the distaste to the plant.

Some people have found the proper way of managing *Wormwood*, and have given a flavour with it to their malt-liquors, even preferable in the opinion of all palates to that given in the common way by hops.

The method is this: The plant is to be gathered when fully ripe and the seeds upon it, and in this state hung up in small bunches to dry. When thoroughly dried, a certain quantity of good strong malt-liquor is to be impregnated with it, to the utmost strength that it can possibly give it. This is to be set by for use, to add to all the rest.

When the hops should in the common way be added to the beer, this liquor is to be added in a proper quantity, making the taste the judge when there is enough of it.

By this means just what degree of bitter is required may be given to the liquor, and the bitter of this common plant thus managed, is as perfectly agreeable as that of any vegetable in the world.

The *Wormwood* for this purpose should have its seeds carefully preserved in the drying, and it is best if not used till the year after it was gathered. Phil. Transf. N°. 124.

Many people who have been fond of the virtues of *Wormwood*, but disgusted at its nauseous bitter taste, have attempted the divesting it of its taste, and yet preserving its qualities; but it being as a bitter that this plant acts in many cases, it is an evidently absurd scheme to take away that quality on which its virtues depend, in order to the rendering them less disagreeable to the palate.

The essential salt of *Wormwood* is afforded in great quantity, and possesses in many respects the virtues of the plant; this is a form in which it were to be wished, that not only this, but many other medicinal plants were more often given.

Wormwood shares with all other bitters the virtues of an abstersive deobstruent, and is in some degree purgative as all bitters are. *Wormwood* is one of those plants which the chemists have generally chosen for their processes of the resuscitation of plants from their ashes; and though the pretended principles of this art are false, yet there have been some of the artists so cunning to form representations of this plant, that have deceived and puzzled the greatest unbelievers, though they have not convinced them. Phil. Transf. N°. 74.

WORMS *Wood-fly*, in natural history, a very small black fly, found on the stalks of the common *Wormwood* in June and July.

WORRALL, in zoology, an animal of the lizzard kind, of about four feet long and eight inches broad, with a forked tongue, which it puts out like a serpent, but without teeth. It is a harmless animal, and feeds only on large flies, and the smaller species of lizzards. It is found in Ægypt only during the hottest months, and principally frequents the grottos and caverns in the mountains on the west of the Nile, where it sleeps during the winter season.

It is said to be greatly affected by music; but experiment shews this to be an erroneous opinion. *Pocock*'s Ægypt. Vol. I. p. 208.

WOUGHS, in mines, are the walls or sides sometimes of hard stone, and sometimes soft; when soft, the miners say they are rotten: These are the bounds of an entry. Betwixt them all sorts of earth, stones, and ore lie; or, as philosophers say, grow. *Houghton*'s compl. Miner, in the Explan. of the Terms.

WOUND (*Cycl.*)—There is nothing will give a truer light into the nature and consequence of a deep *Wound*, than a due consideration of what natural actions of the body are impeded thereby. For instance, in *Wounds* of the breast, when the patient draws his breath with shortness and difficulty, and is at the same time attended with an hæmoptysis and hiccough, we may rationally conjecture that the lungs, or the diaphragm are wounded; so in *Wounds* of the abdomen, when chyle is voided, it is a plain indication that the stomach, small guts, or lacteals, are wounded: When excrements pass by the *Wound*, the great guts are wounded. In the same manner, bilious blood shews the liver or gall-bladder to be divided: If urine passes by the *Wound*, the urinary bladder or else the ureters are wounded; but bloody urine denotes a blow on the kidneys, or a *Wound* of the bladder. But when there are large profusions of blood this way, it is a sign that some of the larger blood-vessels are wounded: Vomiting of blood, declares the stomach to be the injured organ: Violent pains, attended with convulsive twitches, shew that a nerve is wounded, or else that some foreign substance is left in the *Wound*. Whenever the senses are disordered after a *Wound* received on the head, a concussion of the brain is much to be feared. Difficulty of breathing, pains in the breast, and hiccoughing, are symptoms of a *Wound* in the diaphragm. It is of bad consequence for a *Wound* to be attended with a large tumour; but it is of the last consequence if it is attended with no degree of tumour at all; the first is an indication of great inflammation; the last of mortification; some degree of tumour is always therefore best in *Wounds*.

WOUNDS *naturally, and necessarily mortal.* We properly style those *Wounds* mortal which are not to be remedied by all the art and industry of man. Thus *Wounds* are of this kind which are attended with so violent an hæmorrhage, as to produce instant death: of this sort are reckoned *Wounds* that penetrate the cavities of the heart, and all those *Wounds* of the viscera, where the large blood-vessels are opened; such are large *Wounds* of the lungs, liver, spleen, kidneys, stomach, intestines, mesentery, pancreas, uterus; of the aorta, of the iliac, cœliac, renal, mesenteric, and carotid arteries, especially if they are wounded near their origin; of the subclavian also, or vertebral; of the vena cava, the iliac vein, the internal jugular, vertebral; renal, mesenteric of the vena porta, and of the larger veins that lie deep in the body, because their situation will not admit of proper applications to restrain the flux of blood. Heister therefore reckons, very justly, these among the *Wounds* that are absolutely incurable, since they are not remediable either by astringents, ligature, or fire.

Those *Wounds* also are not less mortal than the former, which obstruct, or entirely cut off the passage of the animal spirits to the heart; such are *Wounds* of the cerebellum, of the medulla oblongata, and some violent strokes of the brain itself. There is reason to appreheud very great danger, when the small veins or arteries, which are contained in the cranium, are injured; for the blood flowing from them into the internal sinuses of the brain, either produces too great a pressure upon those very tender parts of the brain, and so obstructs the course of the blood and spirits; or else, being corrupted, it putrifies the brain itself, if it cannot be evacuated by the assistance of the trepan, which is the case when this accident happens at the lower part of the cranium, or in the sinuses of the brain; nor is there less danger where the nerves, which tend to the heart, are wounded, or entirely divided; for, after this, it is impossible for the heart to continue its motion.

To this class are to be referred also all *Wounds* which entirely deprive the animal of the faculty of breathing: there is therefore great danger where the aspera arteria is intirely divided; for where it is only divided in part, it may be healed again by the assistance of an expert surgeon: to this place also belong violent shocks of the bronchia, mediastinum, and diaphragm, especially the tendinous part of it.

Those *Wounds* also which interrupt the course of the chyle to the heart, are no less incurable than the former; such are *Wounds* of the stomach, intestines, receptacle of the chyle, thoracic duct, and larger lacteals; to which may be also added *Wounds* of the œsophagus, if they are large; though death is not so sudden an attendant on these *Wounds*; but, for want of nourishment, the persons afflicted by them are weakened by degrees, and at length die consumptive.

In this account those *Wounds* also are not to be omitted, which are inflicted upon membranous parts, that are situated in the abdomen, and contain some secreted fluid, as on the bladder, either of the bile or urine, the stomach, intestines, receptacle of chyle, and lacteal vessels. The fluids contained in these parts, when once they are let loose into the cavity of the abdomen, cannot be properly discharged, and therefore easily corrode the internal parts of the body; and the membranes that contained them are generally so fine, that they will not admit of agglutination, especially since no medicine from without can be applied. A few indeed have recovered after slight *Wounds* in these parts; but since the number of these instances is but few, and the cure in them has been accidental, and not performed by the surgeon's art, these may very justly be added to the list of mortal *Wounds*.

WOUNDS *mortal by Neglect.* Many *Wounds* there are which, though the experienced surgeon could remedy, yet prove fatal, if neglected, or left to nature: Of this number are those which produce instant death, unless relieved by present assistance; such are *Wounds* of the larger external blood-vessels, which might be remedied by ligature, by the application of astringent medicines, or the actual cautery. Of this kind are *Wounds* of the brachial, or crural artery, unless they are too near the trunk of the body; *Wounds* in the large arteries of the cubit, or tibia; of the branches of the external carotid, or temporal artery; to these also may be added *Wounds* of the jugular and other veins, situated upon the external parts of the body; but in these cases no help can be given, unless the surgeon be brought before there has been a vast profusion of blood. *Heist.* Surg. p. 30.

WOUNDS *mortal by Accident.* *Wounds* are properly said to become mortal by accident, where the patient's death, from them, is occasioned either by the ill conduct of the patient himself, or by the neglect or ignorance of his surgeon, the *Wound* itself being of the number of those deemed curable by the judicious practiser. Under this head are to be reckoned those *Wounds* which the surgeon has neglected to cleanse sufficiently, though he had it in his power to do it; as when some foreign body, which might easily have been extracted, is

is left in the *Wound* by the careleſſneſs of the ſurgeon, and produces inflammations, hæmorrhages, convulſions, and finally death itſelf. So in *Wounds* of the thorax and abdomen; if the ſurgeon does not uſe his utmoſt diligence to evacuate the grumous blood, it will corrupt there, and by drawing the neighbouring parts into conſent, will expoſe the patient to death: great care muſt therefore be taken that the lips of the *Wound* do not cloſe, till the blood, which is collected in the cavity of the body, be all evacuated, if poſſible, which will be perceived by the difficulty of breathing, and other bad ſymptoms going off; but if any of the larger internal veſſels are wounded, then all attempts to diſcharge the blood are vain; for the violence of the hæmorrhage takes off the patient.

Wounds are alſo to be accounted mortal by accident, which are treated or ſearched in too rough a manner by the ſurgeon; for if *Wounds* are handled roughly which are full of nervous parts, or of large blood-veſſels, there is great danger of bringing on hæmorrhages, convulſions, inflammations, gangrenes, and finally death itſelf.

The caſe is alſo the ſame in external *Wounds*, which are ſlight of themſelves, but under which the patient is loſt by the inflammation which is brought on, and increaſed by the ſurgeon's injudicious treatment; or when any one is taken off by the violence of the hæmorrhage, from a *Wound* of the hand or foot; for, in this caſe, the ſurgeon might eaſily have ſtopped the blood, by the application of proper remedies, or by ligature: Or, when the patient is guilty of any intemperance, either in eating or drinking; or of any exceſs of paſſion; of expoſing himſelf to the cold air, or of uſing violent exerciſe; for by theſe means *Wounds*, more eſpecially thoſe of the head, by being liable to freſh hæmorrhages, and other dangerous accidents, frequently become mortal, nowithſtanding that they naturally would not prove ſo, and that though the ſurgeon uſes his utmoſt care and ſkill.

Among theſe alſo are to be accounted thoſe *Wounds* of the head, where the patient is loſt by the vaſt quantity of blood, which is extravaſated in the cavity of the cranium, and is confined there; but where he might have been relieved, if the trepan had been applied in time; for though *Wounds* of this kind generally prove incurable, yet as there is, at leaſt, a poſſibility of ſaving a perſon in theſe circumſtances, by the uſe of the trepan, this may properly be reckoned among the doubtful caſes, and not deemed abſolutely mortal: And laſtly, a bad habit of body frequently prevents the cure of *Wounds*, which would admit of an eaſy cure in a healthful ſubject; ſo we frequently ſee the ſlighteſt puncture in the hand or foot of an hydropical, conſumptive, or ſcorbutic perſon, ſhall produce a gangrene, and prove mortal, though the ſurgeon ſpares no care nor application to prevent it. *Heiſter*'s Surg. p. 29, 31.

Cure of ſlight Wounds. This is generally performed with great eaſe, by applying to the part a ſmall portion of ſcraped lint, well ſaturated with ſpirit of wine, oil of turpentine, or St. John's wort, liniment of Arcæus, or balſam of capivi, Gilead, or Peru, and ſecuring the dreſſing with a plaſter; this dreſſing ſhould be renewed once in a day or two, and the lips of the *Wound* will preſently agglutinate. *Heiſter*, p. 34.

Wounds *dangerous, how to be healed.* *Wounds* of this kind are firſt to be cleanſed from the extravaſated blood, ſordes, &c. In the next place, if a bullet, the point of a ſword, or any part of the cloathing, a piece of glaſs, or any other foreign body, remains in the *Wound*, it is to be removed either with the fingers, or a pair of forceps, or other proper inſtruments. The hæmorrhage is to be ſtopped at the firſt dreſſing; the divided parts are to be brought as near to each other as poſſible, and their ſituation ſhould be ſo maintained, that the cicatrix which is left may appear even.

Where there are no extraneous bodies to be removed, the grumous blood is to be wiped away with a ſoft ſpunge, or a parcel of fine lint wrung out of hot wine or brandy; and when this is done, the next ſtep is to ſtop the hæmorrhage; but before the ſurgeon attempts the removal of extraneous bodies, it behoves him well to conſider whether it be more proper to do it inſtantly, or to wait a more convenient time; for if the patient is become extremely faint, from the loſs of blood he has already ſuſtained, it will be neceſſary, in this caſe, to ſtop the hæmorrhage, and then, in ſome meaſure, to endeavour to revive him by moderate draughts of warm broths, whitewine whey, or ſome cordial medicine; for if theſe precautions are neglected, the patient may not unlikely die in the operation: So alſo where you have reaſon to fear, that in the extracting the broken point of a ſword, or other weapon, you are in danger of wounding a large blood-veſſel or nerve, it will be better to wait a little, either till the patient is ſomewhat come to himſelf, or till the *Wound* is enlarged by ſuppuration. *Heiſter*'s Surg. p. 35.

Gun-Shot-Wounds. See the article Gun-*Shot*.

Wounds *of the Neck.* See the article Neck.

Wounds *of the Eyes.* See the article Eye.

Loſs of Subſtance in Wounds. When this happens in *Wounds*, they will not unite either by the help of plaſters, or the ſuture, or by any other method, till filled up with new fleſh. To bring on this, lint dipped in oil, or ſpread over with ſome vulnerary balſam or ointment, and applied to the bottom of the *Wound*, is very ſerviceable, covering with a plaſter compreſs, and the proper bandages; and this dreſſing is to be repeated daily. There ought to be a balſamic and emollient quality in theſe ſarcotic medicines, that they may not only reſiſt putrefaction, but may alſo ſoften the new fleſh; ſo that it may eaſily receive additions from the blood, and ſuffer itſelf to be elongated. *Heiſter*'s Surg. p. 41.

Wounds *in Horſes.* The moſt terrible *Wounds* theſe creatures are ſubject to, are thoſe got in the field of battle. The farriers that attend camps have a coarſe way of curing theſe; but it is a very expeditious and effectual one.

If the bullet be within reach, they take it out with a pair of forceps; but if it lie too deep to be come at, they leave it behind, and dreſs up the *Wound* in the ſame manner as if it were not there.

They firſt drop in ſome varniſh from the end of a feather, and when the bottom is thus wetted with it, they dip a pledget of tow in the ſame varniſh, which they put into the *Wound*, and then cover the whole with the following charge: Take a quarter of a pound of powder of bole armenic, half a pound of linſeed oil, and three eggs, ſhells and all; add to theſe four ounces of beanflour, a quart of vinegar, and five ounces of turpentine; this is all to be mixed over the fire, and the *Wound* covered with it. This application is to be continued four or five days, then the tent put into the *Wound* is to be dipped in a mixture of turpentine and hogs-lard; by this means a laudable matter will be diſcharged, inſtead of the thin ſharp water that was at firſt. Then the cure is to be compleated by dreſſing it with an ointment made of turpentine, firſt well waſhed, and then diſſolved in yolks of eggs, and a little ſaffron added to it.

This is the practice in deep *Wounds* that do not go through the part; but in caſes where the bullet has gone quite through, they take a few weavers linnen thrumbs, made very knotty; theſe they make up into a kind of link, and dipping it in varniſh, they draw it through the *Wound*, leaving the ends hanging out at each ſide; by means of theſe they move the link or ſkain three or four times a day, always wetting the new part that is to be drawn into the *Wound* with freſh varniſh. They put on a charge of the bole armenic, &c. as before deſcribed, on each ſide of the wounded part, and continue this as long as the *Wound* diſcharges thin watery matter, or the ſides continue ſwelled. After this they dreſs it with the ointment of turpentine, yolks of eggs, and ſaffron, till it is perfectly cured.

The other methods are the dreſſing the *Wound* with an ointment made of wax, turpentine, and lard, and covering it with linnen rags wetted with cream; or the dreſſing, with a mixture of yolks of egg, honey, and ſaffron, and covering it up with cream and baum-leaves beaten together.

When the *Wound* is ſo dangerous as to require the aſſiſtance of internal medicines, they give the following pills: Take aſafœtida, bay-berries, and native cinnabar, of each a pound; beat up the whole into a maſs with brandy, and roll it into pills of fourteen drams weight each. Theſe are to be laid in a ſhady place to dry, after which they will keep ever ſo long without any damage. The horſe is to take two of theſe every other day, or, if neceſſary, every day, till he has taken eight or ten of them, and he is to ſtand bridled two hours before and after the taking them.

When the *Wound* ſeems at a ſtand; not appearing foul, and yet not gathering new fleſh, there muſt be recourſe had to the following powder, whoſe effect in bringing new fleſh is wonderful: Take dragon's blood and bole-armenic, of each two ounces; maſtic, olibanum, and ſarcocolla, of each three drams; aloes, round birth-wort, and common iris-root, of each one dram and a half; make the whole into a fine powder. This is ſometimes uſed dry, ſprinkling it on the *Wound*; but ſometimes it is mixed with turpentine, ſometimes with juice of wormwood, and ſometimes with honey of roſes, and either way does very well.

When the *Wound* grows foul, and requires a detergent to cleanſe it, the common liquor for this purpoſe is a phagedenic water, which they make of lime-water, and ſublimate in this manner:

Take two pounds and a half of newly made and unſlacked lime, put it into a pewter veſſel, and pour on it five quarts of boiling water. When the bubbling is over, let it ſtand to reſt two or three days, ſtirring it often with a ſtick; then pour it clear off after a due time for the lime to ſettle, and filter it through ſome whited brown paper, made for the lining of funnels, on this occaſion. To a quart of the clear lime-water, thus prepared, add eight ounces of ſpirit of wine, and one ounce of ſpirit of vitriol; when theſe are well mixed, by ſhaking them together; then add an ounce of corroſive ſublimate in fine powder; mix all well together, and keep the whole in a bottle, to be uſed for the cleanſing theſe foul *Wounds*, and on any other occaſions, where there may be a detergent of this powerful kind neceſſary. It will keep good many years.

If this water will not thoroughly cleanſe the *Wound*, but there ſtill will remain a quantity of foul matter in it, and there is danger of a gangrene, they add to it as much arſenic, in fine powder, as there was of the corroſive ſublimate; that is, at the rate of an ounce to a quart and half a pint.

Theſe

These are all the medicines that the farrier need carry with him on account of *Wounds*; and they are all such as may be prepared at home, and will continue good so long as he has occasion to keep them, or much longer; and what is left of one year will serve for others.

When the necessary applications are thus settled, it may not be improper to add the general rules by which they conduct themselves in the cure.

1. The *Wound* must be probed at first, but very gently, and afterwards as gently and as seldom as may be, for the horses flesh is the most easy of all others to be contused in wounded parts, and to fall into a gangrene from the hurt. 2. The *Wound* must be kept continually as clean as possible, and free from proud flesh. 3. The necessary revulsion must always be made by bleeding, as soon as the *Wound* is dressed the first time; this prevents inflammation, and a great many other bad accidents. 4. If the *Wound* be in such a place, that the horse can get at it with his tongue to lick it, great care must be taken to prevent his doing so, as it will greatly retard the cure. 5. The farrier is never to proceed to suppuration in any case in which the humours can be either dissolved or repelled, and especially in parts that are full of sinews and ligaments, or that are near the bones. 6. If a *Wound* be accompanied with a great contusion, or if it be of a round or circular figure, incisions are often necessary about its edges, and sometimes the application of caustics. 7. The *Wound* must be always carefully covered, for the access of the air retards the cure. 8. The callous lips of a *Wound* must always be cut to the quick, before these can be united together. These may serve for general rules, that hold good in all cases; and to these may be added some that are principally applicable to peculiar circumstances of the *Wounds*.

Wounds of the breast are to be cured with tents and folds of soft linnen laid over them, steeped in the following mixture: Take verdegrease, vitriol, and alum, of each one ounce; vinegar eight ounces, honey a pound; let all these be boiled together till they become red. *Wounds* in the belly can only be cured by sowing up the peritonæum with strong woollen thread, not silk, leaving the extremities without the skin. The skin is to be sowed together with a strong hempen thread waxed, joining the lips of the *Wound* together, by this means, in form of a buckle. This is to be covered with the common ointment for *Wounds*; and if an inflammation comes on, chalk dissolved in vinegar is to be added.

If the *Wound* be such that the guts come out at it, the horse may still be recovered, if proper caution be used: the guts are to be immediately returned into their place; but they must not in this be touched with the hand, but with a sponge dipped in warm water. And, in order to the making them more readily get into their places, it is proper to make the creature vomit, by thrusting down his throat a feather dipped in oil. If the *Wound* through which they fell is not big enough to return them easily by, it must be enlarged by cutting; but if the guts are found to be bruised or wounded, it is in vain to attempt any thing, for death must follow.

There is also a certainty of death when, after a *Wound* of any kind in the belly, the horse voids blood at the fundament.

When a horse is wounded near the groin, he easily falls into convulsions; in this case he is to be kept from drinking as much as possible: he is also to be covered well up, and kept quiet, and to have green things given him to eat. *Wounds* on the knees are very difficult of cure, because the part is in motion almost continually, and there is very little flesh to work upon. When the *Wounds* are but slight, and in the muscular parts of the body, a mixture of honey and tallow, boiled together, will often prove a cure; when the *Wound* is more considerable, turpentine melted in a little common oil, and applied hot, is the general remedy. If a wound happen between the shoe and the hoof, care must be taken that no foreign matter be left in it, and it must be dressed with any of the ointments that have verdegrease in them; and a charge of bruised elder-leaves is very proper to be applied over all. If the *Wound* be deep and narrow, it must be enlarged at the orifice, and turpentine and wax, melted in lard, must be poured into it. The same rule of opening the orifice holds good in all deep and narrow *Wounds*.

If a nerve happens to be cut, it must be closed, and a defensative must be applied, to prevent a concourse of humours to the part; a fomentation made of oil, wine, and honey, mixed together, is also very proper, wherever a nerve is hurt, and a pultice may be applied over all, made of marshmallow-roots boiled soft, with bread and milk.

If the horse happens to be wounded by a piece of wood, bone, or any other hard substance, part of which remains in the *Wound*, this must be carefully taken out, whatever pain it may cost the creature to do it, and the *Wound* must then be dressed with the common *Wound*-ointments. In this, or any other case of a fresh *Wound*, the washing it with oil of turpentine, is an excellent method of preventing ill consequences.

WRASSE, in zoology, the name of a fish called by authors, *turdus vulgaris*, and by some *tinca-marina*, the sea-tench.

It very much resembles the common fresh-water tench in figure, and is covered with large scales. Its usual size is about five or six inches in length. Its colour is very variable; red, yellow, and brownish, being very frequently mixed in the scales; and it has five or six longitudinal lines, alternately of a pale yellow, an olive-colour, and a dusky red. Its nose is long, and bent upwards, and it has thick and fleshy lips extended over the jaws. Its mouth is small, and its teeth not very sharp; its tail is not forked. The membraoes of the fins and tail are variegated with red and blue spots, and the anterior rays of the back-fin are prickly. It is caught in plenty on the English shores, and is sold among the poorer sort of people in Wales and Cornwall; but is not esteemed a very delicate fish. *Willughby*'s Hist. Pisc. p. 320.

WRECK (*Cycl.*)—*Wreck*, in metallurgy, a vessel in which the third washing is given to the ores of metals.

In Cornwall, when the tin ore has been twice washed, they take the head tin, or that part of the tin ore that lies uppermost, out of the buddle, and throwing it into this vessel, they pour water on it, and work it about with wooden rakes, till it is cleared from whatever other extraneous matter there may still have remained mixed with it, and is, after this, fit for the blowing-house to be run into metal. *Ray*'s English Words, p. 122.

WREN. See the article JENNY-*Wren*.

Crested WREN. See the article REGULUS *Cristatus*.

WRINGLE-*Tail*, a name given by the people of several parts of England, to the *curvicauda*, a species of bee-fly, very much resembling the bee in shape, but having only two wings and no sting.

It is very troublesome to horses, but does not suck their blood, but only lays its eggs in their skins; it is called in other counties the *whame* and the *barrel-fly*.

WRIST (*Cycl.*)—The *carpus* or *wrist* consists of eight small, unequal, and irregular bones, all of which, taken together, represent a sort of grotto, of an irregular quadrangular figure, and connected principally with the basis of the radius.

Considered in this manner, the whole connection of them has two sides and four edges: One of the sides is convex and external, the other concave and internal. The convexity of the outside is pretty regular and even; but the concavity of the inside has four eminencies, one at each corner. One of the four edges touches the fore-arm, and is as it were the head of the carpus; another of the edges touches the metacarpus, and may be called the basis; the third is toward the point of the radius, and the fourth toward the point of the ulna; the first of these latter two may be called the small edge, the latter the larger.

The bones of the carpus are divided into four rows, the first of which lies next the fore-arm, the second next the metacarpus; each row consists of four bones; but the fourth of the first row lies in a manner out of its rank. Each bone has several cartilaginous surfaces for their mutual articulations, and, in some of them, for their articulations with the radius, and bones of the metacarpus and thumb.

It is to no purpose to distinguish the three ordinary dimensions in any of these bones, except one; but in most of them we may consider six sides, one external, turned towards the convex surface of the carpus; one internal toward the concave surface; one toward the fore-arm, which may properly be called the brachial side; one toward the fingers, to be called the digital side; one toward the point of the radius, or the radial side, and one toward the point of the ulna, or the cubical side.

Of these sides some are bony, others are cartilaginous or articular; these last I call sides, the others surfaces, as being portions of the carpus's surface in its natural situation: to distinguish these bones from each other, they have been called the first, second, third, and fourth, bones, of the first or second row, beginning to count from the radius or thumb. But Lycerus has been at the pains of giving a particular name to each of them.

He calls the first of the first row the *os scaphoides*, the second the *os lunare*, the third the *os cuneiforme*, the fourth the *os pisiforme*; the first bone of the second row the *os trapezium*, the second *os trapezoides*, the third *os magnum*, and the fourth *os unciforme*; all which see in their proper places. *Winslow*'s Anatomy, p. 82.

The bones of the carpus are articulated with one another by arthrodia; but the first row forms a sort of ginglymus with the second; because the head of the os magnum may turn in the cotyloide cavity of the first row, while the two first bones of the second row slide upon the digital side of the os scaphoides, and the os unciforme in the same manner on the os cuneiforme.

When all these bones are in their natural situation, a transverse depression is formed in the convex side of the carpus, by which the two rows are distinguished. This depression appears most between the os scaphoides, and the three last bones of the second row, and looks like a fold, by which the second row is thrown back upon the first. The four eminencies on the concave side of the carpus, are for the insertion of a strong transverse ligament. The inner substance of all these bones is spongy, and their sufaces are not very compact. *Winslow*'s Anatomy, p. 85.

Wrist *Fractured.* The bones of the *Wrist* are very seldom subject to fracture, on account of their smallness. And when they are fractured, there is but little hopes of a cure; for the ligaments and tendons are here so numerous, and the bones so very small, that it is scarce possible to reduce them to their places, or to make them grow together again.

On this account the joint of the hand generally becomes stiff and immoveable after these accidents, or else abscesses, suppurations, fistulæ, and caries of the bones follow them; and these, on account of the softness of the bones, and the difficulty of discharging the matter, are seldom remedied, but by amputating the hand. What can be done, however, toward the curing a fracture in this part, is this; the assistant must lay hold of the hand above the *Wrist* and below it, and extend them as far as is necessary in opposite directions; the surgeon is, while this is doing, to replace the bones with his fingers, and when they are all replaced, to bind the hand up with a proper bandage. *Heister.* Surg. p. 129.

Wrist, in the manege. The bridle *Wrist*, is that of the cavalier's left hand. A horseman's *Wrist* and his elbow should be equally raised, and the *Wrist* should be two or three fingers above the pummel of the saddle. To ride a horse from hand to hand, *i. e.* to change hands upon one tread, you need only to turn your *Wrist* to that side you would have the horse to turn to, without advancing your hand. But if your horse stops, you must make use of both your legs. See the article Hand and Leg.

WRIT (*Cycl.*)—Writ *of Inquiry of Damages*, a judicial *Writ* that issues out to the sheriff upon a judgment by default, in action of the case, covenant, trespass, trover, &c. commanding him to summon a jury to enquire what damages the plaintiff hath sustained, *occasione præmissorum*; and when this is returned with the inquisition, the rule for judgment is given upon it; and if nothing be said to the contrary, judgment is thereupon entered. 2 Lill. Abr. 721.

WRITING, (*Cycl.*)—To *write* without blacking the fingers: Prepare the paper with a fine powder, made of three parts of calcined copperas, two of galls, and one of gum arabic, those being fresh mixed, rub them with a hare's foot into the pores of the paper; and then *write* with fair water, and the black letters will immediately appear. *Boyle*'s Works abr. Vol. 1. p. 114, 115.

To make new *Writing* appear old, moisten it with oil of tartar per deliquium, more or less diluted with water, as you desire the ink to appear more or less decayed. *Boyle*, ib. p. 115.

We may *write* without ink, or its materials: For this purpose, take a fine powder of calcined hartshorn, of clean tobacco-pipes, or rather of mutton-bones burnt to a perfect whiteness, and rub it upon the paper, and then *write* with a silver bodkin, or the like. Ibid.

The discharging of ink out of parchment, paper, &c. is commonly done by aqua fortis diluted sufficiently with water, that it may not destroy the paper. The like may be done with oil, or spirit of vitriol diluted. The juice of lemons, or strong vinegar, will take ink out of linnen more safely, as the mineral acids are apt to destroy the linnen, unless great care be used in diluting them.

We may *write* on iron with corrosive sublimate wetted with common water: For this purpose, the parts of metal we would preserve untouched should be covered with wax, and that taken off in the proper places, to make way for the corroding substance. *Boyle*'s Works abr. Vol. 1. p. 528.

The like may be practised by means of aqua fortis.

Mr. Boyle mentions a method he had of copying a whole page of *Writing* at once. But we do not find his description of it any where. See Works abr. Vol. 1. p. 136.

The same author informs us of a method of imitating *Writing*, on copper-plates. The copy to be engraved is to be wrote with a peculiar kind of ink, and the copper-plate being moderately warmed, is rubbed over with a white varnish, and suffered to cool; then the paper being gently moistened, that it may readily communicate its ink, the *Writing* is applied to the prepared surface of the plate, and passed through a rolling-press; by which means the ink adhering to the varnish, leaves the letters very conspicuous. And hence it is easy with a needle to trace the strokes, through the varnish upon the plate, which being afterwards cleaned, the letters are finished with the graver, and the work printed off in a rolling-press, as common cuts.

Mr. Boyle does not mention what the varnish nor ink, used by the artificer from whom he received this method, was; but he tells us, that he himself used the purer sort of virgin-wax, for a varnish; and for his ink he took fine Frankfort black carefully ground, with water, till it obtained the consistence of common ink; but no gum was added, lest it should hinder the ink from coming off. He also observes, that *written* characters may be taken off without the help of a press, by laying the moistened paper smooth upon the varnished copper, and rubbing it on hard with a convex piece of glass. Ibid.

WRONG-*Lands*, in our old writers, seem to denote trees that will never prove timber; such as *wrong* the ground they grow in. Kitch. 169. *Cowel.*

WRY-*Necked*, a term applied to persons affected with a distortion of the neck, and consequently of the head also; which is pulled more to one side than the other.

This is a deformity usually brought into the world with people; but sometimes it is occasioned by accidents afterwards. When it is from the birth, there is very little reason to imagine it curable, because the vertebræ of the neck are rendered crooked by that posture, while the bones are in a soft and pliable state.

There are however, in the writings of surgeons, some instances of this disorder, even in these circumstances, being cured after twelve, sixteen, or eighteen years.

When this disorder comes on adults, it is occasioned generally either by the contraction of the skin from a burn on one side, or from a strong spasmodic contraction of one of the mastoide muscles; which will at length become shorter and indurated, by continuing in that posture; or it may proceed from a relaxation of one or more of those muscles, in consequence of which the neck will be contracted by the stronger antagonist muscle on the opposite side; or lastly, it may proceed from a preternatural ligament drawing down the head. And when either of these is the occasion of the disorder, there is hopes of a cure; especially if the subject be young, and the disorder not of long standing.

If this disorder be recent, and caused by a defluxion of humours, evacuating medicines with mild sudorifics, and heat, may be of service. But when it arises from a contraction of the skin or muscles by burning, the repeated use of oils, ointments, and fomentations, may relax so far as to make a cure. A proper firm bandage must be applied to pull the head toward the natural posture, and a steel collar may be contrived by which the patient shall be suspended very frequently till the neck recover its proper position. But when all these fail, the manual assistance of the surgeon is to be called in. If the skin is contracted by a burn, it must be carefully incided transversely in several places, and the incisions dressed so as to keep them open and dilated, and the head pulled to its proper position by a bandage, till the new flesh filling up these incisions gives room for the head to stand even. But if the *Wry-neck* proceeds from a contraction of one of the mastoide muscles, or from some ligament, they are to be divided by a transverse incision in their lower part, near the clavicle or sternum. *Heister*'s Surgery, V. 2. p. 4. *Tulpius*, V. 4. c. 58.

Wry-*Neck*, in zoology, the English name of a bird, known in Latin by the names *torquilla* and *jynx*. *Ray*'s Ornithol. p. 95. See the article Jynx.

WURST, a Russian measure. See the article Werst.

WYCH-*House* (*Cycl.*)—In the places where there are salt-springs, and salt-works are carried on at them, the work-house where the salt is made is always called the *Wych-house*; and hence we may naturally conclude, that *Wych* was an old British word for salt, which is the more probable in that all the towns in which salt is made end in *Wych*; as *Namptwych*, *Droitwych*, *Middlewych*, &c. *Ray*'s English Words, p. 175.

X.

X.

X. We often meet with the Greek letters X and P joined in this manner ☧, on antient medals. The first we find are on some large brass coins of the Ptolemies, kings of Ægypt, where it was placed on a civil account.

Some writers have taken it for a date, and others for the initial letters of a proper name; but as no reasons are assigned for either of those conjectures, Mr. Ward rather supposes it an abbreviation of the word ΧΡΗΜΑ, *money*, impressed on those pieces, to denote their currency as money; which might be thought proper, as they have not the heads of kings stamped upon them, like their silver and gold coins; but always that of a Jupiter on the front, and an eagle perched on a thunderbolt on the reverse.

This character ☧ was afterwards applied to a very different purpose by Constantine the Great, who made use of it to denote XPICTOC, both in his coins and military ensigns; wherein he was followed not only by some succeeding emperors, but also by private persons, who out of devotion put it on their lamps and other utensils.

It afterwards came to be used merely as a critical note, to point out remarkable passages in manuscripts; and then it stood for the initials of XPHCIMON, *useful*; as we learn from Isidore, Orig. Lib. 1. cap. 20. See Philos. Trans. N°. 474. §. 1.

XAMDELLILAH, an Arabian term, used as a grace or thanksgiving after meat.

The greatest men of that nation will often call in the meanest, even the beggars, to eat with them; who, as soon as they have done, always rise and pronounce this word, which signifies God be praised. *Pocock's* Egypt. p. 183.

XAMI, a name given by some of the old writers to the *ceration* of the Greeks, or carob-tree.

The Arabians use this name, and express by it the same tree which we call by this name: They mention another kind of charnub, which is, their general name for the ceration; this other kind was an astringent, and wholly different from any thing which we know under that name.

It is possible they might mean by it the acacia, which is also a tree that bears pods, and is of an astringent quality.

XANTHICA, Ξανθικα, in antiquity, a Macedonian festival, so called because it was observed in the month Xanthus, at which time the whole royal family with the army were purified. See the article Lustration.

After which the army was divided into two parts, one of which being set in array against the other, there followed a short rencounter, in imitation of a fight. *Potter*, Archæol. Græc. l. 2. c. 20. T. 1. p. 417.

XANTHIUM, in botany, the name of a genus of plants; the characters of which are these: The flower is of the flosculous kind, being composed of a number of floscules, each having one stamen. The seeds are produced on other parts of the plant, and finally become oblong and usually prickly fruits, divided into two cells, and containing each several oblong seeds.

The species of *Xanthium*, enumerated by Mr. Tournefort, are these: 1. The common *Xanthium*, called the smaller burdock. 2. The greater Canada *Xanthium*, with fruit armed with crooked prickles. 3. The jagged-leaved Portugal *Xanthium*, with fruit armed with very strong prickles. *Tourn.* Inst. p. 139.

The roots of this plant are of a bitter and acrid taste, and are recommended as of great service in scrophulous cases, taken in decoction. Matthiolus gives great praises to the root dried and powdered, and given in mixture with rhubarb for the leprosy. *Matthiol.* in Dioscor.

XANTHON, a name given by some of the antients, to a species of marble of a yellowish green colour, much used in ornamenting the inner parts of houses; and from its equal hardness with the Tænarian marble, and the equal high polish it was capable of, supposed by the workmen to be of the same species.

The word *Xanthon* is of very dubious meaning, but is supposed as the name of this marble to have expressed a green colour, as this was otherwise called *marmor herbosum*. See the articles Taenarium, and Herbosum *Marmor*.

XANTHURUS *Indicus*, in zoology, the name of a fish, called by the Dutch *Geel-staerdt*.

It is of the size and shape of the bream; its jaws are armed with strait and very sharp teeth, which stand almost strait out; its back is yellow, and its tail very strongly tinged with that colour; its belly is of a bluish white; its head brown, and its fins of a fine red. It is caught with hooks among the rocks on the shores of the East-Indies; and is a very wholesome and well-tasted fish. *Ray's* Ichthyograph. Append. p. 2.

XANTHUS, in the natural history of the antients, the name of an iron ore of the hæmatites or blood-stone kind, and usually accounted a species of it, and called by others *elatites*.

It was of a pale yellowish white, or the colour of the French pale yellow ochre, used by our painters; but like all other ferrugineous bodies it became red by burning.

Theophrastus gives us expresly the etymology of the name, observing that it was called so from its colour; the Dorians calling a yellowish white ξανθος, *Xanthus*. *Hill's* Theoph. p. 97.

XANXUS, in zoology, a name given by some authors to a large species of sea-shell, somewhat like that with which the tritons of old were painted. It is found in great abundance near Ceylon, and is used there in medicine as an alkali and absorbent, in the same cases in which we give the testaceous powders.

XATHOS, in ichthyology, a name given by Appian, to the fish, called by the generality of authors the *erythrinus*, or *rubellio*. See the article Erythrinus.

It is of the sparus kind, and is described by Artedi under the name of the silver-eyed, red-bodied *sparus*.

XEL, in the materia medica of the antients, a name given to the fruit *sel*. See the article Sel.

XENEXTON, a word used by Paracelsus, to express a sort of amulet to be worn about the neck, to preserve people from infection in the plague.

XENINEPHIDEI, a word used to express a sort of imaginary spirits, mentioned by the adepts, as delighting to discover the occult qualities of bodies to men.

XENISMI, Ξενισμοι, in antiquity, sacrifices offered at the Athenian festival *Anacæa*. *Potter*, T. 1. p. 366. See the article Anacæa.

XENOPAROCHUS, among the Romans, an officer who provided embassadors with all kind of necessaries, at the public expence. *Pitisc.* Lex. Antiq. in voc.

XERANTHEMUM, in botany, the name of a genus of plants, the characters of which are these: The flower is radiated; its disk is composed of flosculcs standing upon the embryoseeds; but the outer circle is composed of plane flat petals, which are not affixed to embryos, but are contained in the same cup with the floscules which make up the disk. The embryos finally ripen into seeds, which are furnished with a foliaceous head.

The species of *Xeranthemum*, enumerated by Mr. Tournefort, are these: 1. The *Xeranthemum*, with large single purple flowers. 2. The *Xeranthemum*, with large double purple flowers. 3. The *Xeranthemum*, with single white flowers. 4. The double white-flowered *Xeranthemum*. 5. The single flowered *Xeranthemum*, with flowers mixed of white and red. 6. The double-flowered *Xeranthemum*, with flowers mixed of a dusky red and white. 7. The white-flowered hoary *Xeranthemum*. 8. The *Xeranthemum*, with small single purple flowers. 9. The *Xeranthemum*, with small single pale purple flowers. *Tourn.* Inst. p. 499.

We have several species of this plant cultivated in our gardens, and known in English by the name of *everlasting flowers*; a name common to all the species of this plant, and of the amaranthoides.

These flowers are of so dry and durable a structure, that if gathered just when they are ripe, they will last many years in perfection, and appear as fresh as while growing; they are also capable of several tinges, and hence are often seen of fine blues and greens, colours not natural to them.

They are all propagated by sowing their seeds in August, in a warm border, observing to water and shade them till they are come up, if the weather proves over dry. When the young plants are two inches high, they should be removed to another warm border under the shelter of a wall, and there planted at five inches distance from each other. They will here stand the winter very well, and in spring will be ready to grow up for flowering without any farther transplanting; they are only to be kept clear of weeds, and in June they will flower; the flowers should be gathered in July for drying, and some of the finest should be suffered to stand for seed; for the plants perish as soon as they have perfected their seeds, and must be renewed by sowing every year. *Miller's* Gardener's Dict.

XERASIA, in medicine, the name of a disease, a species of alopecia, in which the hair falls off through a dryness of the part, and want of due nourishment.

XEROMYRON,

XEROMYRON, a word uſed by the antients to expreſs what they do at other times call in expreſs words a dry ointment. It was a compoſition of warm and aromatic drugs, or of other things fit for external uſe, but without the fatty ingredients, by which they were uſually reduced into the form of ointments.

XEROPHAGY, ξηροφαγία, among the antients, the feeding only on dry victuals, which was the practice of the Athletæ. *Pitiſc.* in voc. *ſaginatio.* See ATHLETA.

XEROTRIBIA, a term uſed by authors to expreſs a dry friction, a rubbing of ſome affected part with the hand or otherwiſe, to recall the warmth and circulation.

XIFINUS, a name given by ſome writers to the ſaphire.

XIMENIA, in botany, the name of a genus of plants deſcribed by Plumier, the characters of which are theſe: The cup is a ſmall three-leav'd perianthium; the leaves of it are cordated, and fall with the flower; the flower is monopetalous, of a bell ſhape, and divided into three ſegments, which ſtand erect, and are oblong, ſomewhat convoluted and obtuſe at the ends. The germen of the piſtil is ſmall, and of an oval figure. The fruit is an oval drupa containing only one cell, in which is an oval nut. *Plum.* p. 21. *Linnæi* Gen. Plant. p. 521.

XINKÆPPETHIJA, in botany, a name given by ſome authors to that ſpecies of the jujube tree, on the branches of which the gum lacca of the ſhops is uſually found. *Herm.* Muſ. Zeyl. p. 40.

XIPHIAS, (*Cycl.*) in the Linnæan ſyſtem of zoology, the name of a genus of fiſhes of the general order of the acanthopterygii or prickly-finned kind.

The characters of this genus are, that the membrane of the gills has eight bones, and the point or extremity of the noſe or ſnout of the fiſh, is ſhaped like a ſword, and that it has no belly fins. *Linnæi* Syſt. Nat. p. 54.

According to the Artedian ſyſtem of ichthyology, the characters of this genus of fiſhes are theſe: The branchioſtege membrane on each ſide contains about eight bones, the ſnout is extended into a very long and depreſſed point, imitating the figure of a ſword, and of a bony ſubſtance; the body is oblong and roundiſh, the back fin is ſmall, and is very low in the middle; there are no belly fins at all. The air bladder in this fiſh is remarkably long, and the anus very near the tail. *Artedi* Gen. Piſc. p. 24.

The *Swordfiſh* is ſo remarkable for the ſhape of its ſnout, which is extended in form of a ſword, that it has been called by all nations by a name expreſſive of that character. Its common name *Xiphias* is from the Greek ξιφὸς, a ſword, and it is called *gladius* in Latin, and in Engliſh the *Swordfiſh*.

It grows to a very conſiderable ſize, ſo as ſometimes to weigh an hundred pounds. It is of a long and rounded body, largeſt near the head, and tapering by degrees toward the tail; its ſkin is conſiderably rough, its back black, and its belly of a ſilvery white; its mouth is of a moderate ſize, and has no teeth; its ſnout runs out into the figure of a ſword in the upper jaw, the under is much ſhorter, and terminates in a very ſharp point; it has one only fin on the back, running almoſt the whole length of it; its tail is very remarkably forked; it has only one pair of fins at the gills, having none on the belly. It is common in the Mediterranean, and ſome other ſeas, and is eſteemed by many a very delicate fiſh for the table. The Manner of fiſhing for it is the ſame at this time, that the old writers have deſcribed it to be in theirs, by the harping-iron. *Willughby*'s Hiſt. Piſc. p. 161.

XIPHION, in botany, the name of a genus of plants, the characters of which are theſe: The flower is liliaceous, conſiſting only of one petal, and much reſembling the iris flower. The piſtil is in the manner of the iris alſo, ornamented with three petals, and the cup becomes a fruit of the ſhape of that of the iris; but the root wholly differs from that of the iris, being bulbous, and compoſed of a number of coats.

The ſpecies of *Xiphion* enumerated by Mr. Tournefort are theſe: 1. The broad-leav'd blue-flower'd ſweet-ſcented ſtalkleſs *Xiphion*. 2. The broad-leav'd ſtalkleſs *Xiphion*, with purple ſweet-ſcented flowers. 3. The broad-leav'd ſtalkleſs *Xiphion*, with ſweet-ſcented milk-white flowers. 4. The white-flower'd *Xiphion*, with blue edges. 5. The Perſian early *Xiphion*, with variegated flowers. 6. The porcelain *Xiphion*. 7. The lavender *Xiphion*. 8. The lavender *Xiphion*, with blue changeable flowers. 9. The purple-flower'd changeable lavender *Xiphion*. 10. The broad-leav'd blue-flower'd *Xiphion*, with ſtalks. 11. The cauliferous broad-leav'd *Xiphion*, with blackiſh purple flowers. 12. The cauliferous broad-leav'd *Xiphion*, with blue flowers variegated with purple, or with violet-colour'd lines. 13. The broad-leav'd cauliferous *Xiphion*, with greyiſh flowers ſtreak'd with violet colour. 14. The broad-leav'd cauliferous white-flower'd *Xiphion*. 15. The *Xiphion* with large ſpotted leaves, and purple flowers. 16. The violet-flower'd *Xiphion*, with large ſpotted leaves. 17. The broad-ſpotted leav'd *Xiphion*, with blackiſh purple flowers, white at the top. 18. The broad and ſpotted leav'd *Xiphion*, with ſnow-white flowers. 19. The narrow-leav'd *Xiphion*, with variegated flowers. 20. The narrow-leav'd *Xiphion*, with three-colour'd flowers. 21. The greater yellow *Xiphion*, with ſcentleſs flowers. 22. The great *Xiphion*, with a pale yellow flower. 23. The great yellow *Xiphion*, with mixt flowers. 24. The many-flower'd changeable colour'd *Xiphion*. 25. The leſſer *Xiphion*, with yellow-ſcented flowers. 26. The large tall *Xiphion*, with changeable yellow flowers. 27. The great but low *Xiphion*, with yellow changeable flowers. 28. The tall narrow-leav'd changeable flower'd *Xiphion*. 29. The low changeable *Xiphion*, with ſmaller flowers. 30. The middle-ſiz'd changeable flower'd yellow *Xiphion*. 31. The narrow-leav'd *Xiphion*, with blue ſweet-ſcented flowers. 32. The narrow-leav'd *Xiphion*, with variegated purpliſh blue flowers. 33. The leſſer blue-flower'd *Xiphion*. 34. The violet blue-flowered *Xiphion*. 35. The narrow-leav'd *Xiphion*, with violet-blue flowers. 36. The narrow-leav'd *Xiphion*, with flowers of a mix'd blue. 37. The white-flower'd narrow-leav'd *Xiphion*. 38. The American *Xiphion*, with blackiſh-yellow flowers. *Tourn.* Inſt. p. 362, ſeq.

We have ſeveral ſpecies of this beautiful plant cultivated in our gardens, where they are called *bulbous Iris's*; and beſides theſe, a vaſt number of varieties or new flowers, as the floriſts call them, are frequently raiſed by thoſe who propagate them from ſeeds. The culture of theſe being the ſame with that of ſeveral other plants of the ſame ſort, which are much valued for their flowers, it may not be amiſs to give it at large.

There ſhould be great care to ſave the ſeeds of the fineſt and ſtrongeſt flowers, and in September ſome ſhallow pans or boxes muſt be placed with holes at their bottom to let out the moiſture, and then filled with light and fine earth. On this the ſeeds muſt be ſown pretty thick, and as evenly as may be; half an inch of the ſame earth muſt be ſifted on theſe, and the boxes muſt then be ſet where they may have the morning ſun; and if the weather proves very dry, they muſt be gently watered at times. They muſt remain in this ſituation till October, and then muſt be removed to a place where they may have the benefit of the ſun as great a part of the day as may be; here they muſt ſtand the winter, keeping the boxes very carefully clear from weeds.

In the ſpring the young plants will appear, and they ſhould then be removed to their firſt ſituation, where they may have only the morning ſun; and if the weather be dry, they muſt be watered at times. In June their leaves will decay, and they muſt then have half an inch of freſh earth ſifted over them, and be left in their ſituation till October, when they muſt be removed to the ſame place as before for the winter.

In the ſpring the leaves will appear again, and when they are again periſhed, the earth muſt be taken out of the boxes, and ſifted to ſeparate the roots, which muſt then be planted at three inches diſtance on a bed of the ſame light earth; they muſt be buried three inches deep, and in the ſpring following muſt have about half an inch of freſh earth ſifted over them; the leaves will this year appear and decay as before; and the following year, in June, they will moſt of them flower, when the fineſt flowers ſhould be marked, that their roots may be taken particular care of. The following year the remainder, which did not flower at firſt, will produce their flowers; ſuch of theſe as are finer than the reſt, ſhould be marked in the ſame manner, and the roots of theſe choice kinds be preſerved with particular care. Whatever fine or new flower is thus raiſed from ſeed, may be afterwards propagated by off-ſets from the roots, which being planted out, will flower the ſecond year, and often produce even finer flowers than the mother root.

The roots of theſe flowers ſhould be taken out of the earth only every other year; this ſhould be done juſt when the leaves are decayed, and they ſhould not be kept out of the earth above a fortnight.

The earth in which theſe flowers thrive beſt, is a light ſandy loam; and if it be taken up with the turf and the graſs rotted among it before it is uſed, it will be ſo much the better. They do not delight in a rich dunged ſoil, nor ſhould they be placed where they are too much expoſed to the ſun; for beſides that the flowers ſoon fade in theſe places, the roots are alſo always found to decay; but in an eaſt border, where they may have the ſun till eleven o'clock, and where the ground is not too moiſt nor over dry, they will ſtand a long time in flower, and thrive extremely well. *Miller*'s Gard. Dict.

XIR, a word uſed by the chemiſts to expreſs mercury.

XISINUM, a word uſed by ſome of the chemical writers to expreſs vinegar.

XOCHIOCOTZO, in botany, a name uſed by ſome authors for the tree which produces the liquid amber, and is called the ſweet gum by the inhabitants of the Weſt-Indies. *Hernandez*, p. 96.

XOCHITENACATL, in zoology, a name given by ſome to the toucan, or American great beaked magpy. *Ray*'s Ornithology. See the article TOUCAN.

XOCHITENACATL *Alia*, in zoology, the name of a bird deſcribed by Nieremberg of the nature of the toucan or Braſilian magpy.

It is of the ſize of a pigeon, its beak is large and thick, and is black and pointed; its wings and tail are variegated with black and white; it has a large black mark reaching from its back to the breaſt; the anterior part of the wings is yellow, the

reſt of its body of a pale colour, and the legs and feet brown. It always is found among the ſweet-flowering trees, and is not uncommon in many parts of South America. *Ray's* Ornithol. p. 298.

XOCOXOCHITL, the Indian name of the clove-berry-tree, or the *caſſia-caryophyllata*, the bark of which is uſed in medicine. *De Laet*. p. 277.

XOMOTL, in zoology, the name of an American bird, of which the Indians are very fond, making a part of their garments of its feathers.

Nieremberg has given this ſhort account of it. It is a web-footed fowl; its back and the upper part of its wings are black; and its breaſt is brown. When it is angry, it raiſes up the feathers of its head in form of a creſt. *Ray's* Ornithol. p. 305.

XOXOUHQUITICPATLI, an American name of a ſtone of the jaſper kind, and of a beautiful green; but uſually pale, and ſometimes with a mixture of grey, and variegated in ſeveral places with ſpots of a deeper green.

It is found among the ſeveral kinds of *lapis nephriticus*, with which that country abounds, and moſt of which the Indians celebrate for their virtues againſt diſeaſes: they are not however acquainted with any medicinal virtues of this ſpecies.

XUCAHA, or XUCAAHI, in botany, the name of a plant much famed for its virtues among the antient Arabians, but unknown at this time.

It was called alſo *amgaila*, and by the Greeks, *leucacantha* and *acantha arabica*, and by many other of the names of the gum-arabic-tree. The uſe of theſe ſynonymous terms has led ſome to ſuppoſe that the gum-arabic-tree, and the *Xucaha* or *amgaila*, which is another of the Arabian names of that plant, were the ſame thing; but this is a great error.

The plant *Xucaha* had a root compoſed of ſeveral knobs, or ſeparate pieces, which when ſeparated and dried, became of a yellowiſh colour, a very light and ſpongy ſubſtance, and of an agreeable aromatic ſmell, but bitter taſte. The antients compared theſe to the cyperus-roots in ſhape, and uſed them as cordials and ſtomachics.

They called the prepared roots *bunk*, and the ſimilitude of this name in ſound with the word *buna*, the fruit of the Ægyptian tree *bon*, that is, coffee, have led ſome to ſuppoſe that it was our coffee which they called by theſe names of *bunk* and *xucaha*; but theſe are all idle conjectures, and the *bunk* being a root, and the coffee a fruit, is ſufficient alone to overthrow this opinion, were there none of the many other reaſons againſt it.

XYLAGIUM, a name given by ſome authors to the lignum ſanctum or guaiacum.

XYLOCARACTA, or XYLOCARACTE, in the materia medica, a name by which ſome authors have called the carob, or ſiliqua dulcis, the ſweet pipe-tree. *Ger.* Emac. Ind. 2.

This was called by ſome of the Greek writers *xyloceraton*, the tree bearing pods, and from a corruption of this name the other has been formed.

XYLOCARPASUM, in natural hiſtory, a name given by ſome authors to a poiſonous kind of wood.

It was the wood of that tree whoſe gum was called *carpaſum* and *apocarpaſum*. This was a much more terrible poiſon than the wood, and as it very much reſembled myrrh in colour, and came from the ſame country from whence the myrrh came, it was often found mixed with it, and many people loſt their lives by taking it.

XYLOCASIA, a term uſed by ſome modern writers on the materia medica, to expreſs what we call *caſſia lignea*, a bark ſomewhat reſembling cinnamon, but leſs aromatic, and of a mucilaginous taſte.

The antients, however, did not mean exactly what we do by this term *caſſia lignea*; they ſometimes pealed off the bark of this tree, and kept it ſeparate; and in this caſe they called it κασία Σύριγξ, a term we have applied to a very different ſenſe, *caſſia fiſtula* with us ſignifying the fruit of the pudding pipe-tree; and when they cut the bark with the wood of the young branches, they then called it *xylocaſia* or *caſſia lignea*.

XYLOCOCCUM, in the materia medica, a name given by ſome of the later Greek writers to the carob-tree, or *ſiliqua dulcis*.

This is alſo called *xyloceraton* by Ægineta, and by ſome of the latin writers of the barbarous ages, *xylocaracte*, a word plainly formed of the others.

XYLOCOLLA, a word uſed by ſome of the antient writers to expreſs what was more uſually called *taurocolla*, glue made of the ears and genitals of a bull.

XYLOCOPIA, Ξυλοκοπία, among the Greeks, a puniſhment with a cudgel. See the article FUSTIGATIO.

XYLOGLYCON, in botany, a name given to the carob, or ſiliqua dulcis, by ſome of the old Greek writers.

The word expreſſes a ſweet, or ſweet-fruited tree, and was ſufficiently expreſſive of the thing; but it was afterwards degraded into a Latin name, ſcarce intelligible, *ſililicon*; this Iſidore writes *ſilicon*, and ſuppoſes to be a falſe ſpelling of the word *ſiliqua*; but it is evidently formed of the word *Xyloglycon*.

Iſidore ſays, the acacia of the ſhops is the juice of the fruit of this tree; but this is an error formed on the expoſitions of the Arabians; they call by the common name *charnub* both the carob-tree and the acacia-tree; and what they have ſaid of the latter he has given to the former.

XYLOIDES, or HYLODES, in botany, a term uſed by many of the antient writers to diſtinguiſh thoſe plants which had woody ſtalks, though they never grew up to any conſiderable ſize; ſuch as the garden-thyme, marjoram, and the like.

XYLON, the *cotton-tree*, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is of the bell-ſhape, very wide at the mouth, and divided into many ſegments. From its bottom there ariſes a pyramidal tube, uſually loaded with ſtamina; and from the bottom of the cup there ariſes a piſtil, which is infixed in the manner of a nail both to the hinder part of the flower, and to the tube. This ripens into a roundiſh fruit, divided into four or more cells, opening at the top, and containing numerous ſeeds wrapped up in a ſtringy white ſubſtance, which is called *cotton*.

The ſpecies of this genus, enumerated by Mr. Tournefort, are theſe: 1. The tree or woody-*Cotton*, with a ſmooth ſtalk, and a blackiſh purple flower. 2. The woody *Cotton*, with yellow flowers. 3. The woody *Cotton* with prickly ſtalks. 4. The herbaceous *Cotton*. 5. The American *Cotton*, with a long pointed fruit: And 6. The fineſt American *Cotton*, with green ſeeds. *Tourn.* Inſt. p. 101.

There are ſeveral varieties, and not a few diſtinct ſpecies of this plant, propagated in the gardens of the curious with us.

The moſt common ſpecies, which is the *Xylon herbaceum*, or herby *Cotton*, is cultivated very plentifully in Candia, Lemnos, Cyprus, Malta, Sicily, Naples, and alſo between Jeruſalem and Damaſcus, from whence the *Cotton* is annually brought in large quantities to us in the northern parts of Europe. It is ſown on plowed lands in ſpring, and is cut down as our corn in harveſt-time, being an annual plant.

The *Cotton* is a woolly or downy ſubſtance, which incloſes the ſeed, and which is contained in a brown huſk or ſeed-veſſel. It is from this plant that moſt of the *Cotton* we uſe is produced, the difference of the ſeveral ſorts of it being owing to the different ſoil and climates it has grown in, and the different culture it has received.

The *Cotton* in the wooll, as it is uſually called, is what we have from Cyprus. Damaſcus *Cotton* is called *Cotton* in the yarn; and the Jeruſalem *Cottons*, which are called *bazaes*, are the fineſt kinds of all.

All the kinds of *Cotton* plants are propagated with us from ſeeds, which muſt be ſown on a hot bed early in the ſpring; and when the young plants are come up, they ſhould be tranſplanted each into a ſeparate pot of light earth, which is to be plunged into a moderate hot bed of tanners bark, obſerving to water and ſhade them till they have taken root; after this they ſhould be watered at times, and have as much air as the ſeaſon will permit. As they enlarge in ſize, they muſt be ſhifted into larger pots; but they muſt be kept in the ſtove, where the herbaceous kinds will annually flower in autumn; but they will ſeldom bring their pods to any perfection. *Miller's* Gard. Dict.

XYLON, Ξύλον, among the Athenians, a puniſhment inflicted by putting the offender into the ſtocks. See the articles PODOCACE and PUNISHMENT.

XYLOSTEON, in botany, a name by which ſome authors have called the ſmall red-berried double-fruited *chameceraſus*.

XYLOSTEUM, in botany, the name of a genus of plants, the characters of which are theſe: The flower conſiſts of one leaf, and is placed on a cup, and always diſpoſed two on each pedicle: it is tubular in ſhape, and divided into ſeveral ſegments at the edge. The cup finally becomes a fruit, compoſed of two berries, which are ſoft, and contain a roundiſh but flatted ſeed. See Tab. 1. of Botany, Claſs 20.

There is only one known ſpecies of this genus, which is the Pyreenan *Xyloſteum*. *Tourn.* Inſt. p. 609.

XYLOSTROTON, among the antients, an appellation given to moſaic or chequered work. *Pitiſc.* Lex. Ant. in voc.

XYMPATHESIS, a word uſed by ſome of the old medical writers for ſympathy.

XYNERESIS, a word uſed by Hippocrates and others of the antients, to expreſs a firm coheſion or connection of any two things: ſome uſe it to expreſs that firm ſhutting together or clenching the teeth, which happens in convulſions.

XYPHION, in botany, a name uſed by ſome authors for the gladiolus or corn-flag, a plant kept in our gardens for the beauty of its flower. *J. Bauhin.* vol. 2. p. 701.

XYRIS, in the Linnæan ſyſtem of botany, the name of a genus of plants, whoſe characters are, that the flower-cup is a ſort of roundiſh ſpike, made up of roundiſh, hollowed, imbricated ſcales, which divide the flowers; the huſk is ſmall and bivalve, each of the valves being compreſſed, arched, and in the ſhape of a little boat; they are alſo acute, and naturally incline toward one another. The flower conſiſts of three petals, which are large, flat, expanded, with notched edges, and narrow ends, of the length of the cup they are immerſed in. The ſtamina are three ſlender filaments, which are ſhorter than the flower. The antheræ are oblong and erect. The germen of the piſtil is roundiſh; the ſtyle is ſingle and thread-like, and the ſtigma divided into three parts. The fruit is a roundiſh capſule,

capsule, contained within the cup, with three cells and three valves. The seeds are very numerous, and extremely small. *Linnæi* Gen. Plantarum. p. 11.

XYSTICI, among the antients, a designation given to the Athletæ, because they performed their exercises in the *Xystus*. See the article XYSTUS, *Cycl.*

Y.

YARD (*Cycl.*)—YARD-*fallen*, a term used among our farriers to express a malady to which horses are sometimes subject, which is the hanging down of the penis from its sheath between the legs, the creature not being able to draw it up again.

This is caused by weakness of the peculiar muscles, which should act in the drawing up; and proceeds sometimes from a violent slip or strain; sometimes from a blow on the back, and sometimes from extreme weariness in long journeys.

The method of curing this, is first to wash it with oil of roses, after this with warm white-wine, and finally, to anoint it with a mixture of oil of roses and honey: it is then to be returned into its place, and kept from falling down again by a little canvas bolster. It is to be thus dressed once in twenty-four hours, till the cure is perfected.

There are some other distemperatures to which this part is subject, in a horse, as the being foul at the end, so that the creature voids his urine in the sheath; in this case the method of cure is to draw out the penis, and cleanse the end of it from any foulness that may be found there; then it is to be washed with butter and white-wine vinegar melted together: sometimes there is a discharge of a yellow stinking matter from the penis: this is peculiar to stone-horses, and principally affects them after the time of their covering of mares.

This running is attended with a swelling of the penis, and with a pain in voiding the urine; the creature also finds a difficulty in drawing up the penis into the sheath. The method of cure is, to dissolve in a pint of white-wine an ounce of roach-alum by boiling, and four or five times a day this is to be used, injecting it up into the *Yard* with a syringe blood-warm. This will prove a certain cure.

YARIN, a word used by some of the chemical writers to express the flos æris.

YARN (*Cycl.*)—*Spun* YARN, on board a ship. See the article SPUN, *Cycl.*

YGROPISSOS, in the materia medica, a word used by some writers to express tar.

YARROW, in botany. See the article MILLEFOLIUM.

YARWHELP, or YARWIP, an English name used in some places for the *godwit*, the *ægocephalus* of authors. See the article ÆGOCEPHALUS.

YAWS (*Cycl.*)—This is a distemper epidemical, or rather endemical to Guinea, and the hotter climates in Africa, seldom failing to attack each individual one time or other of their lives, but most commonly in childhood or youth: It makes its first appearance in little spots on the cuticle, level with the skin, no larger than the point of a pin, which increase daily, and become protuberant like pimples: soon after the cuticle frets off, and then, instead of pus or ichor in this small tumour, white sloughs or sordes are only found, under which is a small fungus growing out of the cuticle, increasing gradually to different magnitudes, some less than the smallest wood-strawberry, some as big as a raspberry, and others even exceeding in bigness the largest mulberries, which they very much resemble. While they are coming to this height, the black hair, which grows out of the part now covered with the *Yaws*, changes gradually white.

It is impossible to calculate the exact time which this distemper requires, to go through these different stages. Some negroes, who were in good plight, and had full nourishment, in a month after discovering the white spots, have had several *Yaws* as big as a mulberry; and in other negroes, that were low in flesh, and had but a poor scanty diet, in three months time none of the *Yaws* have exceeded a common strawberry.

The *Yaws* appear on all the parts of the body; but the most and biggest are generally on the groins, about the privities and anus, in the arm-pits and face. When they are very large, they are few in number; and when they are many in number, they are small in size. All this time the patient is in good health, does not lose his appetite, and seems to have no other uneasiness than what the nastiness of the sores occasion; for they are not painful, except touched too roughly. This is the natural appearance of the distemper, when left to itself, and in this state it will continue a long time without any sensible evacuation.

The *Yaws* do not prove often dangerous, if the cure is undertaken skilfully at a proper time, and the patient has not undergone any course of physic for them before; but if the patient has been once salivated, or taken any quantity of mercury, and the skin once cleared, and they appear again, they are always very difficult, and often impossible, to cure. Medic. Ess. vol. 5. art. 76.

The chief part of the cure is by gentle salivation with calomel, in small doses, that it may neither vomit nor purge. The patient's drink is the decoction of guaiacum and sassafras, fermented with melasses. See Medic. Ess. ibid. or the Abridg. vol. 2. p. 305.

Sometimes one large *Yaw*, high-knobbed, red and moist, called the *master-Yaw*, remains after the rest are fallen off, and the salivation is over. And to subdue this, some have thought new salivations necessary; but it requires only to be destroyed by a gentle caustic, or mild escharotic, as equal parts of red precipitate and burnt alum.

The salivation should not be begun befor the *Yaws* are at the height, which is discovered by their being at a stand, neither increasing in size or number. Their coming to the height should be accelerated by proper medicines. If the patient be salivated before this time, the distemper will return soon after the salivation. Ibid. p. 304.

YAYAUHQUITOTOTL, in zoology, the name of an Indian bird, described by Nieremberg, remarkable for having two feathers of its tail much longer than tho rest, and naked for a great way; but at the end ornamented with black and blue hairs. The bird is of the size of the starling, and is beautifully variegated with green, blue, yellow, and grey.

Mr. Ray is of opinion, that this is the bird described by Marggrave under the name *guaira guainumbi*. *Ray's* Ornithol. app. vol. 298. See the article GUAIRA-*Guainumbi*.

YDRINUS, or HYDRINUS, a name given by some to the *ophites*, or serpent-stone.

YEAR (*Cycl.*)—YEAR is also a word used by some of the chemical writers to express any product of their operations, which may serve as a medicine, whether internally or externally.

YEAST. Common ale-*Yeast* may be kept fresh and fit for use several months, by the following method: Put a quantity of it into a close canvas bag, and gently squeeze out the moisture in a screw-press, till the remaining matter be as firm and stiff as clay.

In this state it may be close packed up in a tight cask, for securing of it from the air; and will keep fresh, sound, and fit for use for a long time.

This is a secret that might be of great use to the brewers and distillers here, who, though they employ very large quantities of *Yeast*, seem to know no method of preserving it, or raising nurseries of it; for want of which they sustain a very considerable loss; whereas the brewers in Flanders make a very great advantage of supplying the malt-distillers of Holland with *Yeast*, which is rendered lasting, and fit for carriage, by this easy expedient. *Shaw's* Lectures, p. 195.

YELION, a word used by some of the barbarous writers to express glass.

YELLOW (*Cycl.*)—Mr. Boyle tells us a most beautiful *Yellow* may be procured by taking good quick-silver, and three or four times its weight of oil of vitriol, drawing off, in a glass retort, the saline menstruum from the metalline liquor, till there remains a dry snow-white calx at the bottom: On pouring a large quantity of fair water on this, the colour changes to an excellent light *yellow*.

He says he fears this colour is too costly to be used by painters, and he does not know how it would agree with every pigment, especially oil-colours. Works abr. vol. 2. p. 91.

The Chinese are famous for their *Yellows* in dying, which never change with washing. They make this dye of the flowers of the acacia, in a manner in which we might use several of our own productions to great advantage.

It is thus: They gather the flowers before they are perfectly ripe, and dry them in an earthen vessel over a gentle heat, till they crisp up in the manner of tea-leaves; they then add to them the ripe seeds of the same tree in different proportions; and then boiling them in river-water with alum, they give the *Yellow* in any degree that they please.

They have three kinds of *Yellow*, which they distinguish by the names of *Ngo-hoang*, *King-hoang*, and *hoang* alone.

The first of these is the brightest *Yellow*; to dye five or six ells of silk of this colour, they use a pound of the flowers of the acacia, about two ounces of the seeds, and four ounces of alum.

The *King-hoang* is a somewhat deeper *Yellow*; to dye this, they use the same ingredient in the same proportion as in the former case; and when the silk is dry from the dipping in this, they give it a second dipping in a slight tincture of Brasil-wood, this brings it to the fine strong *Yellow* we see.

The *hoang* or pale *Yellow*, is made of the same ingredients as the first, only instead of four ounces of alum they put in but three ounces: River-water is found to be greatly preferable to any other, for the extracting these colours; but even in that there is great difference, some doing the business much better than others.

The Chinese are so expert in judging on this occasion, that they can tell by the taste of water whether it will or will not do; and if it taste faint, they know it is faulty; but they dip the pieces twice into it instead of once, and then the colour succeeds well.

The flowers of the acacia, when they have been prepared by roasting in this manner, may be kept all the year round, and employed in dying as occasion requires, only there is to be longer boiling for the dryed flowers than the fresh ones; and it is always found, that the fresh flowers give the brightest colour. Observ. sur les Coutum. de l'Asie, p. 254.

YELLOW *Flower-de-luce*, in botany. See the article IRIS *Palustris*.

YELLOW-*Hammer*, in zoology, the name of a very common English bird, called by authors *emberiza lutea*; and by some *hortulanus*, by others *luteus*, and by others *chloreus*.

It is a little larger than the chaffinch, and is very beautifully variegated with a greenish or greyish brown and a fine bright yellow.

There is beside this another kind, which is much smaller and of a browner colour on the back; this is called by some authors *zivolo*. *Ray*'s Ornithol. p. 196. See the article ZIVOLO.

YELLOWNESS *of Infants*. See the article INFANT.

YELLOWS, a name given by farriers to the jaundice in horses. See the article JAUNDICE.

YERK, in the manege. See the article YERKING, *Cycl.*

YETTUS, in natural history, a name given by the writers of the middle ages, to a species of marble, of a deep red; which was used by some as a touch-stone.

YEVA *Charrum*, in natural history, a name given by the people of the East-Indies to a kind of litharge; which is very common in that part of the world, and is said to be made partly from lead and partly from zink.

It is less heavy than our yellow litharge, and of a paler colour. It is used as a caustic in all the occasions of surgery there.

YEW, *Taxus*, in botany, the English name of a genus of plants. See the article TAXUS.

YEW is also a term used by the salt-workers of Limington, and some other parts of England, to express the first rising of a skum upon the brine in boiling.

In the places where they use this term, they add no clarifying mixtures to the brine, for it ferments in the cisterns, and all its foulness sinks to the bottom, in form of a thin mud; they admit only the clear liquor into the pan, and boil this briskly till it *yews*, that is, till a thin skin of salt appears upon its surface; they then damp the fire, and carefully skim off this film, and clear only the scratch or calcarious earth, which separates to the bottom.

They do not collect this into scratch-pans, as at many of the other works, but they rake it up to one side of the pan, and take it out; they there add a piece of butter, and continue the fire moderately strong till the salt is granulated. They keep a brisker fire on this occasion at Limington, than in most of the other works; so that they will work three pans in twenty-four hours. See the article SALT.

YIELD, or SLACK *the Hand*, in the manege, is to slack the bridle, and give the horse head. See the article SLACK.

YIN, a word used by some of the chemical writers, to express verdigrease.

YOKE (*Cycl.*)—YOKE, in the sea-language. See the article SEA-*Yoke*, *Cycl.*

YOMO, a word used by some of the chemical writers to express verdigrease.

YOS, a word used by some of the chemical writers to express verdigrease.

YOUNG *Animals*. It is commonly thought that the flesh of *young* animals is sooner digested, than the flesh of the same kind of animals arrived at full growth; and Dr. Cheyne is also of this opinion. But Dr. Bryan Robinson shews this to be a mistake, in some instances; and alledges, that veal and lamb are not so soon digested, as beef and mutton. He mentions the case of a man, who took a vomit every second night for some months, who observed, that when he had taken chicken for dinner, he always threw it up undigested; but never threw up any of his food undigested, when he dined on beef and mutton.

YOUTH. The renovation of *Youth* has been much sought after by chemical adepts; and many of them pretended to various secrets, for this purpose: But unluckily, the death of the pretenders proved a sufficient refutation of their doctrine. Paracelsus talks of the mighty things he could do with his *ens primum*; and even Mr. Boyle tells us some strange things about the *ens primum* of balm. *Boyle*'s Works abr. Vol. I. p. 75. but Mr. Boyle gives these wonderful stories on the credit of a French chemist, and not on his own. See the article ENS *Primum*, *Cycl.*

YOUTH, *Juventus*, in the Pagan theology, a goddess worshipped among the Romans, who, together with the gods Mars and Terminus, kept her place in the capitol along with Jupiter, when the other deities were turned out. Whence the Romans drew a lucky omen for the durableness of their empire. Mem. Acad. Inscrip. Vol. I. p. 71. *seq.*

This state of life was, by the antients, compared to Autumn. In which sense, Horace speaking of one approaching to Puberty, says,

Jam tibi lividos
Distinguet Autumnus racemos,
Purpureo varius colore.

The moderns, on the contrary, when they speak of one in the autumn of his age, mean one that is upon the decline; and choose rather to use the comparison of the spring, to denote *Youth*.

YS, in ichthyology, a name given by Athæneus, and some other of the Greek writers, to the fish called *Mus* and *Sus* by others. It is the capriscus of later writers. See the article GOAT-*Fish*.

YSAMBRA, a word used by some as a name for hellebore, and by others to express a species of poison prepared in Spain, of which hellebore is an ingredient.

YSOPUS, a term used by some, to express the chemical art of separation.

YSPAR, a name by which some of the chemical writers call iron.

YTIC, in natural history, the name of a species of duck, common in the Philippine-islands, and in China.

It is of the size of our tame duck, and is that species which the Chinese hatch from the egg by heat, as the Ægyptians do chickens.

YTZAIMPATLI, in the materia medica, a name given by some to the cevadilla, or *hordeum causticum*, the caustic Indian barley. *Hernand.* p. 307.

YUCCA, or MANIHOT, in botany, the name of the Indian corn. See the article MANIHOT.

We have three or four species of this plant preserved in the gardens of the curious; and the common kind, when grown strong and hardy, will endure the cold of our climate in the open air, and produce its flowers with us.

All the species may be propagated either from seeds sent from abroad, or from off-sets or heads taken from the old plants, in the manner of the aloe. When they are to be raised from seeds, these are to be sown in a pot of light fresh earth, which being plunged into a moderate hot bed the young plants will appear in five or six weeks; and when they are two or three inches high they are to be removed, each into a separate pot, which is to be plunged again into the same hot bed, where they are to be watered and shaded, and to have air given them, as the season and the heat of the bed will permit. In July they must be hardened by degrees to the open air, into which they must be removed soon after to harden them against winter. They must be placed in a defended situation, and remain abroad till October, when they are to be removed into the green-house, and placed among the hardier sorts of aloes. They are here to be treated exactly as those plants; and when they are grown sufficiently strong, they may be removed into common borders, where they will remain through our winters, and flower very beautifully.

When they are to be raised from the off-sets, these must be laid in a dry place for a week or ten days before they are planted, that the wound where they where taken off from the old plant may heal; else, like the other succulent plants, they are apt to rot in the earth, and miscarry. *Miller*'s Gardener's Dict.

YUCCA-*Bread*, or CASSADA-*Bread*, a sort of bread made in many parts of the West-Indies, and eaten there; and sometimes brought over as a curiosity to us.

It is made of the root of this plant, known among the botanists by the name of *manihot*. This grows to five or six feet high, the stalk is woody and full of knots, and has a large pith in it; the leaves are digitated or divided into a number of segments, like so many fingers; the flowers are composed of one leaf, and are as large as our narcissus, and are succeeded by a fruit of the size of a hazel-nut.

The root is very large and thick, and of a dark colour without, but very white within. It grows wild, common enough in ſome places; but it is generally cultivated for uſe, ſetting it in large furrows. Its juice is poiſonous, though the dry powder of the root is perfectly innocent and wholeſome; but there is a kind of it which may be eaten raw, and which is now getting into uſe; inſtead of the other, which is a ſpeedy poiſon, if eaten with its juice.

The manner of making the bread from theſe roots, is this; they peel them, raſp them, and putting them into bags ſqueeze out the juice; they then dry the remaining matter over the fire, and when it is ſufficiently dreſſed, they make it into cakes, which being dried either in the ſun, or by artificial heat, are the *Caſſada-bread*; which is very nouriſhing, and will keep without moulding, as well as biſcuit.

The uſe of it is apt to contract the throat, if eaten dry, and ſometimes brings on a danger of choaking; the beſt method is to moiſten it in broth, or otherwiſe. before it is eaten, or elſe to have a bottle of water at hand to waſh down every mouthful.

The juice expreſſed in preparing this root for bread, will kill any animal that drinks it crude; but it may be boiled over the fire till a great part is evaporated, and the remainder if it be far evaporated will be ſweet, and ſerve in the place of honey; if leſs evaporated, and ſet by to ferment, it will make a very good and wholeſome vinegar. The juice of the roucou is ſaid to be a counter-poiſon for the juice of *Yucca*. *Lemery*. Dict. des Drog.

The thicker cakes of *Yucca-bread* are called caſſavi, or caſſada, and are eaten by the poorer ſort. The thinner are called *ſciam*, and are eaten by the rich. *Grew's* Muſæum, p. 371.

YXIR, a word uſed by ſome of the old chemiſts, to expreſs any thing good in medicine.

YZQUANHTH, in zoology, the Indian name for a bird deſcribed by Nieremberg, and called the creſted eagle. See the article AQUILA *Criſtata*.

YZQUIEPATL, in zoology, the name of an American animal of the fox-kind, and much reſembling a common fox when young.

It is a low animal, its body long, and its legs ſhort. Its noſe is ſharp, its ears ſmall, and its body very thick, covered with hair, particularly about the tail, which is long, and covered with the ſame ſort of hair with the reſt of the body, which is black and white. Its claws are very ſharp; it lives in the caves and in the hollows of rocks, where it breeds, and brings up its offspring. It feeds on worms, beetles, and other inſects, and ſmall animals: When purſued, it breaks wind backward with an inſupportable ſtench.

Its whole body is, indeed, of a very ill ſmell; and its urine and dung are ſo horribly ſtinking, that we have no ſtench that can compare with them. It is a mild and harmleſs animal; but when provoked, its only power of hurting is by violently diſcharging its excrements, which it will throw to ſix or eight foot diſtance, and which ſtain people's cloaths with indelible yellow ſpots, and leave a horrible ſtink which remains a long time on them.

The creature in many reſpects reſembles the rackoon, but differs in its offenſive ſmell, and in this remarkable manner of diſcharging its excrements.

Hernandez mentions two other ſpecies of it; the one variegated with numerous white ſtreaks, but this is called by no diſtinct name among the inhabitants; the other they name the *conepatl*, this has only one longitudinal ſtreak on each ſide the back, which run into the tail. *Ray's* Syn. Quad. p. 184.

Z.

Z. This letter formerly ſtood as a mark for ſeveral ſorts of weights. Sometimes it ſignified an ounce and half, and very frequently it ſtood for half an ounce; ſometimes for the eighth part of an ounce, that is a dram Troy-weight; and it has in earlier times been uſed to expreſs the third part of an ounce, or eight ſcruples.

ZZ, theſe letters were uſed by ſome of the antient phyſicians, to expreſs myrrh. At preſent they are often uſed to ſignify *zinziber*, or ginger.

ZAARA, a word uſed by the Arabian phyſicians, to expreſs the *vigilia morboſa*, or continual watchings of perſons in many illneſſes.

ZACINTHA, in botany, the name of a genus of plants, the characters of which are theſe: The flower is of the ſemifloſcular kind, the ſemifloſcules are placed on the embryo-fruit, and are all contained in a general ſcaly cup. This cup finally becomes a ſtriated head, compoſed of ſeveral capſules, each of which contains one ſeed winged with down.

There is only one known ſpecies of this plant, which is what has uſually been called by authors *chicorium verrucoſum*, the wart gum-ſuccory. *Tourn.* Inſt. p. 476.

ZACYNTHUS, an epithet uſed by the antients to a liquid bitumen, from the iſland Zant.

ZADURA, in the materia medica of the antients, a name given to a foreign root, which was round and ſmooth, and of the colour of ginger.

It was at that time imported from the Indies, and greatly eſteemed in peſtilential caſes.

ZAFFABEN, a word uſed by ſome of the chemical writers, to expreſs putty.

ZAFFER, or ZAFFRE, in chemiſtry, the name of a blue ſubſtance, of the hardneſs and form of a ſtone; and generally ſuppoſed to be a native foſſil.

It is in reality, however, a preparation of cobalt; the calx of that mineral being mixed with powdered flints and wetted with water to bring it into this form. *Hill's* Hiſt. of Foſſ. p. 625. See the article COBALT.

To prepare this for uſe in the glaſs-trade, put it in groſs pieces into earthen pans, and let it ſtand half a day in the furnace; then put it into an iron ladle to be heated red hot in the furnace; take it out while thus hot, and ſprinkle it with ſtrong vinegar; and when cold, grind it on a porphyry to an impalpable powder, then throw this into water in glazed earthen pans; and when it has been well ſtirred about, let it ſettle, and pour off the water: Repeat this waſhing often, and the foulneſs of the *Zaffre* will be thus wholly ſeparated: Dry the powder and keep it for uſe.

ZAFFRAMEN, a word uſed by ſome medical writers, to expreſs ſaffron.

ZAFFRAN, a word uſed often in authors to expreſs ſaffron, but ſometimes as the name of other things of a yellow colour; thus ochre was called by this name.

ZAFRANIA, in colours, a term uſed by the Greeks, to expreſs the yellow of ſaffron. The barbarous writers of the after-ages tranſlated it into the Latin *crocietas*, or ſaffron-colour.

The later Greek writers only uſe it, and they have taken it literally from the Arabians Aviſenna and Serapio. This was a term uſed by them to expreſs the colour of the fine bole-armenic of Galen, which they tell us ſtained paper to a fine and beautiful gold colour.

ZAGI. See the article ZEGI.

ZAGU, in the materia medica, the name given by ſome authors to the ſago-tree, the *todda pauna*, or *palma fructu pruniforme*. *Jonſ.* Dendr. p. 144.

ZAHIA, a word uſed by the Arabian phyſicians, to expreſs a ſort of dyſentery, in which there was a very large diſcharge of blood from the rectum, attended with an evident ſenſation of abraſion, or pain in the bowels.

ZAIBAC, one of the many names by which the antient chemiſts have called mercury.

ZAIDIR, a name by which ſome of the chemical writers have called verdigreaſe, or the ruſt of copper; and others, the metal itſelf; and ſome braſs.

ZAIN, in the manege. A horſe is called in French *Zain*, that is of a dark colour, neither grey nor white, and without any white ſpot or mark upon him.

ZAMECH, a name given by ſome writers to the lapis lazuli.

ZAMPOGNA, in the Italian muſic, is uſed to denote any inſtrument that ſounds like a flute; and particularly a bagpipe, being an aſſemblage of divers pipes of different ſizes. It is alſo taken for a common flute.

ZANNA, the name of a medicinal earth, deſcribed by Oribaſius; he ſays, it is found in Armenia, in that part which borders on Cappadocia; and that it is very drying and of a pale colour, and eaſily diſunited by water, falling into a fine powder like lime.

It is called by the natives *Zarina*, and the mountain from which it is taken is near the city Baganona. It is of a drying and aſtringent nature.

ZANNICHELLIA, in botany, a name given by Micheli, to a genus of plants, called by others *algoides*, *aponogeton*, and *gramine folia*.

The characters are theſe: It produces diſtinct male and female flowers, which always ſtand very near one another. The male flower has neither cups nor petals, but conſiſts only of one erect ſtamen or filament, which is conſiderably long,

leaves, and is terminated by an oval anthera. The female flower has a bellied perianthium compofed of one leaf divided into two at the end. There are no petals. The piftil has feveral corniculated germina, with as many fimple ftyles with plain ftigmata of an oval figure. The feeds follow thefe, and are as many in number as there were horns or germina; they are oblong, pointed at each end, and gibbous on one fide, and are covered with a fkin or rind. *Linnæi* Gen. Pl. p. 444. *Vaillant*, A. G. 1719. *Ponteder* Anth. *Dillen*. Gen. p. 169.

ZANONIA, in botany, the name of a genus of plants, the characters of which are thefe: It produces feparate male and female flowers; in the male flower the cup is a perianthium, compofed of three leaves of an oval figure, expanding every way, and fhorter than the flower. The flower is monopetalous, but divided into five fegments, and has an open mouth. The fegments are jagged, and are equal in fize, and bend backwards. The ftamina are five filaments of the length of the cup, ftanding open at their ends, and terminated by fimple apices. The female flowers grow on feparate plants, and have the cup and flower the fame as in the male, only that the cup ftands upon the germen of the piftil. This germen is oblong, and from it are propagated three reflex conic ftyles. The ftigmata are bifid and curled; the fruit is a long and very large berry, truncated at the end, and very fmall at the hafe. It contains three cells, and has a curled future near the apex; the feeds are two; they are of an oblong figure, and flat *Linnæi* Gen. Pl. p. 477. H. Malab. vol. 8. p. 47. 49.

ZANTHENES, in natural hiftory, a name given by the antients to a foffile fubftance found in Media. Pliny quotes Democritus for faying, that if rubbed in palm wine and faffron, it became as foft as wax, and yielded a very fweet fmell.

ZARFA, in botany, a name given by Leo Africanus, and others, to the *lotus* or nettle tree.

It has been doubted by fome what tree he meant, but his own defcription of the *Zarfa* clears it up: he fays, that the leaves of the tree are like the nettle, the fruit like a cherry, but fmaller, and in tafte very much like the jujube; and that the Arabians call it *rabich*.

ZARIFU, a word by which fome of the chemical writers have expreffed tin.

ZARNAB, in the materia medica, a term ufed by Avifenna and Serapion to exprefs the *carpefia* of the antient Greeks.

This was an aromatic drug ufed as a fubftitute for cinnamon, and was the young fhoots of the tree which produces the cubebs, or fome other fuch fhrub. It was a fine aromatic, ftomachic, and cordial.

Galen gives an account of two kinds of it, called *Laerticum* and *Pontiacum*, from the names of places where they grew: both thefe feem to have been the roots of the fame tree, and both to have been produced in the fame country Pamphilia, but on two different mountains there.

Some are of opinion that the *Zarnab* of the Arabians, and *carpefia* of the Greeks, were not the fame thing, but two drugs very like one another; but though Paulus Ægineta, and fome others are of this opinion, it fcarce feems clearly made out. See the article CARPESIA.

ZARNACH, the fame as the word *Zarnich*; the name of the orpiment of the Arabians. See ZARNICH.

It was not confined however to this fenfe alone, but was ufed as a name for other things ufed in painting, and particularly for the *lapis armenus*.

Aetius tells us, that the Syrians called the *lapis armenus Zarnach*, and many others have followed their example. Diofcorides and Theophraftus keep the words, and the things fignified by them, wholly feparate. They call the *lapis armenus* by the name of *armenion*, and the *Zarnach* by that of *arrenecon*, that is orpiment. The red and yellow orpiment were both called by this name, only with the addition of an epithet that expreffed the difference of colour. Diofcorides indeed mentions a fort of red arfenic, different from the red orpiment, which he fometimes calls *fandarach*; but the Arabians confound all thefe things under the name *Zarnach*. See the article CARNID.

ZARNICH, in natural hiftory, the name of a genus of foffils; the characters of which are thefe: They are inflammable fubftances, not compofed of plates or flakes, but of a plain fimple and uniform ftructure, not flexile nor elaftic, foluble in ore, and burning with a whitifh flame, and noxious fmell like garlick.

Of this genus there are four known fpecies: 1. A red one, which is the true *fandarach*. (See the article SANDARACH.) 2. A yellow one, found in great abundance in the mines of Germany, and frequently brought over to us among and under the name of orpiment. 3. A greenifh one, very common in the mines of Germany, and fold in our colour-fhops under the name of a coarfe orpiment. This is alfo found in our own country among the tin mines of Cornwall. And, 4. A whitifh one, a very remarkable fubftance, which has the property of turning black ink to a fine florid red. This is common in the mines of Germany, but is of little value. *Hill*'s Hift. of Foffils, p. 40.

ZARUTHAN, in furgery, a word ufed by fome to exprefs a hard and unequal tumor of the breaft, attended with a burning heat, and a violent but not continual pain.

This is by fome refer'd to the cancer, and accounted a fpecies of that terrible diforder: its caufe is fuppofed to be a fharp ichorous humor in the blood.

ZAUROS, in ichthyology, a name given by the antient Greeks to that fifh which we call *faurus* and *lacertus*, and which is called at Rome the *tarantola*.

It is truly a fpecies of the ofmerus, and is diftinguifhed by Artedi by the name of the ofmerus, with eleven rays in the pinna ani. See the articles OSMERUS and SAURUS.

ZEA. In the writings of the antient Greeks, this word fometimes is ufed to exprefs the libanotis. Diofcorides tells us that the libanotis was by fome called *Zea*, and by others *cachrys*.

It is remarkable alfo, that the word *cachrys* is by fome ufed to fignify the libanotis, and by others for the *Zea*. There cannot well be conceived two more different plants than the *Zea* and the libanotis, the one being a corn, and the other a tall umbelliferous plant; and it is therefore unaccountable that that the Greeks and Romans fhould have borrowed of one another the cuftom of calling them both by the fame name.

The word *Zea*, when taken out of this ambiguity, and afcertained as the name of a corn alone, is yet not certain and determinate in its fenfe in the various writers; moft indeed make it the name of the fpelta, or fpelt corn; and this certainly is keeping up to the fenfe of Diofcorides, whofe *Zea* is evidently the fpelt corn. He mentions two kinds of it, the monococcous and the dicoccous; that is, fuch as has only one grain or two in a hufk.

The *Zea*, or *Zeia* of Theophraftus, is alfo evidently the fame with the *Zea* of Diofcorides, according to his defcription; but there is much doubt whether it can be allowed to be the *Zea* of later writers in the fame language. Theophraftus fays, that the *Zea* is the lighteft of all corn; and in this Diofcorides agrees with him: but Mnefitheus in Athenæus fays, that the grain *Zea* is heavy, and the bread made of it the heavieft and hardeft to be digefted of that of any grain, and that it was therefore to be eat very fparingly, or it would do mifchief; and that people who had not been ufed to it, could not bear even a little of it without harm.

The fame author adds, that it is a grain only fit to be cultivated in the cold northern climes, where other corn will not well grow; and that people, who could cultivate no other corn, were obliged to be very careful in the making of their bread of this, and always cautious of the quantity they eat of it.

It is fufficiently plain from this, that the *Zea* of this author is wholly different from the fpelt corn, that is, the *Zea* of the antient Greeks. Galen defcribes a *Zea* which he fays he had fomewhere feen, agreeing with the characters of this corn, and making a blackifh, heavy, and unwholfome bread.

The bread made of the fpelt corn, or *Zea* of Theophraftus, is lighter and whiter than any other bread; and the only feed of the corn kind which this heavy and coarfe *Zea* feems to agree with, is that kind of fecale or rye defcribed by Pliny, which he fays was efteemed a very bad grain, and only eaten when no other could be had, and which he defcribes as growing up with a thin ftalk, but bearing a great quantity of feeds, and thofe black, heavy, and of a bitterifh, difagreeable tafte. This agrees with the *Zea* of Mnefitheus, in growing where no other grain would, and in all its other properties.

Many authors make the fecale and olyra to be the fame, and many alfo make the olyra and *Zea* to be the fame; and thence rye and *Zea* are by many brought to be the fame corn. Herodotus tells us of the Egyptians ufing olyra, or, as it is otherwife called, *Zea*; fo he expreffes himfelf. And Hefychius fays, that *Zea* is a kind of grain otherwife called *olyra*; and Nicomedes fays, that olyra is a name given to a kind of grain otherwife called rye or fecale.

This author probably means the fecale of Pliny already defcribed, which is not the common rye, but the fame grain with the *Zea* of Mnefitheus. Diofcorides mentions olyra as a grain of the fame genus with what he calls *Zea* or fpelta, but of a different fpecies; therefore whatever authors meant by thefe words at other times, it is evident that the olyra in the days of Diofcorides, was very different from rye. The antients in general are very perplexed and confufed in their accounts of the bread corns; but thus much may be known with certainty of the meaning of the different writers on this fubject, and this may be a very fair ftep to the unriddling all the reft.

ZEBET, a word ufed by fome of the chemical writers to exprefs dung.

ZEBLICIUM *marmor*, in natural hiftory, a name given by feveral authors to a foft green marble variegated with black and white; and though the authors who have defcribed it have not obferved it, yet it no way differs from the white ophites of the antients. *Hill*'s Hift. of Foffils, p.485. See the article OPHITES.

ZEBRA, in natural hiftory, the name of an animal of the afs kind, common in Africa and in fome part of the Eaft-Indies. It is of the figure and ftature of the mule, but is very different in colour, being very beautifully variegated with fmall broad ftripes of black, white, and brown, drawn from the ridge of the back to the belly. It is a very fwift creature, and

and large droves of them are ufually feen together. *Ray*'s Syn. Quad. p. 64.

ZEFR, a word by which fome of the chemical authors exprefs pitch. See the articles PITCH and TAR.

ZEGI, or ZAGI, a word ufed by Avifenna and others, to exprefs all the feveral vitriolic minerals.

Avifenna fometimes writes it *alzagiat*. Some have fuppofed it only the name of the *calcitis*; but Avifenna tells us, that there are feveral kinds of it, the one yellow, which is *colcothar*; another white, which is *calcadis*; a third green, which is *chalcanthum*, or common vitriol; and a fourth red, which is *fory*. See the article COLCOTHAR, &c.

The old interpreter of Avifenna renders the word *Zagi* by *atramenta*, inks, and this has been much cenfured as feeming to exprefs their being all black; but this is not a juft cenfure. The word *atramentum* is ufed by many good authors to fignify ink, and all the falts of which ink is made, that is, all the forts of vitriol. See the article INK.

ZEHERECH, a word ufed by fome of the chemical writers to exprefs flowers of brafs.

ZEITRABRA, a term ufed by fome of the chemifts to exprefs any thing that is fluxile.

ZELEM, in the materia medica of the antients, a name given by Avifenna and others to a fruit common in Africa in their time, and much efteemed by the people of that country, and called there by fome *piper nigrorum*, the black people's pepper, or negro-pepper.

We have at this time given this laft name to the *capficum*; but that is very different from the plant thus called by thefe writers. Avifenna tells us, that the *Zelem* was a fattifh feed, of the fize of a cich, and of a high flavour, in colour yellow on the outfide, and white within, and that it was brought from Barbary. It has been fuppofed by fome, that the *Zelem* of the Arabians was the *trafi*, or fweet cyprus-root, dug up to be eaten in the manner of the pignut. But it is plain, from this account of Avifenna, that this is an erroneous opinion, the *Zelem* being evidently a fruit, not a root. He adds, however, that there was another plant, properly called *fulful alfuaden*, that is, *piper nigrorum*. This, he fays, was a feed contained in pods like kidney-beans, and was black, and of a pungent and acrid tafte.

This was the fame plant with that afterwards called *piper Æthiopum*, or Æthiopian pepper, which all authors figure and defcribe as growing in pods.

Guilandinus grofsly miftakes Serapio, who fpeaks alfo to this effect, and fuppofes that he fays all this of the *Zelem*, which he only fays of the Æthiopian pepper, or what was properly called *piper Nigrorum*. This author, fpeaking of the *Zelem*, calls it *hab*, which word the Arabians never ufe for a feed of a plant contained in pods, but always for the round and fingle fruit of a tree, as a berry, or the like. And Rhafes, where he is fpeaking of the virtues of feveral fruits, brings in this *Zelem* among them. From the whole, we may at leaft clear ourfelves of a great many errors in regard to the *Zelem*, by proving what it is not, though we cannot eafily fay what it is.

ZELPHI. See the article ZENDA, infra.

ZEMA, a word ufed by many of the old writers for a decoction or apozem.

ZEMASARUM, a word ufed by fome of the chemical writers, as a name for cinnabar.

ZEMECH, a word ufed by fome writers as a name for *lapis lazuli*.

ZEMIA, Ζημια, among the Athenians, is fometimes taken in a large and general fenfe for any kind of punifhment; but more frequently for a pecuniary mulct or fine laid upon the criminal, according to the degree of his offence. *Potter*, Archæol. Græc. T. 1. p. 129.

ZEMPHYRUS, in the materia medica of the antients, a name given to a precious ftone, the fragments of which they ufed as a cordial and fudorific.

It appears by their accounts, that this ftone was blue; and hence many have too haftily judged, that it was the *lapis lazuli*; but in truth it was the fapphire.

The word *Zemphyrus* is no where ufed, but in the writings of the later Greeks, and it is plainly formed, as moft of their names of things are, on the Arabian word, expreffing the fame thing. This Arabian word is *femphir*; and this, in Avifenna and Serapio, is always ufed as the name of a fapphire, never as that of any other gem. We find alfo by their accounts, that this fapphire was not the fapphire of the antient Greeks; but the fine blue pellucid gem we now know by that name; for the fapphire of Theophraftus, and the other old writers, was only a kind of lapis lazuli.

ZENDA, a general term coined by Paracelfus, by which he and his followers exprefs extraneous or equivocal generation, or the production of bodies without a feminal principle. The word *zerunda* is ufed to exprefs this particular fort of generation of men, and *zelphi* in regard to other animals.

ZENECHDON, a term ufed by the Arabian phyficians for a preparation of arfenic, for external ufe; *zeech* being their name for arfenic.

ZENEXTOR, one of the many names by which the chemifts have called mercury.

ZENGIFUR, a word by which fome of the chemical writers have expreffed cinnabar.

ZENI, a word ufed by many of the chemical writers as a name for vitriol.

ZENICON, the name of a poifon, compofed of feveral ingredients, and ufed to poifon the tips of the arrows with which the Celtic hunters fhot at the beafts they purfued for food. The poifon was known to be of that quick fpreading nature, that as foon as the beaft was fallen, the huntfman ran up to it, and cut out a large piece of the flefh about the wound, immediately to hinder the venom from fpreading farther. The antidote to this poifon was fuppofed to be the leaves of oak, beech, and other trees.

ZENITH (*Cycl.*)—*Zenith* is alfo a word ufed by fome medical writers to exprefs the firft appearance of the menfes in young women.

ZENUPH, in the Jewifh antiquities, a kind of tiara worn by the kings of Juda. See the article CIDARIS.

ZEOPHILOS, a word ufed by Quercetan as the name of an antimonial medicine.

ZEOPHYRUM, in the materia medica, the name of the *triticum æftivum*, or *hordeum nudum*, as it is called by fome authors, the naked barley. *Dale*, Pharm. p. 260.

ZEPHYRI *Fœtus*, a term ufed by Hartman, and fome other writers, to exprefs a mole, or falfe conception.

ZERICHUM, a name given by fome of the chemical writers to arfenic.

ZERNA, a word ufed by fome of the chemical writers to exprefs an ulcerated lepra or impetigo; the chemical authors ufe it alfo as a name for the foulneffes which they call the *lepræ metallorum*, or leprofies of metals.

ZERTA, the *Zerte*, a fifh caught in the rivers of Italy, and fome other places, of the figure of the chubb, and called by authors, *capito anadromus*, and the *blike*.

It very much approaches to the figure of the nafus, and has by fome been efteemed the fame fpecies of fifh. It is of a long, and not flat fhape, of a bright filvery colour, and covered with fmall fcales. Its back is of a brownifh hue, and its belly-fins of a mixed reddifh and bluifh colour; the fide-lines reaching from the gills to the tail, are fpotted with brown dots. Its head is thick, and its eyes large and white. Its mouth is foft and toothlefs; but the beginning of its throat is armed with ftrong and fharp teeth, feven in number. It feldom grows to more than two pound weight, and, at times, lives in rivers, at times in the fea; and is efteemed a very well tafted fifh, efpecially a little before the feafon of its fpawning. *Ray*'s Ichthyogr. p. 257.

The *Zerte* is that fpecies of cyprinus defcribed by Gefner and others under the name of *capito anadromus*. See the articles CAPITO and CYPRINUS.

ZERUMBETH, in the materia medica, a root found both in the Eaft and Weft Indies. The plant producing it is called by Pifo and Marggrave, *paco-ceroca*, and by Sir Hans Sloane, *zinziber fylveftre*. See the article GINGER.

It is of a yellowifh grey colour on the outfide, but whiter within; when cut, it fhews a very fmooth and gloffy furface; its fmell is very aromatic and agreeable, and its tafte very acrid, fcarce lefs fo than ginger.

It is good in nervous cafes, and on all other occafions that zedoary is. See the article ZEDOARY, *Cycl.*

ZESTOLUSIA, a term ufed by fome medical authors to exprefs bathing in warm water, by way of diftinction from *pfuchrolufia*, or bathing in cold water.

ZETETÆ, Ζηληλαι, among the athenians, were officers appointed upon extraordinary occafions, to enquire after the public debts, when through the neglect of the receivers, or by other means, they were run up to large fums, and began to be in danger to be loft, if not called in. *Potter*.

ZETUS, a word ufed by fome of the chemical writers as a name for vitriol.

ZEUGITÆ, Ζευγιλαι, among the Athenians, the third clafs of the people, or thofe who had an eftate of two hundred medimns. *Potter*, Archæol. T. 1. p. 14.

ZEUS, in the Linnæan fyftem of zoology, the name of a genus of fifhes, of the general order of the acanthopterygii, the characters of which are, that the membrane of the gills has bones not parallel, that the body is flat, and the fcales are fharp. Of this kind are the aper, faber, &c.

The characters of this genus, according to Artedi, are thefe: The branchioftege membrane does not confift of parallel bones, as in other fifhes, but contains various bones, fometimes laid longitudinally, fometimes tranfverfely, and fometimes obliquely. The fcales are rough, and the body very broad, thin, and compreffed; as is alfo the head. The back-fin is long, and as it were double, being cut in near the middle part, almoft to the bottom or bafe.

The fpecies of this genus are thefe: 1. The *Zeus* with a prickly belly, and a tail rounded at the end. This is the *faber* or *john doree*. 2. The forked-tailed *Zeus*. This is the *faber indicus*, or *piexe gallo*. 3. The red *Zeus*, with an even tail, and with the fnout bending upwards. This is the *aper* of

of Rondeletius, and the *riondo*, of the Italians. *Artedi*, Gen. Pisc. p. 35.

ZIBELLINA, or the *Mustela* ZIBELLINA, in zoology, the name of the creature whose furr is the *sable*, so much valued among us.

It is an animal of the weasel-kind, of the size of a cat, and of a dusky yellow colour, with a mixture of a deep brown; the anterior part of the head, and the ears, are of a brownish-grey, and the hairs about its eyes, nose, and mouth, very long. *Ray*'s Syn. Quad. p. 201.

ZIBETHICUM *Animal*, in zoology, the name of the creature commonly, but very improperly, called the *civet cat*; for it does not at all belong to the cat kind; but wholly to that of the dog; the head and nose are plainly of the figure of the dog's; and the figure, number, and disposition of the teeth, are plainly the same as in the wolf, fox, and dog.

Its colour varies very much; its more usual one, however, is that of a pale grey, variegated with long black streaks, though in the females it is often yellowish, and sometimes whitish, and the spots black and round, like those of the leopard, or cat of mountain.

The whole shape of the creature approaches to that of the wolf or dog; its snout is long and small; its ears are small and roundish; its hairs are like those of the badger, but very soft. It body is thick and fleshy, and something resembles the shape of a hog's; its feet are small, and its legs very short. The bags which contain the civet are placed between the anus and pudenda, and are found equally in the males and females; but in the male they are twice as large as in the female; they have a large cavity in their internal part, and their orifice is small and cartilaginous. The perfumed liquor which is found in these bags, seems to be secreted from a number of glands, which lie between the two skins, of which they are composed. See Tab. of Quadrupeds, N°. 16.

It is remarkable, that in this creature, as in the badger, its nose and belly are black, whereas in almost all other animals these parts are either whitish, or much paler than the rest. These creatures copulate backwards. *Ray*'s Syn. Quad. p. 178.

ZIBIBIÆ, in natural history, a name given by some authors to a large sort of raisins, resembling the stones of dates in shape; they have much pulp, but very little moisture.

ZICCARA, a name of an Indian fruit, resembling a pine-cone, and containing twenty, thirty, or more, kernels, of no known use in medicine.

ZIDRACH, in natural history, the name given by Cuba, and some other authors, to that species of the syngnathus of Artedi, commonly called the *hippocampus*.

ZIFIUS, in ichthyology, a name given by Albertus to the *xiphias*, or sword-fish.

ZIGER, a word used by some of the old writers, to express a very fine kind of cassia, extremely aromatic to the taste, and of a purplish black in colour.

ZIGURELLA, in zoology, the name by which some have called the *julis*, a small but very beautiful fish, common about Genoa, and in some degree approaching to the nature of the turdus or wrasse. *Willughby*, Hist. Pisc. p. 324. See the article JULIS.

It is a species of the *labrus*, according to Artedi, and is distinguished by the name of the *palmaris labrus*, with two large teeth in the upper jaw. See the article LABRUS.

ZIMENT-*Water*, or COPPER-*Water*, in natural history, the name by which some have called water found in places where there are copper-mines, and lightly impregnated with particles of that metal.

The most famous spring of this kind is about a mile distant from Newsol in Hungary, in the great copper-mine called by the Germans, *herrn grundt*. It is not easy to say at what time these waters were discovered, since there is no authentic account of it. Kircher, Brown, Toll, and others, mention them as well known in their times; but it is probable that they were not discovered in the days of Agricola, since he no where makes the least mention of them; and it is not probable that so great a curiosity, and that so immediately in his own way, would have escaped him, if known at that time, especially as he has commemorated the like virtue in the Schmolnich waters, much less famous for it, and of much less power than those of Newsol. The water in this mine is found at different depths, and is received into basons, for the purpose of separating the copper from it: in some of these it is much more highly sated with this metal than in others, and will make the supposed change of iron into that metal much sooner. The most common pieces of iron used in the experiments, are horse-shoes, nails, and the like; and they are found very little altered in shape, after the operation, except that their surfaces are more raised. Philos. Trans. N°. 479. p. 355.

The water which performs this wonderful change, appears greenish in the basons where it stands; but if a glass of it be taken up, it looks clear as crystal: it has no smell, but has a very strong vitriolic and astringent taste, insomuch that the lips and tongue are blistered and scorched on tasting it.

The people who taste this water do not perceive the effect upon their lips, while they are in the mine, otherwise than by a gentle itching; but as soon as they come into the open air, the places where it has touched begin to swell, and matter is at length found in pustules in them.

There is great difference however in the strength of the water at different times, both as to its burning the lips, and its power upon the iron; when the springs yield but a small quantity, it is always much the strongest; but when there flows a very large stream of them, they are always more languid and weak. The caverns in which the basons are placed to receive this water, are of no offensive smell; and what appears somewhat singular, are free from vitriol, which abounds so much in other parts of the mine. There are no crystals, nor filaments of it, seen on the walls; and the stones, which are in other places blue with the admixture of it in their granules, are here white, from its absence. This is probably owing to the humidity of the air in these places, which washes away all the particles of that salt, and carries them to parts of the mine, where they may concrete more easily.

The sides of the caverns near the floor or bottom, very often afford a yellowish earthy substance of a foliated texture, resembling isinglass, and of an insipid taste.

The miners are well acquainted with the virtues of this water, in changing the metals; but they also use it as a medicine; whatever sickness they are seized with, they first attempt its cure by a large dose of this water, which usually both vomits and purges them very briskly.

They also use it in disorders of the eyes, in some of which it must be of great power; but in others, it is very improper; so that upon the whole, they do more harm than good with it.

The copper produced from these waters is valued by the people much beyond any other copper, as being much more ductile, and running easier in the fire, the people in the neighbourhood have many vessels of it; but it is to be observed, that its ductility and hardness grow after it is taken out of the water; for, while immersed in it, it is friable.

It is observed, that after great rains the springs are always fuller than at other times, and the virtues of the water considerably less.

A pound of this water when strongest being evaporated over a gentle fire becomes first turbid and cloudy, and afterwards deposits a yellowish sediment, when evaporated to driness. This sediment is found to weigh two scruples and a half, and when warm water is poured upon this and afterwards filtred, there will be left about six grains of yellowish earth in the filtre; and the greenish solution being again evaporated to a pellicle, and this repeated several times, somewhat more than two scruples of a bluish-green vitriol will be separated in small crystals.

A small quantity of oil of tartar being added to a pound of this water, the whole becomes turbid, and on filtration, leaves a large residuum in the filtre; this when dried will be found to weigh about two scruples and a half, and to be a cupreous vitriol with a very small admixture of a neutral salt.

Finally, if a pint of this water be put into a bottle, and a small piece of iron thrown into it, some bubbles will be immediately found standing on the iron, and it will be by degrees changed to a copper colour; the second day will shew the water considerably turbid, and it will afterwards look whitish, and white filaments will gather about the bottom and sides of the glass, and about the iron, which by that time will look throughout of a coppery colour.

From these experiments we may easily understand what the true nature of the water is, that it contains a large quantity of the vitriol of copper, which it probably owes to a solution of that metal, by means of the acid of the common pyrites and water; when this is known, the effects are not difficultly accounted for, there being no real change of one metal into another; but the true state of the case being that the particles of one metal are dissolved and carried away, and those of another metal deposited in their place: A water thus impregnated is a menstruum capable of dissolving iron, and in the solution of that metal becomes so weakned as to let go the copper it before contained, in small parcels. This is seen to be the case, by examining the changed metal while it lies in the water, the copper then appearing not a soft malleable and even mass, but a congeries of granules closely placed together, and resembling the small granules or ova in the spawn of fishes; and it is very friable and fragile while in this state.

This solution of one metal and deposition of the particles of another in its place, is a thing very familiar in chemistry, and is seen every day in numerous instances; but in none so familiar as in a like case, or solution of iron and of copper in the same menstruum. Thus, if a piece of copper be dissolved in aqua fortis, and when this solution is perfected a piece of iron be thrown into the liquor, the same thing will be seen that is in this spring, for the iron will be dissolved, and the copper which was before dissolved in the menstruum will be slowly precipitated and deposited in the place of it.

This water can only depoſit ſo much copper as it before contained, in the ſolution; and this appears upon experiment to be much leſs than might have been imagined, the quantity being no more than in every pound ſo much as can be contained in about two ſcruples of vitriol; that being the utmoſt quantity ſeparable from it, with all the art that could be uſed. Thoſe people are therefore greatly miſtaken, who ſuppoſe, that if ever ſo much iron be put into the water there will be as much copper precipitated in its place. The quantity of copper, however, annually obtained in this manner is conſiderable, as the waters are conſiderable in quantity. Phil. Tranſ. N°. 479. p. 359.

ZIMEX, a word uſed by ſome of the old chemical writers, for verdigreaſe.

ZINARIA, a word uſed by the Arabians, for a kind of vitiated bile, called æruginous bile.

ZINC. See the article ZINC, *Cycl.* and *infra.*

ZINETUS, a word uſed by Paracelſus, as a name for one of the braſs-like marcaſites.

ZINGAR, a word uſed by ſome of the chemical writers for verdigreaſe; and by others for the flos æris, or flowers of copper or braſs.

ZINGI, in the materia medica, the name of a ſeed, ſometimes alſo called the aniſum ſtellatum, or ſtarry-headed aniſe. *J. Bauhin.* V. 1. p. 586.

ZINGIBER. See the article ZINZIBER, *Cycl.* and *Suppl.*

ZINGNITES, or ZINGRITES, a ſtone deſcribed by Albertus, Ludovicus Dulcis, and other writers of that time, and ſaid to be of a cryſtalline tranſparence; they give us no farther deſcription of it, but attribute a number of imaginary virtues to it.

ZINIAR, a name given by ſome of the chemical writers, for verdigreaſe.

ZINIAT, a word uſed by the old chemical writers, to expreſs either the action of fermentation, or any thing that is capable of exciting it in bodies.

ZINK, (*Cycl.*) in natural hiſtory, the name of a very remarkable foſſile ſubſtance, reſembling biſmuth in appearance, but of a bluer colour.

It is a very remarkable mineral, and one that has never been well underſtood as to its origin, till of late; for though the world well knew of a long time both *Zink* and *lapis calaminaris*, and knew that both of them had the remarkable property of turning copper into braſs, which one would think might have given a hint to the diſcovery of a natural alliance between them; yet have they been ever treated of as two different ſubſtances, by the writers on theſe ſubjects; and Dr. Lawſon was the firſt who ever publicly declared, and proved, *lapis calaminaris* to be the ore of *Zink*. See the article CALAMINARIS *Lapis.*

Zink is generally confounded with biſmuth, though in reality a very different body; but the regulus of theſe two minerals having a very great external reſemblance, the vulgar have not diſtinguiſhed them; and hence we hear of many ores of *Zink* in the leſs accurate writers, all which are truly the ores of biſmuth.

The *lapis calaminaris* is the true and general ore of *Zink*, yet that mineral is not confined to this ore alone, but is mixed in great abundance in its diſſeminated particles among the matter of the ores of other metals, particularly of lead. Our artificers have long been acquainted with *Zink*, under the name of *ſpelter*; but none of them till of late have ever been able to make any gueſs as to its origin. We have much *Zink* brought to us from the Eaſt-Indies, under the name of *tutenag*; yet no body ever knew from what, or how it was produced there; and all that was heretofore known of it was, that among that ſtrange mixture of ores which the great mine yields at Goſſelaer in Saxony, when they were fuſed for other metals, a large quantity of *Zink* was produced; but Dr. Lawſon obſerving, that the flowers of *Zink* and of *lapis calaminaris* were the ſame, and that their effects on copper were the ſame, never ceaſed his inquiries till he found the method of ſeparating *Zink* from it.

The pure *Zink* is a ſolid metal-like body, of a bluiſh white, and ſomewhat leſs brittle than biſmuth, eſpecially when gently heated, and moſt of all the metallic minerals approaches to malleability: It melts in a very ſmall fire, and in a ſtrong one takes fire, burning with a bluiſh-green flame, and ſubliming into white flowers, which are with difficulty reducible again into the form of *Zink*: In an open fierce fire, it wholly flies off in vapour.

There is great reaſon to believe, that all the *Zink* or *tutenag* brought from the Eaſt-Indies, is procured from calamine; and we have now on foot at home, a work eſtabliſhed by the diſcoverer of this ore, which will probably make it very ſoon unneceſſary to bring any *Zink* into England, as we have great plenty of the calamine. *Hill's* Hiſt. of Foſſ. p. 626.

The manner of extracting *Zink* from the lapis calaminaris, is this: The lapis calaminaris muſt be finely pulverized, and well mixed with an eighth part of charcoal-duſt, and put into a cloſe retort to prevent the acceſs of the air, which would inflame the *Zink* as it riſes. The retort is to be placed on a violent fire, ſufficient to melt copper. After ſome time the *Zink* riſes, and appears in the form of metallic drops within the neck of the retort. When the veſſel is cool, it muſt be taken out, by breaking off the neck of the retort. *Marggraf.* in the Mem. de l'Acad. de Berlin, 1746.

Mr. Marggraf obſerves, that different ſorts of lapis calaminaris, ſuch as the Poliſh, Hungarian, and Engliſh, afford different quantities of *Zink*. And that a particular kind found in England, gave near half its weight of *Zink*.

This extraction of *Zink*, does not always ſucceed. Some calamine from Bohemia and Aix-la-chapelle yielded nothing. But then, as theſe kinds did not tinge copper with a yellow colour, nor produce any change in it, he thinks them not true calamine. Hence he concludes, that a ſtone which mixed with charcoal, and expoſed to the moſt vehement action of a cloſe fire, produces no *Zink*; or which, in an open fire, does not produce braſs with copper and charcoal, is not true lapis calaminaris.

Zink, produced in the manner above-mentioned, may be hammered into thin plates; which cannot be done with the common *Zink*. We muſt refer to the learned author for ſeveral other obſervations relating to *Zink*, and its flowers. See the article *White* VITRIOL.

Mr. Boyle tells us he diſſolved *Zink* in an urinous ſpirit, and then put to it a quantity of acid ſpirit; but though a manifeſt conflict aroſe, yet the *Zink* remained diſſolved in the mixture. *Boyle's* Works abr. Vol. 1. p. 521.

Zink may be diſſolved, not only by aqua-fortis, aqua-regia, oil of vitriol, ſpirit of nitre, ſpirit of ſalt, and other mineral menſtruums; but alſo by vegetable ſpirits, as diſtilled vinegar; and by animal ones alſo, as ſpirit of ſal armoniac, and ſpirit of human blood. Ibid. Vol. 3. p. 478.

Mr. Boyle obſerves, that if the ſeveral ſolutions of this mineral be compared, it will ſhew what a variety of taſtes is producible from one inſipid body, by aſſociating it with different menſtrua. Works abr. Vol. 1. p. 541.

The ſame author tells us, that by the help of *Zink*, duly mixed after a certain manner, he has given copper as rich a golden colour as ever he ſaw in the beſt gold. Ibid. Vol. 2. p. 180.

Zink gains weight by ignition. *Boyle*, ibid. p. 391. §. 11. But quære the circumſtances of the experiment; for in the ſame book, p. 395. §. 26. the filings of *Zink* put in a boltglaſs with a ſlender neck, and ſet upon quick coals for four hours, loſt weight.

Flowers of ZINK. The flowers of *Zink* are a ſubſtance famous in the writings of the chemiſts, who have led their followers into a thouſand errors by the names by which they have called them.

Some have called them *talc*, and a ſolution of them in vinegar, *oil of talc*; to which they have attributed very extraordinary qualities. Some have ſet the ignorant upon a fruitleſs attempt of extracting an oil from Venetian talc, to do all the things they have commemorated of this oil. Others have called theſe flowers the *ſericum*: Others the *aqua ſicca philoſophorum*; and others the philoſophic cotton.

The moſt ſimple and eaſy way of obtaining the flowers of *Zink* pure and white, is this: Melt the *Zink* in a tall crucible inclined in the furnace in an angle of 45 degrees or thereabouts; let the fire be moderate, little ſtronger than would be neceſſary for the melting of lead. If the *Zink* is left in this ſtate without being ſtirred, it forms a grey cruſt upon its ſurface, and becomes calcined by degrees under it into a granuloſe white ſubſtance; but to have the flowers, the matter muſt be ſtirred from time to time with an iron rod, and this cruſt broken as often as it ariſes; there will then after ſome time appear a bright white flame, and about two inches above it there will be found a very thick ſmoak, and with this there will ariſe a quantity of very white flowers, which will fix themſelves to the ſides of the crucible in the form of fine cotton.

Theſe flowers are to be ſeparated at times, and by careful management there may be collected from the *Zink* a greater weight of flowers than its own weight, when put into the fire. In working four pounds of *Zink* in this manner, there will be only about an ounce of a calcined earthy matter left at the bottom of the crucible, and the quantity of flowers will be about two drams and a half in each pound, more than the quantity of *Zink*; beſide that, it is eaſy to conceive from the manner of making them, that a great quantity muſt have been carried away with the ſmoak. And this is not to be prevented, ſince if the veſſel be cloſed to keep in the fumes, the external air being denied free acceſs, the ſublimation immediately ceaſes, and no more flowers can be obtained, till the veſſel is again opened, and the air admitted.

The fumes of *Zink* have a ſtrong ſmell of garlic, and are very noxious to the lungs. The reducing *Zink* into theſe flowers, is the deſtroying it abſolutely as to its metallic form; for none of the methods uſed by chemiſts to bring back metals to their original ſtate, are able to bring theſe flowers to *Zink* again.

Mr. Hellot, of the Academy of Sciences of Paris, who has given a very accurate analyſis of *Zink*, has tried the diffe-

rent acid menftrua upon it with very great care and attention to their effects.

Diftilled vinegar was firft tried. Eight ounces of this diffolved, in ten days time, over a gentle fire, an ounce all but fix grains of *Zink*; and after this it ceafed to act upon the metal any longer, and was fweetened in the manner of vinegar which has diffolved lead: This, however, is an experiment not proper to be tried by the tafte, the folution being very mifchievous. Six ounces and two drams of an infipid phlegm were diftilled from this folution, and after this the fire being increafed, ftriæ began to appear on the top of the retort; the receiver being changed, there fucceeded to thefe ftriæ a fublimation of very white and beautiful flowers of *Zink*; and after this a few drops of an oil, yellow at firft, and afterwards green, came over into the receiver. The diftillation yielded alfo about four drams of a fulphureous liquor, inflammable as fpirit of wine. This liquor being poured into a phial of water, at firft fwam upon it, and immediately afterwards blended with it in the manner of fpirit of wine, and left only the few drops of oil fwimming on the furface. This was reddifh in colour, and of an aromatic fmell.

This is the famous liquor called by the chemifts oil of talc, and fuppofed to have fo many great virtues, one of which is the fixing of filver; that is, in other words, the concentrating it to the weight of gold, and making it indiffoluble in aqua-fortis, rendering it like gold foluble only in aqua-regia; but in all probability, this oil is really nothing but the effential oil of the grape from which the wine was made, whence the vinegar had been obtained; and then how idle muft appear all thefe expectations from it.

The flowers fublimed to the neck of the retort or head of the cucurbit, during the diftillation, burnt at the flame of a candle, emitting a fine blue flame. Three ounces of fpirit of falt diffolve perfectly three drams, except two grains, of *Zink*; a great heat is perceived while this folution is making, and this acid as well as diftilled vinegar leaves untouched a fmall blackifh refiduum, from this metal. Some authors have fuppofed, that this refiduum contained mercury; but experiments prove the contrary, and its lightnefs alone makes fuch a conjecture very improbable.

This folution being diftilled, yielded two ounces of phlegm, two drams of a weak fpirit of falt of a very agreeable fmell; and afterwards, on changing the receiver, a few drops of a very acid and yellowifh fpirit, and fome flowers, raifed themfelves to the neck of the retort.

Six ounces of fpirit of nitre diffolves five drams and a half of *Zink*, without leaving any remainder; and the remainder left in the folutions of it by diftilled vinegar, and by fpirit of falt, is itfelf foluble in this menftruum. This folution being diftilled, there were feparated four ounces of phlegm, and afterwards fix drams of fpirit of nitre; this was but very weak, and no more could be raifed; the ftronger part of the acid remaining intimately mixed with the *Zink* at the bottom of the veffel, in form of a vifcous tranfparent fubftance, of a yellow or orange colour.

Three ounces of oil of vitriol, with an equal quantity of water, diffolved fix drams and twenty grains of *Zink*; when the liquor was thus far faturated there began to be formed regular cryftals; and after two months ftanding the whole liquor was evaporated, and a cake of tranfparent vitriol left in the bottom of the veffel. Memoires Acad. Scienc. Par. 1735.

ZINZIBER, *Ginger*. See the articles GINGER, *Cycl.* and ZERUMBETH, *Suppl.*

ZINZIBER *Rubrum*, *red Ginger*, a name by which fome authors have called the officinal caffumunar-root.

ZINZIBER *Caninum*, *Dog's-ginger*, in botany, a name given by fome of the old writers to the *perficaria urens*, or biting arfmart; a plant which is very hot, and pungent to the tafte, and grows in watry places. It had hence the name of *hydropiper*, water-pepper, among the Greeks; and was called *Zinziber caninum*, or dog's-ginger, by Avifenna and others, from its heat, and from an opinion that it would poifon dogs that eat of it.

The Arabian name is *Zinzibil alkeleb*. Avifenna, when he gives the hiftory of it, begins with that of ginger: he fays that he repeats the words of Diofcorides; which he really does, but coupling together the common ginger and this, which he calls dog's-ginger, and thefe being defcribed in two different parts of Diofcorides, the commentator on Garcias accufe him of having taken the name of Diofcorides, and the fenfe of fome other Greek author.

This commentator is the only perfon who has given this part of Avifenna a Latin verfion; but when he fays, that the fruit is fmall and contained in pods, he errs; for the word *ania* fignifying fubftance, not pod; the only meaning of the author is, that the feeds are fmall, and the mifinterpreting his words into the defcription of a podded plant carries away the idea of the arfmart; which is not a podded plant, but is yet the true *Zinziber caninum* of Avifenna, and the *hydropiper* of Diofcorides.

ZINZIBER *Caninum* is alfo a name given by fome authors to the *capficum*, or Guinea pepper. *Ger.* Emac. Ind. 2.

ZINZILLA, a name by which fome medical writers have called that fpecies of the herpes, which we ufually call the *fhingles*. See the article SHINGLES, *Cycl.*

ZIRBALIS *Hernia*, a term ufed by medical writers to exprefs that kind of rupture which is caufed by a defcent of the omentum into the fcrotum.

ZIRBUS, the name by which the Arabian phyficians have called the omentum.

ZIVOLO, in zoology, a name by which fome authors have called the fmaller fpecies of *yellow-hammer*, from its conftant note, which is only *zi*, *zi*.

It is of the fize of the common fparrow; its beak is thick and fhort, its breaft and belly yellowifh, fpotted with brown; and its head, back, wing, and tail of a dufky brown, but two of the tail-feathers on each fide have a variegation of white.

The difference between the male and female in this fpecies is, that the male is yellower, and has fome yellow fpots on its neck and fides, which are wanting in the female. It is almoft always feen on the ground, and feeds on feeds, &c. It feems but little if at all effentially to differ from the common yellow-hammer; and Mr. Ray has fome fufpicion, that they are the fame fpecies. *Ray*'s Ornithol. p. 196.

ZIZANIA, in botany, a name ufed by fome for the *lolium*, or darnel. *Ger* Emac. Ind. 2. See the article LOLIUM.

ZIZANIA, according to Linnæus, is a genus of plants diftinct from the *lolium*, and its characters are thefe: It produces male and female flowers on the fame plant: The male flowers have no cup, but the flower is a bivalve glume compofed of two equal pointed leaves without awns, which furround one another; the ftamina are fix very fhort filaments; the antheræ are oblong and fimple. In the female flowers alfo there is no cup, but the flower is a one-leaved glume of a convoluted figure, having fix nerves running along it, and ending in a point terminated by a long awn or beard. The germen of the piftil is oblong, the ftyle is divided into two parts, and the ftigmata are plumofe; the fruit confifts of the flower itfelf, which continues rolled up, and finally parts off horizontally at the bafe: In this is contained one oblong feed. *Linnæi* Gen. Plant. p. 455.

ZIZERIA, a word ufed by Apicius, and fome other authors, to exprefs the inteftines of fowls of the gallinaceous kind, often ufed in decoctions for glyfters, &c.

ZIZIPHORA, in the Linnæan fyftem of botany, the name of a genus of plants, the characters of which are thefe: The cup is a very long, cylindric, and tubular perianthium; it is compofed of one leaf, and is hairy, ftriated, and at the extremity is divided into five very fmall fegments, and is bearded. The flower is ringent, and compofed of a fingle petal; the tube is cylindric, and of the length of the cup; the limb is very fmooth; the upper lip is ovated, erect, emarginated, and obtufe; the lower lip is broad and patent, and is divided into three rounded, equal fegments. The ftamina are two fimple, patent filaments, of the length of the flower; the ftigma is acuminated, and inflex. There is no fruit, but the cup contains four feeds, which are oblong and obtufe, gibbous on one fide, and angular on the other. Vid. *Linnæi* Gen. Plant. p. 13.

ZIZITH, in the Jewifh cuftoms, a name given by the Jews to the tufts or fringes, they ufed antiently to wear at the four quarters of their upper garments [a]; but which they now only wear under their cloaths, fixed to a fquare piece of cloth, which reprefents the garment they antiently wore in their own country before their difperfion. The *Zizith* of the modern Jews is a tuft made of eight threads of yarn, fpun on purpofe for this ufe; each having five knots, which take up half the length. That which is not knotted, being furled out, makes a kind of tuft or fringe [b].— [[a] Numb. xv. 36. Deuter. xxii. 12. [b] *Leo* of Modena, Cerem. of the Jews P. 1. c. 5. *Calmet.* Dict. Bibl. in voc.

ZIZYPHUS, the *Jujube-tree*, in botany, the name of a genus of trees, the characters of which are thefe: The flower is of the rofaceous kind, being compofed of feveral petals arranged in a circular form; the piftil arifes from the cup, and finally becomes a fruit of the fhape of an olive, and of a flefhy fubftance including a ftone divided into two cells, each of which contains an oblong feed.

The fpecies of *Jujube*, enumerated by Mr. Tournefort, are thefe: 1. The cultivated *Jujube*, with large oblong fruit. And, 2. The wild *Jujube*. *Tourn.* Inft. p. 626. See the article JUJUBE.

The *Zizyphus*, according to Linnæus, is only a fpecies of rhamnus, with oval leaves, and two ftyles; the fruit, or nucleus of which, contains two cells, and its corolla has five fegments.

It is a native of Spain and Italy; and the fruit, which is of the bignefs of an olive, and reddifh when ripe, was once efteemed as a pectoral, and fometimes prefcribed in fevers; but is difregarded in the prefent practice. *Hill*'s Hift. Plant. p. 292.

ZMILACES, in natural hiftory, a name given by Pliny to a ftone found in the river Euphrates, refembling marble, and of a bluifh green colour.

ZMILAMPIS, in natural history, the name of a gem, described by Pliny and the antients, which they tell us was very like the Proconnensian marble, except that in the center of the stone there was always a bluish spot, resembling the pupil of an eye.

The Proconnensian marble of the antients was of a fine clear and elegant white, variegated with irregular black veins. Pliny's description is so short, that it has been supposed from him that the *Zmilampis* was a sort of marble; he only says of it, that it was like the Proconnensian marble, but blue in the middle. Many had inferred from this, that he meant no more by it than that this was a stone, which had blue veins instead of the black ones in the Proconnensian kind. But when we examine the rest of the antients, and find that it was a small stone, found in the river Euphrates, and worn in rings; and that its blue spot was like a pupil of an eye, we may easily determine that it was one of those gems which we call *oculus beli*, or *bellocchio*; of which there are a vast variety found in the rivers of the East-Indies, and many have a fine opake white ground, and a bluish or greenish spot for the pupil.

ZMILANTHES, in natural history, a name given by Solinus, and some others, to a gem called by the more correct writers *Zmilampis*. See the article ZMILAMPIS, *supra*.

ZOCHINACAZTLIS, in botany, a name by which some authors have called the *flos auriculæ*, a flower of New Spain, used in the making of the Spanish chocolate. *Hernand.* p. 30.

ZODIAC (*Cycl.*) ZODIAC *of the comets*. Cassini hath observed a certain tract in the heavens, within whose bound (by many observations) he hath found most comets, tho' not all, to keep. This he makes as broad as the other *Zodiac*, and marks it with signs or constellations like that, which are, *Antinoüs*, *Pegasus*, *Andromeda*, *Taurus*, *Orion*, the *Lesser Dog*, *Hydra*, the *Centaur*, *Scorpion*, and *Sagittarius*.

ZODIACAL *Light*, a brightness resembling that of the milky way, and which is sometimes perceived in the heavens, at certain times of the year, after sun-set, or before its rise. The form of this light resembles that of a pyramid, lying lengthways in the *Zodiac*, within which its point and axis are always inclosed, its base being placed obliquely with respect to the horizon. This phænomenon was first discovered, described, and named by Mr. Cassini the elder. See *Mairan*, suite des Mem. de l'Acad Royale des Sciences, 1731. p. 3.

The *zodiacal light* is nothing but the solar atmosphere, a rare and subtile fluid, either luminous by itself, or made so by the rays of the sun surrounding its globe; but in a greater quantity, and more extensively, about its equator, than any other.

The *zodiacal light* is more or less visible according to circumstances: But the solar atmosphere is not always visible by means of this light, though it be always seen about the globe of the sun in total eclipses.

One of the most essential circumstances for the perception of the solar atmosphere by the *zodiacal light*, is its having a sufficient length on the *Zodiac*; for, without this, its brightness is entirely hid from us by the twilights.

Mr. de Mairan says, it may be proved from many observations, that the sun's atmosphere sometimes reaches as far as the earth's orbit, and there meeting with our atmosphere, produces the appearance of an aurora borealis. See the article AURORA *Borealis*, *Cycl.* and *Suppl.*

The length of the *zodiacal light* varies sometimes in reality, and sometimes in appearance only, from various causes.

The oblique position of this light, little different from that of the plane of the ecliptic, does not permit us to see it distinctly, and sufficiently elevated above the horizon; but some time after sun-set, towards the end of the winter, and in spring, or before sun-rising in autumn, and towards the beginning of winter. Several causes hinder our seeing it, any more than the milky way; such as moon-light and strong twilights, among others.

Mr. Cassini [a] often mentions the great resemblance of the *zodiacal light* to the tails of comets. Mr. Fatio [b] has made the same observation; and Mr. Euler has lately endeavoured to prove them owing to similar causes [c].—[[a] Decouverte de la lumiere celeste que paroit dans le *Zodiaque*, art. 41. [b] Lettre à Mr. *Cassini*, printed at Amsterd. 1686. [c] *Euler*, in Mem. de l'Acad. de Berlin, Tom. 2.] See the article TAILS *of Comets*.

The figure of this solar atmosphere must be lenticular, or that of a flatted spheroid. Mr. de Mairan gives us a draught of its appearance and projection. Lib. cit. c. 4. fig. 2.

The extent of the *zodiacal light* from the sun to its point, is seldom less than 50 or 60 degrees: It has even been known to extend to 100 and 103°. Ib. c. 6.

This light seems to have no other motion than that of the sun itself. Ib. c. 7.

Mr. Euler observes, that if the sun has an atmosphere, the force of the impulse of light issuing from that globe, must drive particles of that atmosphere before it; but as gravity is very strong at the sun, this impulse would never drive those particles beyond the limits of their atmosphere, were it not for the centrifugal force arising from the sun's motion round its axis. This being opposite to the action of gravity, and diminishing its effects, the impulse of the light may considerably dilate the figure of the solar atmosphere, from what it would be if it arose from the gravity and centrifugal force of its particles only; and this dilatation will be very considerable near the sun's equator, and very small towards its poles. The action of light thus diminishing the action of gravity, Mr. Euler attempts to calculate how far this diminution of gravity may increase the extent of the sun's atmosphere about its equator. He finds a cubic equation, the roots of which express the semi-axis, or greatest amplitude of this atmosphere. He adds, that this equation having three real roots, it is possible that the solar atmosphere may become a ring surrounding the sun's globe, as the ring of saturn surrounds the body of that planet. Loc. cit. p. 140.

ZONA, a word used by some authors for that species of herpes which others call the *zinzilla*, and we term the *shingles*.

ZONITES, in the materia medica of the antients, a name given to a kind of tutty, called also *placitis*. It had the latter name from the Greek, πλακος, a crust, it being formed by way of crust on the sides of the furnaces. The latter name *zonites* was given it from its being formed of several coats, which, when broken transversely, had the appearance of belts or zones. See the article FURNACE.

ZONITIS *Cadmia*, a name given by some authors to a kind of cadmia fornacum, from its usually surrounding the upper parts of the furnaces like a girdle or belt.

ZOOLATRIA, Ζωολατρία, a species of idolatry, wherein divine worship was offered to animals. *Hofm.* Lex. in voc.

The word is composed of Ζωον, an animal, and λατρια, worship.

ZOOLOGY, (*Cycl.*) the science of animals. This makes one of the three kingdoms, as they are called, of natural history; the vegetable and the mineral being the two others: In these, however, there is this difference made by writers, that while vegetables and minerals are treated of together, as all of a piece in each, the subjects of *Zoology* are divided, and it is made to compose, as it were, several kingdoms. Whoever is to write on plants and minerals, calls his work a treatise of botany, or mineralogy; and we have no words to express any subdivision of them into kingdoms: but, in *Zoology*, we treat, as different subjects, the different parts of it; and the history of birds is separated by some from the rest under the name of *ornithology*; that of quadrupeds under the name of *tetrapodology*; and we have for the rest, the words *entomology*, *amphibiology*, and the like, expressing these things which are properly but the parts of *Zoology*, as so many distinct and separate studies.

This may easily be amended, by our considering the animal world as we do the vegetable and mineral, and dividing it, as we do the others, into its proper families; it will then be found that these are no better distinctions than those of the families of these things, and that the authors may as well set up separate studies under the names of *bulbology*, *umbelliferology*, and the like, as those.

A natural division of the subjects of *Zoology*, on this principle, will afford six several families of its subjects. 1. The hairy quadrupeds. 2. The birds. 3. The amphibious animals, such as serpents, lizards, frogs, and tortoises. 4. The fishes. 5. The insects. And sixthly, those lowest order of animated beings the *zoophytes*. *Artedi* Ichthyol. See the articles QUADRUPED, BIRD, FISH, &c.

ZOOMINERALIA, a word used by some writers to express certain substances which are of animal origin, yet have somewhat of the nature of stones, as pearls.

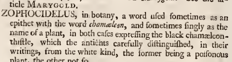
ZOOPHTHALMUS, in botany, a name given by the antient Greeks to the *sedum majus*, or common great house-leek.

It had this name from the Greek Ζωὸν, an animal, and ὀφθαλμὸς, an eye, as expressing a resemblance to the eyes of large animals, in the round and radiated growth of its clusters of leaves. They also called it *ambrosia*.

ZOOPHYTE (*Cycl.*)—ZOOPHYTE-*Marygold*. See the article MARYGOLD.

ZOPHOCIDELUS, in botany, a word used sometimes as an epithet with the word *chamæleon*, and sometimes singly as the name of a plant, in both cases expressing the black chamæleon-thistle, which the antients carefully distinguished, in their writings, from the white kind, the former being a poisonous plant, the other not so.

ZOPPO, in the Italian music, is applied to all those counterpoints, described under the articles PERFIDIATO, OBLIGATO, &c. Thus they say *contra-punto alla zoppa*, a lame or hopping counter-point; because, in these, a note is placed between two others, each of half its value in time: When this comes to be played or sung, the voice or instrument seems to proceed by unequal leaps or steps, like those of a lame person. See the example here annexed.



There

There are *contra-punto alla zoppa sopra il sogetto*, as well as *sotto il sogetto*, *i. e.* above and below the subject. See the article SOGETTO.

ZORABA, a word used by some of the chemical writers to express vitriol.

ZOSTER, a word used by some to express that kind of herpes, called by others *zona* and *zingilla*, and by us usually known under the name of the *shingles*.

ZOTHECA, among the antients, the place where the animals designed for sacrifice were kept. *Pitisc.* in voc.

ZOZONISIUS, in natural history, a name of one of the gems of the antients, but of which our accounts are so short, that we can make no conjecture of what it was. Pliny only tells us, that it was found in the river Indus, and used by the magi.

ZUFFOLO, in the Italian music, a little flute or flagelet, having a very shrill sound, like the whistling of small birds. *Brossard.*

ZURNAPA, in zoology, the Arabian name of an animal of a very singular kind, and seeming properly to belong to no known genus of animals, but to be perfectly *sui generis*. It is also called *camelopardalis* by Latin authors, and *geraffa* by eastern nations.

It is not certainly known whether it chews the cud or not; but as its hoofs are cloven, and it has horns on its forehead, and wants the fore-teeth in its upper jaw, and feeds on vegetables, it is probable that it does.

It is a singular, elegant, and beautiful creature, and is very remarkably tame and tractable, even scarce less so than a sheep, and seems intended by nature for a domestic, not a savage animal. Its head is wholly of the make of the stag's, but differs in size, and has two little obtuse horns, which are not more than six fingers breadth long, and are hairy: the male and female both have these, and the latter is distinguished by having them shorter than the former. Its ears are larger, and like those of the ox-kind; its tongue is also like that of an ox, and it wants the fore-teeth in the upper jaw. Its neck is remarkably long, strait, and slender, in a grown animal. The neck is usually seven feet long, and the measure from the tail to the top of the head eighteen feet; and when it stands erect, its head is sixteen foot from the ground; it has a small mane; its legs are very slender, and the forelegs very long; the hinder ones very short, so that the creature seems always to stand upright.

Its hoofs are cloven exactly as those of the ox, its tail reaches down to its hams, and is rounded and covered with very thick hairs; the middle of its body is slender; it is very like the camel in all its natural properties; when it runs it holds the two forefeet together, it lies down on the belly, and claps its neck down on the thighs and breast in the manner of the camel. As it stands it can scarce reach to eat the grass, unless its fore-legs are very far expanded, and that is a posture of great pain to it; so that nature seems to have allotted it to feed in its wild state on the leaves of trees, which its long neck will very well enable it to get at. It is very beautifully spotted all over its body in the manner of the leopard.

The velvety covering of its horns seems to make it of the stag kind, but its shape is wholly different from those of that genus. *Bellon.* Obs. l. 2. c. 49.

ZYGÆNA, in zoology, the name of a fish of the shark kind, called in English *the ballance fish*, or the *hammer-headed shark*. See Tab. of Fishes, Nº. 2.

It is an extremely singular and remarkable fish, and differs not only from all the other sharks, but from all the fish in the world in the figure of its head: this is not placed, as in all other fishes, longitudinally, or in a line with the body, but is set on transversely as the head of a hammer or mallet upon the handle. This is semicircular at the front, and runs to so thin and sharp an edge, that as the fish swims forward with violence, it may cut other fishes, and is terminated at each end by an eye; these are very large, and so placed, that they more conveniently look down than either upward or sideway. In the farther part of the forehead also, near the eyes, on each side there is a large oblong foramen, serving either for hearing or smelling, or perhaps for both. The mouth is very large, and placed under the head, and armed with four rows of extremely sharp and strong teeth, flat, and serrated at their edges. The tail is composed of two fins, one vastly larger than the other; the body is rounded and very long, and is not covered with scales, but a thick skin; the back is ash-coloured, and the belly white. *Rondelet.* de Aquat. p. 549.

The *Zygæna* is a species of *squalus*, according to the Artedian system of ichthyology. See the article SQUALUS.

It is caught in the Mediterranean, and sometimes in different parts of the ocean. Some authors have called it *Zygena*, and others *Libella*; which last answers to the English name of the *Ballance-fish*.

ZYGASTICUM, Ζυγαστικον, among the antients, money paid for weighing things.

The word comes from Ζυγος, a ballance. *Pitisc.* Lex. Antiq. in voc.

ZYGITÆ, in the Roman galleys, a term used to express those rowers in the triremes, or three-rowed galleys, who sat on the second row, that is above the thalamitæ and below the thranitæ. *Meibom.* de Trirem, See the article THALAMITÆ.

ZYGOPHYLLUM, in botany, the name of a genus of plants described by Linnæus, the same with the *fabago* of Tournefort. See the article FABAGO.

ZYGOSTATES, among the antients, an officer who was the overseer of weights, and was to take care that tradesmen used none but what were just. *Pitisc.* Lex. Antiq. in voc.

ZYMAR, a name given by some of the chemical writers to verdigrease.

ZYME, a word used by many authors to express ferment or leaven. See the next article.

ZYMOLOGY, in chemistry, a term used by some writers to express a treatise on fermentation, or the doctrine of fermentation in general.

This is a very extensive thing, and were it well accounted for, might help us to solutions of many things which at present appear extremely difficult to us.

Dr. Sympson has written a treatise on this subject, wherein he refers the whole to the internal conflicts of acid and sulphur in bodies, and seems to think that the phænomena of hot baths, the generation of minerals, and the production of mineral waters, the grand appearances of light, heat, and fire, and the generality of the subterranean phænomena of damps, earthquakes, and firy eruptions, and the appearance of meteors, may be all explained by the doctrine of fermentation, established on this basis.

Fermentation, according to this author, is nothing but an intestine collision between acid and sulphur, put together by nature or art, and set in a combating motion, in order to the production of concretes, or some other end.

The phænomena of hot baths are explained on this foundation, by observing, that there is nothing of this kind without sulphur, evident even to the senses; and that an acid of some kind is necessary in all mineral fermentation. Acids are well known to be common in the earth, and on the conflicts of the . with the sulphurs evident in those particular places, baths are made hot, and the minerals found about them are formed. Mineral sulphurs are of different kinds, and according to these it is found that the waters of these hot baths differ also, some of them being safe to take internally, and others only fit for external use; in this the acid also may have its share, for in its passage through the earth it frequently corrodes metalline ores, and carries their particles with it; these, if of iron, give virtues to the water, and render it proper in several diseases: but if, on the other hand, they have dissolved copper, they become unwholsome.

The sulphurs and acids contained in the bowels of the earth, and occupying together large spaces of it, are thus formed into a sort of beds of fermenting and hot matter, through which the water of these baths passing slowly and leisurely on, cannot but be heated to the degree we see it of; and the greater the proportion of the acid, and the more the place abounds with metalline or mineral ores, the more hot and the more impregnated with virtues of minerals the water will be. Experiments shew, that sulphur may be made to ferment violently with acids, and that in this fermentation it becomes communicated, volatilized, and made capable of solution in water, though before it was not; and hence is capable of impregnating the baths, as we see.

These mineral productions are not all that are referred by this, and other authors who follow his system, to the doctrine of acid and sulphur fermentations. The vegetable world is said to be as much influenced by it, and the growth of plants, or vegetation itself, is said to be only a natural and slow-paced fermentation from the peculiar acid and sulphur of each plant. Tachenius's doctrine of acids and alkalies, is wholly disallowed in this scheme, and even in a great measure overthrown by it; and the doctrine of subterraneous fires is not necessary to heat the hot baths. It has been supposed that the sulphur, in order to give this heat to them, must be itself flaming and burning; but it is proved in this system, both by reason and experiment, that sulphur properly combined with an acid, may both heat, and communicate its heat to other bodies by fermentation, without being itself ignited or burning within the bowels of the earth; the great improbability of which, in many places where hot baths are found, has been one of the grand reasons for believing sulphur had no share in their production.

The acid, which is the other great cause of fermentation under ground, may be either such as is inbred in the same mineral concretion while in *succo soluto*, or in the state of its original formation; or an extrinsic and accidentally supervening one, which is well known to be of sufficient power for such an effect in the reduction of minerals already formed or completed. Some of the acid juices, which the earth in almost all parts abounds with, are loose in themselves, or fluctuating about, and others embodied in various animals: where they are bedded, and naturally contained in sulphur, they are always ready for these changes of fermentation; but when they are in either of the other states, they can only act as brought upon the sulphurs by their own natural fluctuating course, or educed by water from the other minerals, and carried by it to the beds of sulphur.

Thus the very water may be the efficient cauſe of the fermentation which afterwards gives the heat and virtues to it. All the acids, and all the ſulphurs contained in the earth, are not equally fit for this purpoſe; but ſome of the former have evidently ſo ſtrong a power over ſome of the latter, that they are ſufficient cauſes of heat in the mineral ingredients; and heat in any body concerned, is indeed the natural and neceſſary reſult of theſe fermentations.

The fermentation that ariſes between ſpirit of nitre and butter of antimony, is not from the ſalts in this ſublimate mixing with the acid in the diſſolvent, becauſe the ſame acids poured upon the ſame ſalts while incorporated with mercury in the form of ſublimate, is the cauſe of no fermentation at all: nay, ſublimate, in which the aforeſaid ſalts which are in butter of antimony are lodged, will diſſolve in an acid without the leaſt ebullition, like a piece of ice in water.

It is water always that ſets the inbred particles of acid and ſulphur into their great inward commotions, and makes the fermentation the ſtronger, and conſequently the heat by ſo much the greater. Thus a little water put to oil of vitriol, ſets the fermental principles of acid and ſulphur connatural to that oil, into ſo violent a fermentation and heat, that it is ſcarce poſſible even to endure the hand upon the glaſs where it is mixed. *Sympſon's* Zymolog. Chym.

ZYMOSIS, a word uſed by ſome to expreſs fermentation, and by others for a flatulent tumor of the liver, or other of the viſcera. See the article Zymology, *ſupra.*

ZYTHOGALA, *Beer-poſſet,* a drink recommended by Sydenham, as good to be taken after a vomit, for allaying the acrimonious and diſagreeable taſte it has occaſioned, as well as to prevent gripes. *Syden.* Obſerv. de Morb. acut. p. 39.

The word is formed of Ζυθος, *cerevifia,* and γαλα, *lac.* See the article Zythum, *Cycl.*

APPENDIX.

A P P E N D I X.

A.

ABATE, in the manege. A horse is said to *abate*, or take down his curvets, when working upon curvets, he puts his hinder legs to the ground both at once, and observes the same exactness in all the times. See the article CORVET, *Cycl.*

ABBA-*comes*. See the article ABBOT, *Cycl.*

ABDELAVI, a name given by Arabian authors to the Egyptian melon. See the article MELON, *Suppl.*

ABELMOSC, or ABELMOSCH, *(Suppl.)* is used by some authors for the Egyptian *ketmia*, with perfumed seeds. See KETMIA, N° 21. *Suppl.*

ABIGEAT. See ABIGEATUS, *Suppl.*

ABLATIVE *absolute*. See the article ABSOLUTE, *Cycl.*

ABRICOT, in botany. See the article APRICOCK, *Suppl.*

ABRUS, in botany, a name sometimes given to a species of *Orobus*. See the article OROBUS, *Suppl.*

ABSINTHIUM, *wormwood*, in botany, &c. See the article WORMWOOD, *Suppl.*

ABSINTHIUM is also a name given to other plants, by different authors; as to dwarf *ptarmica*, with leaves divided after the manner of wormwood; also to the alpine *chamæmile*, with southernwood-leaves. Vid. *Tourn.* Inst. Bot. p. 494, 496. See also the articles PTARMICA and CHAMÆMELUM, *Suppl.*

ABUTILON, the name of a genus of plants, according to Dillenius, but comprehended under the *sida* of Linnæus. See the article SIDA, *Suppl.*

ACACIA *(Suppl.)*—*Bastard* ACACIA, in botany, the name used by some for a genus of plants, called by others *robinia*. See ROBINIA, *Suppl.*

ACADEMICIAN, the same with *academic*, or *academist*. See ACADEMIC, *Cycl.* and ACADEMY, *Cycl.* and *Suppl.*

ACANTHIS, in ornithology, a name by which some call the gold-finch, from its feeding among thistles. See the articles CARDUELIS, *Suppl.* and GOLD-FINCH, *Append.*

ACAPTARE. See ACAPITARE, *Cycl.*

ACARUS *(Suppl.)* is also used by some naturalists as the classical name of the lice of animals, which are indeed of as many various genera as the animals on which they breed. See the article LOUSE, *Cycl.* and *Suppl.*

ACCENTED part of a bar, in music. See the articles ACCENT and MEASURE, *Cycl.*

ACCOMPTANT. See ACCOUNTANT, *Cycl.*

ACEPHALITÆ. See ACEPHALUS, *Cycl.*

ACH, or ACHE. See the article ACHE, *Cycl.*

ACHETA, in zoology. See the articles HARVEST-*fly* and CIGALON, *Suppl.*

ACID *(Cycl.* and *Suppl.)* —Whether the air naturally contains any *acid*, is a question among philosophers. See the article AIR, *Append.*

ACIDULÆ *(Cycl.)* — See the article WATER, *Append.*

ACINACES, in antiquity, a Persian weapon of the sword kind. The word is Persian, tho' etymologists affect to give it a Greek origin. Some represent the *acinaces*, as a kind of spear or javelin; others, with more probability, as a short crooked sword, shaped like the Turkish scymitar.

The figure was altered by Darius, and accommodated to that of the Grecian swords. Horace calls it *medus acinaces*, in regard the Romans confounded the Medes with the Persians. It was also in use among the Scythians, where divine honours were paid it. *Boxhorn.* Epist. p. 220. seq. V. *Voss.* Etym. Lat. p. 5. *Martin* Lex. Philos. T. 1. p. 9. *Suid.* Lex. T. 1. p. 84. *Hesych. Aquin.* Lex. Milit. T. 1. p. 14. *Potter*, Arch. Græc. l. 3. c. 4. T. 2. p. 39. *Hor.* l. 1. Od. 17. *Herodot.* l. 4.

ACTINIA, in the history of insects, a small sea-animal of a cylindric shape, equally thick in all parts, and about half an inch long; its tail is divided into three parts, or terminated, as it were, by three points. It lodges itself in little cavities of rocks and of the larger sea-plants of the stony kind, and only appears on their surface when all is quiet about it. Round the mouth are placed a great number of tentacula, like so many conic rays, and disposed in two or three series successively shorter than each other: these are in a continual vibratory motion, and by that means draw small animals into its mouth for food. The whole animal is of a pale flesh colour, except these tentacula, which have a beautiful variety of colours, red, yellow, blue, and many others. It is found on the coasts of the American islands.

There are a variety of species, differing from each other in figure, colour, &c. but all of them furnished with numerous tentacula, or rays. *Hill*'s Hist. of Anim. p. 94. seq.

ADAM'S *apple*, *Adami pomum*, in botany, a name given by some to the orange. See the article ORANGE and ADAMI *pomum*, *Cycl.*

ADDER *(Suppl.)*—*Sea*-ADDER, the English name of a species of *syngnathus*, with a round body, and no pectoral or tail fins. See SYNGNATHUS, *Suppl.*

Water-ADDER, in zoology, a name given to the *natrix*. See the article NATRIX, *Suppl.*

ADDER'S *wort*, in botany, a name sometimes given to snakeweed, or bistort. See BISTORT, *Suppl.*

ADDICO, in the civil law. See ADDICTIO, *Cycl.*

ADMINICULUM, in the French law. See ADMINICLE, *Cycl.*

ADMINISTRATRIX. See ADMINISTRATOR, *Cycl.*

AERIZUSA, a name given by the antients to the sky-coloured *jasper*. See the article JASPER, *Cycl. Suppl.* and *Append.*

ÆS *uxorium*, in antiquity, a sum paid as a penalty for living batchelors to old age. This answered to the Athenian Αγαμιου δικη, and the Spartan οψιγαμιου, and κακογαμιου δικη. *Fest.* and *Pitisc.* Lex. Ant.

This tax for not marrying seems to have been first imposed in the year of Rome 350, under the censorship of M. Furius Camillus, and M. Postumus. V. *Scalig.* and *Dacier*, not. in *Fest.*

The method of levying it was this; at a census or review of the people, each person was asked, *Et tu ex animi sententia uxorem habes liberûm quærendorum causâ?* He who had no wife, was hereupon fined after a certain rate, called *æs uxorium*. Hist. Acad. Inscrip. T. 1. p. 79. seq.

AESPING, in zoology, the name of a species of *coluber*. See the article COLUBER, *Append.*

AFTER-*pains*, in midwifry. See the article LYING-*in-women*, *Suppl.*

AGAUPE, in botany, a name used by some authors for the *nymphæa*, or common white water lilly, and other species of that plant. *Marcgrave*, p. 21.

AGRIÆ, in zoology, the name of a class of quadrupeds, according to Dr. Hill, the characters of which are, that they have no teeth; and that their tongues are very long and cylindric. There are only two genera belonging to this class, which are the *myrmecophaga* and *manis*. See the articles MYRMECOPHAGA and LACERTUS *squamosus*, *Suppl.*

AGRIMONY *(Suppl.)* — *Hemp*-AGRIMONY, in botany, the English name of the plant known among authors by that of *eupatorium*. See EUPATORIUM, *Suppl.*

Water-hemp-AGRIMONY, in botany, a name given to the bidens. See the article BIDENS.

AGUE *(Suppl.)*—AGUE-*cake*, the popular name for a hard tumour on the left side of the belly, lower than the false ribs, said to be the effect of intermitting fevers. Vid. *Pringle*, Observ. on Diseas. of Army, p. 179.

AIR *(Cycl.* and *Suppl.)*—It has been a question among natural philosophers, whether the *air* contains an acid or not. Monsieur Helot gives a probability to the affirmative; and it seems as if this acid were of a vitriolic nature. See Mem. Acad. Scienc. 1737. p. 378 and 1740. p. 141, 142. Edit. *Paris.*

If salt of tartar, or oil of vitriol, be exposed to the open *air*, these, tho' extremely different substances, will each receive and imbibe so great a quantity of matter from the *air* as vastly to increase its weight, without any other alteration in its nature than the diluting or weakening it. The salt becomes a fluid liquor, called *oil of tartar per deliquium*, and increases to several times its quantity; and a vial of oil of vitriol, nearly filled and left unstop'd, will soon be found to fill up of itself and run over.

In both these cases, the aerial particles afforded to the exposed substances, are only water; but the *air* evidently abounds also with a great variety of other principles, which it may and does occasionally afford to other exposed substances, whose pores are so formed as to admit them easily. Thus the mortar exposed in the joinings of old walls, from the particles it attracts out of the *air*, forms a peculiar salt; and a deal shelf, moistened with the liquor of fixed nitre, has been known to become frosted over with perfect and pellucid crystals of pure nitre, only from the imbibing, or regaining the necessary acid from the *air*, in the same manner as if spirit of nitre had been poured upon it. A vial half filled with oil of tartar per deliquium, on being exposed to the *air*, will often form a set of peculiarly figured crystals round the vessel, a little above the surface of the water. Colcothar of vitriol, which is the caput mortuum, or residuum of vitriol, after all the acid has been driven from it by fire,

will, on being exposed to the *air*, attract a new acid, and on being distilled again, it will yield more spirit or oil. Philos. Trans. N°. 157.

It is remarkable, that so strong an acid as this should float in the *air* unperceived, and exert itself only where proper admixtures and a proper nidus call it in. In both the cases of nitre and vitriol divested of their acids, the *air* gives the proper acid again; yet in the case of the exposed alkali salt, no acid, but only pure water is received; and in some acids, as the oil of vitriol, pure water, only, is received from the *air*. This is evidently proved by being careful in concentrating the liquor, first, to a certain degree of strength; and then, after exposing it a proper time, distilling away what was gained from the *air*. This will be found, by the smell and taste, to be no other than pure simple water; and the liquor remaining in the retort, when all this is driven off, will be just as strong as before, and just the same in quantity, and as ready to receive the same particles again.

The stronger the oil of vitriol is, the more powerfully it will attract the *air*'s humidity, and the more it will increase in weight. Such as is perfectly dephlegmated, will increase to more than three times its weight; three drams of it, in an experiment of Mr. Boyle's, increasing to nine drams and thirty grains. The increase is much quicker at first, when it is strongest, than afterwards when it is thoroughly diluted. Oil of vitriol, in the small quantity here mentioned, will receive eighteen grains addition at first, in the same space of time in which it will afterwards receive but two grains. The changes of moist and dry in the *air* also affect it. Philos. Transf. l. c.

It is remarkable, that sulphureous *air* makes an effervescence with pure *air*. Thus if fresh *air* be let into a glass vessel filled with sulphureous vapours, arising from a mixture of spirit of nitre, with a vitriolic mineral, an effervescence will arise, and the fresh *air* will be nearly absorbed, and the *air* in the vessel, which was transparent and clear, will become a reddish turbid fume. After the effervescence is over, the turbid *air* again becomes clear, but upon the admission of fresh *air* again becomes turbid, and the *air* is absorbed as before. But at each re-admission of fresh *air*, the quantity absorbed is less and less, 'till no more is absorbed. See *Hales*, Hæmastatics, p. 280. seq.

Dr. Hales thinks, that the effervescence arising from the mixture of fresh *air*, with that which is strongly impregnated with sulphureous fumes, may give rise to that irksome heat which we feel in summer, and is called a close, sultry, temperature of *air*. And hence the common observation, that lightning cools the *air* seems to be well founded, as being the last effort of this effervescence. *Hales*, ib. 284, 285.

ALANA *gleba*, a name sometimes given to the yellowish white tripoli. See the article TRIPOLI, *Cycl.* and *Suppl.*

ALATED *leaf*, in botany. See LEAF.

ALAUDA, (*Suppl.*) in ichthyology, a name used by some authors for several species of the fish called *blennius*. See the article BLENNIUS, *Suppl.*

ALAUSA, in zoology. See the article THRISSA, *Suppl.*

ALBUGO (*Suppl.*)—Dr. Mead tells us of several cures of the *albugo*, performed by means of an eye powder which he recommends. The receipt is thus, Take of common glass any quantity, pound it in a mortar to a very fine powder; then add an equal quantity of white sugar-candy, and levigate the mixture 'till it becomes impalpable.

A little of this powder put into the eye with a quill, every day, gradually wears off the spot.

Another method of removing the speck, is to have it pared by a surgeon every day with a knife: But this seems a doubtful remedy. See Monit. et Pract. Medic. Append.

ALCA, in ornithology. See the article ALKA, *Suppl.*

ALCALI, } See the articles { ALKALY, *Suppl.*
ALCALINE. } { ALKALINE, *Suppl.*

ALDER-*tree*, *alnus*, in botany. See the article ALNUS, *Suppl.*

Berry-bearing ALDER, the name of a genus of plants, called by authors *frangula*. See the article FRANGULA, *Suppl.*

ALDERAIMIN, or ADERAIMIN, in astronomy, a star on the left shoulder of the constellation Cepheus.

ALECTRUONURUS *gramen*, in botany, a name used by some for the *festuca* of Linnæus. See FESTUCA, *Suppl.*

ALECOST, in botany, a name given by some to a species of tanzy, more usually called *costmary*. See TANACETUM, *Suppl.*

ALEHOOF, in botany, a name by which some call *ground-ivy*. See the article GROUND-*ivy*, *Suppl.*

ALHAGI, in botany, the name of a genus of plants, according to Tournefort; but comprehended under the *hedysarums* by Linnæus.

The characters are these: the flower is papilionaceous, the germen of which finally becomes a pod composed of a great number of parts, articulating, as it were, with each other, and containing each a kidney-shaped seed. To these marks it may be added, that the leaves grow in an alternate disposition.

There is only one known species of this genus, called *genista spartium*, and *genista spinosa*, by other writers. *Tourn.* Inst. Bot. Corol. p. 54.

ALHEAL, a name given to several plants on account of their extraordinary virtues. See PANACEA, *Cycl.* and PANAX, *Append.*

ALISANDERS, in botany, a name given by some to the *smyrnium*. See the article SMYRNIUM, *Suppl.*

ALKANET, in botany. See the article ANCHUSA, *Suppl.*

ALLIARIA, in botany, the name sometimes given to a species of *hesperis*, called in English *jack by the hedge*. See the article HESPERIS, *Suppl.*

ALLIGATOR, in zoology, the name given to the crocodile in the cold climates of America, where it does not grow to its full dimensions. See CROCODILE, *Cycl.* and *Suppl.*

ALLIGATOR-*pear*, in botany. See the articles PEAR and PYRUS, *Suppl.*

ALMNOD (*Suppl.*)—*Dwarf* ALMOND, a name given by some to several species of peaches. See the article PERSICA, *Suppl.*

Ethiopian ALMOND, the name of a genus of plants, called by Linnæus *brabejum*. See BRABEJUM, *Suppl.*

ALVI *fluxus*, in medicine. See the article DIARRHOEA, *Cycl.* and *Suppl.*

ALVI *obstructio*, costiveness, in medicine. See the article OBSTRUCTIO *alvi*, *Suppl.*

AMARACUS, in botany, a name sometimes used for the *parthenium*. See the article PARTHENIUM, *Suppl.*

AMARYLLIS, in the Linnæan system of botany, the name of a genus of plants, called in English *daffodil-lilly*, and by other botanical writers *lilio-narcissus*. See the article LILIO-NARCISSUS, *Suppl.*

AMBER-*tree*, in botany, the English name of a genus of plants, called by Linnæus *anthospermum*. See ANTHOSPERMUM, *Append.*

AMBERBEI, the name of a genus of plants, according to Vaillant, but comprehended by Linnæus under that of *centauria*. See the article CENTAURIA, *Append.*

AMBULON, in botany, the name by which J. Bauhine calls the *myrica*, or sweet-willow. See the article MYRICA, *Append.*

AMENTUM, among botanists, the same with *catkin*. See the article CATKIN, *Suppl.*

AMGAILA. See LEUCACANTHA, *Suppl.*

AMMODYTES, in zoology, the name of a species of *coluber*. See the article COLUBER, *Append.*

AMMONIACUM *sal*, in chemistry, &c. See the article SAL *Ammoniacum*, *Cycl.* and *Suppl.*

AMMOSCHISTA, in natural history, a genus of stones of a laminated structure, and splitting only horizontally, or into flat plates.

The *ammoschista* are coarse, harsh, and rough stones, of a very loose texture, and appearing something porous. They are considerably heavy, and composed of a large, coarse, and obtusely angular gritt, surrounded and in part held together by a loose earthy spar. They are very soft and friable in the mass, but much more so when reduced to small pieces. They make a violent effervescence with aqua fortis, and will not easily strike fire with steel.

The species of *ammoschista*, are these: 1. The grey, friable, dull *ammoschistum*. 2. The brownish white, glittering *ammoschistum*. 3. The greenish grey, shining *ammoschistum*. 4. The yellowish grey, glittering *ammoschistum*. 5. The hard, purple, and white *ammoschistum*. And 6. The bluish, glittering slate stone. *Hill's* Hist. of Foss. p. 443. seq.

AMOMUM, a name sometimes given to a species of *sium*. See the article SIUM, *Suppl.*

AMPHITRITE, in ichthyology, the name of a genus of small water animals, the characters of which are, that they are of an oblong figure, and have a great number of deep striæ, like so many lamellæ; and but one tentaculum, of a slender and oblong form, resembling a piece of thread. They are only a few inches long, of a tolerable firm substance, and have been ranked by some authors among the *urticæ marinæ*, and by others among the *epipetrons*. Vid. *Hill*, Hist. Anim. p. 91.

ANARTHRA, in the history of insects, a classical name established by Dr. Hill, comprehending such insects as have neither wings nor limbs, and whose bodies are covered with a soft skin.

To this class belong the several genera of *worms* and *leeches*. See the articles WORM and LEECH, *Suppl.*

ANASARCOUS *swelling*. See DROPSY, *Append.*

ANEMOSPERMOS, in botany, the name sometimes given to the *arctotis* of Linnæus. See the article ARCTOTIS, *Suppl.*

ANGLE (*Cycl.*)—In the practice of surveying, no *angles* of less than thirty degrees should be taken: nor should any be assumed but such as are actually measured. See Hist. Acad. Scienc. 1740.

ANGUIS *Æsculapii*, the name of a species of *coluber*. See the article COLUBER, *Append.*

ANIMAL (*Suppl.*)—ANIMAL *substances* comprehend all the component parts of *animals*, of what use or intention soever they may be. See SUBSTANCE, *Cycl.*

Fossile ANIMAL *substances*, those found buried in the earth, at various depths, and embodied among various strata.

These are principally of four kinds: 1. Sea-shells. 2. The teeth, bony palate, and bones of fishes. 3. The bones of land *animals*. And 4. Complete fishes. See the articles *Fossile*

Foſſile Bones, *Foſſile* Shells, Marine *remains*, and *Foſſile* Ivory, *Suppl.*

Fermentative quality of Animal *ſubſtances.* See Ferment and Fermentation, *Append.*

ANIMALCULES (*Suppl.*)—Dr. Hill, in his hiſtory of animals, has arranged *animalcules* under three claſſes: 1. Such as have no tails, nor any viſible limbs. 2. Thoſe which have tails, but no viſible limbs. And 3. Thoſe which have viſible limbs. See the article Animalcule, *Cycl.* and *Suppl.*

The firſt claſs, which he calls *gymnia*, contains ſeveral genera: 1. The *enchelides*, of a cylindric or ſubcylindric figure. 2. The *cyclidia*, of a roundiſh or elliptic figure. 3. The *paramecia*, of an irregular oblong figure. 4. The *craſſpedaria*, with an apparent mouth and a ſeries of fimbriæ round it, in manner of a fringe.

The ſecond claſs, or thoſe with tails but no viſible limbs, he calls *cercaria*; of which there are only two genuſes: 1. The *cercaria*, with tails ſhorter than their bodies, and therefore called *brachuri*. 2. The *cercaria*, with tails longer than their bodies, and hence called *macroceri*.

The third and laſt claſs contains ſuch *animalcules* as have viſible limbs, and thence denominated *arthrodia*. There are only two genera belonging to this claſs: 1. The *ſcelaſius*, an *animalcule* with viſible legs. 2. The *brachionus*, or wheel-animal, an *animalcule* furniſhed with an apparatus of arms for taking its prey. *Hill*, Hiſt. Anim. p. 1. ſeq.

ANIMI *deliquium*, fainting or ſwooning, in medicine. See the articles Lipothymia and Swooning, *Suppl.*

ANNULATA, in zoology, the name of a ſpecies of *coluber*. See the article Coluber, *Append.*

ANT-*bear*, in zoology, the Engliſh name of the *myrmecophaga* of Linnæus. See the article Myrmecophaga, *Suppl.*

ANTHERICUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *phalangium*, and in Engliſh *ſpider-wort*. See the article Phalangium, *Suppl.*

ANTHORA, in botany. See Aconite, *Cycl.*

ANTHOSPERMUM, in botany, the name of a genus of plants, the characters of which are theſe: the cup is a one-leaved perianthium, divided into four ſegments reaching more than half way down; there is no corolla; the ſtamina are four capillary filaments, of the length of the cup; the antheræ are two in number, oblong and quadrangular; and the germen of the piſtil ſtands below the receptacle of the flower.

The male and female flowers are ſometimes ſituate on the ſame plant, but more frequently on different plants of the ſame ſpecies; in which laſt caſe, the female flowers have the piſtil and germen, but want the ſtamina. Vid. *Linnæi*, Gen. Plant. p. 496.

ANTIMONY (*Suppl.*)—The needles perceived in *antimony*, are, according to Monſieur Geoffroi, owing to the vitriolic acid united to a bitumen. See Mem. Acad. Scienc. An. 1734. p. 418.

Eſſence of Antimony, an emetic wine made with glaſs of *antimony*; to which is ſometimes added a ſpicy ſtomachic.

Dr. Huxham ſays, he never found any antimonial preparation better, ſafer, and more efficacious than this ſimple infuſion of the glaſs of *antimony* in a generous white wine, with a little ſpice to render it more grateful to the ſtomach. This medicine given to twenty or thirty drops operates by gentle ſweats, and purges in larger doſes very mildly. The judicious phyſician here mentioned, recommends it in obſtinate rheumatiſms.

ANTIQUARY (*Suppl.*)—Since the printing this article, the ſociety of *antiquaries* have been incorporated, by the king's charter.

ANTISEPTIC, an appellation given to ſuch ſubſtances as reſiſt putrefaction. See Putrefaction, *Append.*

We have ſome curious experiments in relation to *antiſeptic* ſubſtances by Dr. Pringle, who has aſcertained their ſeveral virtues. Thus, in order to ſettle the *antiſeptic* virtue of ſalts, he compared it with that of common ſea-ſalt; which being one of the weakeſt, he ſuppoſes equal to unity, and expreſſes the proportional ſtrength of the reſt by higher numbers, as in the following table.

Salts, their antiſeptic virtue.			Salts, their antiſeptic virtue.		
Sea-ſalt	—	1	Saline mixture		3
Sal gemmæ		1+	Nitre	—	4+
Tartar vitriolated		2	Salt of hartſhorn		4+
Spiritus mindereri		2	Salt of wormwood		4+
Tartarus ſolubilis		2	Borax	—	12+
Sal diureticus		2+	Salt of amber		20+
Crude ſal ammoniac		3	Alum	—	30+

In this table the proportions are marked in integral numbers; only to ſome there is added the ſign +, to ſhew, that thoſe ſalts are poſſeſſed of a ſtronger *antiſeptic* virtue than the number in the table expreſſes, by ſome fraction; unleſs in the three laſt, where the ſame ſign imports, that the ſalt may be ſtronger by ſome units. Vid. *Pringle's* Obſerv. on the Diſeaſes of the Army, Append. p. 322. ſeq.

Some reſinous and other ſubſtances even exceed the *antiſeptic* virtues of the neutral ſalts; thus myrrh, aſa fœtida, terra japonica and aloes, are at leaſt twelve times more *antiſeptic* than ſea-ſalt. Two grains of camphor is equivalent to ſixty grains of that ſalt. An infuſion of a few grains of Virginian ſnake-root, in powder, exceeds twelve times its weight of ſea-ſalt. Chamæmile flowers have nearly the ſame extraordinary quality. The jeſuits bark has it alſo. Beſides theſe, pepper, ginger, ſaffron, contrayerva-root, are twelve times more *antiſeptic* than ſea-ſalt. Dried ſage, rhubarb, the root of the wild valerian, mint, angelica, ground-ivy, ſena, green-tea, red-roſes, wormwood, muſtard and horſe-raddiſh, were likewiſe found more antiſeptic than the ſtandard.

To the claſe of *antiſeptic* medicines may likewiſe be added fermented liquors, acids, ſpirits, and even thoſe plants called anti-acids, and erroneouſly ſuppoſed haſteners of putrefaction, particularly horſe-raddiſh. Now vegetables, poſſeſſing this virtue, are the more valuable, in that, being uſually free of acrimony, they may be taken in much greater quantities, than either ſpirits, acids, reſins, or even the neutral ſalts.

Antiſeptics are preſcribed in all putrid, malignant, and peſtilential caſes. It is to be remarked, however, that different kinds of them are to be given in different diſeaſes, and even in different ſtages of the ſame diſeaſe. Thus, the bark is a ſpecific in a gangrene, when the veſſels are relaxed and the blood reſolved or diſpoſed to putrefaction; but will fail, if the veſſels are too full, or the blood be too thick. With the ſame caution is the bark to be uſed in wounds, *viz.* chiefly in caſes of abſorbed matter, when it infects the humours, and brings on a hectic fever.

By the great *antiſeptic* virtue of alum, the bark, and other aſtringents, it ſhould ſeem, that aſtriction had no ſmall ſhare in the cure of putrid diſorders; and, indeed, the very nature of putrefaction conſiſts in a ſeparation or diſunion of the parts. But as aſtringents are improper to be adminiſtered in many caſes, contrayerva-root, ſnake-root, camphor, &c. may ſupply their place; which, tho' highly *antiſeptic*, have very little, or any, of an aſtringent quality. Id. ibid. Append. paſſim.

APAGOGE, in logic. See Abduction, *Cycl.*

APE, *ſimia*, in zoology. See the article Simia, *Suppl.*

Apes. See Apis *infra.*

APHIS, in the hiſtory of inſects, the name of a genus of animals, otherwiſe called *pediculus arboreus*, and in Engliſh the *tree-louſe*.

The trunk of the *aphis* is reflex; the body is formed into two horns behind; the wings are four, and erect, or altogether wanting; and the legs are formed for walking not leaping.

Of this genus there are a great many ſpecies, denominated from the trees or buſhes on which they are found. Vid. *Hill's* Hiſt. of Anim. p. 65.

APHRODITA, in the hiſtory of inſects, a genus of ſea-inſects about two inches in length and one in breadth, of an oval figure, and aculeated; it has alſo a perforation in the middle of the back, and is called in Engliſh the *ſea-mouſe*.

It is one of the gymnarthrodia, or inſects with naked bodies, and may be met with in great abundance on the Kentiſh coaſt, among rocks. There are ſeveral ſpecies of it. Vid. *Hill's* Hiſt. of Anim. p. 90.

Columna calls it *Pudendum regale*; Bartholine, *vermis aureus*; others, *eruca marina griſeo-fuſca*; and ſome, *mus marinus*, or the *ſea-mouſe*.

APIS, or Apes, in zoology, a large genus of four-winged inſects, the diſtinguiſhing characteriſtic of which is, that their wings are entirely membranaceous, and their tails furniſhed with a weapon, or ſting, capable of inflicting a wound.

This genus comprehends the bee, hornet, waſp, and humble-bee. See the articles Bee, Hornet, Wasp, *Suppl.* For the hiſtory of the bee, in particular, ſee alſo the articles Bee-*worm*, Wax, Honey, &c. *Suppl.*

APOSTACY, (*Cycl.*)—*Apoſtacy* is ſaid to have been antiently puniſhable, in England, by burning and tearing to pieces by horſes. Thus Fleta l. 1. c. 37. §. 2. *Apoſtatæ & ſacrilegi, & hujuſmodi, detractari debent et comburi.* And §. 4. *Si inde convincantur, detractentur, et ſuſpendantur.* Where Du Cange interprets, *detractari*, by *tirer a quatre chevaux*.

APPLE (*Suppl.*)—*Cuſtard*-Apple, in botany, a name given by ſome to the *anona*. See the article Anona, *Suppl.*

Sea-Apple, in zoology, the Engliſh name of a ſpecies of *centronia*, or *ſea-hedge-hog*. See the article Centronia, *Append.*

Sour Apple, in botany, a name given by ſome authors to ſeveral ſpecies of *anona*, called by Plumier *guanabanus*. See the article Anona, *Suppl.*

Star-Apple, the Engliſh name of a genus of plants, called by Plumier *cainito*, and deſcribed by Linnæus under that of *chryſophyllum*. See Chrysophyllum, *Append.*

Thorn Apple, the Engliſh name of a genus of plants, called by authors *ſtramonium*. See the article Stramonium, *Suppl.*

APTERIA, in the hiſtory of inſects, a claſſical name comprehending all thoſe inſects which have no wings. See the article Insect, *Append.*

This ſeries is divided into two claſſes: 1. Such as have neither wings nor limbs, called *apteria anarthra*. And 2. Such as have limbs, but no wings, called *apteria podaria*. See the articles Anarthra and Podaria, *Append.*

ARACHIDNA, in botany, the name uſed by ſome authors

for a genus of plants, described by Linnæus under that of *arachis*. See the article ARACHIS, *Append.*

ARACHIDNOIDES, in botany, the name used by some for a genus of plants called by Linnæus *arachis*. See the article ARACHIS, *Append.*

ARACHIS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a perianthium, divided into two parts; the flower consists of three papilionaceous petals; the stamina are two fubulated filaments, adhering at the base, and divided at the top; the antheræ are roundish; the germen of the pistil is oblong; the style fubulated, and of the length of the germen; and the stigma simple: the fruit is a pod of an oblong oval form, narrowest in the middle, with only one cell, containing two oblong gibbous seeds.

This genus comprehends the *arachidna* and *arachidnoides* of other authors. Vid. *Linnæi* Gen. Plant. p. 361.

ARALIASTRUM, in botany, the name of a distinct genus of plants, otherwise called *panax*. See the article PANAX, *Append.*

ARBOR *vine*, a name used for some species of *convolvulus*, or *bindweed*. See the article CONVOLVULUS, *Suppl.*

ARCHANGEL, in botany, a name given to the white *lamium*, or *dead-nettle*. See the article LAMIUM, *Suppl.*

ARCTOTHECA, in botany, the name used by Vaillant for the *arctotis* of Linnæus. See the next article.

ARCTOTIS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the common cup is roundish and imbricated with squamæ; the composite flower is radiated; the proper hermaphrodite ones infundibuliform, with the limb divided into five segments; and the proper female ones ligulated and of a lanceolated shape; the tube is extremely short; the stamina are five very short capillary filaments; the antheræ are cylindric, of the length of the flower, and divided into five parts; the germen of the female flowers is ovato-quadragonal, villose, and coronated with very small squamæ; the style is filiform; and the stigmata, which are two in number, oval, thick, and erect. There is no pericarpium, the cup serving instead of one. The seeds are single, villose, coronated with the leaves of their proper perianthium, and placed in a circle. The receptacle is plane, and somewhat hairy. *Linnæi* Gen. Plant. p. 420.

ARENÆ, *sands*, in natural history. See the article SAND, *Cycl.* and *Suppl.*

ARGENTUM, *silver*, in natural history. See the article SILVER, *Cycl.* and *Suppl.*

ARISARUM (*Suppl.*) is also the name used by some for a species of *arum*, or *wake-robin*. See the article ARUM, *Suppl.*

ARMENIAN *bole*. See the article BOLE *armenic*, *Suppl.*

ARO-ORCHIS, in botany, a name by which some call a genus of plants, described by Linnæus under that of *kæmpferia*. See the article KÆMPFERIA, *Append.*

ARMY. For diseases incident to *armies*, see the articles DISEASE, CAMP, GARRISON, HOSPITAL, SOLDIER, &c. *Append.*

ARROW-*root*, in botany, the name of a genus of plants, called by authors *maranta*. See the article MARANTA, *Append.*

ARSON, in the law of England, a felony at common law, in maliciously and voluntarily burning the house of another by night or by day. See *Hawkins*'s, Pleas of the Crown, B. 1. chap. 39.

As to the punishment of *arson*, it seems now clearly settled, that the principal, not being in holy orders, is excluded from the benefit of clergy. See *Hawk.* lib. cit. B. 2. chap. 33. sect. 107.

In some places this crime is punished by burning the offender. And this was the old Roman law. See *Pitisc.* Lex. Antiq. in voc. *Incendiarius* and INCENDIARY, *Append.*

ARTHRODIA, in zoology, the name of a lately established class of animalcules, containing those with visible limbs. See the article ANIMALCULES, *Append.*

ASARABACCA, in botany, the name of a genus of plants, called by authors *asarum*. See the article ASARUM, *Suppl.*

ASCITES. See the articles DROPSY, *Cycl. Suppl.* and *Append.*

ASCYRUM, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a four-leaved perianthium; the two exterior ones very small, placed opposite to each other, and linear; the two interior ones large, plane, erect, and cordated; all of them being permanent. The flower consists of four oval petals; the two exterior ones being opposite to each other, and very large; the interior ones smaller. The stamina are numerous capillary filaments, connected at their bases into four distinct parts; the antheræ are roundish; the germen of the pistil is oblong; there is no style: the stigma is simple; the fruit is an oblong acuminated capsule, formed of two valves, and included in the larger leaves of the cup; the seeds are numerous, small, and roundish.

It is extremely like the *hypericum* in appearance; but these characters sufficiently distinguish them. Vid. *Linnæi* Gen. Plant. p. 369.

ASH, in botany, the English name of a genus of trees, called by authors *fraxinus*. See FRAXINUS, *Suppl.*

Mountain-ASH, a name given by some to the *sorbus*, or *service-tree*. See the article SORBUS, *Suppl.*

Poison-ASH, a name given to the *toxicodendron* of botanists. See the article TOXICODENDRON, *Suppl.*

ASILUS, in zoology, the name of a genus of insects, called in English the *hornet-fly*, or *wasp-fly*. See the articles HORNET-*fly* and WASP-*fly*, *Suppl.*

The distinguishing characters of this genus, are these: they are of the two-winged kind, with a style or oblong body, terminated by a protuberance or head, and called a ballancer, under each wing: to this add, that the head is furnished, by way of mouth, with a snout of a fubulated figure, which is simple and very sharp at the extremity. They are among the largest of the fly-kind. See the article FLY, *Suppl.*

Authors have called these insects by the names of *Muscæ crabroniformes*, *muscæ rapaces*, and *muscæ vespiformes*. *Hill*'s Hist. of Anim. p. 31.

ASINUS, the *ass*, in zoology, an animal of the horse-kind. See the article EQUUS, *Suppl.*

Though the *ass* agrees with the horse in many respects, it nevertheless has but a mean resemblance to that noble animal; being not only smaller, but wanting the symmetry and beauty, so conspicuous in the horse.

The *ass*'s ears seem much over-proportioned in length to the head. Its eyes are large, but have nothing bright or striking in them; the neck is long, but lank; and the tail is very long, but not hairy all the way, as in the horse. The fur of the *ass* is coarse and dun, only a streak of black runs down its back and across the shoulders.

So nearly allied are the horse and *ass* kind, that they will copulate together, the produce of which commixture is a mule. See the article MULE, *Suppl.*

There is a species of wild *ass*, called *zebra*, differing greatly in the colours and disposition of its streaks from the common *ass*. See ZEBRA, *Append.*

ASPEN-*tree*, in botany, the English name of the poplar with trembling leaves. See the article POPLAR, *Suppl.*

ASPHODEL, *asphodelus*, in botany. See the article ASPHODELUS, *Suppl.*

African ASPHODEL, a name used by some for the *phalangium*, or *spider-wort* of Tournefort. See PHALANGIUM, *Suppl.*

Lilly-ASPHODEL, the English name of a genus of plants. See the article LILIO-ASPHODELUS, *Suppl.*

ASS, *asinus*, in zoology. See the article ASINUS *supra*.

Wild ASS, *onager* and *zebra*. See the articles ONAGER, *Suppl.* and ZEBRA, *Append.*

ASTERIAS, in zoology, a name used by some naturalists for the star-fish, otherwise called *aster* and *stella marina*. See the article STELLA *marina*, *Suppl.*

ASTHMA (*Cycl.* and *Suppl.*)—Dr. Mead has lately given us his observations on this Distemper. Monit. & Pract. Medic. Cap. 8.

Whatever occasions the ambient air to enter the lungs with less freedom than usual, brings on this disease. Hence it may arise, 1st. From whatever is an impediment to the action of the diaphragm, the intercostal and abdominal muscles. 2dly, From whatever obstructs the free passage of the air into the aspera arteria, or its ramifications, whether the obstruction arises from a tumor, or from viscid humors. 3dly, The air itself may be a cause, if it be much heavier, or lighter than usual. 4thly, The tenderness of the lungs may sometimes occasion this distemper, as appears from those who are subject to a difficulty of breathing upon removing from the thick air of the town into the clear air of the country. 5thly, The difficult passage of the air thro' the lungs may be reckoned among the causes of difficult respiration. And this may happen either from the weakness of the heart, or the too great thickness of the blood.

The method of cure, in this distemper, must vary with its causes. Blood letting is, generally speaking, useful in every species of it. Vomits are useful, if the stomach or lungs be loaded with tough phlegm. The body must be kept open with gentle cathartics. Flatulent food and drink should be avoided; exercise used 'till weariness; and friction 'till a sweat is ready to break out.

Oxymel of squills and simple cinnamon water, or garlick, are good in case of viscid and tough humors. But if the fault lie in the nervous juice, the strong smelling gums are proper, especially the milk of gum ammoniac. Anodynes are very hurtful in the first case, but serviceable in this, if joined with volatile salts or spirits. The paregoric elixir is one of the best of this tribe.

As every kind of this disease is attended with more or less effervescence in the blood, the bark will be found useful; and the doctor assures us, that he has known instances where it has done vast services mixed with the cinnabar of antimony.

ASYLUM, in the history of insects, a name sometimes used for the gad-fly, called by zoologists *œstrum*. See the article OESTRUM, *Suppl.*

ATRACTYLIS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is ovated, imbricated, and beset with numerous lanceolated squamæ; the flower is compound and radiated;

 the

the stamina are five extremely short and capillary filaments; the antheræ are cylindraceo-tubulose; the germen of the pistil is very short and coronated; the style is filiform, and of the length of the stamina; the stigma is bifid; and the seeds are of a compressed turbinated shape, and covered with a plumose down. Vid. *Linnæi* Gen. Plant. p. 384.

Atractylis is also the name used by Vaillant for the *carthamus*, or *bastard-saffron*. See the article Carthamus, *Suppl.*

AVENS, in botany, the English name of a genus of plants, called by authors *caryophyllata*. See Caryophyllata, *Suppl.*

AVOCADO, or Avocado-*pear*, in botany, a name given by some to the *persea* of Plumier. See Persea, *Append.*

AVOSETTA, the Italian or modern name of a genus of birds, called in Latin *recurvirostra*. See the article Recurvirostra, *Suppl.*

AURELIA, in natural history, a synonymous term with *chrysalis*. See the article Chrysalis, *Append.*

AURELIANA, in botany, a name used by some writers for the Panax, or *allheal*. See the article Panax, *Append.*

AURICULA, a name sometimes used for the *forficula*, or *earwig*. See the article Forficula, *Append.*

AURICULARIA, a name used by some for the ear-wig, a very troublesome insect. See the article Ear-*wig*, *Append.*

AURUM, *gold*, in natural history. See the article Gold, *Suppl.*

AWK, or Auk. See the article Auk, *Suppl.*

AX-*vetch*, in botany, the English name of a genus of plants, called by authors *securidaca*. See Securidaca, *Suppl.*

AXUNGIA *solis*, in natural history, a name used by some writers for the substance more usually called *silesiaca terra*. See the article *silesiaca* Terra, *Suppl.*

B.

BABOON, in zoology, the English name of such monkeys as are usually called by naturalists *papiones*. See the article Papio, *Suppl.*

BALANCE-*fish*, in zoology. See Ballance-*fish*, *Suppl.*

BALAUSTINE, a name given to the great double-flowered pomegranate. See the article Punica, *Suppl.*

BALISTES, in ichthyology. See the article Ballistes, *Suppl.*

BALM, in botany, the same with *baum*. See Baum.

BALSAM *of capevi*, or *capivi*, in pharmacy and natural history. See the article Balsam *of copaiba*, *Suppl.*

Male-Balsam, or Balsam-*apple*, the name of a genus of plants, known among authors by that of *momordica*. See the article Momordica, *Suppl.*

Balsam-*tree*, in botany, a name used by some writers for the *terebinthus*, or turpentine-tree. See Terebinthus, *Suppl.*

BALSAMINA *scandens*, a name by which some call the large fruited white bryony of Ceylon. See the article Bryonia *alba*, *Suppl.*

BALSAMINE, in botany, the name of a genus of plants, called by authors *balsamina*. See the article Balsamina, *Suppl.*

BALSAMITA, in botany, the name by which some call costmary, a species of tanzy. See Tanacetum, *Suppl.*

BANE-*berry*, in botany, the English name used by some for the herb *christopher*. See the article Christophoriana, *Suppl.*

BAR *(Suppl.)* — To Bar or Strike *a vein*, among farriers, an operation performed on the veins of a horse's legs, or other parts of his body, in order to stop the course, and lessen the quantity of malignant humors prevailing there.

It is thus performed: the farrier opens the skin, after disengaging the vein, ties it above and below, and then strikes between the two ligatures. Sportsm. Dict. in voc.

BARRACKS, in military affairs, buildings to lodge soldiers in fortified towns, or others. Thus we say the *barracks* of the Savoy, of Dublin, *&c.*

Barracks, when damp, are greatly prejudicial to the health of the soldiers lodged in them; occasioning dysenteries, intermitting fevers, coughs, rheumatic pains, *&c.* For which reason quarter-masters ought to be careful in examining every *barrack*, offered by the magistrates of a place; rejecting all ground floors in houses that have either been uninhabited, or have any signs of moisture. Vid. *Pringle*, Observ. on the Diseases of the Army, p. 13, 37, 81 and 97.

BARREN-*wort*, in botany, the English name of a genus of plants, known among authors by that of *epimedium*. See Epimedium, *Suppl.*

BARBADOES-*cherry*, in botany, the English name of a genus of plants, called by authors *malpighia*. See Malpighia, *Suppl.*

Barbadoes-*tar*, a name sometimes used for the thick black kind of *pissasphaltum*. See the article Pissasphaltum, *Suppl.*

BASELLA, in botany, the name used by some botanists for the *cuscuta*, or dodder. See the article Cuscuta, *Suppl.*

BATATAS, the name by which the plant producing our potatoes is sometimes called. See the article Potatoes, *Suppl.* and *Append.*

BATCHELOR's *button*, in botany, the English name of a genus of plants, called by authors *lychnis*. See Lychnis, *Suppl.*

Batchelor's *pear*, a name used by some for several species of *solanum*, or night-shade. See Solanum, *Suppl.*

BATTERING-*ram*, in the military art of the antients. See Aries, *Cycl.*

BAUM *(Suppl.)*—*Turky*-Baum, a name given by some to the *dracocephalon*. See the article Dracocephalon, *Suppl.*

Shrubby-Baum, a name used by some for a genus of plants, called by authors *molucca*. See Molucca, *Suppl.*

BAY *(Suppl.)* —*Alexandria*-Bay, in botany, a name given to the *ruscus*, or butcher's broom. See Ruscus, *Suppl.*

Cherry-Bay, or *cherry*-Laurel, in botany, the English names of a genus of plants, called by Linnæus *padus*. See Padus, *Append.*

Dwarf-Bay, a name sometimes given to the *thymelæa* of authors. See the article Thymelæa, *Suppl.*

Indian Bay, a name given by some to a species of myrtle. See the article Myrtus, *Suppl.*

Rose-Bay, a name used by some writers for the *chamærododendros*. See Chamærododendros, *Suppl.*

Sweet flowering Bay, the English name of a genus of plants, described by Linnæus under that of *magnolia*. See Magnolia, *Suppl.*

BEAD *(Suppl.)*—Bead-*tree*, in botany, the English name of a genus of trees, called by authors *azedarach*. See Azedarach, *Suppl.*

BEAM-*tree*, in botany, a name given to the *cratægus*. See the article Cratægus, *Suppl.*

Hard-Beam, or *horn*-Beam, in botany. See the article Carpinus, *Suppl.*

BEAN *(Suppl.)*—*Bog*-Bean, *bug*-Bean, or *buck*-Bean, names given to the *menyanthes*. See the article Menyanthes, *Suppl.*

Caper-Bean, in botany, the English name of a genus of plants, called by authors *fabago*. See the article Fabago, *Suppl.*

Trefoil-Bean, in botany, the English name of a genus of plants, called by authors *cytisus*. See Cytisus, *Suppl.*

Bean-*tree*, a name given to a genus of plants, called by authors *corallodendron*. See the article Corallodendron, *Suppl.*

Kidney-Bean-*tree*, a name used by some for the *glycine* of Linnæus. See the article Glycine, *Suppl.*

BEAR *(Suppl.)* — *Ant*-Bear. See the article Tamandua, *Suppl.*

Bear's *ear*, in botany, the name of a genus of plants, known among authors by that of *auricula*. See Auricula, *Suppl.*

Bear's *ear fanicle*, in botany, a name given by some to the *cortusa* of Linnæus. See the article Cortusa, *Suppl.*

Bear's *foot*, in botany, a name given to several species of *hellebore*. See the article Helleborus, *Suppl.* and Hellebore, *Cycl.*

BEARD *(Suppl.)*—*Old man's* Beard, in botany, a name given by some to the *clematis* of authors. See Clematis, *Append.*

BECCA-BUNGA, in botany, a name given to the *anagallis aquatica*, called in English *brook-lime*. See the article Anagallis, *Suppl.*

BEDSTRAW, or *ladies* Bedstraw, in botany, the English name of a genus of plants, called by authors *gallium*. See Gallium, *Suppl.*

BEE-*flower*, in botany, the English name of a genus of plants, called by authors *orchis*. See Orchis, *Suppl.*

Bee-*fly (Suppl.)*—*Humble*-Bee-*fly*, a species of *culex*. See the articles Humble, *Suppl.* and Culex, *Append.*

BEER-*posset*. See Zythogala, *Suppl.*

BEETLE *(Suppl.)*—*Oil*-Beetle, the English name of the *meloe* of zoologists. See the article Meloe, *Append.*

Water-BEETLE, the Engliſh name of a genus of *beetles*, called by Dr. Hill *dytiſcus*. See the article DYTISCUS, *Append.*

BELI *oculus*, in natural hiſtory. See OCULUS *beli*, *Suppl.*

BELL-*flower*, in botany, the Engliſh name of a genus of plants, called by authors *campanula*. See the article CAMPANULA, *Suppl.*

BELL-*pepper*, in botany, a name uſed by ſome for the *capſicum*. See the article CAPSICUM, *Suppl.*

BELLS, or *Canterbury* BELLS, in botany, a name given to the *campanula*. See CAMPANULA, *Suppl.*

Hair-BELLS, in botany, a name given to the *hyacinth*. See the article HYACINTH, *Suppl.*

BELLY-*ach-weed*, in botany, a name given to the *ricinoides*. See the article RICINOIDES, *Suppl.*

BELMUSK, or ABELMOSCH, in botany, names uſed for the *ketmia*. See the article KETMIA, *Suppl.*

BENJAMIN-*tree*, in botany, the name of a ſpecies of *laurus*, according to Linnæus, with deciduous leaves, without ribs, of an obverſely oval figure. See the article LAURUS, *Append.*

It is a native of the Eaſt and Weſt Indies, and is called by many late writers *arbor limonii folio, benzoinum fundens*, by reaſon benzoin is procured from it. See BENZOIN, *Suppl.*

BENNET-*herb*, *herba benedicta*, a name uſed by ſome for the *caryophyllata*, or avens. See CARYOPHYLLATA, *Suppl.*

BERBERRY, or BARBERRY-*buſh*, in botany. See the article BERBERIS, *Suppl.*

BERNARD *the hermit*, the Engliſh name of a ſpecies of *ſquill*. See the article SQUILLA, *Append.*

BETHLEHEM-*ſtar*, in botany, a name given to the *ornithogalum*. See the article ORNITHOGALUM, *Suppl.*

BETONY (*Suppl.*)—*Water*-BETONY, a name given to the *ſcrophularia*, or fig-wort. See the article SCROPHULARIA, *Suppl.*

BEZOAR-*goat*, a name uſed for the Indian antelope, or *gazella*, on account of the *bezoar-ſtone* found in its ſtomach. See GAZELLA, *Suppl.*

BIFOL, in botany, a name given by ſome to the *ophris*, or twyblade. See the article OPHRIS, *Suppl.*

BILBERRY, in botany, an Engliſh name given to the *vaccinium*, or *vitis idæa* of authors, called alſo the *whortle-berry*. See VITIS *idæa*, *Suppl.*

BILE (*Cycl.*)—The influence of *bile* upon the animal œconomy is allowed to be very great. By its fermentative quality, it promotes digeſtion; in which reſpect, it differs widely from vegetable bitters, which are retarders of fermentation. Vid. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 377.

However, in one thing, it agrees with them, *viz.* as a corrector of acidities. Id. ibid. p. 378.

Bile ſpeedily corrupts, but not to ſuch an high or offenſive degree as the blood or fibrous parts of the body. To this corruption of the *bile*, as one cauſe, Dr. Pringle attributes the paroxyſms in bilious fevers: nay, all bilious diſorders, as the cholera morbus, dyſentery, *&c.* are thought to be chiefly owing to a redundance or corruption of the *bile*. Hence, the reaſon why theſe diſorders are moſt frequent in hot countries, and in armies when much expoſed to the ſun, is, that the *bile*, if not more abundant, is in ſuch circumſtances more corrupted than uſual. Id. ibid. p. 184. 74.

BILIOUS *fever* (*Suppl.*)—Dr. Pringle, in his Obſervations on the Diſeaſes of the Army, remarks, that the *bilious* or putrid fever is epidemic in camps, eſpecially in low and marſhy countries, where the air being full of moiſt and putrid effluvia, tends to relax the fibres and promote putrefaction. As to the ſymptoms of the *bilious* fever, it always begins with chillneſs and laſſitude, pains of the head and bones, and a diſorder at the ſtomach. At night the fever runs high; the heat and thirſt are great; the tongue is parched; the head aches violently; the perſon gets no reſt, and often becomes delirious; but generally in the morning an imperfect ſweat brings on a remiſſion of all the ſymptoms. In the evening the paroxyſm returns, but without any cold fit, and is commonly worſe than the former: on the ſecond morning it remits as before. Theſe periods go on, daily, 'till the fever changes inſenſibly, either into a confirmed or into an intermitting ſhape. Sometimes looſe ſtools carry off the fit, and ſupply the place of ſweats: however, tho' it reſembles an ague in many particulars, yet it is rare to meet with a real ague in the camp, unleſs the perſon has been ill of it before he took the field. The remiſſions uſually appear from the beginning, eſpecially if the patient has been plentifully blooded: but ſometimes there are no remiſſions for the laſt two or three days. Hæmorrhages of the noſe happen frequently in the height of the paroxyſm, and always bring on the remiſſion ſooner and make it fuller. Vomiting or purging have the like effects. The fits are ſeldom preceded by ſhiverings, or any ſenſe of cold after the firſt attack; the pulſe is always full and quick during the paroxyſms, and in the remiſſions it ſtill indicates ſome degree of fever. The blood is florid, the craſſamentum is firm, in large quantity, and ſinks in the ſerum. Whilſt the weather continues warm, the *bilious* ſymptoms are moſt frequent, but as winter approaches, the inflammatory ones prevail. See INFLAMMATORY.

The doctor enumerates other ſymptoms, as crudeneſs of the urine, *bilious* ſtools, coſtiveneſs, *&c.* and farther obſerves, that the infantry are more liable to it than the cavalry.

As to the cure of the *camp-fever*, before it becomes continued, it depends upon the proper uſe of evacuations, the neutral ſalts, and the bark. Bleeding he judges indiſpenſible; which he would have repeated once or oftner, according to the urgency of the ſymptoms. After bleeding it will be neceſſary to give an emetic, the beſt time for doing which is in the remiſſion of the fever, and rather ſooner after a paroxyſm than before one. He adds, however, that vomits do harm when the ſtomach is anywiſe inflamed; in which caſe they ought never to be given. Ipecacuanha is the ſafeſt and eaſieſt, but antimonials make the moſt efficacious vomit. If the body remains coſtive, it is neceſſary to open it with ſome lenient phyſic; and eſpecially if the bowels are affected with pains, or a teneſmus. He likewiſe recommends ſalt of wormwood, lemon-juice, ſpiritus mindereri, and the bark; which laſt ought not to be given 'till the urine breaks, and the intermiſſions take place. Bleeding and purging are alſo neceſſary before the bark ought to be given: it anſwers beſt in ſubſtance adminiſtered in rheniſh wine, after ſtanding a night in infuſion.

If, after remiſſions or intermiſſions, the diſeaſe changes into a continued fever, bleeding becomes neceſſary, unleſs other ſymptoms forbid it; but whether there be room for bleeding or no, bliſters are not only uſeful, but the beſt remedy. To theſe may be joined the neutral ſalts and diaphoretic powders. But, tho' a ſweat be the proper criſis, it ought never to be promoted by theriaca, or the like hot medicines; unleſs the pulſe ſhould ſink and the petechiæ or other bad ſymptoms appear: in which caſe the warmer alexipharmics are neceſſary, as the diſeaſe has changed into a malignant fever. *Pringle*, Obſerv. on Diſeaſes of the Army, p. 165 and 202. ſeq. See *Malignant catarrhal* FEVER, *Suppl.* and MALIGNANT, *Append.*

BILOCULAR, in botany, is applied to a capſule having two cells. See CAPSULE, *Cycl.*

BIND-*weed* (*Suppl.*) —*Black*-BIND-*weed*, a name ſometimes for uſed the *tamnus*. See the article TAMNUS, *Cycl.*

Prickly-BIND-*weed*, a name given to the *ſmilax* of authors. See the article SMILAX, *Suppl.*

Sea-BIND-*weed*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *ſoldanella*. See the article SOLDANELLA, *Suppl.*

BINN, (*Suppl.*) or BIN, the peaſe and whole oatmeal, uſed at Sea, and which are apt to ſpoil in caſks, Dr. Hales propoſes to prevent this, by putting them into large *bins*, with falſe bottoms of hair clothes laid on bars, whereby freſh air may be blown upwards thro' them, at proper times, with ſmall ventilators. See VENTILATOR, *Append.*

BINOMIAL (*Cycl.*) — *Impoſſible* BINOMIAL, in algebra, is uſed for a *binomial*, one of the terms of which is an impoſſible quantity. Thus, $a + \surd - bb$, is an *impoſſible binomial*.

BINOMIAL *ſurd* is uſed for a *binomial*, the terms of which are ſurds; as, $\surd a + \surd b$, or $a^m + b^m$, if m and n be fractions. The term *binomial ſurd*, is alſo applied to any quantity having a rational part and a ſurd part, as $25 + \surd 968$. For the extraction of roots of *binomial ſurds*, ſee *Newton's* Arithmetica Univerſalis, and *Mac Laurin's* Algebra, p. 114---130.

BINOMIAL *curve* is uſed for a curve, the ordinate of which is expreſſed by a *binomial*. Thus if the ordinate of a curve be of this form $x \times \overline{e + f x^{\lambda}}^{\theta}$, the curve is called a *binomial curve*. *Stirling*, Method. differ. p. 58.

BINOMIAL *theorem* is often uſed to ſignify Sir Iſaac Newton's theorem for raiſing a *binomial* to any power, or for extracting any root of a *binomial*. See ROOT, *Suppl.*

BIOTA, in zoology, a name introduced by Dr. Hill for the *polype*. See the article POLYPE, *Suppl.*

It is of a cylindric figure, but variable; the tentacula are arranged in a ſingle ſeries round the aperture of the mouth, at the extremity of the body. There are ſeveral ſpecies of this animal.

Linnæus calls this creature *hydra*, no doubt, from the reproduction or repullulation of the parts, when cut off; and this name, *biota*, is likewiſe given it on the ſame account, being derived from βιος, life.

BIRCH (*Suppl.*) — BIRCH-*tree of America*, a name given by ſome to the *terebinthus*, or turpentine-tree. See TEREBINTHUS, *Suppl.*

BIRD (*Cycl.* and *Suppl.*)---*Admiſſive* BIRDS, *aves admiſſivæ*, in the augural ſcience of the antients, were birds of a happy omen, which denoted the approbation of the gods in an enterprize. *Danet*. Lex. in voc. *Baxt*. Gloſſ. p. 35. ſeq.

In which ſenſe *aves admiſſivæ* ſtand oppoſed to *arcivæ aves*.

BIRD'S *cherry*, in botany, the Engliſh name of a genus of plants, called by Linnæus *padus*. See PADUS, *Append.*

BIRD'S *eye*, in botany, the name of a genus of plants, called by authors *adonis flos*. See the article ADONIS *flos*, *Suppl.*

BIRD'S *foot*, the Engliſh name of a genus of plants, called by authors *ornithopodium*. See the article ORNITHOPODIUM, *Suppl.*

BIRD'S *foot trefoil*, a name given to ſome ſpecies of *lotus*. See the article LOTUS, *Suppl.*

BIRD-*lime.* See LIME-*twigs*, *Suppl.*

Water-BIRD-*lime.* See LIME-*twigs*, *Suppl.*

BIRD'*s neſt*, in botany, a name uſed by ſome for the *daucus*, or carrot. See the article DAUCUS, *Suppl.*

BIRD'*s pepper*, a name given to the *capſicum*, or Guinea pepper. See the article CAPSICUM, *Suppl.*

BIRD'*s tongue.* See LINGUA *avis*, *Suppl.*

BIRTH (*Cycl.* and *Suppl.*)—*Difficult* BIRTH. See the article DELIVERY, *Suppl.*

BISHOP'*s weed*, in botany, the Engliſh name of the *ammi*. See the article AMMI, *Suppl.*

BITTER (*Suppl.*)—*Bitters* are ſaid to reſiſt putrefaction and moderate fermentation: hence appears their uſe in putrid diſorders. *Bitters* likewiſe correct acidities, and aſſiſt digeſtion, by bracing the fibres of the ſtomach.

BITTER-*ſweet*, in botany, the Engliſh name of the *ſolanum ſcandens*, or climbing nightſhade. See the article SOLANUM, *Suppl.*

BITTER *vetch*, the Engliſh name of the *orobus*. See the article OROBUS, *Suppl.*

BITTER *wort*, the Engliſh name for the *gentiana* of authors. See the article GENTIANA, *Suppl.*

BLACK *berry*, the Engliſh name of a genus of plants called by authors *rubus*. See the article RUBUS, *Suppl.*

BLACK-*bind-weed*, or BLACK-*bryony*, a name given to the *tamnus* of authors. See the article TAMNUS, *Suppl.*

BLACK-*thorn*, a name uſed by ſome for the *prunus ſylveſtris*, or ſloe-tree. See the article PRUNUS, *Suppl.*

BLADDER-*lotus*. See the article LOTUS, *infra.*

BLADDER-*nut*, in botany, the Engliſh name of the *ſtaphylodendron*. See the article STAPHYLODENDRON, *Suppl.*

African BLADDER-*nut*, a name given to the *royena* of Linnæus. See the article ROYENA, *Suppl.*

Laurel-leaved-BLADDER-*nut*, the name uſed by ſome for the *Dodonæa* of Linnæus. See the article DODONÆA, *Suppl.*

BLADDER-*ſena*, a name given by ſome to the *colutea*. See the article COLUTEA. *Suppl.*

BLATTA *byzantia*, in the materia medica. See the article UNGUIS *odoratus*, *Suppl.*

BLEEDING, (*Suppl.*) according to Dr. Pringle, is the moſt indiſpenſible of all remedies in inflammatory diſeaſes; to the delaying of which too long, or not repeating it, are chiefly owing the bad conſequences of colds, as dangerous fevers, rheumatiſms, and conſumptions. He obſerves farther, that, in general, young practitioners are apt to be too ſparing in letting blood, by which means many lives are loſt: for a ſurgeon may be aſſured a ſoldier will never complain of a cough, or pains with inflammatory ſymptoms, wherein *bleeding* is not neceſſary; and from the ſizineſs of the blood, and continuance of the complaints, he is to judge of the neceſſity of repeating it, which, in caſe of a ſtitch, or difficult breathing, is never to be delayed. In inflammatory caſes, from twelve to fifteen ounces may be taken for the firſt *bleeding*, and ſomewhat leſs for all the reſt; and when it is neceſſary to exceed this quantity, it may be proper to follow Celſus's rule, in minding the colour of the blood whilſt it flows, and when it is of a blackiſh caſt, which is always the caſe in difficult breathing and great inflammations, to let it run till it becomes more florid. In all caſes where plentiful *bleeding* is indicated, it is beſt to do it in bed, to prevent fainting; and we may obſerve, that a perſon will bear the loſs of a much greater quantity of blood if the ſtream is ſmall, than by a large orifice, which ſome have thought neceſſary for making a more ſpeedy revulſion.

Bleeding is highly neceſſary in the phrenitis, ophthalmia, quinſey, rheumatiſm, cough, hectic fits, and, in general, in all inflammatory caſes. See *Pringle*'s Obſervations on the Diſeaſes of the Army, *paſſim.*

It is to be obſerved, however, that, in malignant and putrid diſorders *bleeding* frequently renders them more malignant, and therefore to be omitted, or at leaſt not repeated unleſs there appear evident marks of inflammation. See the articles MALIGNANT *fever*, BILIOUS *fever*, DYSENTERY, &c.

BLISTERS (*Suppl.*) are often neceſſary in inflammatory diſorders, as the phrenitis, ophthalmia, quinſey, pleuriſy, &c. as well as in chronic diſtempers, ſuch as palſies, &c. See PHRENITIS, OPHTHALMIA, &c. *Suppl.*

BLITE, in huſbandry. See the articles BLIGHT and RUBIGO, *Suppl.*

BLOIS, *Bole of* BLOIS, *Bolus Bleſenſis*. See the article BLESENSIS *bolus*, *Suppl.*

BLOOD (*Suppl.*)—In order to aſcertain the colour of the different parts of corrupted *blood*, Dr. Pringle made the following experiment. He took a freſh quantity without any inflammatory cruſt, and divided it into the craſſamentum, the ſerum with a few red globules in it, and the pure ſerum. The phials containing theſe ſeveral liquors were put into a furnace, where they ſtood ſome days, till they became thoroughly putrid.

The craſſamentum was changed from a deep crimſon to a dark livid colour; ſo that when any portion of it was diluted with water, it appeared of a tawney hue. Of the ſame colour was the ſerum in which the red globules remained. But the pure ſerum, after becoming turbid, dropped a white purulent ſediment, and changed into a faint olive green.

From this experiment he concludes, that the ichor of ſordes, and that of dyſentery fluxes, conſiſts of the ſerum tinged with a ſmall quantity of red blood putrified; and that when the ſerous veſſels are of a tawney caſt, we are not to refer that colour to inflammation, but to a ſudden ſolution of ſome of the red globules mixed with the ſerum.

A few drops of this putrid craſſamentum was mixed with the recent urine of a healthy perſon, which it immediately changed into a flame-coloured water, common in fevers and in the ſcurvy. After ſtanding an hour or two, the ſame gathered a cloud, reſembling what is ſeen in the crude urine of perſons in acute diſtempers.

As to a green ſerum, it is perhaps never to be ſeen in the veſſels of a living body, ſince it is not to be ſuppoſed that a perſon could ſurvive ſo great a change of the *blood*. In foul ulcers, indeed, and in other ſores, where the ſerum is left to ſtagnate long, the matter is found of a greeniſh colour, and is then always acrimonious. But the effects of a green ſerum is no where to be ſo much dreaded as in the caſe of an aſcites, where it is collected in ſo large a quantity. Of which we had, ſome time ſince, almoſt a fatal inſtance in Mr. Cox, ſurgeon at Peterborough, who, upon tapping a woman but a few hours after death, was ſo affected with the poiſonous ſteams of a green ſerum, that he was preſently ſeized with a peſtilential fever, and narrowly eſcaped with his life.

In regard to the ſediment which the ſerum dropped on becoming turbid, and which reſembled well digeſted matter, the doctor thinks it a terreſtrial ſubſtance, intended for the nouriſhment or reparation of the ſolid; in which opinion he was the more confirmed by obſerving a like ſediment in the urine of men in perfect health: and therefore concludes that the pus, or digeſted matter of ſores, is nothing but this ſubſtance ſeparated from the ſerum of the blood. And hence it is that all large ulcers are extremely weakening, from the great expence of *blood* in furniſhing this ſubſtance. Hence alſo it is, that iſſues are of more conſequence for making drains, than one would expect from the viſible evacuation: as near as the doctor could gueſs, an ounce of ſerum, after ſtanding ſome days, not furniſhing more of this matter than what might be produced in the daily diſcharge of a large pea-iſſue, or from a ſeton. *Pringle*, Obſerv. on Diſeaſes of the Army, Append. p. 386, *ſeq.* Experim. xlv.

There are frequent inſtances of the tawney colour of the ſerum, the reſolution of the craſſamentum, and even of the offenſive ſmell of *blood* recently drawn. And, indeed, if we reflect how putreſcent *blood* is in a heat equal to that of the human body, we may be convinced, that no ſooner is the perſpiration by the lungs impeded, than a corruption begins in the whole maſs; which, if not timely prevented, brings on ſome putrid diſeaſe. If the acrimony is great and ſudden, a fever or flux will enſue; but if the accumulation is ſo ſlow that the body grows habituated to the putrefaction, a ſcurvy prevails. This is the caſe in long voyages, on board unventilated ſhips; in marſhy countries; and, in a leſſer degree, in all northerly climates, in moiſt ſituations. *Id.* p. 400.

BLOOD-*flower*, in botany, the Engliſh name of the *hæmanthus*. See the article HÆMANTHUS, *Suppl.*

BLOWER, among dealers in horſes, a term uſed for ſuch horſes as wheeze much, without wanting wind. See the article WHEEZING, *Suppl.*

BOAR (*Suppl.*) The wild *boar*, among the huntſmen, has ſeveral names, according to its different ages; the firſt year it is called *a pig of the ſaunder*; the ſecond it is called *a hog*; the third, *a hog-ſteer*; and the fourth, *a boar*; when leaving the ſaunder he is called *a ſingler* or *ſangler*.

The *boar* generally lives to twenty-five or thirty years, if he eſcapes accidents. The time of going to rut is in December, and laſts about three weeks. They feed on all ſorts of fruits, and on the roots of many plants; the root of fern in particular ſeems a great favourite with them: and when they frequent places near the ſea coaſts, they will deſcend to the ſhores and demoliſh the tenderer ſhell-fiſh in very great numbers. Their general places of reſt are among the thickeſt buſhes that can be found, and they are not eaſily put up out of them, but will ſtand the bay a long time. In April and May they ſleep more ſound than at any other time of the year, and this is therefore the ſucceſsful time for the taking them in the toils. When a *boar* is rouzed out of the thicket, he always goes from it, if poſſible, the ſame way by which he came to it; and when he is once up, he will never ſtop till he comes to ſome place of more ſecurity. If it happens that a ſaunder of them are found together, when any one breaks away, the reſt all follow the ſame way. When the *boar* is hunted in the wood, where he was bred, he will ſcarce ever be brought to quit it; he will ſometimes make toward the ſides to liſten to the noiſe of the dogs, but retires into the middle again, and uſually dies or eſcapes there. When it happens that a *boar* runs a-head, he will not be ſtopt, or put out of his way by man or beaſt, ſo long as he has any ſtrength left. He makes no doubles nor croſſings when chaſed; and when killed makes no noiſe, if an old *boar*; the ſows and pigs will ſqueak when wounded.

The ſeaſon for hunting the wild *boar* begins in September and ends in December, when they go to rut. If it be a large *boar*, and

and one that has lain long at rest, he must be hunted with a great number of dogs, and those such as will keep close to him, and the huntsman, with his spear, should always be riding in among them, and charging the *boar* as often as he can, to discourage him: such a *boar* as this, with five or six couple of dogs, will run to the first convenient place of shelter, and there stand at bay, and make at them as they attempt to come up with him.

There ought always to be relays also set of the best and staunchest hounds in the kennel; for if they are of young eager dogs, they will be apt to seize him, and be killed or spoiled before the rest come up. The putting collars with bells about the dogs necks is a great security for them, for the *boar* will not so soon strike at them when they have these, but will rather run before them. The huntsmen generally kill the *boar* with their swords or spears; but great caution is necessary in making the blows, for he is very apt to catch them upon his snout or tusks, and if wounded and not killed, he will attack the huntsmen in the most furious manner. The places to give the wound with the spear is either between the eyes in the middle of the forehead or in the shoulder, both these places make the wound mortal.

When this creature makes at the hunter there is nothing for it but courage and address, if he flies for it he is surely overtaken and killed; if the *boar* comes strait up, he is to be received at the point of the spear; but if he makes doubles and windings, he is to be watched very cautiously, for he will attempt getting hold of the spear in his mouth, and if he does so nothing can save the huntsman but another person attacking him behind; he will on this attack the second person, and the first must then attack him again; two people will thus have enough to do with him, and were it not for the forks of the boar-spears that make it impossible to press forward upon them, the huntsman who gives the creature his death's wound would seldom escape falling a sacrifice to his revenge for it.

The modern way of boar-hunting is generally to dispatch the creature by all the huntsmen striking him at once; but the antient Roman way was, for a person on foot, armed with a spear, to keep the creature at bay, and in this case the *boar* would run of himself upon the spear to come at the huntsman, and push forward till the spear pierced him through.

The hinder claws of a *boar* are called *guards*.

In the corn he is said to *feed*; in the meadows or fallow fields, to *rout*, *worm*, or *fern*; in a close, to *graze*.

The *boar* is farrowed with as many teeth as he will ever have, his teeth increasing only in bigness, not in number; among these there are four called *tushes* or *tusks*, the two biggest of which do not hurt when he strikes, but serve only to whet the other two lowest, with which the beast defends himself, and frequently kills, as being greater and longer than the rest. Gent. Recr. p. 1, 7, and 119. Trev. Dict. Univ. tom. iv. p. 1489, *voc.* *Sanglier*.

It is very remarkable, that these creatures in the West Indies are subject to the stone in a very remarkable manner: few of them are absolutely free from it, yet scarce any have the stones of any considerable size. It is common to find a great number in the same bladder, and they are usually of about a scruple weight, and are angular, and that with great regularity, each having five angles. Phil. Trans. n. xxxvi.

Among the antient Romans *boar's* flesh was a delicacy; a *boar* served up whole was a dish of state. *Pitisc.* Lex. Ant. tom. i. p. 120. *voc.* Aper.

The *boar* was sometimes also the military ensign borne by the Roman armies, in lieu of the eagle. *Salmuth.* ad Pancirol. P. I. tit. liii. p. 278.

Among physicians a *boar's* bladder has been reputed a specific for the epilepsy. *Friend*, Hist. of Phys. tom. ii. p. 280. The tush of the wild *boar* still passes with some as of great efficacy in quinzies and pleurisies. *Alleyn*, Dispens. p. 150.

Boar, in the manege. A horse is said to *boar*, when he shoots out his nose as high as his ears, and tosses it in the wind. *Guill.* Gent. Dict. *in voc.*

BOLBONACH, in botany, a name given to the *lunaria* of authors. See the article Lunaria, *Suppl.*

BOLE (*Suppl.*) — See the article Bolus, *Suppl.* and *Append.*

BOLUS *Blesensis*. See the article Blesensis *bolus*, *Suppl.*

Bolus *Etrusca*, the same with *Etrusca terra*. See the article Etrusca *terra*, *Suppl.*

Bolus *Goltbergensis*, the same with *terra Goltbergensis*. See the article Goltbergensis *terra*, *Suppl.*

Bolus *Lemnia*, the same with *terra Lemnia*. See the article Lemnian *earth*, *Suppl.*

Bolus *Livonica*, the same with the *Livonica terra*. See the article Livonica *terra*, *Suppl.*

Bolus *Noceriana*, the same same with *terra Noceriana*. See the article Noceriana *terra*, *Suppl.*

Bolus *Veneta*. See the article Veneta *bolus*, *Suppl.*

BONANA, in botany, the name used for a genus of plants called by authors *musa*. See the article Musa, *Suppl.*

BONE (*Cycl.* and *Suppl.*)—All sorts of *bone* may be stained, or dyed, any kind of colour, as directed under the article Ivory, *Append.*

BOREA, a name given by the antients to a species of jasper, of a blueish green colour. See the article Jasper, *Append.*

BORECOLE, in botany, a name used for a species of *brassica*. See the article Brassica, *Suppl.*

BOTRYS, in botany, a name sometimes given to a species of *chenopodium*, called also *oak of Jerusalem*. See the article Chenopodium, *Suppl.*

BOTRYTIS, in botany, the name given by Micheli to a genus of mosses, called by authors *byssus*. See the article Byssus, *Suppl.*

BOTTLE (*Suppl.*)—*Blue* Bottle, a name used for the *cyanus* of authors. See the article Cyanus, *Suppl.*

BOWER (*Suppl.*)—*Ladies* Bower, or *virgin's* Bower, names given by us to a distinct genus of plants called by botanists *clematitis*. See the article Virgin's *bower*. *Suppl.*

BOX-*thorn*, in botany, the English name of a genus of plants called by authors *lycium*. See the article Lycium, *Append.*

BRACHIONUS, in zoology, the name of a genus of animalcules of the *arthrodia* kind, containing all the wheel animals. See the articles Arthrodia, and Animalcule, *Append.* and Wheel, *Suppl.*

BRACHURI, in zoology, a name given by Dr. Hill to a genus of animalcules of the tailed kind. See the article Animalcule, *Suppl.* and *Append.*

These animalcules are of a roundish figure, with tails shorter than their bodies; their skin is perfectly smooth, thin, and colourless. They are frequent in water-ponds, in pepper-water, and many other infusions of vegetable substances. See *Hill*, Hist. Anim. p. 6, *seq.*

BRACHYPYRENIA, in natural history, a genus of fossils of the class of *septariæ*. See the article Septariæ, *Suppl.*

The *brachypyrenia* have a short roundish nucleus, enclosed by and contained within the body of the mass.

BRAMA *marina*, the sea-bream, in ichthyology, a species of *sparus*, according to Artedi. See the article Sparus, *Sppul.*

BRAMBLE, or Bramble *bush*, in botany, the English name of a genus of plants called by authors *rubus*. See the article Rubus, *Suppl.*

BRAMBLING, in zoology. See the article Bramble, *Suppl.*

BRANCK *ursine*, a name used by some authors for the *acanthus*. See the article Acanthus, *Suppl.*

BRASSE, in ichythology, a name sometimes given to the *lucioperca*, a species of pearch. See the articles Perca and Lucioperca, *Suppl.*

BREAD (*Suppl.*)—*S. John's* Bread, in botany, the English name of the carob-tree, described by Tournefort under that of *siliqua*. See the article Siliqua, *Suppl.*

BREAM (*Suppl.*)—*Sea*-Bream, *brama marina*, in ichthyology, a species of *sparus*. See the article Sparus, *Suppl.*

BREAST (*Suppl.*) — *Diseases of the* Breast. See the article Asthma, *Append.*

BRIAR, in botany, a name given to several species of rose. See the article Rose, *Suppl.*

BRIMSTONE *wort*, in botany, a name given to the *peucedanum* of authors. See the article Pucedanum, *Suppl.*

BRIONY, in botany. See the article Erionia, *Suppl.*

BRISTOL *flower*, in botany, a name used by some for the *lychnis*. See the article Lychnis, *Suppl.*

BROCADE (*Cycl.*) — Brocade-*shell*, the English name of a species of *cylindrus*. See the article Cylindrus, *Suppl.*

It is of a silvery white colour variegated with brown.

BROCATELLO, a name used by our lapidaries for the white and gold veined red marble. See the article Marble, *Suppl.*

BROCOLI, among gardeners. See Broccoli, *Suppl.*

BROMELIA, in the Linnæan system of botany, the name of a genus of plants called by Tournefort *ananas*. See the article Ananas, *Suppl.*

BROOM (*Suppl.*) — *Butcher's* Broom, in botany, the English name of a genus of plants called by authors *ruscus*. See the article Ruscus, *Suppl.*

Green, and *white* Broom, names given to the *spartium* of authors. See the article Spartium, *Suppl.*

Spanish Broom, *spartium*, in botany. See the article Spartium, *Suppl.*

Broom-*lime*, a name used for the plant known among authors by that of *veronica*. See the article Veronica.

Broom-*rape*, a name given to the orobanche of authors. See the article Orobanche, *Suppl.*

BROWN *wort*, in botany, a name given sometimes to the *brunella*, or *prunella* of authors. See the article Prunella, *Suppl.*

Brown *wort* is also sometimes used for the *scrophularia*. See the article Scrophularia, *Suppl.*

BRUISE *wort*, in botany, a name given by some authors to the *lychnis*. See the article Lychnis, *Suppl.*

BRUSH (*Suppl.*) — *Silver*-Brush, the name by which some call the *barba Jovis*, a distinct genus of plants. See the article Barba *Jovis*, *Suppl.*

BUBO, in ornithology. See the article Owl, *Suppl.* and *Append.*

BUCEROS, in ornithology, the name of a species of raven found in the East Indies, China, and Tartary. Its head, neck, rump, and tail are of a glossy black without the least tinge of any other colour. It is of the bigness of a well grown pullet: its head is remarkably large, as is its beak, which has a considerable gibbosity towards the base, rising above the rest of the surface. See *Hill*, Hist. Anim. p. 383.

BUCK's

BUCK's *horn*, or *hart's horn plantain*, in botany, names given to the *coronopus* of authors. See the article CORONOPUS, *Suppl.*

BUCK's *horn cress*, in botany, a name given to the *nasturtium* of authors. See the article NASTURTIUM, *Suppl.*

BUCK-*thorn*, in botany, the English name of a genus of plants called by authors *rhamnus*. See the article RHAMNUS, *Suppl.*

Sea-BUCK-*thorn*, in botany, a name given to the *rhamnoides* of authors. See the article RHAMNOIDES, *Suppl.*

BUCK-*wheat*, in botany, the English name of the *fagopyrum* of authors. See the article FAGOPYRUM, *Suppl.*

BUDDING, among gardeners, the same with innoculation, or innoculating. See the article INNOCULATION, *Cycl.* and *Suppl.*

BUGG, in the history of insects, the English name of the *cimex*. See the article CIMEX, *Suppl.*

BUGG is also the English name of another genus of insects found on several trees. See the article CHERMES, *Append.*

House BUGG, in the history of insects, the English name of a species of *coccus*. See the article COCCUS, *Append.*

BUGLOSS (*Suppl.*) — *Viper's* BUGLOSS, in botany, the English name of the *echium*. See the article ECHIUM, *Suppl.*

BULBINE, in botany, a name used by some for the *phalanguim* or spider-wort of Tournefort. See the article PHALANGIUM, *Suppl.*

BULL-*frog*, the English name of the largest species of the frog kind. See the articles FROG and RANA, *Suppl.*

BULLACE-*tree*, in botany, a name given to a species of the *prunus*, or plum tree. See the article PRUNUS, *Suppl.*

BULLY-*tree*, in botany, a name given to the *cainito* or *chrysophyllum* of authors. See the article CHRYSOPHYLLUM, *Append.*

BUNIUM, in the Linnæan system of botany, the name of a genus of plants called by Tournefort *bulbocastanum*. See the article BULBOCASTANUM, *Suppl.*

BUNK, BUNKEN. See the article LEUCACANTHA, *Suppl.*

BUPLEURUM, hare's ear, in botany. See the article HARE'S *ear*, *Suppl.*

BURDOCK, in botany, the English name of a genus of plants called by authors *Xanthium*. See the article XANTHIUM, *Suppl.*

BURNET, in botany, the English name of a genus of plants called by authors *sanguisorba*. See the article SANGUISORBA, *Suppl.*

BURNET-*saxifrage*, in botany, a name improperly given by some to a species of *tragoselinum*. See the article TRAGOSELINUM, *Suppl.*

BURNING *of diamonds*, is used among the jewellers for putting the diamonds into a fierce fire, in order to divest them of a yellow or brown colour. See DIAMOND, *Suppl.*

BURSA *pastoris minor*, in botany, the name by which the *draba* of Linnæus is called by some writers. See the article DRABA, *Append.*

BUSH (*Suppl.*) — *Poison*-BUSH, the name by which the *tithymalus*, or spurge is sometimes called. See the article TITHYMALUS, *Suppl.*

BUSTARD, the English name of a genus of birds called *otis* by authors. See the article OTIS, *Suppl.*

BUTTER-*bump*, a name used in some parts of England for the bittern, or *ardea stellaris*. See the article BITTERN, *Suppl.*

BUTTERFLY-*flower*, the name of a plant called by authors *orchis*. See the article ORCHIS, *Suppl.*

BUTTERFLY-*shell*, the English name of a species of *voluta*. See the article VOLUTA, *Suppl.*

BUTTERIS, among farriers, the same with *buttress*. See the article BUTTRESS, *Cycl.*

BUTTON-*tree*, a name given to some species of *platanus* and *cephalanthus*. See the articles PLANE-*tree*, *Suppl.* and CEPHALANTHUS, *Append.*

BUTTON-*tree of Jamaica*, a name given to the *conocarpus* of Linnæus. See the article CONOCARPUS, *Append.*

C.

CABBAGE (*Suppl.*) — *Sea*-CABBAGE, or sea-cale, in botany, a name given to the *crambe* of authors. See the article CRAMBE, *Suppl.*

CABBAGE-*tree*, a name used by some for the palm-tree described by Linnæus under that of *phœnix*. See the article PHOENIX, *Suppl.*

CACALIANTHEMUM, in botany, the name by which Dillenius calls a genus of plants described by Linnæus under that of *kleinia*. See the article KLEINIA, *Append.*

CACTUS, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a deciduous perianthium, formed of a single leaf of a tubulated concave form, standing on the germen, and covered with a kind of squamose leaves; the flower consists of a great number of broad obtuse petals, the exterior ones short, the interior longer and connivent; the stamina are numerous subulated filaments, inserted into the calyx, and shorter than the flower. The antheræ are oblong and erect; the germen stands under the tube of the cup: the style is cylindric, and of the length of the stamina: the stigma is capitated and multifid: the fruit is an oblong umbilicated berry, containing only one cell, and covered with little leaves, like the cup: the seeds are numerous, roundish, and small.

This genus comprehends the *cereus*, *opuntia*, *melocactus*, *tuna*, and *pereskia* of botanical authors. The *cereus* is a long cylindraceo-angulated plant; the *melocactus*, a roundish and angulated one; the *opuntia* is ramose and dichotomous; and the *pereskia* is arborescent and foliose. Vide *Linnæi* Gener. Plant. p. 210.

CADLOCK, in botany, a name used in several parts of England for the *rapistrum* of authors. See the article RAPISTRUM, *Suppl.*

CÆMENT (*Cycl.* and *Suppl.*) — We have various receipts for making *cæments* to mend broken china or glasses; one of the finest, and at the same time strongest *cæments* for this purpose, is the juice of garlick stamped in a stone mortar; this will leave little or no mark, if done with care.

Another *cæment* for broken glasses, china, or earthen ware may be prepared by beating the white of an egg very clear, and mixing with it fine powdered quick lime; or isinglass, powdered chalk, and a little lime may be mixed together, and dissolved in fair water, with which the glasses, &c. are to be cæmented, and then set in the shade to dry; a precaution that should be always observed, whichever of the above *cæments* be used.

CÆMENTS *for cracked chemical glasses*. To prepare a *cæment* for these glasses that will stand the fire: take wheat flour, fine powdered Venice glass, pulverized chalk, of each an equal quantity; fine brick dust, one half of the quantity; and a little scraped lint: mix them all together with the whites of eggs: then, spreading this mixture upon a linnen cloth, apply it to the cracks of the glass, which must be well dried before you put it to the fire.

Old varnish is another *cæment* which will answer the same purpose; for by gluing the pieces together therewith, and setting them to dry in the sun, or a warm place, they will hold very well. *Smith's* Laboratory, p. 171.

For the manner of preparing a *cæment* to bind together the various embellishments of grottos, see the article GROTTO, *Append.*

CAINITO, in botany, a name given by Plumier to a genus of plants described by Linnæus under that of *chrysophyllum*. See the article CHRYSOPHYLLUM, *Append.*

CALABASH, in botany, a name used by some for the *melopepo* of authors. See the article MELOPEPO, *Suppl.*

CALABASH-*tree*, the name of a genus of plants called by Plumier *cujete*, and described by Linnæus under that of *crescentia*. See the article CRESCENTIA, *Suppl.*

CALAMINT (*Suppl.*) — *Water*-CALAMINT, in botany, a name given by some to several species of mint. See the article MENTHA, *Suppl.*

CALCITRAPA is made by Vaillant a distinct genus of plants, but ranked by Linnæus among the *centauria*. See the article CENTAURIA, *Append.*

CALCITAPRA is a name by which some call a species of *cnicus*. See the article CNICUS.

CALCITRAPA is also used as the name of several species of our common thistle. See the article THISTLE, *Suppl.*

CALCITRAPOIDES, a distinct genus of plants, according to Vaillant, but comprehended among the *centauria* by Linnæus. See the article CENTAURIA, *Append.*

CALF (*Suppl.*) — *Sea*-CALF, the Engliſh name of a genus of animals called by authors *phoca*. See the article PHOCA, *Suppl.*

CALF's *ſnout*, in botany, an Engliſh name for the *antirrhinum* of authors, otherwiſe called *ſnap-dragon*. See the article SNAP-DRAGON, *Suppl.*

CALKING, among painters, the ſame with calquing. See the article CALQUING, *Cycl.*

CALL, a name given by the miners in many parts of the kingdom to the red *telaugium*, variegated with black and white. See the article TELAUGIUM, *Append.*

CALLITRICHUM, καλλιτριχον. See the article ADIANTUM, *Suppl.*

CAMEA, in natural hiſtory, the ſame with *camæa*, a genus of ſemipellucid gems. See the article CAMÆA, *Suppl.*

CAMEHUIA, in natural hiſtory, the ſame with what is called *camaieu* in the *Supplement*. See the article CAMAIEU, *Suppl.*

CAMPANULA *lychnidea*, the name by which J. Bauhine calls a ſpecies of the *convolvulus*, or bind-weed. See the article CONVOLVULUS, *Suppl.*

CAMMOCK, in botany, a name given by ſome to the *anonis*, or reſt harrow. See the article REST-HARROW, *Suppl.*

CAMOMILE, CHAMOMILE, or *Chamemile*, in botany, the Engliſh name of a genus of plants called by authors *chamæmelum*. See the article CHAMÆMELUM, *Suppl.*

CAMP (*Suppl.*)—Where the grounds are equally dry, thoſe *camps* are always moſt healthful which are pitched on the banks of large rivers; becauſe in the hot ſeaſon ſituations of this kind have a ſtream of freſh air from the water, ſerving to carry off the moiſt and putrid exhalations. On the other hand, next to marſhes, the worſt encampments are on low grounds cloſe beſet with trees: for then the air is not only moiſt and hurtful in itſelf, but, by ſtagnating, becomes more ſuſceptible of corruption. However, let the ſituation be ever ſo good, *camps* are frequently rendered infectious by the putrid effluvia of rotten ſtraw, and the privies of the army; more eſpecially if the bloody flux prevails, in which caſe the beſt method of preventing a general infection is to leave the ground with the privies, foul ſtraw, and other filth of the *camp* behind. This is to be frequently done, if conſiſtent with the military operations; but when theſe render it improper to change the ground often, the privies ſhould be made deeper than uſual, and once a day a thick layer of earth thrown into them till the pits are near full, and then they are to be well covered, and ſupplied by others. It may alſo be a proper caution, to order the pits to be made either in the front or rear, as the then ſtationary winds may beſt carry off their effluvia from the *camp*. Moreover, it will be neceſſary to change the ſtraw frequently, as being not only apt to rot, but to retain the infectious ſteams of the ſick. But if freſh ſtraw cannot be procured, more care muſt be taken in airing the tents as well as the old ſtraw. See *Pringle*, Obſerv. on the Diſeaſes of the army, p. 99, 103, &c.

CAMP-*diſeaſes*. See the article SOLDIER, *Append.*

CAMP-*fever*. See the article BILIOUS *fever*.

CAMP-*hoſpital*. See the article HOSPITAL.

CAMPAIGN (*Cycl.*)—The beginning of every *campaign* is conſiderably more unhealthy than if the men were to remain in quarters. After the firſt fortnight or three week's encampment, the ſickneſs decreaſes daily; the moſt infirm being by that time in the hoſpitals, the reſt more hardened, and the weather growing daily warmer. This healthy ſtate continues throughout the ſummer, unleſs the men get wet cloaths or wet beds; in which caſe a greater or leſſer degree of the dyſentery will appear, in proportion to the preceding heats. But the moſt ſickly part of the *campaign* begins about the middle or end of Auguſt, whilſt the days are ſtill hot but the nights cool and damp, with fogs and dews: then, if not ſooner, the dyſentery prevails; and though its violence is over by the beginning of October, yet the remitting fever gaining ground, continues throughout the reſt of the *campaign*, and never entirely ceaſes even in winter-quarters till the froſts begin.

At the beginning of a *campaign* the ſickneſs is ſo uniform, that the number may be nearly prædicted; but, for the reſt of the ſeaſon, as the diſeaſes are then of a contagious nature, and depend ſo much upon the heats of ſummer, it is impoſſible to foreſee how many may fall ſick from the beginning to the end of autumn. It is alſo obſerved, that the laſt fortnight of a *campaign*, if protracted till the beginning of November, is attended with more ſickneſs than the firſt two months of the encampment: ſo that it is better to take the field a fortnight ſooner, in order to return into winter-quarters ſo much the earlier.

As to winter-expeditions, though ſevere in appearance, they are attended with little ſickneſs, if the men have ſtrong ſhoes, quarters, fuel, and proviſions.

Long marches in ſummer are not without danger, unleſs made in the night, or ſo early in the morning as to be over before the heat of the day. See *Pringle*, Obſerv. on the Diſeaſes of the army, p. 118, *ſeq.*

CAMPHOR-*tree*, in botany, the name of a ſpecies of *laurus*, according to Linnæus, with oval gloſſy leaves on lax pedicles. See the article LAURUS, *Append.* It is a native of many parts of the Eaſt: Breynius calls it *arbor camphorifera Japonica foliis laurinis*, &c.

The *camphor* of the ſhops is prepared from the wood of this tree by a coarſe kind of ſublimation. See the article CAMPHOR, *Cycl.* and *Suppl.*

CAMPION, in botany, the Engliſh name of a genus of plants called by authors *lychnis*. See the article LYCHNIS, *Suppl.*

CANARY. See *Colouring of* MARBLE.

CANARY-*graſs*, in botany. See the article GRASS, *Append.*

CANCER, the crab, in zoology, the name of a genus of *ſquillæ*. See the article SQUILLA, *infra*.

CANDLE-*berry-tree*, a name uſed by ſome for the *myrica* of authors. See the article MYRICA, *Append.*

CANDY-*carrot*, in botany, a name uſed by ſome for the *myrrhis* of Candia. See the article MYRRHIS, *Suppl.*

CANDY-*tuft-tree*, in botany, a name given to the *thlaſpi* of authors. See the article THLASPI, *Suppl.*

CANE (*Suppl.*) — *Bambo* or *bamboo* CANE. See the articles BAMBO and ARUNDO, *Suppl.*

Dumb CANE, in botany, a name given by ſome writers to the *arum*. See the article ARUM, *Suppl.*

Fiſhing-rod-CANE, the name of a ſpecies of *arundo*, or reed. See the article ARUNDO, *Suppl.*

Indian flowering CANE, in botany, the name of a genus of plants called by Linnæus and Tournefort *canna* and *cannacorus*. Se the articles CANNA and CANNACORUS, *Suppl.*

Sugar-CANE, in botany, the Engliſh name of a genus of plants called by Linnæus *ſaccharum*. See the article SACCHARUM, *Suppl.* and SUGAR, *Cycl.*

CANNABINA, baſtard-hemp, in botany, the name of a diſtinct genus of plants, the characters of which are theſe: the flower is apetalous, conſiſting of a number of ſtamina, and is barren, the ſeed being produced on diſtinct female plants of the ſame genus, which have no viſible flower. The ſeeds are triangular, oblong, and contained in membranous capſules.

The ſpecies of *cannabina* enumerated by M. Tournefort, are theſe: 1. The Cretic male *cannabina*, with flowers. 2. The Cretic fruit-bearing or female *cannabina*. Vide *Tourn.* Inſt. Bot. Coroll. p. 52.

CANTERBURY-*bell*, in botany, a name given by ſome to the *campanula* of authors. See the article CAMPANULA, *Suppl.*

CANTHARIS, the glow-worm, in the hiſtory of inſects. See the article GLOW-*worm*, *Suppl.*

CANTHARUS *unctuoſus*, a name by which ſome authors call the *meloe*, or oil-beetle. See the article MELOE, *Append.*

CANUTI *avis*, the name by which ſome call a ſpecies of *tringa*. See the article TRINGA, *Suppl.*

CAP (*Suppl.*)—*Black* CAP, the name uſed by the common people in many parts of the kingdom for the pewit, a bird of the *larus* or ſea-gull kind. See the article PEWIT. *Suppl.*

CAPER (*Suppl.*)— *Bean* CAPER, a name given by ſome to the *fabago* of authors. See the article FABAGO, *Suppl.*

CAPILLUS *veneris*. See the article ADIANTUM.

CAPILLUS *terræ*. See the article ADIANTUM.

CAPITALIS *reflexa*, in ſurgery, a kind of bandage called by the French *capeline*. See the article CAPELINE, *Suppl.*

CAPITO *anodromus*, a name by which ſome authors have called the *zerta* or *zerte*, a fiſh living partly in large rivers and partly in the ſea, and in ſome degree reſembling the common river chubb in ſhape. *Geſner*, de Piſc. p. 1269. See the article ZERTA, *Suppl.*

CAPNIAS, or *capnitis*, in natural hiſtory, names uſed by the antients for the pale bluiſh jaſper with black veins and clouds. See the article JASPER, *Append.*

CAPNORCHIS, the Indian bulbous-rooted fumitory, in botany, the name of a ſpecies of fumitory. See the article FUMARIA, *Suppl.*

CAPON's *tail graſs*, in botany, the Engliſh name of a genus of plants called by authors *feſtuca*. See the article FESTUCA, *Suppl.*

CAPRA, in ornithology, the name by which ſome call the *capella*, or lapwing. See the article CAPELLA, *Suppl.*

CAPREA, a name uſed by Pliny for the roe-deer, a creature not in the leaſt allied to the goat kind. See the article CAPREOLUS, *Suppl.*

CAPRICORNUS, in zoology, the name of a ſpecies of *mordella*, a genus of four-winged flies. See the article MORDELLA, *Append.*

CARABUS, in zoology, the name of a genus of four-winged flies, whoſe antennæ are oblong, ſlender, and ſetaceous; the thorax is ſomewhat convex, marginated, of a cordated figure, and truncated in the hinder part. Vide *Hill*, Hiſt. Animal. p. 47.

CARASSIUS, a name given by ſome to a ſpecies of *cyprinus*, with twenty bones in the back fin, and the ſide line ſtrait. See CYPRINUS, *Suppl.*

CARATAS, in botany. See the article KARATAS, *Append.*

CARAWAY, or CARRAWAY, in botany, the Engliſh name of a genus of plants called by authors *carui*. See the article CARUI, *Suppl.*

CARBO *aquaticus*, a name uſed by Geſner for the cormorant. See the article CORMORANT, *infra*.

CARDIA,

CARDIA, a name given by Dr. Hill to the heart-shells. See the article HEART-*shell*, *Suppl.*

CARDINAL'S *flower*, in botany, a name used by some for the *rapuntium* of authors. See the article RAPUNTIUM, *Suppl.*

CARIQUEIBEIU, in zoology. See the article JIYA.

CARLOCK, a name used by some for the *raphanistrum* of authors. See the article RHAPHANISTRUM, *Suppl.*

CARNATION, in botany, a name given to several species of the *caryophyllus*, or pink, see the article PINK, *Suppl.*

Spanish CARNATION, a name given by some writers to the *poinciana*. See the article POINCIANA, *Suppl.*

CAROB-*tree*, the English name of the *siliqua* of Tournefort and the *ceratonia* of Linnæus. See the article SILIQUA, *Suppl.*

Candy-CARROT, a name given by some to the *myrrhis*. See the article MYRRHIS, *Suppl.*

Deadly, or *scorching* CARROT, in botany, a name given to the *thapsia* of authors. See the article THAPSIA, *Suppl.*

Mountain CARROT, a name sometimes given to a species of *fennel*. See the article FOENICULUM, *Suppl.*

CASSIA, in the Linnæan system of botany is made to comprehend both the *cassia* and *sena* of Tournefort. See the articles CASSIA and SENA, *Suppl.*

CASSIDA, in zoology, the name given by Dr. Hill to a genus of beetles, called in English the tortoise-beetles. See the article SCARABÆUS, *Suppl.*

Under this genus are comprehended all the clypeated beetles, or those covered with a hard crust, of which there are a great many species.

CASSIDONY, in botany, a name given by some to the *stoechas* of authors. See the articles STOECHAS, *Append.*

Mountain CASSIDONY, or *Golden* CASSIDONY, names used for the *gnaphalium* of authors. See the article GNAPHALIUM, *Suppl.*

CASSINE, the cassioberry-tree, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a decompound umbel; the perianthium is very small, thick at the base, divided into five parts, obtuse and permanent; the flower consists of a single petal, divided into five suboval, obtuse, patent segments, larger than the cup; the stamina are five subulated patent filaments, shorter than the flower; the antheræ are simple; the germen of the pistil is conic; there is no style; the stigmata are three, reflex and obtuse: the fruit is a roundish berry, with three cells; the seeds are single and oval.

The *maurocenia* is nearly allied to this genus, which Dillenius makes a species of *phyllerea*. Vide *Linnæi* Gen. Plant. p. 126.

CASSIOBERRY *tree*, in botany, the name of a genus of plants called by Linnæus *Cassine*. See the article CASSINE, *supra*.

CASSUMNIAR, in the materia medica, a root approaching to the nature of zeodary, though belonging to a different species of plants.

We have it from the East Indies; its surface is somewhat wrinkled, and is marked at certain distances with circular rings, which surround it and rise prominent above the rest of the surface. It is of a very compact nature, hard and heavy; not easily cut through with a knife, or powdered in a mortar. When cut it shews a very smooth and shining surface; and when broken, is found to be much yellower within.

It has a fragrant aromatic smell, and is a very famous medicine in nervous cases, being accounted an excellent cardiac and sudorific. It is also given as a stomachic and carminative with success, and is mostly prescribed in powder, boluses, or infusions. Vide *Hill*, Hist. Mat. Med. p. 568.

CAT, the English name of a well known domestic quadruped, of the *felis* kind. See the article FELIS, *Suppl.*

CAT-*mint*, in botany, the English name of the *cataria* of authors. See the article CATARIA, *Suppl.*

CATARACT *(Cycl.* and *Suppl.)* — Though it be, generally speaking, true, that the cause of *cataracts* is the opacity of the crystalline humor, yet it is certain that a real membrane covering the pupil, has been sometimes, though rarely, found. See Mem. Acad. Scienc. 1708. and Dr. *Mead's* Monit. & Pract. Medic. cap. xi.

CATERPILLAR *(Suppl.)*—*Connaught* CATERPILLAR, a kind of caterpillar found in Ireland. See the article WORM, *Suppl.*

CATERPILLAR-*plant*, in botany, a name given to the *scorpioides* of Tournefort. See the article SCORPIOIDES, *Suppl.*

CATERPILLAR-*shell*, the English name of a species of *turbo*. See the article TURBO, *Suppl.*

CAUDA *marina*, in botany, the name used by Dodonæus for the *myosurus* of botanical writers. See the article MYOSURUS, *Append.*

Dead CAVES }
Live CAVES } See the article LIVE *caves*, *Suppl.*

CEDAR *(Suppl.)*—*Bastard* CEDAR, a name given to the *guazuma*, or *theobroma*, of authors. See the article THEOBROMA, *Suppl.*

Bermudas CEDAR, a name given to a species of juniper. See the article JUNIPER, *Suppl.*

CEDAR *of Lycia*, or *Phœnicia*, names given to a species of juniper. See the article JUNIPER, *Suppl.*

Virginia and Carolina CEDAR, names given to a species of juniper. See the article JUNIPER, *Suppl.*

White CEDAR, a name given to a species of cypress. See the article CUPRESSUS, *Suppl.*

CEIBA, in botany, a name given to the *xylon* of authors. See the article XYLON, *Suppl.*

CELANDINE *(Suppl.)* *Lesser* CELANDINE, in botany, the name of a genus of plants called by authors *ranunculus*. See the article RANUNCULUS, *Suppl.*

CELASTRUS, in botany, the name of a genus of trees, called also *euonymoides*, and in English, the African spindle-tree.

The characters are these: the cup is a very small plane perianthium, formed of one leaf, divided into five unequal obtuse segments: the flower consists of five equal, oval, patent, sessile petals, with their tops turned back; the stamina are five subulated filaments, of the length of the flowers; the antheræ are very small, the germen of the pistil is also very small, and is immersed in a large plane receptacle marked with ten striæ; the style is subulated and shorter than the stamina; the stigma is obtuse and trifid; the fruit is a coloured oval capsule, obtusely trigonal, gibbous, formed of three valves, and containing three cells, in each of which are some oval coloured seeds, smooth and half covered by a calyptra, which is also coloured, and has an unequal rim divided into four parts. *Linnæi* Gen. Plant. p. 88.

There is a species with a triple stigma, and no style.

CELLS *of plants*, *Cellæ plantarum*, those partitions or hollow places in the husks or pods of plants, in which the seeds are lodged. *Miller*, Gard. Dict.

CENTAURIA, in the Linnæan system of botany, the name of a large genus of plants, comprehending the *centaurium majus*, *jacea*, and *cyanus* of Tournefort and others; the *calcitrapa*, *calcitrapoides*, *rhaponticum*, *rhaponticoides*, *amberboi*, and *crocodilium* of Vaillant.

The characteristics of this genus are these: the cup is imbricated with squamæ; the stamina are five extremely short capillary filaments; there is no stigma, nor pericarpium; the receptacle is setose.

As to the distinctions of the above genera, as they are called, they are these: the cup of the *calcitrapa* is armed with single spines, which are large and erect; and the seeds either naked or coronated: the cup of the *calcitrapoides* has small clustered spines: the cup of the *rhaponticum* is formed of lax undivided membranes: and in the *rhaponticoides*, of lanceolated and acuminated squamæ: in the *amberboi*, the squamæ of the cup are obtuse and simple: in the *jacea* the squamæ are ciliated: in the *cyanus* they are likewise ciliated, but shorter; and, lastly, the squamæ in the *crocodilium* are aculeated, and the seed downy and plumose. Vide *Linnæi* Gener. Plant. p. 417.

CENTAURIUM *majus*. This is made a distinct genus of plants by Tournefort, but comprehended along with several others under that of *centauria* by Linnæus. See the article CENTAURIA, *supra*.

CENTAURY, in botany. See the article CENTAURIUM, *Suppl.*

CENTIPED *worm*, a term used for such worms as have a great many feet, tho' the number does not amount to an hundred, as the word seems to import. See the article SCOLOPENDRA, *Suppl.*

Mr. Maloet relates the history of a man, who for three years had a violent pain at the lower part of the forehead, near the root of the nose; at length he felt an itching, and afterwards something moving within his nostril, which he brought away with his finger; it was a worm of the *centiped* kind, an inch and an half long, which run swiftly. It lived five or six days among tobacco. The patient was free of his pain ever after. Mr. Littre mentioned a like case in 1708, of a larger *centiped* voided at the nose, after it had thrown the woman, in whose frontal sinus it was, into convulsions, and had almost taken away her reason. Hist. Acad. Scienc. 1733.

CENTRONIA, in ichthyology, the name by which Dr. Hill calls the *echini marini*, or *echinodermata*, called in English sea-hedge-hogs. See the article ECHINODERMA, *Suppl.*

The doctor makes them a distinct series of animals, living under the defence of shelly coverings, formed of one piece, and furnished with a vast number of spines, moveable at the creature's pleasure.

Of the *centronia*, or sea-hedge-hog, we have the following species: 1. The roundish *centronia*, with small papillæ: this is a considerably large species; the colour of the whole shell being of a dusky red, and the spines only a third of an inch long. 2. The roundish *centronia*, with very large square spines. 3. The roundish *centronia*, with very large rounded spines. 4. The roundish bluish *centronia*, with differently shaped spines. 5. The depressed cordated *centronia*, with capillaceous spines. 6. The depressed flat *centronia*, with a digitated edge. 7. The depressed plane *centronia*, with five perforations on the disk. 8. The depressed *centronia*, with two perforations near the edge. 9. The flat biperforate *centronia*, with a digitated edge. 10. The oval depressed *centronia*, with an undulated edge and six perforations. 11. The roundish *centronia*, with crooked and fasciculated spines, called in English the sea-apple. 12. The globose *centronia*, with needle-like spines, and thence called the needle-shell.

The other species of *centronia* are very numerous, but may be all comprehended under the following divisions. 1. The

roundish, or subglobose kind, called by Klein *cidares*. See the article TURBAN-*shell*, *Suppl.*

2. The cordated kinds, called by Klein *spatangi* and *spatagides*. See the articles SPATANGI and SPATAGOIDES, *Suppl.*

3. The flat kinds, called by Klein *placentæ*. See the article PLACENTA, *Suppl.*

Klein, who has been at much pains to arrange these bodies, has divided them into a number of other genera; but they may be all ranked under one or other of these divisions. But beside the known recent species, we meet with several others, fossile, of a very singular figure; for which see the articles ECHINITES and ECHINI *fossiles*, *Suppl.*

CEPA *Ascalonica*, the same with eschalot, vulgarly called *shallot*. See ONION, *Suppl.*

CEPHALANTHUS, in the Linnæan system of botany, the name of a genus of trees, the characters of which are these: the cup consists of a common perianthium, which contains several flowers collected into a kind of head; and of a proper perianthium, which is erect, permanent, and divided into four segments; the flower consists of a single petal; the tube is slender; the limb is divided into four parts, acute, reflex, and of the length of the tube; the stamina are four filaments, inserted into the flower, and shorter than its limbs; the antheræ are simple; the germen of the pistil is placed within the flower; the style and stigma are both simple; the fruit is an oblong capsule, containing only one cell, several of these grow together, and form a roundish head; the seeds are numerous and oblong; the flower has its limb sometimes divided into five segments, instead of four; and then the proper perianthium has also five segments, and there are five stamina.

This genus comprehends the *platanocephalus* of Vaillant, and the *valerianoides* of Petiver. Vid. *Linnæi* Gen. Plant. p. 38.

CERAMBYX, a name given by some authors to the *capricorn-beetle*. See CAPRICORN *beetle*, *Suppl.*

CERATONIA, in botany, the name under which Linnæus describes the *siliqua* of Tournefort. See SILIQUA, *Suppl.*

CERCARIA, in zoology, a class of animalcules lately established by Dr. Hill, and containing all those with visible tails and no limbs. See the article ANIMALCULE, *Append.*

CERCIS, in the Linnæan system of botany, the name of a distinct genus of plants, called by Tournefort *siliquastrum*. See the article SILIQUASTRUM, *Suppl.*

CERNUA, in zoology, a name used by Gaza for the *orpheus*, a species of *sparus*. See the article ORPHEUS, *Suppl.*

CESSAMPELUS, a name by which many call the hoary branched species of *convolvulus*. See the article CONVOLVULUS, *Suppl.*

CESTRUM, in the Linnæan system of botany, the name of a genus of plants, called by other botanists *jasminoidis species* and *hediunda*.

The characters are these: the cup is a small, cylindric, obtuse, perianthium, formed of a single leaf, which is divided into five segments at the rim, erect, and obscure; the flower consists of a single infundibuliform petal; the tube is cylindric, very long and slender, the opening being roundish and the limb plicated, and formed into five equal oval segments; the stamina are five thread-like filaments, adhering longitudinally to the tube, only sending out a little denticle in the middle, which stands inward; the antheræ are roundish, but somewhat tetragonal, and stand within the opening of the petal; the germen of the pistil is of a cylindric, but somewhat oval form, of the length of the cup; the style is filiform, and of the length of the stamina; the stigma is thick, obtuse, and slightly emarginated; the fruit is an oval oblong berry, containing only one cell; in which are numerous and roundish seeds. *Linnæi* Gen. Plant. p. 82.

CHACE (*Cycl.*)—*Wild goose* CHACE, a term used to express a sort of racing on horseback, used formerly, which resembled the flying of wild geese, those birds generally going a train one after another, not in confused flocks as other fowls do. In this sort of race the two horses after running twelve score yards had liberty, which horse soever could get the leading, to ride what ground the jockey pleased, the hindmost horse being bound to follow him within a certain distance agreed on by articles, or else to be whipped in by the tryers and judges who rode by; and which ever horse could distance the other, won the race. This sort of racing was not long in common use, for it was found inhuman and destructive to good horses when two such horses were matched together. For in this case neither was able to distance the other 'till they were both ready to sink under their riders, and often two very good horses were both spoiled, and the wagers forced to be drawn at last. The mischief of this sort of racing soon brought in the method now in use, of running only a certain quantity of ground, and determining the plate or wager, by the coming in first at the post.

CHÆTIA, in zoology, the name of a genus of insects of the *apteria* kind, without any visible limbs. See INSECT, *Append.*

The *chætia* resembles a hair, or a piece of fine thread; its surface is smooth, its body rounded, and very slender in proportion to its length. It is called in English the *hair-worm*, or *guinea-worm*. *Hill's* Hist. of Anim. p. 14. See the article WORM, *Suppl.*

CHAFFER, in zoology, the English name of a species of beetle. See the article SCARABÆUS, *Suppl.*

CHAFFINCH, in ornithology, a bird of the *fringilla* kind, with a ferrugineous breast, and the wings black, spotted with white. See the article FRINGILLA, *Suppl.*

CHALICE-*shell*, or CUP-*shell*. See SHELL, *infra.*

CHALK (*Suppl.*)—*Silver* CHALK, *argentaria creta*, the English name of a kind of earth, not *chalk*. See the article ARGENTARIA *creta*, *Suppl.*

CHAMÆCRISTA, in botany, the name given by Rivinus to the *cassia* of other botanists. See the article CASSIA, *Suppl.*

CHAMÆMILE, in botany, a name given to the *chamæmelum* of authors. See the article CHAMÆMELUM, *Suppl.*

CHAMÆMORUS, in botany, the name of a genus of plants, the characters of which are these: the flower consists of five leaves; the fruit is composed of many acini, in form of the mulberry.

There is only one species of this plant known, which grows on the tops of the highest hills in the north part of England, but cannot be cultivated in a garden by any art. Vid. *Miller's* Gard. Dict. in voc.

CHAMBER (*Cycl.*)—As to the proportions of *chambers*, their length should be to the breadth as $1\frac{1}{2}$ to 1, or some small matter less, but ought never to exceed that proportion; and as for the height, it should be three fourths of the breadth. The height of the *chambers* of the second story, should be a twelfth part less than the height of those below: thus, if the height of the first story be sixteen feet, that of the second will be fourteen feet eight inches. As to the height of the third story, it should be only three fourths of the second.

In building bed-*chambers*, regard should be had as well to the situation of the bed, as to that of the chimney. For which reason, the chimney ought not to be placed just in the middle, but distant from it about two feet, or two and an half, in order to make room for the bed, which prevents this inequality from being discerned. Build. Dict. in voc.

CHAR, in ichthyology. See the article CHARRE, *Suppl.*

CHARVIL, or CHERVIL, in botany. See the article CHERVIL, *Suppl.*

CHEESE-*runnet*, in botany, a name used by some for the *gallium* of authors. See the article GALLIUM, *Suppl.*

CHEMICAL *glasses*, how cæmented, when cracked: see the article CÆMENT, *Append.*

CHERMES, in the history of insects, a genus of the four-winged flies, the rostrum of which is situate under the breast, and the lateral legs formed for leaping.

This genus comprehends the alder-bug, the fir-tree-bug, the grass-bug, and elm-tree-bug; together with those of the birch, maple, willow, ash, nettle, apple-tree, poplar, &c. *Hill's* Hist. of Anim. p. 64.

CHERRY-*tree*, in botany, the English name of a distinct genus of plants, called by authors *cerasus*. See the article CERASUS, *Suppl.*

Barbadoes-CHERRY, or *cowhedge*-CHERRY, names given by some to the *malpighia* of authors. See the article MALPIGHIA, *Suppl.*

Bay-CHERRY, *Bird*-CHERRY, *Laurel*-CHERRY, &c. names used by some for a genus of plants, called by authors *padus*. See the article PADUS, *Append.*

Cornelian-CHERRY, a name given by some to the *cornus*, or cornel-tree, of others. See the article CORNUS, *Suppl.*

Winter-CHERRY, a name used by some for the *alkekengi* and *solanum* of others. See the articles ALKEKENGI and SOLANUM, *Suppl.*

CHERVIL (*Suppl.*) — *Wild*-CHERVIL, in botany, a name given to the *myrrhis* of authors. See the article MYRRHIS, *Suppl.*

CHESNUT-*tree*, the English name of a genus of plants, called by authors *castanea*. See the article CASTANEA, *Suppl.*

It is pity *chesnut*-plantations are not more common. They quickly grow up, and are not only pleasing to the eye, but their flowers prove no less agreeable to the smell, and even the taste will be gratified in time. Another considerable use of these plantations, is to defend those of other trees from the injuries of cold and frost, which they do to admiration.

Next to oak-timber, that of *chesnuts* is most coveted by carpenters and joiners. It likewise makes the best stakes, vine-props, and hop poles; and is extremely proper for mill-timber, and water-works, or wherever it may lie buried.

Chesnut-timber is also proper for columns, tables, chests, chairs, stools, bedsteads, and wine-casks; giving the liquor the least tincture of any wood whatsoever, and is exceeding durable, if dipped in scalding oil, or well pitched. Build. Diction. in voc.

Horse-CHESNUT, in botany. See HIPPOCASTANUM, *Suppl.*

Scarlet-horse-CHESNUT, a name given by some to the *pavia* of authors. See the article PAVIA, *Suppl.*

CHIAN *marble*. See the article CHIUM *marmor*, *Suppl.*

CHIARO *scuro*, among painters. See CLAIR *obscure*, *Cycl.*

CHICHES, a name given to the *cicer*, or chich-pea. See the article CICER, *Suppl.*

CHICK-*weed* (*Suppl.*)—*Berry bearing* CHICK-*weed*, in botany, a name given to the *cucubalus*. See the article CUCUBALUS, *Suppl.*

CHICKLING-*pea*, a name used by some for the *lathyrus* of authors. See the article LATHYRUS, *Suppl.*

Cements for broken CHINA-ware. See CÆMENT, *Append.*

CHIONANTHUS, the *snow-drop-tree*, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: the cup is a one-leaved perianthium, divided into four segments at the edge, erect, acuminated, and permanent; the flower consists of a single petal, and is divided into four parts; the tube is very short and patulous; the limb is divided into four extremely long segments, which are erect, acute, of a linear figure, and somewhat uneven; the stamina are two very short filaments, of a subulated figure, and are inserted into the tube; the antheræ are cordated and erect; the germen of the pistil is of an oval figure; the style is simple and of the length of the cup; the stigma is obtuse and trifid; the fruit is a round berry, containing only one cell, in which is included a single striated osicle. *Linnæi* Gen. Plant. p. 8.

This genus is allied to the *nyctanthes*, *syringa*, *olea*, *ligustrum*, *phillyrea*, and *jasmine*, but, most of all, to the flower bearing *fraxinus*. There is only one known species of it.

CHIVES, a name given to a species of onion. See the article ONION, *Suppl.*

CHIVES is also a name given to the stamina of plants. See STAMINA, *Suppl.*

CHLOREUS, a name given to a bird of the thrush kind, otherwise called *galbula*. See GALBULA.

CHOCOLATE-*tree*, in botany. See the article CACAO, *Suppl.*

CHOUGH, *coracias*, a bird of the corvus kind, no where so frequent with us as in Cornwall, and thence called the *cornish chough*. See the article CORACIAS, *Suppl.*

CHRENECRUDA, a term occurring in writers of the middle age, and expressing a custom of those times, but its signification is doubtful. It is mentioned in *Lege Salica*, Tit. 61. which says, he who kills a man, and hath not wherewithal to satisfy the law, or pay the fine, makes oath that he has delivered up every thing he was possessed of; the truth of which must be confirmed by the oaths of twelve other persons. Then he invites his next relations by the father's side to pay off the remainder of the fine, having first made over to them all his effects by the following ceremony. He goes into his house, and taking in his hand a small quantity of dust from each of the four corners, he returns to the door, and with his face inward throws the dust with his left hand over his shoulders upon his nearest of kin. Which done, he strips to his shirt; and coming out with a pole in his hand, jumps over the hedge. His relations, whether one or several, are upon this obliged to pay off the composition for the murder. And if these (or any one of them) are not able to pay, *iterum super illum chrenecruda qui pauperior est, jactat, & ille totam legem componat.* Whence it appears, that *chrenecruda jactare*, is the same with throwing the dust, gathered from the four corners of the house. Goldastus and Spelman translate it *viridem herbam*, green grass, from the German *gruen kraut*, or from the Dutch *groen*, green, and *gruid*, grass. Wendelinus is of a contrary opinion, who thinks that by this word *denotari purificationis approbationem*, from *chrein*, pure, chaste, clean; and *keuren*, to prove: so that it must refer to the oaths of the twelve jurors. Be this as it will, king Childebert reformed this law by a decree, chap. 15. both because it favoured of pagan ceremonies, and by reason several persons were thereby obliged to make over all their effects: *De crenecruda lex quam paganorum tempore observabant, deinceps nunquam valeat, quia per ipsam cecidit multorum potestas. Du Cange*, Gloss. Lat.

CHRISTMAS-*rose*, in botany, the name used by some for a species of black *hellebore*. See the article HELLEBORUS, *Suppl.*

CHRISTOPHER-*herb*. See the article CHRISTOPHORIANA, *Suppl.*

CHROASTACES, in natural history, a genus of pellucid gems, comprehending all those of variable colours, as viewed in different lights.

Of this kind are the *opal* and the *asteria*, or *oculus cati*. See the articles OPAL and ASTERIA, *Suppl.*

CHRONOMETER, a term used by some for a kind of clock, or machine, so contrived as to measure a small part of time very exactly, even to the sixteenth part of a second.

We have a description of one of these, made by the ingenious Mr. George Graham, in *Desaguliers*, Experim. Philos. vol. I. p. 375.

A *chronometer* is of great use for measuring small parts of time in astronomical observations, the time of the fall of bodies, the velocity of running waters, &c. But long spaces of time cannot be measured by it with sufficient exactness, unless its pendulum be made to vibrate in a cycloid; because, otherwise, it is liable to err considerably, as all clocks are which have short pendulums that swing large arcs of a circle. Id. ibid. p. 376.

CHROSTASIMA, in natural history, the name used by Dr. Hill for all pellucid gems, which have one simple and permanent appearance in all lights.

Of this kind are the diamond, the carbuncle, the amethyst, the sapphire, the beryl, the emerald, and the topaz. See the articles DIAMOND, CARBUNCLE, &c. *Suppl.*

CHRYSALIS, in natural history, the name of that state otherwise called *aurelia*, in which butterflies and several other animals pass the time between their caterpillar or other creeping state, and their winged one.

In this state no creatures afford so beautiful a variety as the butterfly kinds; and they all pass thro' this middle state, without one exception.

The figure of the *aurelia* or *chrysalis*, generally approaches to that of a cone, or at least the hinder part of it is of this shape; and the creature, while in this state, seems to have neither legs nor wings, nor has any power of walking. It seems, indeed, to have hardly so much as life, and to be reduced to a very imperfectly organized mass of matter. It takes in no nourishment in this state, nor has it any organs for the taking any; and indeed its posterior part is all that seems animated, this having a power of giving itself some motions. The external covering of the *chrysalis* is cartilaginous and considerably large, and is usually smooth and glossy; but some few of them have a few hairs, some are also as hairy as the caterpillars from which they are produced, and others are rough, or, as it were, chagreened all over.

In all of these there may be distinguished two sides; the one of which is the back, the other the belly of the animal; and on the anterior part of the latter, there may always be distinguished certain little elevations running in ridges and resembling the fillets wound about mummies. The part whence these have their origin, is esteemed the head of the animal; the other side or back is smooth, and is of a rounded figure in most of the *chrysalises*; but some have ridges on the anterior part and sides of this part; and these usually terminate in a point, and make an angular appearance on the *chrysalis*.

From this difference is drawn the first general distinction of these bodies. They are by this divided into two classes; the round and the angular kinds. The first kind are by the French naturalists called also *feves*, from the common custom of calling the *chrysalis* of the silk worm, which is round, by this name.

There is something more regular in this distinction also than might be at first conceived; for the division is continued from the fly state: the rounded *chrysalises* being almost all produced by the phalenæ or moths; and the angular ones by the papilios or day-flies. There are several subordinate distinctions of these kinds, but in general they are less different from one another than the caterpillars from whence they are produced.

The head of those of the first class, usually terminates itself by two angular parts, which stand separate one from the other, and resemble a pair of horns. In some these horns are bent into the form of crescents, and turned one towards the other. The elm caterpillar, called the *bedaude*, is one that furnishes a *chrysalis* of this kind; other *chrysalises* have only one such horn, instead of two. These horns always give a remarkable figure in their extension along the belly of the *chrysalis*; and when the bark is examined, there is a very remarkable appearance from the lines which run there, the figure often resembling, very exactly, a human face, or a masque of some kind: there is an eminence in the middle of the back, which represents a nose as well as an engraver could have fashioned it; and there are always a number of other marks and eminences, which imagination may form into eyes, chin, and the other parts of a face; and often the resemblance is so perfect as to surprize the observer.

There are a great variety, and a great deal of beauty in the figures and arrangement of the eminences and spots on the other parts of the body of the *chrysalis* of different kinds; some have an arrangement of elegant figures all along one side, and seeming to be a sort of prickles propagated from every ring of the body; and others have a second arrangement of these sort of spines, which begin about the end of the figure of the human face, and run quite to the extremity. The *chrysalises* that are thus furnished, appear actually prickly; and there are some others which have only a few of these prickles on every part; but these have usually two protuberances on their sides, which have the appearance of the fins of fishes. These and the like varieties in marks and figure, give very plain means of dividing the *aurelia* of the several classes into a number of distinct genera.

It is a general observation, that those *chrysalises* which are terminated by a single horn, afford day-butterflies of the kind of those which have buttoned antennæ, and whose wings, in a state of rest, cover the under part of the body, and which use all their six legs in walking, those of many other kinds using only four of them. Those *chrysalises*, which are terminated by two angular bodies, and which are covered with a great number of spines, and have the figure of a human face on their back in the greatest perfection, afford butterflies of the day kind and of that class, the characters of which are, their walking on four legs and using the other two, that is, the anterior pair, in the manner of arms or hands. The

chryſaliſes which have two angular bodies on their heads, but ſhorter than thoſe of the preceding, and whoſe back ſhews but a faint ſketch of the human face, and which have fewer ſpines, and thoſe leſs ſharp, always turn into that ſort of butterfly, the upper-wings of which are divided into ſegments, one of which is ſo long as to repreſent a tail, and whoſe under-wings are folded over the upper part of the back. A careful obſervation will eſtabliſh many more rules of this kind, which is not ſo perfect as to be free from all exceptions, yet are of great uſe, as they teach us in general what ſort of fly we are to expect from the *chryſalis*, of which we know not the caterpillar, and therefore can only judge from appearances.

Theſe are the principal differences of the angular *chryſaliſes*; the round ones alſo have their different marks not leſs regular than thoſe.

The greater number of the round *chryſaliſes* have the hinder part of their body of the figure of a cone; but the upper end, which ought to be its circular plane baſe, is uſually bent and rounded into a ſort of knee: this is uſually called the head of the *chryſalis*; but there are alſo ſome of this kind, the head of which is terminated by a nearly plane ſurface: ſome of the creeping ten-legged caterpillars give *chryſaliſes* of this kind, which have each of them two eminences that ſeem to bring them towards the angular kind. Some of theſe are of a long and ſlender conic figure, terminating in a ſharp point; others are more thick and ſhort, and blunter at the ends; and ſome are very ſhort, and have no part conic except the point: in ſome of the kinds alſo the rounded end or head is flatted on two ſides, and this flatneſs is continued a little way along the belly; and of the conic ones, ſome have a ſort of hollow on the back, reſembling engraved work. Some of this kind alſo are not conic, but are flatted on the belly, and only rounded on the back; and ſome of them have, as it were, a ſort of noſe that bends over the belly.

Among the angular *chryſaliſes* there are ſome whoſe colours ſeem as worthy our obſervation as the ſhapes of the others. Many of them appear ſuperbly clothed in gold: and this in the ſeveral ſpecies is of ſeveral colours; in ſome it is a pure yellow, in others a very pale whitiſh yellow, and in others a greeniſh; but in all, the gold is very bright, and appears like the burniſhed parts of gilding. It is theſe elegant ſpecies which have obtained the names of *chryſalis* and *aurelia*, which are derived from Greek and Latin words, ſignifying gold; and from theſe all other bodies of the ſame kind have been called by the ſame names, though leſs or not at all entitled to them. As ſome kinds are thus gilded all over, ſo others are ornamented with this gay appearance in a more ſparing manner, having only a few ſpots of it in different places on their back and belly. Some ſpecies alſo have ſilver in the place of gold, either extending itſelf all over them, or forming ſome particular ſpots upon their back and belly. Theſe obvious marks, however, are not to be depended upon as certain characters of diſtinction, for accidents in the formation of the *chryſalis* may alter them; and thoſe which naturally would have been gilded all over, may be ſometimes only ſo in part, and either theſe or the others may by accidents be ſo formed as to ſhew nothing of this kind at all, but be only of a duſky brown. Thoſe, however, which have neither ſilver nor gold to recommend them to our eyes, do not want other colours, and thoſe beautifully variegated. Some of them are all over of an elegant green, as is the *chryſalis* of the fennel caterpillar; others are of an elegant yellow, and ſome of a bright greeniſh tinge, variegated with ſpots of a ſhining black; we have a very beautiful inſtance of this laſt kind in the *chryſalis* of the elegant cabbage-caterpillar. The general colour of the *chryſalis* of the common butterflies, however, is brown: they are of a very elegant cheſnut colour, and vary from this into all the ſhades of brown, from the moſt deep and duſky to ſuch as are almoſt white. Some alſo are of a fine deep black, and of theſe many are ſo ſmooth and gloſſy, that they are equal to the fineſt Indian japan. The common caterpillar of the fig-tree gives an inſtance of one of theſe beautifully gloſſy ones; the caterpillar of the vine affords another of theſe fine black *chryſaliſes*.

The rounded *chryſaliſes* do not afford any thing of that variety of colouring ſo remarkably beautiful in the angular ones; they are uſually of a duſky yellow, in different ſhades, and are often variouſly ſpotted with black: but theſe, as well as all other *chryſaliſes*, before they arrive at their fixed colour, paſs through ſeveral other temporary ones, ſome being of a different colour when firſt produced from the caterpillar, from what they are a few days afterwards; and ſome varying ſo greatly, though only in degree, as not to be diſtinguiſhable by the moſt converſant eye for what they were when firſt produced. The green rough caterpillar of the cabbage has a *chryſalis* which is green at firſt, and from that gradually goes through all the ſhades of green to a faint yellow, which is its laſting colour; and one of the oak caterpillars yields a *chryſalis* beautifully ſpotted with red at its firſt appearance, but theſe ſpots change to brown for their fixed colour: the third day from their formation uſually fixes their laſting colours; and if they are obſerved to turn black in any part after this time, it is a ſign that they are dead or dying.

The ſeveral ſpecies of inſects, as a fly, a ſpider, and an ant, do not differ more evidently from one another, in regard to appearance, than do a caterpillar, its *chryſalis*, and a butterfly produced from it; yet it is certain that theſe are all the product of the ſame individual egg; and nothing is more certain than that the creature which was for a while a caterpillar, is, after a certain time, a *chryſalis*, and then a butterfly. Theſe great changes produced in ſo ſudden a manner, ſeem like the metamorphoſes recorded in the fables of the antients, and indeed it is very probable that thoſe fables firſt took their origin from theſe changes. It appears in theſe caſes, that an inſect is immediately transformed into another perfectly different inſect, and this was for a long time ſuppoſed to be really the caſe: better obſervation, however, and the more improved modern philoſophy informs us, that nature does not uſe any ſuch violent and ſudden changes in any of her operations. Malpighi and Swammerdam were the firſt who traced the animal through all its ſeveral forms, and they ſoon found that there was in reality no ſuch change as was here talked of, but that the creature remained the ſame in all: they diſſected the creature a little before the times of their ſeveral changes, and found that the whole ſuppoſed metamorphoſis was due to the firſt ſtate's being a ſort of caſe; under cover of which it was neceſſary that certain parts, hereafter to become neceſſary to the animal, ſhould arrive at their proper ſtate; and that theſe parts were very diſtinct in the body of the animal at the time that it threw off its outer coat, in order to appear in another form, in which they had a better opportunity of becoming as dry and hard as they ought to be, and to be prepared for their final appearance in the open ſtate of the flying inſect. They evidently ſaw and proved, that the butterfly was all the time alive and growing within the body of the caterpillar, and that this growth was effected by a developement of parts, as we ſee to be the caſe in all ſorts of organized bodies, in the vegetable as well as animal world: and while they threw off all the falſe marvels of the transformations and changes which the world had before believed, in regard to theſe animals, they gave matter enough of real admiration in the diſcovery of the truth itſelf.

The words transformation and metamorphoſis then are found to be falſe terms in theſe ſubjects; but as we have already explained the true ſyſtem of the whole, we may be allowed to uſe theſe ſtill, as the moſt received terms, for theſe ſudden changes.

Every animal of this kind, we find, undergoes two of theſe transformations, the one out of the caterpillar into the *chryſalis*, the other out of the *chryſalis* into the butterfly. The laſt of theſe, when properly conſidered, has nothing very wonderful in it, as we find, on an accurate inſpection, that the *chryſalis* itſelf is a butterfly, only folded over with a thin ſkin. We find in it, while yet in this ſtate, every part of a butterfly; the wings, the legs, the antennæ, and the trunk may be all traced out; but they are folded and laid together in ſuch a manner, that the creature cannot in this ſtate make any uſe of them, nor is it fit that it ſhould, as they are all of them yet too ſoft and tender for uſe, and are placed in this ſtate with no other intent, than that they may be by degrees hardened.

The back of a *chryſalis*, when nicely obſerved, ſhews us the origin of the wings; and we may count in it the number of rings of the body. It is eaſy to find that there are nine of theſe rings; there are therefore three wanting of the number that the caterpillar had: theſe are the three at the anterior end, and of theſe the third, or that moſt diſtant from the head, is in part ſeen and in part hid by a cruſt, which is not divided in an annular manner, but which takes up the place of the two firſt rings; this is uſually called the corcelet, in the *chryſalis*, becauſe it is found to lie over the corcelet of the body of the encloſed butterfly: but it is on examining the other ſide, or belly of the *chryſalis*, that we find the ſeveral parts moſt peculiar to the butterfly. This part of the *chryſalis* is always carved as it were in relief, and every figure of this work is ſome part of the animal. Two plates, larger than all the reſt, which have their origin at the corcelet, and either touch or nearly meet one another on the belly, are the elevations formed by the four wings; theſe are placed two on each ſide, and have a much ſmaller extent allowed them than they have afterwards, when the animal is at liberty to fly about. There remains a triangular ſpace between the origin of the wings and the place where they meet in a point, and this is the receptacle of the parts, of the utmoſt conſequence to the animal. In this part one may eaſily trace nine ſtreaks, running longitudinally from the top, or head part, toward the tail; theſe are the legs, antennæ, and trunk of the butterfly, which are all extended ſtrait along the belly, in this ſtate; theſe are all much ſhorter than when the animal is in its perfect ſtate; and the trunk, when the *chryſalis* belongs to a ſpecies that has one, is not rolled up into a ſpiral form, but lies at length in the middle between the antennæ and pairs of legs.

The parts being thus diſtinguiſhable in the *chryſalis*, we eaſily find the difference of the ſpecies or claſs of the fly that is to proceed from it. The naked eye ſhews whether it be one of thoſe that have, or of thoſe that have not a trunk, and the aſſiſtance of a microſcope ſhews the antennæ ſo diſtinctly, that we are able to diſcern whether it belongs to the day or night claſs; and often to what genus, if not the very ſpecies: nay, in

in the plumose horned kinds we may fee by the antennæ whether a male or female phalena is to be produced from the *chryfalis*, the horns of the female being in this ftate evidently narrower and appearing lefs elevated above the common furface of the body, than thofe of the male.

All their parts of the *chryfalis*, however, though feen very diftinctly, are laid clofe to one another, and feem to form only one mafs; each of them is covered with its own peculiar membrane in this ftate, and all are furrounded together by a common one, and it is only through thefe that we fee them, or rather we fee on thefe the figures of all the parts moulded within, and therefore it requires attention to diftinguifh them. There is however a time at which they are very eafily diftinguifhed, when the external covering is thin and tranfparent, nay when this no longer exifts, and when the others are perfectly tranfparent; and all the exterior parts may, after this ftate, be eafily feparated from one another. This however is at a time when it might be leaft expected that any thing worthy obfervation fhould appear; and therefore authors have difregarded it; it is at that time when they fay the whole is a mafs of jelly-like matter that this is to be feen, that is, at the time of its being firft produced out of the body of the caterpillar; but this is a feafon of fhort duration, and muft be carefully attended to.

The *chryfalis* is foft when firft produced, and is wetted on the front with a vifcous liquor; its fkin, though very tender at firft, dries and hardens by degrees; but this vifcous liquor, which furrounds the wings, legs, &c. hardens almoft immediately, and in confequence faftens all thofe limbs, &c. into a mafs, which were before loofe from one another; this liquor as it hardens lofes its tranfparence and becomes brown: fo that it is only while it is yet moift that thefe parts are to be feen diftinct.

It is evident from the whole, that the *chryfalis* is no other than a butterfly, the parts of which are hid under certain membranes, which faften them together, and when the limbs are arrived at their due ftrength they become able to break through thefe membranes, and then expand and arrange themfelves in their proper order.

The firft metamorphofis therefore differs in nothing from the fecond, except that the butterfly comes from the body of the caterpillar in a weak ftate, with limbs unable to perform their offices; whereas it comes from the *chryfalis* perfect. *Reaumur*, Hift. Inf. vol. i. p. 2—17. See the article FEVE, *Suppl.*

Mr. Reaumur has given us many curious obfervations on the ftructure and ufes of the feveral coverings that attend the varieties of the caterpillar kind in this ftate.

The creatures in general remain wholly immoveable in this ftate, and feem to have no bufinefs in it, but a patient attendance on the time when they are to become butterflies: and this is a change that can happen to them only as their parts, before extremely foft and weak, are capable of hardening and becoming firm by degrees, by the tranfpiration of that abundant humidity which before kept them foft; and this is proved by an experiment of Mr. Reaumur, who enclofing fome *chryfalifes* in a glafs tube, found, after fome time, a fmall quantity of water at the bottom of it, which could have come there no other way but from the body of the inclofed animal. This tranfpiration depends greatly on the temperature of the air: it is augmented by heat, and diminifhed by cold; but it has alfo its peculiarities in regard to the feveral fpecies of butterfly to which the *chryfalis* belongs.

According to thefe obfervations, the time of the duration of the animal in the *chryfalis* ftate muft be in different fpecies very different; and there is indeed this wide difference in the extremes, that fome fpecies remain only eight days in this ftate, and others eight months. It may be eafily conceived from this, that there may be in one year two generations of caterpillars of the fame fpecies; and that the eggs laid by the butterfly in the latter end of autumn, having lain the winter in that ftate, become hatched early in the fpring, and the caterpillars produced from thefe being come to the *chryfalis* ftate, remain in it but a little time, becaufe they are favoured by the warmth of the feafon; and hatching into butterflies, thefe fpeedily lay their eggs, that they may have a remainder of warm weather to be hatched in the remainder of the fummer feafon, and give a race of ftrong caterpillars before the end of autumn: but circumftances muft happen very favourably in all refpects, in order to bring this about.

Mr. Reaumur has proved that heat and cold make great differences in the time of hatching of the butterfly from the *chryfalis* ftate: and this he particularly tried with great accuracy and attention, by putting them in veffels in warm rooms, and in icehoufes, and it feemed wholly owing to the haftening or retarding the evaporation of the abundant humidity of the animal in the *chryfalis* ftate, that it fooner or later appeared in the butterfly form. He varnifhed over fome *chryfalifes*, in order to try what would be the effect of thus wholly preventing their tranfpiration; and the confequence was, that the butterfly came forth from thefe two months later than their natural time. Thus was the duration of the animal in this ftate lengthened, that is its life was lengthened, but that without any advantage to the creature, fince it was in the time of its ftate of inaction, and probably of infenfibility. Though this was of no confequence, Mr. Reaumur deduces from it a hint that feems to be of fome. He obferves that hen's eggs, of which we make fo many ufes, and eat in fo many forms, are properly a fort of *chryfalis* of the animal; their germ, after they are impregnated by the cock, containing the young animal alive, and waiting only a due degree of warmth to be hatched and appear in its own form. Eggs tranfpire notwithftanding the hardnefs of their fhells; and when they have been long kept, there is a void found near one of their ends between the fhell and the internal membrane; this is a mark of their being ftale, and is the effect of an evaporation of part of their humidity: and the fame varnifh which had been ufed to the *chryfalifes*, being tried on eggs, was found to preferve them for two years, as frefh as if laid but the fame day, and fuch as the niceft palate could not diftinguifh from thofe that were fo.

It is not yet known how much farther this ufeful fpeculation might be carried, and whether it might not be of great ufe even to human life, to invent fomething that fhould act in the manner of this varnifh, by being rubbed over the body, as the athletæ did of old, and the favages of the Weft Indies do at this time, without knowing why. See the article EGGS, *Suppl.*

But to return to the infects which are the fubjects of this article: their third ftate, that in which they are winged, is always very fhort, and feems deftined for no other action but the propagation of the fpecies. See the article GENERATION, *Suppl.*

CHRYSTAL (*Suppl.*)—*Sprig* CHRYSTAL, the Englifh name of a genus of *chryftals*, called by authors *ellipomacroftyla*. See the article ELLIPOMACROSTYLA, *Suppl.*

Pebble CHRYSTAL, the name of a fpecies of *petridium*. See the article PETRIDIA, *Append.*

CHRYSOLITE *pafte*. The way of making an artifical *chryfolite* pafte is this: take of prepared *chryftal* two ounces, ordinary red lead eight ounces; mix thefe well together, and add crocus martis made with vinegar, twelve grains: mix all together; put them into a crucible, lute it over, and bake the whole for twenty-four hours, or longer, in a potter's kiln, and it will produce a very elegant refemblance of the true *chryfolite*.

CHRYSOMELA, in zoology, a genus of infects frequently confounded with the beetles, the antennæ of which are made in form of bracelets, or necklaces of beads, and are thickeft toward their extremity: the body, in figure, approaches to oval, and the thorax is oblong and rounded.

Of this genus Dr. Hill enumerates a great many fpecies, for which fee his Hift. Anim. p. 43, *feq.* See alfo the article SCARABÆUS, *Suppl.*

CHRYSOMITHRES, in ornithology, the name by which fome call the gold-finch. See the articles CARDUELIS, *Suppl.* and GOLD-FINCH, *Append.*

CHRYSOPHYLLUM, the *ftar-apple*, in the Linnæan fyftem of botany, the name of a genus of plants, the characters of which are thefe: the cup is a fmall permanent perianthium, compofed of five roundifh leaves; the flower is formed of a fimple campanulated petal; the limb being divided into ten fegments, which are alternately roundifh and patalous, and narrow and erect; the ftamina are five fubulated filaments; the antheræ are fimple; the germen of the piftil is roundifh; the ftyle is fubulated; the ftigma is fimple; the fruit is a large berry, containing only one cell; the feeds are offeous, and three in number.

This genus comprehends the *cainito* of Plumier, and is of kin to the *rhamnus* and *fideroxylum*. Vide *Linnæi* Gen. Plant, p. 81. See the articles RHAMNUS, *Suppl.* and SIDEROXYLUM, *Append.*

CHURN *owl*, a name given to a beautiful bird called by authors *caprimulgus*. See the article CAPRIMULGUS, *Suppl.*

CICUTARIA (*Suppl.*) is alfo ufed for a fpecies of *cicuta*, or hemlock, called by fome writers fool's-parfley. See the article CICUTA, *Suppl.*

Sweet CICUTARIA, the name fometimes given to a fpecies of *myrrhis*. See the article MYRRHIS, *Suppl.*

CIBOULS, a name given by fome to a fpecies of onions. See the article ONION, *Suppl.*

CICELY, the name of a genus of plants, called by authors *myrrhis*. See the article MYRRHIS, *Suppl.*

CILERY, in architecture, a term ufed to denote the drapery, or leaveage, which is wrought upon the heads of pillars. Build. Dict. *in voc.*

CIMELIARC, in church-architecture, the room where the plate, veftments, &c. belonging to the church, are kept; this, in Englifh, is called a veftry.

CINNAMON-*tree*, in botany, makes only a fpecies of the *laurus*, according to Linnæus; diftinguifhed by its oblong-ovated, trinervous, plane leaves. See the article LAURUS, *Append.*

Its berries are an excellent carminative, and much ufed in medicine.

CINQUEFOIL (*Suppl.*) — *Strawberry*-CINQUEFOIL, the name by which fome call the *pentaphylloides* of Tournefort. See the article PENTAPHYLLOIDES, *Suppl.*

CIRSIUM, in botany, the name of a genus of plants, according to Tournefort, but comprehended under the *carduus*, or thiftle, by Linnæus. See the article THISTLE, *Suppl.*

CISTUS (*Suppl.*) — *Dwarf* CISTUS, a name given by fome to the *helianthemum*, or fmall fun-flower. See the article HELIANTHEMUM, *Suppl.*

CITRINE *ftæchas*, in botany, a name ufed by fome for a genus of plants called goldy-locks. See the article ELYCHRYSUM, *Suppl.*

CITRON (*Cycl.* and *Suppl.*) — CITRON *water*, a well known ftrong water, or cordial, which may be thus made: take of fine thin lemon-peel eighteen ounces, of orange-peel nine ounces, perfect nutmegs one quarter of a pound, alcohol perfect, that is, the fineft and beft rectified fpirit of wine two gallons and an half; digeft in balneo mariæ for one night; draw off with a flow fire; then add as much water as will juft make the mixture milky (which will be about feven quarts or two gallons) and add alfo two pounds of fine fugar candy.

This compofition may be improved by frefh elder-flowers hung in a cloth in the head of the ftill, fprinkled with ambergreefe in powder, or its effence. This article is referred to WATER, but is there omitted.

CITY (*Cycl.*) — It has been obferved that large *cities* are more liable than other places to peftilential and putrid diforders, which is owing to the ftagnation and corruption of the air. This is always the cafe in thofe which are low and unprovided with common fewers; where the ftreets are narrow and foul, the houfes dirty, water fcarce, and jails and hofpitals crowded: alfo when in fickly times the burials are within the walls, or when dead animals and offals are left to rot in the kennels or on dunghills; when drains are not provided to carry off any large body of ftagnating water in the neighbourhood; when flefh-meats make the greateft part of the diet, without a proper mixture of greens, bread, wine, or fermented liquors; from the ufe of old mouldy grain. In proportion to the number of thefe and the like caufes concurring, a *city* will be more or lefs fubject to peftilential difeafes, or to receive the leaven of the true plague brought into it by any merchandize. *Pringle*, Obfervat. on the Difeafes of the Army, p. 284, *feq.*

However, as great *cities* furnifh many materials for vitiating the air, they likewife afford two confiderable antidotes; the firft arifes from the circulation of the air, by means of the conftant motion of people and carriages, and of the draughts made by fires: the other depends on the great quantity of an acid produced by fuel, the ftrongeft refifter of putrefaction. *Id. ibid.* p. 297.

CLARY, or *garden* CLARY, a name given to the *fclarea* of Tournefort. See the article SCLAREA, *Suppl.*

Wild CLARY, in botany, the fame with the *horminum* of Tournefort. See the article HORMINUM, *Suppl.*

CLEAVERS, or CLIVERS, in botany, the Englifh name of a genus of plants called by authors *aparine*. See the article APARINE, *Suppl.*

CLEDGE, a name given by the miners to the upper part of the ftratum of fuller's earth. See the article FULLER's *earth*, *Suppl.*

CLEMATIS, in botany, the name of a genus of plants, the characters of which are thefe: there is no calyx; the flower confifts of four lax oblong petals, of an uncertain fhape; the ftamina are numerous fubulated filaments, fhorter than the flower; the antheræ adhere to the fides of them; the germina are numerous, compreffed, and terminate in fubulated ftyles, which are longer than the ftamina; the ftigmata are fimple; there is no pericarpium; the receptacle is capitated and fmall; the feeds are numerous, roundifh, compreffed, and have the ftyle adhering to them.

This genus comprehends the *clematitis*, *flammula*, and *viticella* of authors. See the article CLEMATITIS, *Suppl.*

CLIMBER, in botany, a name given to the *clematitis* of authors. See the article CLEMATIS, *Append.*

CLIVERS, or CLEAVERS, in botany. See the article APARINE, *Suppl.*

CLOCK (*Cycl.*) — What is inferted in the *Cyclopædia* on this head, is taken from *Derham*'s Artificial Clock-maker. Since that time a fuller and more complete treatife on this fubject has been publifhed by Mr. Thiout, at Paris, which is recommended in the Hiftory of the Royal Academy of Sciences, an. 1740.

CLOUDBERRY, in botany, the Englifh name of a genus of plants, called in Latin *chamæmorus*. See the article CHAMÆMORUS, *Append.*

CLOWN's *wound-wort*, in botany, a name ufed by fome for the *fideritis* of authors. See the article SIDERITIS, *Suppl.*

COASTMARY, or COSTMARY, a name given by fome to a fpecies of tanzy, called by others *balfamita*. See the article TANACETUM, *Suppl.*

COB-*nut*, a name given by fome to the *corylus*, or hazle. See the article HAZLE, *Suppl.*

COBELLA, in zoology, the name of a fpecies of *coluber*. See the article COLUBER, *Append.*

COBWEB. This fubftance, dried and powdered, is efteemed by fome as a good aftringent and abforbent.

COCCUS, in the hiftory of infects, the name of a very comprehenfive genus, the trunk of which arifes from their breaft; the body is cetofe behind; the wings only two, placed erect, and to be found only on the males.

This genus contains all the progal-infects of Reaumur. See the article PROGAL-INSECT, *Suppl.*

The principal fpecies are: 1. The *kermes*, or *coccus* of the holm-oak. 2. The Poland fcarlet-grain, or the purple *coccus* of the roots of plants. 3. Cochineal, or the *coccus* of the opuntia. 4. The green houfe-bug, or the *coccus* of the orange tree. 5. The water-*coccus*, found on the leaves of the water-lilly. 6. The *coccus* of the birch tree. 7. The *coccus* of other infects. 8. The *coccus* of canary-grafs. 9. The *coccus* of the *jacobæa*. 10. The *coccufes* of the alder, peach, &c. See the article KERMES, &c. *Suppl.*

COCCYGRIA, in botany, the name of a genus of plants, called by Tournefort *cotinus*. See the article COTINUS, *Suppl.*

COCK, *gallus*, in ornithology, the Englifh name of the male of the gallinæ-kind. See the articles GALLINÆ and GALLUS, *Suppl.*

The front part of the *cock*'s head is ornamented with a longitudinal flefhy creft, or comb; and the wattles on the throat are two, they alfo are longitudinal and flefhy.

In the choice of a dunghill-*cock*, he fhould be of a large body, very long from the head to the rump, thick in the girth, the neck long, loofe, and high; the comb, wattles, and throat large; the eyes round and large, and anfwerable to the colour of his plume or main, as grey with grey, yellow with yellow, and fo of the reft; his beak fhould be ftrong and hooked; and his main or neck-feathers very long and gloffy, covering his neck and fhoulders; the legs fhould be ftrait and of a long beam, with very large and long fpurs, a little bending; the colour fhould be black, yellow, or brownifh; the claws fhould be long and ftrong; the tail long, bending back and covering the whole body; the wings very ftrong; and the general colour fhould be reddifh.

Game COCK. See the article GAME, *Suppl.*

Indian COCK, the Englifh name of a diftinct genus of birds called by zoologifts *crax*. See the article CRAX, *Suppl.*

COCK's-*comb*, in botany, a name given to a fpecies of *pedicularis*, or loufe-wort. See the article PEDICULARIS, *Suppl.*

COCK's-*comb* is alfo a name given to a fpecies of amaranth. See the article AMARANTH, *Suppl.*

COCK's-*foot-grafs*, in botany, a name given to a fpecies of grafs. See the article GRASS, *Append.*

COCK's-*head*, in botany, the Englifh name of a genus of plants called by authors *onobrychis*. See the article ONOBRYCHIS, *Suppl.*

COCK-*throppled*, a name given by dealers in horfes to one whofe wind-pipe is fmall and bends like a bow when he bridles his head. See the articles HORSE and HUNTER, *Suppl.*

COCKLE, *pectunculus*, the Englifh name of thofe *pectens* which have no ears. See the article PECTEN, *Suppl.*

COCO-*nut*, or COCOA-*nut*, in botany, the fame with the cacao of Tournefort. See the articles CACAO, *Suppl.* and CHOCOLATE, *Cycl.*

COCOON. See the article SILK.

COD, in ichthyology, the Englifh name of a fpecies of *gadus*. See the article GADUS.

CODLIN-*tree*, in botany, the name of a fpecies of apple-tree. See the articles APPLE and MALUS, *Suppl.*

CODLINS *and cream*, the name of a genus of plants called by Tournefort *Chamænerium*. See the article CHAMÆNERIUM, *Suppl.*

CŒNOTAPH. See the article CENOTAPH, *Cycl.*

CŒRULEUM *nativum*, a name frequently ufed by the antients for the friable blue ochre, called *lapis armenus*. See the article ARMENUS *lapis*, *Suppl.*

COFFEE-*tree*, the Englifh name of a fpecies of jafmine. See the articles JASMINE, *Suppl.* and COFFEE, *Cycl.*

COGGLE, a fmall fifhing-boat upon the coaft of Yorkfhire: it is alfo called a little *cogge*, from the old Teutonic *kogge*, a fhip; whence the middle aged Latin *coggo*, *cogga*, &c. *Preparatis coggionibus, galleis, & aliis navibus*, &c. Mat. Paris. And hence the Latin *cogcio*, a wandering and begging feaman; and the *cogciones*, cog-men or boat-men, who, after fhipwreck, or loffes by fea, travelled about to defraud the people by begging and ftealing, are reftrained by many civil and good laws. *Du Frefne.*

COIX, in the Linnæan fyfem of botany, the name of a genus of plants, called by others *lacryma Jobi*. See the article LACRYMA, *Append.*

COLCOTHAR (*Cycl.* and *Suppl.*) — The Latin writers of the middle ages ufe *colcothar* as a name of vitriol in general, which was called by the Greeks *chalcanthum*.

Colcothar is originally an Arabic word, which does not fignify the common vitriol, but the *chalcitis*. The word has been fpelt *calchuthar*, and from this the word *chalcitis* differs not very much. The Greeks of the middle ages followed the Arabians in the ufe of the word *colcothar*, but added to it a termination proper to their language, and particularly to the cuftom of thofe times, which feemed not to exprefs exactly the fame thing, but a diminutive of it: they wrote it *colcotharion*, or *chalcitarion*. This they alfo called the *orchis*, *orchidion*, the *ladi eladion*, and fo in a thoufand other inftances. Avicenna ufes the word *zagi* to exprefs this fubftance, but then he is by no means determinate

minate in it, but makes it include the *mify*, *fory*, and *melanteria*, as well as the *chalcitis*; but diftinguifhing in another place the feveral kinds of *zagi*, he tells us, that one was the *chalcand*, which was green; a fecond the *chalcitis*, which was yellow; a third the *fory*, which was red. *Alzagiat* is a name alfo ufed by him to exprefs all thefe kinds; and this word the interpreters generally render *atramenta*, inks. This is generally fuppofed to exprefs their being all black fubftances, which is not the cafe; but all that it does fignify is, that they are all vitriolic foffils: *atramentum* being a name of vitriol, as a fubftance ufed in the making of ink.

COLD (*Suppl.*) — The difeafes arifing from *cold*, are all of the inflammatory kind, *viz.* coughs, pleurifies, peripneumonies, rheumatic pains, and confumptions; which, in the army, are almoft always owing to neglected coughs. All poffible means ought therefore to be ufed, in order to remove thefe in the beginning; for which purpofe, fmall and repeated bleedings are moft efficacious, and likewife prove highly beneficial in coughs and the confirmed confumption, even after a purulent fpitting and hectic fymptoms have appeared. The quantity drawn may be from four to feven or eight ounces, once in eight or ten days. It is obfervable, that the patients never find themfelves fo much relieved on the firft, as on the fecond or third night after venefection. See CONSUMPTION, *Append.*

COLD-*finch*, in zoology, the name of a bird of the *œnanthe* kind, or nearly approaching to that genus, common about the Peak in Derbyfhire. Its belly is white; its breaft of a yellowifh brown, and its head and back of a brownifh or greenifh grey; the long feathers of its wings and tail are black, but with fome variegation of white toward the end; its beak is flender, ftrait, and fomewhat ridged or triangular; it feeds on worms and other infects. *Ray's* Ornithology, p. 170.

COLE-*fish*, a name given to a fpecies of beardlefs *gadus*. See the article GADUS, *Suppl.*

COLE-*wort*, the Englifh name of a fpecies of *cabbage*. See the articles CABBAGE and BRASSICA, *Suppl.*

Sea-COLE-*wort*, a name given to the *convolvulus* of authors. See the article CONVOLVULUS, *Suppl.*

COLLAR, among builders, the fame with *cincture*. See CINCTURE, *Cycl.*

COLLAR-*beam*, among houfe-carpenters, the beam which is framed crofs betwixt two principal rafters. Build. Dict. in voc.

COLLIFLOWER, the name of a kind of *cabbage*. See the articles CABBAGE and BRASSICA, *Suppl.*

COLOCASIA, in botany, a name ufed by fome for a fpecies of *arum*. See the article ARUM, *Suppl.*

COLOQUINTIDA, a name often ufed for the *colocynthis* of botanical writers. See the article COLOCYNTHIS, *Suppl.*

COLT'S *foot* (*Suppl.*)—*Alpine* COLT'S *foot*, a name ufed by fome for the *cacalia* of authors. See the article CACALIA, *Suppl.*

COLUBER, in zoology, the name of a very numerous genus of ferpents, the abdomen of which is covered with fcuta, and the under part of the tail with fquamæ or fcales.

Of this genus are the *natrix torquata*, the viper, and a great many other fpecies. See the articles NATRIX, VIPER, *&c.* *Suppl.*

COLUMBINA *marga*, the name by which Pliny calls the ftony bluifh marle. See the article MARLE, *Suppl.*

COLUMBINE (*Suppl.*) — *Feathered* COLUMBINE, a name ufed by fome for a plant known among authors by that of *thalictrum*. See the article THALICTRUM, *Suppl.*

COLUMNAR-*marble*, the fame with the *bafaltes*, or *lapis lydius*. See the article BASALTES, *Cycl.* and *Suppl.*

COMB (*Suppl.*)— *Ladies*-COMB, or *Venus* COMB, the name of a diftinct genus of plants, called by Tournefort *fcandix*. See the article SCANDIX, *Suppl.*

COMB-*fish*, *pecten*, in ichthyology, a genus of fifhes fo called from the longitudinal ftriæ refembling the teeth of a *comb*, with which its ftructure is covered. See PECTEN, *Suppl.*

COMBUSTIO *pecuniæ*, the antient way of trying mixed and corrupt money, by melting it down, upon payments into the Exchequer. In the time of king Henry II. a conftitution was made called the trial by *combuftion*; the practice of which differed little or nothing from the prefent method of affaying filver. But whether this examination of money by *combuftion* was to reduce an equation of money only of fterling, *viz.* a due proportion of alloy with copper, or to reduce it to pure fine filver, doth not appear. On making the conftitution of trial it was confidered, that tho' the money did anfwer *Numero et Pondere*, it might be deficient in value; becaufe mixed with copper or brafs, *&c.* Vide *Lownde's* Effay upon Coin, p. 5.

COMET (*Suppl.*) — The *comet* which appeared in December 1743, and in January and February following was exceeding bright and diftinct. The diameter of its nucleus being nearly equal to that of Jupiter. Its tail extended above 16 degrees from its body.

From the obfervations of Mr. Blifs, and from fome taken at the obfervatory of the earl of Macclesfield, Mr. Betts has determined this *comet's* parabolic trajectory. He found the place of the afcending node to be ♉. 15°. 45'. 20''; the logarithm of the perihelion diftance 9.346472; the logarithm of the diurnal motion 0.940420; the place of the perihelion ♎. 17°. 12'. 55''; the diftance of the perihelion from the node 151°. 27'. 35''; the logarithm, fine, and cofine of the inclination of the orbit to the ecliptic 9.865138, 9.832616; and thence the time the *comet* was in the vertex of the parabola, or the time of the perihelion was Febr. 19^d. 8^h. 12'. The motion of the *comet* in its orbit was according to the order of the figns.

From thefe elements, by the help of Dr. Halley's general table, he has given us the computation of the *comets* places, for the times of obfervation, and the differences between the obferved and computed places, which feldom amount to above half a minute.

The nodes of this *comet* and of the planet Mercury, are within lefs than half a degree of each other, which perhaps gave rife to a report, that the *comet* had carried Mercury from its orbit. But the *comet* was at that time diftant from Mercury nearly $\frac{1}{3}$ of the femi-diameter of the *orbis magnus*, and almoft twice as near to the fun; hence it could have no fenfible influence on the motions of that planet.

This *comet* is fuppofed at leaft equal in magnitude to the earth. See Phil. Tranf. N°. 474. fect. 2.

Comet of 1743. See obfervations of this *comet* made at Vienna by father Frank, a Jefuit, in Phil. Tranf. N°. 470. fect. 1.

The parabolic orbit of the *comet* of 1739, as obferved by Signior Zanotti at Bologna, is defcribed in Phil. Tranf. N°. 461. fect. 15.

The path of the *comet* which appeared from the beginning of March to the beginning of April 1742, has been computed by Mr. Hodgfon from the obfervations of the Jefuits of Pekin in China. Vide Phil. Tranf. N°. 481. p. 264.

COMFREY (*Suppl.*)—*Spotted* COMFREY, a name by which fome call the *pulmonaria*. See the article PULMONARIA, *Suppl.*

COMMENDATORY *Abbot*. See ABBOT *in commendam*, *Cycl.*

COMPOSITION (*Cycl.*)—COMPOSITION *of ratios*, in arithmetic and algebra, is performed by multiplying the quantities or exponents of two or more ratios together; the produce is then faid to be compounded of the ratios whofe components were multiplied. Thus if the quantities or exponents of the ratios a to b, c to d, e to f, be multiplied, we fhall have $\frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} = \frac{ace}{bdf}$. And the ratio ace to bdf, is then faid to be compounded of the feveral ratios a to b, c to d, e to f, *&c.* Thus alfo the ratio of 10 to 12, is compounded of the ratio of 2 to 5, and of 3 to 4; for $\frac{2}{5} \times \frac{3}{4} = \frac{10}{12}$.

This operation is by fome called *addition* of ratios.

CONCAMERATED, among builders, an appellation given to fuch roofs as are arched in the manner of vaults.

CONCHA *anatifera*, in the hiftory of fhell-fifh. See the article ANATIFERA *concha*, *Suppl.*

CONCHA *veneris*, in natural hiftory, the name by which feveral fpecies of *chama* are called. See the article CHAMA, *Suppl.*

CONCHÆ *margaritiferæ*, a name fometimes ufed for thofe *mytuli* which produce pearls. See the article MYTULUS, *Suppl.*

CONE (*Cycl.*)—CONE *and key*. Bracton, lib. 2. c. 37. num. 3. fays, *Fæmina in tali ætate* (*i. e.* 14 *et* 15 *Annorum*) *poteft difponere domui fuæ et habere* Cone *et* Key.

The words come from the Saxon *colne*, *i. e. calculus*, and key *clavis*; fo that a woman was then held to be of competent years when fhe was able to keep the accounts and keys of the houfe: and *Glan.* lib. 7. cap. 9. has fomewhat to the fame purpofe.

CONE, in botany, an hard dry feed-veffel of a conical figure, confifting of feveral woody parts; and is, for the moft part, fcaly, adhering clofely together, and feparating when ripe. *Miller's* Gardener's Dict. in voc.

CONGE (*Cycl.* and *Suppl.*) — The *conge*, originally, was a ring or ferril, fixed on the extremities of wooden pillars, to keep them from fplitting; this, afterwards, came to be imitated in ftone-work. Build. Dict. in voc.

CONGELATIONS. See FREEZING, *Suppl.*

CONIC-*fection* (*Cycl.*) —The doctrine of the *conic-fections* is of great ufe in phyfical and geometrical aftronomy, and the phyfico-mathematical fciences. This doctrine has been much cultivated by geometers antient and modern; and we have many good treatifes on the fubject; but that publifhed by Mr. Simfon, profeffor of mathematics at Glafgow, deferves to be particularly mentioned not only for its elegance, but for its geometrical accuracy, which as he juftly remarks in his preface, has not always been fo well obferved in treatifes of this kind, as it ought to be.

To the properties of the *conic-fections* mentioned in the *Cyclopædia*, it may be proper to add the properties of their ofculatory circles or circles of curvature. See CURVATURE.

CONJUGATE (*Cycl.*)—CONJUGATE *hyperbolas*, in geometry. See HYPERBOLA, *Append.*

CONJURATION, *conjuratio*, (*Cycl.*) signifies a plot or confederacy, made by perfons combining together by oath or promife, to do fome public harm.

But it was more particularly ufed, formerly, for the having a perfonal conference with the devil, or fome evil Spirit, to know any fecret, or to effect any purpofe. *Anno* 5 *Eliz.* c. 16.

It is faid in fome of our law books, that the difference between *conjuration* and *witchcraft* is, that the former endeavours by prayers and invocation of God's powerful name, to compel the devil to fay or do what the offender commands him; the latter deals rather by friendly and voluntary conference or agreement with the devil or familiar, to have the offender's defires ferved, in lieu of blood, or other gift offered to the devil, efpecially of the offender's foul. And both thefe differ from *inchantment* or *forceries*; becaufe thofe are perfonal conferences with the devil, and thefe are but medicines and ceremonious forms of words (commonly called *charms*) without apparition. *Cowel.*

But all thefe nice diftinctions are now ufelefs, fince the ftatute of his prefent majefty forbidding all profecutions for witchcraft, &c.

CONOCARPODENDRON, in botany, a name given by Boerhaave to a genus of plants, defcribed by Linnæus under that of *leucodendros*, or the filver pine-tree. See the article PINE-*tree*, *Suppl.*

CONOCARPUS, the *button-tree*, in the Linnæan fyftem of botany, the name of a genus of plants, the characters of which are thefe: the cup is a very fmall, erect perianthium, formed of one leaf, and divided, at the extremity, into five fubulated fegments; it is placed on the germen, and is permanent; there is no corolla; the ftamina are five; the germen is large, compreffed, obtufe, thickeft towards the point, and placed under the receptacle of the flower; the ftyle is fimple; there is no fruit, but the feed is naked and fingle, and has on each fide a prominent, membranaceous margin; a number of the germina are arranged together, in an imbricated manner, and form a fhort and roundifh one; they appear like fo many reflex fquamæ.

This genus comprehends the *rudbeckia* of Houfton, and is called *alni fructu laurifolia arbor*, by Sir Hans Sloane. Vide *Linnæi* Gen. Plant. p. 75.

CONSOLIDA, in botany, a name given by fome authors to the plant more ufually called *bugle*. See BUGULA, *Suppl.*

CONSOUND, a name given to feveral different plants: thus *fymphytum* is called the great *confound*, *bugula* the middle *confound*, *bellis* the leaft *confound*, and *folidago* the faracens *confound*. See SYMPHYTUM, &c. *Suppl.*

CONSUMPTION (*Suppl.*) is frequently the confequence of a neglected cold. See COLD, *Append.*

Befides repeated fmall bleedings, which is the beft of all remedies for diminifhing the hectic fits, the faline draughts and a cool diet are to be ufed. Colliquative fweats may be checked by drinking about a pint of lime-water, foftened with a little new milk.

In the advanced ftate of a *confumption*, we may diftinguifh two kinds of coughs, one caufed by the ulcers of the lungs, and the other by a thin rheum falling upon the fauces and trachea. For the firft of thefe, about ten drops of balfam of Peru or Copaiba may be given twice a day in a bolus of conferve of rofes; and for the latter, incraffants, as conferve of rofes and opium; which laft ought to be given with caution, as being apt to beat the body.

CONVAL-*lilly*, *lilium convallium*, or lilly of the valley. See the article LILIUM *convallium*, *Suppl.*

CONVALLARIA, in botany, the name given by Linnæus to a large genus of plants, comprehending the *lilium convallium*, *polygonatum*, and *unifolium* of other botanical writers. See LILIUM *convallium*, &c. *Suppl.*

The characters of the *convallaria*, according to Linnæus, are thefe: there is no calyx; the flower confifts of a fingle fmooth petal, of a campanulated form, divided at the extremity into fix fhort, obtufe, patento-reflex fegments; the ftamina are fix fubulated filaments, inferted into the petal of the flower, and fhorter than it; the antheræ are oblong and erect; the germen of the piftil is globofe; the ftyle is filiform and longer than the ftamina; the ftigma is obtufe and trigonal; the fruit is a globofe berry, containing three cells, and is fpotted before it is ripe; the feeds are fingle and roundifh.

In the *lilium convallium*, the petal of the flower is globofe, campanulated and patent; in the *polygonatum*, it is tubulato-campanulated; and in the *unifolium*, a third part of all the fructification is wanting.

Some of the fpecies of Tournefort's *fmilax* are likewife included in this genus; in which the petal of the flower is divided into fix very acute and patent fegments. Vide *Linnæi* Gen. Plant. p. 146.

CONYZA is alfo ufed, by C. Bauhine, for a different genus of plants from the *flea-bane*, and called *erigeron* by Linnæus. See the article ERIGERON, *Append.*

CONYZOIDES, or CONYZELLA, in botany, names by which Dillenius calls the *erigeron*, or fweet flea-bane of Linnæus. See the article ERIGERON, *Append.*

COPAIBA, or COPAYBA, in natural hiftory and pharmacy. See the articles COPIVI, *Cycl.* and BALSAM *of Copaiba*, *Suppl.*

COPERAS, in natural hiftory, the fame with *copperas*. See the article COPPERAS, *Cycl.* and *Suppl.*

COPPER (*Cycl.* and *Suppl.*)—*White* COPPER, a kind of metal frequently brought from China, and fuppofed, by many, to be natural. But according to Mr. Geoffroi, *white copper* is only a mixture of red *copper* with arfenic. See Hift. Acad. Scienc. 1739. p. 24.

CORAAGE, *coraagium*, in our old cuftoms, a kind of impofition extraordinary, growing upon fome unufual occafion; and it feems to be of certain meafures of corn: for *corus tritici* is a meafure of wheat. *Bracton*, l. 2. c. 116. num. 6. who in the fame chapter, num. 8. has thefe words,—— *Sunt etiam quædam communes præftationes, quæ fervitia non dicuntur, nec de confuetudine veniunt, nifi cum neceffitas intervenerit, vel cum rex venerit; ficut funt hidagia, coraagia, & carvagia, et alia plura de neceffitate et ex confenfu communi totius regni introducta*, &c.

CORAL (*Cycl.* and *Suppl.*)—For the method of making artificial *coral* to adorn grottos, fee GROTTO, *Append.*

CORAL-*tree*, or CORAL-*wood*, in botany, the Englifh name of a plant, called by authors *corallodendron*. See the article CORALLODENDRON, *Suppl.*

CORCHORUS, the name of a genus of plants, by miftake printed *corehorus*. See the article COREHORUS, *Suppl.*

CORIARIA, *myrtle-fumach*, in the Linnæan fyftem of botany, the name of a genus of plants, the characters of which are thefe: the cup is compofed of five very fhort leaves, which are concave and of a fomewhat oval figure; the flower confifts of five petals, and is very like the cup; the ftamina are ten filaments of the length of the flower; the antheræ are fimple; the germina of the piftil are five in number, compreffed, and adhering together by their inner fides; there are likewife five fetaceous long ftyles; the ftigmata are fimple; there is no pericarpium; the feeds, which are five in number, and kidney-fhaped, being inclofed in the petals of the flower, which become carnous. Vid. *Linnæi* Gen. Plant. p. 204.

CORK (*Cycl.*)—Cups made of *cork*, are faid by fome to be good for hectical perfons to drink out of. The Egyptians made coffins of *cork*; which being lined with a refinous compofition, preferved dead bodies uncorrupted. The Spaniards line ftone-walls with it, which not only renders them very warm, but corrects the moifture of the air. The wood of the *cork*-tree is not only good firing, but applicable to feveral other ufes.

CORK-*tree*, the Englifh name of a genus of plants, called by authors *fuber*. See the article SUBER, *Suppl.*

CORMORANT, in ornithology, the Englifh name of a bird of the order of *anferes*, or goofe kind, called alfo *pelicanus* and *corvus aquaticus*. See the articles PELICAN and CORVUS *aquaticus*, *Suppl.*

CORN-*bottle*, or *blue-bottle*, a name given to the *cyanus* of authors. See the article CYANUS, *Suppl.*

CORN-*flag*, in botany, a name given to the *gladiolus* of authors. See the article GLADIOLUS, *Suppl.*

CORN-*marygold*, a name given to the *chryfanthemum* of authors. See the article CHRYSANTHEMUM, *Suppl.*

CORN-*parfley*, in botany, a name given to a fpecies of *fium*. See the article SIUM, *Append.*

CORN-*fallet*, in botany, a name given to the *valerianella* of authors. See the article VALERIANELLA, *Suppl.*

CORN-*violet*, a name ufed by fome for the *campanula* of authors. See the article CAMPANULA, *Suppl.*

CORNEL-*tree*, in botany, the Englifh name of a genus of plants, called by Latin writers *cornus*. See the article CORNUS, *Suppl.*

CORNELIAN, *farda*, in the hiftory of gems. See the articles CORNELIAN, *Cycl.* and SARDA, *Suppl.*

CORNELIAN-*cherry*, a name ufed by fome for a fpecies of the *cornus*, or cornel-tree. See the article CORNUS, *Suppl.*

CORNER-*ftones*, among builders, the name of the two ftones which ftand one in each jaumb of a chimney. Their faces are hollowed in breadth, being a certain fweep of a circle. The breadth of each ftone is equal to that of the jaumb, and their height reaches from the hearth to the mantle-tree *Corner-ftones* are commonly made of Rigate or fire-ftone. Build. Dict. in voc.

CORSA, in architecture, the fame with *plat-band*. See the article PLAT-BAND, *Cycl.*

CORTEX *aurantiorum*. The powder of *cortices aurantiorum*, fometimes cures quartan agues. Commerc. Norimb. 1735. hebd. 11. §. 3.

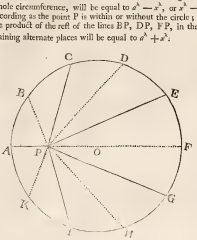
COSTMARY, the Englifh name of a fpecies of tanzy, called by fome writers *balfamita*. See the article TANACETUM, *Suppl.*

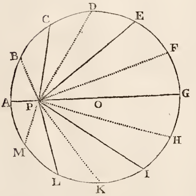
COSTUME (*Suppl.*)—To obferve the *coftume*, among painters, is to make every perfon and thing fuftain the proper character, by not only obferving the ftory, but the circumftances, the fcene of action, the country or place, habit, manners, &c.

The word is Italian, fignifying cuftom.

COTESIAN *theorem*, in Geometry, an appellation ufed for an elegant property of the circle difcovered by Mr. Cotes. The theorem is,

If the factors of the binomial $a^\lambda \pm x^\lambda$ be required, the index λ being any integer: let the circumference ABCD, the center of which is O, be divided into as many equal parts as there are units in 2λ; and from all the diviſions let there be drawn to any point P in the radius OA, produced if neceſſary, the right lines AP, BP, CP, DP, EP, FP, &c. then ſuppoſing $OA = a$, $OP = x$, the product of all the lines AP, CP, EP, &c. taken from the alternate diviſions throughout the whole circumference, will be equal to $a^\lambda - x^\lambda$, or $x^\lambda - a^\lambda$, according as the point P is within or without the circle; and the product of the reſt of the lines BP, DP, FP, in the remaining alternate places will be equal to $a^\lambda + x^\lambda$:





For inſtance, if $\lambda = 5$, let the circumference be divided into 10 equal parts, and the point P be within the circle, then will $AP \times CP \times EP \times GP \times IP$ be equal to $\overline{OA}^5 - \overline{OP}^5$, and $BP \times DP \times FP \times HP \times KP = \overline{OA}^5 + \overline{OP}^5$. In like manner if λ be $= 6$, having divided the circumference into twelve equal parts, $AP \times CP \times EP \times GP \times IP \times LP$ will be equal to $\overline{OA}^6 - \overline{OP}^6$, and $BP \times DP \times FP \times HP \times KP \times MP = \overline{OA}^6 + \overline{OP}^6$.

The demonſtration of this theorem may be ſeen in Dr. *Pemberton*'s Epiſt. de Coteſii inventis.

By means of this theorem the acute and elegant author was enabled to make a farther progreſs in the inverſe method of fluxions, than had been done before. But in the application of his diſcovery there ſtill remained a limitation, which was removed by Mr. de Moivre. See Dr. *Smith*'s Theoremata logometrica & trigonometrica, added to *Cotes*'s Harmonia menſurarum, p. 114, 115. *De Moivre*, Miſcel. Analyt. p. 17, *ſeq.*

COTTON (*Cycl.*) — *Lavender*-COTTON, a name ſometimes given to a genus of plants, called by authors *ſantolina*. See the article SANTOLINA, *Suppl.*

COTTON-*tree*, in botany, the Engliſh name of a genus of plants, called by authors *goſſypium*. See the article GOSSYPIUM, *Append.*

Silk-COTTON, a name uſed by ſome for a genus of plants, called by authors *xylon*. See the article XYLON, *Append.*

COTTON-*weed*, a name uſed for the *gnaphalium* of authors. See the article GNAPHALIUM, *Suppl.*

COUCH-*graſs*, or dog's-graſs, in botany. See the article GRASS, *Append.*

COVENTRY-*bells*, a name ſometimes given to the *campanula*. See the article CAMPANULA, *Suppl.*

COUGHS (*Cycl.*) — See the articles COLD and CONSUMPTION, *Append.* and TUSSIS, *Suppl.*

COULTER *neb*, in zoology, a name given to the *anas arctica*. See the article DUCK, *Suppl.*

COW, in zoology, the female of the ox-kind. See the articles Bos and Ox, *Suppl.*

Sea-COW, the Engliſh name of a genus of ſea-animals, called by zoologiſts *manati*. See the article MANATI, *Suppl.*

COW-*itch*, *phaſeolus hirſutis*, in botany. See the article PHASEOLUS, *Suppl.* Vide *Quinc.* Pharm. p. 230.

COW's-*lip of Jeruſalem*, in botany, a name ſometimes given to the *pulmonaria* of authors. See the article PULMONARIA, *Suppl.*

French COW's-*lip*, a name by which ſome call the *auricula*, or bear's ears of botanical authors. See the article AURICULA, *Suppl.*

COWL (*Cycl.*) — *Friar's*-COWL, in botany, a name ſometimes uſed for the *ariſarum* of authors. See the article ARISARUM, *Suppl.*

CRAB, in zoology, the Engliſh name of a genus of ſhell-fiſh, of the *ſquilla* kind. See the article SQUILLA, *infra.*

CRAB-*tree*, in botany, the Engliſh name of the *malus ſylveſtris* of authors. See the article MALUS, *Suppl.* and *Append.*

CRABRO, the hornet, in zoology, the name of a genus of flies of the *apis*, or bee-kind. See the articles BEE and HORNET, *Suppl.* and APIS, *Append.*

CRANE (*Cycl.*) — There are ſeveral improvements of this uſeful machine mentioned in *Deſagulier*'s Experim. Philoſ. p. 178, *ſeq.* particularly how to prevent the inconveniencies ariſing from ſudden jerks, as well as to increaſe its force by uſing a double axis in peritrochio, and two handles.

CRASPEDARIA, a genus of animalcules, without any viſible limbs or tails, but with an apparent mouth, and a ſeries of fimbriæ round it in the manner of a fringe.

Of this genus there are three ſpecies: 1. The *craſpedarium* with a roundiſh body. 2. The *craſpedarium* with an oval body. 3. The *craſpedarium* with a cylindric body. *Hill*'s Hiſt. of Anim. p. 5.

CRASSULA, in botany, the name of a diſtinct genus of plants called by ſome *baſtard-navel-wort*.

The characters of this genus are theſe: the cup is a perianthium, formed of five lanceolated, hollowed, acute, erect, and permanent leaves, which meet in ſuch a manner as to form a kind of tube; the corolla is ſomewhat of an infundibuliform ſhape, and is compoſed of five petals, the ungues of which are very long, linear, ſtrait, connivent, and joined at their baſes; and the bracteæ, which form the limb, oval and reflexo-patent; the nectaria are five very ſmall emarginated ſquamæ, annexed outwardly to the baſe of the germen; the ſtamina are five ſubulated filaments, of the length of the tube, and inſerted into the ungues of the corolla; the antheræ are ſimple; the germina are five, oblong, acuminated, and terminated by ſubulated ſtyles, of the length of the ſtamina; the ſtigmata are obtuſe; the fruit is compoſed of five oblong, acuminated, ſtrait, compreſſed capſules, opening longitudinally inwards; the ſeeds are numerous and ſmall. *Linnæi* Gen. Plant. p. 133.

Vaillant makes it only a ſpecies of *ſedum*. See the article SEDUM, *Suppl.*

CRAX, in zoology, a name given by the antients to the *ortygometra*, or daker hen, a bird larger than the quail, and common in Ireland and ſome of the northern counties of England. *Ray*'s Ornithology, p. 122. See the article ORTYGOMETRA, *Suppl.*

CRAY-*fiſh*. Theſe fiſh are comprehended among the ſpecies of *ſquillæ*. See the articles CRAY-*fiſh*, *Suppl.* and SQUILLA, *Append.*

CRAZE-*mill*, or CRAZING-*mill*, a mill in all reſpects like a griſt-mill to grind corn, and is ſo called by the tin-miners, who uſe it to grind their tin, which is yet too great, after trambling, and then it is trambled only.

CREEPER, the Engliſh name of a ſpecies of *iſpida*, which, though very unlike the common king's-fiſher both in colour and figure, yet is comprehended under that genus on account of the ſtructure of its feet. See the article ISPIDA, *Suppl.*

This ſmall bird has likewiſe been called *certhia* and *certhius*, by authors, and in Engliſh the ox-eye. See the article CERTHIA, *Suppl.*

CREODIBA, in the cuſtoms of the middle age, a robbery and murther committed in a wood, where the body of the perſon killed was burnt, in order to prevent any diſcovery of the crime. The word, ſays Wendelinus, is compounded of *gruy* and *diven*, that is, wood-robbers. Tit. 74. of the Salic Law, edit. Heroldi, relates to *creodiba*. *Du Cange*, Gloſſ. Lat.

CRESSES (*Suppl.*) — *Indian* CRESS, *Naſturtium Indicum*, in botany, the Engliſh name of a genus of plants, called by authors *cardamindum* and *tropæolum*. See the articles CARDAMINDUM, *Suppl.* and TROPÆOLUM, *Append.*

Sciatica CRESS, a name uſed by ſome for a genus of plants, called by others *iberis* and *cardamine*. See the article CARDAMINE, *Suppl.*

Sciatica CRESS, or *babylonian* CRESS, are names ſometimes alſo given to the *lepidium*, or Dittander. See the article LEPIDIUM, *Suppl.*

Water-CRESS, or *winter*-CRESS, names given by ſome writers to a genus of plants known among authors by that of *ſiſymbrium*. See the article SISYMBRIUM, *Suppl.*

CRESTED *graſs*, in botany. See the article GRASS, *Append.*

CRIMSON

CRIMSON *graſs-vetch*, a name given to the *niſſolia*, a genus of plants. See the article NISSOLIA, *Suppl.*

CRINUM, in the Linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is a ſpathiform general involucrum, compoſed of two oblong leaves, which bend downwards, and expoſe to ſighta kind of little umbel; the flower conſiſts of a ſingle petal, which is infundibuliform; the tube is oblong, cylindric, and bent; the limb is divided into ſix lanceolato-linear, obtuſe, concave, reflex ſegments, three of which, alternately, are diſtinguiſhed by an uncinated appendage; the ſtamina are ſix fubulated filaments ariſing from the baſe of the limb, they are of the length of the limb, and connivent; the antheræ are oblong, linear, incumbent, and aſſurgent; the germen of the piſtil is placed in the bottom of the flower; the ſtyle is fubulated and ſhorter than the ſtamina; the ſtigma is trifid and very ſmall; the fruit is a capſule of a ſuboval figure, with three cells; the ſeeds are numerous.

This genus, of which we know only one ſpecies, is commonly, though improperly, reckoned a ſpecies of lilly-aſphodel. *Linnæi* Gen. Plant. p. 140.

CROCEUS, in natural hiſtory, is ſaid to be an amphibious animal which is neither fiſh nor bird, but both. All the ſummer it is a bird, of a ſaffron colour, and flies through the mountains; but towards the end of autumn it returns to the ſea and becomes a fiſh. It is only in the winter that they catch it, when it proves a very ſavoury bit. *Hoffm.* Lex. Univ. in voc.

CROCODILIUM, in botany, a diſtinct genus of plants, according to Vaillant; but comprehended by Linnæus under the *centauria*. See the article CENTAURIA, *Append.*

CROCODILODES, in botany, the name uſed by Vaillant for a genus of plants, called by others *atractylis*. See the article ATRACTYLIS, *Append.*

CROSS (*Cycl.*) — The adoration of the *croſs* appears to have been practiſed in the antient church, in as much as the heathens, particularly Julian, reproach the primitive chriſtians with it [a]. And we do not find that their apologiſts diſclaimed the charge. Mornay, indeed, aſſerted that this had been done by St. Cyril, but could not ſupport his allegation at the conference of Fontainbleau. St. Helena is ſaid to have reduced the adoration of the *croſs* to its juſt principle, ſince ſhe adored in the wood, not the wood itſelf, which had been direct idolatry and heatheniſm, but him who had been nailed to this wood [b]. With ſuch modifications ſome proteſtants have been induced to admit the adoration of the *croſs*: John Huſs allowed of the phraſe, provided it were expreſly added, that the adoration was relative to the perſon of Chriſt. But however Roman catholics may ſeem to triumph by virtue of ſuch diſtinctions and mitigations, it is well known they have no great place in their own practice: Imbert [c], the good prior of Gaſcony, was ſeverely proſecuted in 1683, for telling the people, that in the ceremony of adoring the *croſs*, practiſed in that church on Good-friday, they were not to adore the wood, but Chriſt who was crucified on it: the curate of the pariſh told them the contrary; it was the wood, the wood! they were to adore. Imbert replied, it was Chriſt, not the wood: for which he was cited before the archbiſhop of Bourdeaux, ſuſpended from his functions, and even threatened with chains and perpetual impriſonment. It little availed him to cite the biſhop of Meaux's diſtinction; it was anſwered, that the church allowed it not. [[a] Nouv. Rep. Lett. tom. x. p. 508. [b] *Du Pin*, Bibl. Eccleſ. tom. xvii. p. 34, *ſeq.* Id. Bibl. Ant. Separ. tom. ii. p. 310. *Tillem.* Mem. Eccleſ. tom. vii. Nouv. Rep. Lett. tom. xxi. p. 344. Jour. des Scav. tom. lix. p. 104. [c] *Wake*, Expoſ. of the Doct. of the Ch. of Eng. Pref. p. ix, *ſeq.* *ejuſdem.* Def. of Expoſ. p. 121, *ſeq.* Bibl. Univ. tom. xi. p. 459. Nouv. Rep. Let. tom. iv. p. 691.]

CROSS-*wort*, in botany, the Engliſh name of a genus of plants called by authors *cruciata*. See the article CRUCIATA, *Suppl.*

CROSS *of Jeruſalem*, a name ſometimes given to the *lychnis* of authors. See the article LYCHNIS, *Suppl.*

CROW (*Suppl.*) — *Scare*-CROW, the Engliſh name of a bird of the *larus* kind. See the articles LARUS, *Suppl.* and SCARE-*crow*, *Append.*

CROW-*flowers*, in botany, a name ſometimes give to a genus of plants, called by authors *lychnis*. See the article LYCHNIS, *Suppl.*

CROW-*garlick*, a name given by ſome writers to a ſpecies of onion. See the article ONION, *Suppl.*

CROWN-*imperial-ſhell*, the name of a ſpecies of *voluta*. See the article VOLUTA, *Suppl.*

CRYSTALLIZATION *of ſalts*. See the articles SALT and VEGETATION *of ſalts*, *Suppl.*

CTENITA, or CTENOIDES, names ſometimes given to thoſe *pectens*, which have one of their ſhells very convex. See the article PECTEN, *Suppl.*

CUBICLE, a name ſometimes uſed for a bed-chamber. See the article CHAMBER, *Cycl.* and *Suppl.*

CUCKOW-*flower*, in botany, a name uſed by ſome writers for the *cardamine*, or lady's-ſmock. See the article CARDAMINE, *Suppl.*

CUCKOW-*ſpit-inſect*, the Engliſh name of a ſpecies of *cicada*. See the articles CICADA and HARVEST-*fly*, *Suppl.*

CUCKSOO, the name of a common diſh among the Moors of Africa, made of flower, and prepared for ſeveral ways of dreſſing afterwards. They take fine wheat flower, or, when that is ſcarce, barley, millet, or *Indian* corn flower is made to ſerve: they firſt ſprinkle ſome water over the bottom of an unglazed earthen pan, and then ſhake ſome of this flower into it; they knead theſe together with their hands, and roll it backwards and forwards under their open palms; by this means they work it into grains like ſago, and then it is fit for uſe: when they have meat to ſtew, they do this in an earthen pot, and over the mouth of this they place a colander, in which is put a quantity of this granulated paſte; over this colander is fixed on a top or cover for the pot, and by this means as the meat ſtews, all the vapour that aſcends from it is received into the grains of *cuckſoo*; by that time the meat is done enough, the *cuckſoo* is ſo too; and opening the pot, they firſt take out this, which is ſoft, ſwelled, and tender, and piling it up in a diſh, they make a hollow in the top of the heap, in which they lay the meat, and then add their ſpices, which are better than thoſe of many neighbouring nations; the pooreſt uſing pepper, ginger, and ſaffron, the richer a great variety. The diſh is ſet upon a mat on the ground, and four people conveniently may eat at it, ſometimes ſix do.

CUCULLA, a cowl. See the articles ABBOT and COWL, *Cycl.*

CUCULARIA, in botany, a term by which Juſſieu calls the fumitory. See the article FUMARIA, *Suppl.*

CUCUMBER, in botany See the article CUCUMIS, *Suppl.*

Wild CUCUMBER, a name ſometimes uſed for the *elaterium* or *momordica* of authors. See the article MOMORDICA, *Suppl.*

CULEX, in zoology, the name of a genus of two-winged flies, comprehending the gnats and humble-bee-flies. See the articles GNAT and HUMBLE-*bee-fly*, *Suppl.*

The diſtinguiſhing characteriſtic of this genus, is, that their head is furniſhed with a ſiphon, or ſucker, very ſlender, oblong, and filiform. *Hill*, Hiſt. Anim. p. 35.

CULLION, in botany, a name uſed by ſome for a genus of plants called by authors *orchis*. See the article ORCHIS. *Suppl.*

CUMIN, or CUMMIN, (*Cycl.*) in botany, the name of a genus of plants, the characters of which are theſe: the general umbel, as well as the partial ones, are frequently quadripartite; the general involucrum is compoſed of four leaves, longer than the umbel, they are ſometimes entire, ſometimes trifid; the partial involucrum is ſimilar; the proper perianthium is very ſmall; the general corolla is uniform; the ſingle flowers conſiſt each of five inflexo-emarginated and ſomewhat unequal petals; the ſtamina are five ſimple filaments; the antheræ are ſimple; the germen is oval, larger than the flower, and ſtands under its cup; the ſtyles are two, and very ſmall; the ſtigmata are ſimple; the fruit is naked, of an oval figure, and ſtriated; the ſeeds are two, of an oval figure, convex, and ſtriated on one ſide, ſmooth and plain on the other.

Of this genus there is only one known ſpecies, which is the common *cummin*. See *Linnæi* Gen. Plant. p. 115.

Meadow CUMMIN, a name ſometimes given to a ſpecies of *carui*. See the article CARUI, *Suppl.*

CUNEI, in natural hiſtory, a name given to thoſe *tellinæ*, which have one ſide of their ſhell much more extended in length than the other. See the article MYTULUS, *Suppl.*

CUNICULUS, in zoology, the name of a genus of animals of the *lepus*, or hare kind, called in Engliſh rabbits. See the articles RABBIT and LEPUS, *Suppl.*

CUNICULUS *Sibericus*, the name of the long-tailed Siberian rabbit, the fur of which is much valued. During the ſummer months many of them are beautifully variegated with oblique and tranſverſe ſtreaks of black and grey. *Hill*, Hiſt. Anim. p. 525.

CUNICULUS *Braſilienſis*, the name of a ſpecies of rabbit called by zoologiſts *aperea*. See the article APEREA, *Suppl.*

CUNILA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants called by Tournefort *marrubiaſtrum*. See the article MARRUBIASTRUM, *Suppl.*

CUP-*ſhell*, or CHALICE-*ſhell*. See the article SHELL, *infra*.

CUPRUM, *copper*, in natural hiſtory. See the article COPPER, *Cycl.* and *Suppl.*

CURATAS, a title given to the petty princes of Peru. See the article CAZIC, *Suppl.*

CURATOR, among the Romans, an officer under the emperors, who regulated the price of all kinds of merchandize and things to ſell in the cities of the empire.

They had likewiſe the ſuperintendence of the cuſtoms and tributes; whence alſo they were called *logiſtæ*. *Hoffm.* Lex. in voc.

CURCULIO, in zoology, the name of a genus of beetles diſtinguiſhed from the others by having their antennæ affixed to an elongated horny ſnout. See the article SCARABÆUS, *Suppl.*

CURRENT (*Cycl.*) — The doctrine of *currents*, their cauſes, &c. is ſtill very imperfect: it were to be wiſhed that it were otherwiſe, for the improvement of navigation and natural hiſtory. See *Marſigli*, Hiſt. Phyſ. de la Mer, p. 44—47.

CURRODREPANUS, in antiquity, a kind of chariot armed with ſcythes. The driver of theſe chariots was obliged to

ride on one of the horses, as there was no other seat for him: the usual place for him being all armed with knives, as was likewise the hinder part of the chariot. There were no scythes pointing down to the earth, either from the beam or axle-tree; but these were fixed at the head of the axle-tree in such a manner as to be moveable by means of a rope, and thereby could be raised or let down, and drawn forward or let fall backward by relaxing the rope. *Pitisc.* Lex. Ant. *in voc.*

CURVATURE *(Cycl.)* — The theory of the *curvature* of lines is of great use in geometry, and in the physico-mathematical sciences. Hence mathematicians have treated this subject fully. We shall here insert as much of this doctrine as seems necessary to enable beginners to form a just notion of the subject, and refer those who desire a farther knowledge to Mr. Mac Laurin's Treatise of Fluxions, whom we have in this, as in many other articles, followed; because he every where endeavours to avoid that air of paradox and mystery which has been more than once made a reproach to modern mathematicians.

Any two right lines applied to each other, perfectly coincide; and the rectitude of lines admits of no variety. Arches of equal circles applied upon each other, perfectly coincide likewise; and the *curvature* is uniform in all the parts of the same, or of equal circles. Arches of unequal circles cannot be applied upon each other so as to coincide; but when they touch each other, the arch of the greater circle is less inflected from the common tangent, and passes betwixt it and the arch of the lesser circle, through the angle of contacts formed by them, and is therefore less curve. Any two arches of curve lines touch each other when the same right line is the tangent of both at the same point; but when they are applied upon each other in this manner, they never perfectly coincide, unless they be similar arches of equal and similar figures: and the *curvature* of lines admits of indefinite variety. As the *curvature* is uniform in a given circle, and may be varied at pleasure in circles by increasing or diminishing their diameters, their flexure or *curvature* will therefore serve for measuring that of other lines. There is but one right line that can be the tangent of a given arch of a curve at the same point; but an indefinite variety of circles may touch it there; and these have various degrees of more and less intimate contact with it. And as of all the right lines that can be drawn through a given point in the arch of a curve, that is the tangent which touches the arch so closely, that no right line can be drawn between them; so of all the circles that touch a curve in any given point, that is said to have the same *curvature* with it, which touches it so closely that no circle can be drawn through the point of contact between them, all other circles passing either within or without them both.

This circle is called the *circle of curvature*; its centre, the *centre of curvature*; and its semidiameter, the *ray* or *radius of curvature*, belonging to the point of contact. It is also called, especially by foreign mathematicians, the *osculatory circle*.

The arch of this circle cannot coincide with the arch of the curve, but it is sufficient to denote it the circle of *curvature*, that no other can pass between them; as the tangent of the arch of a curve cannot coincide with it, but is applied to it so that no right line can be drawn between them.

As in all figures, rectilinear ones excepted, the position of the tangent is continually varying; so the *curvature* is continually varying in all curvilinear figures, the circle only excepted.

As the curve is separated from its tangent by its flexure or *curvature*, so it is separated from the circle of *curvature* in consequence of the increase or decrease of its *curvature*; and as its *curvature* is greater or less, according as it is more or less inflected from the tangent, so the variation of *curvature* is the greater or less according as it is more or less separated from the circle of *curvature*.

It is manifest, that there is but one circle of *curvature* belonging to an arch of a curve at the same point. For if there were two such circles, any circle described between these through that point, would pass between the curve and circle of *curvature*; against the supposition.

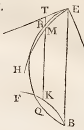
When any two curves touch each other in such a manner that no circle can pass between them, they must have the same *curvature*; for the circle that touches the one so closely that no circle can pass between them, must touch the other in the same manner.

It appears from the demonstrations of geometricians, that circles may touch curve lines in this manner; that there may be indefinite degrees of more or less intimate contact between the curve and the circle of *curvature*; and that a conic section may be described that shall have the same *curvature* with a given line at a given point, and the same variation of *curvature*, or a contact of the same kind with the circle of *curvature*.

If we conceive the tangent of any proposed curve to be a base, and that a new line be described, whose ordinate is a third proportional to the ordinate and base of the first; this new line will determine the chord of the circle of *curvature*, by its intersection with the ordinate at the point of contact; and by the tangent of the angle in which it cuts that circle, it will measure the variation of the *curvature*. The less this angle is, the closer is the contact of the curve and circle of *curvature*; and of this contact there may be indefinite degrees.

To give an example: let any curve EMH (fig. I.) and a circle ERB touch the right line ET on the same side at E; let any right line TK, parallel to the chord EB, meet the tangent in T, EMH in M, and a curve BKF that passes through B in K: then if the rectangle MTK be always equal to the square of ET, the *curvature* of EMH at E will be the same as that of the circle ERB; and the contact EM and ER will always be the closer, the less the angle is that is contained at B by the curve BKF, and the circle of *curvature* BQE.

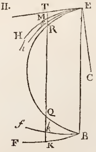
Fig. I.



For it is demonstrable from the elements of geometry (see Mac *Laurin's* Fluxions, art. 366.) that all the circles that can be described through E fall without both ER and EM, or within them both, and no circle whatever can pass between them when the rectangle MTK is always equal to the square of ET, and the curve in which K is always found, passes thro' B, and consequently the circle ERB, and the curve EM, have the same *curvature* at E.

Now let E*m* (fig. II.), any other curve touching ET in E, and *fk*B another curve passing through B meet TK in *m* and *k*, and let the rectangle *m*T*k* be likewise equal to the square of ET; then will the *curvature* of E*m* at E be the same as that of the curve EM, as has been mentioned. But the rectangles *m*T*k*, MTK, RTQ being equal to each other, and their sides therefore in a reciprocal proportion to each other, it is plain that if the arch B*k* pass between BK the arch of the curve BKF, and BQ the arch of the circle BQE; the curve E*m* must pass between EM the arch of the curve EMH, and ER the arch of the circle of *curvature* ERB: so that E*m* must have a closer contact with this circle than EM has with it; and the less the angle is that is formed by the curve FKB and the circle of *curvature* EQB at B, the closer is the contact at E of the curve EMH and the circle of *curvature* ERB. Thus the curve BKF, by its intersection with EB, determines the *curvature* of EM; and by the angle in which it cuts the circle of *curvature* it determines the degree of contact of EM and that circle, the angle BET and the right line ET being given.

Fig. II.



Hence it follows, that the contact of the curve EMH, and the circle of *curvature*, is closest when the curve BK touches the arch BQ in B, the angle BET being given; but it is farthest from this, or is most open, when BK touches the right line EB in B.

Hence, also, there may be indefinite degrees of more and more intimate contact between a circle and a curve.

The first degree is, when the same right line touches them both in the same point; and a contact of this sort may take place betwixt any circle and any arch of a curve. The second is when the curve EMH, and circle ERB have the same *curvature*, and the tangents of the curve BKF and circle BQE intersect each other at B in any assignable angle. The contact of the curve EM and circle of *curvature*, ER, at E is of the third degree, or order, and their osculation is of the second, when the curve BKF touches the circle BQE at B, but so as not to have the same *curvature* with it. The contact is of the fourth degree, or order, and their osculation of the third, when the curve BKF has the same *curvature* with the circle BQE at B, but so as that their contact is only

only of the fecond degree: and this gradation of more and more intimate contact, or of approximation towards coincidence, may be continued indefinitely, the contact of EM and ER at E being always of an order two degrees clofer than that of BK and BQ at B. There is alfo an indefinite variety comprehended under each order: thus, when EM and ER have the fame *curvature*, the angle formed by the tangents of BK and BQ admits of indefinite variety, and the contact of EM and ER is the clofer, the lefs that angle is. And when that angle is of the fame magnitude, the contact of EM and ER is the clofer the greater the circle of *curvature* is. When BK and BQ touch at B, they may touch on the fame or on different fides of their common tangent; and the angle of contact KBQ may admit of the fame variety with the angle of contact MER; but as there is feldom occafion for confidering thofe higher degrees of more intimate contact of the curve EMH and circle of *curvature* ERB, Mr. Mac Laurin calls the contact or ofculation of the fame kind, when the chord EB and angle BET being given, the angle contained by the tangents of BK and BQ is of the fame magnitude. Lib. cit. Art. 368.

When the *curvature* of EMH increafes from E towards H, and confequently correfponds to that of a circle gradually lefs and lefs, the arch EM falls within ER, the arch of the circle of *curvature*, and BK is within BQ. The contrary happens when the *curvature* of EM decreafes from E towards H, and confequently correfponds to that of a circle that is gradually greater and greater, the arch EM falls without ER, the arch of the circle of *curvature*, and BK is without BQ. And according as the *curvature* of EM varies more or lefs, it is more or lefs unlike to the uniform *curvature* of a circle; the arch of the curve EMH feparates more or lefs from the arch of the circle of *curvature* ERB, and the angle contained by the tangents of BKF and BQE at B, is greater or lefs. Thus the quality of *curvature*, as it is called by Sir Ifaac Newton [a], depends on the angle contained by the tangents of BK and BQ at B; and the meafure of the inequability or variation of *curvature*, is as the tangent of this angle, the radius being given and the angle BET being right [b]. — [[a] Method of Flux. and Inf. Ser. Prob. vi. p. 75. [b] *Mac Laurin*, lib. cit. Art. 369.]

The rays of *curvature* of fimilar arches in fimilar figures, are in the fame ratio as any homologous lines of thefe figures; and the variation of *curvature* is the fame. See *Mac Laurin*, lib. cit. fect. 370.

When the propofed curve EMH, is a conic-fection, the new line BKF is alfo a conic-fection; and it is a right line when EMH is a parabola, to the axis of which the ordinates TK are parallel. BKF is alfo a right line when EMH is an hyperbola, to one afymptote of which the ordinate TK is parallel. *Mac Laurin*, lib. cit. Art. 371, 372.

When the ordinate EB, at the point of contact E, inftead of meeting the new curve BK, is an affymptote to it, the *curvature* of EM will be lefs than in any circle; and this is the cafe in which it is faid to be infinitely little, or that the radius of *curvature* is infinitely great. Of this kind is the *curvature* at the points of contrary flexure in lines of the third order. See *Mac Laurin*, lib. cit. Art. 377—379.

When the curve BK paffes thro' the point of contact E, the *curvature* is greater than in any circle, or the radius of *curvature* vanifhes; and in this cafe the *curvature* is faid to be infinitely great. Of this kind is the *curvature* at the cufpids of the lines of the third order. See *Mac Laurin*, lib. cit. Art. 378, 379.

As to the circles of *curvature* for lines of the third or higher orders, fee lib. cit. Art. 379; and Art. 380, when the propofed curve is mechanical.

As lines which pafs thro' the fame point have the fame tangent when the firft fluxions of the ordinates are equal, fo they have the fame *curvature* when the fecond fluxions of the ordinate are likewife equal; and half the chord of the circle of *curvature* that is intercepted between the points wherein it interfects the ordinate, is a third proportional to the right lines that meafure the fecond fluxion of the ordinate and firft fluxion of the curve, the bafe being fuppofed to flow uniformly. When a ray revolving about a given point, and terminated by the curve, becomes perpendicular to it, the firft fluxion of the radius vanifhes; and if its fecond fluxion vanifhes at the fame time, that point muft be the center of *curvature* [a]. The fame may be faid, when the angular motion of the ray about that point is equal to the angular motion of the tangent of the curve; as the angular motion of the radius of a circle about its center is always equal to the angular motion of the tangent of the circle. Hence the various properties of the circle may fuggeft feveral theorems for determining the center of *curvature* [b]. — [[a] *Mac Laurin*, lib. cit. Art. 382, &c. [b] *Ibid.* Art. 389, &c.]

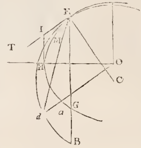
See alfo Art. 396, of the faid treatife, and the following, concerning the *curvature* of lines that are defcribed by means of right lines revolving about given poles, or of angles that either revolve about fuch poles, or are carried along fixed lines.

It is to be obferved, that as when a right line interfects an arch of a curve in two points, if by varying the pofition of that line the two interfections unite in one point, it then becomes the tangent of the arch; fo when a circle touches a curve in one point and interfects it in another, if, by varying the center, this interfection joins the point of contact, the circle then has the clofeft contact with the arch, and becomes the circle of *curvature*; but it ftill continues to interfect the curve at the fame point where it touches it, that is, where the fame right line is their common tangent, unlefs another interfection join that point at the fame time. In general, the circle of *curvature* interfects the curve at the point of ofculation, only, when the number of the fucceffive orders of fluxions of the radius of *curvature*, that vanifhes at the term of time that this radius comes to the point of ofculation, is an even number. *Mac Laurin*, Flux. Art. 493.

It has been fuppofed by fome, that two points of contact, or four interfections of the curve and circle of *curvature*, muft join to form an ofculation. But Mr. James Bernoulli infifted juftly, that the coalition of one point of contact and one interfection, or of three interfections, was fufficient. In which cafe, and in general, when an odd number of interfections only join each other, the point where they coincide continues to be an interfection of the curve and circle of *curvature*, as well as a point of their mutual contact and ofculation. See *Mac Laurin*'s Fluxions, Art. 493.

From thefe principles the circle of *curvature* at any point of a conic-fection may be determined. Suppofe EMH (fig. III.) to be any conic-fection, ET the tangent at E, HI a tangent parallel to EB, (a chord of the circle of *curvature*) that meets ET in I, and let EMH meet EB in G. Take EB to EG, in the fame ratio as the fquare of EI is to the fquare of HI; or, when the fection has a center as in the ellipfis and hyperbola, as the fquare of the femi-diameter O*a* parallel to ET, is to the fquare of the femi-diameter OA parallel to EB; and a circle defcribed upon the chord EB that touches ET, will be the circle of *curvature*.

Fig. III.



When BET is a right angle, or EB is the diameter of the circle of *curvature*, EG will be the axis of the conic-fection, and EB will be the parameter of this axis; and when the point G where the conic-fection cuts EB, and B are on the fame fide of the point E, EMG will be an ellipfis, and EG the greater or leffer axis, according as EG is greater or lefs than EB.

The propofitions relating to the *curvature* of the conic-fections, commonly given by authors, follow without much difficulty from this conftruction.

1. When the chord of *curvature* thus found paffes thro' the center of the conic-fection, it will then be equal to the parameter of the diameter that paffes thro' the point of contact.

2. The fquare of the femi-diameter O*a*, is to the rectangle of half the tranverfe and half the conjugate axis, as the ray of *curvature* CE is to O*a*. And therefore the cube of the femi-diameter O*a*, parallel to the tangent ET, is equal to the folid contained by the radius of *curvature* CE, and the rectangle of the two axes. See *De Moivre*, Mifcel. Analyt. p. 235.

3. The perpendicular to either axis bifects the angle made by the chord of *curvature*, and the common tangent of the conic-fection and circle of *curvature*.

4. The chord of the circle of *curvature* that paffes thro' the focus, the diameter conjugate to that which paffes thro' the point of contact, and the tranfverfe axis of the figure, are in continued proportion.

5. When the fection is an ellipfis, if the circle of *curvature* at E meet O*a* in *d*, the fquare of E*d* will be equal to twice the fquare of O*a*. Hence $Ed : Oa :: \sqrt{2} : 1$. Which gives an eafy method of determining the circle of *curvature* to any point E, when the femi-diameter O*a* is given in magnitude and pofition.

Several other properties of the circle of *curvature*, and methods of determining it when the fection is given; or *vice verfa*, of determining the fection when the circle of *curvature* is given, may be feen in Mr. *Mac Laurin*'s Fluxions, Art. 375.

Variation of CURVATURE. See VARIATION, *Suppl.*

Double CURVATURE is used for the *curvature* of a line, all the parts of which are not situated in the same plane. See the next article.

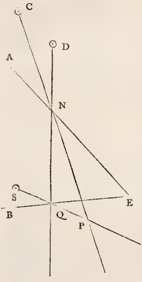
CURVE (*Cycl.* and *Supl.*)—The theory of *curves* is a very considerable branch of the mathematical sciences. Those who are curious of advancing beyond the knowledge of the circle and the conic-sections, and to consider geometrical *curves* of a higher nature, and in a general view, will do well to study Mr. Cramer's Introduction a *L'Analyse des lignes Courbes Algebriques*, printed at Geneva, 4. 1750, which the learned and ingenious author composed for the use of beginners. We have an elegant posthumous work of Mr. Mac Laurin's, printed at the end of his Algebra, and intituled *De Linearum geometricarum proprietatibus generalibus*. The same author at a very early age gave a remarkable specimen of his genius and knowledge in his *Geometria Organica*, and carried these speculations farther afterwards, as may be seen in the theorems he has given us in the Philosophical Transactions. See Dr. *Martin's* Abridg. vol. viii. p. 62, seq.

Curves may be organically described by the rotation of angles, in the manner mentioned in the *Cyclopædia*, which is Sir Isaac Newton's invention.

But there is another general method of describing *curves* by the rotation of rulers or strait lines, instead of angles.

Thus, if instead of angles we use three rulers, DQ, CN, SP, (fig. IV.) which are supposed to revolve about the poles D, C, S, and to cut one another always in three Points N, Q, and P; if any two of these intersections as N and Q, be carried along the given strait lines A E, E B, the third intersection P will describe a conic-section. See *Mac Laurin's* Algebra, p. 346. seq.

Fig. IV.



If you assume any number of poles whatsoever, and make rulers revolve about each of them, and all the intersections but one, be carried along given right lines, that one shall never describe a line of a higher nature than a conic-section. And if instead of rulers you substitute given angles which move on the same poles, the *curve* described will still be no more than a conic-section.

But by carrying one of the intersections necessary in the description over a conic-section, lines of higher orders may be described. *Mac Laurin*, ib. p. 351.

The Rev. Mr. Brakenridge has given us a general method of describing *curves* by the intersection of right lines moving about points in a given plane. See Phil. Transf. N°. 436. Dr. *Martin's* Abridg. vol. viii. p. 58. seq. But the demonstrations are not yet extant, excepting the particular cases demonstrated in his *Exercitatio Geometrica de Curvarum descriptione*, *Lond.* 1733, 4°.

Curves may also be described by the projection, or shadows of other *curves*. Thus the projection, or shadow of the circle upon different planes, will form the rest of the lines of the second order, or conic-sections. This is evident, because the rays of light proceeding from a point out of the plane of a circle, and falling upon the circumference of that circle form a cone, which being cut by the plane upon which the shadow of the circle is projected, the different conic-sections will be formed according to the position of the intersecting plane.

In like manner the projections or shadows of lines of the third order, will form other lines of the third order; and projections or shadows of lines of the fourth order, will form lines of the fourth order, *&c.*

And as the circle, by the projection of its shadow, forms the conic-sections, so the five diverging parabolas among the lines of the third order, will, by their shadows, form and exhibit all the rest of the lines of that order. See *Newton*, enumerat. lin. tertij. ordin. published by Mr. *Jones*, 1711.

This hint of Sir Isaac Newton has been lately pursued and illustrated with great elegance by Mr. Murdoch, in his treatise entitled, *Newtoni Genesis curvarum per Umbras, seu perspectivæ universalis elementa. Lond.* 1746, 8°.

By an accurate enumeration of these projections, Mr. Murdoch finds, that the number of species of the lines of the third order amount to seventy-eight in all.

CURVE *of a double curvature*, or CURVE *having a double curvature*, is used for a *curve*, all the parts of which do not lie in the same plane, that is, such as cannot be described on the same plane.

The *curves* commonly treated of in geometry, are supposed to be described, or to have all their points placed in the same plane; but if a *curve* be supposed to be described on a *curve* surface, in such a manner that all the points of that *curve* cannot lie or be situated in one and the same plane, then will the *curve* so described have a *double curvature*.

Monsieur Clairaut has published an ingenious treatise on *curves of a double curvature*. See his *Recherches sur les Courbes, a double Courbure*, at *Paris*, 4°. 1731. Mr. Euler has also treated this subject in the Appendix to his *Analysis infinitorum*, Vol. II. p. 323, seq.

CUSTARD-*apple*, a name used by some for the *guanabanus*, a species of *anona*. See the article ANONA, *Suppl.*

CUTTLE-*fish*, the English name of the *sepia* of authors, called also the *ink-fish*. See the articles SEPIA and INK-*fish*, *Append.*

CYANEUS, in zoology, the name of a species of *coluber*. See the article COLUBER, *Append.*

CYANUS. This is made a distinct genus of plants by Tournefort, but comprehended under that of *centauria* by Linnæus. See the article CENTAURIA, *Append.*

CYCLIDIA, in zoology, the name used by Dr. Hill for a genus of animalcules of a roundish or elliptic figure, and without any visible limbs or tail. See the article ANIMALCULE, *Suppl.* and *Append.*

CYMBIUM, in natural history, a name given to the *gondola*-shell. See GONDOLA.

CYNOCRAMBE, in botany, a name given to a species of *dog's* mercury. See the article MERCURIALIS, *Append.*

CYNOCTONUM. See ACONITE, *Cycl.*

CYPRESS (*Cycl.* and *Suppl.*)—The timber of the *cypress-tree* is good for making chests, musical instruments, and other utensils. It never cleaves, and is extremely hard and durable; its bitter juice resisting worms and putrefaction. Thus, we are told, that the gates of St. Peter's church at Rome, made of *cypress-wood*, had lasted had six hundred years as fresh as new, when pope Eugenio ordered gates of brass in their stead. Some will have it, that the wood, gophir, of which Noah's ark was made, was *cypress*; which Plato preferred to brass itself, for writing his laws on. Build. Dict. in voc.

Summer-CYPRESS, a name used by some for the *chenopodium* of authors. See the article CHENOPODIUM, *Append.*

CYSTICAPNOS, in botany, a name used by Boerhaave for the *fumaria*, or fumitory. See FUMARIA, *Suppl.*

D.

D.

DAFFODIL, the English name of a genus of plants known among authors by that of *narcissus*. See the article NARCISSUS, *Suppl.*

DAFFODIL-*lilly*, in botany, a name sometimes given to the *lilio-narcissus* of authors. See the article LILIO-*Narcissus*, *Suppl.*

Sea-DAFFODIL, the English name of a genus of plants called by authors *pancratium*. See the article PANCRATIUM, *Append.*

DARE. See the article LEUCISCUS, *Suppl.*

DAIRY, or DAIRY-*house*, in rural architecture, a building where milk, butter, cheese, whey, &c. are made or kept. See the articles MILK, BUTTER, &c. *Suppl.*

DAISY, in botany, the English name of a genus of plants called by authors *bellis*. See the article BELLIS, *Suppl.*

Great DAISY, a name sometimes given to a genus of plants known among authors by that of *leucanthemum*. See the article LEUCANTHEMUM, *Suppl.*

Ox-eye DAISY, a genus of plants called by botanical writers *buphthalmum*. See the article BUPHTHALMUM, *Suppl.*

DAME's *violet*, in botany, a name used by some for the *hesperis* of authors. See the article HESPERIS, *Suppl.*

DAMP is sometimes used in a synonymous sense with moisture. See the article MOISTURE, *Append.*

DANE-*wort*, or dwarf-elder, names sometimes given to a genus of plants called by authors *sambucus*. Seethe article SAMBUCUS, *Suppl.*

DARNEL, the English name given to a genus of plants called by botanical writers *lolium*. See the article LOLIUM, *Suppl.*

DARNEL-*grass*. See the article GRASS, *Append.*

DARSINE, a kind of cinnamon. See the article CINNAMUM, *Suppl.*

DASYPUS, in zoology, the name of a genus of animals called *armadillo* and *tatu-mustelinus*. See the articles ARMADILLO, TATU, and TATUETE, *Suppl.*

DATE (*Cycl.*) — DATE-*tree*, in botany, a name given to several species of palm-tree. See the article PALM, *Suppl.*

DATE-*plum*, the name of a genus of plants called by Linnæus *diospyros*, and by Tournefort *guaiacana*. See the article GUAIACANA, *Suppl.*

DAY-*lilly*, a name used sometimes for the *hemerocallis* of authors. See the article HEMEROCALLIS, *Suppl.*

DEAD-*nettle*, in botany, the English name of a genus of plants called by authors *lamium*. See the article LAMIUM, *Suppl.*

DEADLY *carrot*, the English name of a genus of plants called by authors *thapsia*. See the article THAPSIA, *Suppl.*

DEADLY *nightshade*, in botany, a name given to the *belladonna* of authors. See the article BELLADONNA, *Suppl.*

DEATH-*watch*, in zoology, the English name of the *pediculus* of old wood. It is nearly of the size of the common louse, and the noise, resembling the beating of a watch, is made by the male or female, when wooing each other. *Hill*, Hist. Anim. p. 22.

DECURSIO, in Roman antiquity, See the article CAMPICURSIO, *Suppl.*

DEER (*Suppl.*) — *Rein*-DEER, the English name of an animal of the *deer* kind, called by authors *rangifer*. See the article RANGIFER, *Suppl.*

DENTALIUM, in zoology, the same with *dentale*. See the article DENTALE, *Suppl.*

DERMESTES, the name given by Dr. Hill to a numerous genus of insects commonly confounded with the *scarabæi*, or beetles, from which they are distinguished by having their antennæ of a clavated figure. Vide *Hill*, Hist. Anim. p. 40.

DETTANDER. See the article LEPIDIUM, *Suppl.*

DEVICE, among painters, &c. the same with devise. See the article DEVISE, *Cycl.*

DEVIL *in a bush*, a name sometimes given to a genus of plants called by authors *nigella*. See the article NIGELLA, *Suppl.*

DEVIL's *bit*, in botany, a name used by some writers for the *scabiosa* of others. See the article SCABIOSA, *Suppl.*

DEW-*born*, in the management of cattle, an excessive swelling of the body, proceeding from the greediness of a beast to feed, when put into rank pasture.

This swelling is often so great that the creature runs the utmost hazard of bursting; in which case it should be made to stir much, and purge well: but the proper cure is to bleed the creature in the tail, then putting a nutmeg into an egg, to thrust it down the creature's throat, shell and all; after which by walking him up and down he will soon mend. Rust. Dict. in voc.

DIABETES (*Cycl.* and *Suppl.*) — According to Dr. Mead, the *diabetes* is a disease of the liver, and not of the kidneys, as has been generally thought. See Monit. & Pract. Medic. cap. ix. § 2. and Mechanic Account of Poisons, Essay i. Ed. 4.

The Doctor recommends the following medicine as efficacious in this distemper: take four pints of milk, boil it a little, and turn it with three drachms of alum; four ounces of this should be taken three times a day at least.

This disease happens most frequently to those who, without due exercise, indulge themselves with drinking vinous liquors, and then quench the thirst arising from thence by too great a quantity of such as are cooling.

The *diabetes* seem to have been rare among the antients, since Galen says he saw it but twice only.

DIAGONAL *scale*. See the article PLOTTING *scale*, *Cycl.*

DIALLING (*Cycl.*) — We have a treatise, by Mr. Deparcieux, on this subject, published 1740, recommended in Hist. Acad. Scienc. 1740.

DIAMOND (*Cycl.* and *Suppl.*) — When *diamonds* are fouled with a yellow or brown colour, it is a common practice among jewellers to put them into a fierce fire; this divests them of their colour, without doing them the least sensible injury. *Du Fay*, in Mem. Acad. Paris. 1735.

DIAPENTE, (*Cycl.*) among farriers, a drink made for horses, of gentian, round birthwort, barberries, myrrh, and ivory shavings, of each a like quantity, which are to be pounded separately, and finely searced: this powder, to the quantity of two or three spoonfuls, is mixed with a pint and a half of muscadine, or sack, or, for want of either, with strong ale or beer, and given in fevers, the cough, glanders, surfeits, inflammations, yellows, &c. It is said to purify the blood from all foulnesses, as well as to restrain the overflowing of the gall, working of the spleen, &c. Rust. Dict. in voc.

DIARY, a term sometimes used for a journal, or day-book, containing an account of every day's proceedings. Thus we say *diaries* of the weather, &c.

DIAUGOPHRAGMIA, in natural history, a genus of *septariæ*, whose septa are of spar, with an admixture of crystal, which being sometimes also mixed among the matter of the tali, renders the whole more bright and glossy. See the article SEPTARIÆ, *Suppl.*

Of this genus we have the following species: 1. The ferrugineous red *diaugophragmia*, with brownish yellow partitions. 2. The brownish yellow *diaugophragmium*, with whitish partitions. 3. The blueish white *diaugophragmium*, with strawcoloured partitions. Vide *Hill*, Hist. Foss. p. 522.

DIBBLE, among gardeners, a setting-tool, or forked stick, wherewith plants are set. Rust. Dict. in voc.

DICTAMNUS, in the Linnæan system of botany, the name of a genus of plants called by Tournefort *fraxinella*. See the article FRAXINELLA, *Suppl.*

DIE. See the article DYE, *Cycl.*

DIER. See the article DYER, *Suppl.* and *Append.*

DIESIS (*Suppl.*) — a wrong notation has crept into this article; for E, ♮ E, F, read E, ♯E, F. And so in other places of this article, where ♮ E occurs, substitute ♯ E.

DIET. See the article FOOD, *Suppl.*

One great reason why leprosies, hot scurvies, dysenteries, plagues, pestilential fevers, and the like distempers, formerly so frequent in London, are now so rare, is the change that has been made in the *diet* of the inhabitants. Hopped beer, wine, and spirituous liquors coming into general use, have been a great means of suppressing putrid diseases; greens and fruit are likewise more universally eat, and salted meats make a much less part of *diet* than formerly: to this add the more general consumption of tea and sugar. *Pringle*, Observ. on the Diseases of the army, p. 294, *seq.*

A vegetable *diet* is most proper for scorbutic and hectical persons, and does very well with people who have great exercise; but, in other circumstances, a mixed *diet* of vegetable and animal substances, such as is commonly used, seems best calculated to nourish and preserve the body from decay. *Id. ibid.* p. 366, *seq.*

Irregularities in *diet* are commonly, though unjustly, supposed to have the greatest share in producing military diseases; were this the case, the changes in the weather and seasons would not so remarkably affect their health; the soberest and most regular corps would not be so sickly; different nations in the same camp, living variously, would not be afflicted with the same distempers; nor would there be such an inequality in the numbers of the sick in different years, were the greatest part of diseases owing solely to *diet*.

Against excess, the most common error in *diet*, the smallness of a soldier's pay is a sufficient security: in regard to them, therefore

therefore, the danger lies on the other hand; for, when all are not obliged to eat in messes, some will be apt to lay out their pay upon strong liquors, and to squander away in one day what is but barely a maintenance for a week; but, on the supposition that every man contributes his share to a mess, we may be assured there can be no errors in *diet* of any consequence, whilst almost the whole pay is spent upon common food. As to the abuse of spirits and fruit, soldiers are generally blamed without any foundation; spirits being rather beneficial than hurtful to them, so often exposed to the extremes of heat and cold, to moist and bad air, long marches, wet cloaths, and scanty provisions; and as to fruit, a few disorderly men may rob orchards, which is the only way they can come at fruit, but the camp-diseases are incident to the most regular equally with them. See *Pringle*, Observ. on the Diseases of the army, p. 86, *seq*.

A fundamental rule in regard to the *diet* of soldiers, is to oblige them to eat in messes, by which means their pay will be laid out upon wholesome food. The greatest impediment to messing are the wives and children, who must often be maintained on the soldier's pay; in which circumstances it is not improper food, but the want of it, that may endanger a soldier's health.

The messing being established, there remains only to see that the men be well supplied with bread, and that the markets be so regulated that the traders may have encouragement to come to the camp, and the messes have good provisions at a moderate price; and particularly vegetables, which, during the hot weather, ought to make a great part of the *diet*. In establishing the messes, some regulations might be made with regard to an allowance of spirits, either by stoppages on the pay or otherwise. This is already practised in the navy, and probably for the same reasons that make spirits necessary for soldiers; since in ships men are liable to distempers from moist and corrupted air.

As to the *diet* of officers, their chief rule, in sickly times, is to eat moderately, avoiding all surfeits and indigestion, and using wine in moderation. *Id. ibid.* p. 112, *seq*.

DIFFERENTIAL *equation* is used by some mathematicians for an equation involving infinitesimal differences, or fluxions. Thus the equation $3x^2dx - 2axdx + aydx - 3y^2dy + axdy = 0$ in the foreign notation, or $3xx\dot{x} - 2ax\dot{x} + ay\dot{x} - 3y^2\dot{y} + ax\dot{y} = 0$ in the English notation, is called a *differential equation*. But these equations should consistently with the English or Sir Isaac Newton's notation, be rather called fluxional equations.

Hence some of our mathematicians have applied the term *differential equation* in another sense, to certain equations defining the nature of series's. See the article SERIES, *Append.*

DIFFERENTIAL *method*, in mathematics, an appellation given to a method of describing a curve of the parabolic kind thro' any given number of points.

This method is given by Sir Isaac Newton in the fifth lemma of the third book of his Principles. He distinguishes two cases of this problem; the first, when the ordinates drawn from the given points to any line given in position, are at equal distances from each other; and the second, when these ordinates are not at equal distances. He has given a solution of both cases, but without demonstration in that place, which has since been supplied by himself and others. See his Methodus Differentialis, published with other tracts of the same author, by Mr. Jones, London, 1711; and Stirling's explanation of the Newtonian *differential method* in the Philos. Transf. N°. 362. *Cotes*, de Methodo differentiali Newtoniana, in his works published by Dr. Smith; *Herman*. Phoronomia in Append. p. 389; see also *Le Seur* and *Jacquier*, in their Comment on Sir Isaac's Principles, tom. ii. p. 42, *seq*.

Where it is to be observed, that the methods there demonstrated by some of these authors extend to the description of any algebraic curve through a given number of points, which Sir Isaac, writing to Mr. Leibnitz, mentions as a problem of the greatest use.

By this method, some terms of a series being given, and supposed to be placed at given intervals, any intermediate term may be found nearly; and this therefore gives a method for interpolations. *Newt.* Meth. Differ. prop. v.

Any curvilinear figure may also be squared nearly, of which some ordinates may be found. *Newt. ibid.* prop. vi.

And this method may be extended to the construction of mathematical tables by interpolation. *Ibid.* in schol. p. 100.

The successive differences of the ordinates of parabolic curves, becoming ultimately equal, and the intermediate ordinate required being determined according to Sir Isaac's rules, by these differences of the ordinates, is the reason of this method's being called the *differential method*.

To be a little more particular:

The first case of Sir Isaac's problem amounts to this; a series of numbers, placed at equal intervals being given, to find any intermediate number of that series when its interval from the first term of the series is given.

Subtract every term of the series from the next following, and let the remainders be called first differences; then subtract each difference from the next following, and let these remainders be called second differences; again, let each second difference be subtracted from the next following, and let these remainders be called third differences, and so on: then if A be the first term of the series, d' the first of the first differences, d'' the first of the second differences, d''' the first of the third differences, &c. and if x be the interval between the first term of the series and any term sought, E, that is, let the number of terms from A to E, both inclusive, be $= x + 1$, then will the term sought,

$$E = A + \frac{xd'}{1} + \frac{x.\overline{x-1}}{1.2}d'' + \frac{x.\overline{x-1}.\overline{x-2}}{1.2.3}d''' + \frac{x.\overline{x-1}.\overline{x-2}.\overline{x-3}}{1.2.3.4}d'''' + \&c.$$

which series differs from the Newtonian in this, that the quantities $\frac{d''}{1.2}$, $\frac{d'''}{1.2.3}$, $\frac{d''''}{1.2.3.4}$ here used, signify the same with d'', d''', d'''', used by Sir Isaac.

Hence if the differences of any order become equal, that is, if any of the quantities d'', d''', d'''' become $= 0$, we shall have a finite expression for E, the term sought; it being evident, that the series must terminate when any of the differences d'', d''', &c. become $= 0$.

It is also evident that the coefficients $\frac{x}{1}$, $\frac{x.\overline{x-1}}{1.2}$, &c. of the differences, are the unciæ of the binomial theorem.

A method may be deduced from the foregoing expression, of finding the sums of the terms of such a series. For if we imagine a new series, whereof the first term shall be $= 0$, the second $= A$, the third $= A + B$, the fourth $= A + B + C$, the fifth $= A + B + C + D$, and so on, it is plain that the assigning one term of this series is finding the sum of all the terms A, B, C, D, &c. Now since those terms are the differences of the sums 0, A, $A + B$, $A + B + C$, $A + B + C + D$, and that, by the supposition, some of the differences of A, B, C, D, &c. are $= 0$; it follows that some of the differences of the sums will also be $= 0$; and that whereas in the series $A + xd' + \frac{x.\overline{x-1}}{1.2}d''$, &c. whereby a term was assigned, A represented the first term, d' the first of the first differences, and that x represented the interval between the first term and the last, we are to write 0 instead of A, A instead of d', d' instead of d'', d'' instead of d''', &c. and $x + 1$ instead of x; which being done, the series expressing the sums will be

$$0 + \overline{x+1}.A + \frac{\overline{x+1}.x}{1.2}d' + \frac{\overline{x+1}.x.\overline{x-1}}{1.2.3}d'' + \&c.$$

or

$$\overline{x+1} \times A + \frac{x}{2}d' + \frac{x.\overline{x-1}}{2\ 3}d'' + \frac{x.\overline{x-1}.\overline{x-2}}{2.3.4}d''', \&c.$$

Or again, if the real number of terms of the lines be called z, that is, if $z = x + 1$, or $z - 1 = x$, we shall have the sum of the series

$$= z \times \overline{A + \frac{z-1}{2}d' + \frac{\overline{z-1}.\overline{z-2}}{2.3}d'' + \frac{\overline{z-1}.\overline{z-2}.\overline{z-3}}{2.3.4}d''' + \&c.}$$

See *De Moivre*, Doctr. of Chances, p. 52, 53. Misc. Analyt. p. 153.

For instance, let it be required to find the sum of a series of the squares of the natural numbers $1 + 4 + 9 + 16 + 25 + 36$

Then,

$$\begin{array}{llll}
A = 1 & d' & & \\
 & 3 & d'' & \\
4 & & 2 & d''' \\
9 & 5 & & 0 \\
16 & 7 & & 0 \\
 & & 2 & \\
25 & 9 & & 0 \\
 & & 2 & \\
36 & 11 & &
\end{array}$$

The sum consequently will be,

$$= z \times \overline{1 + \frac{z-1}{2} \times 3 + \frac{\overline{z-1}.\overline{z-2}}{2.3} \times 2}$$

$$= z \times \overline{1 + \frac{3z-3}{2} + \frac{zz-3z+2}{3}}$$

$$= z \times \frac{6 + 9z - 9 + 2zz - 6z + 4}{6}$$

$$= z \times \frac{1 + 3z + 2zz}{6} = \frac{z.\overline{1+z}.\overline{1+2z}}{6} = \frac{6.7.13}{6} = 91$$

This easy example will be sufficient to shew the applications of the rule. Those who are desirous of seeing its use in questions of chance, may consult Mr. *de Moivre*'s Doctrine of chances, p. 53, *seq*. Various other instances of the use of this rule in finding sums of progressions of figurate members, &c. may be seen in Misc. Analyt. p. 154, *seq*.

As to the *differential method*, it is to be observed, that though Sir Isaac and others have treated it as a method of describing an algebraic curve, at least of the parabolic kind, through any number of given points; yet the consideration of curves is not at all essential, though it may help the imagination. The description of a parabolic curve through given points, is the same problem as the assigning of quantities from their given differences, which may always be done by algebra, and by the

the reſolution of ſimple equations. See Mr. *Stirling*'s Methodus Differentialis, p. 97. This ingenious author has treated fully of the *differential method*, and ſhewn its uſe in the ſolution of ſome very difficult problems.

DIFFERENTIAL *ſcale*, in algebra, is uſed for the ſcale of relation ſubtracted from unity. See the article *Recurring* SERIES, *Append.*

DIGESTION, how promoted by fermentation. See the article FERMENTATION, *Append.*

DIMNESS *of ſight*, in horſes. Seethe article SIGHT, *Append.*

DISAFFORESTED, the ſame with deafforeſted. See the article DEAFFORESTED, *Cycl.*

DISBUDDING *of trees*, is the taking away ſuch branches or ſprigs, newly put forth, as are ill placed. Dict. Ruſt. in voc.

DISBURDENING *of fruit-trees*, is the taking off part of the leaves and fruit, when too numerous, that thoſe which remain may grow the larger. Dict. Ruſt. in voc.

DISCLOSED, a term uſed for chickens or hawks newly hatched, or juſt peeping through the ſhells; alſo for buds or flowers juſt blown. Dict. Ruſt. in voc.

DISEASES *of ſoldiers*. See the article SOLDIERS, *Append.*

DISEMBARK, in the ſea-language, ſignifies to land goods from on ſhip-board. Dict. Ruſt. in voc.

DISPLANTING, among gardeners, is the plucking up a tree or plant out of the ground. Dict. Ruſt. in voc.

DISPLANTING *ſcoop*, an inſtrument for taking up plants with earth about their roots. *Id. ibid.*

DISSEPIMENTUM, among botaniſts, the thin ſeptum ſeparating the cells of the fruits of plants.

DISTAFF, an inſtrument about which flax is tied, in order to the ſpinning it.

DISTAFF-*thiſtle*, a name ſometimes given to the *atractylis* of authors. See the article ATRACTYLIS, *Append.*

DITTANDER, in botany, the Engliſh name of a genus of plants, called by authors *lepidium*. See the article LEPIDIUM, *Suppl.*

DITTANY (*Suppl.*) — *Baſtard*-DITTANY, the Engliſh name of a genus of plants called by authors *Pſeudo-dictamnus*. See the article PSEUDO-*dictamnus*, *Suppl.*

DOCK (*Suppl.*) in botany, the Engliſh name of a genus of plants called by authors *lapathum*. See the article LAPATHUM, *Suppl.*

DOCK, among ſportſmen, denotes the fleſhy part of a boar's chine, between the middle and the buttock.

DOCTOR *Tinkar's weed*, in botany, a name given to a genus of plants called by authors *trioſteoſpermum* and *lonicera*. See the article LONICERA, *Append.*

DOE, the female of the buck-kind. See the article BUCK, *Cycl.* and *Suppl.*

DOG, (*Suppl.*) the Engliſh name of a very numerous genus of animals. See the articles DOG and CANIS, *Suppl.*

DOG's *bane*, in botany, the Engliſh name of a genus of plants called by authors *apocynum*. See the article DOG's *bane*, *Suppl.*

DOG-*berry-tree*, a name given to the *cornus*, or cornel-tree. See the article CORNUS, *Suppl.*

DOG-*days*, the ſame with canicular days. See the article CANICULAR, *Cycl.*

DOG's *graſs*, in botany. See the article GRASS, *Append.*

DOG's *mercury*, in botany, a name given to a ſpecies of *mercurialis*. See the article MERCURIALIS, *Suppl.*

DOG's *ſtones*, in botany, a name by which ſome call the *orchis*. See the article ORCHIS, *Suppl.*

DOG's *tongue*, in botany, the Engliſh name of a genus of plants called by authors *cynogloſſum*. See the article CYNOGLOSSUM, *Suppl.*

DOG's *tooth-ſhell*, the Engliſh name of a ſpecies of *dentalium*. See the article DENTALIUM, *ſupra*.

DOG-*wood*, a name ſometimes given to the *cornus*, or cornel-tree. See the article CORNUS, *Suppl.*

DOG-*wood of Jamaica*, the name by which ſome authors call *robinia*, a genus of plants. See the article ROBINIA, *Suppl.*

DOG-*wood of Virginia*, a name ſometimes given to a ſpecies of *laurus*, or bay-tree. See the article LAURUS, *Suppl.*

DOGGS, machines of iron for burning wood on; alſo hooks fixed in large timbers, for drawing them with horſes. *Blanckley*, Nav. Expoſitor, p. 51.

DOOLS, a term uſed in ſeveral parts of the kingdom for balks, or ſlips of paſture, left between the furrows of ploughed lands. Dict. Ruſt. in voc.

DORIA, in botany, the name uſed by Dillenius for the *ſolidago*, or *virga aurea* of other botaniſts. See the article VIRGA *aurea*, *Suppl.*

DORMOUSE, the Engliſh name of a genus of animals called by authors *ſorex*. See the article SOREX, *Suppl.*

DOTTEREL (*Suppl.*) — For MAINELLUS, referred to in this article, read MORINELLUS.

DOUBLE (*Cycl.* and *Suppl.*) — A hare is ſaid to *double* when ſhe keeps in plain fields, and winds about to deceive the hounds. Dict. Ruſt. in voc.

DOUBLE-*leaf*, or TWYBLADE, in botany, names given by ſome to the *ophris* of authors. See the article OPHRIS, *Suppl.*

DOUBLE-*tongue*, a name ſometimes given to the *ruſcus*, or butcher's broom. See the article RUSCUS, *Suppl.*

DOUCETS, or DOULCETS, among ſportſmen, denote the teſtes of a deer or ſtag. Dict. Ruſt. in voc.

DOVE's *foot*, in botany, a name ſometimes uſed for the *geranium*, or crane's bill of authors. See the article GERANIUM, *Suppl.*

DOWN, in natural hiſtory, denotes the fineſt feathers of geeſe, with which beds, pillows, &c. are ſtuffed: alſo the cottony ſubſtance growing on the tops of thiſtles, and other plants.

DOWNY, ſomething partaking of the nature, or abounding with down: thus, ſome leaves, fruit, &c. are found covered with a *downy* matter.

DRABA, in the Linnæan ſyſtem of botany, makes a diſtinct genus of plants, which have no ſtyle, and whoſe fruit is an oval pod of an oblong figure.

C. Bauhine calls it the *burſa paſtoris minor*.

DRABA is alſo a name by which ſome ſpecies of two very diſtinct genuſes of plants, not only from the former, but from each other, are ſometimes called; thoſe are the *lepidium* and *heſperis* of botanical writers. See the articles LEPIDIUM and HESPERIS, *Suppl.*

DRAFF, a term uſed in many parts of the kingdom for the waſh given to hogs: alſo for the grains of brewers uſually given to cows.

DRAGG (*Suppl.*) — *Draggs* are alſo a kind of baſket uſed in clearing the aprons of ſhip-docks of filth. *Blanckley*, Nav. Expoſ. p. 51.

DRAGON (*Suppl.*) — *Sea*-DRAGON, in ichthyology, the Engliſh name of the *cottus*, with the ſecond back-fin white. See the article COTTUS, *Suppl.*

DRAGON-*tree*, a name ſometimes uſed for the palm-tree. See the article PALM, *Suppl.*

Wild DRAGON, a name ſometimes given to *abrotanum*, or ſouthernwood. See the article SOUTHERNWOOD, *Suppl.*

DRAW-*net*, a kind of net for taking the larger ſort of wild fowl, which ought to be made of the beſt packthread, with wide meſhes: they ſhould be about two fathoms deep and ſix long, verged on each ſide with a very ſtrong cord, and ſtretched at each end on long poles.

It ſhould be ſpread ſmooth and flat upon the ground, and ſtrewed over with ſedge, graſs, or the like, to hide it from the fowl; and the ſportſman is to place himſelf in ſome ſhelter of graſs, fern, or ſome ſuch thing. Dict. Ruſt. in voc.

DRAW-*gear*, in huſbandry, any kind of harneſs for drawing a waggon or other carriage.

DRAWING *of teeth*, or *Tooth*-DRAWING, in ſurgery. See the article TOOTH-*drawing*, *Suppl.*

DRAY, a name given by ſportſmen to ſquirrel-neſts, built in the tops of trees. See the article SQUIRREL, *Suppl.*

DRAY is alſo a kind of cart uſed by brewers for carrying barrels of beer; alſo a ſledge drawn without wheels. Dict. Ruſt. in voc.

DREDGE, or DREG, a term uſed by the farmers for oats and barley mingled together. Dict. Ruſt. in voc.

DREDGERS, a term uſed in the admiralty-courts for the fiſhers for oyſters. Dict. Ruſt. in voc.

DRIFFLAND, the ſame with droffland. See the next article.

DROFFLAND, or DRIFFLAND, in our old cuſtoms, a yearly payment made by ſome tenants to their landlords, for driving their cattle through the manor to fairs and markets. Dict. Ruſt. in voc.

DROP-*wort*, the Engliſh name of a genus of plants called by authors *filipendula*. See the article FILIPENDULA, *Suppl.*

Water-DROP-*wort*, the Engliſh name of a genus of plants called *œnanthe* by authors. See the article ŒNANTHE, *Suppl.*

DROPSY (*Suppl.*) — *Dropſies*, attended with anaſarcous ſwellings, are not to be cured with purging alone, nor by ſoap, nor mercurials; but chiefly by the lixivial ſalts, either in the form of broom-aſhes, ſalt of wormwood, or ſalt of tartar. The common method is this; about thirty or forty grains of ſalt of tartar is diſſolved in an infuſion of wormwood, to which is added ſpirit of juniper; and this mixture is to be given in three doſes, and repeated daily. Beſides this it may be proper to give the patient, once in four or five days, half a dram of *pilulæ ex coloquintida cum aloe*, as a purge; and toward the decline of the diſeaſe, ſome common chalybeate. The diureſis may alſo be promoted by ſwallowing garlick, or muſtard-ſeed. See *Pringle*, Obſerv. on Diſeaſes of the Army, p. 213.

DROSERA, in the Linnæan ſyſtem of botany, the name of a genus of plants called by Tournefort *ros ſolis*. See the article ROS *ſolis*, *Suppl.*

DRUM (*Cycl.*) — *Mire*-DRUM, the name by which the bittern is called in ſeveral parts of the kingdom. See the article BITTERN. *Suppl.*

DUBBING *of a cock*, a term uſed by cock-maſters for the cutting off a cock's comb and wattles. Dict. Ruſt.

DUCK's *foot*, in botany, the Engliſh name of a genus of plants known among authors by thoſe of *podophyllum* or *anapodophyllum*. See the article ANAPODOPHYLLUM, *Suppl.*

DUCK-*weed*, or DUCK's *meat*, the Engliſh name of a genus of plants called by authors *lemna*. See the article LEMNA, *Append.*

DUMBNESS (*Cycl.*) — When this diſorder ariſes from deafneſs, it ſometimes admits of a cure. See the Phil. Tranſ. N°. 61. where Dr. Wallis gives an account of two perſons deaf and dumb, who were taught to underſtand and ſpeak a language. And in N°. 245. the doctor gives an account of his method for this purpoſe. This art is now practiſed ſucceſsfully in London by the ingenious Mr. Baker.

DWALE, a name fometimes given to the deadly nightfhade, or *belladonna*. See the article BELLADONNA, *Suppl.*

DYER's *broom*, in botany, the name of a fpecies of *geniſta*. See the article GENISTA, *Suppl.*

DYNA, in commerce, a kind of Eaft-Indian coin, worth about thirty Shillings of Englifh money.

DYSENTERY (*Cycl.* and *Suppl.*) — The *dyfentery* is owing to caufes little different from thofe which produce the bilious or putrid fever. Accordingly it is agreed on all hands, that it proceeds chiefly from two caufes, different in appearance, but in effect the fame; one from acrimony generated within the body, and the other from foul fteams, which being received into it, act as a ferment, and fuddenly produces the fame diforder that arifes more flowly from an internal caufe.

As to the acrimony, it appears to be of the putrid kind, the *dyfentery* being moft frequent in hot, clofe, and moift feafons, when bodies are moft fubject to putrefaction; and, befides, prevails chiefly among thofe of a fcorbutic habit, or the meaneft and pooreft people, who, from foul air, bad diet, and naftinefs, are moft liable to putrid difeafes.

There is likewife an old obfervation, that fuch feafons as produce moft flies, caterpillars, and other infects (the increafe whereof depends fo much upon heat, moifture, and confequently upon corruption) have likewife been the moft productive of *dyfenteries*.

Laftly, it is beyond difpute, that the infection is communicated by putrid effluvia from the bodies, but more efpecially the fæces of thofe who are ill of the diftemper. See *Pringle*, Obfervations on the Difeafes of the Army, p. 224, *feq.*

This difeafe is the fame in camps as in other places; its greater fatality in the former arifing more from want of neceffaries than from any extraordinary virulence in the *dyfentery* itfelf.

Phyficians diftinguifh three ftates of the *dyfentery*; the firft, when recent, the fecond, when it has continued fome time, and has much impaired the ftrength, weakened the tone of the inteftines, and abraded their villous coat; and the third, when, either from the putrid fumes within the body, or the foul air of an hofpital, a malignant fever is joined, and a mortification threatened.

In the firft ftage bleeding is proper, though not in the fubfequent ones; alfo vomiting with *ipecacuhana*, in fmall quantities, and repeated feveral times. *Vitrum ceratum antimonii* is alfo recommended as the moft efficacious emetic for relieving the ftomach and bowels, provided it be given in the beginning of the diftemper. After vomiting, a purge of rhubarb, to which are added a few grains of falt of wormwood, may be given. In winter, indeed, and vernal fluxes, bleeding and rhubarb have been found fufficient, without vomits. In regard to diet, the common practice is to confine the patient in the beginning to rice-gruel, panado, mutton-broth, and the like; and for drink rice or barley-water, or the white decoction are recommended. In the convalefcent ftate they may be allowed meat, but no fmall beer, and never any milk unlefs diluted with lime-water. *Pringle*, Obferv. on the Difeafes of the Army, p. 230, *feq.*

In the fecond ftage, the fame diet, with fmall dofes of the bark, to which has been added the extract of logwood, or the *tinctura Japonica*, is recommended.

The *dyfentery*, after a feeming cure, is apt to recur upon any cold, or error in diet: however, it is to be obferved, that, for the moft part, relapfes are not attended with fuch acrimony as at firft. When relapfes are apprehended, or the cure imperfect, the patient muft ftill ufe a foft mucilaginous diet, and continue to take fome mild aftringent; which laft intention may be anfwered by lime-water, given to a pint a day, and foftened with half that quantity of boiled milk. Sometimes fmall dofes of the bark have been no lefs effectual. *Id. ibid.*

Gripes always attend the *dyfentery*, and are relieved by opiates, by fomenting the belly, and by drinking chamemile-tea; for, carminatives, in this cafe, inftead of mitigating, increafe the pains. The tea produces this effect not only by its antifpafmodic but antifeptic virtue. The fomentations, which are made of herbs, adding fome fpirits, muft be frequently repeated; and when thefe are found ineffectual, the pains may be relieved with a blifter, or only a warm plafter with a fourth or fifth part of the *emplaftrum epifpafticum* added to it.

As to the third ftage of this diftemper, it coincides with the malignant or hofpital fever. See the article HOSPITAL *fever*, *Append.*

DYTISCUS, in zoology, the name of a genus of four-winged flies, the antennæ of which are flender and fetaceous. They have likewife feet formed for fwimming, and their habitation is generally in the water, whence they have been called in Englifh, water-beetles.

E.

EADISH, among farmers. See the article EDDISH, *Append.*

EAGLE (*Suppl.*) — *Sea*-EAGLE, in ichthyology, the Englifh name of the *aquila marina*, a fpecies of *raja*. See the articles RAJA and AQUILA *marina*, *Suppl.*

EAGLE-*bat*, the Englifh name of an animal of the bat-kind. See the article VESPERTILIO, *Suppl.*

EAGLE-*flower*, the name by which fome call the *balfamina*, a diftinct genus of plants. See the article BALSAMINA, *Suppl.*

EAGRASS. See the article EDDISH, *Append.*

EAR-*wig*, *forficula*, a well known infect, very fwift, with two fmall horns on its head, and fix feet; its tail is forked; its body is about the thicknefs of a fmall worm, and very fmooth.

It is a very troublefome creature, frequently introducing itfelf into the ears, and caufing a great deal of pain by its biting: it likewife burrows in other parts of the body, which it bites in the fame manner.

The dried powder of *ear-wigs* is efteemed good for deafnefs; and the oil prepared from them, in convulfions and fpafms. Vide *Lemery*, Dict. des Drog. *in voc. Forficula.*

EARNING, or YEARNING, a name ufed in feveral parts of the kingdom for rennet.

EARSH. See the article EDDISH, *Append.*

EARTH (*Suppl.*) — *Fuller's* EARTH, *terra fullonica*, the Englifh name of a fpecies of marle. See the articles MARLE and FULLER's*earth*, *Suppl.*

EARTH-*nut*, in botany, the Englifh name of a genus of plants called by authors *bulbocaftanum*. See the article BULBOCASTANUM, *Suppl.*

EARTH-*nut-peas*, in botany, the name of a genus of plants called by authors *lathyrus*. See the article LATHYRUS, *Suppl.*

African EARTH-*nut-peas*, in botany, a name fometimes given to the *arachis* of authors. See the article ARACHIS, *Append.*

ECHINI *marini*. See the article CENTRONIA, *Append.*

ECLIPTIC (*Cycl.*) — The obliquity of the *ecliptic* is not conftant. The mean obliquity is, according to Dr. Bradley, 23° 28′ 30″. Whether this obliquity be the refult only of the nutation of the earth's axis from the caufe mentioned in the article STAR, *Append.* or whether there be befides fome caufe producing a gradual approach of the *ecliptic* to the equator, either at the rate of 1′ in 100 years, or at any other rate, is not yet afcertained.

EDDISH, or EADISH, among farmers, denotes the latter pafture, or grafs, which comes after mowing or reaping, and is otherwife called eagrafs, earfh, and etch.

EEL-*backed*, a term ufe by dealers in horfes, for thofe which have black lifts along their backs.

EFFLUVIA, (*Suppl.*) in medicine, are affigned as the caufe of various diforders, efpecially of the contagious kind. Thus, when a confiderable quantity of putrid *effluvia* has been admitted into the blood, befides acting thereupon flowly, by way of inquinamentum, or ferment, they feem immediately to affect the nerves, and thereby to bring on fome extraordinary diforder of the whole frame. Hence arife fpafms, obftructions, palpitations, a high degree of fever, or a languid circulation, chillnefs, or intenfe heat, and a variety of contrary fymptoms, according to the different affection of the nerves. To putrid *effluvia* is likewife owing the jail diftemper, which is the fame with the hofpital fever. See the article HOSPITAL-*fever*, *Append.*

Some, indeed, unacquainted with the dangerous nature of putrid *effluvia*, have afcribed the mortality occafioned by them, to a cold, or other the like caufe; but, in this, they have entirely miftaken the caufe. Vide *Pringle*, Obferv. on the Difeafes of the Army, p. 186, *feq.*

Effluvia iffuing from corrupted fubftances chiefly confift of the phlogifton or fulphur principle, fince they fo readily unite with, and volatilize acids, as appears from the increafe and particular change of the fmell. But it is proper to remark, that from a fimple putrid fubftance the phlogifton does not arife alone, but combined with the faline parts of the body; for this principle, when fingle, is perhaps imperceptible to the fmell; and, when divefted of thefe falts, is never, fo far as is known, peftilential: fo that the deleterious particles of rotten fubftances

ſubſtances ſeem to conſiſt of a certain combination of the ſulphureous with the ſaline principle, which united, not only become the moſt irritating ſtimuli to the nerves, but act upon the humours as a putrid ferment in promoting their corruption. *Id. ibid.* p. 385. See the article MALIGNANT, *Append.*

EGG *(Suppl.)* — *Sea*-EGG, the Engliſh name of a ſpecies of *centronia*. See the article CENTRONIA, *Suppl.*

EGLANTINE, in botany, a name given to the ſweet-briar, a ſpecies of roſe. See the article ROSE, *Suppl.*

EGLECOPALA, a name ſometimes uſed for the ſtony, blueiſh marle. See the article MARLE, *Suppl.*

ELAEAGNON, or ELAEAGNON *Theophraſti*, in botany. See the article AGNUS *caſtus*.

ELATER, the name of a genus of four-winged flies with ſetaceous antennæ; which, when laid on their backs, have a power of leaping with great force and agility.

ELATERIUM, in botany, a name uſed by ſome for the *momordica* of others. See the article MOMORDICA, *Suppl.*

ELDEN, a word uſed in ſome parts of the kingdom for fuel. Dict. Ruſt.

ELDER-*tree*, *alnus*, in botany, the Engliſh name of a genus of plants. See the article ALNUS, *Suppl.*

Dwarf-ELDER, in botany, a name given ſometimes to the *ſambucus* of authors. See the article SAMBUCUS, *Suppl.*

Marſh-ELDER, or *Water*-ELDER, the name by which ſome writers call the OPULUS. See the article OPULUS, *Suppl.*

Spaniſh-ELDER, the Engliſh name of a genus of plants called by authors *Saururus*. See the article SAURURUS, *Suppl.*

ELEPHAS, the elephant, in zoology. See the article ELEPHANT, *Suppl.*

ELICHRYSUM, in botany, the name of a genus of plants, called in Engliſh *goldy-lock*. See the article ELYCHRYSUM, *Suppl.*

ELICHRYSUM, in botany, is alſo a name given by Tournefort to the *gnaphalium*, or cut-weed, of Linnæus. See the article GNAPHALIUM, *Suppl.*

EMPHEREPYRA, in natural hiſtory, a genus of *ſiderochita*, compoſed of various cruſts, or coats, ſurrounding a nucleus of the ſame matter and ſtructure with themſelves. See the article SIDEROCHITA, *Append.*

Of this genus we have the following ſpecies: 1. The very hard ſmooth *empherepyra*, with brown, yellow, and red cruſts. 2. The hard, glittering, rough *empherepyra*, with brown, purple, and deep yellow cruſts. 3. The ſoft browniſh-yellow *empherepyra*. 4. The ſoft *empherepyra*, with ſhining brown and duſky green cruſts. 5. The ſoft *empherepyra*, with lucid, whitiſh, yellowiſh, and red cruſts. *Hill*, Hiſt. Foſſ. p. 532, *ſeq.*

EMPRIMED, among ſportſmen, a term applied to a hart when he forſakes the herd. Dict. Ruſt. in voc.

ENCAMPMENT. See the article CAMP, *Append.*

ENCEPHALOS, ἐγκέφαλος, in phyſiology, is uſed for the brain. *Caſtel.* Lexic. Medic. See the article BRAIN, *Cycl.*

ENCHANTER's *nightſhade*, a name ſometimes given to a genus of plants, called by authors *circæa*. See the article CIRCÆA, *Suppl.*

ENCHELIDES, in zoology, the name of a genus of animalcules, containing the capillary eels, whether of pepper-water, vinegar, &c. See the articles ANIMALCULE, *Append.* and PEPPER, VINEGAR, and EEL, *Suppl.*

ENDEW, in falconry, is ſaid of a hawk that digeſts her meat ſo well, that ſhe not only diſcharges her gorge of it, but even cleanſes her pannel. Dict. Ruſt.

ENDIVE, *endivia*, in botany, a name given to ſeveral ſpecies of *cichorium*. See the article CICHORIUM, *Suppl.*

ENGOUTED, in falconry, is ſaid of a hawk's feathers when they have black ſpots in them. Dict. Ruſt.

ENHYDRIS, in zoology, a name given by the antient Greeks to the otter, from its living in the water. See the article LUTRA, *Suppl.*

ENHYDRI, in natural hiſtory, a genus of cruſtated ferrugineous bodies, formed into large, and in great part, empty caſes, encloſing a ſmall quantity of an aqueous fluid.

Of this genus we have only two ſpecies: 1. The thick ſhelled *enhydrus*, with black, reddiſh, brown, and yellow cruſts. 2. The thinner ſhelled *enhydrus*, with yellowiſh, brown, and purpliſh cruſts. *Hill*, Hiſt. Foſſ. p. 544.

ENSEELED, in falconry, a term uſed for a hawk which has a thread drawn through her upper eye-lid, and made faſt under her beak, to take away the ſight. Dict. Ruſt.

ENTERING *of a hawk*, among falconers, denotes her being allowed to kill for the firſt time. Dict. Ruſt.

ENTERING *of hounds*, is the inſtructing them how to hunt. Dict. Ruſt. See the article ENTRANCE, *Suppl.*

ENTERMEW, in falconry. See the article FALCON.

ENTERMEWER, among falconers, a hawk which changes the colours of her wings by degrees. Dict. Ruſt.

ENTERSELE, in architecture, a kind of ſmall ſtory, ſometimes called a *mezanine*. See the article MEZANINE, *Cycl.*

ENTRY, among ſportſmen, a term by which ſome call thoſe places or thickets, through which deer are found lately to have paſſed. Dict. Ruſt.

EPILOBIUM, in the Linnæan ſyſem of botany, the name of a diſtinct genus of plants, called by Tournefort *chamænerium*. See the article CHAMÆNERIUM, *Suppl.*

EQUATION *(Suppl.)* — Dr. Halley's method for the ſolution of *equations* is thus:

Let the root z of any *equation* be taken equal to $a \pm e$; where a is ſuppoſed to be taken near to the true value. Then from the quantity $a \pm e$ let all the powers of z found in the propoſed *equation*, be formed; and to theſe let their reſpective coefficients be prefixed. Let the power to be reſolved be ſubducted from the ſum of the parts of the firſt column where e is not found; and let the difference be $\pm b$. Then take the ſum of all the coefficients of e in the ſecond column, which call s: and having added all the coefficients of ee, the ſum of which is called t; the root ſought z, will, in a rational form, $= a \pm \frac{sb}{-ss \pm tb}$; and, in an irrational form, $= a$ $\frac{\mp \frac{1}{2}s \mp \sqrt{\frac{1}{4}ss \mp bt}}{t}$

For inſtance, let it be propoſed to find a root of the *equation* $z^4 - \underset{d}{3}zz + \underset{c}{75}z = 10000$, where 10000 is the reſolvend.

For a firſt ſuppoſition let $a = 10$; we ſhall therefore have the *equation*

$$
\begin{aligned}
&z^4 = a^4 \pm 4a^3e + 6a^2ee \pm 4ae^3 + e^4 \\
&-dzz = -da^2 \pm dae - dee \\
&+cz = +ca \pm ce \\
&= 10000 \pm 4000e + 600e \pm 40e^3 + e^4 \\
&- \quad 300 \pm \quad 600e - \quad 3e \\
&+ \quad 750 \pm e \quad 75e \\
&- 10000 \\
\hline
&+450 \mp \underset{s}{4015}e + \underset{t}{597}ee \mp \underset{u}{40}e^3 + e^4 = 0
\end{aligned}
$$

The ſigns $+$ and $-$ with reſpect to e and e^3 are left doubtful, till it be known whether e be affirmative or negative; in which there is ſome difficulty, as in *equations* having ſeveral roots, the *homogenea comparationis*, as they are called, are often increaſed by diminiſhing a, and on the contrary diminiſhed by increaſing a. But the ſign of e is determined by the ſign of the quantity b; for the reſolvend being ſubtracted from the *homogeneum* formed from a, the ſign of se, and therefore of the parts prevailing in its compoſition, will always be contrary to the ſign of the difference b. Hence it will appear whether e be affirmative or negative, or whether a has been aſſumed greater or leſs than the true root. But e is always equal to $\frac{\frac{1}{2}s - \sqrt{\frac{1}{4}ss - bt}}{t}$, as often as b and t have the ſame ſign; but when they are connected with different ſigns, e becomes $= \frac{\sqrt{\frac{1}{4}ss + bt} - \frac{1}{2}s}{t}$. After that e has been found to be negative, e, e^3, e^5, &c. muſt be made negative in the affirmative members of the *equation*; and affirmative in the negative members, that is, they muſt be writ with a contrary ſign: but if e be affirmative, then muſt e, e^3, e^5, &c. be affirmative in the affirmative members, and negative in the negative.

In the propoſed example we have 10450 inſtead of the reſolvend 10000, or $b = +450$; from whence it appears that a was taken greater than the true root, and conſequently that e is negative. Hence the *equation* becomes $10450 - 4015e + 597ee - 4e^3 + e^4 = 10000$; that is, $450 - 4015e + 597ee = 0$. Therefore, $450 = 4015e - 597ee$, or $b = se - tee$; the root of which is $e = \frac{\frac{1}{2}s - \sqrt{\frac{1}{4}ss - bt}}{t}$, or $\frac{s}{2t} - \sqrt{\frac{ss}{4tt} - \frac{b}{t}}$, that is, in the preſent caſe, $e = \frac{2007\frac{1}{2} - \sqrt{3761406\frac{1}{4}}}{597}$, from whence the approximated root is found to be $= 9.886$. Now this root being taken for a ſecond ſuppoſition, and the operation being repeated we ſhall have $a + e = z = 9.88626039364 95$, which is very exact, ſcarcely exceeding the truth by above 2 the laſt figure.

This is ſufficient to give a notion of Dr. Halley's method: thoſe who deſire more examples, and farther inſtructions, may conſult the Philoſ. Tranſ. N°. 210. or Lowthorp's Abridg. vol. i. p. 85, *ſeq.*

Differential EQUATION. See the article DIFFERENTIAL, *Append.*

ERIFFS, a name given to canary birds about two years old. See the article CANARY, *Suppl.*

ERIGERON, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by other botaniſts *conyzoides*, *conyzella*, and *ſenecionis ſpecies*; and by us the great ſweet fleabane.

The characters of this genus, according to Linnæus, are theſe: the common cup is oblong, cylindric, imbricated, and beſet with ſubulated ſquamæ; the compoſite flower is radiated; the proper hermaphrodite ones are of an infundibuliform ſhape, the limb being divided into five ſegments; and the proper female ones linear, ſubulated, erect, and moſt frequently entire; the ſtamina of the hermaphrodite flowers are five very ſhort capillary filaments, the antheræ, cylindraceo-tubuloſe; the germen of the piſtil is extremely ſmall; the ſtyle is filiform; the ſtigmata are two, oblong and revolute; there is no

no pericarpium; the feeds are fmall, oblong, and covered with long down; the receptacle is naked and plane. See *Linnæi* Gen. Plant. p. 400.

The fpecies of *erigeron* are thefe: 1. The fingle lateral flowered *erigeron*, with fquamofe cups. 2. The toad-flax-leaved annual Canada *erigeron*, called by fome *conyza*. 3. The coronopus-leaved *erigeron* of America. 4. The ovato-lanceolate-leaved camphorated *erigeron*. 5. The fhort leaved *erigeron*. 6. The ramofe, long leaved, fmall flowered *erigeron*. 7. The larger flowered *erigeron*. *Hill*, Hift. Plant. p. 575.

ERINGO, in botany, the Englifh name of the *eryngium*, a diftinct genus of plants. See the article ERYNGIUM, *Suppl.*

ERUCA *marina grifeo-fufca*, a name fometimes given to the *aphrodita*, a genus of fea-infects. See the article APHRODITA, *Append.*

ETCH. See the article EDDISH, *Append.*

ETCH-*crop*, among farmers, the third crop of corn upon land newly broken up. Ruft. Dict. in voc.

ETERNAL *flower*, the Englifh name of two different genufes of plants, the *gnaphalium* and *xeranthemum*. See the articles GNAPHALIUM and XERANTHEMUM, *Suppl.*

EVERLASTING-*pea*, the name of a genus of plants, called by authors *lathyrus*. See the article LATHYRUS, *Suppl.*

EUONYMOIDES, in botany, a name ufed by fome for the *celaftrus* of Linnæus. See the article CELASTRUS, *Append.*

EUPHONIC *accent*. See the article ACCENT, *Cycl.*

EWE, the Englifh name of the female of the fheep-kind. See the articles SHEEP and OVIS, *Suppl.*

EXAGON, the fame with hexagon. See the article HEXAGON. *Suppl.*

EXERCISE (*Cycl.*) — Proper *exercife* conduces much to the health of foldiers in camp.

The *exercife* of a foldier may be confidered under three heads; the firft relating to his duty, the fecond to his living more commodioufly, and the third to his diverfions.

The firft, confifting chiefly in the *exercife* of his arms, will be no lefs the means of preferving health, than of making him expert in his duty; and frequent returns of this, early and before the fun grows hot, will be made more advantageous than repeating it feldom, and ftaying too long out at a time; for a camp affording little convenience for refrefhment, all unneceffary fatigue is to be avoided.

As to the fecond article, cutting boughs for fhading the tents, making trenches round them for carrying off the water, airing the ftraw, cleaning their cloaths and accoutrements, and affifting in the bufinefs of the mefs, ought to be no difagreeable *exercife* to to the men, for fome part of the day.

Laftly, as to diverfions, the men muft be encouraged to them either by the example of their officers, or by fmall premiums to thofe who fhall excel in any kind of fports, as fhall be judged moft conducive to health; but herein great caution is neceffary, not to allow them to fatigue themfelves too much, efpecially in hot weather, or fickly times; and above all, that their cloaths be kept dry, wet cloaths being the moft frequent caufe of camp-difeafes.

EXPEDITIONS *in winter*. See the article CAMPAIGN, *Append.*

EYE (*Suppl.*) — EYE-*flaps*, thofe pieces of leather which covers the *eyes* of coach-horfes. Ruft. Dict. in voc.

EYE-*brow*, in architecture, the fame with lift, or fillet. See the article FILLET, *Cycl.*

EYESSE, in falconry. See the article FALCON, *Suppl.*

F.

FABA *Græca*, in botany, a name fometimes given to the *guiacana* of Tournefort. See the article GUIACANA, *Suppl.*

FAGG, in the fea language, denotes the end of thofe ftrands which do not go through the tops, when a cable or rope is clofed. *Blanckley*, Nav. Expof. p. 54.

FAINTING. Some people are extremely apt to *faint* during the operation of bleeding. In all cafes, therefore, where plentiful bleeding is indicated, it is beft to do it in bed, in order to prevent the patient's *fainting*. It is likewife obferved, that a perfon will bear the lofs of a much greater quantity of blood, if the ftream is fmall, than by a large orifice, which fome think neceffary for making a more fpeedy revulfion. *Pringle*, Obferv. on the Difeafes of the Army, p. 131. See the article LIPOTHYMIA, *Suppl.*

FAKE, in the fea-language, one round or circle of a cable: this is otherwife called quoil. *Blanckley*, Nav. Expof. p. 54.

FAN (*Suppl.*)—FAN is alfo an inftrument ufed in winnowing corn.

FAR, in horfemanfhip, a term ufed to denote any part of the horfe's right fide: thus the *far*-foot, *far*-fhoulder, &c. is the right foot, right fhoulder, &c.

FASHIONS, a name fometimes ufed for the farcin. See the article FARCIN, *Cycl.*

FAT (*Cycl.*)—The antients ufed the terms *adeps*, *pinguedo*, *fevum*, indifferently: but modern anatomifts have found it convenient to eftablifh a diftinction; according to thefe *pinguedo* is made the general name for all *fat*, and *adeps* and *fevum*, made branches or fpecies of it: the *adeps* comprehends the thinner, fofter, and moifter fort, which eafily liquifies and difficultly coalefces; the *fevum*, fuet, or leaf, includes the harder, coarfer, and drier [a].

According to an antient gloffarift *adeps* is properly the inner *fat*, or that which cleaves to the inteftines [b].

The fpecific virtues afcribed to certain *fats* do not feem well warranted; fome even doubt their being poffeffed of any properties different from other fubftances of like kind, unlefs what may arife out of their different confiftencies and degrees of volatility: that of the viper feems to have the moft right to claim fomething extraordinary upon that account [c].

The way of preparing *fat* for medicinal purpofes, is to take out the fkins, veins, fibres, &c. wafh it till it becomes unbloody; then melt, ftrain, and preferve it from air [d].

Some chemifts defcribe *adeps* as a pinguedo coagulaled or condenfed to a confiftence by the admixture of fomething faline; for in diftillation the fulphureous part of the *adeps* afcending, leaves only a faline matter at the bottom, the coagulation being deftroyed, the fubftance ceafes to be *adeps*, and is called *oleum adipis* [e].

[[a] *Blaf.* Comm. ad Vefling, cap. i. p. 10. *Gal.* De ufu partium, lib. 16. *Gorr.* Def. Med. p. 374. *feq. in voc.* πιμελη. [b] See *Du Cange*, Gloff. Lat. tom. i. p. 56. [c] *Quinc.* Pharm. P. II. §. xii. p. 27. [d] Pharmac. Edinb. [e] See *Johnf.* Chym. in Addit. p. 7.]

FAT, in the brewery. See the article VAT, *Cycl.*

FEATHER (*Suppl.*) — *Prince's* FEATHER, in botany, the name of a genus of plants called by authors *amaranthus*. See the article AMARANTHUS, *Suppl.*

FEE (*Cycl.*) in Latin *feudum*, and more antiently *feodum*, is defined by Struckius [a], "Feudum eft conceffio dominii utilis "fub lege fidelitatis." Thefe *feuds*, no doubt, took their origin from the conquefts of the northern hive that overfpread Europe. The general divided the conquered country into large diftricts, over each of which he placed one of his principal officers, and they again fubdivided their provinces among the fubalterns and foldiers; this was in lieu of pay, and thefe lands being given under the condition of fidelity, by which was chiefly meant affiftance in war, made an united kingdom under the general, who generally affumed the title of king, as Hengift did in Kent, though he had it not before he made his conqueft. [[a] Examen Juris Feudal. cap. ii. qu. 11.]

We muft not imagine that *feuds* were always invariably of the fame form; they altered much in procefs of time. Craig diftinguifhes them into four ages, calling them *infantia*, *pueritia*, *adolefcentia*, and *virilis ætas*. *Infantia* was from the firft irruption of the northern nations, about the middle of the fifth century to *an.* 650, during which *feuds* were annual, or at moft for life, like the Turkifh timariots. *Pueritia* he reckons from 650 to 800, the time of Charlemagne; during which fons crept into the fucceffion of their fathers. *Adolefcentia* extended from this to Conrad II. *an.* 1022, or 1027. This emperor intending an expedition into Italy, the better to encourage his followers extended the right of fucceffion to grand-children and brothers. *Virilis ætas* followed, from Conrad to Frederic, *an.* 1155. in whofe time the feudal books were compiled, and fucceffions to all heirs whatfoever eftablifhed.

This is the general account of the origin and progrefs of *feuds*. When they were firft eftablifhed in this ifland has been matter of difpute among the learned: Craig and Spelman fay at the conqueft; others affert their higher antiquity; lord chief juftice Hale, particularly, afferts that the Norman cuftoms derive from the Englifh: this carries little probability with it. Sir Edward Coke, in the preface to his Sixth Report, brings an old Saxon charter, to prove that lands efcheated for felony. In this charter, dated *an.* 995, Ethelred gives lands, forfeited by one Ethelfig, for ftealing fome fwine, to one Ulfric, "in

" perpetuam hæreditatem," and then adds, " post istius labilis vitæ excessum, cuicunque sibi libuerit successori relinquat." This clause of disposing of his land by last will, and the omission of fealty throughout the whole, shews this to have been no *feud* but rather allod, it being well known that after the conquest, till the time of Henry VIII, lands were not generally deviseable by will; and that in all charters fealty was expressed: so that this forfeiture of the land, must rather be considered as a fine, or like the *confiscatio bonorum* among the Romans, who knew nothing of *feuds*, than as a feudal escheat. Besides, it must be observed in general, that no great stress can be laid on Saxon charters, most of them being forged by monks, and imposed upon the ignorant Normans, when they enquired into the titles of convents to their lands. See *Rapin*, Hist. d'Angl. p. 500.

Craig's reasons for affirming that the feudal law came in with William I. are, 1. That all the terms of art are French; nor does it appear that the Saxons had any words to express the same things. 2. That the penalties inflicted for crimes, among the Saxons, were not the *amissio feudi*, but pecuniary, if the crimes were small; and capital for those of a higher nature. 3. It appears from all historians, that William asserted his dominion over all the lands in England, confiscated the lands of all those that followed Harold, and let others retain theirs *sub lege fidelitatis*. Craig gives two examples of investiture, one of Athelstan, the other of the conqueror: Athelstan's words are, " Ego Athelstanus rex, do tibi Pauline Oddam & Roddam tam bona atque pulchra quam unquam mea erant, teste Mathilde conjuge mea." The conqueror invested Hugo Lupus, his sister's son, in the county of Chester, " tenendum sibi & hæredibus ita liberè ad gladium, ut ipse rex totam tenebat Angliam ad coronam." And Craig adds, " licet hæc posterior dispositio magis affinis investituto videatur, neutra tamen feudalem dispositionem sapit, cum nulla sit in eis servitiorum aut recognitionis præstatio nulla, de dominio superiore mentio: propriusque ad allodii formam accedunt." Vide *Craig*, De Jur. Feud. lib. i. diegef. 7.

Authors are not agreed as to the etymology of *feudum* or *feodum*; their different opinions may be seen in *Strykii* Examen Juris Feudalis. He himself derives it from the Italian *fede*, with little reason, since *feuds* were by no means of an Italian but Gothic original, and therefore the Gothic languages should be enquired into for the etymology of the word. That of Grotius [a] seems probable enough; he derives *feod* from *fe* and *od*, that is, *stipendii possessio*; *fe*, according to him, signifying of old *stipendium*, and *od*, or *oed*, *possessio*. This holds even now in the German language, where the word *kleinod* is used for a jewel, " quasi *parvum bonum*, vel *parva possessio*." Schilter, in his Praxis Juris Romani in Foro Germanico, Exerc. lib. iv. § 23. derives *feod* pretty much in the same manner, *viz.* from the verb *fa* or *fahen*, which signifies *capere*, *in custodiam tradere*, and *od*, signifying *bona*, *facultates*, *possessionem*, as Grotius says. Stryckius adds, that *feuds* were sometimes called *leod*, from *od* and the verb *lehnen*, or *leihen*, to lend; and the Germans call a feud *lehn guht*, or simply *lehn*, to this day. *Leodum* and *leodes* was also taken for the vassal and for homage, as in an old record mentioned by Schilter, loc. cit. where it is said, " fidelitatem præcelso filio nostro vel nobis & leode & *Samio* debeant promittere & conjurare." Where he thinks *famio* to be an error for *famto*, the abbreviation of *sacramento*. Somner, in his Treatise of Gavelkind, gives another etymon (approved of by serjeant Wright, in his Treatise of Tenures) of *feod*, *viz.* from *fe*, *stipendium*, and the termination *hode*, *hoad*, or *head*, signifying a quality in abstract: but this seems too metaphysical and forced, and does not seem near so natural as the derivation from *od*, *bonum*, *possessio*, &c. [[a] Florum sparsio ad Jus Justinian. p. 340.]

Craig defines a *feud* thus [b]: " *Feudum* est beneficium, seu benevola & libera rei immobilis aut æquipollentis concessio, cum utilis dominii translatione retenta proprietate, seu dominio directo, sub fidelitate & exhibitione servitiorum honestorum." See his explanation, loc. cit. This is the proper and original meaning of a *feud*; time has so much altered it, that Hottoman thinks it should be no longer called *feudum*, but *feudastrum*: the original intent and consideration of granting them was for assistance in war; now, money is the chief consideration; and variety of other than military services have been introduced. [[b] De Jure Feudal. p. 42.]

The vassal or tenant could not alien his *fee* without the consent of his lord [c]. However it seems that this was not long rigorously observed in England, since Magna Charta, cap. xxxii. provides, " quod nullus liber homo det de cætero amplius alicui de terra sua, quam ut de residuo terræ suæ possit sufficient. fieri domino feodi servitium ei debitum quod pertinet ad feodum illud." But neither was this well observed; since by West. 3. 18 Ed. I. it was provided, that any one might alien any part, or the whole, " ita ut feoffatus teneat de capitali domino. In Scotland, where the feudal law is more strictly observed, alienating half without licence, incurs a forfeiture of the whole; this they call recognition, and is the punishment of the vassal's ingratitude.

[[c] Stryck. Examen Juris Feudalis, cap. xix. quest. 2.]

Writers on the feudal law have distinguished the *substantialia*, the *naturalia*, and the *accidentalia* of *feuds*.

Substantialia, called by Craig *essentialia*, are the essentials, that is, qualities not implying each other, which if taken away the *feud* can no longer subsist.

Naturalia are the qualities superadded by law.

Accidentalia are the qualities superadded by agreement of the lord and vassal.

The *naturalia* are different in different places, and always presumed, unless it be otherwise agreed between the parties. The *accidentalia* must be expressed not presumed. Vide *Wolfii* Horæ Subs. Marburg. an. 1729. trimestr. æstiv. and *Craig*, p. 61.

Wolfius defines a *feud* thus, " Feudum est, dominium utile in re aliqua alteri a domino concessum sub conditione fidelitatis mutuæ.

" *Substantialia* sunt determinationes essentiales, quibus notio feudi in genere absolvitur.

" *Naturalia* sunt differentiæ specificæ feudi auctoritate legis communiter recepta.

" *Accidentalia* sunt differentiæ specificæ specierum feudorum a specie juris auctoritate communiter recepta diversorum."

FELIS, in zoology, the name of a very comprehensive genus, or rather order, of animals. See the article CAT, *Suppl.*

This order takes in the lion, the tyger, leopard, cat of the mountain, lynx, ounce, and the domestic cat. See the articles LION, TYGER, &c. *Suppl.*

FELL-*wort*, a name sometimes given to the *gentiana*, or gentian of authors. See the article GENTIANA, *Suppl.*

FELON-*wort*, a name given to the *solanum*, or nightshade of authors. See the article SOLANUM, *Suppl.*

FENNEL, in botany, the English name of a genus of plants called by authors *fœniculum*. See the article FOENICULUM, *Suppl.*

Scorching FENNEL, a name sometimes given to a genus of plants known among authors by that of *thapsia*. See the article THAPSIA, *Suppl.*

FENNEL-*flower*, in botany, a name sometimes given to the *nigella* of authors. See the article NIGELLA, *Suppl.*

FERMENT, (*Suppl.*) among physicians, is sometimes used in a synonymous sense with putrefaction, or rather for a putrid habit of body, considered as the cause of malignant disorders.

But these authors are, nevertheless, very careful not to confound putrefaction with vegetable fermentation, accounting them only analogous processes; for which reason they use the same term for the putrefying and fermenting agent. It were to be wished, to avoid ambiguity, that we had two different words to denote the exciting cause of these two intestine commotions; but this is the less to be expected, on account of the tendency of all putrid animal substances to promote both animal putrefaction, and a vinous fermentation in vegetables. See the next article.

FERMENTATION (*Suppl.*) — In order to ascertain the *fermentative* quality of animal substances, Dr. Pringle, in the Appendix to his Observ. on the Dis. of the Army, has made several curious experiments: bread and water only stood several days, in a furnace, heated, as usual, to 100 degrees; but two drams of fresh meat being added to double the former quantity of bread, and water in proportion, the mixture began to *ferment* in a few hours, and continued to do so about two days. For the most part the *fermentation* was so strong that if the corks had not frequently given way the phials must have burst. The bread and flesh which at first lay at the bottom, soon rose to the top, and, constantly, as the air elapsed, let fall some particles that had been buoyed up by the fluid; thus a sediment was formed, resembling lees, whilst the lightest part, or flowers, remained on the surface; but the *fermentation* continuing, these also subsided, and the acid taste and smell of the liquors, after the action ceased, was a farther proof of the preceding *fermentation*. This change was the more extraordinary, that when the motion began the mixture was tending to corruption, and, in effect, in a few hours afterwards, became offensive; but next day the putrid smell abated, and went off, before the *fermentation* ceased.

The doctor made several other experiments, to the same purpose, and with nearly similar effects; from all which, he thinks it probable that most animal substances tending to putrefaction, are endowed with a power of raising a *fermentation* in the farinacea, and even of renewing that action in such as have undergone it before.

The effect of *fermentation* therefore is to change putrid substances to a state of acidity, which they not only retain, but grow still more and more acid. It is observed, indeed, that the acid arising from *fermentation* has something of an austere and saltish taste, but without any offensive smell. Now, considering how much air is generated by *fermentation*, it may seem strange that the same materials, used as food, should make so little disturbance in the body. And the difficulty would be the greater, did the saliva, as some suppose, promote both *fermentation* and putrefaction. See the article SALIVA.

From this theory of *fermentation* the doctor accounts for the sourness or acidity of the stomach, a disorder to which many people are subject; since not only a strong, but an austere acid may be produced from the food of those who live on flesh, bread, and water only, as often as the stomach is relaxed, or

or any way disabled from conveying the whole aliment into the intestines; for, what is left having time to undergo a complete *fermentation*, is thereby changed into a harsh sort of vinegar. See the article HEART-*burn*, *Append.*

Spirits, wines, acids, bitters, aromatics, and the hotter antiscorbutic plants retard alimentary *fermentation*, by their power of correcting putrefaction. However, they may have their several uses; some for checking immoderate *fermentation*, when by reason of a putrid effluvia, or a defect of it, the aliment may ferment too violently; and others, again, for bracing the stomach, and fitting it for expelling its contents in due time. All these facts correspond with digestion; for the most nourishing and digestable food to people in health, consists in a due mixture of animal and vegetable substances with water: scorbutic or putrid habits require acids, wine, or other antiseptics. An acid abounding in the stomach, is corrected by absorbents; and, in a want of natural heat, and a debility of the stomach, wines, bitters, and warm and acid substances become necessary. See *Pringle*, Observ. on the Diseases of the Army, Append. p. 350, *seq.*

Fermentations have been usually supposed to engender great heat, and effervescence has been used as a synonimous term to express it by; it has not been imagined all this while, that many of the most violent of them are, instead of heat, attended with a very violent cold, as is easily proved by the thermometer.

It might be supposed, that water poured into spirit of wine should cool so fiery a liquor; but on the contrary, experiment proves, that there is always a considerable heat from this mixture, and that this heat is greater, as the proportion of the water is so. There is another phænomenon however in regard to spirit of wine more remarkable than this: as water, which is a cold phlegmatic liquor, might naturally be supposed to cool it, so a mixture of the essential vegetable oil might be as naturally expected to heat it; these being disposed the most readily of all bodies to take fire, and being composed almost entirely of a sulphureous matter; yet these liquors, mixed with spirit of wine, produce cold and not heat with it; and water, which generates so great a heat with spirit of wine, has no effect at all with these oils.

The reason of all this phænomena is, that water will not mix with oil, but that salts will. All spirit of wine contains a great deal of water, and all essential oils are well known to contain a great deal of essential salt. The water added to oils makes no change, because it mixes not with them; with spirit of wine it makes a heat by mixing with the water in that spirit, and dissipating the sulphur it is well known to contain; and the oils cool the spirit on the common principle of all salts cooling water, the salts originally contained in these oils immediately dissolving on the mixture, in the water contained in the spirit of wine: and the degree of cold, which is different with the different oils, is wholly regulated by the greater or lesser quantity of salt the several oils contain. Mem. Acad. Par. 1727.

FERMENTED *liquors (Suppl.)* are esteemed great antidotes to putrefaction; accordingly the abstinence from them is assigned as one cause why the Turks are more subject than other people to the plague, and other contagious distempers. It is likewise observed, that beer, wine, and spirituous liquors coming more into general use, has been one great means of suppressing putrid diseases. See *Pringle*, Observ. on the Diseases of the Army, p. 286, 294.

FERN *(Suppl.)* — *Dwarf*-FERN, the English name of a genus of plants called by botanists *filicula*. See the article FILICULA, *Suppl.*

Sweet FERN, a name by which some call the *myrrhis*, or wild chervil. See the article MYRRHIS, *Suppl.*

FERRET, the English name of an animal of the *mustela* kind. See the article MUSTELA, *Suppl.*

FERRY-*boat*. See the article BAC, *Suppl.*

FEVER *(Suppl.)* — *Ardent* FEVER. See the article INFLAMMATORY *fever*, *Append.*

Bilious FEVER. See the article BILIOUS, *Append.*

Malignant FEVER, or *jail* FEVER, the same with that called *hospital fever*. See the article HOSPITAL *fever*, *Append.*

FEVERFEW *(Suppl.)* — *Bastard*-FEVERFEW, in botany, a name sometimes given to the *parthenium* of authors. See the article PARTHENIUM, *Suppl.*

FEWMET, among sportsmen. See the article FUMET, *Append.*

FIANTS, or FUANTS, the dung of a badger, or fox, and of all other vermin. Rust. Dict. in voc.

FIDDLE, *(Cycl.)* — FIDDLE-*dock*, the name of a species of *lapathum*. See the article LAPATHUM, *Suppl.*

FIG-*tree*, *ficus*, in botany. See the article FICUS, *Suppl.*

Indian FIG, a name sometimes given to a genus of plants called by authors *opuntia*. See the article OPUNTIA, *Suppl.*

Infernal FIG, a name by which some call the *argemone*, called by authors the thorny Mexican poppy. See the article ARGEMONE, *Suppl.*

Pharaoh's FIG, a name sometimes used for a genus of plants called by authors *musa*. See the article MUSA, *Suppl.*

Marigold FIG, a name used by some for the *ficoides* of Tournefort, called by Linnæus *mesembryanthemum*. See the article FICOIDES, *Suppl.*

FIG-*shell*, a species of *dolium*. See the article DOLIUM, *Suppl.*

FILACEOUS, a term applied to such roots of plants as are full of filaments. See the article FILAMENT, *Cycl.*

FILAGO, in botany, a name used by Vailliant for the *gnaphalium*, or cud-weed. See the article GNAPHALIUM, *Suppl.*

FILBERT-*tree*, in botany, the English name of the hazle, called by authors *corylus*. See the article HAZLE, *Suppl.*

FILLAR-*horse*, that yoked immediately to a cart. See the article CART, *Suppl.*

FILLY, a term used in many parts of the kingdom for a female colt. See the article COLT, *Suppl.*

Ladies FINGER. See the article LADIES, *infra.*

FINGRIGO, in botany, a name used by some for a genus of plants called by Plumier *pisonia*. See the article PISONIA, *Suppl.*

FIR *(Suppl.)* — *Scotch* FIR, a name commonly given to the mountain-pine. See the article PINE, *Suppl.*

FIRE-*engine*, the common name of a machine to raise water by fire, or rather by the force of water turned into steam.

The first who gave a hint of the possibility of such a machine was the marquis of Worcester, in his Century of Inventions, printed at London in 1663. Captain Savery took the hint from him, and put the engine in practice: the captain's engine is described in Harris's Lexicon Technicum, under the head *Engine*. Farther improvements were afterwards made by Mess. Newcomen and Cawley, who brought it to the form in which it is now most commonly used.

The moving force in this machine is the expansion of water into steam; and that power is raised by fire, from whence the engine takes its name.

It is not possible in a few words, and without figures, to give any adequate idea of this most philosophical and useful contrivance. Dr. Desagliers has given a very full description of the engine, in his Course of Experimental Philosophy; and as we may suppose that none of the curious in mechanics will choose to be without the doctor's book, we shall content ourselves with referring to his second volume, from p. 465 to 490.

This engine working by the steam into which water rises after it boils, should entitle it more properly to the name of the *steam-engine*, than to that of *fire-engine*, by which the engines for extinguishing fires are sometimes called.

It is considered as a defect in this fire or steam-engine, that the vessel in which the water is always kept boiling, is so large when only an inconsiderable part of the water is employed in the work. Mr. Blake has therefore endeavoured to regulate the just proportion between the altitude and base of the cylindrical vessel employed in this machine; and he finds that the broader the cylinder is, the better. See Phil. Transact. vol. xlvii. p. 197, *seq.*

This engine to raise water by steam seems to have received a farther improvement from Monf. De Moura, a Portuguese gentleman, who, by an ingenious contrivance, has rendered it capable of working itself. See Phil. Transact. vol. xlvii. p. 436, *seq.*

As to the engines for putting out fires, those of Mr. Newsham seem to have merited universal approbation: for a detail of their construction, see *Desaguliers*, Course of Experim. Philos. vol. ii. p. 505, *seq.*

FIRM *ore*. See the article LEAD *ore*, *Suppl.*

FISH *(Suppl.)* — *Needle* FISH. See the article NEEDLE, *infra.*

FISH-*garth*, a wear or dam in a river for the taking of *fish*. Rust. Dict. in voc.

FITCH, or FITCHOW, a name given to the pole-cat, or to the skin or fur of that animal. See the article PUTORIUS, *Suppl.*

FIVES, among farriers, the same with VIVES. See the article VIVES, *Suppl.*

FIXEN, among sportsmen. See the article VIXEN, *Append.*

FLAG *(Suppl.)* — *Corn*-FLAG, a name by which some writers call the *gladiolus*. See the article GLADIOLUS, *Suppl.*

Sweet-scented FLAG, a name used by some for the *acorus* of botanical writers. See the article ACORUS, *Cycl.* and *Suppl.*

FLAG is also used for a kind of rush called sedge, as well as for the upper part of the turf, pared off to burn. Rust. Dict. in voc.

FLAG-*worm*, a kind of worm so called on account of its being found in flaggy ponds, and other sedgy places. Rust. Dict. in voc.

FLAREING, among seamen. See the article FLAIR, *Suppl.*

FLEA-*bane (Suppl.)* — *African* FLEA-*bane*, a term sometimes used for a genus of plants otherwise called *tarconanthus* and *parthenium*. See the article PARTHENIUM, *Suppl.*

Sweet FLEA-*bane*, the English name of a distinct genus of plants, called by Linnæus *erigeron*. See the article ERIGERON, *Suppl.*

FLIX-*weed*, the name of a genus of plants called by Tournefort and others *erysimum*. See the article ERYSIMUM, *Suppl.*

FLOAT-*boards*, those boards fixed to water-wheels of undershot mills, serving to receive the impulse of the stream, whereby the wheel is carried round. See the article *Water*-WHEEL, *Append.*

It is a disadvantage to have too great a number of *float-boards*. The best rule in this case is, to have just so many, that each of them may come out of the water as soon as possible, after it has received and acted with its full impulse; or, which

comes to the same thing, when the succeeding one is in a perpendicular direction to the surface of the water.

As to the length of these *float-boards*, it may be regulated according to the breadth of the stream. See *Desaguliers*, vol. ii. p. 425, *seq*.

FLOAT-*grass*, in botany. See the article GRASS, *Append.*

FLOWER *of Bristol*, a name sometimes used for the *lychnis* of botanical writers. See the article LYCHNIS, *Suppl.*

Gentle FLOWER, the English name of a genus of plants called by botanical writers *amaranthus*. See the article AMARANTHUS, *Suppl.*

Eternal FLOWER, a name by which some call the *xeranthemum* of botanical writers. See the article XERANTHEMUM, *Suppl.*

Everlasting FLOWER, a term by which some call the *gnaphalium*, or cud-weed, of Linnæus and Tournefort. See the article GNAPHALIUM, *Suppl.*

FLOWER-*fence*, a term sometimes used for a genus of plants known among authors by the name of *poinciana*. See the article POINCIANA, *Suppl.*

Four o' clock FLOWER, a name given by some to *jalap*. See the article JALAP, *Suppl.*

Side-saddle FLOWER, the name used by some for the *Sarracena* of botanists. See the article SARRACENA, *Suppl.*

Sultan-FLOWER, a name sometimes used for the *cyanus*, or bluebottle. See the article CYANUS, *Suppl.*

Sun-FLOWER, the English name of a genus of plants, called by botanical writers *helianthus* and *corona solis*. See the article SUN-*flower*, *Suppl.*

FLUELLIN, in botany, a name sometimes given to speed-well, called by authors *veronica*. See the article VERONICA, *Suppl.*

FLY (*Cycl.* and *Suppl.*) — *Humble-bee* FLY, the English name of a species of *culex*. See the articles HUMBLE, *Suppl.* and CULEX, *Append.*

FLY-*wort*, in botany, a name by which some call the *lychnis* of authors. See the article LYCHNIS, *Suppl.*

FLY, in mechanics, a cross with leaden weights at its ends, or rather a heavy wheel at right angles to the axis of a heavy windlas or roller, by means of which the force of the power is not only preserved, but equally distributed in all the parts of the revolution.

The *fly* may be applied to several sorts of engines, whether moved by men, horses, wind, or water; and is of great use in those parts of an engine, which have a quick circular motion, and where the power or resistance act unequally in the different parts of a revolution. In this case the *fly* becomes a moderator, making the motion of revolution almost every where equal.

The force of a *fly*, when joined with the screw, for stamping the image upon coins, may be calculated thus: suppose its two arms to be each 15 inches long, measuring from the center of the weights to the axis of motion, and the weights to be 50lb. each, and the diameter of the axis pressing upon the dye to be 1 inch; if every stroke be made in half a second, and the weights describe an half circumference, which will in this case be of 4 feet, the velocity will at the instant of the stroke be at the rate of 8 feet in a second, and therefore the momentum 800; but the arms of the *fly* being as leavers, one brachium of which is 15 inches long, whilst the other, *viz.* the semi-axis, is but of half an inch, we must increase this force 30 times, which will give 24000; an immense force, equal to that of 100lb. weight falling 120 feet, or near 3 seconds in time; or to that of a body of 750lb. falling $16\frac{1}{12}$ feet, or one second in time.

Some of these engines for coining crown-pieces have the arms of the *flies* five times as long, and the weights twice as heavy as those here mentioned, so that the effect is ten times greater. *Desaguliers*, Exper. Philosoph. p. 245, 339.

FŒNUM *sanctum*, *saint* FOIN, in botany, a name by which the *Onobrychis* of anatomists is sometimes called. See the articles ONOBRYCHIS and SAINT-*foin*, *Suppl.*

FŒTUS (*Cycl.*) — The question about the circulation of the blood in the *fœtus* seems not yet determined. See Mem. Acad. Scienc. 1699, 1701, 1703, 1717, 1725, and 1739.

FOLDAGE, among farmers, denotes the liberty of penning sheep by night. Dict. Rust. in voc.

FOND, the same with fund. See the article FUND, *Cycl.*

FOOL's-*stones*, in botany, an appellation given by some to a genus of plants called *orchis* by botanical writers. See the article ORCHIS, *Suppl.*

FOOT-*husks*, among herbalists, the same with the cup of a flower. See the article CALYX, *Suppl.*

FORCE, (*Cycl.*) in mechanics. — Whenever a body, which was at rest begins to move, or has a motion which is either not uniform, or not direct, the cause of this change in the state of the body is called *force* [a].

While a body remains in the same state, either of rest, or of uniform and rectilinear motion, the cause of its remaining in such a state, is in the nature of the body, and it cannot be said, that any extrinsic *force* has acted on it: this internal cause or principle is called *inertia* [b]. [[a] Mr. *Euler*, in Mem. Acad. Berlin. 1745, p. 21. [b] *Ibid.*]

Mechanical *forces* may be reduced to two sorts; one of a body at rest, the other of a body in motion.

The *force* of a body at rest, is that which we conceive to be in a body lying still on a table, or hanging by a rope, or supported by a spring, &c. And this is called by the names of *pressure*, *tension*, *force*, or *vis mortua*, *solicitatio*, *conatus movendi*, *conamen*, &c. To this class also of *forces* we must refer centripetal and centrifugal *forces*, though they reside in a body in motion; because these *forces* are homogeneous to weights, pressures, or tensions of any kind. But of this more particularly farther on.

The measure of this *force* is the weight with which the table is pressed, or the rope stretched, or the spring is bent. And as to this measure there is no dispute, notwithstanding the diversity of appellations by which it is called.

The *force of a body in motion* is on all hands agreed to be a power residing in that body, so long as it continues its motion, by means of which it is able to remove obstacles lying in its way; to lessen, destroy, or overcome the *force* of any other moving body, which meet it in an opposite direction; or to surmount any dead pressure or resistance, as tension, gravity, friction, &c. for some time; but which will be lessened or destroyed by such resistance as lessens or destroys the motion of the body.

This is called *moving force*, *vis motrix*, and by some late writers *vis viva*, to distinguish it from the *vis mortua* spoken of before: and by these appellations, however different, the same thing is understood by all mathematicians; namely, that power of displacing, of withstanding opposite moving *forces*, or of overcoming any dead resistance, which resides in a moving body, and which, in whole or in part, continues to accompany it, so long as the body moves.

But about the measure of this sort of *force*, mathematicians are divided into two parties. Both sides agree that the measure of this *force* depends partly upon the mass, or weight, of the body, and partly upon its velocity; so that upon any increase either of weight or velocity, the moving *force* will become greater. It is also agreed that the velocity being given, or being the same in two bodies, their *forces* will be in proportion to their masses or weights.

But when two bodies are equal, and the velocities with which they move are different, the two parties no longer agree about the measure of the moving *force*.

The Newtonians and Cartesians maintain, that the moving *force* is in proportion to the velocity with which the bodies move. But the Leibnitians assert, that the moving *force* is in proportion to the square of the velocity; so that if the velocity of a moving body be double, triple, quadruple, &c. of that of another equal body, the *force* of the former will be fourtimes, nine times, sixteen times as great as that of the latter. Hence the Newtonians pretend that the *vis motrix*, or moving *force* of bodies is in the compound ratio of their weights and velocities; and the Leibnitians maintain it to be in the compound ratio of the weights and the squares of the velocities.

This controversy was first started by the famous Mr. Leibnitz, and has been carried on by him and his followers near seventy years, during whith time a great number of pieces have been published on both sides of the question, and a great number of experiments have been made, or proposed to be made in order to decide it: but tho' both parties agree in the event of the experiments, whether actually made or only proposed, yet as the writers on each side have found a way of deducing from those experiments a conclusion suitable to their own opinion, the disagreement still continues as wide as ever.

Now it must be owned that these opposite conclusions from the same experiments are not so much owing to false reasoning on either side, as to their disagreement in the principles on which the reasoning is founded. See Dr. *Jurin*, in Phil. Transf. N°. 476.

Those who maintain that the moving *force* is as the weight into the velocity, lay down for a principle or axiom, that when two bodies meet one another in contrary directions, if their moving *forces* be equal, neither body will prevail over each other: and if their moving *forces* be unequal, the stronger will always prevail over the weaker. This is maintained by Mr. Mac Laurin, among others, in his piece which gained the prize in the Royal Academy of Sciences, in 1724, in his Fluxions, and lately in his Account of Sir Isaac Newton's discoveries; it is also agreed to by all the opposers of the Leibnitian doctrine, though some do not formally lay it down as an axiom, but pretend to derive it from the more general principles of pressure and the time it acts.

But the followers of Leibnitz deny the truth of this principle, and lay down others, which, as they pretend, are more clear and satisfactory, such as, that it always requires a determinate degree of *force* to bend a given spring to a given degree, whether this be performed in a longer or shorter time, or *vice versa*; that a given spring bent to a given degree, always communicates the same *force* to a body, by unbending itself, whether the time it takes to unbend itself be longer or shorter. Mr. 'S Gravesande's words are express: *Idem elasterium, eodem modo flexum, dum relaxatur equalem semper vim corpori communicat, sive lentius sive velocius relaxetur.* '*S Gravesande*, Phys. Elem. Math. § 731. edit. 1742. It is true, he does not assume it as a principle, but derives it from a more general principle, that the *force* communicated by a pressure is in a compound ratio of the pressure and the space through which it passes. But these propositions are alike denied by the Newtonians. Now if it be admitted, that those bodies have equal *forces*,

which meeting each other in contrary directions, do not prevail over each other, it cannot be disputed, that bodies which have equal quantities of motion, have also equal *forces*; and consequently that the moving *forces* of bodies are in a compound ratio of their masses and velocities.

On the other hand, if it be admitted that a given spring bent to a given degree, always communicates the same *force* to whatever body it be applied to, it is no less indisputable that the *forces* of moving bodies will be in a compound ratio of their masses and the squares of their velocities. For the bending of a spring to the same degree; cannot be done by different masses with equal quantities of motion, or a spring by unbending itself cannot communicate to different masses equal quantities of motion; but the bending or unbending of the spring always corresponds to and with what the Leibnitians call the *vis viva*; that is, the product of the mass of a body by the square of its velocity. This is admitted by the Newtonians, and follows from the avowed principles of both parties.

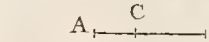
Thus, let M and m denote the masses of two bodies, V and v their respective velocities; then if any spring, a cross-bow for instance, bent to a certain degree, give the body M a certain velocity V, the same spring or cross-bow, bent to the same degree, will never give another body m a velocity v, so that MV shall be equal to mv, but will always communicate such a velocity to m, that MVV shall be equal to mvv. See the article SPRING, *Suppl.*

This is admitted by the Newtonians, but the conclusion, that the *forces* of the bodies M and m are equal, is denied.

To put an end, therefore, to this controversy, other principles must be found. This has been attempted by several authors, and we have had no small profusion of obscure metaphysics on this occasion. Many subtile reasonings have been formed from the nature of action, cause, effect, time, space, &c. by which we believe more readers have been confounded than enlightened; and after all the controversy is still undecided, and must remain so while the Newtonians, on one hand, assume, that *equal pressures in equal times produce equal moving forces*; and that the Leibnitians, on the contrary maintain, that *equal pressures urging a body through equal spaces produce equal forces.* Hence, supposing equal pressures to act on equal bodies, either to produce motion in them, or to stop what motion they have, the question will be, *whether the force generated or destroyed be proportional to the time the pressure acts, or to the space through which it acts.* For example, let two equal bodies, with the velocities, as 1 and 2, ascend against the action of uniform gravity, according to Galileo's hypothesis; it is certain that the body whose velocity is 2, will resist the *force* of gravity twice the time that the body whose velocity is only 1 can: and it is no less certain, that the body whose velocity is 2, will ascend to four times the height that the other can. So that if we measure the forces of these bodies by the pressure and time requisite to destroy their motion these *forces* will be as the velocities of the moving bodies; but if we measure the *forces* by the pressure, and space through which it extends, requisite to destroy these *forces*, we shall find them proportional to the squares of the velocities of the moving bodies.

This holds in uniform pressures, such as gravity is supposed to be near the earth; but if the pressure be not uniform, as it is not in the action of springs, which press more or less as they are more or less bent, we must then have recourse to the fluxions of the space and time. Thus if p stand for the pressure, t for the time, s for the space; the fluxion, or infinitesimal element as some call it, of the velocity will, according to both parties, be expressed by $p\dot{t}$. According to the Newtonians this is also the fluxion or element of the *force*; but according to the Leibnitians the element of the *force* is proportional to $p\dot{s}$[a]. As to any demonstration, either that in uniform pressures on the same body, the *force* produced is in proportion to the pressure and the time it acts, and in pressures not uniform that the element of the *force* is proportional to $p\dot{t}$; or that, on the contrary, the *force* thus produced is proportional to the pressure and space in the first case, or that its element is proportional to $p\dot{s}$ in the second case, we have never been fortunate enough to meet with any conclusive argument on either side: nor do we believe any such demonstration possible, till somebody shall be metaphysician enough to analyse the notions of *force*, action, time and space farther than has hitherto been done. — [[a] See *Dan. Bernoulli* in Act. Petrop. vol. viii. p. 100.]

It has been already mentioned, that some Leibnitians do not assume it as a first principle, that action or *force* is proportional to the pressure and space; but they say, that a pressure being given, its action will be proportional to the velocity of the point moved by that pressure. Hence they infer, that the whole action of a pressure, is at its intensity, as the velocity of the point to which it is applied, and as the time the pressure acts. And space being as the time and velocity, they conclude, the action of a pressure to be as that pressure and the space through which it acts. And hence they infer, that the force communicated by the pressure is also as the pressure and space. Thus, say they, if a point runs through a determinate space AB, and presses with a certain given *force* or intensity of pressure, it will perform the same action whe-



ther it move fast or slow, and therefore the time of the action in this case ought not to be regarded. *'S Gravesande*, lib. cit. § 723—728.

But the Newtonians do not submit to this reasoning, and insist, notwithstanding, that the action of the pressure is as the intensity of the pressure, and the time during which it acts, without any regard to the space through which it acts; and they make it an axiom, that equal pressures in equal times produce equal *moving forces.*

Leibnitz himself assumed it as certain, that the action is as the effect by the velocity with which it is produced: and hence he deduces, that the power is as the mass by the square of the velocity: his words, as quoted by Wolfius, are, *Calculum virium purarum seu actionum talem instituo. Sit spatium s, tempus t, velocitas v, corpus c, effectus e, potentia p, actio a, in motu æquabili erit tv ut s, e ut cs, tp ut a. Atque hæc quidem sine demonstratione assumi possunt. Accedit quod demonstrandum, ev ut a. Huic porro plurima theoremata demonstrari possunt,* e. gr. *p ut* cv^2. *Nam tp ut cv: sed e ut cs & s ut tv. Ergo fit tp ut* ctv^2, *seu p ut* cv^2. Vide Act. Petrop. tom. i. p. 232.

But as we cannot pretend to give a full account of all the arguments that have been made use of in this controversy, we must refer the curious to some of the principal authors on this subject, such as Sir Isaac Newton[a], Mr. Mac Laurin[b], Dr. Jurin[c], Dr. Pemberton[d], Mr. Robins[e], Monf. de Mairan[f], and others, on one side: Mess. Leibnitz[g], John[h] and Daniel Bernoulli[i], Herman[k], Poleni[l], Wolfius[m], 'S Gravesande[n], Camus[o], and many more, on the other. But notwithstanding all that has been said, the difficulty of determining whether the element of the moving *force* be proportional to $p\dot{t}$, or to $p\dot{s}$ still remains, and till that be demonstratively decided, we do not see but the question about the measure of the *force* of bodies in motion, must remain undetermined. See *Dan. Bernoulli*, in Act. Petrop. tom. i. p. 131, *seq.* [Philos. Trans. N°. 371. one of the arguments there proposed being Sir Isaac's, according to Dr. Pemberton. [b] Acc[t]. of Sir. If. Newton's discoveries. Fluxions, art. 511, in the notes. Recueil des pieces qui ont emporté le prix, &c. tom. i. [c] Philos. Transact. N 476, and in some other pieces. [d] Phil. Trans. N°. 371. [e] Pres. State of the Repub. of Let. May, 1728. [f] Mem. de l'Acad. Scienc. 1728. [g] Act. Erud. 1686. and Nouv. de la Rep. Let. Sept. 1686. art. 2. [h] Discours sur les loix de la communication du mouvement. oper. tom. iii. & Differt. de vera notione virium vivarum. ib. [i] Acta Petropol. tom. i. p. 131, seq. Hydrodynamica, § i. [k] Acta Petropol. tom. i. [l] De Castellis. [m] Acta Petropol. tom. ii. & in Cosmolog. general. [n] Journ. Lit. and in Phys. Elem. Mathem. [o] Mem. de l'Acad. des Scienc. 1728.]

Though Leibnitz was the first that expressly asserted the *force* of a body in motion to be as the square of its velocity, yet Huygens has been thought to have led him into this notion. This eminent mathematician had demonstrated, that in the collisions of two bodies, perfectly elastic, the sum of the products of the bodies by the squares of their respective velocities, was the same after the shock as before. And this proposition is so far general as to obtain in all collisions of bodies that are perfectly elastic. It is also true when bodies of a perfect elasticity strike any immoveable obstacle, as well as when they strike one another; or when they are constrained by any power or resistance to move in directions different from those in which they impel one another[a]. These considerations might have induced Huygens to lay it down as a general rule, that bodies constantly preserve their *ascensional force*[b], that is, the product of their mass, by the height to which their center of gravity can ascend; and, therefore, in a given system of bodies the sum of the squares of their velocities will remain the same and not be altered by the action of the bodies among themselves, nor against immoveable obstacles. Leibnitz's metaphysical system led him to think that the same quantity of action or *force* subsisted in the universe; and finding this impossible, if *force* were estimated by the quantities of motion[c], be adopted Huygens's principle of the preservation of the ascensional *force*, and made it the measure of moving *forces*. But it is to be observed, that Huygens's principle is general only when bodies are perfectly elastic; and in some other cases, which Mr. Mac Laurin has endeavoured to distinguish[d]. — [[a] See *Mac Laurin*'s Fluxions, art. 571. [b] *Hæc constans lex est, corpora servare* vim suam ascendentem, *& idcirco summam quadratorum velocitatum illorm semper manere eandem. Hoc autem non solum obtinet in ponderibus pendulorum & percussione corporum durorum, sed in multis quoque mechanicis experimentis. Huygen.* Oper. tom. i. p. 248. [c] Huygens, p. 247. of the same book, observes, *Quod sæpe pereat pars motus, licet hunc in aliquo effectu edendo consumi, affirmare non possumus, ut in multis casibus percussionis durorum corporum — ita ut minime pro lege naturæ habendum sit, eandem motus quantitatem semper conservari, nisi alicui impendatur & consumatur; sed hæc constans lex est corpora servare vim suam ascendentem, &c.* Where it is to be observed, that by hard

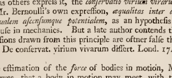
bodies Huygens means ſuch as are elaſtic, as appears from his treatiſe De motu corporum & percuſſione, oper. vol. ii. [d] *Mac Laurin*, lib. cit. art. 533.]

But it is to be obſerved, that though it be true, that in the colliſion of elaſtic bodies the *vis viva*, or aſcenſional *force* is preſerved before and after the ſhock; yet during the ſhock, while the elaſtic bodies are bending and preſs on each other, there ſeems to be a diminution of this *force*, which is afterwards reſtored by the action of their elaſticity; though the followers of Leibnitz do not allow that any *force* is loſt even during the ſhock. They ſay, the *vis viva* is communicated to the ſpring while it is bending, and then is recommunicated to the bodies by the unbending of the ſpring. They alſo deny that any *force* is loſt in the percuſſion of ſoft bodies. For though the *force* of the bodies impelling each other be diminiſhed, yet their *force* does not periſh, but is communicated to ſome other matter [e], ſuch as the ſubtle fluid cauſing coheſion and elaſticity [f]. — [[e] *Vis viva quæ in percuſſione amittitur, non perit, ſed conſervatur. Wolf.* Coſmol. § 486. *In toto univerſo ſemper conſervatur eadem virium vivarum quantitas.* ibid. § 487. *Vis viva — dum figura corporum in contactu mutatur, in alia materia conſervatur.* Ibid. demonſtr. § 486. [f] Mr. Dan. Bernoulli, ſpeaking of this principle of the preſervation of the *vis viva*, obſerves, *Quamvis principium univerſale ſit, non tamen eſt ſine circumſpectione adhibendum, quia ſæpe contingit ut motus tranſeat in materiam alienam. Ita verbi gratia poſitio illius valet pro regulis motuum ex percuſſione eruendis, ſi modo corpora ſint perfectè elaſtica; ſed cum talia non ſunt, facile eſt videre, partem* virium vivarum *ſive* aſcenſus potentialis *in compreſſionem corporum impenſam corporibus non reſtitui, ſed materiæ cuidam ſubtili, ad quam tranſiit, impreſſam hærere.* Hydrodynam. p. 12, 13. And Mr. Daniel Bernoulli, in this treatiſe, has aſſumed the preſervation of the *vis aſcendens* of Huygens, or, as others expreſs it, the *conſervatio virium virarum*; and, in Mr. Bernoulli's own expreſſion, *æqualitas inter deſcenſum actualem aſcenſumque potentialem*, as an hypotheſis of wonderful uſe in mechanics. But a late author contends that the concluſions drawn from this principle are oftner falſe than true. See De conſervat. virium vivarum diſſert. Lond. 1744. quarto.]

As to the eſtimation of the *force* of bodies in motion, Mr. Euler obſerves, that a body in motion may meet with two kinds of obſtacles, one oppoſing its velocity only, the other its direction. In either caſe, the body exerts its *force* on theſe obſtacles. When the velocity only of the body is changed, as it happens when two bodies in motion meet each other directly, the change reſulting is then ſaid to happen by ſhock, percuſſion, or colliſion. If the obſtacle be of ſuch a nature as only to oppoſe the direction of the body, as when it revolves in a ſling, or moves in an incurvated tube, the obſtacle then acts by preſſure, and this preſſure is called centrifugal *force*. Hence a double *force* is the reſult of the inertia of bodies: that produced by an obſtacle to its velocity is denominated *force* of percuſſion, and the other ariſing from the change of its direction is called *force* of preſſure [g]. — [[g] *Euler*, Mem. Acad. Berlin. p. 25.]

Leibnitz and his followers make a great difference between theſe two kinds of *forces*. They call *force* of preſſure *vis mortua*, and the *force* of percuſſion *vis viva*. By this oppoſition of terms, they not only ſignify that there is a difference between theſe *forces*, but alſo that they are heterogeneous or not comparable. Hence, though we have an exact meaſure of preſſures, they invented new rules for the meaſure and compariſon of percuſſions, and have thereby occaſioned great diſputes in the philoſophical world.

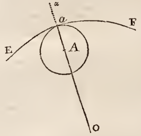
Philoſophers have ſtated this queſtion ſomewhat vaguely: to fix our notions, let us conſider the body B at reſt, and another body A ſtriking it with a given velocity, in the direction *ab*; it is manifeſt that A exerts an action of a certain *force* on B to diſturb its ſtate. The queſtion is, what



is the *force* exerted on B? Philoſophers have given themſelves little trouble to determine the true meaſure of this *force*: They have confined themſelves to the compariſon of different *forces* of the ſame kind. In eſtimating the quantity of *force* of the body A, by the quantity of the alteration which happens in the ſtate of the body B, they eaſily perceived that this change would be greater, according as the body A had a greater maſs, or a greater velocity. The Newtonians, or rather the Carteſians, and Leibnitians could not agree how to expreſs the reſults of the maſs, and velocity of the ſtriking body: the firſt inſiſt, that the *force* ſhould be expreſſed by the product of the maſs by the velocity. Leibnitz, on the other hand, pretends, that the meaſure of this *force* is the product of the maſs by the ſquare of the velocity. The diſpute has been carried on with great warmth on both ſides; but it ſeems almoſt needleſs to relate the various arguments brought by them in ſupport of their different opinions: for as they have never agreed about the effect, the quantity of which was to be the meaſure of the *force*, the diſpute often degenerated into a logomachy.

It is evident, that neither the one nor the other of theſe opinions admit any compariſon between the *force* of percuſſion and that of preſſure: for this is neither comparable to the product of the maſs by the velocity, nor to the product of the maſs by the ſquare of the velocity. The Leibnitians particularly deny the *vires mortuæ* and *vivæ* to be homogeneous; they make the ſame difference between them as between a line and a ſurface. It ſeems to them that experience confirms their notions; a ſmall blow, as that of a hammer on a nail, often producing an effect ſuperior to that of the greateſt preſſure, eſpecially if the ſame effect is to be produced in ſo ſhort a time as that of driving in the nail by the hammer. But thoſe who lay a ſtreſs on this example ſeem to think, that percuſſion is inſtantaneous. If this were true, there could be no doubt of the heterogeneity of the *vires mortuæ* and *vivæ*; for no preſſure, however great, can produce the leaſt ſenſible effect in an inſtant. Beſides, although the effect of percuſſion were not inſtantaneous, there ſtill appears ſo great a difference between the effects of ſtriking and thoſe of preſſing, that whether the force of percuſſion be proportional to its velocity, or to the ſquare or other power of its velocity, we can never produce a preſſure equivalent to a percuſſion: all which confirms the Leibnitians in their notion that preſſure and percuſſion are heterogeneous [h]. — [[h] Mem. Acad. Berlin. 1745. p. 29.]

Mr. Euler obſerves, with reſpect to this diſpute concerning the meaſure of vivid *force*, that we cannot abſolutely aſcribe any *force* to a body in motion, whether we ſuppoſe this *force* proportional to the velocity, or to the ſquare of the velocity: for the *force* exerted by a body, ſtriking another at reſt, is different from that which it exerts in ſtriking the ſame body in motion; ſo that this *force* cannot be aſcribed to any body conſidered in itſelf, but only relatively to the other bodies it meets with. There is no *force* in a body abſolutely conſidered, but its inertia, which is always the ſame whether the body be at reſt or in motion. But if this body be forced by others to change its ſtate, its inertia then exerts itſelf as a *force*, properly ſo called, which is not abſolutely determinable; becauſe it depends on the changes that happen in the ſtate of the body. Suppoſe, for inſtance, a body A forced to move in an incurvated tube, or along the curve ſurface E*a*F, the body in this caſe will preſs the ſurface wherever it touches it in a direction *a*α normal to the curve; and with a certain *force* commonly determined in mechanics, by the maſs of the body, its velocity, and by the radius of curvature O*a*. Now the body exerts a preſſure, or *vis mortua*;



yet it would be abſurd to aſcribe a certain and determinate *force* of preſſure to this body conſidered in itſelf, ſince this preſſure may vary very much, acording to the difference of the curvature of E*a*F. In like manner it ſeems unreaſonable to place a certain abſolute *force* of percuſſion in bodies, ſince it principally depends on the external circumſtances accompanying the ſhock.

A ſecond obſervation which has been made by ſeveral great men, is, that the effect of a ſhock of two or more bodies is not produced in an inſtant, but requires a certain interval of time. If this be ſo, the heterogeneity between the *vires vivæ* and *mortuæ* vaniſhes; ſince a preſſure may always be aſſigned, which in the ſame time, however little, ſhall produce the ſame effect. If then the *vires vivæ* be homogeneous to the *vires mortuæ*, and ſince we have a perfect meaſure and knowledge of the latter, we need require no other meaſure of the former than that which is derived from the *vires mortuæ* equivalent to them.

Now that the change of ſtate in the ſhock of two bodies does not happen in an inſtant, appears evidently from the experiments made on ſoft bodies: in theſe, percuſſion forms a ſmall cavity, viſible after the ſhock, if the bodies have no elaſticity. Such a cavity cannot certainly be made in an inſtant. And if the ſhock of ſoft bodies require a determinate time, we muſt certainly ſay as much of the hardeſt, though this time may be ſo ſmall as to be beyond all our ideas. Neither can any inſtantaneous ſhock agree with that conſtant law of nature,

by

by virtue of which nothing is performed *per saltum*. But it is needless to insist farther on this, since the duration of any shock may be determined from from the most certain principles.

There can be no shock or collision of bodies, without their making mutual impressions on each other: these impressions will be greater or less according as the bodies are more or less soft, other circumstances being the same. In bodies called hard, the impressions are small; but a perfect hardness, which admits of no impression, seems inconsistent with the laws of nature [i]: so that while the collision lasts, the action of bodies is the result of their mutually pressing each other. This pressure changes their state; and the *forces* exerted in percussion are really pressures, and truly *vires mortuæ*, if we will use this expression, which is no longer proper, since the pretended infinite difference between the *vires vivæ* and *mortuæ* ceases [k].—[[i] See the article HARD *bodies*, *Suppl.* [k] *Euler*, ibid. p. 32, 33.]

The *force* of percussion, resulting from the pressures bodies exert on each other while the collision lasts, may be perfectly known, if these pressures be determined for every instant of the shock.

The mutual action of the bodies begins the first moment of their contact, and is then least; after which this action increases, and becomes greatest when the reciprocal impressions are strongest [l]. If the bodies have no elasticity, and the impressions, they have received, remain, the *forces* will then cease. But if the bodies be elastic, and the parts compressed restore themselves to their former state, then will the bodies continue to press each other, till they separate. To comprehend therefore perfectly the *force* of percussion, it is requisite to define, first, the time the shock lasts, and then to assign the pressure corresponding to each instant of this time: and as the effect of pressures in changing the state of any body may be known, we may thence come at the true cause of the change of motion arising from collision. The *force* of percussion, therefore, is no more than the operation of a variable pressure during a given time; and to measure this *force* we must have regard to the time, and to the variations according to which the pressure increases and decreases. [[l] Vide infra.]

Mr. Euler has given us some calculations with respect to these particulars [m]. It will be sufficient here only to illustrate their tendency by the instance he brings. Suppose two bodies A and B; that the hardness of these bodies is equal; and such, that being pressed together with the *force* of 100lb. the impression made on each is of the depth of $\frac{1}{1000}$ part of a foot. Suppose, farther, B to be at rest, and fixed, and that A strikes it with the velocity of 100 feet in a second; according to Mr. Euler, the greatest *force* of compression will be equivalent to 400olb. and this *force* will produce in each of these bodies an impression equal to $\frac{1}{25}$ of a foot; and the duration of the collision, that is, till the bodies arrive at their greatest compression, will be about $\frac{1}{500}$ of a second. Mr. Euler, in his calculations, supposes the hardness of a body to be proportional to the *force* or pressure requisite to make a given impression on it; so that the *force* by which a given impression is made on a body, is in a compound ratio of the hardness of the body and of the quantity of the impression. But he observes, that regard must be had to the magnitude of the bodies, as the same impression cannot be made on the least bodies as on the greatest, from the defect of space through which their component particles must be driven: he, therefore, only considers the least impressions, and that the bodies are of such magnitudes, that with respect to them the impressions may be looked upon as nothing. What he supposes about the hardness of bodies, neither implies elasticity nor its defect, elasticity only producing a restitution of figure and impression when the pressing *force* ceases; but this restitution needs not be here considered. It is likewise supposed, that the bodies shocking have plane and equal bases, by which they touch each other in the collision; so that the impression hereby made diminishes the length of each body. It is farther to be observed, that in Mr. Euler's calculations, bodies are supposed so constituted, that they may not only receive impressions from the *forces* pressing them, but that a greater *force* is requisite to make a greater impression. This excludes all bodies fluid or solid in which the same *force* may penetrate farther and farther, providing it have time, without ever being *in equilibrio* with the resistance. Thus a body may continually penetrate farther into soft wax, although the *force* impelling it be not increased. In these, and the like cases, nothing is required but to surmount the first obstacles; which being once done, and the connexion of parts broken, the penetrating body always advances, meeting with the same obstacles as before, and destroying them by an equal *force*. But Mr. Euler only considers the first obstacles which exist before any separation of parts, and which are, no doubt, such, that a greater impression requires a greater *force*. This, indeed, principally takes place in elastic bodies; but it seems likewise to obtain in all bodies, when the impressions made on them are small, and that the contexture of their parts is not altered. —[[m] Ibid. p. 37, *seq.*]

These things being premised, let the mass or weight of the body A be expressed in general by A, and let its velocity before the shock be that which it might acquire by falling from the height *a*. Farther, let the hardness of A be expressed by M, and that of B by N, and let the amplitude of the base, by which the impression is made be *cc*; then will the greatest compression be made with a *force* $\sqrt{\frac{MNcc}{M+N}\times Aa}$. Therefore if the hardness of the two bodies, and the plane of their contact during the whole time of their collision be the same, this *force* will be $\sqrt{Aa}$, that is, as the square root of the *vis viva* of the striking body A. And as $\sqrt{a}$ is proportional to the velocity of the body A, the *force* of percussion will be in a compound ratio of the velocity and of the subduplicate ratio of the mass of the body striking: so that in this case neither the Leibnitian nor the Cartesian proportions take place. But this *force* of percussion depends chiefly on the hardness of the bodies; the greater this is, the greater will the *force* of percussion be. If M = N, this *force* will be as $\sqrt{Mcc\times Aa}$, that is, in a compound subduplicate ratio of the *vis viva* of the body striking, of the hardness, and of the plane of contact. But if M, the hardness of one of the bodies, be infinite, the *force* of percussion will be as $\sqrt{Ncc\times Aa}$; at the same time if M = N, this force will be as $\sqrt{\frac{1}{2}Ncc\times Aa}$. Therefore all other things being equal, the *force* of percussion, if the striking body be infinitely hard, will be to the *force* of percussion if both the bodies be equally hard, as $\sqrt{2}$ to 1. Mr. Euler farther deduces from his calculation, that the impression received by the body A will be as $\sqrt{\frac{N\times Aa}{\overline{M+N}\times Mcc}}$ and the impression on B will be as $\sqrt{\frac{M\times Aa}{\overline{M+N}\times Ncc}}$. If, therefore, the hardness of A, that is M, be infinite, it will suffer no impression, whereas that on B will extend to the depth of $\sqrt{\frac{Aa}{Ncc}}$. But if the hardness of the two bodies be the same, or that M = N, they will each receive equal impressions of the depth $\sqrt{\frac{Aa}{2Ncc}}$. So that the impression received by the body B, in this case, will be to the impression it receives in the former as 1 to $\sqrt{2}$ [n]. —[[n] Ibid. p. 46, 47.]

Mr. Euler has likewise considered and computed the case when the striking body has its anterior surface convex, with which it strikes an immoveable body whose surface is plane [o]. He has also examined the case when both bodies are supposed immoveable [p]; and from his formulæ he deduces the known laws of the collision of non-elastic and elastic bodies. He has also determined the greatest pressures the bodies receive in these cases [q]; and likewise the impressions made on them. In particular he shews that the impression received by the body struck, or B, if moveable, is to the impression received by the same body when immoveable as $\sqrt{B}$ to $\sqrt{A+B}$. —[[o] Ibid. p. 48. § xxiv. [p] Ibid. § xxv. xxvi. [q] Ibid. § xxvii.]

This doctrine of Mr. Euler may serve to shew, that the dispute about the measure of *forces* is very needless in physics; since the laws of motion may, independently of any hypothesis about the measure of the *vis viva*, be deduced from the most uncontested principles of pressure and time. But we doubt whether we shall be enabled hereby to settle the metaphysical part of this dispute to the satisfaction of both parties, each of which may assent to all that Mr. Euler says, and yet adhere either to the Cartesians or Leibnitians. — But whatever may be said of the metaphysical part of the dispute, it is certain, from experience,

That the number of equal springs requisite to produce any velocity in a given body, is always proportional to the square of the velocity to be produced. Thus if one spring can, by unbending half, produce one degree of velocity in a body, it will require four equal springs to produce two degrees of velocity in that body; nine springs to produce three degrees of velocity, *&c.* See the article SPRING, *Suppl.*

Also, if a portion of a yielding substance, as clay, tallow, *&c.* be just sufficient to stop the motion of a body moving with a certain degree of velocity, it will require four times the quantity of the same resisting substance to stop it, if the velocity of the moving body be double, *&c.* The same holds in the resistance of wood against musquet-balls, as Mr. Robins observes in his New Principles of Gunnery: so that a ball moving with twice the velocity of another, will penetrate four times as deep into earth, clay, tallow, wood, *&c.* And in like manner if the action of one man, one horse, or other animal, can give a certain degree of velocity to a given mass, it will require the action of four equal men, horses, *&c.* to give the same mass two degrees of velocity; nine men, horses, *&c.* to give it three degrees of velocity; and so on.

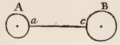
These practical points have been put out of all question by the experiments of Poleni, 'S Gravesande, Desaguliers, and others, and are of great use, although they do not decide the controversy about the measure of the *force* of bodies in motion.

FORCE *of inertia*, or *vis inertiæ*. It may be a question, whether the *vis inertiæ* of bodies can properly be called a *force*? As to

to which Mr. Euler obſerves, that if we give the name of *force* to ſuch cauſes only as can change the ſtate of bodies, the *inertia*, by which all bodies remain in their ſtate of motion, or reſt, cannot properly be called *force*; although a true *force* may ſometimes be the reſult of it. For when the inertia preſerves a body in its ſtate of reſt, or an uniform and direct progreſſion, the ſame inertia may be the cauſe of a change in the ſtate of other bodies: ſo that tho' the name of *force* does not belong to this inertia, with reſpect to the body wherein it reſides, yet it may change into a *force* with reſpect to other bodies. Mr. Euler[a] even thinks it probable that all the changes which happen in the world, ariſe, without exception, from the inertia of bodies, and that there are no other *forces* in nature than what are excited by this inertia. — [[a] In Mem. Acad. Berlin. 1745. p. 22.]

To illuſtrate this, he conſiders a body A (fig. I.) moving with a given velocity in the direction *ac*: ſo long as this body meets with no obſtacle, its motion will continue with the ſame velocity, and in the ſame direction, and thus it will perſevere in the ſame ſtate, the cauſe of this perſeverance being the inertia of the body. But ſuppoſing another body B at reſt, and that the body A has approached ſo near to B, that their extremities touch; what will happen? The bodies

Fig. I.



being impenetrable, it is plain that A cannot remain in its ſtate, without diſturbing that of B; ſince A muſt, in order to continue its motion, either drive B before it with a velocity equal to, or greater than its own, or it muſt turn aſide. Alſo the body B cannot remain in its ſtate of repoſe, unleſs A ſtops, or returns, or deflects to one ſide. All this clearly ſhews, that theſe two bodies cannot at the ſame time preſerve their ſtate. When A touches B, the ſtate of one or both muſt be changed, ſince both equally endeavour to preſerve their ſtate: there can be no reaſon why the one ſhould ſuffer a change rather than the other, and therefore the ſtate of both muſt be altered. But whatever change happens in this reſpect it muſt ariſe from the *vis inertiæ*; for when B's ſtate of reſt is changed to motion, the cauſe is the inertia of A; ſince B would have remained eternally at reſt had it not been for the appulſe of A. In like manner, the cauſe of the change which happens in the motion of the body A, can be nothing elſe than the inertia of B, ſince without this A would have preſerved its motion without any alteration. The inertia being the cauſe of the perſeverance of a body in its ſtate, cannot be conceived but as a principle of reſiſtance to any change of ſtate; ſince we could not ſay that a body has power of remaining in its ſtate, if it gave way without reſiſtance to any cauſe endeavouring to alter that ſtate. This conſideration authoriſes the giving the name of *force* to the inertia, taking the term *force* in an extenſive ſenſe. When then the body A endeavours by its inertia to preſerve its uniform rectilinear motion, it has at the ſame time the *force* to reſiſt all obſtacles; and the body B, the inertia of which exerts itſelf in the preſervation of its ſtate of reſt, has a *force* by which it reſiſts all cauſes endeavouring to draw it out of that ſtate. Hence in the ſhock of theſe two bodies, both being unable to preſerve their ſtate, becauſe of their impenetrability, and the inertia of each reſiſting a change, this inertia of the one muſt produce a change in the other; therefore, though the inertia cannot be called a *force* with reſpect to the body in which it reſides, becauſe it only produces a preſervation of its ſtate, yet with reſpect to other bodies it may become a true *force*, by which their ſtate is changed. Now as many bodies muſt ſhock each other in a world full of bodies differently moved, and that ſome muſt hinder others from perſevering in their ſtate, it follows, that the ſtate of all thoſe bodies muſt undergo perpetual changes; and the cauſe of all theſe will be the inertia by which all bodies have a tendency to preſerve their ſtate. Nor do the changes which continually happen in the world oblige us to aſcribe moving *forces* to bodies, different from their inertia, ſince this alone may produce all the alterations we obſerve [b]. — [[b] Ibid. p. 23, 24.]

The inertia, as well as impenetrability and extenſion, is an univerſal property of all matter; and this inertia is proportional to the maſs or quantity of matter. A body, whether at reſt or in motion, has the ſame inertia, or the ſame power or *force* to preſerve its ſtate. This inertia is the cauſe of a body's reſiſting either to a change of its velocity, or of its direction: and from hence ariſes the two kinds of *forces* before mentioned [c]. — [[c] Ibid. p. 25.]

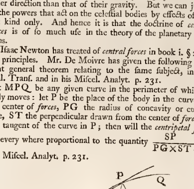
Central Force. It may be proper here to ſubjoin ſomething on the head of *centripetal* and *centrifugal*, or, in one word, *central forces*, to what is ſaid in the *Cyclopœdia*, under the head Central. The doctrine of *central* or *centripetal* and *centrifugal forces* has been much cultivated by mathematicians, as being of extenſive uſe in the theory of gravity and other phyſico-mathematical ſciences.

In this doctrine it is ſuppoſed, that a body at reſt never moves itſelf: and that a body in motion never changes the velocity or direction of its motion of itſelf; but that every motion would continue uniform, and its direction rectilinear, unleſs ſome external *force* or reſiſtance affected it. Hence, when a body at reſt always tends to move, or when the velocity of any rectilinear motion is accelerated continually, or when the direction of a motion is continually varied and a curve line deſcribed, theſe are ſuppoſed to proceed equally from the influence of ſome power that acts inceſſantly; which may be meaſured either by the preſſure of the quieſcent body againſt the obſtacle that hinders it to move, in the firſt caſe; or by the acceleration of the motion, in the ſecond; or by the flexure of the curve deſcribed, in the third caſe; due regard being had to the time in which theſe effects are produced, and the other circumſtances, according to the principles of mechanics. Effects of the power of gravity of each kind fall under our conſtant obſervation near the ſurface of the earth; for the ſame power which renders bodies heavy while they are at reſt, accelerates them when they deſcend perpendicularly, and bends their motion into a curve line when they are projected in any other direction than that of their gravity. But we can judge of the powers that act on the celeſtial bodies by effects of the laſt kind only. And hence it is that the doctrine of *central forces* is of ſo much uſe in the theory of the planetary motions.

Sir Iſaac Newton has treated of *central forces* in book i. § 2. of his principles. Mr. De Moivre has given the following elegant general theorem relating to the ſame ſubject, in the Phil. Tranſ. and in his Miſcel. Analyt. p. 231.

Let MPQ be any given curve in the perimeter of which a body moves: let P be the place of the body in the curve, S the center of *forces*, PG the radius of concavity or curvature, ST the perpendicular drawn from the center of *forces* to the tangent of the curve in P; then will the *centripetal force* be every where proportional to the quantity $\frac{SP}{PG \times ST \text{ cub.}}$ See Miſcel. Analyt. p. 231.

Fig. II.



What is here called the *center of force*, is the point to which the *central force* is always directed.

Monſ. Varignon has alſo given two general theorems on this ſubject in the Memoirs of the Acad. Scienc. an. 1700, 1701, and has ſhewn their application to the motions of the planets. See alſo the ſame Memoirs, an. 1706, 1710.

Mr. Mac Laurin has alſo treated the ſubject of *central forces* very fully in his Fluxions, from art. 416 to 493. where he gives a great variety of expreſſions for theſe *forces*, and ſeveral elegant methods of inveſtigating them.

Sir Iſaac Newton has demonſtrated[d] this fundamental theorem of *central forces*, that the areas which revolving bodies deſcribe by radii drawn to an immoveable center, lie in the ſame immoveable planes, and are proportional to the times in which they are deſcribed. — [[d] Princip. lib. i. prop. 1.]

A late eminent mathematician obſerves that this law, which is originally Kepler's, is the only general principle in the doctrine of *centripetal forces*; but ſince this law, as Sir Iſaac Newton himſelf has proved, cannot hold whenever a body has a gravity or *force* to any other than one and the ſame point, there ſeems to be wanting ſome law that may ſerve to explain the motions of the moon and ſatellites which have a gravity towards two different centers: the law he lays down for this purpoſe is,

That where a body is deflected by two *forces* tending conſtantly to two fixed points, it will deſcribe by lines drawn from the two fixed points, equal ſolids in equal times, about the line joining thoſe fixed points. See *Machin*, of the Laws of the Moon's Motion, in the poſtſcript. This ſhort treatiſe is publiſhed at the end of the Engliſh tranſlation of Sir Iſaac Newton's Principles.

Force, in practical mechanics. We have ſeveral curious as well as uſeful obſervations in Deſaguliers's Experimental Philoſophy, concerning the comparative *forces* of men and horſes, and the beſt way of applying them. An horſe draws with the greateſt advantage when the line of direction is level with his breaſt: in ſuch a ſituation, he is able to draw 200lb. eight hours a day, walking about two miles and an half an hour. And if the ſame horſe is made to draw 240lb. he can work but ſix hours a day, and cannot go quite ſo faſt. On a carriage, indeed, where friction alone is to be overcome, a middling horſe will draw 1000lb. But the beſt way to try a

horſe's

horſe's *force*, is by making him draw up out of a well, over a ſingle pully or roller; and in ſuch a caſe one horſe with another will draw 200lb. as already obſerved.

Five men are found to be equal in ſtrength to one horſe, and can, with as much eaſe, puſh round the horizontal beam of a mill, in a walk 40 feet wide; whereas three men will do it in a walk only 19 feet wide.

The worſt way of applying the *force* of a horſe, is to make him carry or draw up hill: for, if the hill be ſteep, three men will do more than a horſe, each man climbing up faſter with a burden of 100lb. weight, than a horſe that is loaded with 300lb. a difference which is owing to the poſition of the parts of the human body being better adapted to climb than thoſe of a horſe.

On the other hand, the beſt way of applying the *force* of a horſe, is in an horizontal direction, wherein a man can exert leaſt *force*; thus a man drawing a boat along, by means of a rope coming over his ſhoulders, cannot exert above one ſeventh part of the *force* of a horſe employed to the ſame purpoſe. The very beſt and moſt effectual poſture in a man, is that of rowing; wherein he not only acts with more muſcles at once for overcoming the reſiſtance, than in any other poſition; but as he pulls backwards, the weight of his body aſſiſts by way of leaver. *Deſaguliers*, Exp. Phil. vol. i. p. 241, *ſeq.* where we have ſeveral other obſervations relative to *force* acquired by certain poſitions of the body, from which that author accounts for moſt feats of ſtrength and activity. Ibid. p. 254. *ſeq.*

FORCER, in mechanics, is properly a piſton, without a valve. See the article PISTON, *Cycl.*

There are ſeveral ways of making *forcers*: the moſt common of all conſiſts of a braſs cylinder, a very little leſs in diameter, at its top and bottom, than the bore of the barrel of the pump, and turned ſtill leſs at the middle, in order to let in a leathern ring or collar (made of a thick leather put round the braſs cylinder) which makes it juſt equal to the bore of the barrel, ſo as to fit it quite when it is put into it.

The ſecond ſort of *forcers* conſiſts of three braſs cylinders which can be ſcrewed together. The middle one ought to be almoſt equal in diameter to the bore of the pipe, ſo as to ſlide in it without any friction. The upper cylinder and the lower muſt be a little leſs, and equal to one another. There are two leathers which muſt be put between them when they are unſcrewed: then it is evident, that if the cylinders be ſcrewed together, and the leathers, which ought to be a little bigger than the braſs cylinders, apply themſelves folding upwards round the upper cylinder, and downwards round the lower, they will become juſt equal to the bore of the barrel; and conſequently they will hinder any air from getting through the ſides of the *forcer*, when it moves up and down in the barrel. The uſe of the middle braſs cylinder is to hinder the leathers from turning themſelves back by the motion.

This kind of *forcer* has, above the other, the advantage of having a great deal leſs friction; and beſides, as the leathers, which are applied to it, may be thin ones, they are much ſmoother than thick ones, which are uſed in the other.

But the beſt way of making *forcers*, is, to have a plunger, or ſolid braſs cylinder, equal in length to the barrel of the pump, and a little leſs in the diameter than the bore; ſo that it may move freely in it without any friction. There muſt be two hollow, ſhort, braſs cylinders, or rather rings, at the top of the barrel, which can be ſcrewed together; the upper one muſt be equal in bore to the barrel, and the lower a little leſs: there are two leathers, both having in the middle a leſs hole than the bore of the pipe; the one muſt be applied between the barrel and the lower ring, and the other between the ſame ring and the upper one; and the whole muſt be ſcrewed together. Then if the ſolid cylinder or *forcer*, be put into it, and moved up and down, it is evident that the two before-mentioned leathers, which are applied the one to the barrel and the other to the inſide of the hollow cylinder or ring, will hinder any air from getting between them and the ſolid cylinder.

The advantage of this kind of *forcer*, is, that it has no other friction but at the top of the barrel, and that the inſide of the barrel need not be ſmooth, as in other kinds of pumps; but only the outſide of the *forcer* muſt be turned true and poliſhed, which can be done with much more eaſe. See *Deſaguliers*, Courſe of Experim. Philoſ. p. 161, 162.

FORCING *pump*. See the article PUMP, *Append.*

FORCING *pipe*. See the article PIPE, *Append.*

FORFICULA, the ear-wig, in zoology, the name of a genus of inſects, the tail of which forms a kind of forceps, capable of pinching; the exterior wings are very ſhort, but dimidiated; and the antennæ are ſetaceous. See the article EAR-*wig*, *Append.*

FORM (*Cycl.*) — FORM *of a ſeries*, in algebra, is uſed for that affection of an undeterminate ſeries, ſuch as,

$Ax^n + Bx^{n+r} + Cx^{n+2r} + Dx^{n+3r}$, &c. which ariſes from the different values of the indices of x.

Thus if $n=1$, and $r=1$, the ſeries will aſſume the *form*,

$Ax + Bx^2 + Cx^3 + Dx^4 +$, &c.

If $n=1$, and $r=2$, the *form* will be,

$Ax + Bx^3 + Cx^5 + Dx^7 +$, &c.

If $n=\frac{1}{2}$, and $r=1$, the *form* is,

$Ax^{\frac{1}{2}} + Bx^{\frac{3}{2}} + Cx^{\frac{5}{2}} + Dx^{\frac{7}{2}} +$, &c.

Again, if $n=0$, and $r=-1$, the *form* of the ſeries will be

$A + Bx^{-1} + Cx^{-2} + Dx^{-3} +$, &c.

When the value of a quantity cannot be found exactly, it is of uſe in algebra, as well as in common arithmetic, to ſeek an approximated value of that quantity ſufficient for practice. Thus in arithmetic, as the true value of the ſquare root of 2 cannot be aſſigned, a decimal fraction is found to a ſufficient degree of exactneſs in any particular caſe. And this decimal fraction is in reality no more than an infinite ſeries of fractions converging or approximating to the true value of the root required. For the expreſſion $\sqrt{2} = 1.41421356$, &c. is equivalent to this $\sqrt{2} = 1 + \frac{4}{10} + \frac{1}{100} + \frac{4}{1000} + \frac{2}{10000} + \frac{1}{100000} +$, &c. Or ſuppoſing

$$x = \tfrac{1}{10},\quad \sqrt{2} = 1 + \frac{4}{x} + \frac{1}{xx} + \frac{4}{x^3} + \frac{2}{x^4} + \frac{1}{x^5} +, \text{ \&c.}$$

$$= 1 + 4x^{-1} + x^{-2} + 4x^{-3} + 2x^{-4} + x^{-5} +,$$

&c. which laſt ſeries is a particular caſe of the general indeterminate ſeries $Ax^n + Bx^{n+r} + Cx^{n+2r} +$, &c. when $n=0$, $r=-1$, and the coefficient $A=1$, $B=4$, $C=1$, $D=4$, $E=2$, &c.

But the application of the notion of approximations in numbers, to ſpecies, or to algebra, is not ſo obvious. Sir Iſaac Newton, with his uſual ſagacity, took the hint, proſecuted it, and thereby diſcovered general methods in the doctrines of infinite ſeries, which before him had only been treated in a particular manner, though with great acuteneſs, by Dr. Wallis and a few others. See *Newton*'s Meth. of Fluxions and infinite Series, with Mr. Colſon's Comment; as alſo the Analyſis per æquationes numero terminorum infinitas, publiſhed by Mr. Jones, in 1711, and ſince tranſlated and explained by Mr. Stewart, together with Sir Iſaac's Quadrature of Curves, Lond. 1745, quarto. To theſe may be added Mr. *Mac Laurin*'s Algebra, part II. chap. x. p. 244. and *Cramer*'s Analyſe des Lignes Courbes Algebriques, ch. vii. p. 148.

Among the various methods for determining the value of a quantity by a converging ſeries, that ſeems, on many occaſions, preferable to the reſt, which conſiſts in aſſuming an indeterminate ſeries equal to the quantity, the value of which is ſought, and afterwards determining the values of the terms of this aſſumed ſeries.

For inſtance, ſuppoſe a logarithm being given, it were required to find its number.

Let the number be $=1+x$, and the given logarithm $=z$. Then, by the nature of logarithms and fluxions (ſee the article FLUXION and LOGARITHM, *Suppl.*) $\dot{z} = \frac{\dot{x}}{1+x}$, and $\dot{z} + x\dot{z} = \dot{x}$. Suppoſe,

$x = Az + Bz^2 + Cz^3 + Dz^4 +$, &c. conſequently,

$\dot{x} = A\dot{z} + 2Bz\dot{z} + 3Cz^2\dot{z} + 4Dz^3\dot{z} +$, &c. $= \dot{z} + x\dot{z}$
$= \dot{z} + Az\dot{z} + Bz^2\dot{z} + Cz^3\dot{z} + Dz^4\dot{z} +$, &c.

Now if the correſponding terms of theſe two equal ſeries's (each being $=\dot{x}$) be compared, we ſhall have

$A=1$, $B=\frac{1}{2}$, $C=\frac{1}{6}$, $D=\frac{1}{24}$, &c. which values being ſubſtituted in the ſeries $Az + Bz^2 + Cz^3 +$, &c. give,

$$x = z + \tfrac{1}{2}z^2 + \tfrac{1}{6}z^3 + \tfrac{1}{24}z^4 + \tfrac{1}{120}z^5 + \tfrac{1}{720}z^6 +, \text{ \&c.}$$

$$= z + \frac{1}{1.2}z^2 + \frac{1}{1.2.3}z^3 + \frac{1}{1.2.3.4}z^4 + \frac{1}{1.2.3.4.5}z^5$$

$+$, &c. And conſequently $1+x$, the number ſought, will be $= 1 + z + \frac{1}{1.2}z^2 +$, &c.

But the indeterminate ſeries $Az + Bzz + Cz^3 +$, &c. was here arbitrarily aſſumed, and will not ſucceed in all caſes.

For inſtance, if from an arc given it were required to find the tangent. Let $x=$ tangent, $v=$ arc, the radius $=1$. Then, from the nature of the circle, we ſhall have $\frac{\dot{x}}{1+xx} = \dot{v}$, or $\dot{x} = \dot{v} + xx\dot{v}$. Now if to find the value of x we ſuppoſe $x = Av + Bv^2 + Cv^3 +$, &c. and operate as before, we ſhall find all the coefficients B, D, F, of the even powers of v, each $=0$. Therefore the ſeries aſſumed is not of a proper *form*. But ſuppoſing $x = Av + Bv^3 + Cv^5 + Dv^7 +$, &c. we ſhall find $A=1$, $B=\frac{1}{3}$, $C=\frac{2}{15}$, $D=\frac{17}{315}+$, &c. and conſequently $x = v + \frac{1}{3}v^3 + \frac{2}{15}v^5 + \frac{17}{315}v^7 +$, &c.

Now to find a proper indeterminate ſeries in all caſes, tentatively, would often be very laborious, and often an impracticable work. Mathematicians have therefore endeavoured to find out a general rule for this purpoſe. But, till lately, the method has been but imperfectly underſtood and delivered. Moſt authors, indeed, have explained the manner of finding the coefficients A, B, C, D, &c. of the indeterminate ſeries $Ax^n + Bx^{n+r} + Cx^{n+2r} +$, &c. which is eaſy; but the values of n and r, wherein the main difficulty lies, have been aſſigned by many, as if they were ſelf-evident, or at leaſt diſcoverable by an eaſy trial or two, as in the laſt example.

Sir Iſaac Newton himſelf has ſhewn the method of determining the number n, by his rule for finding the firſt term of a converging ſeries, by the application of his parallelogram and ruler. For the particulars of this method, ſee the authors above cited. See alſo the article PARALLELOGRAM, *infra*.

Dr. Taylor, in his Methodus incrementorum, inveſtigates the

the number r; but, according to Mr. Stirling[a], the rule given by the doctor fails ſometimes. [[a] Lineæ tert. ordin. Newtonian. p. 28.]

Mr. Stirling found a correction of Dr. Taylor's rule, but ſays he cannot affirm it to be univerſal, having only found it by chance. 'S Graveſande obſerves, that though he thinks Mr. Stirling's rule never leads into error, yet that it is not perfect. See *'S Graveſande*, De determin. form. ſeriei infinit. printed at the end of his Matheſeos univerſalis elementa, Lugd. Bat. 1727. This learned profeſſor has endeavoured to rectify the rule. But Mr. Cramer has ſhewn it to be ſtill defective in ſeveral reſpects; and he himſelf, to avoid the inconveniences to which the methods of thoſe who wrote before him are ſubject, has aſcended to the firſt principles of the method of infinite ſeries, and has entered into a more exact and inſtructive detail of the whole method, than is to be met with elſewhere; for which, and for many other reaſons, his treatiſe deſerves to be particularly recommended to beginners.

But it muſt be obſerved, that in determining the value of a quantity by a converging ſeries, it is not always neceſſary to have recourſe to an indeterminate ſeries: for it is ſometimes more expeditious to find it by common diviſion, or by extraction of roots. See *Newton*, Meth. of Fluxions and inf. Series, above cited. Thus, if it were required to find the arc of a circle from its given tangent, that is, to find the value of v in the fluxional equation, $\dot{v} = \frac{\dot{x}}{1+xx}$, by an infinite ſeries: divide $\dot{x}$ by $1+xx$, the quotient will be the ſeries $\dot{x} - x^2\dot{x} + x^4\dot{x} - x^6\dot{x} +$, &c. And taking the fluents of each term, we ſhall have $v = x - \frac{1}{3}x^3 + \frac{1}{5}x^5 + \frac{1}{7}x^7 +$, &c. which is the ſeries often uſed for the quadrature of the circle. If x 1, that is, if x be the the tangent of 45°, then will $v = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} +$, &c. = the length of an arc of 45°, that is, $\frac{1}{8}$ of the circumference of a circle, whoſe radius $= 1$; or $\frac{1}{4}$ of the circumference, if the diameter $= 1$. Conſequenly, if 1 be the ſquare of the diameter, $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} +$, &c. = the area of the circle: becauſe $\frac{1}{4}$ of the circumference multiplied by the diameter, gives the area of the circle. And this is Leibnitz's ſeries, as alſo James Gregory's.

FORMED *ſtones*, in natural hiſtory. See the article *Formed* STONES, *Suppl.*

FORMICA, among ſportſmen, the name of a diſeaſe incident to ſpaniels. See the article SPANIEL, *Suppl.*

FORMICATION *(Cycl.)* — This term is alſo uſed among builders, for an arching or vaulting.

FORMS, among ſportſmen, is ſaid of a hare when ſhe ſquats in any place. Dict. Ruſt. in voc.

FOUCADE. See the article FOUGADE, *Cycl.*

FOULDAGE, the ſame with foldage. See the article FOLDAGE, *Append.*

FOUNDATION *(Cycl.)* — Architects ought to uſe the utmoſt diligence in regard to *foundations*, ſince of all errors which may happen in building, an error in this point is moſt pernicious.

The ground fit for building upon is of various kinds; ſometimes it is ſo hard as ſcarce to be cut with iron; in other places it is ſtiff, blackiſh, or whitiſh. This laſt is reckoned the weakeſt; and, in general, that is the beſt which requires moſt labour in cutting or digging.

When the ground is very bad, you muſt get large oaken piles of ſuch a length as may reach the ſound ground, and whoſe diameter muſt be about one twelfth part of their length: theſe muſt be driven down with a machine, as cloſe to one another as poſſible, and that under the middle walls as well as the outer ones; and upon their tops large planks are to be pinned down. But if the ground be only faulty in ſome places, arches may be turned over them, by which means no part of the weight of the building will reſt upon them.

As to the rules neceſſary to be obſerved in conſtructing the ground-work, they are theſe: 1. That the bottom of the trench be made exactly level. 2. That the loweſt ledge or row be all of ſtone, laid cloſe together. 3. That the breadth of the ground-work be at leaſt double that of the wall that is to be raiſed on it. However, art ought always to give way to diſcretion, for the breadth may be regulated according to the goodneſs of the ground, and the weight of the intended edifice. 4. That the *foundation* be made to diminiſh as it riſes, only care muſt be taken that it do ſo equally on both ſides. 5. That you ought never to build upon the ruins of an old *foundation*, unleſs well aſſured of its depth and goodneſs. Build. Dict. in voc.

FOUNDATION *of bridges.* See the article BRIDGE, *Suppl.*

FOX, *vulpes*, in zoology, an animal of the dog-kind. See the articles CANIS and VULPES, *Suppl.*

FOX *tail-graſs*, in botany. See the article GRASS, *Append.*

FOYLING *of land*, among farmers, is the fallowing it in the ſummer or autumn. Dict. Ruſt. in voc.

FOYLING, among ſportſmen, a term uſed for the footſteps of a ſtag, on the graſs or leaves. Dict. Ruſt. in voc.

FRACTION *(Cycl.)* — *Infinite ſeries of* FRACTIONS. The ſums, or rather the limit of the ſums of infinite ſeries's of *fractions*, has been one of the principal objects of the modern methods of computation; and theſe ſums may often be found. Thus the ſum of $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} +$, &c. *ad infinitum*, or rather, the limit to which this ſum may approach nearer than by a given difference is 1. So likewiſe the limit of the ſum $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} +$, &c. is $\frac{1}{2}$. And theſe and the like ſums of geometric progreſſions may be readily found, by applying the common rule for determining the ſum of geometric progreſſions from the firſt and laſt terms and the ratio given. For in theſe converging infinite geometric progreſſions, the laſt term muſt be conſidered as 0; ſo that the ſums of the antecedents of theſe progreſſions are conſidered as the ſum itſelf, becauſe they differ from the ſum of the progreſſion by leſs than any aſſigned quantity; but in every geometric progreſſion the ſum of the antecedents is to the ſum of the conſequents as one antecedent to one conſequent. Hence calling the ſum S, the firſt term a, and the ratio r, we ſhall have $S : S - a :: a : ar :: 1 : r$. Therefore $Sr = S - a$, or $S = \frac{a}{1-r}$. Thus if $a = \frac{1}{2}$, and $r = \frac{1}{2}$, S will $= \frac{1}{2}$ divided by $\frac{1}{2}$, or 1. And if $a = \frac{1}{3}$, and $r = \frac{1}{3}$, S will $= \frac{1}{3}$ divided by $\frac{2}{3}$, or $\frac{1}{2}$; and ſo of the reſt.

But the ſeries's of *fractions* that occur in the ſolution of problems are rarely reducible to geometric progreſſions; nor can any general rule, in caſes ſo infinitely various, be given. The art here, as in moſt other caſes, is only to be acquired by examples, and by a careful obſervation of the arts uſed by great authors in the inveſtigation of the ſeries's of *fractions* they have conſidered. And the general methods of infinite ſeries which have been carried ſo far by Mr. de Moivre[a], Mr. Stirling[b], and Mr. Euler[c], are often found neceſſary to determine the ſum of a very ſimple ſeries of *fractions*. — [[a] Miſcel. Analyt. paſſim. [b] Method. Differentialis. [c] Analyſ. infinitorum, & Act. Petropol. paſſim.]

The ſum of a ſeries of *fractions* decreaſing continually, is not always finite, but ſometimes infinite, that is, no limit can be aſſigned but what may be exceeded by the ſum of a certain number of the terms of the ſeries. This is the caſe of the ſeries $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}$, &c. called the harmonic ſeries, the ſum of which (as has been ſaid under the article PROGRESSION) exceeds any given number, and the analogy of this progreſſion with the ſpace comprehended between the Apollonian hyperbola and its aſymptote, ſhews this. But the ſame may be ſhewn independently of the hyperbola from the nature of progreſſions. See *Jac. Bernoulli*, De Seriebus infinit.

The foundation of Mr. Bernoulli's demonſtration is, that a number of terms, beginning from any part of the ſeries, may be found, the ſum of which ſhall always exceed unity, and conſequently the number of terms of the ſeries being ſuppoſed infinite, as many partial ſums as we pleaſe, each exceeding unity, may thus be taken out of the ſeries, which therefore may be continued till it exceed any given number.

But if the denominators of this harmonic ſeries, $\frac{1}{1}, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}$, &c. be ſquared, that is, if we form the ſeries $\frac{1}{1}, \frac{1}{4}, \frac{1}{9}$, &c. the common numerator of which is 1, and the denominators of which are the ſquares of the natural numbers 1, 2, 3, 4, &c. the ſum of this ſeries of *fractions* will not only be limited, as was ſaid under the head PROGRESSION, *Suppl.* but this ſum will be preciſely equal to the ſixth part of the number, which expreſſes the ratio of the ſquare of the circumference of a circle to the ſquare of its diameter. That is, if the circumference be 3.14159, &c. and the diameter 1, then will $\frac{1}{1} + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} +$, &c. $= \frac{\overline{3.14159, \&c.}^2}{6}$. This propoſition was firſt diſcovered by Mr. Euler, and his inveſtigation may be ſeen in the Acta Petropolit. vol. vii. Mr. Mac Laurin[a] has ſince obſerved, that this may eaſily be deduced from his Fluxions, art. 822. — [[a] Philoſ. Tranſ. N°. 469.]

It would require a treatiſe to enumerate the various kinds of ſeries's of *fractions* which may be ſummed. Sometimes the ſum or limit of the infinite ſeries cannot be aſſigned, either becauſe it is infinite, as in the harmonic ſeries $\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}$, &c. or although this ſum be finite, as in the ſeries $\frac{1}{1} + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} +$, &c. yet its ſum cannot be aſſigned in finite terms, or by the quadrature of the circle, or hyperbola, which was the caſe of this ſeries before Mr. Euler's diſcovery; but yet the ſum of any given number of the terms of the ſeries may be expeditiouſly found, and the whole ſum may be aſſigned by approximation, independently of the circle. See *Stirling*, Method. Different. and *De Moivre*, Miſcel. Anal.

Beſides the ſeries's of *fractions*, the ſums of which converge to a certain quantity, there ſometimes occur ſeries's of *fractions*, which converge by a continual multiplication. Of this kind is the ſeries found by Dr. Wallis[a], for the quadrature of the circle, which he expreſſes thus,

$\square = \frac{3 \times 3 \times 5 \times 5 \times 7 \times 7 \times 9 \times 9 \times \&c.}{2 \times 4 \times 4 \times 6 \times 6 \times 8 \times 8 \times 10 \times \&c.}$ where $\square$ ſignifies the ratio of the ſquare of the diameter to the area of the circle. Hence the denominator of this *fraction*, continued *ad infinitum*, is to its numerator as the circle is to the ſquare of its diameter. It may be obſerved, that this ſeries is equivalent to, $\frac{3 \times 3}{8} \times \frac{5 \times 5}{24} \times \frac{7 \times 7}{48} \times$, &c. or to $\frac{3^2}{3^2 - 1} \times \frac{5^2}{5^2 - 1} \times \frac{7^2}{7^2 - 1} \times$, &c. that is, the product of the ſquares of all the odd

odd numbers 3, 5, 7, 9, &c. is to the product of the ſame ſquares ſeverally diminiſhed by unity, as the ſquare of the diameter is to the area of the circle [b].—[[a] Arithmet. infinit. prop. cxci. Oper. vol. i. p. 469. [b] Id. Oper. vol. ii. p. 819.]

Theſe products of *fractions*, and the like quantities ariſing from the continued multiplication of certain factors, have been particularly conſidered by Mr. Euler, in his Analyſis infinit. vol. I. chap. xv. p. 221, *ſeq.*

Continued FRACTION is uſed for a *fraction* the denominator of which is a whole number with a *fraction*, the denominator of which is again a whole number and a *fraction*, and ſo on, whether this affection be continued *ad infinitum*, or whether the ſeries breaks off after a finite number of terms. Thus,

$$\cfrac{1}{2+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{5+}}}}\text{, \&c.} \quad\text{or}\quad \cfrac{1}{2+\cfrac{2}{3+\cfrac{3}{4+\cfrac{4}{5+}}}}\text{, \&c. are}$$

continued fractions.

If we make uſe of letters inſtead of numbers, we ſhall have general expreſſions of theſe *fractions*, thus,

$$a+\cfrac{1}{b+\cfrac{1}{c+\cfrac{1}{d+\cfrac{1}{e+\cfrac{1}{f+}}}}}\text{, \&c.}$$

and

$$a+\cfrac{\alpha}{b+\cfrac{\beta}{c+\cfrac{\gamma}{d+\cfrac{\delta}{e+\cfrac{\varepsilon}{f+}}}}}\text{, \&c.}$$

The reduction of theſe *continued fractions* to thoſe of a common form, is not difficult by the uſual rules of arithmetic and algebra. Thus, to give an example, which may at the ſame time ſhew the uſe of theſe *continued fractions*, ſuppoſe the *continued fraction*

$$3+\cfrac{1}{7+\cfrac{1}{15+\cfrac{1}{1+\cfrac{1}{292+\cfrac{1}{1+\cfrac{1}{1+}}}}}}\text{, \&c.}$$

which expreſſes the circumference of a circle, when the diameter is one; if we ſtop at $\frac{1}{7}$, we ſhall have $3+\frac{1}{7}=\frac{21+1}{7}=\frac{22}{7}$. If we ſtop at $\frac{1}{15}$, we ſhall have

$$3+\cfrac{1}{7+\cfrac{1}{15}}=3+\cfrac{1}{\frac{106}{15}}=3+\frac{15}{106}=\frac{318+15}{106}=\frac{333}{106}$$

But if we ſtop at $\frac{1}{1}$, which is convenient on account of the ſmall *fraction* $\frac{1}{292}$, added to the laſt denominator 1, we ſhall then find, $3+\cfrac{1}{7+\cfrac{1}{15+\cfrac{1}{1}}}=\frac{355}{113}$. The firſt of the reductions gives the proportion of Archimedes, and the laſt that of Adrian Metius.

But as beginning at the laſt denominator of the *continued fraction* makes the computation ſomewhat tedious, ſhorter methods have been contrived for the reduction of theſe *fractions*, and for a continued approximation to their true value. And Mr. Cotes's method for the reduction of ratios to ſmaller terms, may be here applied. (See the article RATIO, *Suppl.*) For it is to be obſerved, that when the numerators of the *continued fraction* are each units, the denominators will be the quotients ariſing from the continued diviſions in Mr. Cotes's method; or in the common, for reducing *fractions* to a lower denomination, which is in effect the ſame as Euclid's method for finding the greateſt common meaſure of two magnitudes, lib. x. prop. 3.

But a detail of theſe things would lead us too far, we therefore refer the reader for a farther account of theſe *continued fractions* to Dr. *Wallis's* Arithmet. infinit. prop. 191. oper. vol. i. p. 469, *ſeq.* *Huygens*, Deſcript. automat. planetar. in oper. poſthum. p. 173, *ſeq.* edit. Amſtelod. 1728. and particularly to Mr. *Euler's* Analyſ. infinit. vol. I. cap. xviii. p. 295, *ſeq.* who has ſhewn the uſe and application of this doctrine in many inſtances.

Lord Brouncker ſeems to have been the firſt who conſidered *continued fractions*, or at leaſt who firſt applied them to the quadrature of curves. The hint ſeems uſeful, but has been pretty much neglected, excepting in approximations to *fractions* or ratios expreſſed in great numbers. See the article RATIO, *Suppl.* His ſeries for the quadrature of the circle, is

$$\square = 1\cfrac{1}{2\cfrac{9}{2\cfrac{25}{2\cfrac{49}{2\cfrac{81}{2}}}}}\text{, \&c.}$$

in his and Dr. Wallis's notation, which amounts to the ſame thing as

$$1+\cfrac{1}{2+\cfrac{9}{2+\cfrac{25}{2+}}}\text{, \&c.}$$

in the notation of Huygens and Euler.

The ſymbol $\square$ denotes, as before, the ratio of the ſquare of the diameter to the area of the circle.

Repetend of a decimal FRACTION, See the article REPETEND, *Append.*

FRAMBOISE, a name uſed by ſome for the *rubus*, or blackberry-buſh. See the article RUBUS, *Suppl.*

FRANK *(Cycl.)* — FRANK, among farmers, denotes a place to feed a boar in. Dict. Ruſt. in voc.

FRAY, among ſportſmen. A deer is ſaid to *fray* her head when ſhe rubs in againſt a tree to renew it, or cauſe the pills of her new horns to come off.

FREAM, among farmers, arable or ploughed land worn out of heart, and laid fallow till it recover.

FREAM, among ſportſmen, a term uſed for the noiſe of a boar in rutting time. Dict. Ruſt. in voc.

FRET, in muſic, is uſed for the ſtops uſed on ſome inſtruments, eſpecially baſs viols and lutes: it conſiſts of ſtrings tied round the neck of the inſtrument at ſuch diſtances, within which ſuch and ſuch notes are to be found. Theſe ſtrings or *frets* are ſometimes, yet ſeldom, put on the baſs violin for learners, and taken off again when they can find the notes without them. On lutes and viols they always remain. *Graſſin.* Muſ. Dict. in voc.

FRESCO *(Cycl.)* — The bruſhes and pencils for this work ought to be long and ſoft, otherwiſe they will rake and raiſe the painting. The colours ſhould be full, and flowing from the bruſh; and the deſign perfect: for, in this work, you cannot alter or add upon any colour.

FRIAR's *cowl*, in botany, a name by which ſome call the *ariſarum* of botanical authors. See the article ARISARUM, *Suppl.*

FRICTION *(Cycl.)* — It is hardly poſſible to give general and exact rules concerning *friction*, ſince it depends upon the ſtructure of bodies, the form of their prominent parts and cavities, and upon their rigidity, their elaſticity, their coherence, and other circumſtances. Some authors have made *friction* upon a horizontal plane equal to one third of the weight; but others have found that it was only one fourth of it, and ſometimes only $\frac{1}{6}$ or $\frac{1}{7}$ of it. Of late, authors have told us, that *friction* depends not on the ſurface of the body, but its weight only; but neither is this found to be accurately true. In leſſer velocities, the *friction* is nearly in the ſame ratio as the velocities; but in greater velocities the *friction* increaſes in higher proportion, whether the bodies are dry or oiled.

It being of great importance to diminiſh this *friction*, ſeveral contrivances have been invented for that purpoſe. In wheel-carriages, the *friction* is transferred from the circumference of the wheel (where it would act if the wheel did not turn round) to the circumference of the axis; and, conſequently, is diminiſhed in the proportion of the radius of the axis to the radius of the wheel. In theſe, therefore, the *friction* is always diminiſhed by diminiſhing the diameter of the axis, or by increaſing the diameter of the wheel. The *friction* is likewiſe diminiſhed by making the axis of an engine to reſt upon the circumferences of wheels that turn round with it, inſtead of reſting in fixed grooves that rub upon it; for, by this contrivance, the *friction* is transferred from the circumference of thoſe wheels to their pivots; and the *friction* may be ſtill diminiſhed farther, by making the axles of thoſe wheels reſt upon other *friction*-wheels that turn round with them.

Dr. Deſaguliers has treated fully of the *friction* of engines, carriages, &c. See his Courſe of Experim. Philoſ. vol. i. p. 133 to 138. and p. 182 to 254. ſee alſo p. 458 to 460.

FRIGERATORY, among builders, denotes a place deſigned to keep things cool in ſummer. Build. Dict. in voc.

FRILL, in falconry. When a hawk trembles or ſhivers, they ſay ſhe *frills*. Dict. Ruſt. in voc.

FRINGE-*tree*, the Engliſh name of a genus of plants called by botanical authors *chionanthus*. See the article CHIONANTHUS, *Append.*

FRINGILLA, in zoology, the name of a bird, known in Engliſh by the name of the chaffinch, and called *ſpina* by the antient naturaliſts.

The ſame word is alſo ſometimes uſed as the name of the brambling, a bird more frequently known by the name of the *montifringilla*, and called *oroſpina* by the old authors. See the article MONTIFRINGILLA, *Suppl.*

FRITTILLARIA *craſſa*, in botany, a name ſometimes given to the *aſclepias*, or ſwallow-wort. See the article ASCLEPIAS, *Suppl.*

FROG, among farriers, the ſame with fruſh. See the article FRUSH, *Append.*

FRONTALIS *verus muſculus*, in anatomy, a name given by Douglas, in his Myography, to one of the muſcles of the face, called alſo by himſelf, and, ſince his time, by Albinus, *corrugator ſupercilii*. See the article CORRUGATOR, *Suppl.*

FROUNCE, a diſeaſe in horſes, when ſmall warts or pimples ariſe in the midſt of the palate, which are very ſoft and ſore, and ſometimes breed in the lips and tongue.

This

This diſorder is occaſioned many ways; ſometimes by eating wet hay, whereon rats or other vermin have piſt; by drawing frozen duſt into his mouth among the graſs, &c.

As to the method of treatment, it conſiſts in letting him blood in the two largeſt veins under the tongue, and waſhing the ſore with vinegar and ſalt, or with ale and ſalt, till they bleed. Dict. Ruſt. in voc. *Camery.*

FROUNCE, in falconry, a diſeaſe incident to hawks, ariſing from moiſt and cold humours falling down to the palate and root of the tongue; by which means they loſe their appetite and cannot cloſe their clap. Waſhing with alum-water, lemon-juice, &c. is held good for it.

FROWEY, a term uſed by workmen for timber, which is evenly tempered, and works freely without tearing. Build. Dict. in voc.

FRUCTIFICATION *(Suppl.)* — The organs of *fructification* in plants are the *pointal*, generally contained in the middle of flowers; and the *threads*, which ſurround it, furniſhed at their extremities with little *heads*; theſe the botaniſts term, the firſt the *piſtillum*, the ſecond the *ſtamina*, and the third, or heads of the ſtamina, the *antheræ*, or *apices*. See the article FLOWER, *Suppl.*

The apices contain the *farina fœcundans*, a fine ſubtile matter analogous to the *ſemen maſculinum* in animals; the ſtamina ſerve only for their ſupport, and to convey nutrition to them; and the *piſtillum* is the part deſtined to receive this *farina*, and convey it to the ſeeds.

It is upon theſe principles that the excellent Linnæus has founded his ſyſtem of the vegetable world, and formed his claſſes. This author's work has been received by the learned world in all nations with the reſpect it merits; but has been too generally cenſured among the ſlighter proficients in botanical reſearches, as abſtruſe, difficult, and unintelligible. The viewing theſe things in a new light, and the neceſſity of making new words to convey new ideas, has indeed given this great attempt ſomething of the face of an abſtruſe piece; but premiſing a few general hints, it may not be difficult to vindicate the author from the heavy charges which have been laid againſt him, and give the Engliſh reader a clear and perfect view of his work.

From the ſtructure and uſe of the *piſtillum*, *ſtamina*, and *apices*, it is eaſy to conceive that the former muſt be accounted the *female*, and the two latter the *male parts* of flowers. This is the great baſis of his ſyſtem. To expreſs the different combinations of theſe in the different claſſes of plants, by formal deſcriptions to each, had been tedious, and an over burthen to the memory: to avoid this, he has excellently contrived the compriſing that deſcription, or general character, in one word. It is eaſy to conceive there could be no word already in uſe, that could expreſs what had never before been thought of; he was therefore neceſſitated to invent new ones for this purpoſe. He has ventured therefore to form twenty-four ſuch, for his claſſes, which are of that number, and has taken them from that language which all the learned have ever uſed on the ſame occaſion, the Greek; and this with the leaſt oſtentation or ſhew of learning imaginable: in ſhort, to underſtand all theſe, there is no need of knowing more Greek than that ἀνὴρ ſignifies a man, or any thing male; and γυνὴ, a woman, or female; that δύναμις is power or efficacy; ἀδελφὸς, a brother; and thence ἀδελφὰ, brotherhoods or communities; that σὺν is together; γένεσις, generation or origin; and οἶκος, a houſe, or habitation; that πολὺς ſignifies many; γάμος, marriage; and κρυπτὸς, hidden, or concealed: and that the numbers one, two, three, four, five, ſix, ſeven, eight, nine, ten, twelve, and twenty, or their derivatives, once, twice, &c. are expreſſed by the Greek words μόνος, δὶς, τρὶς, τέτρα, πέντε, ἕξ, ἑπτὰ, ὀκτὼ, ἐννέα, δεκὰς, δώδεκα, εἴκοσι: there needs, I ſay, no more knowledge of Greek than this, to underſtand perfectly the meaning of all the terms this author, to avoid tedious deſcriptions, has uſed as the characters of his claſſes. To begin with certainty and regularity;

He firſt divides the whole vegetable world into ſuch ſpecies as have their flowers viſible and obvious to the eyes, and ſuch as have them inviſible, or at the utmoſt ſcarce diſcernible.

Thoſe which have them viſible he then divides again into ſuch as have the *ſtamina*, *apices*, and *piſtillum*, that is the male and female parts of fructification in the ſame flower: Theſe he for that reaſon calls *hermaphrodite* flowers.

And ſuch as have the male and female parts of *fructification*, that is the *apices* and *piſtillum*, either in different flowers upon the ſame ſtalk, or upon different plants of the ſame ſpecies: theſe he calls the diſtinct male and female flowers.

Thoſe which have the different organs of *fructification* lodged in the ſame flower, he again divides into ſuch as have the ſtamina in no part growing together, or cohering to one another: and ſuch as have them either growing together or cohering together mutually in ſome part, either with one another, or with the *piſtillum*.

Thoſe which have them in no part cohering either with the *piſtillum* or with one another, he again ſubdivides into ſuch as obſerve no exact or accurate proportion of length one among another; and ſuch as have ever two of the ſtamina ſhorter than the reſt.

From theſe general diviſions he deſcends to his particular claſſes, of which he eſtabliſhes twenty-four.

The firſt thirteen are of the plants which have *hermaphrodite* flowers, with the organs of *fructification* disjunct, no where cohering with one another, and obſerving no exact proportion in length.

The firſt is the *monandria*: the word is derived from the Greek μόνος and ἀνὴρ, one male part, and ſignifies a flower that has only one ſuch. This claſs accordingly comprehends thoſe plants which have an *hermaphrodite* flower, and in it only one ſingle *ſtamen*: of this claſs are the *blite*, *turmeric*, &c.

The ſecond is of the *diandria*; the word, derived from the ſame ἀνὴρ and δὶς, twice, and ſignifying a flower that has two male parts, comprehends all thoſe plants which have *hermaphrodite* flowers with two *ſtamina* in each: of this claſs are the *jaſmine*, *phillerea*, *olive*, *roſemary*, *butterwort*, &c.

The third is of the *triandria*; the word, derived from the ſame ἀνὴρ and τρὶς, thrice, ſignifies a flower that has three male parts in it, and comprehends thoſe plants which have *hermaphrodite* flowers with three *ſtamina* in each: of this claſs are the *valerian*, *ſaffron*, many of the *graſſes*, &c.

The fourth is of the *tetrandria*; the word, derived from the ſame ἀνὴρ and τέτρας, four times, ſignifies a flower that has four male parts, and accordingly comprehends thoſe plants which have *hermaphrodite* flowers with four *ſtamina* in each; of this claſs are the *teaſel*, *madder*, *plantain*, &c.

The fifth is of the *pentandria*; the word derived, from the ſame ἀνὴρ and πέντε, five, ſignifies a flower with five male parts, and accordingly this claſs comprehends thoſe plants which have *hermaphrodite* flowers with five *ſtamina* in each; of this claſs are the *primroſe*, *willow-herb*, *bind-weed*, &c.

The ſixth is of the *hexandria*; the word, derived from the ſame ἀνὴρ and ἕξ, ſignifies a flower that has ſix male parts, and accordingly comprehends thoſe plants which have *hermaphrodite* flowers with ſix *ſtamina* in each; theſe *ſtamina*, the author obſerves, are either all equal in length, or alternately one ſhorter than another: of this claſs are *garlick*, *hyacinths*, *meadow-ſaffron*, &c.

The ſeventh is of the *heptandria*; the word, derived from the ſame ἀνὴρ and ἑπτὰ, ſeven, ſignifies a flower with ſeven male parts, and comprehends thoſe plants which have *hermaphrodite* flowers with ſeven *ſtamina* in each: of this claſs are the *horſe-cheſnut* and *trientalis*.

The eighth is of the *octandria*; the word, derived from the ſame ἀνὴρ and ὀκτὼ, eight, ſignifies a flower with eight male parts, and comprehends thoſe plants which have *hermaphrodite* flowers with eight *ſtamina* in each: of this claſs are the *maple*, *rue*, *heath*, &c.

The ninth claſs is of the *enneandria*; the word, derived from the ſame ἀνὴρ and ἐννέα, nine, ſignifies a flower that has nine male parts, and comprehends thoſe plants which have *hermaphrodite* flowers with nine *ſtamina* in each: of this claſs are the *bay*, *rhubarb*, &c.

The tenth claſs is of the *decandria*; the word, derived from the ſame ἀνὴρ and δεκὰς, ten, ſignifies a flower which has ten male parts, and comprehends all thoſe plants which have *hermaphrodite* flowers with ten *ſtamina* in each: of this claſs are the *Judas-tree*, *baſtard-dittany*, *caltrops*, &c.

The eleventh is of the *dodecandria*; the word, derived from the ſame ἀνὴρ and δώδεκα, twelve, ſignifies a flower which has twelve male parts in it, and comprehends thoſe plants which have *hermaphrodite* flowers with twelve *ſtamina* in each: of this claſs are the *aſarabacca*, *agrimony*, &c.

The twelfth is of the *icoſandria*; the word, derived from the ſame ἀνὴρ and εἴκοσι, twenty, ſignifies ſtrictly a flower with twenty male parts in it; the author however does not underſtand it in that ſtrict ſenſe, but uſing it as we frequently do words expreſſing large quantities, as indefinite and in an indeterminate ſenſe, defines it to mean only a larger number of *ſtamina* than are expreſſed under any other of the diſtinctions; and comprehends under it, in this claſs, all thoſe plants which have *hermaphrodite* flowers and more than twelve *ſtamina* in each; thoſe *ſtamina* alſo growing to the inner ſide of the cup of the flower, not to the receptacle of the future ſeeds: of this claſs is the *torch-thiſtle*, the *myrtle*, *ſtorax*, the *almond*, &c.

The thirteenth is of the *polyandria*; the word, derived from the ſame ἀνὴρ and πολὺς, many, ſignifies, in an exact ſenſe, no other than what he makes the *icoſandria*, the title of the laſt claſs, expreſs: theſe are, perhaps, the only two words in which his expreſſion is deficient, the name he has given the claſſes not at all importing their particular difference from one another: this, however, he has very acurately done in the character which follows them; and comprehends under this claſs thoſe plants which have *hermaphrodite* flowers with more than twelve *ſtamina* in each, but which grow in this to the receptacle of the future ſeed, not as in the other claſs to the inner ſide of the cup of the flower; of this claſs are the *water-lilly*, *poppy*, *celandine*, &c.

Theſe are the claſſes this accurate diſtinguiſher has eſtabliſhed among the *hermaphrodite* flowers, whoſe *ſtamina* have no regular

gular proportion of length, in regard to one another. To these he next subjoins two classes of such of them as have ever two of their *stamina* shorter than the rest.

The first of these (the fourteenth class of the general order) is of the *didynamia*: the word derived from the before-mentioned δὶς and δυνάμις, power or efficacy, signifies with him such flowers as have two of their male parts of more efficacy than the rest; and in this class he accordingly comprehends all those plants which have *hermaphrodite* flowers, two of whose *stamina* are longer, and of greater efficacy in the great work of fecundating the seeds, than the rest: of this class are the *thyme, lavender, basil, &c.*

The second of these (the fifteenth class in the general order) is of the *tetradynamia*: the word derived from the before-mentioned τέτρας and δυνάμις, signifies a flower with four of its male parts of more efficacy than the rest; and in this class he comprehends the plants with *hermaphrodite* flowers, four of the *stamina* of which are longer than the rest: of this class are the *scurvy-grass, radish, mustard, &c.*

From these he proceeds to those *hermaphrodite* flowers whose *stamina* cohere, either mutually among one another, in different manners; or with the *pistillum* of the flower: these coalitions of the *stamina* he calls brotherhoods, or communities, and according to the different state of these, and their conjunctions with the *pistillum*, he establishes five classes of them.

The first of these (the sixteenth in the general order) is of the *monadelphia*: the word derived from the before-mentioned μόνος, single, and ἀδελφά, brotherhoods, or communities, signifies with him a flower whose *stamina*, by means of the filaments running in among one another, are all formed into one body; and under this class he comprehends those plants with *hermaphrodite* flowers, whose *stamina*, or male parts, are all bound together in one body: of this class are the *crane's-bill, mallow, &c.*

The second of these (the seventeenth class in the general order) is of the *diadelphia*: the word derived from the before-mentioned δὶς and ἀδελφά, signifies with him a flower whose *stamina* are, by the conjunction of their filaments, formed into two bodies; and under this class he comprehends those plants which have *hermaphrodite* flowers, the *stamina* of which are so clustered together into two bodies: of this are the *fumitory, millwort, broom, &c.*

The third of these (the eighteenth in the general order) is of the *polyadelphia*: the word derived from the before-mentioned πολὺς and ἀδελφά, signifies with him a flower whose male parts are clustered into three or more separate bodies; and in this he comprehends those plants with *hermaphrodite* flowers, whose *stamina*, by the conjunction of their filaments, are formed into three or more clusters: of this class are the *orange, St. John's wort, &c.*

The fourth of these classes (the nineteenth in the general order) is of the *syngenesia*: the word derived from σὺν, together, and γένεσις, generation, origin, or formation, signifies with him such flowers as have their male parts naturally formed into a single regular congeries; and accordingly he comprehends under this class such plants as have *hermaphrodite* flowers, the *stamina* of which, by the junction of their *apices*, are formed into a single, regular, cylindric body: of this class are the *lettuce, succory, hawkweed, &c.*

The fifth of these classes (the twentieth in the general order) is of the *gynandria*: the word derived from γυνὴ, a woman, or female, and ἀνὴρ, male, signifies with this author a conjunction of the male and female parts of a flower at their origin; and he accordingly comprehends under this class those plants which have *hermaphrodite* flowers, the *stamina*, or male parts of which grow to the *pistillum*, or female part of the flower, and not to the receptacle of the seeds: of this class are the *barrenwort, passion-flower, birthwort, &c.*

Next after these he ranges those plants which have flowers not *hermaphrodite*, but regularly and distinctly male and female, as the sexes in animals are disposed; and after these such plants as have flowers irregularly of one, or the other, or sometimes of both sexes:

Of these he establishes only three classes.

The first of these (the twenty-first class in the general order) is of the *monoecia*: the word derived from the before-mentioned μόνος, and οἶκος, a habitation, signifies with this author such plants as have their distinct flowers on the same individual; and he comprehends accordingly under it those plants which have the male and female flowers distinct in themselves, but placed on the same plant, or the different stalks from the same root: of this class are the *alder, mulberry, amaranth, arrowhead, &c.*

The second of these (the twenty-second class in the general order) is of the *dioecia*: the word derived from the same οἶκος and δὶς, signifies with him plants which have their male and female flowers, not on the same individual; and accordingly comprehends under it such plants as have distinct male and female flowers, on different plants of the same species, either of which, the male and female plants, as they are hence called, might have arisen from the same seed: of this class are the *willow, misletoe, hemp,* and *spinach, &c.*

The third of these (the twenty-third in the general method) is of the *polygamia*: the word derived from πολὺς, many, and γάμος, marriage, signifies with this author plants which have a diversity of combinations and many ways of *fructification*, in the same species; and accordingly he comprehends under this class those plants which have, in the same species, some flowers male, others female, each distinct and perfect in its kind; and others mixed or *hermaphrodite*, with the male and female organs of *fructification* both in each: of this class are *pellitory of the wall, orrache, the ash, &c.*

After all these he places those plants whose flowers are either absolutely invisible, or scarce discernible by the eye: of these he makes only one, his twenty-fourth and last class, the *cryptogamia*: the word derived from κρυπτὸς, hidden, or concealed, and the before-mentioned γάμος, or marriage, signifies a set of plants, in which the *fructification* is concealed: and under this last class he comprehends those plants which either flower, as is generally supposed, within the fruit, or have the organs of their *fructification* so mingled as to escape our observation: of this class are the *ferns, mosses, liverworts,* and *mushrooms.*

These are the classes into which this author has regularly and certainly reduced the whole vegetable world; the characters of which are so expressive, and the parts they are founded upon so fixed and invariable in their nature and office, that there seems no reason hereafter to perplex the world with any new system.

As the classes are here all taken from the number, site and disposition of the male parts of the flower; so the orders which make their subdistinctions are, by this author, deduced from the differences of the female parts or *pistillum*; and as that is single, double, triple, and so on, they are on the same principles named *monogynia, digynia, trigynia, &c.*

It were to be wished indeed that the characters of the different genera of these classes were as perfect and accurate as the classes themselves: this, however was more than the work of one man; the author has fixed the general distinction, and led the way; and it is easy now for a much less genius to follow him.

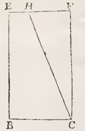
FROWEY, a term used by workmen for timber which is evenly tempered all the way, and works freely without tearing. Build. Dict. in voc.

FRUIT (*Suppl.*)—*Ripening of* FRUIT. For the method of forwarding this operation of nature, see the article RIPENING, *Append.*

FRUSH, or FROG, among farriers, that part of a horse's foot, which is placed from the middle of the sole towards the heel, upon both sides: it is more soft and higher raised than the rest of the sole. Dict. Ruff. in voc.

FRUSTUM (*Cycl.*) — FRUSTUM *of a cone.* The cylinder generated by the revolution of the rectangle EBCF (fig. I.) about one of its sides EB, which is the height of the *frustum* of a cone, the other side BC being the radius of its greatest base, is to the *frustum* generated by the revolution of the trapezium EBCH, as the square of BC is to the rectangle contained under BC and EH, added to one third part of the square of the difference of these lines. *Archimedes.*

Fig. I.



We have a general theorem in Mr. Mac Laurin's Treatise of Fluxions, concerning the *frustum* of a sphere, cone, spheroid, or conoid, terminated by parallel planes, when compared with a cylinder of the same altitude, on a base equal to the middle section of the *frustum* made by a parallel plane. The difference between the *frustum* and the cylinder is always the same in different parts of the same, or of similar solids, when the inclination of the planes to the axis, and the altitude of the *frustum* are given.

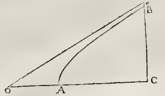
FRUSTUM *of a parabolic conoid.* In the parabolic conoid this difference vanishes, the *frustum* being always equal to a cylinder of the same height, upon the section of the conoid that bisects the altitude of the *frustum*, and is parallel to its bases.

FRUSTUM *of a sphere.* In a sphere the *frustum* is always less than the cylinder by one fourth part of a right angled cone, of the same height with the *frustum*, or by one half of a sphere of a diameter equal to that height; and this difference is always the same in all spheres, when the altitude of the *frustum* is given.

In the cone, the *frustum* always exceeds the cylinder by one fourth part of the content of a similar cone that has the same height with the *frustum*.

Frustum *of an hyperbolic conoid.* In the hyperbolic conoid this excefs is the fame as in the cone generated by the triangle OCe, (fig. II.) formed by the axis OC, the afymptote Oe, and the perpendicular Ce, the altitude of the *fruf-*

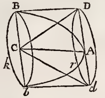
Fig. II.



tum and the inclination of the axis to their bafes being the fame in both.

Frustum *of a fpheroid.* In the fpheroid $ABkb$, (fig. III.) the cylinder exceeds the *fruftum*; and the difference between them is the fame as in the cone $CDrd$, the plane Drd, or Bkb, being fuppofed parallel to thofe which terminate the *fruftum.* In different inclinations of thofe planes, when the altitude of the *fruftum* is given, that difference is reciprocally as the cube of the diameter Bb, which is the conjugate of CA, the axis of the *fruftum.* But if the altitude of the *fruftum* be alfo varied fo as to be reciprocally proportional to the diameter Bb, then the difference between the *fruftum* and cylinder will be always of the fame magnitude in the fame fpheroid or conoid.

Fig. III.



When the inclination of the axis of the folid to the planes that terminate the *fruftum* is given, the difference between the *fruftum* and cylinder, in the fame, or in fimilar bodies, is as the cube of their common altitude. *Mac Laurin's* Fluxions, Introd. p. 24, 25.

Thefe propofitions concerning *fruftums* are of ufe in gauging. See the article Gauging, *Suppl.*

FUMAGE, a term ufed in fome parts of the kingdom for dung, or manuring with dung.

FUMER, in zoology, a name given to the pole-cat. See the article Putorius, *Suppl.*

FUMET, among fportfmen, a term ufed for the ordure or dung of harts, otherwife called fewmets.

FUNCTION *(Cycl.)* — The term *function* is ufed in algebra, for an analytical expreffion any way compounded of a variable quantity, and of numbers, or conftant quantities. Therefore every analytical expreffion, in which, befides a variable quantity x, there are conftant quantities, is a *function* of x. Thus $a+3x$, $ax-4xx$, $ax+b\sqrt{aa-xx}$, c^x, &c. are *functions* of x.

The difference of *functions* confifts in the manner in which they are compounded; and depends, therefore, upon the operations by which quantities may be compounded and mixed. Thefe operations are, addition, fubtraction, multiplication, and divifion, the raifing to powers, and extraction of roots, to which the refolution of equations ought to be referred. Befide thefe operations, which are called algebraical, there are other tranfcendental ones, fuch as exponential, logarithmic, and many others arifing from the inverfe method of fluxions.

Functions may arife from the moft fimple and analytical operations: thus we have the multiple *functions* $2z$, $3z$, $\frac{1}{2}z$, az, &c. and the powers of z, as z^2, z^3, $z^{\frac{1}{2}}$, z^{-1}, &c. are called *functions.*

Functions are divided into *algebraical* and *tranfcendental*: *algebraical* or *algebraic functions*, are thofe formed by algebraic operations only; fuch are thofe above fpecified, except c^x, which belongs to the following fpecies.

Tranfcendental functions are thofe formed by tranfcendental operations: fuch are exponential quantities or powers, the exponents of which are variable quantities; whereas in algebraic *functions* the exponents are always conftant quantities.

It is to be obferved as to *tranfcendental functions*, that thofe *functions* only of a variable quantity are to be deemed tranfcendental, which not only enter the compofition with, but alfo affect the variable quantity: thus if z fignifies a circular arc, or a logarithm, then will ca^z, and the like expreffions, be *tranfcendental functions* of z. But if the tranfcendental operation appertains only to conftant quantities, the *function* is no more than algebraic: thus if c denote the circumference of a circle, the radius of which is $=1$, c will be a tranfcendental quantity, and yet the expreffions $c+z$, cz^2, $4z^c$, are but algebraic *functions* of z. Some indeed have doubted whether z^c ought to be ranked among algebraic *functions*, or not; but the doubt is of fmall weight. And fome choofe to call the powers of z, the exponents of which are irrational numbers, *interfcendent functions*: thus $z^{\sqrt{2}}$ is an interfcendent *function* of z.

On the fubject of *functions*, their divifions, transformations, explication by infinite feries, &c. Mr. Euler fhould be confulted, who has treated this matter very fully in the firft chapter of his Analyf. infinitorum.

FURCA & *flagellum*, in our old writers, denotes the meaneft of all fervile tenures, when the bondman was at the difpofal of his lord for life and limb. — *Ipfe tenet in villenagio ad* furcam & flagellum *de domino fuo*, &c.

FURROW, among gardeners, denotes a ridge or fwelling on the fide of a tree, ftalk, fruit.

Furrow is alfo ufed for the deep trench left between ridges, to drain off the fuperfluous moifture.

FURZE, in botany, the Englifh name of a genus of plants called by authors *genifta fpartium.* See the article Genista *fpartium*, *Suppl.*

FUSTIC-*tree*, in botany. See the article Fustuc, *Suppl.*

G.

GABLOCKS, the name by which the artificial fpurs of game cocks are called. See the article Cock, *Suppl.*

GADDS, among miners. See the article Digging, *Suppl.*

GAFFS, a name fometimes ufed for the gablocks of cocks. See the article Gablock, *fupra.*

GALANGAL, the name by which the root of a genus of plants called by Linnæus *Kæmpferia*, is commonly known. See the article Kæmpferia, *Append.*

GALANTHUS, in the Linnæan fyftem of botany, the name of a diftinct genus of plants, which Tournefort makes only a fpecies of *Narciffo-leucoium.* See the article Narcisso-*leucoium*, *Suppl.*

GALE, in botany, the name of a genus of plants defcribed by Linnæus under that of *myrica.* See the article Myrica, *Append.*

GALL-*ficknefs*, a name fometimes given to bilious and intermitting fevers. See the article Bilious *fever*, *Append.*

GALLY, on fhip-board, a place in the cook-room, where the grates are put up, fires lighted, and the victuals boiled or roafted. *Blanckley*, Nav. Expofitor, p. 62.

GAMMER-*lamb.* See the article Gimmer-*lamb*, *Append.*

GAMMONING, on fhip-board, are feveral turns of rope taken round the bow-fprit, and reeved through holes in the knees of the head, for the greater fecurity of the bow-fprit. *Blanckley*, Nav. Exp. p. 62.

GANDER, the popular name for a male goofe: one of thefe will ferve five geefe.

GAR-*fifh*, in ichthyology, a name ufed in feveral parts of the kingdom for the *efox.* See the article Esox, *Suppl.*

GARGET, a difeafe of cattle, confifting in a fwelling of the throat and the neighbouring parts; to prevent which, bleeding in the fpring is recommended.

GARGIL, a diftemper in geefe, which by ftopping the head frequently proves mortal. Three or four cloves of garlick, beaten in a mortar with fweet butter, and made into little balls, and given the creature fafting, is the ordinary cure. Dict. Ruft. in voc.

GARLICK *(Suppl.)*—*Wild*-Garlick, a name by which fome call a fpecies of onion. See the article Onion, *Suppl.*

GASKETS, on fhip-board, the fmall cords ufed for faftening fails to the yards when furled up. *Blanckley*, Nav. Exp. p. 63.

GAST-

GAST-*hound*. See the article HOUND, *Append.*

GATE, among sportsmen, a term used for the footsteps of a hart. Dict. Rust. in voc.

GATTON-*tree*, a name sometimes given to the cornel-tree. See the article CORNUS, *Suppl.*

GAULE, in botany, a name used by some writers for the *myrica*, or sweet-willow. See the article MYRICA, *Append.*

GAZE-*hound*, or GAST-*hound*. See the article HOUND, *Append.*

GELDER-*rose*, the term by which some call the *opulus*, or water-elder. See the article OPULUS, *Suppl.*

GENERATION (*Cycl.* and *Suppl.*) — The antients believed that males and females were equally concerned in the work of *generation*, and that the fœtus was formed in the womb by a mixture of the seminal juices of both sexes; without pretending to know, or determine by any system, the manner of nature's operation.

Modern philosophers have thought that they saw farther than the antients, and have, at different times, adopted the two systems of *generation* mentioned in the *Cyclopædia* under this head.

But the late experiments of Monf. de Buffon, and of Mr. Needham, if they do not establish a new system, seem at least in a great measure to overturn the old ones.

Monf. de Buffon has endeavoured to prove that the ova in women and quadrupeds are chimeras, and that the spermatic animalcule cannot be the fœtus. He could never find any ova which had detached themselves from the ovary, and passed through the Fallopian tube into the matrix. But he discovered a glandular body on the female testicle, which anatomists had mistaken for one of these; which glandular body, at certain times, swelled, opened and discharged a liquor full of the same animalcules, which Lewenhoek took for living creatures in the semen of males. And Monf. de Buffon adds that he found bodies perfectly similar to these, not only in the semina of very different animals, but in the infusions of plants, of grains, and in the juices of flesh-meats, dressed and prepared by the fire so as to leave no creature living in them. From whence this ingenious gentleman concludes, that these pretended animalcules are not future animals of the species of the father: he does not even allow them to be true animals, but says they are something of an intermediate nature between brute matter and animals; parts organized and animated, the assemblage of which forms the fœtus. See Lettres de Monf. de Maupertuis, let. 17.

But the chief difficulty consists in conceiving how the fœtus is formed from these elements. Monf. de Buffon thinks that every part of the body in both sexes furnishes these organic moleculæ, the reservoirs of which are the seminal liquors of both sexes; that these liquors arrange and unite themselves by attraction, in certain internal moulds, in a manner which that learned author has endeavoured to explain at large; but which will not seem susceptible of any abridgment, to those who would not choose to run the risque of misrepresenting his sentiments on so obscure a subject; we therefore refer to the original, that is, to the Histoire Naturelle, printed at Paris, 1749, where the subject of the *generation* of animals takes up the greatest part of the second volume.

Monf. de Maupertuis's system, in his Venus Physique, has a near resemblance to that of Monf. de Buffon, and tends equally to overturn the systems of the ova, and of the spermatic animalcules, which have prevailed among modern physiologists. The former of these gentlemen, to confirm his own and Mr. de Buffon's opinion, adds an account of a sexdigitary family, as he calls it, at Berlin, many of which had a supernumerary finger or toe, and sometimes both. He says that this sexdigitism, or quality of having supernumerary fingers or toes, has been transmitted equally by the father and by the mother; that it was lost by alliances with those who had but the common number of fingers. He adds, that he does not believe that any one will ascribe the continuation of sexdigitism in a family, to chance; these supernumerary parts might have been accidental varieties at first, but if they be once established by a sufficient number of *generations*, where both sexes have had them, they then become a foundation for a distinct species; and perhaps all the different species discernible in animals of the same kind, have been multiplied in this way. What we may observe in other animals gives ground for these suspicions. See the Letter before cited.

GEODES, in natural history, a genus of crustated bodies formed into large and in great part empty cases, inclosing a small quantity of earthy, or arenaceous matter. See the article SIDEROCHITA. *Append.*

Of this genus are the following known species: 1. The cracked *geodes*, with ferrugineous brown and yellow crusts. 2. The wrinkled *geodes*, with ferrugineous reddish-brown and gold-yellow crusts. 3. The sparkling *geodes*, with ferrugineous purplish and orange-coloured crusts. 4. The long scabrous *geodes*, with a single purplish crust. 5. The long *geodes*, with a single blackish crust. *Hill*, Hist. Foss. p. 541.

GERMANDER-*tree*, in botany, the English name of a genus of plants known among authors by that of *teucrium*. See the article TEUCRIUM, *Suppl.*

GESSES, the same with *jesses*. See the article JESSES, *Append.*

GHERKINS. See the article GUERKINS, *Append.*

GIDDINESS, the popular name for the distemper called by physicians *vertigo*. See the article VERTIGO, *Cycl.*

Giddiness in horses is cured by a glyster and blood-letting, to be repeated after two days moderate exercise. Dict. Rust. in voc.

GIGG (*Cycl.*) — GIGGS, among farriers, small bladders or blisters on the inside of a horse's lips. They must be laid open; and cleansed with salt and vinegar, or alum-water. Dict. Rust. in voc.

GIGGE, in the manufacture of flax, denotes a hole made in the earth, where fire is made to dry the flax laid over it. Dict. Rust. in voc.

GILDER. See the article GUILDER, *Append.*

GILDING (*Cycl.* and *Suppl.*) - GILDING-*knife*, a slip of the hollow Spanish cane, cut up to a smooth and sharp edge, with a good pen-knife: this cane-knife cuts the gold-leaf better than one of steel, as it is apt to stick to this last.

GILDING-*pallet*, a flat piece of wood, about three inches long and an inch broad, covered with a piece of fine woollen cloth.

By breathing upon this pallet, to moisten the cloth a little, and then clapping it gently down upon the gold-leaf, this may be raised from the cushion, and conveyed to the work to be gilded.

GILL-*go-by-ground*, the name used by some writers for ground-ivy. See the article IVY, *Suppl.*

GILLIFLOWER, or JULY-*flower*, in botany, the English name given to several species of *caryophyllus*. See the article PINK, *Suppl.*

Queen's GILLIFLOWER, the name by which some call a distinct genus of plants, described by authors under that of *hesperis*. See the article HESPERIS, *Suppl.*

Stock GILLIFLOWERS, the name of another distinct genus of plants called by botanical writers *leucoium*. See the article LEUCOIUM, *Suppl.*

GIMMER-*lamb*, or GAMMER-*lamb*, a term used by country-people for a female or ewe lamb. Dict. Rust. in voc.

GINGER, the English name of a genus of plants called by authors *zinziber*. See the article ZINZIBER, *Suppl.*

GINGIDIUM, a name used by some botanists for a species of fennel. See the article FOENICULUM, *Suppl.*

GINSENG, in botany, the name given by the people of the East-Indies to the *panax* of botanical writers. See the article PANAX, *Append.*

GIRDLE (*Suppl.*) — GIRDLE-*wheel*, a small spinning-wheel made for hanging to a woman's girdle, or apron-string; so that she may spin with it, though walking about. Dict. Rust. in voc.

GIRKIN, among gardeners, denotes a small kind of cucumber, used for preserving, about the end of October. Rust. Dict. in voc.

GIRT, among builders, the same with fillet. See the article FILLET, *Cycl.*

GIRTHS *of a saddle*, the strong straps, made of a canvas stuff called *girth*-web; which being buckled under the horse's belly, serve to fix the saddle. Rust. Dict. in voc.

GLADDON, or GLADWIN, in botany, the name of a plant, otherwise called spurge-wort. Rust. Dict. in voc.

GLADE, in zoology. See the article GLEAD.

GLADE, in gardening, an open and light passage made through a wood, by lopping off the branches of trees. *Miller*, Gard. Dict. in voc.

GLADWIN, a name sometimes used for the *iris*, or *flower de luce*. See the aricle IRIS, *Suppl.*

GLANDULOUS *roots*, among botanists, such tuberose roots as are fastened together in large numbers by small fibres or threads. Rust. Dict. in voc.

GLASS-*wort*, is sometimes used as the name of a genus of plants described by Linnæus under that of *salicornia*. See the article SALICORNIA, *Append.*

GLASSES, *chemical*, how cæmented, when cracked. See the article CÆMENT, *Append.*

GLASTONBURY-*thorn*, a name sometimes given to the *mespilus*, or medlar. See the article MEDLAR, *Suppl.*

GLAUBER'S *salt*. See the article SAL *mirabile*, *Suppl.*

GLAZIER, an artificer who works or deals in glass.

GLEAD, or GLADE, a name used in the northern parts of the kingdom for the *milvus*, or kite. See the article KITE, *Append.*

GLEBA *alana*, a name by which some call the yellowish white *tripoli*. See the article TRIPOLI, *Cycl.* and *Suppl.*

GLEDE, in ornithology. See the article GLEAD, *Append.*

GLISTER. See the articles CLYSTER, *Cycl.* and ENEMA, *Suppl.*

GLOBE-*daisy*, the English name of a genus of plants called by authors *globularia*. See the article GLOBULARIA, *Suppl.*

GLOBE-*crow-foot*, a name sometimes given to the *helleborus*, or black hellebore. See the article HELLEBORUS, *Suppl.*

GLOBE-*amaranth*, the name of a genus of plants called by botanical writers *amaranthoides*. See the article AMARANTHOIDES, *Suppl.*

GLOBE-*fish*, in ichthyology, the name by which many species of the *ostracion* are called in English. See the article OSTRACION, *Suppl.*

GLOBE-*flower*, or GLOBE-*bottle*, names sometimes given to the *cyanus*, or blue-bottle. See the article CYANUS, *Suppl.*

GLOBE-*thistle*, in botany, the English name of the *echinopus*. See the article ECHINOPUS, *Suppl.*

GLORIOSA, *superb lilly*, in botany, the name of a distinct genus of plants, the characters of which are these: there is no cup: the flower consists of six oblong, lanceolated, undulated, and every way long petals, reflex nearly to the base; the stamina are six subulated filaments, patulous and shorter than the petals of the flower; the antheræ are incumbent; the germen of the pistil is globose; the style is filiform, inclined, and longer than the stamina; the stigma is simple and obtuse; the fruit is an oval pellucid capsule, consisting of three valves, and containing three cells; the seeds are numerous, globose, and disposed in a double series. *Linnæi* Gen. Plant. p. 144.

Tournefort, in the Memoirs of the Academy of Sciences, has called this genus *methonica*. Id. ibid.

GLUE (*Suppl.*) — *Bees* GLUE, a name used by some for crude or rough wax. See the article WAX, *Suppl.*

GLUT, among falconers, denotes the slimy substance that lies in a hawk's pannel. Dict. Rust. in voc.

GLUTTON, *gulo*, in zoology, a name sometimes given to the reddish brown *mustela*, with the middle of its back black. See the article MUSTELA, *Suppl.*

GNOMONIC (*Cycl.*) — GNOMONIC, or GNOMONICAL *projection*, that which represents the circles of an hemisphere, upon a plane touching it in the vertex, by lines or rays from the center of the hemisphere to all the points of the circles to be projected.

In this projection all the great circles of the sphere are projected into right lines. Any lesser circle parallel to the plane of projection is projected into a circle. And any lesser circle not parallel to the plane of projection, is projected into a conic section.

The *gnomonic projection* is also called the *horologiographic projection*, because it is the foundation of dialling. In other respects it is not much used, because the circles of the sphere are projected into conic sections, which are difficult to describe. However this projection has its conveniencies in the solution of some problems of the sphere, on account of the great circles being all projected into right lines.

Mr. Emerson, known by an ingenious treatise upon Fluxions, has given the theory and practice of the *gnomonic projection*, in his Treatise on the Projection of the Sphere, Lond. 1749, octavo. See also Mr. *Murdoch's* Newtoni Genesis Curvarum per Umbras, p. 46, *seq.*

GOAT's *rue*, in botany, the English name of a genus of plants called by authors *galega*. See the article GALEGA, *Suppl.*

GOAT's *stones*, in botany, a name sometimes given to the *orchis* of botanical writers. See the article ORCHIS, *Suppl.*

GODWIT, in zoology, the English name of the *ægocephalus*. See the article ÆGOCEPHALUS, *Suppl.*

GODWIT, in ornithology, the English name of a species of *tringa*. See the article TRINGA, *Suppl.*

GOLD *of pleasure*, in botany, a term by which some call the *myagrum* of botanical authors. See the article MYAGRUM, *Suppl.*

GOLD-*finch*, in ornithology, the name of a species of *fringilla*. See the article FRINGILLA, *Suppl.*

It is smaller than the common sparrow, but of a more elegant form; its colours are extremely beautiful and gay; there is a spot of red at the base of the beak; the top of the head is black, and its hinder part white; the neck and back are of a mixed colour, composed of grey and reddish brown; the belly is white; the ground colour of the wings and tail is black, but they are elegantly variegated with yellow and white; the legs are short, and the hinder toe is longer than any of the others.

GOLDEN *flower-gentle*, a name sometimes given to several species of the *amaranth*. See the article AMARANTH, *Suppl.*

GOLDEN-*cups*, a name by which some call the *ranunculus*, or *crow-foot*. See the article RANUNCULUS, *Suppl.*

GOLDEN-*head*, in ornithology, a water-fowl, otherwise called *anas arctica*. See the article DUCK, *Suppl.*

GOLDY-*locks*, the English name of a genus of plants, called by botanical writers *elichrysum*. See the article ELICHRYSUM, *Suppl.*

GOLF, or GOUF, the name of a diversion, or exercise, much used in Scotland, and played upon the lawns, or links, as they are there called.

It consists in driving a ball with clubs, between two goals or holes, half a mile or a mile asunder. He who can do this with the fewest strokes of his club is the conqueror.

GOMER, or HOMER, a Hebrew measure. See the article CORUS, *Suppl.*

GONDOLA-*shell*, a species of *dolium*. See the article DOLIUM.

GOOSE-*foot*, in botany, the English name of a genus of plants called by botanists *chenopodium*. See the article CHENOPODIUM, *Suppl.*

GOOSE-*grass*, in botany, a name sometimes given to the *aparine* of authors. See the article APARINE, *Suppl.*

GOOSEANDER, a name used in several parts of the kingdom for a species of *mergus*. See the articles MERGUS and MERGANSER, *Suppl.*

GOOSEBERRY *of Barbadoes*, a name by which some call the *pereskia* or *cactus* of botanical writers. See the article CACTUS, *Suppl.* and *Append.*

American GOOSEBERRY, the name of a genus of plants called by botanists *melastoma*. See the article MELASTOMA, *Suppl.*

GORCE, in botany, See the article GORSE, *Append.*

GOREING, or GORING, is said of a sail when cut slanting, so that it is broader at the clew than at the earing, as all topsails and top-gallant-sails are. *Blanckley*, Nav. Exp. p. 65.

GORSE, or GOSSE, in botany, a name sometimes used for furze. See the articles ULEX and GENISTA *spartium*, *Suppl.*

GOSLINGS, a term used to denote young geese. See the article GOOSE, *Suppl.*

GOSSYPIUM, the *cotton-plant*, in botany, the name of a genus of plants, the characters of which are these: the cup is double, the exterior one being composed of one leaf deeply divided into three segments, and the inner one slightly divided into five segments; the flower consists of five leaves adhering at the base, cordated at the top, plane, and patent; the stamina are numerous filaments, which by adhering together form a kind of cylinder at the base; the antheræ are kidney-shaped; the germen of the pistil is roundish; the style columnar, and of the length of the stamina; the stigmata are four, and pretty thick; the fruit is a roundish capsule, divided into four cells and containing numerous egg-shaped seeds, surrounded with a fine downy matter. Vide *Linnæi* Gen. Plant. p. 331.

GOUF, or GOLF. See the article GOLF, *Append.*

GOURD (*Suppl.*) — *Bitter* GOURD, a name sometimes given to the *colocynthis* of botanical writers. See the article COLOCYNTHIS, *Suppl.*

Indian tree-GOURD, a term by which the *cujete*, or *crescentia*, of botanical writers, is sometimes called. See the article CRESCENTIA, *Suppl.*

Sour GOURD, in botany, a name sometimes given to the *baobab*, or *baobob*. See the article BAOBAB, *Suppl.*

GOURD-*worm*, the English name of a species of worm found in the intestines of several animals. It has this name from its resembling the seed of the gourd in figure.

GOURDY *legs of horses*. See the article GREASE, *Cycl.*

GOUT-*wort*, a name sometimes given to a genus of plants called by botanists *angelica*. See the article ANGELICA, *Suppl.*

GRAIN (*Suppl.*) — *Oily* GRAIN, the name by which some call the *sesamum*, or *myagrum* of botanical writers. See the article MYAGRUM, *Suppl.*

Scarlet GRAIN, in botany, a term sometimes used to denote the *opuntia* and *ilex* of botanical writers. See the articles OPUNTIA and ILEX, *Suppl.*

GRAMEN, *grass*, in botany, the name by which botanists call a large genus of plants. See the article GRASS, *Append.*

GRAMEN *murorum, spica longissimâ*, the name given by Mr. Raymond to a genus of plants called by Linnæus *festuca*. See the article FESTUCA, *Suppl.*

GRAPE, the fruit of the vine. See the article VITIS, *Suppl.*

Sea-side GRAPE, in botany, a name by which some call the *guajabara*. See the article GUAJABARA, *Append.*

Hyacinth GRAPE, a name sometimes used for the *muscari*, a genus of plants. See the article MUSCARI, *Suppl.*

GRASS, *gramen*, in botany, the English name of a large genus of plants, the characters of which are these: the flower, which is disposed in fasciculi, has no petals, consisting wholly of a number of stamina, arising, for the most part, out of a squamose cup; the germen of the pistil finally becomes a roundish or oblong seed, inclosed in the cup itself, or in a distinct capsule, and containing very little farina or flour. See *Tournefort*, Inst. Bot. p. 516. See also the Article GRASS, *Suppl.*

Of this genus there are a vast multiplicity of species, enumerated by the above-mentioned author, whom the curious may consult on that head.

Canary-GRASS, the English name of a distinct genus of plants called by botanists *phalaris*. See the article PHALARIS, *Suppl.*

Capon's tail GRASS, the English name of a distinct genus of plants called by botanists *festuca*. See the article FESTUCA, *Suppl.*

Crested-GRASS, or *Cock's foot* GRASS, names given to a distinct genus of plants, called by Linnæus *cynosurus*. See the article CYNOSURUS, *Suppl.*

Couch-GRASS, a name given to the green-leav'd *triticum*, with a creeping root. See the article TRITICUM, *Suppl.*

Dog's GRASS, *gramen Caninum*, the name by which some call a species of *triticum*. See the article TRITICUM, *Suppl.*

Sea-dog's GRASS, a name sometimes given to the double-spiked *secale*, or rye. See the articles SECALE and RYE, *Suppl.*

Dog's-tail GRASS, the Engliſh name of a diſtinct genus of plants called by authors *cynoſurus*. See the article CYNOSURUS. *Suppl.*

Fox-tail GRASS, the Engliſh name of a diſtinct genus of plants known among botaniſts under that of *alopecurus*. See the article ALOPECURUS, *Suppl.*

Knot-GRASS, a name given to ſeveral diſtinct genera of plants. See the articles POLYGONUM and PARONYCHIA, *Suppl.*

Love-GRASS, a name ſometimes given to a ſpecies of *briza*, a diſtinct genus of plants. See the article BRIZA, *Suppl.*

Meadow-GRASS, the Engliſh name of a diſtinct genus of plants called by authors *poa*. See the article POA, *Suppl.*

Hard Meadow-GRASS, a name ſometimes given to a ſpecies of the *cynoſurus*, or *dog's-tail graſs*. See the article CYNOSURUS, *Suppl.*

Millet-GRASS, in botany. See the article MILIUM, *Suppl.*

Oat-GRASS, in botany, a name by which ſome call a ſpecies of *feſtuca*. See the article FESTUCA, *Suppl.*

Buſh-oat-GRASS, or *tall oat*-GRASS, names given to a diſtinct genus of plants, called by botaniſts *bromus*. See the article BROMUS, *Suppl.*

Quaking GRASS, *gramen tremulum*, the name by which ſome call a ſpecies of *briza*. See the article BRIZA, *Suppl.*

GRASS *of Parnaſſus*, the Engliſh name of a diſtinct genus of plants called by authors *Parnaſſia*. See the article PARNASSIA, *Suppl.*

Pudding-GRASS, a name ſometimes given to the *pulegium*, or penny-royal, a ſpecies of mint. See the articles MENTHRA and MINT, *Suppl.*

Rattle-GRASS, a name ſometimes uſed for the *pedicularis*, or louſe-wort. See the article PEDICULARIS, *Suppl.*

Scorpion-GRASS, the Engliſh name of a genus of plants called by botaniſts *ſcorpioides*. See the article SCORPIOIDES, *Suppl.*

Shave-GRASS the name uſed by ſome writers for the *equiſetum* of botaniſts. See the article EQUISETUM, *Suppl.*

Silk-GRASS, a name by which ſome call two very different genuſſes of plants, the aloe and dog's-bane. See the articles ALOE and DOG'*s-bane*, *Suppl.*

Sword-GRASS, a name ſometimes given to the *gladiolus* of botaniſts. Ruſt. Dict. in voc.

Trefoil-GRASS, or *three-leaved* GRASS, a diſtinct genus of plants. See the article TREFOIL, *Suppl.*

Vetch-GRASS, the Engliſh name of a diſtinct genus of plants called by authors *niſſolia*. See the article NISSOLIA, *Suppl.*

Viper's GRASS, a name by which ſome call the *ſcorzonera* of botanical writers. See the article SCORZONERA, *Suppl.*

GRAVING, in the ſea language, is the bringing a ſhip a-ground, and then burning off with furze, reed, or broom, all the filth and foulneſs that ſticks to her bottom without-board, in order to pay her new. *Blanckley*, Nav. Exp. p. 67.

GRAVITY *(Cycl.)* — To determine the ſpecific *gravity* of bodies accurately, requires ſo much care, and is liable to ſo many difficulties, that we need not be ſurprized when we find authors differing from one another. The lateſt we have on this ſubject, and the beſt, is Dr. Richard Davies, in the Philoſ. Tranſact. N°. 488. This gentleman has with great pains and judgment collected all the experiments of this kind, that have been made by the moſt accurate authors, ſhewing how widely they diſagree, and pointing out the cauſes of their differences; and he has alſo given us the ſpecific *gravities* of ſeveral ſubſtances from his own obſervations; to which we refer the curious.

GRAY, the Engliſh name of a ſpecies of duck, otherwiſe called gadwall. See the article GADWALL, *Suppl.*

GRAYMILL, in botany, a name ſometimes given to the *lithoſpermum* of authors, more uſually called gromwell. See the article LITHOSPERMUM, *Suppl.*

GREEN *(Suppl.)* — *Saxon* GREEN, an extremely beautiful *green* colour, the proceſs of dying which is this: the cloth or ſilk is firſt to be dyed a Saxon blue, in the following manner; having ground nine parts of indigo with twenty of red arſenic into a fine powder, add forty-eight parts of ſtrong ſpirit of vitriol; which mixture ſwells, grows hot, and emits a ſulphureous ſmell. After ſtanding in a moderate warmth for twenty-four hours, pour off the liquid part, which will be of an extremely deep blue. A ſmall quantity of this liquor, dropt into hot water, inſtantly ſpreads, tinges it of a fine light blue, and fits it for dying the prepared wool, cloth, or ſilk; and, by increaſing or diminiſhing the proportion of the blue compoſition, the colour may be rendered deeper or lighter.

The cloth or ſilk, thus dyed blue, is next to be dipt in the yellow decoction of weld or fuſtic, and the deſired colour will be obtained.

Or the ſubject may be died *green* at one operation, by boiling it for a little time in a mixture of the blue and yellow liquors.

By thus combining any blue and yellow dyes, in different proportions, all the ſhades of *green* may be produced, from the bluiſh *green* of the cabbage-leaf to the greeniſh yellow of the olive.

Winter-GREEN, the name of a diſtinct genus of plants called by authors *pyrola*. See the article PYROLA, *Suppl.*

GREEN-*finch*, the Engliſh name of a ſpecies of *fringilla*, which has a ſtrong tinge of *green* diffuſed over all its body; the wings and tail are black, but both variegated with a beautiful yellow. See the article FRINGILLA, *Suppl.*

GREENS, in diet. It is to be obſerved, that *greens* as well as fruit are but a flatulent diet, and therefore ought to be eaten with moderation in bilious diſorders. However, on account of their antiſeptic quality, they are eſteemed good for preventing putrid and contagious diſeaſes. *Pringle*, Obſerv. on the Diſeaſes of the Army, p. 210, 294.

GREY, or GRAY, in zoology. See the article GRAY, *Suppl.*

GREY *fly*, the name of a ſpecies of two-winged flies, called by zoologiſts *œſtrum*. See the article ŒSTRUM, *Suppl.*

GRICE, a term uſed by country people for a young wild boar. Dict. Ruſt. in voc.

GRIG, in ichthyology, a name frequently uſed for the ſand-eel or *ammodytes*. See the article AMMODYTES, *Suppl.*

GRIPES, in the dyſentery. See the article DYSENTERY.

GRISLEY *ſeeds*, among herbaliſts, denote thin, flat ſkinny ſeeds. Ruſt. Dict. in voc.

GROATS, a term uſed in many parts of the kingdom for culled oats or oat-meal only half ground. Dict. Ruſt. in voc.

GROOVE *(Suppl.)* — GROOVE, or GROVE, among joiners, denotes the channel that is made by their plough in the edge of a moulding, ſtyle, or rail.

GROOVE alſo denotes a gardener's tool for tranſplanting flowers. Dict. Ruſt. in voc.

GROTTO *(Cycl. and Suppl.)* — A cæment for artificial *grottos* may be made thus: take two parts of white roſin, melt it clear, and add to it four parts of bees wax; when melted together add two or three parts of the powder of the ſtone you deſign to cæment, or ſo much as will give the cæment the colour of the ſtone; to this add one part of flower of ſulphur: incorporate all together over a gentle fire, and afterwards knead them with your hands in warm water. With this cæment the ſtones, ſhells, &c. after being well dried before the fire, may be cæmented. *Smith*'s Laboratory, p. 169.

Artificial red coral branches, for the embelliſhmrnt of *grottos*, may be made in the following manner: take clear roſin, diſſolve it in a braſs pan; to every ounce of which add two drams of the fineſt vermillion: when you have ſtirred them well together, and have choſen your twigs and branches, peeled and dried, take a pencil and paint the branches all over whilſt the compoſition is warm; afterwards ſhape them in imitation of natural coral. This done, hold the branches over a gentle coal-fire, till all is ſmooth and even as if poliſhed.

In the ſame manner white coral may be prepared with white lead, and black coral with lamp-black.

A *grotto* may be built with little expence of glaſs, cinders, pebbles, pieces of large flint, ſhells, moſs, ſtones, counterfeit coral, pieces of chalk, &c. all bound or cæmented together with the above deſcribed cæment.

GROUND-*pine*, in botany. See the article CHAMÆPYTIS, *Suppl.*

Stinking GROUND-*pine*, the name by which ſome call the *polycnemum* and *camphorata* of botanical writers. See the articles POLYCNEMUM, *Append.* and CAMPHORATA, *Suppl.*

GROUND-*worm*, in the hiſtory of inſects. See the articles WORM and EARTH-*worm*, *Suppl.*

GROUNSEL, *ſenecio*, in botany. See the article SENECIO, *Suppl.*

African GROUNSEL, a name ſometimes given to a genus of plants called by Linnæus *kleinia*. See the article KLEINIA, *Append.*

GROWSE, in ornithology. See the article GROUSE, *Suppl.*

GRUB-*ax*, or GRUBBAGE, among gardeners, &c. a tool for grubbing up the roots of trees, weeds, &c. Ruſt. Dict. in voc. See GRUBBING, *Suppl.*

GUABANI, in botany, the name of a delicate fruit of the Weſt-Indies, cooling and of a ſweet taſte: it is about two hands breadth long, and has a white delicious pulp, containing a number of hard kernels or ſeeds.

GUAIACAN, in botany, a name by which ſome authors have called the tree whoſe wood is the *lignum vitæ*, or *guaiacum* of the ſhops.

GUAJABARA, the *ſea-ſide-grape*, the name of a genus of plants, the characters of which are theſe: the flower is of the roſaceous kind, conſiſting of ſix petals; in the center ariſes the pointal, which afterwards becomes a pulpy fruit, incloſing one roundiſh ſtone terminating in a point.

The ſpecies of *guajabara* are theſe, 1. The *ſea-ſide-grape*, with oblong leaves. 2. The common *ſea-ſide-grape*, with roundiſh leaves. 3. The *ſea-ſide-grape*, with very broad leaves. 4. The *ſea-ſide-grape*, with ſmaller and longer leaves.

All theſe ſorts, which are natives of the Weſt-Indies, muſt be propagated by ſeeds, ſown in pots of light rich earth, and plunged into an hot-bed of tanner's bark: the plant muſt conſtantly remain in a ſtove, being too tender to live in the open air, even in our warmeſt weather; only in ſummer they may be frequently refreſhed with water, and have freſh air admitted to them. *Miller*'s Gard. Dict. in voc.

GUANA, in zoology, a ſpecies of lizard, otherwiſe called *iguana*. See the article IGUANA, *Suppl.*

GUARANTY, in politics, an engagement of mediatorial or neutral states, whereby they pledge their faith, that the articles of a particular treaty shall be inviolably observed on both sides.

This engagement implies, that the guarantees are obliged to assist the party invaded contrary to the treaty, against the injurious agressor; but not if the war is occasioned by any other causes than the violation of the articles of peace. *Puffendorff*, Law of Nature and Nations, book VIII. ch. viii. § 7.

GUAVA, a name sometimes given to the *guajava* of Tournefort. See the article GUAJAVA, *Suppl.*

GUERKINS, a kind of cucumbers for pickling, otherwise called gherkins. Dict. Rust. in voc.

GUERNSEY-*lilly*, a name used for a genus of plants, called by some *amaryllis*, and by others *lilio-narcissus*. See the article LILIO-NARCISSUS, *Suppl.*

GUILLEMITES, an order of monks in Flanders, whose habit resembles that of the Cistertians: they follow the rule of St. Augustine, and are governed by a superior, who does not take the title of provincial, and is elected every four years. See *Broughton's* Dict. Relig. in voc.

GUINEA-*henweed*, in botany, a name by which some call the *petiveria* of botanical writers. See the article PETIVERIA, *Suppl.*

GUINEA-*pepper*, the English name of a genus of plants, called by authors *capsicum*. See the article CAPSICUM, *Suppl.*

GUINEA-*wheat*, a name sometimes given to the maiz, or Indian corn, called by botanists *yucca*. See the article YUCCA, *Suppl.*

GUINEA-*worm*, in the history of insects, the same with what zoologists call *chætia*. See the article CHÆTIA, *Append.*

GULO, in zoology, a name sometimes given to a species of *mustela*. See the article GLUTTON, *Append.*

GUM *(Suppl.)* — Grew, in his Anatomy of Plants, makes the following remarks concerning the import of the word *gum*, and the distinction thereof both from a rosin and a mucilage.

A rosin, he observes, is originally a turpentine, or acidulous liquor, having an exceeding small quantity of watery parts mixed therewith; and which, for that reason, will not be dissolved in water, but only in oil: of this kind are mastic, benzoin, tacamahaca, commonly called *gums*, though, strictly speaking, they are all true rosins.

A *gum*, on the other hand, is originally a milky liquor, having a greater quantity of water mixed with its oily parts; and which, for that reason, dissolves either in water or oil: of this kind are sagapenum, opopanax, ammoniac, &c.

A third sort of *gum* is that which is unoily; and which, therefore, dissolves only in water, as *gum* arabic, the *gum* of the cherry-tree, &c.

These last substances, though commonly called *gums*, are only dried mucilages; being originally nothing else but the mucilaginous lymph issuing from the vessels of the tree, in the same manner as it does from comfrey, mallows, &c. and even from the cucumber; the vessels thereof, upon being cut across yielding a lymph which is plainly mucilaginous, and which being well dried at length becomes a kind of *gum*, or rather a hardened mucilage.

In like manner, the *gums* of the plumb-tree, cherry-tree, and the like, are nothing else but dried mucilages.

If we will take the word in its widest sense, all *gums* are originally either a terebinth, or a milk, or a mucilage. *Grew*, Anat. of Plants, book III. ch. iv. p. 134.

Gums, in medicine, should always be strained before they are used, as being seldom free from dross and other admixtures, which hinder their operation.

Dr. Pringle, in his Observations on the Diseases of the Army, tells us, that *gums* are all powerful antiseptics. See the article ANTISEPTICS, *Append.*

GUM-*succory*, in botany, a name by which the *chondrilla* of authors is sometimes called. See the article CHONDRILLA, *Suppl.*

GUNDELIA, in botany, a distinct genus of plants called *hacub* by Vaillant; the characters of which are these: there is scarcely any common cup, except the surrounding leaves; the flower is of the compound kind, uniformly tubulated, being made up of equal hermaphrodite floscules, consisting of a single clavated petal, divided into five segments at the edge; the stamina are five very short capillary filaments; and the antheræ cylindraceous, tubulated, and long: the germen of the pistil is ovated, immersed in the receptacle, crowned with very small squamæ, and placed at the bottom of each flosculе; the style is filiform, and longer than the flower-petals; the stigmata are two in number, and turned backwards; there is no pericarpium; the seeds, which are single, roundish, and acuminated, being concealed in the receptacle, which is of a conic figure. *Linnæi* Gen. Plant. p. 386.

GUNNERY *(Cycl.)* — Mr. Robins, from the experiments related in his New Principles of *Gunnery*, having concluded, that the force of fired gun-powder, at the instant of its explosion, is the same as that of an elastic fluid of a thousand times the density of the common air, and that the elasticity of this fluid, like that of air, is proportionable to its density, proposes the following problem:

The dimensions of any piece of artillery, the weight of its ball, and the quantity of its charge being given, to determine the velocity which the ball will acquire from the explosion, supposing the elasticity or force of the powder at the first instant of its firing to be given.

In the solution of this problem he assumes the two following principles: 1. That the action of the powder on the bullet ceases as soon as the bullet is got out of the piece. 2. That all the powder of the charge is fired, and converted into an elastic fluid, before the bullet is sensibly moved from its place.

These assumptions, and the conclusions before-mentioned, make the action of fired gun-powder to be entirely similar to that of air condensed a thousand times; and from thence it will not be difficult to determine the velocity of the ball arising from the explosion. For the force of the fired powder diminishing in proportion to its expansion, and ceasing when the ball is out of the piece; the total action of the powder may be represented by the area of a curve, the base of which represents the space through which the ball is accelerated; and the ordinates to which, represent the force of the powder at every point of that space. And these ordinates being in reciprocal proportion to their distance from the breech of the gun, because when the spaces occupied by the fired powder are as 1, 2, 3, 4, &c. the force of the powder, or the ordinates representing it, will be as, 1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, &c. it appears that the curve will be a common hyperbola, and that the area intercepted between it, its asymptote, and the two ordinates representing the force of the powder at the first explosion and at the muzzle of the piece, will represent the total action of the powder on the ball. But if the ball were urged through the same space, by an uniform force equal to its gravity, the total action of this force would be represented by a rectangle, the base of which would be the base of the curve or intercepted portion of the asymptote before-mentioned, and the height of which would represent the uniform force of gravity. Hence the square of the velocity of the ball resulting from the action of the gunpowder, will be to the square of the velocity resulting from the action of gravity, as the area of the hyperbolic space is to the area of the rectangle [a]. But the velocity of the ball resulting from gravity is given, being the velocity it would acquire from a height equal to the space through which the powder accelerates it; and the proportion between the hyperbolic space and the rectangle is also given, from the analogy of hyperbolic spaces and logarithms [b]; therefore the velocity of the ball arising from the action of the fired gun-powder will be given. — [[a] By prop. 39. lib. i. of Newton's Principles. [b] See the article LOGARITHM, *Suppl.*]

To give an example of this, let us suppose the length of the barrel of a gun to be 45 inches, its diameter, or rather the diameter of the ball to be $\frac{3}{4}$ of an inch; and the space occupied by the powder to be $2\frac{5}{8}$ inches; to determine the velocity which will be communicated to a leaden bullet by the explosion, supposing the bullet laid at first with its surface contiguous to the powder.

By the theory here laid down it appears, that at the first instant of the explosion the flame will exert, on the ball lying close to it, a force one thousand times greater than the pressure of the atmosphere. But the medium pressure of the atmosphere is esteemed equal to that of a column of water 33 feet high; whence lead being to water as 11,345 to 1, this pressure will be equal to that of a column of lead 34,9 inches in height, whence multiplying this by 1000, a column of lead 34900 inches high would produce a pressure equal to what is exerted on the ball by the powder in the first instant of the explosion; and the leaden ball being $\frac{3}{4}$ of an inch in diameter, and consequently equal to a cylinder of lead on the same base $\frac{1}{2}$ an inch in height, the pressure at first acting on it will be equal to 34900×2, or 69800 times its weight; whence the force of gravity is to that of the powder at its first explosion, as 1 to 69800. Now an uniform force, as 1, accelerating the ball through a space of $45 - 2\frac{5}{8} = 42\frac{3}{8}$ inches, will give it a velocity of 15.07 feet in one second of time; for this is the velocity the ball would acquire in falling from a height of $42\frac{3}{8}$ inches. And an initial force, as 69800, but diminishing continually, as the hyperbolic ordinates, will, upon computation, be found to communicate a velocity to the ball, which will be to that communicated by gravity as 110.7 to 1. Therefore the velocity of the ball arising from the action of the gun-powder will be $= 110.7 \times 15.07 = 1668.249$ feet in one second of time; that is, the ball, when it first leaves the piece, will be carried at the rate of 1668 feet in one second.

As to the first of the principles here assumed, the author has observed, in the Philos. Transact. N° 469. p. 445, that it would be found erroneous, if examined with a geometrical rigour; since it cannot be questioned but the flame acts in some degree on the bullet after it is out of the piece: but in experiments no such accuracy is attainable; minute irregularities

ties are the neceffary concomitants of all complicated experiments: in the collifion of bodies, in the running or fpouting of water, even in fmall velocities, irregularities happen, not reconcileable to theory or to each other: what may not then be fuppofed to happen from the action of fo furious a power as gun-powder? From experiments it appears, that velocities of bullets fired from the fame piece, charged with the fame powder, and all other circumftances, as nearly as poffible, the fame, do yet differ from each other by fometimes more than $\frac{1}{20}$ part of the whole: but this is a fmall degree of inaccuracy in a cafe of this nature, and if the action of the flame on the bullet, after it is out of the piece, is fo fmall as to produce no greater effect than what may be deftroyed by the inevitable variations of the experiments, the neglecting it entirely is both convenient and a reafonable procedure. Now what gives ground to think that this poftulatum, though not rigoroufly true, may be fafely affumed, is the confideration of the fpreading of the flame by its own elafticity, as foon as it efcapes from the mouth of the piece; for by this it may be conceived that the part of it which impinges on the bullet may be neglected, although the impulfe of the flame be a very remarkable force.

With regard to the fecond affumed principle, that all the powder is fired before the bullet is fenfibly moved from its place; it is to be obferved, that this very pofition, having been examined by a committee of the Royal Society, was, after feveral experiments, determined in the negative; from whence many may be ready to conclude, that the whole theory muft be overturned. But this requires a farther difcuffion, and it will appear that though this principle be not rigoroufly true, no more than the former, yet it feems alfo that it may be fafely admitted in inveftigating the effects of powder, fince, even in fhort barrels, where the fpace the bullet was impelled thro' was not five inches, and where of courfe the deficiency of velocity was greateft, it cannot amount to one thirtieth of the whole. This will appear from the experiments made by the committee; for when the barrel was fo fhortned, that the bullet being placed clofe to the wad, lay with its outer furface nearly level with the mouth of the piece; yet even in this fhort tranfit of the bullet but $\frac{1}{8}$ of the whole charge, at a medium, was collected unfired; which $\frac{1}{8}$, properly reduced, amounts to but $\frac{1}{12}$ of the charge. This reduction is founded on thefe confiderations, that the powder ufed by the committee being unequally grained, when the fmaller grains, collected by fifting, were ufed, the quantity remaining unfired was lefs at a medium in the ratio of 5 to 3, than when it was ufed without fifting. Alfo, by extracting the falt-petre from the powder collected unfired, there was lefs falt-petre contained in it than in real powder, nearly in the ratio of 9 to 7. Now thefe two proportions compounded, make the proportion of 15 to 7, in which proportion muft the quantities of powder unfired be reduced, in order to determine the quantity of fine good powder that might be fuppofed to remain unfired in the experiments brought to confirm the aforefaid theory.

Now it appears by experiments, that the velocities of bullets placed in the fame fituation are in the fubduplicate proportion of the charges: confequently the deficiency of velocity arifing from the lofs of $\frac{1}{12}$ of the charge will be about $\frac{1}{24}$ of the velocity only. And in the experiments made with a barrel $5\frac{1}{5}$ inches in length, where the ball had not three inches to move, the quantity of real powder collected unfired from a charge of 12dwt. would have been no more than 16 grains, at a medium, or $\frac{1}{18}$ of the whole charge, which would produce a deficiency of $\frac{1}{36}$ of the velocity only: a difference lefs than what frequently occurs in the exacteft repetition of the fame experiments.

This, it is thought, is fully fufficient to juftify the principle in queftion; efpecially as in all cafes of real ufe the length of the barrel, in proportion to the quantity of the charge, will be much greater than in the inftances here mentioned. See Phil. Tranf. N°. 469, p. 450, 452, &c. and fee the Experiments of the committee in the Tranfactions, N°. 465, p. 172, 173, &c.

The greateft part of thofe who have written on the manner in which powder takes fire, have fuppofed it to be done by regular degrees; the firft grains firing thofe contiguous, and they the next fucceffively; and it has been generally thought, that a confiderable time was employed in thefe various communications: for Mr. Daniel Bernoulli, in his *Hydro-dynamica*, has concluded from fome experiments made at Peterfburg, that the greateft part of the charge efcapes out of the piece unfired, and that the fmall part which is fired, does not take fire 'till it is near the mouth. Many theories too have been compofed on the time of the progrefs of the fire amongft the grains, and the different modifications which the force of powder did thence receive; and it has been generally conceived, that the proper lengths of pieces were determinable from this principle; that they fhould be long enough to give time for all the powder to fire.

But no fuch regular and progreffive fteps feem obfervable in the explofion. For confidering that by loading with a greater weight of bullet, and thereby almoft doubling the time of the continuance of the powder in the barrel, its force receives but an inconfiderable augmentation; and that doubling and trebling the ufual charge, the powder thus added always produces a correfpondent effect in the velocity of the bullet; likewife, that in a piece near four feet in length, charged with an ufual charge of powder, the velocity communicated to the bullet, during the firft three inches of its motion, is full half the velocity acquired in its whole paffage thro' the barrel; and confidering alfo that the elafticity or force of the powder, in the three firft inches of its expanfion, is at a medium near eight times greater than in the laft two feet of the barrel; it may be concluded from all thefe circumftances, that the time employed by the powder in taking fire was not neceffary to be attended to in thefe computations; but that the whole mafs might be fuppofed to be kindled, before the bullet was fenfibly moved from its place.

And the experiments reported by the committee of the Royal Society, in the Tranfaction, N°. 465, before-mentioned, are ftrong proofs that the powder is not fired in the progreffive manner ufually fuppofed; for when the fhort barrel was charged with 12 penny-weight and fix penny-weight refpectively, the quantity of powder which was collected unfired from 12 penny-weight, did not exceed by three grains, at a medium, what was collected from fix penny-weight, although the bullet was a lefs time in paffing thro' the barrel with 12 penny-weight than with fix, it having a lefs way to move; confequently the quantity remaining unfired of the fix penny-weight, did not continue unfired for want of time; fince when the piece was charged with 12 penny-weight, the additional fix penny-weight was confumed in a fhorter time. See Phil. Tranf. N°. 469. p. 450.

Mr. Robins has alfo given us an ingenious way of determining, by experiments, the velocity which any ball moves with, at any diftance of the piece it is difcharged from.

This may be effected by means of a pendulum made of iron, having a broad part at bottom, covered with a thick piece of wood, which is faftened to the iron by fcrews. Then having three poles joined together by their tops and fpreading at bottom, fuch as are vulgarly ufed in weighing and lifting heavy bodies, and called by workmen triangles, on two of thefe poles, towards their tops, are fcrewed on fockets, on which the pendulum is hung by means of a crofs piece, which becomes its axis of fufpenfion, and on which it ought to vibrate with great freedom. Something lower than the bottom of the pendulum there fhould be a brace, joining the two poles to which the pendulum is fufpended; and to this brace there is faftened a contrivance made with two edges of fteel, fomething in the manner of a drawing pen; the ftrength with which thefe edges prefs on each other being diminifhed or increafed at pleafure, by means of a fcrew. To the bottom of the pendulum fhould be faftened a narrow ribbon, which paffing between the fteel edges, may hang loofely down by means of an opening cut in the lower piece of fteel.

The inftrument being thus fitted, if the weight of the pendulum, the refpective diftances of its center of gravity, and of its center of ofcillation, from its axis of fufpenfion, be known, it may from thence be found, what motion will be communicated to this pendulum by the percuffion of a body of a known weight moving with a known degree of velocity, and ftriking it in a given point; that is, if the pendulum be fuppofed at reft before the percuffion, it will be known what vibration it ought to make in confequence of fuch a blow; and if the pendulum being at reft, is ftruck by a body of a known weight, and the vibration which the pendulum makes after the blow is known, the velocity of the ftriking body may from thence be determined.

Now the extent of the vibration, made by the pendulum, may be meafured by the ribbon. For if the preffure of the fteel edges on the ribbon be regulated by the fcrew, fo as to be free and eafy, tho' with fome minute refiftance to hinder its flipping of itfelf: then fetting the pendulum at reft, let the part of the ribbon between the pendulum and the fteel edges be drawn ftrait, but not ftrained, and fixing a pin in the part of the ribbon contiguous to the edges, the pendulum fwinging back by the impulfe of the ball, will draw out the ribbon to the juft extent of its vibration, which will be determined by the interval on the ribbon between the edges and the place of the pin.

The computation by which the velocity of the ball is determined, from the vibration of the pendulum after the ftroke, is founded on this principle of mechanics; That if a body in motion ftrikes on another at reft, and they are not feparated after the ftroke, but move on with one common motion, then that common motion is equal to the motion with which the firft body moved before the ftroke: whence, if that common motion and the maffes of the two bodies are known, the motion of the firft body before the ftroke is thence determined. On this principle it follows, that the velocity of a bullet may be diminifhed in any given ratio, by its being made to impinge on a body of a weight properly proportioned to it; and hereby the moft violent motions, which would otherwife efcape our examination, are eafily determined by the retarded motions which have a given relation to them.

 See

See New Princip. of Gunnery, p. 28, 29, &c. See alſo the Phil. Tranſ. N. 469, p. 444. where a ſmall correction, relating to a number in Mr. Robins's 8th propoſition, is mentioned.

It is to be obſerved, that the length to which the ribbon is drawn, is always nearly the chord of the arch deſcribed by the aſcent; it being ſo placed, as to differ inſenſibly from thoſe chords which moſt frequently occur; and theſe chords are known to be in the proportion of the velocities of the pendulum acquired from the ſtroke. Hence it follows, that the proportion between the lengths of ribbon drawn out at different times, will be the ſame with that of the velocities of the impinging bullets.

Now from the computations delivered by Mr. Robins, it appears, that the velocity of the bullet was 1641 feet in one ſecond of time, when the chord of the arch deſcribed by the aſcent of the pendulum, in conſequence of the blow, was $17\frac{1}{4}$ inches. Therefore, by the proportion of any other lengths of ribbon drawn out, by any percuſſion, to $17\frac{1}{4}$, the proportion of the velocity with which the bullets impinge, to the known velocity of 1641 feet in 1″, will be determined.

As experiments of this kind are often attended with danger and difficulty, thoſe who may be diſpoſed to make any, will find ſeveral uſeful practical cautions, in p. 31, 32 and 33 of the ſaid Treatiſe.

By the experiments recited at large, in Propoſition IX. of the ſame Treatiſe, it appears, that the computations from Mr. Robins's theory, compared with thoſe experiments, which were made with barrels of various lengths, from ſeven inches to forty-five, and with different quantities of powder, from ſix penny-weight to thirty-ſix, have a remarkable coincidence, and ſuch as occurs but in few philoſophical ſubjects of ſo complicated a nature.

Suppoſing, for inſtance, the length of a barrel to be 45 inches, the quantity of powder 12 penny-weight, and the ball $\frac{3}{4}$ inch diameter, weighing $1\frac{1}{2}$ ounce, or $\frac{1}{12}$ of a pound averdupoiſe, and the windage or exceſs of the diameter of the barrel above that of the bullet about $\frac{1}{20}$ of an inch; the velocity of the bullet will, by theory, be about 1670 feet in one ſecond: and this velocity is found in theſe experiments, to be the mean velocity which the ball really receives in thoſe circumſtances. Hence we may determine the velocities with which muſket and cannon ſhot are diſcharged from their reſpective pieces by their uſual allotment of powder.

For as a leaden ball of $\frac{3}{4}$ inch diameter, and weighing nearly $1\frac{1}{2}$ ounce averdupoiſe, being fired from a barrel of 45 inches in length with half its weight of powder, will have a velocity at its iſſuing from the piece, which, if uniformly continued, would carry it near 1700 feet in 1″: ſo if inſtead of a leaden ball an iron one of the ſame diameter was placed in the ſame ſituation in the ſame piece, and was impelled by the ſame quantity of powder, the velocity of ſuch an iron bullet would be greater than that of the leaden one, in the ſubduplicate ratio of the ſpecific gravities of lead and iron; and ſuppoſing that ratio to be as 3 to 2, and computing on the foregoing principles, it will appear, that an iron bullet of 24 lb. weight, ſhot from a piece of 10 feet in length, with 16 lb. of powder, will acquire from the exploſion a velocity which, if uniformly continued, would carry it nearly 1650 feet in 1″. But if inſtead of this full charge weighing two thirds of the ball, we ſuppoſe the charge to be only half that weight, then its velocity will be no more than at the rate of 1490 feet in 1″; and the ſame would be the velocities of every leſſer bullet, fired with the ſame proportions of powder, if the lengths of all pieces were conſtantly in the ſame ratio with the diameters of their bore: and tho' this proportion does not always hold, yet the difference is not conſiderable enough to occaſion a very great variation from the velocities here aſſigned. But in theſe determinations, the windage is ſuppoſed to be no more than is juſt neceſſary for the eaſy putting down the bullet; whereas in real ſervice, either thro' negligence or unſkilfulneſs, it often happens, that the diameter of the bore ſo much exceeds the diameter of the bullet, that great part of the inflamed fluid eſcapes by its ſide; whence the velocity of the ſhot may, in this caſe, be conſiderably leſs than what is here aſſigned: however, part of this may poſſibly be compenſated by the greater heat which in all probability attends the firing of theſe large quantities of powder.

The theory here eſtabliſhed ſuppoſes what is ſaid under the head GUN-POWDER, that the powder when fired is equally hot with iron at the beginning of its white heat; but in very ſmall quantities of powder the heat is probably leſs, and conſequently the elaſticity leſs than what ariſes from this ſuppoſition. Now this decreaſe of elaſticity in ſmall quantities of powder has been found in many trials actually to take place. For inſtance, according to the theory before laid down, the velocity given the ball by the action of the powder is in round numbers 1670 feet in 1″; and this, as has been ſaid, is confirmed by the experiments taken at a medium. If now the barrel and poſition of the ball remaining the ſame, there be placed in the ſpace that contained 12 penny-weight of powder there mentioned, only one penny-weight; it follows, that if the elaſticity of the ſmaller charge be the ſame in proportion to its quantity with that of the larger, then the velocity of the bullet, when impelled by the exploſion of the ſmaller charge, will be to the velocity of a bullet impelled by a greater charge in the ſubduplicate ratio of the quantities of the reſpective charges, that is, in the ſubduplicate ratio of 1 to 12. Conſequently the velocity communicated by 12 penny-weight being known to be that of 1670 feet in 1″, the velocity communicated by one penny-weight would be that of 482 feet in 1″ nearly; but by repeated trials differing little from each other, it has been found, that the real velocity acquired by the ball in this caſe, from the exploſion of one penny-weight, was rather leſs than that of 400 feet in 1″. Whence it is evident, that the elaſticity of one penny-weight of powder, when fired, is leſs in proportion to its quantity than that of 12 penny-weight, as it ought to be by the theory.

So if three penny-weight of powder be placed in the ſame manner with the one penny-weight laſt mentioned, the real velocity the ball will acquire from the exploſion, will be from 740 to 720 feet in 1″. Whereas, ſuppoſing the elaſticity of three penny-weight, when fired, to be in ſimilar circumſtances the ſame with that of 12 penny-weight, the velocity acquired by the ball ſhould be 835 feet in 1″.

It is farther to be obſerved, that the theory eſtabliſhed under the head GUN-POWDER, ſuppoſes that in the firing of gunpowder about $\frac{3}{10}$ of its ſubſtance is converted by the ſudden inflammation into a permanent elaſtic fluid, the elaſticity of which, in proportion to its heat and denſity, is the ſame with that of the common air in the like circumſtances: it farther ſuppoſes, that all the force exerted by gun-powder in its moſt violent operations, is no more than the action of the elaſticity of the fluid thus generated; and theſe principles enable us to determine the velocities of bullets impelled from fire arms of all kinds.

From this theory appears the inconcluſiveneſs of what ſome authors have advanced relating to the advantages of particular forms, for the chambers of mortars and cannon; for all their laboured ſpeculations on this head are evidently founded on very erroneous opinions about the actions of fired powder. See lib. cit. p. 41.

But it muſt not be diſſembled, that however probable this theory may be from the experiments and reaſons on which it is founded, there ſtill remains a difficulty which ſeems not yet fully accounted for. The doubt ariſes from ſome experiments made before a committee of the royal ſociety, who hereupon gave it as their opinion, that the change of the form in the chamber will produce a change of the diſtance to which the bullet is thrown. The experiments upon which this opinion was founded, were as follows:

Three braſs chambers were made, whoſe depths were reſpectively three inches, $1\frac{1}{2}$ inch and $\frac{3}{4}$ inch; ſo turned as to fit the chamber of a braſs mortar exactly; each of theſe chambers contained, when full, one ounce troy of powder. The ball was of braſs, weighing nearly 356 ounces troy. The ball touched the powder of the charge in all theſe experiments. With the firſt chamber of three inches deep, the elevation of the mortar being 45, the range taken at a medium of three ſhot was 741 feet: and the mean diſtance to which the ball was thrown with the chamber of $\frac{3}{4}$ inch deep, was but 464 feet. As to the chamber of $1\frac{1}{2}$ inch, it not fitting the chamber of the mortar exactly, the ranges were very irregular; but the leaſt range, tho' fired late in the damp of the evening, exceeded the fartheſt range of the $\frac{3}{4}$ inch chamber, and the fartheſt range extended to 686 feet; ſo that the committee ſeem well warranted in their opinion. The difficulty is to reconcile this with the foregoing theory. Its ingenious author has, in general obſerved, in the account of his book given in the Phil. Tranſ. N°. 469, p. 455, that when the charge is much ſmaller than the uſual allotment of powder, there are ſome irregularities, as thoſe ariſing from the different heat of ſmall and large quantities of powder, to which head too perhaps muſt be referred the experiments made by the committee on the effect of different ſmall chambers; but in cuſtomary charges, the velocities of bullets reſulting from all the experiments hitherto made, are really ſuch as the theory requires. And it appears, that theſe velocities are much greater than what they have been hitherto accounted; and there are reaſons from the theory to believe, that in cannon ſhot the velocities may ſtill exceed the foregoing computation. See Phil. Tranſ. N°. 465.

If a bullet be laid at a conſiderable diſtance from the charge, the principles before laid down cannot then be applied to determine the velocity of the ball; they being only applicable in caſes where the bullet is contiguous to the charge, or nearly ſo. For by what is ſhewn under the head GUN-POWDER, when the ſurface of fired powder is not confined by a heavy body, which it is obliged to impel before it, the flame dilates itſelf with a velocity much beyond what it can at any time communicate to a bullet by its continued preſſure; becauſe the powder having acquired a conſiderable degree of velocity of expanſion, the firſt motion of the ball will not be

be produced by the continued preffure of the powder, but by the percuffion of the flame. From whence it follows, that the velocity of a bullet, laid a confiderable diftance before the charge, ought to be greater than what would be communicated to it by the preffure of the powder acting as before-mentioned in this article. And this deduction from theory is confirmed from experience, by which it was found that a ball laid in a barrel, at the diftance of 11$\frac{1}{4}$ inches from the breech, and impelled by 12 penny-weight of powder, acquired in its difcharge a velocity of about 1400 feet in 1″; whereas if it had been acted on by the preffure of the flame only, it would not have acquired a velocity of 1200 feet in 1″. The fame was found to hold true in all other greater diftances (and alfo in leffer, tho' not in the fame degree) and in all quantities of powder. And from hence arifes a confideration of confequence in practice, which is, that no bullet fhould at any time be placed at any confiderable diftance before the charge, unlefs the piece be extremely well fortified: for a moderate charge of powder, when it has expanded itfelf thro' the vacant fpace, and reaches the ball, will, by the velocity each part has acquired, accumulate itfelf behind the ball, and be thereby prodigioufly condenfed; whence if the barrel be not extraordinary ftrong, it muft burft. This is confirmed by the experience of an exceeding good tower mufket of very tough iron, which being charged with 12 dwt. of powder, and the ball being placed 16 inches from the breech; upon firing the piece, part of the barrel, juft behind the bullet, was fwelled out to double its diameter, and two large pieces burft out of it. If the powder be not placed together at the breech, but fcattered uniformly thro' the whole cavity left behind the bullet, the progreffive motion of the flame may hence be fuppofed to be prevented by the expanfion of the neighbouring parts. And it was found that the ball being laid as before, 11$\frac{1}{4}$ inches from the breech, its velocity, in this cafe, inftead of 1400 feet in 1″, was only 1100 feet. See New Princip. of Gunnery, Part I. Prop. xii.

It appears from experience, that bullets of the fame diameter and denfity impinging on the fame folid fubftance with different velocities, will penetrate that fubftance to different depths, which will be in the duplicate ratio of thofe velocities nearly. Thus a leaden bullet of $\frac{3}{4}$ of an inch in diameter, being fired againft a folid block of elm with different velocities, as of 1700 feet, 730, and 400 feet in 1″; the cavities were found to be as 55, 10 and 3 refpectively; which are nearly in the duplicate proportion of thofe velocities: perfect regularity in cafes of this nature cannot be expected, when the unequal texture of the fame piece of wood, and the change of the form, and the bullet by the ftroke, are confidered.

From the penetration being in the duplicate proportion of the velocity of the impinging body, it follows, that the refiftance of the wood, like that of gravity, is uniform. See New Princip. of Gunnery, p. 94, 95.

GUN-POWDER *(Cycl.)* — *Gun-powder*, fired either in a vacuum or in air, produces by its explofion, a permanent elaftic fluid.

If a red-hot iron be included in a receiver, and the receiver be exhaufted, and *gun-powder* be then let fall on the iron, the powder will take fire, and the mercurial gage will fuddenly defcend upon the explofion; and, tho' it immediately afcends again, yet it will never rife to the height it firft ftood at, but will continue depreffed by a fpace proportioned to the quantity of *gun-powder* which was let fall on the iron. By this means (firing fmall quantities at a time) the mercurial gage may be reduced from 29$\frac{1}{2}$ inches to 12$\frac{3}{4}$. Now this experiment, which has been often repeated, proves the propofition with refpect to the production of a permanent elaftic fluid in a vacuum; for the defcent of the gage could only be effected by the preffure of fome new generated fluid in the receiver, ballancing in part the preffure of the external air. That this fluid, or fome part of it at leaft was permanent, appears from thence, that tho' in thefe experiments the quickfilver afcended after the operation, yet next day it had afcended no higher than to 22$\frac{1}{2}$, at which place it feemed to continue fixed. And, that this fluid is elaftic, is proved from the defcent of the mercurial gage: fince the quantity of matter contained in this fluid, could not by its gravity alone have funk the quickfilver by the leaft fenfible quantity; alfo from its extending itfelf through any fpace, however great, the experiment fucceeding in either a large or fmall receiver, only the larger the receiver the lefs will be the defcent of the mercurial gage to the fame quantity of powder; the preffure of the generated fluid diminifhing as its denfity diminifhes. See Phil. Tranf. N°. 295.

The fame production likewife takes place, when *gun-powder* is fired in the air [a]; for if a fmall quantity of *powder* be placed in the upper part of a glafs tube, and the lower part of the tube be immerged in water, and the water be made to rife fo near the top that only a fmall portion of air is left in that part where the *gun-powder* is placed; if in this fituation the communication of the upper part of the tube with the external air be clofed, and the *gun-powder* be fired, (which may eafily be done by a burning-glafs) the water will, in this experiment, defcend on the explofion, as the quickfilver did in the laft, and will always continue depreffed below the place, at which it ftood before the explofion, and the quantity of this depreffion will be greater, if the quantity of *powder* be increafed, or the diameter of the tube be diminifhed. From whence it is proved, that as well in air as in a vacuum, the explofion of fired *powder* produces a permanent elaftic fluid [b]. — [[a] *Haukfbee*, Phyf. Mechan. Exp. p. 81. [b] *Robins*'s New Prin. of Gunnery, Prop. I.]

It alfo appears from experiment, that the elafticity or preffure of the fluid produced by the firing of *gun-powder*, is *cæteris paribus*, directly as its denfity. This follows from hence, that, if in the fame receiver a double quantity of *powder* be let fall, the mercury will fubfide twice as much as in the firing of a fingle quantity. For the vapour produced from the double quantity, being contained in the fame receiver, will be of double the denfity of that produced from the fingle quantity; whence the elafticity or preffure, eftimated by the defcent of the mercury being likewife double, the preffure is directly as its denfity. Alfo the defcents of the mercury, when equal quantities of *powder* are fired in different receivers, are reciprocally as the capacities of thofe receivers; and confequently as the denfity of the produced fluid in each.

To determine the elafticity and quantity of this elaftic fluid, produced from the explofion of a given quantity of *gun-powder*, Mr. Robins premifes, that the elafticity of this fluid increafes by heat, and diminifhes by cold, in the fame manner as that of the air; and that the denfity of this fluid, and confequently its weight, is the fame with the weight of an equal bulk of air, having the fame elafticity and the fame temperature. From thefe principles, and from his experiments, for a detail of which we muft refer to the book itfelf, he concludes, that the fluid produced by the firing of *gun-powder* will be $\frac{3}{10}$ of the weight of the *gun-powder*; and the ratio of the refpective bulks of the *powder*, and the fluid produced from it, will be, in round numbers, 1 to 244. See New Princip. of Gunnery, Scholium to Prop. II.

Hence we are certain, that any quantity of *powder* fired in any confined fpace, which it adequately fills, exerts at the inftant of its explofion againft the fides of the veffel containing it, and the bodies it impells before it, a force at leaft 244 times greater than the elafticity of common air, or, which is the fame thing, than the preffure of the atmofphere; and this without confidering the great addition which this force will receive from the violent degree of heat with which it is endued at that time; the quantity of which augmentation is the next head of Mr. Robins's enquiry. He determines that the elafticity of the air is augmented, when heated to the extremeft heat of red-hot iron, in the proportion of 796 to 194$\frac{1}{3}$; and fuppofing that the flame of fired *gun-powder* is not lefs hot than red-hot iron, and the elafticity of the air, and confequently of the fluid generated by the explofion, being augmented by the extremity of this heat in the ratio of 796 to 194$\frac{1}{3}$, it follows, that if 244 be augmented in this ratio, the refulting number, which is 999$\frac{1}{3}$, will determine how many times the elafticity of the flame of fired *powder* exceeds the elafticity of common air, fuppofing it to be confined in the fame fpace which the *powder* filled before it was fired.

Hence then the abfolute quantity of the preffure exerted by *gun-powder* at the moment of its explofion, may be affigned; for fince the fluid then generated, has an elafticity 999$\frac{1}{3}$, or in round numbers, 1000 times greater than common air; and fince common air, by its elafticity, exerts a preffure on any given furface equal to the weight of the incumbent atmofphere, with which it is in equilibrio, the preffure exerted by fired *powder*, before it has dilated itfelf, is 1000 times greater than the preffure of the atmofphere, and confequently the quantity of this force, on a furface of an inch fquare, amounts to above fix tun weight; which force, however, diminifhes, as the fluid dilates itfelf.

Tho' it has here been fuppofed, that the heat of *gun-powder*, when fired in any confiderable quantity, is the fame with iron heated to the extremity of a red heat, or to the beginning of a white heat, yet it cannot be doubted but that the fire produced in the explofion is fomewhat varied (like all other fires) by a greater or lefs quantity of fuel; and it may be prefumed, that according to the quantity of *powder* fired together, the flame may have all the different degrees from that of a languid red heat to the heat fufficient for the vitrification of metals; but as the quantity of *powder* requifite for the production of this laft mentioned heat, is certainly greater than what is ever fired together for any military purpofe, we fhall not be far from our fcope, if we fuppofe the heat of fuch quantities as come more frequently in ufe to be, when fired, nearly the fame with the ftrongeft heat of red-hot iron; allowing a gradual augmentation to this heat in larger quantities, and diminifhing it when the quantities are very fmall.

Some authors have attributed the force of *gun-powder*, or at leaft a confiderable part of it, to the action of the air con-

tained

tained either in the *powder* or between the intervals of the grains. They have supposed that air to exist in its natural elastic state, and to receive all its addition of force from the heat of the explosion; but from what was said before, relating to the increase of the elasticity of the air by heat, we may conclude, that the heat of the explosion cannot augment the elasticity to five times its common quantity; consequently, the force arising from this cause only, cannot amount to more than the 200th part of the real force exerted on this occasion. Ibid. p. 43.

We must here observe, that the experiment of firing *gun-powder*, in the top of a tube, by means of a burning-glass, and thereby making the water descend, and hence deducing that there is a permanent air or elastic fluid contained in *gun-powder*, and that those who pretend to account for the effects of *gun-powder*, from the rarefaction of the natural air, alledge an insufficient cause; this, I say, was so long ago as the year 1690, shewn by Mr. John Bernoulli in his dissertation *De effervescentia et fermentatione*. But as the experiment of this ingenious author was made with so very small a quantity of *powder* as four grains or corns *(granulæ)* and that the space the water subsided was not exactly measured; it is no wonder that he should conclude this factitious air to be only something more than 100 times *(centies et amplius)* denser than the natural air. See *Jo. Bernoulli*, Oper. vol. i. p. 35, 36.

But if this gentleman has supposed the force of *gun-powder* too little, his son Mr. Daniel Bernoulli, in his *Hydrodynamica*, has on the other hand supposed it a great deal too much, making its elasticity not less than 10000 times greater than that of the air. His reasons are founded, chiefly, on the great quantity of *powder* that escapes unfired from guns. But that this quantity of unfired *powder* is not very considerable, seems to be fully proved under the head GUNNERY.

The variations of the density of the atmosphere does not any way alter the action of *powder*. By comparing several trials, made at noon in the hottest summer sun, with those made in the freshness of the morning and the evening, no certain difference could be perceived; and it was the same with those made in the night and in winter. Indeed, considering that the same quantity of that elastic fluid in which the force of *powder* consists, is generated in a vacuum and in common air, it is difficult to conceive how this force can be affected by the greater or less density of the atmosphere.

But the moisture of the air has a very great influence on the force of *powder*, for that quantity which in a dry season would communicate to a bullet a velocity of 1700 feet in one second, will not in damp weather communicate a velocity of more than 12 or 1300 feet in a second, or even less, if the *powder* be had and negligently kept. New Princip. of Gunnery, p. 43, 44.

This agrees with an experiment made before a committee of the Royal Society, where *powder* having been dried by being put into a phial placed in boiling water, threw a ball out of a mortar twice as far as the same quantity of *powder* taken out of the same barrel before it was dried. Now the ranges under the same circumstances of charge, elevation, &c. being as the squares of the velocities of the ball, these velocities, in this experiment, will be to each other nearly as 17 to 12, which gives ranges as 289 to 144. Phil. Trans. N. 465, p. 182, 183.

If *powder* be damp, shot made with equal quantities of it out of the same parcel, will differ considerably from each other, perhaps ten times more than if the *powder* was in good order. A small charge seems to lose a greater part of its force than a larger, each being equally damp. Another circumstance attending damp *powder* is, a remarkable foulness in the piece, after firing, much beyond what arises from an equal quantity of dry *powder*. New Princip. of Gunnery, p. 44.

That *powder* will imbibe moisture from the air, and thereby increase in weight, is certain. A parcel of very good *powder* being placed on a white paper, pierced with a great number of fine holes, and held over the steam of hot water; the *powder* in half a minute was increased about $\frac{1}{70}$ in weight. Another parcel continuing longer in the steam was increased by $\frac{1}{27}$ part. That the moisture of the atmosphere has a like effect, appears from this; that an ounce of *powder* kept for some time in a room having a fire in it every day, being dried before the fire, lost above $\frac{1}{100}$ part of its weight; one third of which it regained in less than two hours, by being removed to a part of the room distant from the fire. And as the air is often much moister than when this experiment was tried, and that the open air is more moist than a room with a fire; it cannot be doubted but that the twentieth or thirtieth part of the substance of the best *powder* is water. Now as a certain quantity of water mixed with *powder* will prevent its firing at all, it cannot be doubted but every degree of moisture must abate the violence of the explosion; and hence the effects of damp *powder* are not hard to account for.

It is to be observed, that the moisture imbibed by *powder* does not render it less active when dried again. Indeed, if *powder* be exposed to the greatest damps without any caution, or if common salt abounds in it, as often happens thro' negligence in refining the nitre, the moisture it imbibes may, in such cases, be perhaps sufficient to dissolve some part of the nitre, which is a lasting damage that no drying can retrieve. But when tolerable care is taken in preserving *powder*, and the nitre it is composed of has been well purged from common salt, it will retain its force much longer than is usually supposed; and it is said that *powder* has been known to have been preserved for 50 years, without any apparent damage from its age.

Some care is necessary in the drying of damp *gun-powder*; for there is a degree of heat, which tho' not sufficient to fire the *powder*, will yet melt the brimstone, and destroy the texture of the grains. Nay more, there is a heat with which the brimstone will flame and burn away gradually, and yet the *powder* will not explode; of this any one may satisfy himself by heating a piece of iron red-hot, and then throwing a few grains of *powder* on it at different intervals, during the time of its cooling, for by this means he will find, that at a certain time the separate grains that fall on the iron will not explode, but will burn with a small blue flame for some space of time, the grain still remaining unconsumed. Indeed, when it has begun to burn in this manner, it sometimes ends with exploding, but this more commonly happens when a number of grains lie near together, for then tho' each separate flame is not sufficient to explode its respective grain, yet the whole fire made by them all together grows strong enough at last to end in a general explosion; however, by attending to the proper temperature of the iron, and spreading the grains, two or three inches square may be covered with a blue lambent flame, which will last a considerable time without any explosion, and the grains afterwards will not apparently have lost either their colour or their shape. Now since these grains, when the brimstone is thus burnt or even melted out of them, will no longer act as *powder*, it is evident that *powder* may be spoiled by being dried with too violent a heat. Ibid. Schol. to Prop. x.

The velocity of expansion of the flame of *gun-powder*, when fired in a piece of artillery without either bullet or other body before it, is prodigious. By the experiments of the author so often quoted, it seems this velocity cannot be much less than 7000 feet in a second. This however must be understood of the most active part of the flame. For, as was observed before, the elastic fluid in which the activity of *gun-powder* consists, is only $\frac{3}{10}$ of the substance of the powder, the remaining $\frac{7}{10}$ will in the explosion be mixed with the elastic part, and will by its weight retard the activity of the explosion; and yet they will be so completely united as to move with one common motion, but the unelastic part will be less accelerated than the rest, and some of it will not even be carried out of the barrel, as appears by the considerable quantity of unctuous matter, which adheres to the inside of all fire-arms after they have been used. These inequalities in the expansive motion of the flame, render it impracticable to determine its velocity otherwise than from experiments. The foundation of which determination is, that a barrel being fixed in a proper situation on a pendulum, such as described under the head GUNNERY, and being charged with 12 dwt. of powder, without either ball or wad, the powder being only put together by the rammer; on the discharge the pendulum ascended through an arch whose chord was 10 or $10\frac{1}{10}$ inches. Now if the piece be again loaded with the same quantity of powder, rammed down by a wad of tow weighing 1 dwt. it may be supposed, that this wad being very light, will presently acquire that velocity, with which the elastic part of the fluid will expand itself when uncompressed; and it was accordingly found, that the chord of the ascending arch was by this means augmented to 12 inches; so that by the additional weight of 1dwt. of matter moving with the velocity of the swiftest part of the vapour, the pendulum ascended through an arch whose chord was two inches longer than before. And by calculating upon these facts and the principles laid down in his book, Mr. Robins determines that the velocity with which this 1 dwt. of matter moved, must be about 7000 feet in one second. Ibid. prop. xi.

It is this prodigious celerity of expansion of the flame of fired *gun-powder*, which is its peculiar excellence, and the circumstance in which it so eminently surpasses all other inventions, either antient or modern, for the purpose of military projections: for as to the quantity of motion of these projectiles only, many of the warlike machines of the antients produced this in a degree far surpassing that of our heaviest cannon-shot or shells; but the great celerity given to these bodies cannot be in the least approached by any other means than by the flame of powder. The reason of this difference is, that the antients could by weights, or the elasticity of springs and stretched cords, augment their powers to any degree desired; but then each addition of power brought with it a proportional addition of matter to be moved: so that as the power increased, those parts of the machine which were to communicate motion to the projectile and were consequently to

to move with it, were likewise increased; and thence it necessarily happened, that the action of the power was not solely employed in giving motion to the impelled body, but much the greatest part of it was spent in accelerating those parts of the machine in which the power resided, to enable them to pursue the body to be projected with perpetual impulse, during its whole passage through the extent of their activity. Hence then it came to pass, that, though these antient machines could throw enormous weights, they could project them but with small degrees of celerity, compared with what we can communicate to our cannon and musket-shot; whence in all operations, where these great velocities are useful, our machines are infinitely superior to those of antiquity; although, in more confined and shorter projections, these last have some advantage which may yet render them worthy of the attention of those military geniuses, who have capacity enough to consider each part of the profession according to its true and genuine value, independent of the partial estimation of the times they live in. Ibid. p. 55.

Powder being a mixture of sulphur and charcoal, which are very inflammable substances, with salt-petre, which in itself is not, if the salt-petre be too much in quantity, when compared with the other two, their burning may not be sufficient to consume the whole of the salt-petre; whence the fire may be less violent, and consequently the powder less vigorous, than if some of the salt-peter was taken away, and a like quantity of the other materials were added in its stead. On the other hand, if the salt-petre in the composition be less than what the burning of the other two substances can easily consume, the fire will be less active than it ought to be, because it is not augmented so much as it would be if a large quantity of salt-petre had been added to the composition.

Hence it appears that the goodness of powder is not to be estimated only from the quantity of salt-petre contained in it, although that substance seems to be the basis of the elastic fluid, in which its force consists. For since the converting of the salt-petre into that fluid, and the elasticity of the fluid, afterwards, depend in some measure on the violence of the fire produced at the explosion, it is plain that there is a certain proportion in the mixture of the materials, which will best contribute to this purpose, and consequently to the perfection of the powder.

What this proportion is, has been ascertained by experience, and it seems now to be generally agreed, that in any quantity of powder $\frac{3}{4}$ of it should be salt-petre, the remaing $\frac{1}{4}$ consisting of equal quantities of sulphur and charcoal. This is the proportion followed by the French, and by most nations in Europe: we, indeed, pretend to a greater degree of nicety in our proportions; though, it is said, they do not greatly differ from what is here mentioned; nor is it certain that they are preferable: this however may be depended on, that no methods of proving powder, hitherto generally practised in England, could at all ascertain the difference; and other powders made with the usual proportions, are nothing inferior to ours. Ibid. p. 62.

But it is not the due proportion of the materials only, which is necessary to the making of good powder; another circumstance, not less essential, is the mixing them well together; if this be not effectually done, some parts of the composition will have too much salt-petre in them, and others too little; and in either case there will be a loss of strength in the powder.

As the excellence of powder then depends on so many particulars, in the quality and quantity of the materials, and in the working them together, it is, doubtless, of great importance, that those who receive the public stores should have it in their power to satisfy themselves about the goodness of what is delivered to them. The method most commonly followed for this purpose, here with us, says the author above quoted, is to fire a small heap of it on a clean board, and to attend nicely to the flame and smoke it produces, as likewise to the marks it leaves behind it on the table; from all which instructive particulars the merit of the powder is ascertained with great accuracy, as is pretended; but besides this uncertain method, which, how much soever it may be practised, none will undertake seriously to defend, there are, on particular occasions, other contrivances made use of, all which bear some analogy to the common powder-triers, sold at the shops: only they are more artfully fabricated, and instead of a spring they move a weight, which is a more certain and equable power.

But these machines, though more perfect than the common powder-triers, are yet liable to great irregularities; for as they are all moved by the instantaneous stroke of the flame, and not by its continued pressure, they do not determine the force of the fired powder with that certainty and uniformity which were to be desired in these kinds of trials: and therefore, the method followed by the French, in the receiving of powders from the makers, seems to be much better. Their practice is thus:

They have, in each magazine, a small mortar cast with its bed, according to a determined pattern, which is the same throughout the kingdom: this mortar is always pointed at 45°, and it contains just three ounces of powder; and it is a standing maxim, that no powder can be received into their stores, unless three ounces of it, placed in the chamber of this mortar, throws a solid ball of $7\frac{1}{2}$ inches diameter to the distance of at least 55 French fathom. But if each barrel of powder was to be proved in this manner, the trouble of charging the mortar, *&c.* would be intolerable, and the delay so great, that no business of this kind could ever be finished. The method by firing against a pendulum, in the manner mentioned under the head GUNNERY, seems a readier way; but still it requires some nicety and time, which it were to be wished could be obviated. Ibid. p. 63.

It has been observed that a heap of *gun-powder* of a certain diameter being fired, will always set fire to another heap not distant from the former above eight times its diameter.

Persons keeping more than 200lb. weight of *gun-powder* at one time, within the cities of London and Westminster, or their suburbs, *&c.* are liable to forfeitures if it be not removed; and justices of peace may issue warrants to search for, seize, and remove the same, 5 and 11 Geo. I. and 5 Geo. II. cap. 20.

GURGIPTING, in falconry, a term used when a hawk is stiff and choaked up. Rust. Dict. in voc.

GUTTA *rosacea*, in medicine, denotes a red or pimpled face; a distemper, which, tho' not always owing its original to hard drinking, is nevertheless most incident to tiplers of strong beer, wines, spirits, *&c.*

As to the cure, besides making a revulsion by bleeding, blistering, cupping, issues, *&c.* the diet ought to be moistening and cooling, as lettuce, purslain, sorrel and spinach: the drink may be an emulsion of the cold seeds, milk and water, clarified whey, *&c.*

In the use, however, of this cooling regimen, great caution is necessary; for if a person be taken off at once from his strong liquors, and allowed nothing but whey, or milk and water, it may cost him his life, by hastening a sudden decay of heat, palling his appetite, and bringing on a leucophlegmatia, or dropsy. *James*'s Medicinal Dictionary, in voc.

As for what concerns topics, much caution is likewise to be used. If there be only redness without pimples, and the disease recent, refrigerants and repellants take place: but if pustules appear, discutients must be mixed; and if these pustules seem hard, and the disease be of long standing, there may be reason for emollients to ripen and digest the tough and viscid matter, which is afterwards to be let out. Id. ibid.

If the disease be stubborn, and the tubercles grown hard, we are to begin with emollients, both fotus and ointment: such are the decoction of mallows, vervain, solomon's seal, and linseed; also a cerate of sperma ceti, or Bate's white cerate. Id. ibid.

GUTTER (*Cycl.*) — *Gutters* are either parallel to the horizon, or vertical. The former should be made with a proper descent, that there may be a good current, as the workmen term it; for if laid too level, the water will be apt to stand in plashes.

As to the vertical *gutters*, or those formed by two roofs meeting at right angles to each other, or by the end of one roof joining to the side of another, they are either made of lead, or tiles, which are either plain or concave; these last are called *gutter*-tiles, and may be easily laid. But in laying on the plain tiles the workman begins at one side of the *gutter*, and so works across, as if it were plain work, and then brings the next row of tiles back again; so that he works forth and back, to and fro, from right to left. By this means the *gutters* laid after this manner are not angular, but of a kind of distorted curvilinear form, which prevents the mortar from being washed away with the rain. Build. Dict. in voc.

GWAYF, or WAIF. See WAIF, *Cycl.*

GYMNARTHRIDIA, in the history of insects, a series or class of insects, which have soft and naked bodies, furnished with limbs. See INSECT, *Append.*

These have been generally called *zoophytes*, a term expressing creatures partly of an animal, and partly of a vegetable nature; but as it is now well known that there are none such, it is proper the term *zoophyte* should no longer be retained.

Under this class are comprehended the *limax*, or the naked snail, the *lernea*, *medusa*, *aphrodita*, *amphitrite*, *&c.* *Hill*, Hist. Anim. p. 87. See the articles LIMAX, LERNEA, *&c.* *Append.*

GYMNOSOPHISTS (*Cycl.*) — There were likewise African *gymnosophists*, who dwelt upon a mountain in Ethiopia, near the Nile, without the accommodation either of house or cell. These did not form themselves into societies, like those of India; but each had his private retirement. where he studied and performed his devotions by himself. If any person had killed another by chance, he applied to these sages for absolution, and submitted to whatever penances they enjoyned. They pretended to an extraordinary frugality, and lived only upon the fruits of the earth. Lucian ascribes to these philosophers several new discoveries in astronomy. *Broughton*, Dict. Relig. in voc.

GYMNIA, in zoology, a new eſtabliſhed claſs of animalcules, containing ſuch as have neither tail, nor any viſible limbs. See the article ANIMALCULE, *Append.*

GYPSUM *(Suppl.)* — GYPSUM *ſtriatum*, *ſtriated plaſter-ſtone*, in natural hiſtory, the name commonly uſed for the whitiſh leſs gloſſy *tricheria*, with ſhort thick filaments. See the article TRICHERIA, *Suppl.*

It is of a rude, irregular and unequal ſurface, and lax, friable texture, found in maſſes of various ſizes, from one to twelve or eighteen inches over, but always broad and flat; its thickneſs being uſually but an inch and an half, and in the broadeſt pieces ſeldom much more than two inches: it is compoſed of conſiderably large and coarſe longitudinal filaments, running uſually very evenly through the maſs: it is eaſily fiſſile in a perpendicular direction, that is parallelly to the arrangement of theſe filaments: it is of a dull whitiſh colour, and its filaments, when examined ſingly, have a ſlight ſhare of tranſparency.

It will not at all give fire with ſteel, nor ferment with *aqua fortis*, but very readily calcines to a perfectly white ſubſtance. It is found in clay and marle pits, among the ſtrata of gravel, and in the fiſſures of ſtone, and is common in Yorkſhire and other parts of the kingdom.

The Germans uſe it in the fluxing the ſulphureous ores of metals; and our druggiſts ſell it under the name of Engliſh talc, for cleaning of ſilver lace. See *Hill's* Hiſt. Foſſ. p. 89.

Tymphacian GYPSUM, a name given by the antients to the hard, fungous, alkaline, white marle, otherwiſe called *calx nativa*, or native lime. See the article CALX, *Suppl.*

GYRINUS, in zoology, the name ſometimes uſed for a ſpecies of *mordella*. See the article MORDELLA, *Suppl.*

GYRLE, among ſportſmen, See the article GIRLE, *Append.*

GYROVAGI, in eccleſiaſtical writers, monks who leaving their monaſteries, under the pretence of piety, wandered about from one religious houſe to another. *Du Cange*, Gloſſ. Lat. tom. ii. p. 683.

The ſame appellation was alſo given to prieſts, who left their pariſhes. Id. ibid.

H.

H.

HÆMATOPUS, the *Sea Pye*, in Ornithology, a genus of birds of the order of the Scolopaces.

Its beak is of a compreſſed form, ending in a cuneiform figure, and the upper and under chaps are equal in length.

Authors deſcribe it under different names, ſome calling it the *Pica Marina*, others *Himantopus*; but *Hæmatopus* ſeems the moſt proper. See the articles HIMANTOPUS, and PICA *marina*, *Suppl.*

HAIR-*Bell*, in botany, the name by which ſome call the *Hyacinth*. See the article HYACINTH, *Suppl.*

HAIR-*Worm*, the Engliſh name of a ſpecies of worms, called by zoologiſts *Chætia*. See the article CHÆTIA, *Append.*

HAKEL, or HATCHEL. See HATCHEL, *Append.*

HALIOTIS, in the natural hiſtory of ſhells, the name of a large genus, called in Engliſh *Ear-ſhells*. See the article EAR-*Shells*, *Suppl.*

HALL (*Cycl.*) — The length of a *Hall* ſhould be at leaſt twice and a quarter its breadth, and in great buildings three times its breadth. As to the height of *Halls*, it may be two thirds of the breadth; and if made with an arched ceiling, it will be rendered much handſomer, and leſs ſubject to fire. In this caſe its height is found by dividing its breadth into ſix parts, five of which will be the height from the floor to the under ſide of the key of the arch. Build. Dict. in voc.

HALM. See the article HAUM, *Append.*

HAMMER-*headed-ſhark*, the Engliſh name of the *Zygæna*. See the article ZYGÆNA, *Suppl.*

HARDBEAM, or HORNBEAM, in botany, the name by which ſome call the *Carpinus* of authors. See the article CARPINUS, *Suppl.*

HARE.(*Suppl.*)—*Sea*-HARE, the Engliſh name of a genus of inſects, called by Dr. Hill *Lernea*. See the article LERNEA, *App.*

HARE's-*foot Trefoil*, in botany. See the articles TRIFOLIUM and TREFOIL, *Suppl.*

HARE's *Lettuce*, in botany, the name by which ſome call the *Sonchus*, or Sow-thiſtle. See the article SONCHUS, *Suppl.*

HARE's-*Strong*, in botany, the name by which the *Peucedanum* or Hog's-fennel, is ſometimes called. See the article PEUCEDANUM, *Suppl.*

HARLE, a name uſed in ſome parts of the kingdom for the *Merganſer*. See the Article MERGANSER, *Suppl.*

HARP-*Shell*, a ſpecies of *Dolium*. See DOLIUM.

HARIOT. See the article HARIOT, *Cycl.*

HART-*wort*, in botany, a name ſometimes given to the *Tordylium* of authors. See the article TORDYLIUM, *Suppl.*

Ethiopian HART-*wort*, the name by which ſome call the *Peucedanum*, or Hog's-fennel. See the article PEUCEDANUM, *Suppl.*

HART's-*horn*, in botany, the name of a genus of plants, otherwiſe called *Buck's-horn*, and by botaniſts *Coronopus*. See the article CORONOPUS, *Suppl.*

HASEL, or HASLE, in botany. See the article HAZLE, *Suppl.*

HATCHEL, or HITCHEL, in the manufactory of flax, hemp, *&c.* a tool, not unlike a card, for dreſſing and combing them into fine hairs. See the article CARD, *Cycl.*

They conſiſt of ſharp pointed iron-pins, or teeth, ſet orderly in a board. Dict. Ruſt. in voc.

Of theſe there are ſeveral ſorts, ſome with finer and ſhorter teeth, others with them coarſer and longer.

HATCHET-*Vetch*, in botany, the name by which the *Securidaca*, a diſtinct genus of plants, is ſometimes called. See the article SECURIDACA, *Suppl.*

HATCHING (*Cycl.*)—The artificial method of *hatchings* eggs, as practiſed in Egypt, has been mentioned in the Cyclopædia; and Mr. Reaumur has diſcovered, that the heat neceſſary for this purpoſe, is nearly the ſame with that mark'd 32, upon his thermometer, or that mark'd 96 on Fahrenheit's. If, therefore, eggs be kept in this degree of heat, they will as certainly *hatch*, as if the parent hen had ſat upon them; and, indeed, it is impoſſible it ſhould be otherwiſe, ſince this heat anſwers nearly to that of the ſkin of the hen, or even of mankind; ſo that the empreſs Livia, as Pliny relates, might truly *hatch* a chicken in her boſom, if ſhe had but the patience to keep an egg there, for the ſame number of days that it ought to have continued under a hen.

After many experiments, Mr. Reaumur found, that ſtoves, heated by means of a baker's oven, ſucceeded equally well with thoſe made hot by layers of dung. The furnaces of glaſs-houſes, and thoſe of the melters of metals, might, no doubt, be made to anſwer the ſame purpoſe. If, therefore, an eaſy method could be found to regulate the heat of the ſtove, it would be extremely convenient for bakers or paſtry-cooks to *hatch*, with little or no expence, a very great number of chickens; which they might diſpoſe of to the country people, to be reared up till marketable. Should a thermometer be judged neceſſary for this purpoſe, it will be ſufficient to mark on it only ſuch degrees as are abſolutely neceſſary; by which means the inſtrument will not only come cheaper, but be more readily underſtood by the ignorant people, for whoſe uſe it is deſigned.

Such an inſtrument, however, may be wholly diſpenſed with; a lump of butter, of the ſize of a walnut, melted with half as much tallow, ſerving to indicate the heat of the ſtove with ſufficient exactneſs. When the heat is too great, this mixture, which is to be kept in a phial, will become as liquid as oil; and when the heat is too ſmall, it will remain fixed in a lump; but it will flow like thick ſyrup, upon inclining the bottle, if the ſtove be of a right temper. Great attention, therefore, ſhould be given to keep the heat always at this degree, by letting in freſh air, if it be too great, or ſhutting the ſtove more cloſe, if it be too ſmall.

But this is not all. That all the eggs in the ſtove may equally ſhare the irregularities of the heat, it will be neceſſary to ſhift them from the ſides to the center, and *vice verſa*; thereby imitating what the hens themſelves do by thoſe upon which they ſit; for hens are frequently ſeen to make uſe of their bills, to puſh to the outer parts thoſe eggs that were neareſt to the middle part of their neſts, and to bring into that middle part ſuch as before lay neareſt to the ſides of the ſame.

As to the form of the ſtoves, no great nicety is neceſſary. A chamber over an oven will do very well; only in order to aſcertain the due degree of heat, it will be neceſſary to have phials of butter, as directed above, in ſeveral parts of the room; and when the heat wants to be either increaſed or diminiſhed, it is ſufficient to diminiſh or increaſe the communication between the air in the room and that abroad, by opening or ſhutting ſome of the openings made in the wall for that purpoſe.

In order to cheriſh the new hatch'd chickens, capons may be taught to tend them in the ſame manner as hens do. Mr. Reaumur tells us, that he has ſeen above two hundred chickens at once, all led about and defended by only three or four ſuch capons; which clucked like hens, to call in the chickens that had ſtrayed too far off; and even redoubled their call, when they found any nice bits, to invite the young brood to come and pick them up. Nay cocks may be taught to do the ſame office, which they, as well as the capons, will continue to do all their lives afterwards.

But Mr. Reaumur, not ſatisfied with the aſſiſtance he could thus procure from cocks and capons, has invented a ſort of low boxes without bottoms, and lined with furs. Theſe, which he calls artificial parents, not only ſhelter the chickens from the injuries of the air, but afford a kindly warmth; ſo that they preſently grow fond of them, and take the benefit of their ſhelter as readily as they would have done under the wings of a hen.

For a few weeks after *hatching*, it will be neceſſary to keep the chickens in a room artificially heated, and furniſhed with theſe boxes; but afterwards they may be ſafely expoſed to the air in the court-yard, in which it may not be amiſs to place one of theſe artificial parents to ſhelter them, ſhould there be any occaſion.

As to the manner of feeding the young brood, they are generally a whole day after being *hatched*, before they take any food at all; and then a few crumbs of bread may be given them for a day or two, or millet-ſeeds mixed with the crumbs; after which they will begin to pick up inſects and graſs for themſelves.

People in the country, who have plenty of conveniencies for the raiſing of poultry, will hardly give themſelves the trouble to *hatch* chickens in this artificial manner. It is in villages near great towns, and principally in the neighbourhood of the capital city, that it would be of the greateſt importance to promote the eſtabliſhment of this kind of ſtoves. Vid. Mr. *Trembley*'s Abſtract of the Art of Hatching domeſtic fowls, tranſlated from the original treatiſe of Mr. Reaumur, where he explains every difficulty.

HATCHING *of Bees*. See the article *Bee*-WORM, *Suppl.*

HATCHING, among miners. See the article DIGGING, *Suppl.*

HAVER, a word uſed in ſome parts of the kingdom for oats. Dict. Ruſt. in voc.

HAUGH, the ſame with HAW. See the article HAW, *Suppl.*

HAUM, HALM, or HAWM, among farmers, denotes the ſtem or ſtalk of corn, peaſe, beans, &c. from the root to the ear. Dict. Ruſt. in voc.

HAWK (*Suppl.*)—*Make* HAWK, in falconry, a name given to an old ſtanch hawk; which, being uſed to fly, will teach a young one. Ruſt. Dict. in voc.

HAW-*thorn*, the Engliſh name of ſeveral ſpecies of Meſpilus, or Medlar. See the article MESPILUS, *Suppl.*

HAWM. See the article HAUM, *Append.*

HAZLE, or HAZEL (*Suppl.*)—*Witch*-HAZLE, a name sometimes used for the *Ulmus*, or Elm. See the articles ULMUS and ELM, *Suppl.*

HEART-*burn*. In surfeits, or upon swallowing without due mastication; when meats are eat tough and fat, or with farinaceous substances unfermented; or when by any accident the saliva is vitiated, too scanty, or not intimately mixed with the food, the fermentation becomes tumultuous, the stomach swells with air, and this extraordinary commotion being attended with an unusual heat, brings on the uneasiness called the *heart-burn*; which is remedied by whatever promotes a greater secretion of salvia, or helps to mix it with our aliment. *Pringle*, Observ. on the diseases of the army, p. 168. See the article FERMENTATION, *Append.*

HEART's-*ease*, a name sometimes used for a species of violet, otherwise called *Pansay*. See the article VIOLET, *Suppl.* It is said to be good for ruptures and the falling sickness. Rust. Dict. in voc.

HEAT (*Suppl.*) — *Heat* is found to expand and dilate metals considerably, as appears from an experiment of Muschenbroek, who tells us, that having prepared cylindric rods of iron, steel, copper, brass, tin, and lead, he exposed them first to a pyrometer with two flames; then successively to one with three, four, and five flames. But previous to this trial, he took care to cool them equally, by exposing them some time upon the same stone; when it began to freeze, and Fahrenheyt's thermometer was at 32 degrees. The effects of which experiment are digested in the following table, where the degrees of expansion are marked in parts equal to the $\frac{1}{12500}$ part of an inch.

Expansion of	Iron	Steel	Copper	Brass	Tin	Lead
By one flame	80	85	89	110	153	155
By two flames, placed close together	117	123	115	220		274
By two flames 2 $\frac{1}{2}$ inches distant	109	94	92	141	219	263
By three flames placed close together	142	168	193	275		
By four flames placed close together	211	270	361			
By five flames	230	310	310	377		

It is to be observed of tin, that it will easily melt, when heated by two flames placed together. Lead commonly melts with three flames, placed together, especially if they burn long.

From these experiments it appears at first view, that iron is the least rarified of any of these metals, whether it be heated by one or more flames; and therefore is most proper for making machines, or instruments, which we would have free from any alterations by heat or cold, as the rods of pendulums for clocks, &c. So likewise the measures of yards or feet should be made of iron, that their length may be as nearly as possible the same, summer and winter.

The expansion of lead and tin, by only one flame, is nearly the same; that is, almost double of the expansion of iron. It is likewise observable, that the flames, placed together, cause a greater rarefaction, than when they have a sensible interval between them; iron, in the former case, being expanded 117 degrees, and only 109 in the latter; the reason of which difference is obvious.

By comparing the expansions of the same metal, produced by one, two, three, or more flames, it appears, that two flames do not cause double the expansion of one; nor three flames three times that expansion, but always less; and these expansions differ so much the more from the ratio of the number of flames, as there are more flames acting at the same time.

It is also observable, that metals are not expanded equally, at the time of their melting, but some more, some less: Thus tin began to run, when rarified 219 degrees; whereas brass was expanded 377 degrees, and yet was far from melting. *Desagul.* vol. 1. p. 423, *seqq.*

HEAT, in Medicine. Great *Heats* are not so much the immediate, as the remote cause of a general sickness, by relaxing the fibres, and disposing the fibres to putrefaction; especially among soldiers, and persons exposed the whole day to the sun; for the greatest *heats* are seldom found to produce epidemic diseases, till the perspiration is stopped by wet cloaths, fogs, dews, damps, &c. and then some bilious or putrid distemper is the certain consequence, as fluxes, and ardent intermitting fevers. Nevertheless, it must be allow'd, that *heats* have sometimes been so great, as to prove the more immediate cause of particular disorders. As when centinels have been placed without cover, or frequent reliefs, in scorching *heats*; or when troops march, or are exercised in the *heat* of the day: or when people imprudently lie down and sleep in the sun: All these circumstances are apt to bring on distempers, varying according to the season of the year. In the beginning of summer, these errors produce inflammatory fevers; and, in the end of it, or in the beginning of autumn, a remitting fever, or dysentery. *Pringle*, Observ. on the Diseas. of the army, p. 79, *seqq.*

To prevent, therefore, the effects of intemperate *heat*, commanders have found it expedient so to order the marches, that the men come to their ground before the heat of the day; and to give strict orders, that none of them sleep out of their tents; which in fixed encampments may be covered with boughs, to shade them from the sun. It is likewise a rule of great importance to have the soldiers exercised before the cool of the morning is over; for, by that means, not only the sultry *heats* are avoided, but the blood being cooled, and the fibres braced, the body will be better prepared to bear the heat of the day. Lastly, in very hot weather, it has been found proper to shorten the centinels duty, when obliged to stand in the sun. Id. ibid. p. 95.

HEATH (*Suppl.*) — *Mountain*-HEATH, a name sometimes given to the *Saxifrage* of botanical writers. See the article SAXIFRAGE, *Suppl.*

Berry-bearing HEATH, a name sometimes given to a genus of plants, called by botanists *Empetrum*. See the article EMPETRUM, *Suppl.*

Low-pine HEATH, the name of a distinct genus of plants, called by botanists *Coris*. See the article CORIS, *Suppl.*

HECKLE, among hemp-dressers. See HATCHEL, *supra.*

HECTIC. See the article CONSUMPTION, *Append.*

HEDERA (*Suppl.*) —*Virginian*-HEDERA, the name by which Plukenet calls the *Menispermum* of Linnæus. See the article MENSPERMUM, *Append.*

HEDGE-*hog*, in zoology, the English name of a genus of animals, called by zoologists *Erinaceus*. See the article ERINACEUS, *Suppl.*

HEDGE-*hog*, in botany, the English name of a genus of plants, called by botanists *Erinacea*, See the article ERINACEA, *Suppl.*

Sea HEDGE-*hog*, the English name of a series of shell-fish, called by different authors *Centronia*, *Echini marini*, *Echinodermata*, &c. See CENTRONIA, *Append.* and ECHINODERMA, *Suppl.*

HEDGE-*hog-Medica*, the name by which some call several species of *Medica*, or lucerne. See the article MEDICA, *Suppl.*

HEDGE-*hog-thistle*, a name sometimes given to a distinct genus of plants, called by authors *Cactus*. See the article CACTUS, *Append.*

HEDGE-*hyssop*, a name sometimes given to a distinct genus of plants, called by botanists *Digitalis*. See the article DIGITALIS, *Suppl.*

HEDGE-*mustard*, the name of a genus of plants, known among botanists by that of *Erysimum*. See the article ERYSIMUM, *Suppl.*

HEDGE-*nettle*, a name sometimes given to a genus of plants, called by botanists *Galeopsis*. See the article GALEOPSIS, *Suppl.*

HEDGE-*nettle-shrub*, a name by which some call the *Prasium*, a distinct genus of plants. See the article PRASIUM, *Suppl.*

HEDGE-*sparrow*, the English name of a species of *Motacilla*, See the article MOTACILLA, *Suppl.*

HEDIUNDA, in botany, a name used by some writers for the *Cestrum* of Linnæus. See the article CESTRUM, *Append.*

HEDYSARUM, in the Linnæan system of botany, the name of a large genus of plants; which that author makes to comprehend the *Hedysarum*, *Onobrychis*, and *Alhagi* of Tournefort. See the articles HEDYSARUM and ONOBRYCHIS, *Suppl.* and ALHAGE, *Append.*

HEEL, among carpenters, denotes an inverted *Ogee*. See the article OGEE, *Cycl.*

HEINASE, among sportsmen, a roe-buck of the fourth year. Rust. Dict. in voc.

HELEGUG, in zoology, a name given to the *Anas arctica*. See the article DUCK, *Suppl.*

HELENIUM, in botany, the name used by some for several species of *Aster*, or star-wort. See the article STAR-WORT, *Suppl.*

HELIANTHUS, in the Linnæan system of botany, the name by which that author calls the *Corona solis*, or great *sun-flower*. See the article SUN-*flower*, *Suppl.*

HELICHRYSUM, in botany, a name used by some authors for the *Gnaphalium*, or cudweed. See the article GNAPHALIUM, *Suppl.*

HELIOTROPE, in botany, the name by which some call the turnsol, a distinct genus of plants. See the article HELIOTROPIUM, *Suppl.*

HELIOTROPIUM is also a name used by some for a species of *Ricinoides*. See the article RICINOIDES, *Suppl.*

HELIOTROPIUM is likewise used by some for the *Helianthus*, *Corona solis*, or great sun flower. See the article SUN-*flower*, *Suppl.*

HELLEBORE, in botany, the English name of a distinct genus of plants. See the article HELLEBORUS, *Suppl.*

 Bastard-

Bastard-HELLEBORE, the name of a genus of plants, called by authors *Helleborine*. See the article HELLEBORINE, *Suppl.*

White-HELLEBORE, the name of a genus of plants, otherwise called *Veratrum*. See the article VERATRUM, *Suppl.*

HELM, (*Cycl.*) a term used by country people for wheat or rye-straw, bruised by thrashing, or otherwise, and usually bound up in bundles for thatching. See THATCHING, *Append.*

HELMET-*flower*, in botany, a name by which some call the *Scutellaria*, or *Cassida* of authors. See the article CASSIDA, *Suppl.*

HEMANDIA, (*Suppl.*) This is an error of the press, for HERNANDIA See HERNANDIA, *Append.*

HEMEROBIUS, in zoology, a name used by some for the fly, called *Golden-eye*, and *Chrysopis*. See the article CHRYSOPIS, *Suppl.*

HEMLOCK, in botany, the English name of a genus of plants, called by botanists *Cicuta*. See the article CICUTA, *Suppl.*

Bastard-HEMLOCK, the name by which some call a distinct genus of plants, known among botanists by that of *Cicutaria*. See the article CICUTARIA, *Suppl.*

HEMP, in botany, the English name of a distinct genus of plants, called by botanical writers *Cannabis*. See the article CANNABIS, *Suppl.*

Bastard-HEMP, the English name of a genus of plants, called by Tournefort *Cannabina*. See the article CANNABINA, *Suppl.*

Water-HEMP, a name sometimes used for a genus of plants, called by botanical writers, *Bidens*. See the article BIDENS, *Suppl.*

HEMP-*Agrimony*, a name sometimes given to a distinct genus of plants, called by botanists *Eupatorium*. See the article EUPATORIUM, *Suppl.*

HEN (*Suppl.*) — HEN-*house*, a place or building, made for sheltering or confining poultry. Dict. Rust. in voc.

HENBANE, (*Suppl.*) — *Yellow*-HENBANE, a name by which some call the *Nicotiana* of botanical authors. See the article NICOTIANA, *Suppl.*

HEPS, in botany, the same with *hips*. See the article HIPS, *Append.*

HERB-*Bennet*, *herba benedicta*, a name sometimes given to a distinct genus of plants, called by authors *Caryophyllata*. See the article CARYOPHYLLATA, *Suppl.*

HERB-*Christopher*, *herba Christophoriana*, in botany, the name of a distinct genus of plants. See the article CHRISTOPHORIANA, *Suppl.*

HERB-*Gerard*, in botany, a name sometimes given to a distinct genus of plants, otherwise called *Angelica*. See the article ANGELICA, *Suppl.*

HERB *of grace*, a name by which some call rue. See the article RUTA, *Suppl.*

HERB-*Robert*, a name sometimes used for the *geranium*, or crane's bill. See the article GERANIUM, *Suppl.*

HERB-*Trefoil*, in botany, See the articles TREFOIL and TRIFOLIUM, *Suppl.*

HERB-*Trinity*, in botany, a name sometimes given to the violet. See the article VIOLA, *Suppl.*

HERB-*True-love*, the name by which the *Herb-Paris* is sometimes called. See the article HERBA-*Paris*, *Suppl.*

HERB-*Twopence*, the name of a distinct genus of plants, called otherwise *Lysimachia*, or *Summularia*. See the article LYSIMACHIA, *Suppl.*

HERB-*Willow*, or *Willow-herb*, a name sometimes given to two distinct genuses of plants, the *Lysimachia* and *Chamænerium*. See the articles CHAMÆNERIUM, and LYSIMACHIA, *Suppl.*

HERCULES's *Alheal*, the name of a distinct genus of plants, described by Linnæus under that of *Panax*. See the article PANAX, *Append.*

HEMISPHÆRIA, a name by which Dr. Hill calls the genus of flies, known in English by that of *Lady-Cow*.

Ray, and other writers, have described these among the Beetles. See the article SCARABÆUS, *Suppl.*

HERMIT-*fish*, the name by which some call the long-tailed Squilla, with a soft tail, and the right claw the larger. See the article SQUILLA, *Append.*

HERMODACTYLE, *Hermodactylus*, in botany, a name improperly used by some for the *Iris*, or flower-de-luce of botanists. See the article IRIS, *Suppl.*

The true *Hermodactyle* is the root of a species of *Colchicum*, or *Meadow-saffron*. See the article MEADOW-*saffron*, *Suppl.*

HERN, the same with *Heron*. See the article HERON, *Suppl.* A *Hern* at siege, among sportsmen, is one standing at the water-side, watching for prey. Dict. Rust. in voc.

HERN-*shaw*, or HERNERY, a place where the Herons breed. Id. ibid.

HERNANDIA, in botany, the name of a distinct genus of plants, the characters of which are these: The petals of the flower are multifid, and placed in a circular order; the male and female flowers stand on distinct plants. There is no pericarpium; but the cup of the flower is very large, swelled, and roundish; containing a plicated oval nut, with only one cell, and a globose nucleus. *Linnæi* Gen. Plant. p. 516.

We know only one species of this genus, which is the *hernandia*, with a large umbilicated ivy-like leaf, commonly called in the West-Indies *Jack in a box*.

It is a native of Jamaica, Barbadoes, and other parts of the West-Indies; and is propagated among us in the gardens of the curious, by only sowing the seed in a hot-bed in the spring. They must be constantly kept in the back stove. Vid. *Miller*'s Gard. Dict. in voc.

HERRIOT. See HARIOT, *Cycl.*

HETEROPYRÆ, in natural history, the name of a genus of ferrugineous fossils, composed of several coats, inclosing a nucleus of a different substance from themselves, and often loose, and rattling in them. See the article SIDEROCHITA. *Append.* Of this genus there are the following species: 1. The hard *heteropyra*, with brown and purplish crusts, and a whitish-green nucleus. 2. The rough, purplish *heteropyra*. 3. The mis-shapen *heteropyra*, with ferrugineous, red, and dusky yellow crusts, and a greenish-white nucleus. 4. The yellow, brown, and black *heteropyra*, with a whitish nucleus. 5. The yellow, ferrugineous, and purplish-crested *heteropyra*, with a pale-yellow nucleus. 6. The coarse, yellow, and brown-crusted *heteropyra*, with a brownish-yellow nucleus. 7. The coarse *heteropyra*, with brown, black, and orange-colour'd crusts, and a yellow nucleus. *Hill.* Hist. Foss. p. 536.

HIGH-*taper*, in botany, a name by which some call the *Verbascum* of botanists. See the article VERBASCUM, *Suppl.*

HILL, in the natural history of the Earth, &c. See the article MOUNTAIN, *Suppl.* and *Append.*

HINNULARIA, in zoology, a name given by some authors to a species of Eagle. See the article PYGARGUS, *Suppl.*

HIPPO, in zoology, the name of a species of *Coluber*, the scuta of whose abdomen are one hundred and sixty, and the squamæ of the tail one hundred. See the article COLUBER, *Append.*

HIPPURIS (*Suppl.*)—Pliny has made a great confusion of plants under this name. The antients called the *Hippuris*, or horse-tail, *Polygonum*, on account of its having so many joints in its stalks and branches; this name confounded it with the knot-grass and Pliny has made a description from the accounts of different authors, which has the characters and qualities of both, and therefore suits neither.

It is easy however to trace his errors; where he speaks of the stalks being naked, rush-like, and brittle, it is plain that he is speaking of the *Horse-tail*; and where he gives it small oval and pointed leaves, it is equally certain that he means this of the knot-grass; but he adds in one place, that it has a large spreading root, that it grows in woods and shady places, and that it bears a round fruit like a coriander-seed. These are characters belonging neither to the horse-tail nor knot-grass; and might seem to bespeak this *Hippuris* a plant different from both; but it rather appears, that Pliny has brought in by an error of his own a third plant, to perplex the case, and is here transcribing some author's account of the Solomon's-seal, or polygonatum, a name sounding like the word polygonum, and easily mistaken for the same word, by so hasty a writer as this author appears to have been. He had before err'd in his opinion, that the polygonum and horse-tail were the same plant; and here taking the polygonatum to be the same plant with the polygonum, he has not scrupled to attribute to the horse-tail whatever he found recorded of the polygonatum.

HIPPURIS is also a name given by Dillenius to the *Chara* of Linnæus, a distinct genus of plants. See the article CHARA, *Suppl.*

HIND-*calf*, a female hart of the first year. She fawns in April and May. Her flesh is softer than that of a hart, but not so savoury, and is drest after the same manner. If it be roasted, it ought to be larded, dipt in a marinade or pickle, and moistened while it is roasting.

HITCHEL, the same with *Hatchel*. See HATCHEL, *Append.*

HITCHING, in horsemanship, is to wriggle or move forwards by degrees, or to knock the legs together in walking. Dict. Rust. in voc.

HIVE-*dross*, a name sometimes given to crude or rough wax. See the article WAX, *Suppl.*

HOCK, the same with *Ham*. See HAM, *Cycl.*

HOG's-*fennel*, in botany, the English name of a genus of plants, called by botanists *Peucedanum*. See the article PEUCEDANUM, *Suppl.*

HOG-*plum*, the name of a distinct genus of plants, called by authors *Spondias*. See the article SPONDIAS, *Suppl.*

HOG-*weed*, the name of a distinct genus of plants, called by Linnæus *Boerhaavia*. See the article BOERHAAVIA, *Suppl.*

HOLIBUT, or HOLYBUT, in ichthyology, a name given by the people of some parts of England to the Turbott in general; but in other parts, only to the larger fishes of that species.

HOLLI, the Indian name for what the Spaniards call *ulli*; a resinous liquor, which flows spontaneously from the tree *Holquaghuytl*, or *Chilli*. It is often mixed with chocolate in the making, in the proportion of one fourth part: it gives the chocolate in this case no very disagreeable flavour; and it becomes a very powerful medicine in dysenteries. It is usual, however, before the making it, to mix the cacao and *Holli* on an iron plate, and torrify them thoroughly together. *Ray*'s Hist. Plants.

HOLLOW-*root*, in botany, a name fometimes given to the *fumaria*, or fumitory. See the article FUMARIA, *Suppl.*

HOLLY (*Suppl.*)—The timber of *holly* is the whiteft of all hard wood, and therefore ufed by the inlayers. See the article MARQUETRY, *Cycl.*

It is alfo fit for all fturdy ufes, and therefore preferred to all others by the mill-wright, turner, and engraver. It makes the beft handles and ftocks for tools, flails, cart-whips, bowls, fhivers, and pins for blocks; and is excelnt for door-bars, &c.

Knee-HOLLY, a name fometimes given to the *Rufcus*, or butchers broom. See the article RUSCUS, *Suppl.*

Sea-HOLLY, the name by which fome call the *eryngium* of botanical writers. See the article ERYNGIUM, *Suppl.*

HOLY-*thiftle*, or BLESSED *Thiftle*, a name fometimes given to the *Cnicus*, or faffron-flower of botanifts. See the article CNICUS, *Suppl.*

HOLY-*Rofe*, or *Rock-Rofe*, names given to a diftinct genus of plants, called by botanifts *Ciftus*. See the article CISTUS, *Suppl.*

HOMO, *Man*, in zoology. See the articles MAN, *Append.* and ANTHROPOMORPHA, *Suppl.*

HONE-*wort*, *Sium*, in botany, the name of a diftinct genus of plants. See the article SIUM, *Suppl.*

HONESTY, in botany, a name fometimes ufed for the *Lunaria*, or moon-wort. See the article LUNARIA, *Suppl.*

HONEY-*flower*, a name by which the *Melianthus*, a diftinct genus of plants, is called in Englifh. See the article MELIANTHUS, *Suppl.*

HONEY-*fuckle*, *French* HONEY-*fuckle*, a name fometimes ufed for the *Hedyfarum* of botanical writers. See the article HEDYSARUM, *Suppl.*

Trumpet HONEY-*fuckle*, the name by which fome call the *Periclymenum* of Tournefort. See the article PERICLYMENUM, *Suppl.*

Upright HONEY-*fuckle*, the name of a genus of plants, called by Linnæus *Lonicera*. See the article LONICERA, *Suppl.*

HOOD, (*Cycl.*) — HOOD, on fhip-board, is a copper-frame, made to go on the top of the chimney, and to fhift as the wind does, that the fmoke may always fly to leeward. *Blanckly*, Nov. Expofitor, p. 78.

HOOK-*land*, or OPE-*land*, among farmers, land ploughed and fowed every year. Dict. Ruft. in voc.

HOOPOE, in ornithology, the Englifh name of the *Upupa*, See the article UPUPA, *Suppl.*

HOP-*hornbeam*, a name fometimes given to the *Carpinus* of botanifts. See the article CARPINUS, *Suppl.*

Wild-HOP, a name fometimes given to the *Dodonæa*, a diftinct genus of plants. See the article DODONÆA, *Suppl.*

HOREHOUND. (*Suppl.*)—*Black* or *ftinking* HOREHOUND, in botany, the Englifh name of a genus of plants, called by botanical writers *Ballote*. See the article BALLOTE, *Suppl.*

Bafe-HOREHOUND, a name by which fome call the *Stachys* of botanifts. See the article STACHYS, *Suppl.*

Baftard-HOREHOUND, the Englifh name of a genus of plants, called by botanifts *Marrubiaftrum*. See the article MARRUBIASTRUM, *Suppl.*

Water-HOREHOUND, the Englifh name of a diftinct genus of plants, called by botanifts *Lycopus*. See the article LYCOPUS, *Suppl.*

HORNS-*and Hedge-hog*, the name of a genus of plants, called by botanifts *Medica*. See the article MEDICA, *Suppl.*

HORNBEAM, in botany, the Englifh name of a genus of plants, called by botanifts *Carpinus*. See the article CARPINUS, *Suppl.*

HORNED-*Poppy*, in botany. See the article POPPY, *App.*

HORSE (*Suppl.*)—HORSE-*dung* is ufed by gardeners for making hot-beds, being efteemed fitter than any other for this purpofe; but it is to be obferved, that it is fo much the better, the higher the *Horfe* is fed. Ruft. Dict. in voc.

HORSE-*Chefnut*, a name given by fome to the *Hippocaftanum* of botanical writers. See the article HIPPOCASTANUM, *Suppl.*

Scarlet HORSE-*Chefnut*, the Englifh name of a diftinct genus of plants, called by botanifts *Pavia*. See the article PAVIA, *Suppl.*

HORSE-*heal*, a name fometimes ufed for Elecampane, or *Helenium*. See the article HELENIUM, *Suppl.*

HORSE-*hoeing*, in *Hufbandry*. See the article HUSBANDRY *Suppl.*

HORSE-*Mint*, the Englifh name given to a fpecies of *Mint*. See the articles MINT and MENTHA, *Suppl.*

HORSE-*Radifh*, the name of a diftinct genus of plants, called by botanifts *Cochlearia*, or Scurvy-grafs. See the article COCHLEARIA, *Suppl.*

HORSE-*fhoe-vetch*, the Englifh name of a diftinct genus of plants, called by botanifts *Hippocrepis*, or *Ferrum equinum*. See the article FERRUM *equinum*, *Suppl.*

HOSE-*in-Hofe*, a name given to a genus of plants, called by botanifts *Primula veris*. See the article PRIMULA, *Suppl.*

HOSPITAL (*Cycl.*)—Camp *Hofpitals* are either general or regimental.

The general *hofpitals* are of two kinds, *viz.* the flying *hofpital*, attending the camp at fome convenient diftance, and the ftationary *hofpital*, which is fixed to one place. In the choice of both, it will be better to have them in towns than villages, as the former will afford larger wards, befides more of other conveniencies: Thefe wards fhould be as airy as poffible.

As to the difpofition of *hofpitals*, in regard to preferving the purity of the air, the beft rule is to admit but few patients into each ward. It will alfo be found a good expedient, when the ceilings are low, to remove fome part of them, and to open the garret ftory. The doors and windows may likewife be opened, and ventilators ufed to purify the air of every ward. In winter *hofpitals*, the wards are to be warmed with chimneys, and never by ftoves; for, though the latter may warm a large ward better, and at a lefs expence, yet by fcarce making any draught of air, they will be apt to increafe its putrid quality; whereas a fire, kept up in a chimney, acts like a conftant ventilator.

The general *hofpital* fhould receive only fuch fick as the regimental ones cannot conveniently contain, together with thofe who cannot be moved with the army. Without this difperfion of the fick, the general *hofpital*, in bad feafons, would have a greater number, than could be well attended; and what is equally, if not more pernicious, it would be too much crouded, by which means the contagion would fpread, and the mortality be rendered more general.

Regimental *hofpitals* are of the greateft importance, and therefore fhould be fupplied with blankets and medicines from the public ftores, with an allowance alfo for nurfes and other neceffaries. Nor are they to be maintained in the field only, but alfo in winter-quarters, as there will always be a great many more fick, than can be taken care of in the general *hofpital*.

Barns, ftables, grannaries, and other out-houfes, but above all, churches, make the beft *hofpitals*, from the beginning of June to October: for as the greateft danger arifes from foul air, which cannot be compenfated by diet or medicine, we may lay it down as a rule, that the more airy and large the *hofpitals* are, the lefs danger there is of the ficknefs fpreading. *Pringle* Obferv. on the Difeafes of the Army, p. 104, *feqq.*

HOSPITAL-*fever*, a name given to the *malignant catarrhal fever*, as being frequent in hofpitals. See the article FEVER, *Suppl.*

Dr. Pringle has given us an elaborate account of the rife, fymptoms, and cure of this terrible difeafe, in his obfervations on the difeafes of the army. It may be owing to a great many concurring caufes, but the principal are foul and putrid air, occafioned by filth and impurity of any kind. Hence it is no wonder that it prevails in marfhy countries after hot feafons, and in populous cities; efpecially if low, and ill-aired, unprovided with common fhores, or where the ftreets are narrow and foul, the houfes dirty, water fcarce, and where jails or hofpitals are crouded, and not ventilated and kept clean; when in fickly times the burials are within the towns, and the bodies not laid deep; when flaughter-houfes are alfo within the walls; or when dead animals or offals are left to rot in the kennels, or on dunghils; when drains are not provided, to carry off any large body of ftagnating or corrupted water, in the neighbourhood; when flefh-meats make the greateft part of the diet, without a proper mixture of bread, greens, wine, or other fermented liquors; from the ufe of old and mufty grain, or what has been damaged by a wet feafon; or, laftly, when the fibres are relaxed by immoderate warm bathing.

When the difeafe comes on flowly, the fymptoms are fmall interchanges of heats and cold, trembling of the hands, interrupted fleep, &c. But when it advances faft, the above fymptoms are all in a higher degree; and befides thefe, the patient is afflicted with great laffitude, a naufea, pains in the back, a conftant pain and confufion in the head, a dejection of fpirits, and an uncommon tremor of the hands. If the fick lie warm, and have had no preceding flux, the body is generally coftive; but when they lie cold, as they often do in field-hofpitals, the pores of the fkin being fhut, a diarrhœa is a common fymptom: in the worft cafes, a flux appears in the laft ftage; when the ftools are involuntary, colliquative, ichorous, or bloody, and of a cadaverous fmell; which are the effects of a mortification of the bowels, and the figns of approaching death: fome are never delirious, but all are under a great ftupor or confufion. The petechiæ are the frequent, but not infeparable attendants of the fever; they are fometimes of a brighter or paler red, at other times of a livid colour, but are never raifed above the fkin. For the moft part, thefe fpots are fo little confpicuous, that unlefs looked for attentively, they may efcape notice. They are thickeft on the breaft and back, lefs on the legs and arms, and the Dr. never remembers to have feen any upon the face. This fever, tho' of the continued kind, has often exacerbations at night, with remiffions, and partial fweats next day; and, after a long continuance, is apt to change into a hectic, a remitting, or intermitting form.

Prognoftics in it. To have a little dilirium, the ftrength little impaired, turbid urine in the decline of the difeafe, and at the fame time a gentle fweat or moifture diffufed over the body, are reckoned good figns; and it feems peculiar to malignant fevers, that deafnefs is rather a good fign.

Method of cure. This varies according to the ftate of the difeafe, which may be diftinguifhed into three periods; the firft continuing as long as the perfon is able to go about; the fecond beginning with his confinement, and the third when the pulfe finks, and a ftupor comes on.

In the firft, as well as in the other periods, the cure is principally to be aimed at by removing the patient out of the foul air. When this cannot be done, the ward or room fhould be purified by making a fucceffion of air by means of fires, or letting it in by doors and winduws, or diffufing the fteams of vinegar.

The next thing to be done, is to promote a diaphorefis, which, in this period, fhould only be attempted by mild fudorifics, as the *fpiritus Mindereri*.

When the fever is confirmed, contrayerva-powders, with nitre, camphor, the common ptifan acidulated, and fuch medicines as are good in inflammatory cafes, ought to be given. Coftivenefs is to be prevented by emollient clyfters. But opiates are dangerous, both in this and the third ftage, in which the pulfe finks, and ftupor is greater, a delirium impends, and petechiæ often appear. When this is obferved to be the cafe, the nitre and diaphoretic medicines are to make room for a decoction of fnake-root, to which a fmall quantity of ftrong water may be added. It may alfo be given in fubftance from two to four fcruples a day, with fenfible good effects. Towards the decline of the fever, an equal quantity of peruvian bark may be joined with the root. Wine is alfo an excellent cordial at this period, and may be given either made into Whey, or added to the panado, which was the only food allowed to the fick. It may be taken from half a pint to a quart a day, according to the ftrength of the patient. Perhaps there is no rule of more importance, than to give ftrict charge to the attendants of the fick, never to let the patient, when low, remain above two or three hours without taking fomething cordial and nourifhing. But however neceffary wine, volatiles, and other cordials are in this low ftate of the fever, it ought to be remembered, that they muft never be given with an intention to force a fweat, but only as antifeptics, and to fupport the *vis vitæ*. If there be danger of a phrenitis coming on, it will be proper to call in the affiftance of epifpaftics. Sinapifms too may be ufed when the pulfe is greatly funk. If a diarrhœa comes on in the decline of the fever, it is to be moderated, by adding a few drops of the tinctura thebaica, to the full quantity of the alexipharmic decoction; or by giving a fpoonful or two of an aftringent mixture. In proportion, however, to the putrid nature of the ftools, aftringents are to be ufed with the more caution. When the fever is over, there are few but complain of a vertigo, and want of reft, a continuation of the deafnefs, and other nervous fymptoms, are frequently the confequence of great lownefs; in which cafe, the pillulæ Matthæi are to be given at night, with analeptics and medicines of the ftrengthening kind. Vid. *Pringle's* Obferv. on difeaf. of army. p. 243—278.

HOSPITAL - *Ventilator*. See the article VENTILATOR, *Append.*

HOVEL, properly fignifies a covering, or fhelter for cattle, made of huroles, or the like; but is alfo ufed for any other mean building. Ruft. Dict. in voc.

HOUND(*Suppl.*)—*Gaze*-HOUND, or *Gaft*-HOUND, one who makes more ufe of his fight than fmell, from the word *gaze*, to ftare at.

Thefe dogs make excellent fport with the fox and hare, and are much ufed in the north of England, and on champaign ground, rather than bufhy and woody places. Dict. Ruft. in voc.

HOUSE (*Cycl.* and *Suppl.*) — *Summer*-HOUSE, a little edifice erected at the corner of a garden, and contrived fo as to let in air on all fides; or to exclude it, as you find proper. Build. Dict. in voc. *Summer*.

HOUSING (*Cycl.*) — HOUSING, among brick-layers, a term ufed for a brick which is warped, or is caft crooked or hollow in burning; in fuch a cafe, they fay it is *houfing*. Build. Dict. in voc.

HUMBLE-*bee-fly* is a fpecies of *Culex*; it is lanigerous, and has fomewhat obfcure wings. See the articles HUMBLE, *Suppl.* and CULEX, *Append.*

HUMBLE-*plant*, a name fometimes given to the *mimofa*, or fenfitive plant. See the articles MIMOSA and SENSITIVE, *Suppl.*

HUNGARICUS *morbus*, a difeafe fo called from its being firft obferved in the imperial army in Hungary, in the year 1566; from whence it fpread over a great part of Europe.

It is defcribed as a malignant fever, attended with ficknefs at the ftomach, a pain and hardnefs about the epigaftric region, great thirft from the beginning, a parched tongue, and a conftant head-ach, ending in a delirium. It was highly contagious and mortal, and is fuppofed to have been a compound of the bilious and hofpital fever, taking its rife firft in the camp, but acquiring that high degree of malignity from the foul air of the places in which the fick were crouded. *Pringle*, Obferv. on the difeafes of the army, p. 118, feq. See the articles BILIOUS and HOSPITAL-*fever*, *Append.*

HUNGRY *Evil* (*Cycl.*) — Nothing is better in this diftemper, than to feed the horfe feveral times a day with wholefome bean-bread well baked, or oats well dried and fifted. Dict. Ruft. in voc.

HUTCH, among farmers, denotes a veffel or particular place in which to lay corn; alfo a kind of hollow trap for the taking of weefels, or other vermin, alive. Dict. Ruft. in voc.

HYACINTH (*Suppl.*) — *Grape* HYACINTH, or *Mufk* HYACINTH, the Englifh name of a genus of plants, called by botanical writers *Mufcari*. See the article MUSCARI, *Suppl.*

HYACINTH *of Peru*, or the *Starry* HYACINTH, names fometimes given to a diftinct genus of plants, known among authors, by that of *Ornithogalum*, and called in Englifh Star of Bethlehem. See the article ORNITHOGALUM, *Suppl.*

Tuberofe HYACINTH, the name by which fome call the *Polyanthes* of Linnæus. See the article POLYANTHES, *Append.*

HYDRA, or HYDRUS, in zoology, names given to the water-fnake, called by authors *Natrix*. See the article NATRIX, *Suppl.*

HYDRA, is alfo the name by which Linnæus calls the *Polype*. See the articles POLYPE, *Suppl.* and BIOTA, *Append.*

HYDROCANTHARUS, the name by which fome call the water-beetle. See the article DYTISCUS, fupra.

HYDROCORAX, in ornithology, the name by which Barrelier calls the Indian-raven. See the article CORVUS *Indicus*, *Suppl.* and BUCEROS, *Append.*

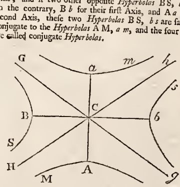
HYDROMETER (*Suppl.*) — We have feveral new improvements of this inftrument, in Defaguliers, Experim. Philofoph. vol. 2. p. 233, feq.

HYDROPHOBIA (*Cycl.*) — Vinegar is recommended by Dr. Kramer, as a fpecific againft the *Hydrophobia*, efpecially, if fome powder of Cantharides is mixed with it. The Receipt given by him is, to boil from four to ten grains of the fine powder of Cantharides, in an ounce and an half, or two ounces, of the beft vinegar, which is to be given warm to the patient. Commerc. Norimb. 1735, hebd. 1183.

HYDROPIPER, a name ufed by fome for the *Perficaria*, or arfmart, of other botannical writers. See the article PERSICARIA, *Suppl.*

HYPERBOLA (*Cycl.*) — *Conjugate* HYPERBOLAS, a name given to four *Hyperbolas*, when the firft and fecond Axes of two oppofite *Hyperbolas* are the fecond and firft Axes of two other oppofite *Hyperbolas*.

Thus if two oppofite *Hyperbolas* A M, *a m* have the line A *a*, for their firft Axis, and the line B *b*, for their fecond Axis; and if two other oppofite *Hyperbolas* BS, *b s*, have on the contrary, B *b* for their firft Axis, and A *a* for their fecond Axis, thefe two *Hyperbolas* B S, *b s* are faid to be conjugate to the *Hyperbolas* A M, *a m*, and the four together are called conjugate *Hyperbolas*.



The Afymptotes H C *h*, G C *g*, of the *Hyperbolas* A M, *a m*, will alfo be the Afymptotes to the *Hyperbolas* B S, *b s*. See *L' Hopital*, Sect. Coniq. Art. 132.

HYPERICOIDES, in botany, the name by which Plumier calls the *Afcyrum* of Linnæus, a diftinct genus of plants. See the article ASCYRUM, *Append.*

HYPERICUM, in the Linnæan fyftem of botany, a large genus of plants; which, according to that author, comprehends the *Androfæmum* and *Hypericum* of Tournefort. See the articles ANDROSEMUM and HYPÆRICUM, *Suppl.*

HYPETHRE, in antient architecture, two rows of pillars all about, and ten at each face of any temple, &c. with a Periftyle within of fix columns.

I.

JACEA, *Knapweed*, is comprehended by Linnæus among the *Centauria*. See the article Centauria, *Append.*

JACINTH, in botany, a name ufed by fome for the *hyacinth*. See the article Hyacinth, *Suppl.*

JACK (*Suppl.*)—Jack is alfo ufed for a well known engine to turn a fpit; for a horfe or wooden frame to faw timber upon; for an inftrument to pull off a pair of boots; for a great leathern pitcher to carry drink in; for a fmall bowl that ferves as a mark at the exercife of bowling; and for a young pike. Dict. Ruft. in voc.

Jack *by the hedge*, a name fometimes given to the *Thlafpi* of botanical writers. See the article Thlaspi, *Suppl.*

Jack *by the hedge* is alfo ufed as the name of a fpecies of *Hefperis*. See the article Hesperis, *Suppl.*

Jack *in a box*, the name by which fome call a diftinct genus of plants, called by botanifts *Hernandia*. See the article Hernandia, *Append.*

JACOB's *Ladder*, a name ufed by fome for the *Polemonium* of botanical writers. See the article Polemonium, *Suppl.*

JACOBÆOIDES, in botany, the name of a genus of plants, according to Vaillant, but comprehended under the *Solidago* by Linnæus. See the article Solidago, *Append.*

JAIL-*fever*, a name given to the *malignant catarrhal fever*, as being frequent in jails; it is likewife call'd the *hofpital fever*, for a like reafon. See the articles Fever and Hospital-*fever*, *Append.*

JALAP, a name fometimes given to the *Convolvulus*, or bind-weed of botanifts. See the article Convolvulus, *Suppl.*

JAMBS, among carpenters and bricklayers. See the article Jaums, *Append.*

JANNOCK, a kind of oaten bread, much ufed in the northern parts of England, and made of four leaven. Dict. Ruft. in voc.

JASMINE (*Suppl.*) *Ilex-leaved* Jasmine, the name by which the *Lantana*, a diftinct genus of plants, is fometimes called. See the article Lantana, *Suppl.*

Arabian, or *Indian* Jasmine, the Englifh name of a genus of plants, called by Linnæus *Nyctanthes*. See the article Nyctanthes, *Append.*

Scarlet Jasmine, a name fometimes given to the *Bignonia*, or trumpet flower. See the article Trumpet *flower*, *Suppl.*

Red-Jasmine, a name given to the *Plumeria* of botanical writers. See the article Plumeria, *Suppl.*

Perfian-Jasmine, the name by which fome call *Lilac*. See the article Lilac, *Suppl.*

Fennel-leaved Jasmine, a name fometimes given to *Quamoclit*. See the article Quamoclit, *Suppl.*

JASMINOIDES, in botany, the name by which Dillenius calls the *Lycium*, of other botanifts. See the article Lycium, *Suppl.* and *Append.*

Jasminoidis *fpecies*, the name improperly given by Dillenius to a diftinct genus of plants, called by Linnæus *Ceftrum*. See the article Cestrum, *Append.*

JASPER, *Jafpis*, (*Suppl.*) in natural hiftory, a genus of ftones of the *Scrupi*-kind, greatly refembling the finer marbles, or femi-pellucid gems. See the article Scrupi, *Append.*

Jafpers, though commonly reckoned among the precious ftones, undoubtedly belong to the clafs of foffils above referred to; being only detached opake maffes of various forms and fizes, and compofed of a cryftalline matter, debafed with an earthy admixture. It is to this laft ingredient of their compofition, that they owe all that variety of colours, and difference of opacity, whence naturalifts have fubdivided them into no lefs than feven orders, containing the white, the green, the red, &c. *Jafpers*.

Of the white *Jafpers*, there is only one known fpecies, the hard, fhining, white, marbly *Jafper*, commonly called the *Nephritic ftone*, on account of its fuppofed virtue in cafes of the ftone and gravel. It is found in many parts of America, particularly the great river of the Amazons, and worn by the natives as an amulet. As to its medical virtues, they are too ridiculous to deferve a ferious refutation; but its other ufes merit the attention of lapidaries, fince it is capable of being fafhioned into cups and vafes of a beautiful polifh, and great brightnefs.

Of the green and greenifh *Jafpers*, we have the following fpecies: 1. The hard, fine green *Jafper*. This is found in many parts of the world, as Egypt, Tartary, China, &c. and worn as an amulet againft fluxes, hæmorrhages, &c. 2. The foft dufky green *Jafper*. This ftone, which is of much lefs beauty and value than the foregoing fpecies, is very common in Germany, Italy, France, England, &c. 3. The hard bluifh green *Jafper*, with red variegations. This is the *heliotrope* of the antients, and *blood-ftone* of the moderns. It is common in Africa, Egypt, and the Eaft-Indies; and is worked into cups, vafes and fnuff-boxes. 4. The hard whitifh-green *Jafper*, which is the nephritic ftone of authors. It is found in many parts of America, where the natives fafhion it into figures of birds, beafts, fifhes, and other forms; and formerly ufed to wear it hung to their lower lips. A thoufand amazing ftories are told, by very grave authors, of the nephritic qualities of this ftone. 5. The hard, yellowifh-green *Jafper*, celebrated likewife for its nephritic virtues. It is found in feveral parts of America, as alfo in Germany, Bohemia, and fome other countries of Europe. 6. The bluifh-green, marbly *Jafper*, variegated with grey and black. 7. The hard, greyifh-green *Jafper*, called by authors the *Jade*, or *Lapis divinus*, the divine ftone. 8. The dull, deep green *Jafper*, called by different authors *Molochite*, *Molochites*, and *Malachites*. 9. The bluifh-green, fofter, dull *Jafper*. This is the *borea*, or fky-coloured *Jafper* of the antients, and makes a very beautiful appearance in cups, vafes, and other ornamental things. 10. The dufky-green *Jafper*, variegated with white and flefh colour; this, tho' a coarfer fpecies than the preceding one, is not without its beauty.

Of the red *Jafpers*, we know only four fpecies: 1. The hard, variegated, purple *Jafper*: This is the rofe-coloured *Jafper* of authors. It is a very beautiful ftone, and capable of a high polifh. It is found in the Eaft and Weft-Indies, as alfo in Germany, Bohemia, and Spain, but of a coarfer kind. 2. The bright red *Jafper*, variegated with white. America and Europe both afford this fpecies; but thofe from the former are the fineft. 3. The dull, purple and white *Jafper*. This, tho' of a coarfe and irregular ftructure, is not unfrequently found manufactured into handles of knives, and other toys, both in England, Italy, and Germany. 4. The hard, dull, flefh-coloured *Jafper*. It is of an extremely pale whitifh red, generally throughout.

The fourth order of *Jafpers* contains thofe of a brown colour, of which we have only one fpecies, the pale-brown, hard *Jafper*, with purple veins. It is common on the Yorkfhire and Suffex fhores, and alfo in many of our gravel-pits.

The fifth order contains the yellowifh *Jafpers*, of which there is only one known fpecies, the yellowifh, hard, variegated *Jafper*. This is the turpentine-coloured *Jafper* of the antients. It is very common in the Eaft-Indies; and we have it alfo in Germany, Bohemia, and other parts of Europe, but inferior to the oriental ones.

The bluifh *Jafpers* conftitute a fixth order; and of thefe there are only two fpecies: 1. The pale bluifh *Jafper*, with black veins and clouds; called by the antients the fmoaky *Jafper*. 2. The bluifh, marbly *Jafper*, variegated with white.

The feventh and laft order of *Jafpers* contains the black ones, whereof there are only two fpecies: 1. The black, marbly *Jafper*, variegated with white. 2. The black, marbly *Jafper*, variegated with yellow. *Hill*, Hift. Fofs. p. 573—592.

JAUMS, among carpenters, denote the door-pofts, as alfo the upright pofts at the ends of window-frames. Build. Dict. in voc.

Jaums, among bricklayers, &c. the upright fides of chimneys, from the hearth to the mantle-tree. Id. ibid.

JAY, in zoology, the Englifh name of a fpecies of *Corvus*, with the upper feathers of the wings blue, variegated with black and white. See Corvus, *Suppl.*

IBERIS (*Suppl.*) is alfo the name ufed by fome writers for a fpecies of *Lepidium*, or dittander. See the article Lepidium, *Suppl.*

ICE-*houfe*, a building defigned to preferve *Ice*, for the ufe of families in the fummer feafon.

Thefe are more generally ufed in warm countries, than with us; particularly in Italy, where the meaneft perfon, who rents a houfe, is not without his vault or cellar for keeping of *Ice*.

Ice-houfes being much more ufed with us than formerly, it may not be amifs to give fome general directions for the choice of the fituation, and ftructure of them; as alfo for the management of the *Ice*.

The fituation, then, fhould be upon a dry fpot of ground; becaufe wherever there is moifture, the *Ice* will melt: for which reafon, too much care cannot be taken to make drains all round them. The place fhould likewife be elevated, and as much expofed to the fun and air as poffible.

As to the figure of the building itfelf, the proprietor may choofe fuch as pleafes his own fancy; but a circular form is the beft for the well where the *Ice* is to be preferved, which fhould be large in proportion to the quantity to be kept.—It is beft to have as much as may ferve two or three years, in cafe of a mild winter, when little or no *Ice* is to be got. At

the bottom of the well, there should be a space of about two feet deep left to receive any moisture which may drain from the *Ice*; and a small drain under ground should be laid from this, to carry off the wet. Over this space of two feet should be placed a strong grate of wood; and the sides of the well should be built of brick, at least two bricks thick; for the thicker it is, the less danger there will be of the well being affected by any external cause.

When the well is brought up within three feet of the surface, there must be another outer arch or wall begun, which must be carried up to the height of the intended arch of the well; and if there is another arch turned over from this wall, it will add to the goodness of the house. The roof must be high enough above the inner arch, to admit of a door-way to get out the *Ice*. If the building is to be covered with slates, or tiles, reads should be placed considerably thick under them, to keep out the sun and external air; the thickness of six or eight inches, with a plastering of hair and lime, will be sufficient to prevent all danger.

The external wall needs not be built circular, but of what figure the proprietor pleases. Sometimes the *Ice-house* is so contrived as to have an handsome alcove seat in its front.

Two feet diameter is sufficient for the aperture of the mouth of the well; which should have a stone, so contrived, as to stop it up in the exactest manner; and all the vacant space between this aperture and the outer door, should be filled up with barley-straw; and this last is to be always shut, before the inner door is opened. The building thus finished, should have time to dry, before the *Ice* is put into it.

If a layer of reads be placed smooth over the grate at the bottom of the well, on which to lay the *Ice*, it will do better than straw, which is commonly used; and as to the choice of the *Ice*, the thinner it is, the easier it may be broken to powder: for the smaller it is broken, the better it will unite, when put into the well. In putting it in, care must be taken to ram it as close as possible; as also to allow a vacancy of about two inches all round next the side of the well, to give passage to any moisture occasioned by the melting of some of the *Ice*.

When the *Ice* is put into the well, if a little salt-petre be mixed with it at every ten inches, or foot thickness, it will cause the *Ice* to join more closely into a solid mass. *Miller's* Gard. Dict.

JEAN-Capelle, in ichthyology, a name given by Ruysch, and some others, to the fish called by authors, the *Faber Indicus*, or Indian Doree; and more expressively named by Artedi, the Zeus with a forked tail. See the article Zeus, *Suppl.*

JEMBUT, in the materia medica, a name used by Avisenna and others, to express the seeds in the pods of the carob tree, or siliqua dulcis; which they call *Charub* or *Charnub*, and the Greeks *Ceratium*. These seeds contained in the pods of this tree, when carefully dryed, served the antient physicians as weights; and hence is derived the Greek word Ceration for a weight which expresses one of these seeds. The Arabian writers mention two kinds of this tree Charnub: The one they call Alscemi, and the other Alnabati. These are translated Syriaca and Nabathæa siliqua. Pliny, Columella, and all the other antients who have written on these subjects, mention the Syrian siliqua, or Charnub. This is called Scemi or Xami; and they have also mentioned the siliqua Græca, which is the common siliqua. The distinction Avisenna makes between the Syrian and Nabathæan siliqua or Charnub is, that the first was a purgative, and gave relief in colics, and other pains in the bowels; and that the other was an astringent, and was very successful in the cure of fluxes of blood, particularly in profluvia of the menses; and that it was for this purpose both eaten and put up as a pessary.

JERGUER, in the Custom-house, an officer who oversees the actions and accounts of the waiters. Dict. Rust. in voc.

JERSEY, among wool-combers, denotes the finest wool taken out of other sorts, by dressing it with a *Jersey-comb*. Dict. Rust. in voc.

JERUSALEM-*cowslip*, a name by which some call the *Pulmonaria* of botanists. See the article Pulmonaria, *Suppl.*

Jerusalem-*sage*, a name sometimes given to two distinct genuses of plants, the *Pulmonaria* and *Phlomis*. See the articles Phlomis and Pulmonaria, *Suppl.*

JESSES denote the ribbons hanging down from garlands and crowns; also the short straps of leather fastened to a hawk's legs, and so to the vervels. Dict. Rust. in voc.

JESSAMIN, or JESSAMY, in botany, the same with *Jasmine*. See Jasmine, *Suppl.*

JESUITS *Bark*, the name of a medicinal drug, otherwise called *cortex peruvianus*, and *quinquina*, or *quinaquina*. See the articles Quinquina, *Cycl.* and Peruvian, *Cycl.* and *Suppl.*

False Jesuit's-*Bark*, a name sometimes given to the *Balsamita* of botanists. See the article Balsamita, *Append.*

JETAIBA, in botany, a name used by some authors for the tree which affords the Gum Anime of the shops. *Piso*, p. 60.

JEWS *Mallow*, a name by which the *corchorus*, a distinct genus of plants, is sometimes called. See the article Corchorus, *Append.*

INCENDIARY, *Incendiarius*, is applied to one who is guilty of maliciously setting fire to another's house. This offence is called *Arson* in our law.

Among the antients, criminals of this kind were to be burnt. *Qui ædes, acervumque frumenti juxta domum positum sciens, prudensque dolo malo combusserit, vinctus, igni necatur. Pitisc.* Lex. Ant. in voc.

INCINERATED *Salts*, in Chemistry, the same with lixivial salts. See Incineration and Lixivious, *Cycl.* and Salts, *Suppl.*

INDEX *of Relation*, in Algebra, the same as *Scale of Relation*. See Scale *of Relation* and Series, *Append.*

INDIAN-*arrow-root*, in botany, a name sometimes given to the *Maranta* of botanists. See the article Maranta, *Ap.*

Indian-*fig*, the name by which some call the *Opuntia* of botanists. See the article Opuntia, *Suppl.*

Indian *god-tree*, the name given by some to a species of fig-tree. See the article Ficus, *Suppl.*

Indian-*reed*, a name given to the *Cannacorus* of botanical writers. See the article Cannacorus, *Suppl.*

INFARCTION of the Liver. See Hepatis *infarctus*, *Sup.*

INFLAMMATION *of the Eyes*, the same with what physicians call *Ophthalmia*. See the article Ophthalmia, *Cycl.*

INFLAMMATORY *Diseases*. To these are to be referred coughs, pleurisies, peripneumonies, acute rheumatisms, *Inflammations* of the brain, bowels, and other parts, attended with a fever; also lesser *Inflammations* without a fever, and fevers of an *inflammatory* kind, where no part is so peculiarly affected as to give name to the disease. And, lastly, all chronic disorders arising from *Inflammations*, whereof the chief are old coughs, consumptions, and the rheumatism without a fever.

All these diseases are the consequences of catching colds, and are prevented by the same means as colds. See the article Cold, *Append.*

Bleeding is the most indispensible remedy in the cure of all *inflammatory* diseases, and therefore to the delaying this too long, or not repeating it, it is owing, that colds end in dangerous fevers, rheumatisms, or consumptions. See the article Bleeding, *Append.*

In all *inflammatory* disorders, the principal intention of cure is to diminish the force of the blood, to thin it, and to relax the fibres; on which account, bleeding, attenuants, and diaphoretics, are the chief remedies. An early sweat tends also to prevent an *inflammatory* fever; for which purpose, the diaphoretic draught of the Edinburgh dispensatory is recommended; or, instead of it, a spoonful of the plain Spiritus Mindereri may be given every two hours, till a sweat breaks out; or two scruples of the salt of hartshorn, saturated with about three spoonfuls of common vinegar, may be given in one draught at bed-time. *Pringle*, Observ. on the Diseases of the army, p. 73, 77, 127, seq.

Inflammatory *fevers*. These may be distinguished into two stages; the first whilst the pulse continues hard, in which it is proper to bleed; and the second, when the *inflammatory* symptoms still remaining, the pulse is too low for that evacuation. In this last state, blisters are the chief remedy, and which, except in a few singular cases, are not to be used sooner. If the blisters are large, it is better to apply them gradually, than many at a time. It is usual to begin with the back, and, if necessary, to apply them next to the legs or thighs, reserving the arms last, that the patient may be so much the longer conveniently moved. In great lowness, attended with a delirium, sinapisms applied to the soles of the feet, have frequently more efficacy than blisters, in raising the pulse, and relieving the head.

If the body has been costive before the disease, it is proper to open it by a laxative, after bleeding; and after recovery, some lenient physic is generally requisite, for preventing a too hasty repletion incident to convalescents, upon indulging their appetites. *Pringle*, Observ. on the Dis. of the army, p. 134.

There is no caution more necessary to a young physician, than to abstain from all opiates throughout these fevers, however much the patient may complain of pain or watchfulness. Indeed, if the fever be accompanied with a diarrhœa, which is not critical, the looseness is to be gradually checked by diascordium, after giving rhubarb, and endeavouring to turn the humours to the skin by the use of diaphoretics, (omitting the nitre) with the use of the white decoction for common drink. Id. ibid. 136.

INK-*fish*, the same with the *Sepia*, or cuttle-fish. This animal, when it is in danger of being taken, emits a black liquor like ink, out of its mouth in considerable quantities, whereby the water being obscured, it finds an opportunity of escaping; and from this property it has got the name of the *Ink-fish*. See the article Sepia, *Append.*

INSECTS. (*Suppl.* — Dr. Hill, in his history of animals, has established a new system of *Insects*; which is this:

He first subdivides them into three general series, each whereof comprehends under it several classes, and those again many distinct genera.

The first series of *Insects* is called *Apteria*; because under it are comprehended all *Insects* of what kind soever, having neither wings nor limbs.

Of this series there are two classes, the *Anarthra* and *Podaria*. See the articles Anarthra and Podaria, *Append.*
The second series of *Insects* is called *Pteraria*, as comprehending all the winged kinds.
Of this series there are likewise two orders or subdivisions: 1. The *Pteraria Diptera*, or *Insects* with two wings. 2. The *Pteraria Tetraptera*, or those with four wings. See the article Pteraria, &c. *Append.*
The third and last series of *Insects* is called *Gymnarthridia*, and comprehends all those *Insects* which have soft and naked bodies, furnished with limbs. See Gymnarthridia.

INTERCALATION. See the article Interpolation, *infra.*

INTERMITTING *fever*. See the article Bilious *fever*, *Append.*

INTERPOLATION, *(Cycl.)* in algebra, is used, for the finding an intermediate term of a series, its place in the series being given. This is also called *Intercalation.*
The method of doing this is called the *Method of Interpolations*, or *Intercalations.*
When the algebraic equation of the series is given, the term required, whether it be a primary or intermediate term, may be found by the resolution of affected equations; but when this equation is not given, as it often happens, the value of the term sought must be exhibited by a converging series, or by the quadrature of curves. See *Stirling*, Method. Different. p. 86. seq. *Meier*, in act. petrop. Tom. II. p. 180, seq.
When the first, second, or other successive differences of the terms of a series become at last equal, the *interpolation* of any term of such a series may be found by Sir Isaac Newton's Differential Method. See Differential *Method*, *App.*

INTERSCENDENT, in Algebra, is applied to quantities, when the exponents of their powers are radical quantities. Thus $Z^{\sqrt{2}}$, $z^{\sqrt{m}}$, &c. are *interscendent* quantities. *Euler*, introduct. ad Analyf. infinit. Vol. I. pag. 6. Hence, an *interscendent* Series or Function is easily understood. See the article Function, *Append.*

IN-TURN, among wrestlers, is when one puts his thigh between those of his adversary, and lifts up his thigh. Dict. Rust. in voc.

JOCKEY, in the management of horses, the person who trims up, and rides about horses for sale. Rust. Dict. in voc.

JOCKLET, or YOCLET, a term used in some parts of Kent for a little farm which requires but one yoke of oxen to till it. Dict. Rust. in voc.

JOHN's *bread*, or St. John's *bread*, a name sometimes given to the *ceratonia*, or carob-tree, called by Tournefort *Siliqua*, See the article Siliqua, *Suppl.*

John's, or *Sweet* John's, a name sometimes given to the *Caryophyllus*, or pink. See the article Pink, *Suppl.*

JOINT-*Clerks of the Acatery*. See the article Acatery, *Cycl.*

JOKY. See the article Jockey, *Append.*

JONQUIL, a name given by some to the *Narcissus* of botanists. See the article Narcissus, *Suppl.*

JOVIS *barba*, in botany, the name of a distinct genus of plants. See the article Barba *Jovis*, *Suppl.*

IRON *(Suppl.)* — For the expansion of *Iron* by heat. See the article Heat, *Append.*

Iron-*wood*, in botany, the name of a genus of plants, called by botanists *Sideroxylum.* See the article Sideroxylum, *Append.*

Filings of Iron, in medicine, when reduced to an impalpable powder, is an excellent form to be given in female disorders, in which the body is weak, languid, and full of acidities; the juices are themselves the best menstruum in the world for it, as appears from its producing eructations of the smell of garlick, and by its tinging the excrements as black as ink. The natural heat, before wanting, is always excited by this means.

IRRIGATION, *Irrigatio*, denotes the watering of a meadow, garden, &c. Dict. Rust. in voc.

ISARUS, in zoology, a name given by the antients to the chamoy-goat. See the article Rupicapra, *Suppl.*

ISOPERIMETRICAL *(Cycl.)* — *Isoperimetrical* lines and figures have greatly engaged the attention of mathematicians since the invention of fluxions. The analysis of the general problem concerning figures, that among all those of the same perimeter produce maxima and minima, was given by Mr. James Bernoulli, from computations that involve second and third fluxions.[a] And several inquiries of this nature have been since prosecuted in like manner, but not always with equal success. Mr. Mac Laurin, to vindicate the doctrine of fluxions from the imputation of uncertainty, or obscurity, has illustrated this subject, which is commonly considered as one of the most abstruse parts of this doctrine, by giving the resolution and composition of these problems by first fluxions only; and in a manner that suggests a synthetic demonstration, serving to verify the solution[b]. [[a] *Analysis magni problematis isoperimetrici*, Act. erudit. Lips. 1701. p. 213, seq. [b] See *Mac Laurin's* Fluxions, B. I. chap. 13. p. 486, seq. See also Mem. Acad. Scienc. 1706. 1718. and *Jo. Bernoulli*, oper. Tom. I. p. 202, 208, 424, seq. Tom. II. p. 235, seq.]

ISSUES *(Suppl.)* — *Issues* above the shoulder-blades are good in asthmatic cases; and Dr. Mead thinks that their benefit in this and some other distempers, lies not only in giving vent to the humours, but likewise in lessening the over great tension of the nerves. Monit. et Pract. medic. cap. v.
The use of *Issues* or setons, made in the side on the part most affected, is recommended instead of bleeding in consumptive cases. See the article Consumption, *Append.* and Issue, *Suppl.*

ITCH *(Cycl.)* — Sulphur is specific in this disorder, being both more safe and more efficacious than mercury. For unless a mercurial ointment were to touch every part of the skin, there can be no dependance on it; whereas by a sulphureous one, a cure may be procured only by partial unctions.
It would seem, as if the *Itch*-insects, like other animals, were killed by the steams of brimstone, though only raised by the heat of the body.
As to the internal use of mercury, which some have accounted specific, there are many instances of people who have undergone a complete salivation for the cure of the venereal disease, without curing the *Itch*.
A pot of sulphureous ointment may be prepared thus: take of common sulphur one ounce; of the root of white hellebore, two drams; or one dram of crude sal ammoniac; make them into an ointment with two ounces and an half of hog's lard. This quantity will serve for four unctions, once every night. But to prevent any disorder that might arise from stopping too many pores at once, it will be proper to anoint only one fourth of the body at one time.
Though the *Itch* may be thus removed by one pot of ointment, it will be proper to renew the application, and to touch the parts most affected, for a few nights longer, till a second quantity, equal to the first, is also exhausted; and, in the worst cases, to subjoin the internal use of sulphur. Now, as the fumes of the sulphur may heat the blood, at a time when the perspiration is so much impeded, the patient should live all the while on a cool diet, and guard against cold. If he be of a full habit, or in any degree feverish, it will be proper to bleed and take physic; otherwise, neither of the two evacuations is necessary. See the article Scabies, *Suppl.*

Itch-*animal*, a creature found in the pustules of the *Itch*; it is a species of *Acarus*. See the article Acarus, *Append.*

JUCCA, in botany, the name of a distinct genus of plants, otherwise called *Yucca*. See the article Yucca, *Suppl.*

JUCKING, the notes of a cock-partridge, inviting the hen to come to him. These serve the sportsman in good stead for finding the places where they are. Rust. Dict. in voc.

JUCURUTA, a very beautiful species of owl, found in the Brazils, and variegated with black and yellow.

JUFFERS, among carpenters, a term used for pieces of wood, about four or five inches square, and of several lengths.

JUGLANS, in the Linnæan system of botany, the name of a distinct genus of plants, called by Tournefort simply *Nux*; and in English the *Walnut-tree*. See the article Nux, *Suppl.*

JUJUBE-*tree*, the English name of a distinct genus of plants, called by authors *Ziziphus*. See the article Ziziphus, *Suppl.*

JULIANS, the name of a distinct genus of plants, called by botanists *Hesperis*. See the article Hesperis, *Suppl.*

JULY-*flowers*, the English name for several species of *Caryophyllus*, or pink. See the article Pink, *Suppl.*

JUNCUS *odoratus*, *aromaticus*, and *rotundus*, in botany, names given to the *Schænanth*. See the article Schænanth, *Suppl.*

IVORY *(Cycl.* and *Suppl.)*—*Staining or Dying of* Ivory. To stain *Ivory* of a fine green colour, take to two parts of verdigrease one part of sal armoniac.

JUTTY-*heads*, in the sea-language, platforms standing on piles, near the docks, and projecting without the wharfs for the more convenient docking and undocking ships. *Blanckley*, Nav. Expositor, p. 84.

JUG, a sort of earthen pot, or pitcher, to hold drink; also a term used in many parts for a common, pasture, or meadow. Rust. Dict. in voc.

JUNAMES, in husbandry, denotes land sown with the same grain, as it had been the preceding year.

JUPITER's-*beard*, the English name of a distinct genus of plants, called by Tournefort *Barba Jovis*. See the article Barba *Jovis*, *Suppl.*

IVY *(Suppl.)* — *Ground*-Ivy, *Hedera terrestria*, the name of a genus of plants, the characters of which are these; the cup is a one-leaved perianthium, tubulated, cylindric, striated, very small, and permanent; with its mouth divided into five acuminated, unequal segments. The flower is monopetalous, and ringent; the tube is slender and compressed, the upper lip being erect, obtuse, and semibifid; the under one patent, large, obtuse, and trifid. The stamina are four, standing under the upper lip of the flower; each of the two pair of antheræ is arranged in the form of a cross. The germen of the pistil is quadrifid; the style is filiform, and inclinated; the stigma bifid and acute. There is no pericarpium beside the cup; the seeds, which are ovated, and four in number, being contained in it. *Linnæi* Gen Plant. p. 269.

Virginian-Ivy, a name used by some writers for the *Menispermum*, a distinct genus of plants. See the article Menispermum, *Append.*

K.

KAB, in Jewish antiquity. See the article CAB, *Suppl.*

KÆMPFERIA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The cup is a simple spatha, consisting only of one leaf, and opening on one side. The flower consists of a single petal; the tube is long and thin, the limb is plane, and divided into six parts, three of the segments being alternately lanceolated in figure, and equal in size; two other of the segments are of an ovated form, and the single lower one is divided into five parts, which are each vertically cordated; all the segments are equal in length. The stamen is a single filament, of a membranaceous structure, and somewhat ovated figure, and is emarginated. The anthera is of a lineal figure, it grows to the filament all its length, and scarce emerges out of the tube of the corolla. The germen of the pistil is roundish; the style is of the length of the tube, and the stigma is obtuse. The fruit is a roundish, and somewhat trigonal capsule, composed of three valves, and containing three cells, in each of which there are a great number of seeds. Vid. *Linnæi* Gen. Plant. p. 4.

The root of the *Kæmpferia*, of which there is only one known species, is the *Galangal* of the shops. See the article GALANGAL, *Suppl.*

KAHIASEE, in the turkish court, an officer of state, answering to our master of the ceremonies.

KANTREF, or KANTREV. See the article CANTRED, *Suppl.*

KARFE, a kind of Cinnamon. See the article CINNAMUM, *Suppl.*

KARLE *(Cycl.)* — KARLE-*hemp*, a term used by country people for the latter green hemp. Dict. Rust. in voc.

KASTRIL, in zoology, the same with *Kestril*, a bird of the hawk-kind. See the article KESTRIL, *Suppl.*

KATKIN. See the article CATKIN, *Suppl.*

KEELERS, in the sea language, small tubs for holding stuff to grave a ship's bottom. *Blanckley*, Nav. Expos. p. 85.

KEEVE, or KEEVER, a large tub, or brewing vessel, in which ale or beer ferments before it is tunned. Dict. Rust. in voc.

KENNEL, a term used indifferently for a puddle, a watercourse in the streets, a house for a pack of hounds, and the pack or cry of hounds themselves. Dict. Rust. in voc.

Among sportsmen, a fox is said to *kennel*, when he lies close in his hole. Id. ibid.

KERSEY, a kind of coarse woollen cloth, made chiefly in Kent and Devonshire. Dict. Rust. in voc.

KESITAH. This word is to be met with in Genesis [a], and in Job [b]; and is translated in the septuagint and vulgate Sheep or Lambs. But the Rabbins and modern interpreters are generally of opinion, that *Kesitah* signifies rather a piece of money. Bochart and Eugubinus are of opinion the septuagint meant *Minæ*, and not *Lambs*; in Greek *hecatonmnon*, ἑκατονμνων instead of ἑκατον ἀμνων. Now a Mina was worth sixty Hebrew shekels, and consequently six pounds sixteen shillings and ten pence halfpenny sterling [c]. M. de Pelletier of Rouen, is of opinion, that *Kesitah* was a Persian coin, stamped on one side with an archer (*Kesitah*, or *Keseth*, in Hebrew, signifying a Bow) and on the other with a Lamb; that this was a gold coin known in the east by the name of a Daric [d], and was in value about twelve livres and ten pence French money. Several learned men, without mentioning the value of the *Kesitah*, say it was a silver coin, the impression whereof was a sheep; for which reason the septuagint and vulgate translate it by this name. Calmet is of opinion, that *Kesitah* was a purse of gold or silver. In the east they reckon at present by purses. The word *Kista* in Chaldee signifies a measure, a vessel. And *Eustathius* says, that *Kista* is a Persian measure. Jonathan and the *Targum* of *Jerusalem* translate *Kesitah* a pearl [e].

[[a] Gen. XXXIII. 19.— [b] Job XLII. 11.—Or Nine pounds *English*, supposing, as Dr. *Prideaux* does, that a shekel is worth three shillings.— [d] A Daric is a piece of gold, worth, as Dr. *Prideaux* says, five and twenty shillings *English*. See his Connect. P. I. p. 101.— [e] See *Calmet* Comment. upon Gen. XXXIII. 19. Gen. XXV. 12, &c. and Dict. Bibl.]

KEY *(Suppl.)* — KEYS, a name commonly given to the seeds of ash-trees. Dict. Rust. in voc.

KID, in zoology, the English name of the young of goats. See the article GOAT, *Suppl.*

KIDNEYS *(Cycl.)* — The lymphatic vessels of the *Kidneys* appear upon blowing by the ureter into the pelvis of the *Kidney*. See Hist. de l'Acad. des Sciences, 1733.

KIDNEY-*bean-tree*, the name by which some call the *Glycine*. See the article GLYCINE, *Suppl.*

KIDNEY-*wort*, in botany, a name promiscuously used for two distinct genuses of plants, called by botanists *Geum*, and *Cotyledon*. See the articles GEUM and COTYLEDON, *Suppl.*

KILLOS, a name given by the miners of Cornwall to a stone of the slate kind, found in the mines there. See the article GROWAN, *Suppl.*

KINE, in zoology. See the articles COW and BO, *Suppl.*

KING-*fisher*, the English name of a genus of birds, called by zoologists *Ispida*. See the article ISPIDA, *Suppl.*

KING's-*spear*, a name sometimes used for the *Asphodelus* of botanists. See the article ASPHODELUS, *Suppl.*

KINKS, in the sea language. When ropes are new, or too hard laid, they are apt in folding, to make turns, which are called *Kinks*. *Blanckley*, Nav. Expos. p. 16.

KIPE, a kind of osier basket, wide in the middle, and narrow at both ends, used for taking fish. Rust. Dict. in voc.

KIPE is also the name of a game, which consists in throwing something into a hole, called the *Kipe*-hole.

KIRTLE, a term used for a short jacket; also for a quantity of flax, about an hundred weight. Rust. Dict. in voc.

KITE, in ornithology, the English name of a bird of the hawk-kind, with a brown body, and a white head; its tail is forked, and the wings are immoderately long and large, measuring nearly three times the length of the body. See the article MILVUS, *Suppl.*

KLEINIA, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The cup is cylindric, and covered with squamæ; the compound flower is tubulose; the proper one infundibuliform, insensibly terminating in a tube; the stamina are five very short capillary filaments; the antheræ are cylindraceo-tubulose; the germen of the pistil is coronated; the style is filiform, and of the length of the stamina; the stigmata are two, oblong, and revolute. There is no pericarpium. The seeds are solitary, oblong, and covered with very long capillary down. The receptacle is naked, plane, and punctated. *Linnæi* Gen. Plant. p. 394.

Linnæus queries whether this genus be not the same with the *Tithymaloides* of Tournefort. See the article TITHYMALOIDES, *Suppl.*

KNAG, a term used by country people for a knot in wood; also for the branches which grow out in the hart's-horns, near the forehead. Rust. Dict. in voc.

KNEE-*holm*, or KNEE-*holly*, the name by which some call the *Ruscus*, or Butcher's-broom. See the article RUSCUS, *Suppl.*

KNIGHT's *Cross*, a name sometimes used for the *Lychnis*, a distinct genus of plants. See the article LYCHNIS, *Suppl.*

KNOLL, a term used in many parts of the kingdom for the top of a small hill, or for the hill itself. Rust. Dict. in voc.

KNOT-*berries*, in botany, the name by which some call the *Rubus*. See the article RUBUS, *Suppl.*

KNOT-*grass*, *(Suppl.)*—*Mountain* KNOT-*grass*, or *single* KNOT-*grass*, the name sometimes given to a distinct genus of plants, called by botanists *Paronychia*. See the article PARONYCHIA, *Suppl.*

L.

LABURNUM, in botany, the name used by Rivinus, for the cytisus of other botanists. See the article CYTISUS, *Suppl.*

LACRYMA *Jobi*, in botany, the name of a genus of plants, the characters of which are these: The male flowers are formed into a lax spike; the female ones are fewer in number, and are situate at the base of the male spike on the same plant. In the male flowers the cup is a glume, containing two flowers, and has no awns; the corolla is also a glume, without any aristæ or awns. The stamina are three capillary filaments; the antheræ are oblong, and quadrangular. In the female flowers, the cup is also a glume, containing two flowers, as is the corolla, both being without any awns. The germen of the pistil is of an oval form; the style is short, and divided into two parts. The stigmata are two in number, corniculated, and longer than the flower. The seed, which is single and roundish, is covered by the indurated cup. Vid. *Linnæi* Gen. Plant. p. 445.

LADDER *to heaven*, the name by which some call the *Polygonatum*, a distinct genus of plants. See the article POLYGONATUM, *Suppl.*

LADIES *bed-straw*, in botany, the English name of a distinct genus of plants, called by botanists *Gallium*. See the article GALLIUM, *Suppl.*

LADIES *bower*, or *Virgin's bower*, names given to a distinct genus of plants, called by botanists *Clematitis*. See the article VIRGIN'S *bower*, *Suppl.*

LADIES *comb*, or VENUS'S *comb*, in botany, the name of a distinct genus of plants, called by botanists *Scandix*. See the article SCANDIX, *Suppl.*

LADLE (*Suppl.*) — LADLE-*boards*, those boards disposed on the circumference of the water-wheels of over-shot mills; forming hollows, or receptacles not unlike ladles to receive the water that falls upon the wheel. See the article *Water*-WHEEL, *Append.*

LADIES *finger*, the name by which some call a species of *Vulneraria*. See the article VULNERARIA, *Suppl.*

LADIES *mantle*, in botany, the name of a genus of plants, known among authors by that of *Alchimilla*. See the article ALCHIMILLA, *Suppl.*

LADIES *seal*, a name sometimes given to a distinct genus of plants, called by botanists *Tamnus*. See the article TAMNUS, *Suppl.*

LADIES *traces*, a name sometimes used for the *Orchis*, a distinct genus of plants. See the article ORCHIS, *Suppl.*

LADY *cow*, the English name of a genus of beetles, called by some *Hemisphæria*. See the articles SCARABÆUS, *Suppl.* and HEMISPHÆRIA, *Append.*

LAKE-*weed*, in botany, a name sometimes used for the *Persicaria*, or arsmart. See the article PERSICARIA, *Suppl.*

LAMB'S *Lettuce*, a name by which some call the *Valerianella*, a distinct genus of plants. See the article VALERIANELLA, *Suppl.*

LAMPADIAS is used by some authors for a kind of bearded comet, which, as they pretend, resembles a burning lamp, being of several shapes; its flame or blaze tapering upward sometimes like unto a sword, and being at others double or triple pointed.

LANIARDS. See the article LANNIERS, *Suppl.*

LANIO, in ornithology, the name used by Linnæus for the butcher-bird. See the article LANIUS, *Suppl.*

LANNAR, in ornithology, a bird of the hawk-kind. See the article LANNARIUS, *Suppl.*

LANYARDS. See the article LANNIERS, *Suppl.*

LAPIS *Calaminaris*, in natural history. See the article CALAMINARIS *Lapis*, *Suppl.*

LAPPA, in botany, a name used by some for the *Xanthium*, or burdock. See the article XANTHIUM, *Suppl.*

LAPWING, in ornithology, the English name of the black-breasted *Tringa*, with a hanging crest. See the article TRINGA, *Suppl.*

Were the *Lapwing* less common, it would be highly esteemed for its beauty. It is very frequent in our fenny countries, and in the wet places of most other parts of Europe.

Authors have described it under the names *Vanellus*, *Capra*, and *Capella*. See the article CAPELLA, *Suppl.*

LARCH-*tree*, in botany, the English name of a distinct genus of plants, called by botanists *Larix*. See the article LARIX, *Suppl.*

LASER-*wort*, in botany, the name of a distinct genus of plants, See the article LASERPITIUM, *Suppl.*

LASK, a term used by farriers for a looseness in horses, frequently fatal to them. Ruft. Dict. in voc.

LATCHETS, the same with *Laskets*. See the article LASKETS, *Suppl.*

LATHYRUS is also a name used by some for the *Nissolia* of others. See the articles LATHYRUS and NISSOLIA, *Suppl.*

LAVENDER, the English name of a distinct genus of plants, called by authors *Lavendula*. See the article LAVENDULA, *Suppl.*

Cotton LAVENDER, the name by which some call the *Santolina* of botanists, a distinct genus of plants. See the article SANTOLINA, *Suppl.*

French LAVENDER, a name sometimes given to a distinct genus of plants, called by authors *Stoechas*. See the article STOECHAS, *Append.*

Hollow-leaved Sea LAVENDER, a name sometimes used for a species of *Sarracena*. See the article SARRACENA, *Suppl.*

Sea LAVENDER, the English name of a distinct genus of plants, known among botanists by that of LIMONIUM. See the article LIMONIUM, *Suppl.*

LAVER, in botany, the English name of a genus of plants, called by botanists *Tremella*. See the article TREMELLA, *Suppl.*

LAUREL, *Laurus*, in botany, the name given by Linnæus to a large genus of plants. See the article LAURUS, *Append.*

Alexandrian LAUREL, a name sometimes given to the *Ruscus*, or butcher's broom. See the article RUSCUS, *Suppl.*

Dwarf LAUREL, or *spurge* LAUREL, names sometimes given to the *Thymelæa* of botanists. See the article THYMELÆA, *Suppl.*

Portugal LAUREL, the name of a distinct genus of plants, called by authors *Padus*, or *Lauro-Cerasus*. See the article LAURO-*Cerasus*, *Suppl.*

Sea-side LAUREL, a name sometimes given to the *Phyllanthus*, a distinct genus of plants. See the article PHYLLANTHUS, *Suppl.*

LAUROTAXA, in botany. See the article RUSCUS, *Suppl.*

LAURUS, in the Linnæan system of botany, the name of a large genus of plants, comprehending the *Laurus*, or common bay-tree, of Tournefort; the *Cinnamon-tree*, the *Camphor-tree*, and the *Persea*, *Borbonia*, *Benzoe*, and *Sassafrass* of others.

The characters of this genus are these: There is no calyx, the corolla much resembles a calyx, and has been mistaken for one; it consists of six erect, hollow, ovo-acuminated petals, alternately exterior; the nectarium is composed of three coloured, acuminated turbercles, terminating each in two hairs, and standing round the germen; the stamina are nine filaments, shorter than the corolla, compressed, obtuse, and placed in threes; the antheræ adhere to the edge of the upper part of the filaments on each side; and there are two globose corpuscles, affixed, by a very short filament, to each of the stamina of the inner series, near the base; the germen is oval; the style is simple, equal, and of the length of the stamina; the stigma is obtuse and oblique; the fruit is a drupe of an oval, acuminated figure, containing only one cell, and contained in the corolla; the seed is a single ovato-acuminated nut; its kernel is of the same shape.

The greater number of the species of this genus, as the cinnamon-tree, camphor-tree, &c. are of the hermaphrodite kind; but some, as the common bay, have the male flowers on separate trees: In this case the stamina vary in number from eight to fourteen, and the corolla is naked, and divided into four parts. The little bodies adhering to some of the filaments, are the great characteristics of the genus. Vid. *Linnæi* Gen. Plant. p. 174.

LAURUSTINE, the English name of a genus of plants, known among authors by that of *Tinus*. See the article TINUS, *Suppl.*

LAW-*Day*, *Lagedayum*, in our old Law-writers, was any day of open court, and commonly used for the courts of a county or hundred. It is also called *View of frank-pledge*, or *Court-leet*. — *Et quieti sint de Sectis Comitatuum & Hundredorum nostrorum, de visu franci plegii & Lawdayorum*, &c. Chart. 39. H. 3. *Terms of law.*

LAYR. See the article LAIR, *Cycl.*

LAYES, or LEYES, a term used in many parts of England, for such pasture ground, as formerly had been tilled and sown. Ruft. Dict. in voc.

LAZEROLE, in botany, a name used for several species of medlar. See the articles MESPILUS and MEDLAR. *Suppl.*

LEAM, or LIAM, among sportsmen, the line for holding a hawk or dog, more usually called a Leash. See the article LEASH, *Cycl.*

LEDGERS, among builders. See the article PUTLOGS, *Cycl.*

LEE (*Suppl.*) — LEE-*fangs* are ropes reeved into the cringles of a yacht's or hoy's sails. *Blankley's* Naval Expositor, p. 93.

LEECH, the same with LEETCH. See the article LEETCH, *Suppl.*

LEEK *(Suppl.)* — *Houſe*-LEEK, the Engliſh name of a genus of plants, called by botanical writers *Sedum*. See the article SEDUM, *Suppl.*

LEMNA, *Duckweed*, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by others LENTICULA and HYDROPHACE.

The characters of it are theſe: It produces diſtinct hermaphrodite and female flowers on the ſame plant. In the hermaphrodite flowers the cup is monophyllous, of a roundiſh figure, and opens ſidewiſe; it is dilated obliquely outwards, and is large, expanded, obtuſe, and not divided at the edges. There is no corolla; but in this calyx there ſtands two ſubulated, crooked filaments, of the length of the cup, and on theſe double globoſe antheræ. In the female flower there is no corolla; the calyx is the ſame as in the other. The germen of the piſtil is of an oval form; the ſtyle is ſhort and permanent, the ſtigma ſimple. The fruit is a rounded capſule, but terminating in a point, and contains only a ſingle cavity; in which are lodged a ſmall number of ſeeds, of an oblong figure, pointed at each end, and ſtriated on one ſide. Vid. *Linnæi* Gen. Plant. p. 508.

The ſpecies of *Lemna* enumerated by authors are theſe. 1. The roundiſh leaved, ſingle rooted *Duck-weed*. 2. The ſingle rooted *Lemna*, with oblong leaves. 3. The many rooted, broad, oval leaved *Duck-weed*. 4. The ſingle rooted, oval leaved *Lemna*. 5. The oval leaved *Lemna* with no root. 6. The ramoſe, pediculated *Lemna*, with oblong leaves. Vid. *Hill*'s Hiſt. Plant. p. 128.

Beſides theſe ſix diſtinct ſpecies of *Lemna*, there are two varieties that may eaſily be miſtaken for diſtinct ſpecies alſo: theſe are a very ſmall, oblong, and thick leaved kind; and a larger, roundiſh, and thin leaved one.

The common *Lemna* is recommended, as a refrigerant, and reſtringent; and Bates tells us of a wonderful cure performed by an infuſion of it in wine, in an obſtinate jaundice. Id. ibid. p. 130.

LEMON-*tree*, *Limon*, in botany. See the article LIMON, *Suppl.*

The culture of the *Lemon-tree* is much the ſame with that of the Orange-tree. See the article ORANGE, *Suppl.*

However, it is proper to obſerve, that the common *Lemons* are ſomewhat hardier than the orange, and require a greater ſhare of freſh air in winter, for which reaſon they ſhould be placed nearer to the doors or windows of the green-houſe. Another difference likewiſe deſerves to be mentioned; and that is, that the *Lemons* require to be more plentifully watered than the orange. But as to the tender kinds of *Lemons*, they muſt be treated with more care. *Miller*, Gard. Dict.

Water-LEMON, a name ſometimes given to the *Granadilla*, or paſſion flower. See the article GRANADILLA, *Suppl.*

LENTIL, in botany, the Engliſh name of a diſtinct genus of plants, called by botanical writers, *Lens*. See the article LENS, *Suppl.*

Lentils make excellent ſweet fodder; and are therefore to be preferred to all other kinds for calves and other young cattle. They likewiſe are the beſt as well as cheapeſt food for pidgeons. Ruſt. Dict. in voc.

Peruvian-LENTISK, the name ſometimes given to the *Molle* of botanical authors. See the article MOLLE, *Suppl.*

LEOPARD, in zoology, the Engliſh name of the long-tailed *Felis*, with the upper ſpots round, and the lower ones virgated. See the article FELIS, *Suppl.*

LEPRAS, in ichthyography. See the article TURDUS, *Suppl.*

LEPROSY *(Cycl.)* — The leſſer degrees of *Leproſy* are frequently confounded with the ſcurvy, and even itch; from which, however, it may be diſtinguiſhed by the hardneſs of the ſkin in one or more parts of the body, attended with a dry ſcurf, ſometimes oozing puſtules, or dry ſcabs, and always with ſome degree of itching; whereas the true ſcorbutic ſpots are of a livid colour, not commonly ſcurfy or raiſed above the ſkin, and are attended with manifeſt ſigns of a lax ſtate of the fibres, and corruption of the blood. For a real ſcurvy imports a flow, but general reſolution or putrefaction of the whole frame; whereas the ſcabies, impetigo, or leproſy may be found to affect thoſe of a very different conſtitution. *Pringle*, Obſerv. on Diſeaſ. of the Army, p. 306.

This diſorder is ſo far from being curable by externals only, that it is ſometimes dangerous to attempt to remove the ſcurfs of *leprous* people in that manner. On the contrary, it is neceſſary to change the humours, by a ſpare diet, exerciſe, alterative mercurials, or frequent purges of the ſaline kind. Id. ibid.

Dr. Mead recommends the Tincture of Cantharides in this diſtemper. *De morbis biblicis.*

LEPTURA, in the hiſtory of inſects, the name of a genus of four-winged flies, the antennæ of which are oblong, ſlender, and ſetaceous; the exterior wings are truncated at their extremity, and the thorax is of a ſubcylindric figure. *Hill*, Hiſt. Anim. p. 46.

Theſe flies have been, by the generality of authors, reckoned among the beetles. See the article SCARABÆUS, *Suppl.*

LEPTURUS, the name is of Greek origin, and is form'd of the λεπτὸς ſlender, and οὐρα a tail; expreſſing that this fiſh has a very long and ſlender tail.

LEPUS *Marinus*, a name uſed by many authors for the *Lernea*. See the article LERNEA, *Append.*

LERNEA, in zoology, the name of a genus of naked inſects. Its body is of an oblong, cylindric figure, from one to two inches long; and is perforated in the forehead; the tentacula reſemble ears.

It is found on rocks waſhed by the ſea, and even on the ſides of the bream, carp, and roach, in many of our ponds and rivers.

Authors have called it *Lepus marinus*, the ſea-hare; of which they enumerate a great many ſpecies. *Hill*, Hiſt. Anim. p. 88.

LESSES, a term uſed by ſportſmen for the dung of a wild boar, bear, or wolf. Ruſt. Dict. in voc.

LETTUCE — *(Suppl.)* *Lamb's* LETTUCE, in botany, the name of a genus of plants, called by botaniſts *Valerianella*. See the article VALERIANELLA, *Suppl.*

Wild-LETTUCE, a name ſometimes given to the *Prenanthes*, a diſtinct genus of plants. See the article PRENANTHES, *Suppl.*

LEUCO-*Narciſſo-lirion*, a name uſed by *Lobel*, for the plant called by Linnæus *Galanthus*, and comprehended by Tournefort among the *Narciſſo-Leucoiums*. See the article NARCISSO-*Leucoium*, *Suppl.*

LEUCOIUM *bulboſum*, a name ſometimes given to a ſpecies of *Narciſſo-Leucoium*, according to Tournefort, but made a diſtinct genus by Linnæus, under the name *Galanthus*. See the article NARCISSO-*Leucoium*, *Suppl.*

LEUCORHOEA. See the article FLUOR *Albus*, *Suppl.*

LIBELLULA, in zoology, the name of a genus of two winged flies, the mouth of which is furniſhed with jaws, the antennæ ſhort, and the tail terminated by a kind of forceps.

The ſpecies of this genus are very numerous, ſome carrying their wings erect when they ſit, and others horizontally. Vid. *Hill*, Hiſt. Anim. p. 73.

LICE *of trees*. See the article APHIS, *Append.*

LIFE *(Suppl.)* — *Annuity for* LIFE. Dr. Halley's Table of the values of annuities for lives for different ages, inſerted in the Cyclopædia, under ANNUITY, was computed at a high rate of intereſt, and coincides nearly with Mr. De Moivre's Tables at 6 per Cent; but as intereſt is now much fallen, it may be proper here to ſhew the values of ſuch Annuities, when intereſt is eſtimated at 3, 3 ½, 4, and 5 per Cent.

Value of an Annuity for life of 1 £. Intereſt being,

Age	3 *per* Ct.	3½ *per* C.	4 *per* Ct.	5 *per* Ct.
9 *and* 10	19. 87	18. 27	16. 88	14. 60
8, 11	19. 74	18. 16	16. 79	14. 53
7, 12	19. 60	18. 05	16. 64	14. 47
13	19. 47	17. 94	16. 60	14. 41
6, 14	19. 33	17. 82	16. 50	14. 34
15	19. 19	17. 71	16. 41	14. 27
16	19. 05	17. 59	16. 31	14. 20
5, 17	18. 90	17. 46	16. 21	14. 12
18	18. 76	17. 33	16. 10	14. 05
19	18. 61	17. 21	15. 99	13. 97
4, 20	18. 46	17. 09	15. 89	13. 89
21	18. 30	16. 96	15. 78	13. 81
22	18. 15	16. 83	15. 67	13. 72
23	17. 99	16. 69	15. 55	13. 64
3, 24	17. 83	16. 56	15. 43	13. 55
25	17. 66	16. 42	15. 31	13. 46
26	17. 50	16. 28	15. 19	13. 37
27	17. 33	16. 13	15. 04	13. 28
28	17. 16	15. 98	14. 94	13. 18
29	16. 98	15. 83	14. 81	13. 09
30	16. 80	15. 68	14. 68	12. 99
2, 31	16. 62	15. 53	14. 54	12. 88
32	16. 44	15. 37	14. 41	12. 78
33	16. 25	15. 21	14. 27	12. 67
34	16. 06	15. 05	14. 12	12. 56
35	15. 86	14. 89	13. 98	12. 45
36	15. 67	14. 71	13. 82	12. 33
37	15. 46	14. 52	13. 67	12. 21
38	15. 26	14. 34	13. 52	12. 09
1, 39	15. 05	14. 16	13. 36	11. 96
40	14. 84	13. 98	13. 20	11. 83
41	14. 63	13. 79	13. 02	11. 70
42	14. 41	13. 59	12. 85	11. 57
43	14. 19	13. 40	12. 68	11. 43
44	13. 96	13. 20	12. 50	11. 29
45	13. 73	12. 99	12. 32	11. 14
46	13. 49	12. 78	12. 13	10. 99
47	13. 25	12. 57	11. 94	10. 84
48	13. 01	12. 36	11. 74	10. 68
49	12. 76	12. 14	11. 54	10. 51
50	12. 51	11. 92	11. 34	10. 35
51	12. 26	11. 69	11. 13	10. 17
52	12. 00	11. 45	10. 92	9. 99
53	11. 73	11. 20	10. 70	9. 82
54	11. 46	10. 95	10. 47	9. 63
55	11. 18	10. 69	10. 24	9. 44

Age

Value of an Annuity for life of 1 £. Intereſt being

Age	3 per Ct.	3 ½ per Ct.	4 per Ct.	5 per Ct.
56	10. 90	10. 44	10. 01	9. 24
57	10. 61	10. 18	9. 77	9. 04
58	10. 32	9. 91	9. 52	8. 83
59	10. 03	9. 64	9. 27	8. 61
60	9. 73	9. 36	9. 01	8, 39
61	9. 42	9. 08	8. 75	8. 16
62	9. 11	8. 79	8. 48	7. 93
63	8. 79	8. 49	8. 20	7. 68
64	8. 46	8. 19	7. 92	7. 43
65	8. 13	7. 88	7. 63	7. 18
66	7. 79	7. 56	7. 33	6. 91
67	7. 45	7. 24	7. 02	6. 64
68	7. 10	6. 91	6. 75	6. 36
69	6. 75	6. 57	6. 39	6. 07
70	6. 38	6. 22	6. 06	5. 77
71	6. 01	5. 87	5. 72	5. 47
72	5. 63	5. 51	5. 38	5. 15
73	5. 25	5. 14	5. 02	4. 82
74	4. 85	4. 77	4. 66	4. 49
75	4. 45	4. 38	4. 29	4. 14
76	4. 05	3. 98	3. 91	3. 78
77	3. 63	3. 57	3. 52	3. 41
78	3. 21	3. 16	3. 11	3. 03
79	2. 78	2. 74	2. 70	2. 64
80	2. 34	2. 31	2. 28	2. 23

The columns marked 3 per Ct. &c. ſhew the values of annuities for LIFE in years purchaſe, and decimals of a year; thus an annuity for LIFE at 3 per Ct. for an age of 56, will be 10. 90. that is worth 10 $\frac{9}{10}$ years purchaſe.

Dr. Halley alſo publiſhed a Table [a] for eſtimating the probabilities of life, grounded on the Breſlau Bills of Mortality; and the values of annuities for *life* have been commonly determined from this Table, and from the rate of intereſt. See *De Moivre*, Doct. of Chances, p. 211, ſeq.

We ſhall here inſert Dr. Halley's Table, divided into ſeveral columns, ſhewing alternately the age, and the number of perſons living of that age.—[[a] Philoſ. Tranſ. N° 196. Lowthorp's Abridg. Vol. III. p. 671.]

Age	Perſons	Age	Perſons	Age	Perſons	Age	Perſons
1	1000	22	586	43	417	64	202
2	855	23	579	44	407	65	192
3	798	24	573	45	397	66	182
4	760	25	567	46	387	67	172
5	732	26	560	47	377	68	162
6	710	27	553	48	367	69	152
7	692	28	546	49	357	70	142
8	680	29	539	50	346	71	131
9	670	30	531	51	335	72	120
10	661	31	523	52	324	73	109
11	653	32	515	53	313	74	98
12	646	33	507	54	302	75	88
13	640	34	499	55	292	76	78
14	634	35	490	56	282	77	68
15	628	36	481	57	272	78	58
16	622	37	472	58	262	79	49
17	616	38	463	59	252	80	41
18	610	39	454	60	242	81	34
19	604	40	445	61	232	82	28
20	598	41	436	62	222	83	23
21	592	42	427	63	212	84	20

By the help of this table we may find what the reſpective probabilities are for a man of a certain age, 30, for inſtance, living 1, 2, 3, 4, &c. years. Thus, look for the number 30 in one of the columns of age; then over-againſt that number in the next adjacent column on the right hand, you will find 531, under which are written 523, 515, 507, 499, &c. each correſponding, reſpectively, to the numbers written in the column of age; the meaning of which is, that out of 531 perſons living of the age of 30, there remain but 523, 515, 507, 499, &c. that attain the reſpective ages of 31, 32, 33, 34, &c. and who conſequently do from that term of 30, live 1, 2, 3, 4, &c. years reſpectively.

Hence ſuppoſing the quantities A, B, C, D, E, &c. to repreſent reſpectively the perſons living at a given age, and the ſubſequent years, it is evident, that there being A perſons of the age given, and one year after B perſons remaining, the probability which the perſon of the given age has to continue in life, for one year, is meaſured by the fraction $\frac{B}{A}$ and that the probability which he has to continue in life for two years, is meaſured by the fraction $\frac{C}{A}$ and ſo on. Therefore, if money bore no intereſt, it would be ſufficient to multiply thoſe probabilities by the ſum to be received annually, and the ſum of the products would expreſs the preſent value of the annuity. But as money bears intereſt, all thoſe values muſt be properly diſcounted at compound intereſt according to a given rate, and the new reſulting value will be the true value of an annuity for a given life at a given rate of intereſt.

Mr. De Moivre obſerved, that in Dr. Halley's Table the probabilities of life decreaſed nearly in an arithmetic progreſſion, when conſidered from a term given, and hence he found an eaſy rule for the value of an annuity on a life of a given age. His rule is, $\frac{1-\frac{r}{n}P}{r-1}$ where P repreſents the value of an annuity certain of 1 £ for as many years as are intercepted between the age given, and the extremity of old age, ſuppoſed at 86, and that interval of life is expreſſed by n. r ſtands for the amount of the principal and intereſt of 1 £ in one year.

The rule, therefore, in words at length, will be, Take the value of an annuity certain for ſo many years as are denoted by the complement of life; multiply this value by the rate of intereſt, and divide the product by the complement of life; then let the quotient be ſubtracted from 1, and let the remainder be divided by the intereſt of 1 £; then this laſt quotient will expreſs the value of an annuity for an age given. See *Complement* of LIFE, *infra*.

Thus ſuppoſe it were required to find the preſent value of an annuity of 1 £ for an age of 50, intereſt being at 5 per cent. The complement of life being 36; let the value of an annuity certain, according to the given rate of intereſt, be taken from the tables of ſuch annuities [a], and this value will be found to be 16.5468. Let this value be multiplied by the rate of intereſt 1. 05; the product will be 17. 3741. Let this product be divided by the complement of life, that is, in this caſe, by 36, the quotient will be 0. 04826; ſubtract this quotient from unity, the remainder will be 0.5174. Laſtly, divide this quotient by the intereſt of 1 £; that is, in the preſent caſe, 0. 05, and the new quotient will be 10. 35, which will expreſs the value of an annuity of 1 £ to continue during a life of 50, or, in other words, how many years purchaſe a life of 50 is worth [b].—[[a] See *Dodſon's* Calculator, p. 11.—[b] *De Moivre's* Annuit. Probl. I, and Doctr. of Chances, p. 213, ſeqq.

The following queſtions being of frequent uſe, we have here inſerted them, with the rules for their ſolution.

I. The values of two ſingle lives being given, to find the value of an annuity granted for the time of their joint continuance; or, the value of two ſingle lives being given, to find the value of the joint lives.

Multiply together the values of the two lives, and reſerve the product. Let that product be again multiplied by the intereſt of 1 £; and let that new product be ſubtracted from the ſum of the values of the lives, and reſerve the remainder. Divide the firſt quantity reſerved by the ſecond, and the quotient will expreſs the value of the two joint lives.

Thus ſuppoſing one life of 40 years of age, the other of 50, and intereſt at 5 per Cent; the value of the firſt life will be found in the tables to be 11. 83; the value of the ſecond 10. 35; and the product will be 122. 4405, which product muſt be reſerved. Multiply this again by the intereſt of 1 £; that is, by 0. 05, and this new product will be 6. 12025. which being ſubtracted from the ſum of the lives, or 22. 18, the remainder will be 16. 057975, and this is the ſecond quantity reſerved. Now dividing the firſt quantity reſerved by the ſecond, the quotient will be 7. 62 nearly; and this expreſſes the values of the two *joint lives*.

II. The values of two ſingle lives being given, to find the value of an annuity upon the longeſt of them; that is, of an annuity to continue ſo long as either of them is in being.

From the ſum of the values of the joint lives, ſubtract the value of the joint lives, and the remainder will be the value of the longeſt.

Suppoſe for inſtance, two lives, one worth 13 years purchaſe, the other 14, and intereſt at 4 per Cent. The ſum of the values of the lives is 27; the value of the two joint lives by the rule before given is 9. 23; and ſubtracting 9. 23 from 27, the remainder 17. 77 is the value of the longeſt of the two lives.

III. The values of three ſingle lives being given, to find the value of an annuity upon the longeſt of them:

Take the ſum of the three ſingle lives, from which ſum ſubtract the ſum of all the joint lives combined two and two; then to the remainder add the value of the three joint lives, and the reſult will be the value of the longeſt of he three lives.

Thus ſuppoſing the ſingle lives to be 13, 14, and 15 years purchaſe, the ſum of the values will be 42; the values of the firſt and ſecond joint lives are 9. 24; of the firſt and third 9. 65; of the ſecond and third 10. 18; the ſum of all which is 29. 06; which being ſubtracted from the ſum of the lives, that is, from 42, the remainder will be 12. 94; to which adding the value of the three joint lives 7. 41, the ſum 20. 35, will be the value of the longeſt of the three joint lives.

IV. To find the preſent value of a remainder in fee, after a life of a given age. That is, ſuppoſing A to be in poſſeſſion of an annuity for his life; and that B after the deceaſe of A, is to have the annuity for him and his heirs for ever, to find the preſent value of the remainder; or, as ſome call it, the reverſion.

From

From the value of the fee fimple or perpetuity, fubtract the value of the *life* in poffeffion; what remains will be the value of the reverfion.

Thus fuppofing that A is 60 years of age; an annuity upon his *life*, intereft at 5 per Cent. would be 8. 39; which being fubtracted from the value of the fee, or perpetuity 20, the remainder will be 11. 61; which is the prefent value of the expectation of B.

By this rule the value of an eftate fubject to a jointure may be determined.

In like manner, fuppofing that C were to have an annuity for him and his heirs for ever, after the *lives* of A and B, then from the perpetuity or fee fimple fubtracting the value of the longeft of the two *lives* A and B, the remainder will exprefs the value of C's expectation.

Thus, fuppofing the ages of A to be 40, and of B to be 50, the value of an annuity upon the longeft of thefe two *lives* would be found by the foregoing rule to be 14. 56: and this being fubtracted from the perpetuity 20, the remainder is 5. 44; which is the value of C's expectation.

V. To find the value of an annuity for *life*, after another annuity for *life*.

Suppofe for inftance, that A is in poffeffion of an annuity for his *life*, and that B, after the *life* of A, is to have the annuity for his *life* only, and that his heir or reprefentative is to have nothing, in cafe A furvives B; what is the value of the *life* of B, after the *life* of A.

From the prefent value of the *life* of B, fubtract the prefent value of the joint *lives* of B and A, and the remainder will be the value of B's expectation.

There are many other ufeful queftions, the determinations of which depend on the values of annuities for *lives*, joint *lives*, and fucceffive *lives*; but it would lead us too far to infert them here: We muft therefore refer the reader to M. De Moivre's annuities on *lives*; efpecially the fourth edition, which is more correct than the former. See alfo the Doctrine of Chances, page 211, 212, &c.

We think it proper to add, that Mr. Kerfeboom's Table of the value of annuities for *life*, does not agree entirely with thofe of M. De Moivre, either at 3, or $3\frac{1}{2}$ per Cent. intereft. But as Mr. Kerfeboom feems to have taken great pains in his obfervations on the probabilities of *life*, it may be worth while here to infert his Table.

Mr. Kerfeboom's table of annuities for *life*.

Let the annuity be 100 guilders a year upon a *life* under a year old.

			Guilds.	
Its prefent value is			1667	that is 6 per Ct.
Upon a *life* of 5 years to 1 inclufive, is			1869	5. 35
	10	6	1835	5. 45
	15	11	1770	5. 65
	20	16	1667	6. 00
	25	21	1587	6. 30
	30	26	1515	6. 60
	35	31	1429	7. 00
	40	36	1334	7. 50
	45	41	1212	8. 25
	50	46	1093	9. 15
	55	51	971	10. 30
	60	56	840	11. 40
	65	61	709	14. 10
	70	66	570	17. 55

See Phil. Tranf. N° 450. Sect. 15.

Monfieur de Parcieux has alfo given us many ufeful obfervations tending to determine the probability of the duration of the *life* of man. See Effai fur les probabilités de la durée de la vie humaine, Paris, 1746. 4to.

According to this gentleman's eftimate, the values of annuities for *life* are higher than thofe of M. De Moivre's Tables. Thus fuppofing intereft at 5 per Cent. Mr. De Parcieux eftimates an annuity for *life* of 100 livres, according to the following table.

Table of the values of an annuity of 100 livres for *life*, according to Monfieur de Parcieux. Intereft at 5 per Cent.

Age	Livres	Age	Livres	Age	Livres
3	1557	14	1602	25	1523
4	1582	15	1594	26	1516
5	1600	16	1586	27	1508
6	1613	17	1578	28	1500
7	1620	18	1571	29	1492
8	1624	19	1565	30	1484
9	1627	20	1558	31	1475
10	1625	21	1551	32	1464
11	1622	22	1544	33	1453
12	1617	23	1537	34	1442
13	1610	24	1530	35	1431
36	1419	56	1022	76	480
37	1407	57	999	77	455
38	1394	58	975	78	431
39	1379	59	950	79	408
40	1362	60	924	80	386
41	1344	61	898	81	365
42	1324	62	871	82	345
43	1304	63	843	83	324
44	1284	64	814	84	301
45	1264	65	784	85	278
46	1243	66	752	86	256
47	1222	67	722	87	234
48	1201	68	693	88	210
49	1180	69	664	89	184
50	1158	70	636	90	158
51	1136	71	610	91	132
52	1114	72	584	92	105
53	1091	73	558	93	71
54	1068	74	532	94	47
55	1045	75	506	95	00

Complement of LIFE, is ufed by Mr. De Moivre, for that time which remains from a given age to the extremity of old age, eftimated by that author at 86 years. Annuit. on Lives, p. 14. Doctrine of Chances, p. 213, feq.

Thus, fuppofing an age of 50, the *Complement of life* will be 36; becaufe this number is the difference between 86 and 50.

Expectation of LIFE, is ufed by Mr. De Moivre, for the time which a perfon of a given age may juftly expect to continue in being, that is when the chance for his living or dying becomes equal.

According to that gentleman's calculation, upon the fuppofition of an equal decrement of *life*, the *Expectation of life* would be expreffed by $\frac{1}{2}n$, if n denotes the complement of *life*. Thus the *expectation of life* for a man of 50 years of age will be, $18 = \frac{36}{2}$: That is, he had an equal chance, or of 1 to 1, of living 18 years. But if that interval be once attained, there arifes a new expectation of $\frac{1}{4}n$; and afterwards of $\frac{1}{8}n$, &c. Annuities p. 65, 66.

Hence he gives the folution of the following problem: To find the *expectation* of two joint *lives*, that is, the time which two *lives* may expect to continue together in being.

For this the rule is, from one half of the fhorteft complement fubtract the fixth part of its fquare, divided by the greateft complement, the remainder will exprefs the number of years fought.

Thus fuppofing a *life* of 40, and another of 50; the fhorteft complement will be 36; the greateft 46; $\frac{1}{2}$ of the fhorteft will be 18; the fquare of 36 is 1296, whereof the fixth part is 216, which being divided by 46, the quotient will be $\frac{216}{46}$ = 4. 69; and this being fubtracted from 18, the remainder 13. 31 will exprefs the number of years due to the two joint *lives*. As to the probability of one *Life*'s furviving others, fee *de Moivre*, Annuit. p. 54. Doct. of Chances, p. 223.

Infurance upon LIVES. The value of infurances upon *Lives* depends upon the probability of the continuance of any propofed *life* or *lives*, during any propofed term. Any queftions of this kind may be determined from Dr. Halley's Table, and from the principles of the Doctrine of Chances. But, as far as we can learn of the practice on fuch occafions, the premiums paid to infurers are generally higher than any computation founded on obfervations concerning the probabilities of human *life*, will warrant. Thus it is not unufual to make a perfon pay 5 per Cent. for the infurance of his *life* for a twelvemonth, that is, in cafe the perfon dies within the year, the infurer is to pay 100 *l.* for every 5 *l.* received. Now it appears from Dr. Halley's Table, which eftimates the probability of *life* low enough, that 5 per Cent. is an adequate value only for a *life* of an advanc'd age, fuch as 64.

LIFE *everlafting*, a name by which the *Elichryfum*, or *Gnaphalium*, of botanical writers, is fometimes called. See the article GNAPHALIUM, *Suppl.*

LIGHT *(Cycl.)* — The motion of *Light* was deduced from the obfervations of an apparent inequality in the times of the eclipfes of the fatellites of Jupiter, by Mr. Romer [a]; but the conclufion was attacked by Monfieur Caffini. Mr. Romer's opinion found an able advocate in Dr. Halley[b]; who removed Caffini's difficulty, and left Mr. Romer's conclufion in its full force. In the year 1707, Monfieur Maraldi endeavour'd to give a new ftrength to Caffini's arguments; but Monfieur Romer's doctrine found a new defender in Mr. Pound[c]. — [[a] See Phil. Tranf. N° 136. Lowthorp's Abridg. Vol. I. p. 409. [b] Phil. Tranf. abr. by Lowth. Vol. I. p. 409, 422. [c] 'sGrav. Phyf. Elem. N° 2636, feqq.]

Mr. Romer's deduction from his theory was, that *Light* fpent about eleven minutes in its paffage from the fun to us; but it hath fince been concluded by others, from the like eclipfes of Jupiter's fatellites, that it is propagated as far in about feven minutes. — [[b] Phil. Tranf. N° 406. *'sGravefande*, Phyf. Elem. N 2638.]

Our excellent aſtronomer, Dr. Bradley, has found nearly the ſame velocity of *Light*, from his accurate obſervations, and moſt ingenious theory, to account for ſome apparent motions in the fixed ſtars. Phil. Tranſ. N° 406. See the article STAR, *Suppl.*

To underſtand this, it muſt be premiſed, that the fixed ſtars are luminous bodies, and at reſt, with reſpect to our planetary ſyſtem, from which they are vaſtly remote. In this ſyſtem alſo the earth is conſidered as one of the planets, and moving about the ſun.

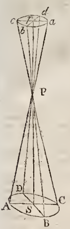


Fig. 1.

Suppoſe the ſun repreſented in S, (Fig. 1.) and that the circle A B C D repreſents the path of the earth, or the ecliptic. At the center S ſuppoſe a perpendicular S P raiſed to the plane of the ecliptic, and that this perpendicular paſſes thro' any fixed ſtar. If a ſpectator were placed in S, he would ſee the ſtar in the ſame perpendicular; but if the ſpectator paſſes over the circle A B C D, the diameter of which is ſuppoſed to bear a ſenſible, tho' ſmall proportion to the diſtance of the ſtar, it will be perceived to change its ſituation in the heavens. For a ſpectator in A would ſee the ſtar in the line A P *a*; in C he would ſee the ſame ſtar in the line C P *c*; and ſo in any other point of his progreſs: Whence it follows, that the ſtar would ſeem to deſcribe a circle in the heavens repreſented by *a b c d*. If the diſtance of the ſtar was ſo very great, that in reſpect of it the diameter of the earth's orbit A C might be eſteemed a point; in this caſe, the foreſaid circle would be entirely inſenſible; all the lines drawn from the points of the orbit to the ſtar might paſs for perpendiculars to the plane of the ecliptic, and in appearance would correſpond to the ſame point in the heavens with the perpendicular in S, in which point the ſtar would always appear, if its light would reach us in an inſtant. But if in this caſe, where the ſtar is ſo remote, the *Light* is ſuppoſed to be propagated from the ſtar with a certain velocity, at the ſame time that the earth proceeds in its orbit, the ſtar will be ſeen in an oblique direction to the plane of the orbit; becauſe of the motion compounded of the motion of *Light*, and that of the ſpectator.

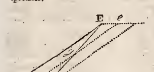


Fig. 2.

Suppoſe the *Light* to move in the line E G (Fig. 2.) making an angle with the line F G, in which the ſpectator is carried along; whom we ſhall conceive placed in F. Let the velocity of the ſpectator be to the velocity of the *Light*, as F G to E G. While the ſpectator moves along F G, the *Light* does the ſame along E G; and the particle of *Light* which is in E, when the ſpectator is in F, enters the eye only when he arrives at G. Now the direction of the *Light*, with reſpect to the eye, makes with the line F G the angle E F G. For if we conceive the line F E drawn, and to be carried with a parallel motion along with the eye, ſo that in reſpect thereof it be at reſt, while this continues moving, the *Light* will reach the eye in the direction of the ſaid line; for when the eye ſhall be in *f*, the middle point between F and G, the transferred line will cut E G in its middle point *g*, to which the particle of *Light* has reached, and which is likewiſe the middle point of the transferred line *f e*. Wherefore the particle of *Light*, which was in E, in the extremity of the line E F, arrives at, and will enter the eye in the direction *e g*.

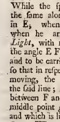


Fig. 3.

Let the angle E G F (Fig. 3.) be a right one, and E G to F G as the velocity of the *Light* to the velocity of the earth in its orbit; then E F G will be the angle, which the ray of *Light* entering the eye, makes with the plane in which the earth moves round the ſun.

If the earth be in B, (Fig. 4.) it moves in the direction of the tangent to its orbit in this point; that is, if we ſuppoſe the ſpectator in the ſun, the direction of the earth's motion is parallel to S C; and making the angle *a* S C equal to the angle E G F, in the former figure, the line S *a* will repreſent the line in which the ſpectator would ſee the ſtar.

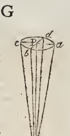


Fig. 4.

In the ſame manner when the earth is in D, the ſpectator in the ſun will ſee the ſtar in S *c*, the angles P S *c* and P S *a* being equal; and this line S *a* or S *c*, by its revolution about P S, would deſcribe a cone, whoſe baſe in the heavens would be a circle repreſenting the apparent path of the ſtar thro' a whole year: Let us ſuppoſe this circle to be *a b c d*, as in the annexed figure.

When the ſtar is not in the perpendicular to the plane of the ecliptic, but the line PS (Fig. 5.) is inclined to that plane, the lines which determine the apparent motion of the ſtar in the heavens, will form cones, as in the caſes already explained; only they would be oblique, and in both caſes the apparent path of the ſtar in the heavens would be determined as above; but in this laſt caſe it would be an ellipſis, the greater diameter of which would be equal to the diameter of the circle *a b c d*, of the former figures; ſo that knowing this ellipſis, the circle might eaſily be found, which the ſtar would deſcribe, if placed in the perpendicular to the plane of the ecliptic.

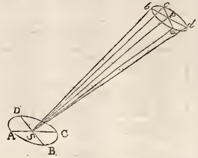


Fig. 5.

The only way to determine, whether the ſtars deſcribe ſuch ellipſes, is by obſervations; in making which there are great difficulties, which however Mr. Bradley has with incomparable induſtry ſurmounted.

Nothing can immediately be determined concerning the foreſaid elliptic motion. The diſtance of the ſtar from the pole of the world muſt be meaſured at different times of the year; and from the different diſtances, the elliptic motion is to be determined by calculation, allowing for the motion of the pole itſelf during the ſpace of time between the obſervations; for the pole moves in a leſſer circle, one degree of which it paſſes over in ſeventy years. Mr. Bradley, making all neceſſary allowances, obſerved ſeveral ſtars at different times of the year, whereby he immediately diſcovered, that their diſtances from the pole of the world varied; and was convinced that this variation could not be attributed to the nutation of the pole; for he examined two ſtars at equal diſtances from the pole, but ſo oppoſite, that the one ought to have receded from the pole as much as the other acceded to it, if the motion was in the pole itſelf. But this did not fall out ſo; for the change of the one ſtar was double of that of the other; a proper allowance being always made for the pole's motion ariſing from above the revolution. However this indefatigable obſerver inferr'd from his obſervations, that the ſtars in certain times receded from, and acceded to, the pole of the world with a motion entirely analogous to that which is performed in an ellipſis; and alſo that they move in ſuch curves, for each of which the motion in the ſame little circle, as *a b c d*, (Fig. 5.) anſwers, when the ſtars are referred to the perpendicular in S to the plane of the ecliptic; and the diameter of this minute circle for them all is 40″ ½.

It is plain from obſervations, to which of the abovementioned cauſes we are to aſcribe the motion of the ſtar. For if the firſt takes place, the ſtar would be carried from *a* to *c*, while the earth paſſed over the part A B C of its orbit; but this being contrary to obſervation, this cannot be the true cauſe. But this change in the ſituation of the ſtar takes place according to the obſervations, while the earth deſcribes the part B C D of its orbit, which is juſt what the ſecond cauſe requires.

If both the cauſes took place at the ſame time, the arc, deſcribed by the earth, would differ from that indicated by either of them; beſides, this concurrence of the cauſes is contrary to the obſervations; unleſs perhaps it may be thought reaſonable to attribute a little influence to the firſt cauſe, but ſo very ſmall a portion, as not to be ſenſibly perceived in the obſervations.

From all which the following concluſions may be deduced: 1. That the ſecond cauſe alone takes place here, viz. That the diſtance of the ſtars is ſo great, that the diameter

ter of the earth's orbit has no fenfible proportion to it. 2. That the angle F E G (Fig. 2.) in the abovementioned triangle, is 20 ″ ¼; and confequently that the ratio of E G to F G, or the velocity of the *Light* to the velocity of the earth in its orbit, as 10210 to 1; whence it follows that the *Light* comes from the fun to us in eight minutes and an half. 3. That the *Light* proceeds with the fame velocity from all the ftars; for all have the fame angle F E G. Whence, (if we fuppofe that all the ftars are not equally diftant from us, as many arguments prove) it will follow, that the motion of *Light*, all the way it paffes through the immenfe fpace, above our atmofphere, is æquable or uniform. 4. Laftly, It muft be confidered, that very fmall differences cannot be perceived; and no body will deny, but that in meafuring a fmall angle, an error of a fecond may be committed, whatever care is ufed to prevent it; and therefore, although we have faid, that the firft caufe is to be rejected, we do not deny that the ftars may poffibly by its influence defcribe a minute circle whofe diameter is 1 ″, or even a little more. *s'Gravefande* Phyf. Elem. Math. L 2. c. 1. p. 709. feq. Hence it appears, that the fucceffive propagation of *Light* will caufe an *aberration* in the appearances of the ftars, planets, and comets. After Mr. Bradley had difcovered this caufe of error in the apparent places of the fixed ftars, Mr. Clairaut [a] and others [b], inveftigated feveral rules for the computation of this aberration. Mr. Euler [c] alfo has lately given us a paper on this fubject. —[[a] Mem. Acad. Scienc. 17. — [b] Mr. Simpfon, in his Effays. — [c] Mem. de L'Academ. de Berlin, Tom. 2. Pp. 141, feq.]

LIGNUM *Vitæ*, the wood of a genus of trees, called by botanifts *Thuya*. See the article THUYA, *Suppl.*

Lignum Vitæ is much valued by turners; making extremely beautiful cups, bowls, boxes, and other curiofities. Ruft. Dict. in voc.

LILLY *(Suppl)*—*Afphodel*-LILLY, *Belladonna* LILLY, *Daffodel*-LILLY, *Guernfey*-LILLY, *Mexican*-LILLY, *Japan*-LILLY, names ufed by different authors for the *Amaryllis*, or *Lillio-Narciffus* of Linnæus and Tournefort. See the article LILIO-NARCISSUS, *Suppl.*

LILLY-*Daffodel*, a name fometimes given to a genus of plants, known among authors by that of *Pancratium*. See the article PANCRATIUM, *Append.*

Day-LILLY, a name fometimes ufed for the *Hemerocallis* of botanifts. See the article HEMEROCALLIS, *Suppl.*

Hyacinth-LILLY, in botany, a name given by fome writers to the *Scilla*, or *Lillio-Hyacinthus*, of botanifts. See the article LILLIO-HYACINTHUS, *Suppl.* and SCILLA, *Append.*

May-LILLY, the name by which fome call the *Convallaria* of Linnæus, a large genus of plants, comprehending the *Lillium-Convallium*, *Polygonatum*, &c. of other writers. See the article CONVALLARIA, *Append.*

Perfian-LILLY, a name fometimes given to the *Fritillaria*, a diftinct genus of plants. See the article FRITILLARIA, *Suppl.*

Superb-LILLY, the Englifh name of a diftinct genus of plants, called by Linnæus *Gloriofa*. See the article GLORIOSA, *Append.*

Water-LILLY, *Nymphæa*, in botany, the name of a genus of plants. See the article NYMPHÆA, *Suppl.*

LIMAX, in the hiftory of infects, the name of a genus of thefe animals, comprehending all the naked fnails, See the article SNAIL, *Suppl.*

The body of the *Limax* is of a figure approaching to cylindric, and is perforated at the fide; the tentacula are four in number, and two of them have the appearance of eyes.

Of this genus authors enumerate the following fpecies: 1. The black naked *Snail*. 2. The red naked *Snail*. 3. The yellow one, called the *Amber Snail*, variegated with fpots of a greyifh colour. 4. The very large grey *Limax*, fpotted with a dufky-brown. 5. The little fhort and thick grey *Limax*, without fpots. 6. The fmooth-bodied, reddifh-brown *Limax*. 7. The fmall dufky-brown, furrow'd *Limax*. 8. The deep chocolate-coloured *Limax*. *Hill*, Hift. Anim. p. 87.

LIME *(Cycl.)* — LIME-*water*. It appears now from the ingenious Dr. Alfton's experiments, that one part of quick *Lime* is fufficient for five or fix hundred parts of water. Water will diffolve but a certain portion of quick *Lime*; and how much that is cannot be eafily afcertained. So far feems certain from Dr. Alfton's experiments, that one pound of quick *Lime* is fufficient for making fix hundred pounds of good *Lime* water; and that thofe who with Charas have fuppofed, that the fecond and third *Lime-water* is weaker than the firft, have been led into error by the fmall quantity of water they ufed. And it has been generally believed, that in order to obtain good *Lime-water*, the quick *Lime* muft not only be recent, and fully calcined, but alfo for one part of quick *Lime* only eight, ten, or at moft twelve parts of water taken; as if it could impregnate no more. But the Doctor fays he has found by many experiments, that it is altogether indifferent whether the water be hot or cold, poured on gradually, or at once, the water poured on the *Lime*, or the *Lime* thrown into the water; whether the quick *Lime* be in fhells, or flaked; or even expofed to the air for feveral months, for fuch quantities of the water as are commonly ufed; and if the quick *Lime* be frefh, whether for one pound of it, eight, ten, twenty, fifty, or five hundred pounds of water be taken. Only it is neceffary, even for the firft water after the ebullition is over, to ftir and mix the *Lime* with the water, and allow it time to impregnate itfelf; which is beft known by the cruft formed on its furface. Filtration indeed is not neceffary, if it be not to prevent any undiffolved *Lime* being mixed with it; or crufts diminifhing its tranfparency.

The Doctor, for his own ufe, poured about eight pounds of boiling water upon a pound of ftone quick *Lime* in a glazed earthen veffel. He drank about a pint and an half of this *Lime-water*, daily for about fixteen months; filling up the veffel, when neceffary, with frefh water, fometimes hot, and fometimes cold, without obferving any difference in the *Lime-water*, which he conftantly filter'd through grey paper, before he drank it. He obferved, that the *Lime* was not exhaufted after two years and two months, nor was the water fenfibly weaker, when it ftood a fufficient time on the *Lime*, which he knew by the crufts that were formed. But the *Lime* becoming confiderably lighter, after it is long thus ufed, it at length requires feveral days to fubfide, and form the crufts, and after the crufts are formed, it does not leave half the water clear, as it did at firft. On the whole, this fingle pound of *Lime* afforded the Doctor about fix hundred pounds of *Lime-water*. He adds, that having taken *Lime-water* made indifferently of Lime-ftone, or of Chalk, or of Shells, and fometimes made of all the three together, he was never able to difcover any difference in their effects. But fo much *Lime-water* is not to be obtained from quick-lime, unlefs it be frefh, completely calcined, and free from heterogeneous fubftances; for if defective in any of thefe, it will yield proportionably lefs *Lime-water*.

Lime-water, which was long looked on as a cauftic, was, in the laft century, found to be a very fafe and valuable remedy. It is uncertain who firft ventured to give it inwardly; but Willis, Bates, and Moreton feem to have ufed it much.

Lime-water kills worms, and many other, if not all, infects; hence Dr. Alfton concludes it might prove a good anthelmintic for children, and experience has confirmed this notion.

It is probable, that *Lime-water* may be of great ufe in long fea voyages, in preventing the corruption of water, or infects breeding in it, as well as curing the difeafes to which feafaring people are moft fubject. The experiment is certainly fafe, eafy, and attended with no expence; one pound of frefh well-burnt quick-lime of any kind, being enough for a hogfhead of water, which may not only be ufed for common drink by the difeafed, or for prevention by the healthy; but alfo by boiling and expofing it to the air for a fhort time, it may be reduced to fweet water, and ufed in dreffing the victuals of the moft delicate.

The virtues of *Lime-water* do not depend on its abforbency; and it may as juftly be called antalcaline, as antacid.

Lime-water prevents or long protracts the putrefaction of animal fubftances. Dr. Alfton alfo thinks that quick-lime in a fhip's well, would effectually prevent the corruption of the water, and confequently the putrid fteams, or foul air thence arifing, which fometimes prove fatal to the crew.

The virtues of *Lime-water* outwardly applied in many difeafes of the fkin, in excoriations, ulcers, gangrenes, &c. are well known. Perhaps there is not a better gargarifm for feveral forts of fores in the mouth and throat, than *Lime-water*. It has alfo been known to be of great ufe in the tooth-ach. Inwardly taken, *Lime-water* has all the virtues of the pure element, which are not a few; and on which probably depend the good effects of mineral waters, more than on the minerals they contain. Dr. Alfton never found it caufed thirft; on the contrary, he found it quenched thirft, as well as fimple-water, and cuftom rendered it agreeable. *Lime-water* is notably detergent and attenuating, even more fo than foap itfelf, of mucous, vifcid, and other animal fordes, which makes it preferable, in many cafes, to the pureft, as well as to mineral waters. In a word, *Lime-water* may be faid, in general, to purify the blood, with as good reafon, as any one medicine whatever, efpecially from any putrid, purulent, or fcorbutic foulnefs.

That *Lime-water* is lithontriptic has been fhewn fufficiently by Dr. Hales, and more fully by Dr. Whytt; and this has been further confirmed by Dr. Alfton, who has fhewn the efficacy of *Lime-water* in this refpect, not only when made by the firft infufion, and affifted by artificial heat; but even after fifty or more infufions, and in the common air. The Doctor thinks that the energy of *Lime-water* in this cafe probably confifts in its penetrating detergency, whereby infinuating itfelf among the folid parts of the calculi, or into their pores, it feparates them, or diminifhes their cohefion, but does not diffolve them.

Since there is but a fmall proportion of *Lime* in the water, it may be thought that taking a few grains of the quick-lime in fubftance would prove much more effectual in the Stone, than large quantities of *Lime-water*. But this is a miftake; and hence Mrs. Stephens's egg-fhells and fnail-fhells, if burnt to quick-lime, can never be equally fuccefsful with *Lime-water* for the Stone.

As for the *aquæ benedictæ compofitæ*, or *compound Lime-waters*, they are not to be compared with fimple *Lime-water* in the gravel; nor, in Dr. Alfton's opinion, in any difeafe requiring this water.

The Doctor adds, in his Appendix, that though he cannot yet determine how far *Lime-water* may be proper, even in acut

acute diftempers, yet he has found it fafe in feverifh colds; and by the cafes he there mentions, it feems probable that *Lime-water*, by its diluent, and diuretic qualities, may prove more ufeful in fevers, than is at prefent believed.

However, this may prove on farther trials, it may be faid, in general, that *Lime-water* is diluent, detergent, antifceptic, anthelmintic, diuretic, and vulnerary; ufeful in all difeafes proceeding from, or accompanied with obftructions in the bowels or glands, vifcid phlegm, calculous concretions, or putrefaction; and commended for the fcurvy, fcrophulæ, gravel, confumption, empyema, afthma, arthritis vaga, œdematous fwellings, diabetes, fluor albus, fluxes, &c. and outwardly for difeafes of the fkin, ulcers, gangrenes, &c. It may be taken to the quantity of a pound, once, twice, or thrice a day; or ufed for common drink. See Dr. Alfton's Differtation on quick-lime, and *Lime water*, Edinb. 1752.

The ingenious and learned Dr. Whytt of Edinburgh, has greatly recommended *Lime-water*, in the ftone and gravel. See his effay on the virtues of *Lime-water*, in the cure of the ftone. This gentleman prefers oyfter-fhell *Lime-water* to any other for thofe diftempers. Dr. Alfton feems to think this a matter of indifference, and was himfelf cured chiefly by the ftone quick-lime water before-mentioned.

LIMER, or LIME-*Hound*, names fometimes ufed for the blood-hound. See the article HOUND, *Suppl.*

LIMITED, adjunct. See the article ADJUNCT, *Cycl.*

LIMITS (*Suppl.*) — We may add to what is faid under this head in the *Supplement*, that there being two cafes of variable quantities and ratio's tending to a *Limit*, it might have conduced to perfpicuity, and prevented difputes, to have diftinguifhed thefe different *Limits* by fome addition. As in the firft cafe, to have called it a *Limit* or ultimate ratio *inclufive*; becaufe the *Limit* is the laft of the quantities or ratio's limited: And in the fecond, to have called it a *Limit* or ultimate ratio *exclufive*; becaufe the quantities limited never attain to the *Limit*, tho' they approach to it indefinitely.

This diftinction may perhaps receive fome farther illuftration from the following example. It is known that the ofculatory circle is a circle that touches a curve fo clofely that no other circle can be drawn through the point of contact between them, all other circles paffing within or without them both; and hence the ofculatory circle is fuppofed to have an equal curvature with the curve at that point. See Mr. *Mac Laurin*'s flux. art. 364.

Now if we conceive the ofculatory circle at the end of the great axis of an ellipfis, it will fall entirely within the ellipfis; and the curvatures of the ellipfis and ofculatory circle may both be faid to be *limits* of the curvatures of all the circles falling wholly within, and touching the ellipfis at the end of its great axis. But the term *Limit* will not in both cafes have precifely the fame meaning; for the ofculatory circle is a *Limit inclufive*, being the laft of the circles limited; and the ellipfis is a *Limit exclufive*, none of the circles limited ever coinciding with it. As to the circles which fall wholly without the ellipfis, and touch it at the end of its great axis, they have no *Limit inclufive*, no circle touching the ellipfis fo clofely, that no other can pafs between; the only *Limit* here is *exclufive*, the ellipfis itfelf.

The contrary of this happens at the endo f the leer axis. At any other point of the ellipfis one half of every ofculatory circle is a *Limit inclufive* of the femicircles that fall within, and the other half is a *Limit inclufive* of thofe that fall without.

May we not afk, if a curve is the *Limit* of its infcribed or circumfcribed polygons in any other fenfe, than the curvature of the illipfis is the *Limit* of the curvatures of the circles before defcribed, which approach nearer and nearer to the curve, but never coincide with it? It is true we hear it often faid, that the ofculatory circle is æquicurval, and fo coincides with the ellipfis; but this feems a confequence of the language of infinitefimals. It would be more accurate to fay, that the curvature of the ellipfis is the *Limit exclufive* of all the before mentioned circles, and that the ofculatory circle is their *Limit inclufive*. That excellent geometer, Mr. Simfon, in his Conic Sections, Lib. v. Prop. 36. Cor. fays only, after demonftrating the chief property of the ofculatory circle, that *eandem habere cum fectione conica curvaturam dicitur*, giving this only as an appellation, but not as a propofition.

LIMNOPEUCE, in botany, the name by which Vaillant calls the *Hippuris* of Linnæus. See the article HIPPURIS, *Suppl.*

LINE (*Cycl*) — *Algebraic* LINES are divided into different orders, according to the degree of their equations. Thefe degrees are eftimated, as in determined equations, by the degree of the higheft term of the equation.

Thus $a + by + cx = 0$ is a general equation, expreffing the nature of *Lines* of the firft order, or of ftrait *Lines*.

The equation $a + by + cx + dyy + exy + fxx = 0$ reprefents the *lines* of the fecond order; that is, the conic fections, and the circle, which is one of them.

And the equation $a + by + cx + dyy + exy + fxx + gy^3 + bxyy + ix^2y + lx^3 = 0$, expreffes in general the *lines* of the third order. And the *Lines* of the fourth and higher orders may be expreffed in the like manner. See *Cramer*, Introd. a l'analyfe des lignes courbes. p. 52, feq.

Mr. Cramer ufes the terms, *Line* of the fecond, third, fourth, &c. order, and *Curve* of the fecond, third, fourth, &c. order, indifferently. Sir Ifaac Newton has made a diftinction: according to him,

LINE *of the third order* is the fame as CURVE *of the fecond kind*; becaufe a *Line* of the firft order, cannot, ftrictly fpeaking, be called a Curve.

Lines of the third order may be cut by a right line in three points, and by a circle in fix points.

We have a fhort treatife by Sir Ifaac Newton upon the *Lines* of the third order, entitled, *Enumeratio linearum tertii ordinis*, which was firft printed at the end of Dr. Clarke's latin tranflation of Sir Ifaac's Optics; and fince publifhed more correctly by the late Mr. Jones in 1711, with the treatife of quadratures, and other tracts of its illuftrious author.

This enumeration is fo concife, as to need a comment. Mr. Stirling gave one in 1717; but this comment is too difficult for beginners. Mr. Cramer has lately explained this fubject very fully, in his *Introduction a l'analyfe des lignes courbes algebriques*, printed at Geneva 1750, 4to, to which the curious may have recourfe; as alfo to the Appendix to Mr. Mac Laurin's Algebra, entitled, De linearum geometricarum proprietatibus generalibus; and to Mr. *Euler*'s Analyfis infinitorum, Vol. II.

An algebraic *Line* of the order m can cut another algebraic *Line* of the order n, in the number of points expreffed by mn, but not in more. Thus if $m = 1$ and $n = 2$, the *lines* of thofe orders can interfect each other in two points only; and if $m = 2$ and $n = 2$, then may they interfect each other in four points, as is well known; fince a ftrait *Line* cannot interfect a conic fection in more than two points; nor can one conic fection interfect another in more than four points. In like manner if $m = 5$ and $n = 4$, then may the *lines* of thefe orders interfect each other in 20 points; but not in more. See *Cramer*, Anal des lignes courbes, p. 75, 76.

The number of the fpecies of the *Lines* of the third order amount to 78. See Mr. *Murdoch*'s Genefis Curvarum per Umbras. Sir Ifaac reckoned only 72 fpecies of the third order; but Mr. Stirling and Mr. Stone have fhewn his enumeration to be imperfect; and Mr. Murdoch has fince found fome new fpecies.

LION. The *Lion* is comprehended among the *felis*, or catkind of animals. See the article FELIS, *Append.*

LION's *leaf*, the Englifh name of a genus of plants, defcribed by Tournefort under that of *Leontopetalon*. See the article LEONTOPETALON, *Suppl.*

LION's *foot*, the Englifh name of a diftinct genus of plants, called by botanifts *Catanance*. See the article CATANANCE, *Suppl.*

LIQUID *Amber*, in botany, the name of a diftinct genus of plants, called by botanifts *Anthofpermum*, and *Tournefortia*. See the articles ANTHOSPERMUM, *Append.* and TOURNEFORTIA, *Suppl.*

LIQUORICE (*Suppl.*)—*Vetch*-LIQUORICE, the Englifh name of a genus of plants, called by botanifts *Orobus*. See the article OROBUS, *Suppl.*

Wild LIQUORICE, the name of a diftinct genus of plants, called by authors *Aftragalus*. See the article ASTRAGALUS, *Suppl.*

LIQUORS, fermented. See the article FERMENTED *liquors*, *Suppl.* and *Append.*

LIST, in the fea-language, the fame with *luft*. See the article LUST, *Suppl.*

LITHONTRIPTIC (*Suppl.*) — The reward which the parliament of England gave to Mrs. Stephens, the inventrefs of fome medicines, which were faid to be a perfect and certain cure for the *Stone*, made the generality of the world believe, that they were really as efficacious as they were pretended to be; but it appeared, on examination, that the opinion of a cure in the very inftances on the fuccefs of which the reward was given, was erroneous; and that the *Stones* had all the time remained in the bladders of the patients, tho' fuppofed to have been voided, after being diffolved and wafhed away by the medicines.

The principal inftance of a fuppofed cure was Mr. Gardiner. This man was in December 1748, examined by able furgeons, and found to have a ftone in his bladder; after this he took Mrs. Stephens's medicines for eight months without intermiffion; and at the end of that time he declared himfelf free from all his ufual complaints; and on fearching him, there could no ftone be found in the bladder. Mr. Gardiner died about three years afterwards, and his body was opened. When the bladder was examined, there were found in it fix preternatural apertures of different fizes; but the biggeft capable of admitting the end of a finger. Each of thefe apertures led to a feparate bag form'd by an enlargement of the internal membrane of the bladder, protruded between the fibres of its mufcular coat. Thefe bags were eafily feen on the back part of the bladder a little above the veficulæ feminales, and when viewed on the outfide, they feemed to be but two, tho' in reality equal in number to the openings within, and divided from one another by the duplicature of the internal membrane, which form'd a feptum between each of them. Philof. Tranf. N° 462. p. 12.

As to Mrs. Stephens's medicine, it is a compofition of foap, and lime made of different fhells, which every body knows

knows to be highly cauſtic; and is therefore condemned by Dr. Mead; ſince its corroſive quality muſt be injurious to the bladder. However, under proper management, he thinks it may be of ſome ſervice in expelling gravel by the urinary paſſages; tho' it will never be able to break calculi of the hardneſs of ſtone: And beſides, its long continued uſe muſt be attended with great danger, for the reaſons above given. And as for its ſubſtitute, the ſoap-lees, though it be a medicine of a more commodious form for taking, yet it will not prove much ſafer in its conſequences, for the ſame reaſons. *Mead*, Monit. and Pract. Medic. pag. 199, ſeq.

Dr. Whytt of Edinburgh, after conſidering the inconveniencies, and ſometimes the miſchiefs alſo, of this celebrated ſpecific, reſolved to omit the ſoap, and try what virtues lime-water might have in diſſolving the calculus. See the article LIME-*water*, *Append.*

His firſt experiments were made on ſeveral fragments of calculi, with lime-water, from common quick-lime; and afterwards reſolving to try the power of animal lime, he repeated them with lime-water made with oyſter-ſhells and cockle-ſhells, well calcined, by pouring ſeven or eight pints of water on one pound of the freſh-calcined ſhells. The experiments ſucceeded with both ſorts; but he ſoon found, that the oyſter and cockle-ſhell lime-water poſſeſſed a much greater power of diſſolving the calculus, than that of the ſtone-lime.

He therefore propoſes the drinking of ſhell-lime-water to the quantity of four pints, every day, for adults; and for children leſs in proportion: And he concludes with inſtances of the happy effects of this method. However, as ſtones of great hardneſs can never be diſſolved by any medicine whatſoever, Dr. Mead recommends, in theſe caſes, a new method of cutting for the Stone. Id. ibid. See the article LITHOTOMY, *Append.*

Dr. Hartley has publiſhed, in the London Gazette, the following receipt for making a *lithontriptic* electuary. Take five pounds of Alicant ſoap, ſhaved, and one pound of oyſter-ſhell lime; put them into a tin veſſel, and pour upon them five quarts of water; make the water boil, till the ſoap be perfectly diſſolved in it, and then ſtrain all into a glazed earthen veſſel. Expoſe this maſs to the air, ſtirring it every day, till it becomes both mild to the taſte, and of a proper conſiſtence to be formed into pills, or long pellets, without ſticking to the fingers. This may be expected to happen in two or three months. If it becomes ſufficiently mild before it has acquired a due conſiſtence, it may be brought to this, by being heated over the fire, in a tin veſſel: If it acquires a too hard conſiſtence, before it is ſufficiently mild, it muſt be ſoftened with water. This is what the Doctor calls the *lithontriptic* maſs or electuary; which he orders to be made in a tin veſſel, becauſe a braſs or copper one would make it emetic.

He gives another more expeditious way of making it, which is this: Pour two gallons of water upon a pound of oyſter-ſhell lime; ſtir it two or three times, and when it has fallen to the bottom, pour off the clear part of the water. Repeat this fifteen or twenty times, or till the clear water, which is poured off, be almoſt taſteleſs; leaving about five pints of water upon the lime, after the laſt ablution. Then pour this mixture of water and dulcified lime upon five pounds of Alicant-ſoap, ſhaved; and proceed as directed in the firſt receipt. The maſs, prepared in this manner, will be fit for uſe in a few days, or even immediately; but then the Doctor prefers the foregoing receipt, where time can be allowed for it.

If the maſs of ſoap and oyſter-ſhell lime, dulcified in either of the above-mentioned ways, be made of the conſiſtence of an electuary, it is then called the *lithontriptic* electuary; which for cure is more convenient than the maſs, for thoſe who deſire to take the medicine diſſolved in a liquid vehicle, as milk, water ſweetened with honey or ſugar, water flavoured with brandy or rum, and ſmall beer.

Where a perſon is ſuppoſed to have a large Stone in the kidneys or bladder, he ought to take every day as much of the maſs, or electuary, as contains two ounces of the ſoap, unleſs his pain and provocation to make water be violent; in which caſe it will be proper to begin with about half this quantity, and to increaſe it as he can bear. The medicine ought alſo, in this caſe, to be dulcified, in an extraordinary degree.

By this medicine, the Doctor thinks the generation of gravel, and gravel-ſtones, may be entirely prevented. See the article STONE, *Append.*

It is likewiſe recommended in diſorders of the ſtomach and bowels, ariſing from, or attended with acidities there; and in gouty habits. The patient may, in many of theſe caſes, begin with ſuch a quantity every day, as contains an ounce of ſoap, and afterwards increaſe or leſſen this quantity, as he finds occaſion.

LITHOTOMY (*Cycl.*) — We have an hiſtory of the lateral operation for the ſtone by Monſ. Morand, who argues, that the methods of Celſus, Frere Jacques, Rau, and Cheſelden, are in the main the ſame. See Mem. de L'Acad. des Sciences, 1731.

APPEND.

Mr. Cheſelden's method is deſcribed in his anatomy, Chap. VI. of the fifth edition This method of cutting for the ſtone is much recommended by Dr. Mead; who aſſures us, that now not only children and youths, but alſo perſons advanced in years, may ſubmit to this operation, without great danger; and in caſe the ſtone prove too big to be extracted without tearing the neck of the bladder, it is now no longer neceſſary to ſplit the ſtone, before the extraction; the invention of which is aſcribed to Ammonius, a Greek phyſician, who from thence was furnamed λιθοτόμος, the lithotomiſt. *Mead*, Monit. and Pract. Med. p. 203.

Mr. Houſtet has collected a great many inſtances of ſtones lodged in facs formed in the bladder, from which it was impoſſible to extract them, without tearing the bladder, or cutting on one ſide of the fac, which Mr. Garengeot did once with ſucceſs. In ſome of the caſes which he mentions, the veſſels of the bladder were in appearance grown into the ſtone, and the extraction of the ſtone was attended with a mortal hæmorrhage. See Mem. de L'Acad. de Chirurg. Tom. I.

The diſtenſion of the bladder with a liquor in performing the high operation for the Stone, is attended with difficulties, eſpecially in women. Dr. Kulm has therefore contrived an elevatory catheter for that ſex. The bending of the inſtrument is fitted to the turn of the os pubis, and its great curve, inſtead of being only furrowed, is pierced quite through. He introduces this, with its convexity to one ſide, then gently raiſes it to the hypogaſtrium, and cuts ſecurely upon it. See Nov. Act. Erudit. Lipſ. Mart. 1732.

LITHOZUGIA, in natural hiſtory, the name of a genus of foſſils, of the claſs of the *Scrupi*, compoſed of a cryſtalline matter a little debaſed, and containing within them various extraneous bodies, as pebbles. &c. See the article SCRUPI, *Append.*

Dr. Woodward has ranked this genus among the pebbles, becauſe of the pebbles they contain; which is by no means a ſufficient reaſon for confounding two ſuch different foſſils; the *Lithozugia* approaching to the nature of flint.

Mercatus and other naturaliſts have called the *Lithozugia oculati lapides*; and among Engliſh lapidaries they are known by the name of *Pudding-ſtones*. See the article OCULATUS *Lapis*, *Suppl.*

Of this genus we have the following ſpecies, 1. The yellowiſh-white *Lithozugium*, filled with pebbles. 2. The greeniſh-white *Lithozugium*, filled with pebbles. 3. The red *Lithozugium*, filled with pebbles. Vid. *Hill*, Hiſt. Foſſ. p. 557—559.

Beſides theſe, there are other *Lithozugia* of a coarſer texture, approaching to the nature of quarry-ſtone; of theſe we have the following ſpecies: 1. The fleſh-coloured *Lithozugium*, filled with reddiſh, impure, cryſtalline nodules. 2. The bluiſh and glittering *Lithozugium*, filled with white, impure, cryſtalline nodules. 3. The whitiſh-green elegant *Lithozugium*, filled with cryſtalline nodules: And, 4. The friable, pale-red *Lithozugium*, variegated with white veins, and red nodules. *Hill*, Hiſt. Foſſ. p. 560—562.

LIVE *ever*, a name ſometimes given to the *anacampſeros*, or orpin, a diſtinct genus of plants. See the article ANACAMPSEROS, *Suppl.*

LIVE *in idleneſs*, a name ſometimes uſed for the violet. See the article VIOLA, *Suppl.*

LIVER (*Suppl.*) — *Infarction of the* LIVER. See the article HEPATIS *Infarctus*, *Suppl.*

LIZARD's *tail*, the Engliſh name of a genus of plants, deſcribed by Linnæus under that of *Saururus*. See the article SAURURUS, *Suppl.*

LOCKER-*gowlans*, a name by which ſome call a ſpecies of Hellebore. See the article HELLEBORUS, *Suppl.*

LOCUST, or *St.* JOHN's *bread*, in botany, names uſed by ſome for the *Ceratonia*, or *Siliqua*, of botaniſts, See the article SILIQUA, *Suppl.*

Baſtard LOCUST, a name ſometimes uſed for a diſtinct genus of plants, called by botaniſts *Courbaril*, or *Hymenæa*. See the article HYMENÆA, *Suppl.*

LOCUST *of Virginia*, a name by which a ſpecies of *acacia* is ſometimes called. See the article ACACIA, *Suppl.*

LOCUST-*tree*, in botany, a name given by the people of the Weſt-Indies to a ſpecies of *Acacia*. See the article ACACIA, *Suppl.*

LOGARITHM (*Suppl.*) — In the common tables of *Logarithms* we find the *Logarithm* correſponding to any given number within the limits of the table, by inſpection; but it is of uſe alſo to have a table wherein the *Logarithms* are placed in their natural order, from 0 to 100,000 for inſtance, and with the correſponding natural numbers; ſo that a *Logarithm* being given, we may find the correſponding number by inſpection only, which can ſeldom be done by the common tables; nor can the correſponding number to a *Logarithm* not in the table be found without ſome trouble.

A table of this ſort is called by Dr. Wallis an *anti-logarithmic canon*; and by this canon a *Logarithm* being given, its number may be found with the ſame facility that a *Logarithm* of a given number may be found by the common canon.

Dr.

Dr. Wallis tells us, that a canon of this kind was formed many years ago. It was begun, perhaps, by Harriot, and it was finifhed at leaft, and prepared for the prefs, if not begun, by Warner. This canon feems to have been loft; but the lofs has been fupplied by Mr. Dodfon. See the *Anti-logarithmic canon* by James Dodfon, Lond. 1742. fol. where the author alfo fhews the conftruction and ufe of his table at large.

Imaginary LOGARITHM is ufed for the *logarithm* of negative and imaginary quantities [a], fuch as $a-\sqrt{-a}$, &c. Thus alfo the fluents of certain imaginary fluxionary expreffions, fuch as $\frac{\dot{x}}{x\sqrt{-1}}$, $\frac{a\dot{x}}{2bx\sqrt{-1}}$, &c. are *imaginary logarithms*.

[a] *Euler*, Analyf. infin. Vol. 1. pag. 72, 74.]

The expreffion $\frac{\dot{x}}{x}$ reprefents the fluxion of the *Logarithm* of x, and the fluent therefore of $\frac{\dot{x}}{x}$ is the *Logarithm* of x; but no *Logarithm* can reprefent the fluent of $\frac{\dot{x}}{x\sqrt{-1}}$, which is therefore called an *imaginary Logarithm*.

However, when thefe *imaginary Logarithms* occur in the folutions of problems, they may be transformed into circular arcs or fectors; that is, the imaginary *Logarithm*, or imaginary hyperbolic fector becomes a real circular fector. See *Bernoulli*, Oper. Tom. I. p. 400. and p. 512. *Mac Laurin's* Fluxions, Art. 762, feq. *Walmefley*, Anal. des mef. p. 63.

LOGARITHMIC. This head is referred to in the *Append.* from the article CURVE, in the *Suppl.* by miftake. But fee the article LOGARITHMIC, *Suppl.*

LOGGERHEAT, in the fea-language, denotes a large round ball of iron, with a long handle, for heating pitch. *Blanckley's* Nav. Expof. p. 100.

LOGWOOD, the wood of a genus of plants, called by Linnæus *Hæmatoxylum*. See the article HÆMATOXYLUM, *Suppl.*

LONDON *pride*, a name ufed among Gardeners for the *geum*, a diftinct genus of plants. See the article GEUM, *Suppl.*

LONICERA, *(Suppl.)* in the Linnæan fyftem of botany, the name of a large genus of plants, comprehending, according to that author, the *Caprifolium*, *Periclimenum*, *Chamæcerafus* and *Xylofteum* of Tournefort, and other botanifts; together with the *Triofteofpermum* and *Symphoricarpos* of Dillenius. See the articles CAPRIFOLIUM, &c. *Suppl.*

The characters are thefe. The cup is a fmall perianthium, placed on the germen, and divided into five fegments. The flower confifts of a fingle petal, the tube is oblong, and gibbofe downwards, the limb is divided into five fegments, one of which is more deeply ferrated than the reft, and all turn backward. The ftamina are five fubulated filaments, nearly of the length of the flower; the antheræ are oblong, the germen is roundifh, and placed under the receptacle, the ftyle is filiform, and of the length of the flower, the ftigma is obtufely capitated. The fruit is a roundifh, umbilicated berry, containing two cells; the feeds are roundifh and compreffed.

As they all agree in thefe general characters, they are to be accounted only one genus. *Linnæi* Gen. Plant. p. 75.

LOOKING *Glafs(Suppl.)*—*Venus's* LOOKING *glafs*, in botany, a name by which fome call the *Campanula*. See the article CAMPANULA, *Suppl.*

LOOSE *ftrife*, a name fometimes given to the *Lyfimachia*, or willow-herb of botanifts. See the article LYSIMACHIA, *Suppl.*

Podded LOOSE *ftrife*, the name of a genus of plants, called by botanifts *Epilobium*, or *Chamænerium*. See the article CHAMÆNERIUM, *Suppl.*

Spiked LOOSE *ftrife*, the name of a genus of plants, called by botanifts *Salicaria*. See the article SALICARIA, *Suppl.*

LORANTHUS, in the Linnæan fyftem of botany, the name of a genus of plants, called by others *Lonicera*. See the article LONICERA, *Suppl.*

LORD *in grofs*, he who is *Lord*, not by reafon of any manor, as the king in refpect of his crown, &c. *Terms of law*, *Blount*, *Cowel*.

LOTE-*tree*, in botany, the name of a genus of plants, called by authors *Celtis*. See the article CELTIS, *Suppl.*

LOTUS *Africanus*, in botany, a name by which fome call the *Guaiacana* of Tournefort. See the article GUAIACANA, *Suppl.*

Bladder LOTUS, a name fometimes given to a fpecies of *Vulneraria*. See the article VULNERARIA, *Suppl.*

LOVE-*grafs*, in botany. See the article GRASS, *Append.*

LOVE *in a mift*, a name ufed among gardeners for the *Granadilla*, or paffion-flower. See the article GRANADILLA, *Suppl.*

LOVE *lies a-bleeding*, a popular name for the *Amaranth*. See the article AMARANTH, *Suppl.*

LOUSE*(Suppl.)* — *Tree*-LOUSE, a genus of infects, called by zoologifts *Aphis*. See the article APHIS, *Append.*

LOUSE-*wort*, a name ufed by fome for the *Delphinium* of botannical writers. See the article DELPHINIUM, *Suppl.*

LOUSE-*wort* is alfo the Englifh name of a genus of plants, called by botanifts *Pedicularis*. See the article PEDICULARIS, *Suppl.*

LOWINGS, in falconry. See the article LUNES, *Append.*

LUMBRICUS, in zoology, the name of a genus of infects, called in Englifh earth-worms. See the articles WORM and EARTH-*worms*, *Suppl.*

The *Lumbricus* is an infect of the larger kind, of an oblong form, confiderably thick rounded in fhape, and covered with a foft and flender fkin, marked with annular ridges, and furrows. When full grown, it is often ten inches, or more, in length, and more than a third of an inch in diameter. Its colour is a dufky red.

It is common every where, at little depths, under the furface of the earth; it is not unfrequently alfo met with in the human inteftines, as well as in thofe of other animals, in which ftate it has been fuppofed a different creature, and called by a new name.

Befides the common earth-worm, there is found another fpecies of *Lumbricus* in the mud about the Sea-fhores, very large, growing very often to a foot or more in length; it entirely refembles the other, only that it is of a paler red, and has its fkin covered with little prominences, which makes it rough or fcabrous to the touch. Vid. *Hill*, Hift. Anim. p. 15.

LUNES, or LOWINGS, in falconry, leafhes, or long lines to call in hawks. Ruft. Dict. in voc.

LUNGS *(Suppl.)* — *Sea*-LUNGS, the Englifh name of the *Medufa*, a genus of infects. See the article MEDUSA, *Append.*

Ships-LUNGS, a name given to the ventilators of fhips. See the article VENTILATOR, *Append.*

LUNG-*wort (Suppl.)*— *Cow's* LUNG-*wort*, a name fometimes given to the *Verbafcum*, or Mullein. See the article VERBASCUM, *Suppl.*

LURCHER, among fportfmen, a kind of hunting dog, like a mongrel greyhound, with pricked ears, a fhaggy coat, and generally of a yellowifh-white colour. Ruft. Dict. in voc.

LUST-*wort*, a name by which fome call *Ros folis*, a diftinct genus of plants. See the article ROS *folis*, *Suppl.*

LYCIUM, *Avignon-berry*, *Avignon-thorn*, or *box-thorn*, in botany, the name of a genus of plants, the characters of which are thefe: The cup is a fmall, erect, obtufe, permanent perianthium, divided into five fegments; the flower confifts of a fingle infundibuliform petal; the tube is cylindric, patent and crooked; the limb is fmall, divided into five fegments, obtufe and patulous; the ftamina are five fubulated filaments, growing out of the tube of the flower; they are fhorter than it, and inclinated; the antheræ are erect; the germen of the piftil is roundifh; the ftyle is fimple, and longer than the ftamina; the ftigma is bifid and thick; the fruit is a roundifh berry, containing two cells; the feeds are numerous, and kidney-fhaped; and the receptacles are convex. Vid. *Linnæi* Gen. Plant. p. 81.

This genus comprehends likewife the *Jafminoides* of other authors.

LYCOCTONUM. See the article ACONITE, *Cycl.*

LYING *under the fea*, is when, in a ftorm, the fhip is a-hull, and the helm fo faftened a-lee, that the fea breaks upon her bow, or broadfide. *Blanckley*, Nav. Expof. p. 102.

LYNCHET, among farmers, a line of green fward, ferving as a boundary to feparate plowed land, in common fields. Ruft. Dict. in voc.

LYSIMACHIA *filiquofa*, the name by which fome call the *Chamænerium* of Tournefort. See the article CHAMÆNERIUM, *Suppl.*

M.

MACAO, in zoology, the name of a fpecies of parrot. See the article MACAW, *Suppl.*

MACAW, (*Suppl.*) or MACAW-*tree*, in botany, the name of a fpecies of palma, or *Phœnix*. See the article PHOENIX, *Suppl.*

MACHINE (*Cycl.*) — The fimple *Machines*, or mechanical powers, according to their different ftructure, ferve for different purpofes; and it is the bufinefs of the fkilful mechanift to choofe them, or combine them, in the manner that may be beft adapted to produce the effect required, by the power which he is poffeffed of, and at the leaft expence. The lever can be employed to raife weights a little way only, unlefs the engine itfelf be moved; as, for inftance, to raife ftones out of their beds in quarries. But the axis and wheel may ferve for raifing weights from the greateft depths. Pullies being eafily carried, are therefore much employed in fhips. The wedge is excellent for feparating the parts of bodies; and the fcrew for compreffing or fqueezing them together; and its great friction is even fometimes of ufe, to preferve the effect already produced by it. The ftrength of the *Machine*, and of its parts, muft be proportioned to the effects which are to be produced by it. Thus, when the center of motion is placed between the power and the weight, it muft fuftain the fum of their efforts: a fmall ballance, therefore, ought not to be employed for weighing great weights; for thefe diforder its ftructure, and render it unfit for ferving that purpofe with accuracy. Neither are great *Machines* proper for producing fmall effects. It were to be wifhed, that we had a detail of all thefe things drawn up by fome fkilful and experienced mechanift.

From thefe fimple *Machines*, compounded ones are formed by various combinations, and ferve for different purpofes; in all which the fame general laws take place; and particularly this, that the power and weight fuftain each other, when they are in the inverfe proportion of the velocities which they would have in the directions wherein they act, if they were put in motion.

But in practice the friction of *Machines* is to be confidered, without allowing for which we fhall often find ourfelves at a lofs See the article FRICTION, *Append.*

Accurate defcriptions and draughts of *Machines* would be a very curious and ufeful work. But to make a collection of this kind as advantageous as poffible, it fhould, befides the defcriptions of *Machines*, contain an analyfis of them; pointing out their advantages and difadvantages; the reafons of the conftructions; and the general problems, implied in thefe conftructions, with their folutions, fhould be extracted. None of thefe things have as yet been done, in a complete and fatisfactory manner, in any treatife of this kind. However, many curious particulars may be gathered from Strada, Beffon, Beroaldus, Auguftinus de Ramellis, Bockler, Leupold, Beyer, Limpergh, Van Zyl, Perault, and others; a fhort account of whofe works we find in *Wolfii* commentatio de præcipuis fcriptis mathematicis. Elem. Mathef. Univ. Tom. 5. pag. 84. feq. To thefe muft be added, Monfieur Belidor's Architecture Hydraulique, and Dr. Defaguliers's Courfe of Experimental Philofophy. The Royal Academy of Sciences at Paris have alfo given us a collection of *Machines* and inventions approved of by them. This work, publifhed by Monfieur Gallon, confifts of fix volumes in 4to, containing engraved draughts of the *Machines*, with their defcriptions annexed. But a complete inftitution of practical *Mechanics* is ftill wanting. See the article MECHANICS, *Append.*

MACHINE *of Marly* (*Cycl.*) — This *Machine* was made by a common mechanic of Liege, and has a great many excellent contrivances; but yet does not raife all the water that it might have done, becaufe the maker did not know how to give the River Seine all the advantages of which it was capable. Hence appears the neceffity of a mechanic's being well acquainted with mathematics; or that able mathematicians would apply themfelves to mechanics more than they do, and not think it below them to direct workmen. See *Defagul.* Exper. Philof. Vol. II. p. 442, to 449.

According to Dan. Bernoulli's computation, the effect of the *Machine of Marly* is not more than $\frac{1}{56}$ of its abfolute force; that is, there is a lofs of $\frac{55}{56}$ of that force. *Dan. Bernoul.* Hydrodyn. p. 182.

MACHINES *for raifing water.* See the article *Raifing* WATER, *Append.* See alfo the article FIRE-*engine*.

MACROCERCI, the name eftablifhed by Dr. Hill for a large genus of animalcules, diftinguifhed from all others by having tails longer than their bodies. See the article ANIMALCULE, *Cycl. Suppl.* and *Append.*

MAD-*wort*, the Englifh name of a genus of plants, called by botanifts *Alyffon*. See the article ALYSSON, *Suppl.*

MADDER (*Suppl.*) — *Petty*-MADDER, the Englifh name of a genus of plants, known among authors by that of *Rubeola*. See the article RUBEOLA, *Suppl.*

MADNESS — Dr. Michelotti relates the cure of a young man, who, after being expofed to very hot weather at fea, and having committed violent debauches in drinking, became mad, without any fever. He was cured by violent bleeding, ftarving, weak very cold drink, the cold bath, and pouring cold water on his head. Hift. de l'Acad. des Scienc. 1734. See the article MANIA, *Suppl.*

MAGNESIA, the fame with *Manganefe*. See the article MANGANESE, *Suppl.*

MAGNET (*Cycl.*) — *Armed* MAGNET. See the article LOAD-STONE, *Suppl.*

The power of natural *Magnets* may be greatly increafed by art; and this feems to have received farther and very great improvements from Dr. Knight. See Philof. Tranf. N° 474. p. 163. feq.

The poles of natural *Magnets* may be inverted, or their directions may be changed. Remarkable inftances of this may be feen in the Phil. Tranf. N° 101. p. 164. feq. and N° 476. p. 36. feq. Thus the magnetical virtue may be placed in fuch a manner, that the two oppofite ends of a ftone fhall become, both, fouth poles; and the middle quite round, a north pole. Or, the two oppofite ends may be north poles; and the two oppofite fides fouth poles. Half of the furface of the ftone may be made a north pole, and the other half a fouth pole. A north pole may be placed fo as to be furrounded by a fouth pole; and at the other end of the ftone, a fouth furrounded by a north pole; fo that the edges of each furface have a pole of a different denomination from that which occupies the middle. See Phil. Tranf. N° 476. p. 361. feq.

Artificial MAGNET. *Artificial Magnets* have been made in great perfection by the before mentioned gentleman. See the Phil. Tranf. N° 474, p. 161. feq. where various experiments of the force of thefe *Artificial Magnets* are recorded; one in particular weighing, without its armour, juft an ounce, and with the armour, cramps, and rings, one ounce 17 pen. wt. lifted fix pounds ten ounces troy weight. See pag. 166, N° cit.

It is hoped, that Doctor Knight will foon oblige the world with his difcoveries in magnetifm. In the mean time, the ingenious Mr. Canton has found out a method of making artificial *Magnets*, without the ufe of, and yet far fuperior to, natural ones. This gentleman has fucceeded fo well in his attempts to convey a confiderable magnetic virtue to bars of hardened fteel, as to be able to impregnate fuch bars with this virtue, to as high a degree as any of the fame weight and dimenfions which he had yet feen or heard of; and to as high a degree, as, he apprehends, the fame bars in their prefent ftate are capable of being impregnated. Mr. Canton has publifhed the defcription of his procefs, with fuch directions, that any perfon may readily perform the fame.

The apparatus, befides the bars of hard and foft fteel, confifts only in an iron poker and tongs, the larger they are, and the longer they have been ufed, the better. But for the application of this apparatus, we muft refer to the ingenious author himfelf, who has expreffed himfelf clearly and concifely, and added figures for the more eafy intelligence of his procefs. See a method of making artificial *Magnets*, without the ufe of natural ones, by *John Canton*, M. A. London, 1751. See alfo Phil. Tranf. Vol. 47. p. 31.

MAGPYE, in ornithology, the Englifh name of a large order of birds. See the article PICA, *Suppl.*

MAHOGANY, a well known, and, juftly, much valued wood, brought from Jamaica, and other parts of the Weft-Indies.

It is the wood of a very beautiful tree, with pinnated leaves, but hitherto not reduced to any certain clafs or genus of plants. Catefby, indeed, who faw only the withered remains of its flower, tells us, that he could plainly perceive it to be pentapetalous, or confifting of five leaves. Its fruit has fome, tho' but a remote, refemblance to that of the pine.

MAIDEN-*hair* (*Suppl.*) — *Black* MAIDEN-*hair*, a name fometimes given to the *Filicula*, or dwarf Fern. See the article FILICULA, *Suppl.*

Englifh MAIDEN-*hair*, the name of a genus of plants, called by botanifts *Trichomanes*. See the article TRICHOMANES, *Suppl.*

White MAIDEN-*hair*, the name by which fome call the *Ruta-muraria*, or wall-rue. See the article RUTA-*muraria*, *Suppl.*

MAILLS, on fhip-board, are fquare machines, compofed of a number of rings interwoven net-wife, and ufed for rubbing off

off the loose hemp which remains on lines or white cordage, after it is made. *Blanckley*'s Nav. Expos. p. 102.

MAKE-*Hawk*, in falconry. See the article Hawk, *Append.*

MALIGNANT (*Cycl.*) — *Malignant* fevers and fluxes are frequent, not only in marshy countries, after hot seasons, but in populous cities. See the article City, *Append.*

History abounds with examples of *malignant* or pestilential fevers, added to the other calamities of a siege: Nay, there is scarce any instance of a town being long invested, without some fatal malady of this kind; which may, in great part, be attributed to the filth of the place, crowded with people and cattle. Corrupted grain, and meats long salted becoming putrid, have likewise given rise to *malignant* diseases.

It is remarkable how much the plague, and other pestilential fevers, hot scurvies, and dysenteries have abated in Europe within this last century; a blessing we can ascribe to no other second cause, than to the improvement of every thing relating to cleanliness, and to the more general use of Antiseptics. See the article Antisceptics, *Append.*

In regard to diet too, it may be observed, that hopped beer, wine, and spirituous liquors coming more into general use, have been a great means of suppressing putrid and *malignant* diseases. Greens and fruit are likewise more universally eat, and salted meats make a much less part of diet than formerly. To this add the more general consumption of tea and sugar. All which are no inconsiderable antisceptics. *Pringle*, Observ. on Dis. of the army, p. 284, 288, 293.

As to the contageous nature of all putrid disorders, Dr. Pringle thinks that the putrid effluvia, received into the blood, have a power of corrupting the whole mass, of which he conceives the resolution of the blood, and sometimes even its smell, in the advanced state of a *malignant* fever, the offensiveness of the sweats, and other excretions, the livid spots, blotches, and mortifications incident to this distemper, to be sufficient proofs. By the acrimony of these effluvia, the nerves are affected with various spasms, the pulse is always quickened, at first raised, but soon depressed. Id. ibid. p. 298.

Were putrefaction the only change made in the body by contagion, it would be easy to cure such fevers, at any period, by the use of acids, or other antisceptics. But, as this cannot be effected, till the stated time of their decline, it seems probable, that whilst the sceptic progress goes on, the fever is chiefly supported by an inflammation in the brain; so that a cure cannot be expected, till the obstructing matter is resolved or suppurated. Id. ibid.

That this is the case, appears from the method of cure. Thus, before the inflammation is fixed, the sceptic particles may be expelled by sweating; after that period, the most effectual method is to support the strength; but so as not to increase the inflammation; and near the end of the last stage of the disease, the humours being resolved by putrefaction, the obstruction is thereby removed; at which time the stronger antisceptic and cordial medicines have place, in order to correct and expel what is so much vitiated. In this low state the volatiles are often necessary for raising the pulse: Wine is a constant cordial; and not only wine, but camphor, snake-root, and the bark, are endowed with strong antisceptic qualities. Id. ibid. p. 299. seq. See the articles Bilious *fever*, Hospital-*fever*, Dysentery, &c. *Append.*

MALABAR-*nut*, in botany, the English name of a genus of plants, called by botanists *Adhatoda*. See the article Adhatoda, *Suppl.*

MALL, or *Sea*-Mall, the name by which we call several species of the *Larus*, or gull. See the article Larus, *Suppl.*

MALLOW, in botany, the English name of a genus of plants, called by botanists *Malva*. See the article Malva, *Suppl.*

Jews Mallow, the name by which some call the *Corchorus*, of botanists. See the article Corchorus, *Append.*

Indian Mallow, a name given to two different genuses of plants, called *Sida* and *Urena*, by botanists. See the articles Sida and Urena, *Suppl.*

Marsh-Mallow, the English name of a genus of plants, called *Althæa* by botanical writers. See the article Althæa, *Suppl.*

Syrian Mallow, or *Venetian* Mallow, names by which some call the *Ketmia*, of botanical authors. See the article Ketmia, *Suppl.*

Vervain Mallow, the English name of a distinct genus of plants, known among botanists by that of *Alcea*. See the article Alcea, *Suppl.*

Yellow Mallow, a name sometimes given to the *Sida* of Linnæus. See the article Sida, *Suppl.*

MALOBATHRUM, among the Romans, a precious kind of ointment, brought from the Indies through Syria to Rome. *Pitisc.* in voc.

MALTSTER, a person whose employment it is to make malt, or one who trades with it. Ruff. Dict. in voc.

MALVINDA, in botany, the name given by Dillenius, to a genus of plants, called by Linnæus *Sida*. See the article Sida, *Suppl.*

MALUS, the *Apple-tree*, in botany, the name of a genus of plants, the characters of which are these; the flower is rosaceous, and consists of several leaves; the fruit is fleshy, almost round, and for the most part umbilicated at both ends; it is divided into several cells or partitions, in each of which is contained an oblong callous seed.

The species of *Apple-tree*, enumerated by Mr. Tournefort, are these: 1. The *Apple* with a full or double flower. 2. The *Dwarf-Apple*, with white fruit; this is rather a shrub than a tree. 3. The *Dwarf-Apple*, with reddish fruit. 4. The *Crab-tree*, or wild *Apple*, with very sour fruit. 5. The wild *Apple*, with acid fruit. 6. The wild *Apple*, with white and acid fruit. 7. The large *Apple*, with very tender and early ripening fruit. 8. The cultivated *Apple*, with green spots both without and within the fruit. 9. The garden *Apple*, with fruit almost without a pedicle. 10. The garden *Apple*, with roundish pale green fruit, of a sweetish acid taste, 11. The garden *Apple*, with greenish iron coloured fruit. 12. The garden *Apple*, with fruit full of protuberances. 13. The garden *Apple*, with orbicular, sweet-scented fruit. 14. The garden *Apple*, with bright purple fruit. 15. The garden *Apple*, with blood coloured fruit, of a sweetish sour taste. 16. The garden *Apple*, with large reddish and very acid fruit, and a long pedicle. 17. The garden *Apple*, with deep red and violet scented fruit. 18. the garden *Apple*, with pale red, scentless, and large fruit. 19. The garden *Apple*, with deep blood-red coloured fruit, variegated with rust-coloured spots. 20. The garden *Apple*, with turbinated, tender fruit. 21. The garden *Apple*, with oblong, hard, chesnut-tasted fruit. 22. The garden *Apple*, with globose fruit, partly red and partly yellow, and of a sweetish-sour taste. 23. The garden *Apple*, with orbicular sessile fruit, of a vinous taste. 24. The garden *Apple*, with pentagonal stelliform fruit, and somewhat acid taste. 25. The garden *Apple*, with polygonal fruit, of a vinous and somewhat acid taste. 26. The large, angular, vinous-tasted garden *Apple*. 27. The garden *Apple*, with large pileiform greenish-yellow fruit. 28. The garden *Apple*, with striated fruit, variegated with yellowish-red spots. 29. The garden *Apple*, with fruit partly white, and partly reddish, variegated with red spots. 30. The angular, sweet, garden *Apple*, dissolving in the mouth. 31. The angular, whitish, citron-coloured garden *Apple*. 32. The fructiferous *Apple*, with fading flowers. 33. The garden *Apple*, with oblong, sugar tasted, Anis-scented, greyish iron-coloured fruit. 34. The garden *Apple*, with whitish fruit partly punctated, and partly variegated with deep-red striæ. 35. The hard, sugar tasted garden *Apple*, with purple fruit. 36. The garden *Apple*, with very sweet, red, sessile fruit. 37. The oblong, somewhat arched, very white garden *Apple*, of a sweetish acid Taste. *Tournef.* Inst. Bot. 634, seq.

MAN, *Homo*, in zoology, is ranked by Linnæus at the head of a class of animals, which he calls *Anthropomorpha*. See the article Anthropomorpha, *Suppl.*

He distinguishes *Men*, according to their colours; into the European, or white *Men*; the American, or reddish-coloured *Men*; the Asiatic, or tawney-brown-coloured men; and lastly, those of Africa, or the blacks. *Linnæi*, system. Natur. p. 63. Mons. Buson, among many other curious particulars, has given us several relating to the natural history of *Man*. See Histoire Naturelle Vol. III. pag. 305. Edit. Paris. That ingenious author has entered into a considerable detail with respect to the varieties of the human species. See Vol. III. pag. 371, seq. of the same work.

MANCHINEEL-*tree*, the English name of a genus of plants, called by botanists *Mancanilla*. See the article Mancanilla, *Suppl.*

MANGLES, in botany, the name by which Plumier calls the *Rhizophora* of Linnæus. See the article Rhizophora, *Suppl.*

MANGROVE-*tree*, a name by which some call the *Ketmia*. See the article Ketmia, *Suppl.*

Mangrove-*grape*, the name of a genus of plants, known among authors by that of *Guajabara*. See the article Guajabara, *Append.*

MANIS, in zoology, the name of the scaly lizard, otherwise called *Lacertus squamosus*. See the article Lacertus *squamosus*, *Suppl.*

MANNING (*Suppl.*) — Manning *of a hawk*, in falconry, is the making her tractable, gentle, and tame. Dict. Rust. in voc.

MANTLE (*Suppl.*) — *Ladies*-Mantle, in botany, the English name of a genus of plants, known among authors by that of *Alchimilla*. See the article Alchimilla, *Suppl.*

MARACOCK, a name sometimes used for the *Granadilla* of botanical writers. See the article Granadilla, *Suppl.*

MARANTA, *Indian arrow-root*, in botany, the name of a genus of plants, the characters of which are these; the cup is a small perianthium affixed upon the germen, of a lanceolated figure, and consisting of three leaves; the flower is monopetalous, and of the ringent kind; the tube is oblong, compressed, crooked, and oblique; the limb is divided into six parts, the alternate exterior segments being of an ovated figure, equal in size, and small, one standing below,

below, and two above; whereas the two lateral segments are very large, of a roundish figure, and represent a lower lip; the the upper one being small, and bipartite. The stamen is a single membranaceous filament, much resembling a segment of the corolla; the anthera is of a linear figure, and affixed to the side of the filament; the germen of the pistil is roundish, and is placed beneath the receptacle of the flower; the style is simple, and of the length of the flower; and the stigma is somewhat trigonal and bent. The fruit is a roundish capsule, somewhat obscurely trigonal, and composed of three valves, in each of which there is a single, hard, rugose seed, of an ovated figure.

It is a native of America, described by Plumier, and is nearly allied to the Canna, but cannot be joined with it. Vid. Linnæi Gener. Plantar. p. 2.

MARJORAM *(Suppl.)* — *Spanish* MARJORAM, a name used by some for the *Urtica*, with pellitory leaves and round balls. See the article URTICA, *Suppl.*

Sweet MARJORAM, a name given by some to a genus of plants, called by others *Parthenium*. See the article PARTHENIUM, *Suppl.*

MARKING-*Yarn*, in ships of war, is white yarn spun the wrong way, and put into all cordage of three inches and upwards, as the king's mark. *Blanckley's* Naval Expositor, p. 103.

MARSH-*Elder*, or *Water-Elder*, the name by which some call the *Opulus*. See the article OPULUS, *Suppl.*

MARSH-*fever*, is a species of bilious *fever*. See the article BILIOUS, *Append.*

Those, seized with the *Marsh-fever*, are tormented with a burning heat, and violent head-ach. They complain likewise of intense thirst, aking of the bones, a pain of the back, great lassitude and inquietude; and frequently of a nausea, sickness, or a pain about the pit of the stomach; which is sometimes attended with a vomiting of green or yellow bile, of an offensive smell. The head is sometimes so suddenly and violently affected, that without any previous complaint, the patients run about in a wild manner, as if they were mad; and would throw themselves out of windows, or into the water, if not prevented. *Pringle*, Observ. on the Dis. of the Army, p. 171.

MARSH *trefoil*, the name of a genus of plants, called by authors *Menyanthes*. See the article MENYANTHES, *Suppl.*

MARSHY *Countries*. It is to be observed, that neither canals, nor even large inundations, where the water is deep, are nearly so dangerous in regard to peoples health, or exhale so much noxious vapours, as *marshy* grounds, or meadows that have been once floated, and but lately drained; and that fields, tho' dry in appearance, may nevertheless be moist, by the transpiration of subterraneous water. *Pringle*, Observ. on the Dis. of the Army, p. 82.

By this exhalation, as well as by that of ditches and canals, in all which innumerable plants and insects die and rot, the atmosphere is filled, especially during the latter part of summer and autumn, with moist, putrid, and insalutary vapours. Add to this, that *marshy* countries being low, and without hills to receive the winds, or direct them in streams upon the lower grounds, the air is apt to stagnate and corrupt. The common water too, being either collected from rains, and preserved in cisterns, or drawn from shallow wells, is, in hot and dry seasons, soon corrupted; so that every thing conspires, in summer, not only to relax the solids, but to dispose the humours to putrefaction. Id. ibid. p. 2.

In *marshy* countries rainy and moist seasons differ greatly; since intense and continued heats occasion the greatest moisture in the atmosphere, by the immense exhalations they raise; whereas frequent showers, during the hot season, cool the air, check the excess of vapours, dilute and refresh the corrupted stagnating water, and precipitate all putrid and noxious effluvia. But, if heavy rains in the beginning of summer, are succeeded by great and uninterrupted heats, those rains, by overflowing the meadows, serve only for matter of more exhalation, and to make the season more fickly, and the distempers more fatal. Id. ibid. p. 5.

The epidemic of the hot season, and the great endemic of *marshy* countries, is a fever of an intermitting nature, commonly of a tertian shape, but of a bad kind; which in the damper places and worst seasons, appears in the form of a double tertian, remittent, continued, putrid, or even an ardent fever. *Marshy* countries are likewise subject, more than any others, to the cholera morbus, dysentery, and a kind of scurvy, peculiar to a moist and corrupted air; the symptoms of which last agree so much with the sea-scurvy, that they may be accounted the same disease; the exhalations of the canals and *marshes*, in hot weather, acting like the vapour which rises from the bildge-water of a ship. Id. ibid. p. 6, seq.

As to the diet necessary in moist places, it may be observed in general, that those who can afford to live above the common rate, keep freest from the diseases of the *marshes*. For such climates require dry houses, the apartments raised from the ground, proper exercise, without labour in the sun, or in the evening damps, a just quantity of vinous liquors, and victuals of good nourishment. Without such helps, not only strangers, but the natives themselves, are extremely sickly after hot and close summers. Id. ibid. p. 9.

MARTAGON, the name given by some to several species of *Lilly*. See the article LILIUM, *Suppl.*

MARTIN, in ornithology, the English name of the black *Hirundo*, with only the throat white. See the article HIRUNDO, *Suppl.*

MARYGOLD *(Suppl.)* — *Fig*-MARYGOLD, the name by which some call the *Ficoides* of botanists. See the article *Suppl.* and *Append.*

MASH, the name of a drink given to horses or cattle. It is made of half a peck of ground malt, put into a pail; on which is poured as much hot scalding water, as will wet it well; then stirring it about half an hour, till it becomes lukewarm, and sweet like honey, it is to be given to the horse. A *mash* is only given after a purge, to make it work better; after hard labour, or for drink in time of sickness. Ruft. Dict. in voc.

MASTER-*wort*, a name sometimes given to the *Astrantia* of botanical writers. See the article ASTRANTIA, *Suppl.*

MASTIC-*tree*, the name by which some call the *Lentiscus* of authors. See the article LENTISCUS, *Suppl.*

MASTIC-*tree of Jamaica*, a name sometimes given to the *Calaba*, or *Caryophillum*. See the article CARYOPHILLUM, *Append.*

Indian MASTIC, the name by which the *Molle*, or Peruvian Lentisk is sometimes called. See the article MOLLE, *Suppl.*

MATFELON, a name sometimes gived to the *Jacea* of botanists, more usually called *Knapweed*. See the article JACEA, *Suppl.*

MATURATION *of fruit*. For the several ways of hastening the *maturation of fruit*, see the articles HOT-*beds*, FORCING, and CAPRIFICATION, *Suppl.*

MAUDLIN, the English name of a genus of plants, called by botanists *Ageratum*. See the article AGERATUM, *Suppl.*

MAUROCENIA, in botany, the name of a genus of plants, the characters of which are these; the cup is a very small one-leaved perianthium, divided into five segments, and permanent; the flower consists only of one leaf, divided into five oval, patent segments; the stamina are five erect subulated filaments, longer than the flower; the antheræ are simple; the germen of the pistil is conic; there is no style; the stigmata are three, and gibbous; the fruit is an oval berry, umbilicated with the stigmata; the seeds are three, oblong, and scarce separable from the pulp.

Dillenius makes this genus a species of Frangula. Vid. *Linnæi* Gen. Plant. p. 125.

MAW, or SEA-MAW, the same with the *Sea-Mall*. See the article MALL, *supra*.

MAY-*bush*, in botany, a name sometimes given to the *Mespilus*, or Medlar. See the article MESPILUS, *Suppl.*

MAY-*duke*, a name used among Gardeners for a species of cherry-tree. See the article CERASUS, *Suppl.*

MAY-*lilly*, a name sometimes used for the *Convallaria*, or *Lilium Convallium*. See the article LILIUM CONVALLIUM, *Suppl.*

MAY-*weed*, a name by which some call the *Chamæmile*. See the article CHAMÆMELUM, *Suppl.*

MAZE, in gardening, the same with *Labyrinth*. See the article LABYRINTH, *Cycl.* and *Suppl.*

MEADOW-*grass*, in botany. See the article GRASS, *Append.*

MEADOW-*rue*, the English name of a genus of plants, called by botanists *Thalictrum*. See the article THALICTRUM, *Suppl.*

MEADOW-*sweet*, in botany, the English name of a genus of plants, called by authors *Ulmaria*. See the article ULMARIA, *Suppl.*

MEALY-*tree*, in botany, a name sometimes given to the *Viburnum*. See the article VIBURNUM, *Suppl.*

MECHANICS *(Cycl.)* — The term *Mechanics* has of old been, and still is, used in a double sense in very different sciences, both with respect to their objects and principles. For the name *Mechanics* is applied equally to that science which treats of the equilibrium and comparison of powers; and to that science in which the nature, generation, and alteration of motion is explained. To avoid ambiguity, therefore, it would be proper to give the name *Statics* to the science of the equilibrium and comparison of powers, and to restrain the term *Mechanics* to the science of motion.

These two sciences not only differ as to their objects and principles, but also with respect to the times in which they have been cultivated. Some of the principles of *Statics* were established by Archimedes; but Galileo laid the first foundation of Mechanics, when he investigated the descent of heavy bodies; and since his time, by the assistance of the new methods of computation, a great progress has been made, particularly by Sir Isaac Newton, in his Principia. This admirable work is now rendered more accessible to beginners by the learned comment of the fathers le Seur and Jacquier, printed, with the text, at Geneva, 1739,

1739, 4to, 1742, 4 vols. 4to. We have also the sciences of Statics and *Mechanics* treated of under the name of Phoronomia, by the late learned professor Herman. Amst. 1716. 4to. Mr. Euler's *Mechanica, sive de motus scientia*; is sufficiently recommended by the name of the author, well known as one of the most eminent mathematicians in Europe. This work, however, did not escape the censure of a late ingenious writer; but granting the justness of his remarks, it may be said, that a few inaccurate expressions, owing to analogies carried too far, and to the style of infinitesimals, are but small flaws in such a work. As to statics, the subject has been almost exhausted by Varignon, in his Mecanique, Paris, 1725, 2 vol. 4to.

The doctrine of machines or engines is a principal branch of *Mechanics*; but has not as yet been treated as it deserves. We shall here insert a few observations on this useful subject, from a late eminent author.

In treating of machines, we should consider the weight that is to be raised, the power by which it is to be raised, and the instrument or engine by which this effect is to be produced. There are two principal problems that ought to be resolved in treating of each of them.

The first is, to determine the proportion which the power and weight ought to have to each other, that they may just sustain one another, or be in æquilibrio.

The second is, to determine what ought to be the proportion of the power and weight to each other, in a given machine, that it may produce the greatest effect possible, in a given time.

All the writers on *Mechanics* treat of the first of these problems, but few have considered the second, tho' equally useful with the other.

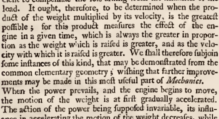
As to the first problem, this general rule holds in all powers: Suppose the engine to move, and reduce the velocities of the power and weight to the respective directions in which they act; find the proportions of those velocities; then if the power be to the weight, as the velocity of the weight is to the velocity of the power, or, which amounts to the same thing, if the power multiplied by its velocity, gives the same product as the weight multiplied by its velocity, this is the case wherein the power and weight sustain each other, and are in equilibrio; so that in this case, the one would not prevail over the other, if the engine was at rest; and if it is in motion, it would continue to proceed uniformly, if it were not for the friction of its parts, and other resistances.

The second general problem in *Mechanics*, is, to determine the proportion which the power and weight ought to bear to each other, that when the power prevails, and the machine is in motion, the greatest effect possible may be produced by it in a given time. It is manifest, that this is an inquiry of the greatest importance, tho' few have treated of it. When the power is only a little greater than that which is sufficient to sustain the weight, the motion is too slow; and tho' a greater weight is raised in this case, it is not sufficient to compensate the loss of time. When the weight is much less than that which the power is able to sustain, it is raised in less time; and this may happen not to be sufficient to compensate the loss arising from the smallness of the load. It ought, therefore, to be determined when the product of the weight multiplied by its velocity, is the greatest possible; for this product measures the effect of the engine in a given time, which is always the greater in proportion as the weight which is raised is greater, and as the velocity with which it is raised is greater. We shall therefore subjoin some instances of this kind, that may be demonstrated from the common elementary geometry; wishing that farther improvements may be made in this most useful part of *Mechanics*.

When the power prevails, and the engine begins to move, the motion of the weight is at first gradually accelerated. The action of the power being supposed invariable, its influence in accelerating the motion of the weight decreases, while the velocity of the weight increases. Thus the action of a stream of water, or air, upon a wheel, is to be estimated only from the excess of the velocity of the fluid above the velocity already acquired by the part of the engine which it strikes, or from their relative velocity. On the other hand, the weight of the load that is to be raised, and the friction, tend to retard the motion of the engine; and when these forces, viz. those that tend to accelerate it, and those that tend to retard it, become equal, the engine then proceeds with the uniform motion it has acquired.

Let A B (Fig. 1.) represent the velocity of the stream, A C, the velocity of the part of the engine which it strikes,

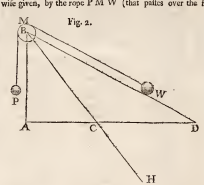
Fig. 1.



when the motion of the machine becomes uniform; and C B will represent their relative velocity, upon which the effect of the engine depends. It is known that the action of a fluid, upon a given plane, is as the square of this relative velocity; consequently the weight raised by the engine, when its motion becomes uniform, being equal to this action, it is likewise as the square of C B. Let this be multiplied by A C, the velocity of the part of the engine impelled by the fluid; and the effect of the engine in a given time will be proportional to $A\,C \times C\,B^2 =$ (supposing C B to be bisected in D) $A\,C \times 2\,C\,D \times 2\,D\,B = 4\,A\,C \times C\,D \times D\,B$; consequently, the effect of the engine is greatest, when the product of A C, C D, and D B is greatest. But it is easy to see, that this product is greatest, when the parts A C, C D, and D B, are equal; for if you describe a semicircle upon A D, and the perpendicular C E meet the circle in E, then $A\,C \times C\,D = C\,E^2$, and is greatest, when C is the center of the circle; so that in order that $A\,C \times C\,D \times D\,B$ may be the greatest possible, A D must be bisected in C; and C B having been bisected in D, it follows, that A C, C D, D B, must be equal; or that A C, the velocity of the part of the engine impelled by the stream, ought to be but one third of A B, the velocity of the stream. In this case, when (abstracting from friction) the engine acts with the utmost advantage; the weight raised by it is to the weight that would just sustain the force of the stream, as the square of C B, the relative velocity of the engine and stream, to the square of A B, which would be the relative velocity, if the engine was quiescent; that is, as 2×2 to 3×3, or 4 to 9. Therefore, that the engine may have the greatest effect possible, it ought to be loaded with no more than $\frac{4}{9}$ of the weight, which is just able to sustain the efforts of the stream. See *Mac Laurin's* Account of Sir Isaac Newton's Discov. p. 171. seq. and Fluxions, Art. 908.

Again suppose that a given weight P, (Fig. 2.) descending by its gravity in the vertical line, raises a greater weight W likewise given, by the rope P M W (that passes over the fixed

Fig. 2.



pully M) along the inclined plane B D, the height of which B A is given; and let it be required to find the position of this plane, along which W will be raised in the least time, from the horizontal line A D to B. Let B C be the plane upon which if W was placed, it would be exactly sustained by P; in which case, P is to W as A B to B C. But W is to the force with which it tends to descend along the plane B D, as B D to A B; consequently the weight P is to that force, as B D to B C. Therefore the excess of P above that force (which excess is the power that accelerates the motions of P and W) is to P, as B D — B C to B D; or taking B H upon B C equal to B D, as C H to B D. But it is known that the spaces described by motions uniformly accelerated, are in the compound ratio of the forces which produce them and the squares of the times; or that the square of the time is directly as the space described in that time, and inversly as the force; consequently, the square of the time, in which B D is described by W, will be directly as B D, and inversly as $\frac{C\,H}{B\,D}$, and will be least when $\frac{B\,D^2}{C\,H}$ is a minimum; that is, when $\frac{B\,C^2}{C\,H} + C\,H + 2\,B\,C$, or (because $2\,B\,C$ is invariable) when $\frac{B\,C^2}{C\,H} + C\,H$ is a minimum. Now as when the sum of two quantities is given, their product is a maximum, when they are equal to each other; so it is manifest, that, when their product is given, their sum must be a minimum, when they are equal. Thus it is evident, that as in Fig. 1. the rectangle or product of the equal parts A C and C D was equal to $C\,E^2$; so the rectangle of any two unequal parts, into which A D may be divided, is less than $C\,E^2$, and A D is the least sum of any two quantities, the product of which is equal to $C\,E^2$. But the product of $\frac{B\,C^2}{C\,H}$ and C H is $B\,C^2$, and consequently given; therefore the sum of $\frac{B\,C^2}{C\,H}$ and C H is least, when

these

thefe parts are equal, that is, when C H is equal to B C, or B D equal to 2 B C. It appears, therefore, that when the power P and weight W are given, and W is to be raifed by an inclined plane, from the level of a given point A to the given point B in the leaft time poffible; we are firft to find the plane B C, upon which W would be fuftained by P, and to take the plane B D double in length of the plane B C; or we are to make ufe of the plane B D, upon which a weight that is double of W could be fuftained by the power P.

For another example, fuppofe a fluid, moving with the velocity and direction A C, (Fig. 3.) ftrike the plane C E; and fuppofe that this plane moves parallel to itfelf in the direction C B, perpendicular to C A, or that it cannot move in any other direction. Then let it be required to find the moft advantageous pofition of the plane C E, that it may receive the greateft impulfe from the action of the fluid. Let A P be perpendicular to C E in P, draw A K parallel to C B, and let P K be perpendicular upon it in K, and A K will meafure the force with which any particle of the fluid impells the plane E C, in the direction C B. For the force of any fuch particle being reprefented by A C, let this force be refolved into A Q parallel to E C, and A P perpendicular to it; and it is manifeft, that the latter A P only has any effect upon the plane C E. Let this force A P be refolved into the force A L perpendicular to C B, and the force A K parallel to it; then it is manifeft, that the former, A L, has no effect in promoting the motion of the plane in the direction C B: fo that the latter A K, only, meafures the effort by which the particle promotes the motion of the plane C E in the direction C B. Let E M and E N be perpendicular to C A and C B, in M and N; and the number of particles, moving with directions parallel to A C, incident upon the plane C E, will be as E M. Therefore the effort of the fluid upon C E being as the force of each particle, and the number of particles together, it will be as $AK \times EM$; or, becaufe A K is to A P ($= EM$,) as E N to C E, as $\frac{EM^2 \times EN}{CE}$; fo that C E being given, the problem is reduced to this, to find when $EM^2 \times EN$ is the greateft poffible, or a maximum. But becaufe the fum of EM^2 and of EN^2 ($= CM^2$) is given, being always equal to CE^2, it follows, that $EN^2 \times EM^4$, is greateft, when $EN^2 = \frac{1}{3} CE^2$; in the fame manner as it was demonftrated above, that when the fum of A C and C B (Fig. 1.) was given, $AC \times CB^2$ was greateft, when $AC = \frac{1}{3} AB$. But when $EN \times EM^4$ is greateft, its fquare root $EN \times EM^2$ is of neceffity at the fame time greateft. Therefore the action of the fluid upon the plane C E in the direction C B is greateft when $EN^2 = \frac{1}{3} CE^2$, and confequently $EM^2 = \frac{2}{3} CE^2$; that is, when E M, the fine of the angle A C E, in which the ftream ftrikes the plane, is to the radius, as the $\sqrt{2}$ to $\sqrt{3}$; in which cafe it eafily appears, from the trigonometrical tables, that this angle is of 54°. 44′.

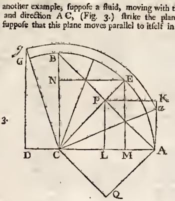


Fig. 3.

Several ufeful problems in *Mechanics* may be refolved by what was fhewn in the preceding paragraph. If we reprefent the velocity of the wind by A C, a fection of the fail of a wind-mill perpendicular to its length by C E, as it follows from the nature of the engine, that its axis ought to be turned directly towards the wind, and the fail can only move in a direction perpendicular to the axis, it appears, that, when the motion begins, the wind will have the greateft effect to produce this motion, when the angle A C E, in which the wind ftrikes the fail, is of 54°. 44′. In the fame manner, if C B reprefent the direction of the motion of a fhip, or the pofition of her keel, abftracting from her lee-way, and A C be the direction of the wind, perpendicular to her way, then the moft advantageous pofition of the fail C E, to promote her motion in the direction C B, is when the angle A C E, in which the wind ftrikes the fail, is of 54°. 44′. The beft pofition of the rudder, where it may have the greateft effect in turning round the fhip, is determined in like manner. And the fame angle enters likewife into the determination of the figure of the rhombufes that form the bafes of the cells in which the bees depofite their honey, in the moft frugal manner. See the article Bee, *Suppl.*

But it is to be carefully obferved, that when the fine of the angle A C E is to the radius as $\sqrt{2}$ to $\sqrt{3}$; or, which is the fame thing, when its tangent is to the radius, as the diagonal of a fquare to its fide; this is the moft advantageous angle only at the beginning of the motion of the engine; fo that the fails of a common wind-mill ought to be fo fituated, that the wind may indeed ftrike them in a greater angle than that of 54°. 44′. For it is demonftrable, that when any part of the engine has acquired the velocity c, the effort of the wind upon that part will be greateft, when the tangent of the angle in which the wind ftrikes it is to the radius, not as the $\sqrt{2}$ to 1, but $\sqrt{2 \times \frac{9cc}{4aa}} \times \frac{3c}{2a}$ to 1; the velocity of the wind being reprefented by a. If, for example, $c = \frac{1}{3} a$; then the tangent of the angle A C E ought to be double of the radius; that is, the angle A C E ought to be of 63° 26′. If $c = a$; then A C E ought to be of 74° 19′. This obfervation is of the more importance, becaufe, in this engine, the velocity of the parts of the fail remote from the axis, bears a confiderable proportion to the velocity of the wind, and perhaps fometimes is equal to it; and becaufe a learned author, Mr. Daniel Bernoulli, has drawn an oppofite conclufion from his computations in his *Hydrodynamics*, by miftaking a minimum for a maximum; where he infers, that the angle in which the wind ftrikes the fail, ought to decreafe as the diftance from the axis of motion increafes; that if $c = a$, the wind ought to ftrike in an angle of 45°; and that if the fail be in one plane, it ought to be inclined to the wind, at a medium, in an angle of 50°. How he fell into thefe miftakes, is fhewn by Mr. *Mac Laurin*, in his Fluxions, §. 914.

In like manner, though the angle A C E of 54°. 44′. be the moft advantageous at the beginning of the motion, when a fhip fails with a fide wind; yet it ought to be enlarged afterwards as the motion increafes. In general, let A a, parallel to C B, be to A C, as the velocity which the engine has already acquired in the direction C B, to that of the ftream; upon A C produced take A D to A C as 4 to 3, draw D G parallel to C B, and let a circle defcribed from the center C with the radius C a, meet D G in g; and the plane C E fhall be in the moft advantageous fituation for promoting the motion of the engine, when it bifects the angle a C g.

It is generally fuppofed, that a direct wind always promotes the motion of a fhip, the fail being perpendicular to the wind, more than any fide-wind; and this has been affirmed in feveral late ingenious treatifes; but, to prevent miftakes, we are obliged to obferve, that Mr. *Mac Laurin* has demonftrated the contrary, in his Treatife of Fluxions, §. 919; where other inftances of this fecond general problem in *Mechanics* are given, to which we refer. See *Mac Laurin's* Account of Sir Ifaac Newton's Philofophical Difcoveries, B. II. c. 3. p. 173. feq.

MECHOACAN, *(Cycl.)* the name by which the great American *Convolvulus*, or bindweed, is known in the fhops. See the article Convolvulus, *Suppl.*

MEDIC-*vetching*, a name by which fome call the *Onobrychis*, a diftinct genus of plants. See the article Onobrychis, *Suppl.*

MEDICA *(Suppl.)*—*Baftard*-Medica, the Englifh name of a genus of plants, called by botanical writers *Medicago*. See the article Medicago, *Suppl.*

MEDLAR *(Suppl.)*—*Parfley-leaved* Medlar, the name by which fome call a fpecies of *Cratægus*. See the article Cratægus, *Suppl.*

MEDUSA, in zoology, the name of a genus of infects, of the order of the *Gymnarthria*. See the article Gymnarthria, *Append.*

The body of the *Medufa* is of an orbiculated convex figure of a gelatinous fubftance, and not hairy. The tentacula, or the plicæ, which ferve inftead of them, are fituated in the center of the under part of the animal. Authors have defcribed them under the names *Urticæ marinæ*, and *Pulmones marini*. See the article Urtica *Marina*, *Suppl.*

MELANCHOLY *thiftle*, *Cirfium*, in botany, the name of a fpecies of *Thiftle*. See the article Thistle, *Suppl.*

MELANTHIUM, in botany, a name ufed by fome authors for a fpecies of *Nigella*. See the article Nigella, *Suppl.*

MELOE, in zoology, the name of a genus of four-winged flies, whofe antennæ are flender and filiform; and the exterior wings dimidiated. It is called in Englifh the *oil-beetle*, as being foft and mucuous to the touch. It is black, but not at all gloffy, and has been defcribed by authors under the names *Scarabæus mollis*, *Cantharus unctuofus*, and *Profcarabæus*. See the article Scarabæus, *Suppl.*

MELON *(Suppl.)*—*Water*-Melon, the name of a genus of plants, called by botanifts *Anguria*. See the article Anguria, *Suppl.*

Thiftle-Melon, *Cactus*, in botany, the name of a genus of plants. See the article Cactus, *Suppl.* and *Append.*

MENIANTHES, in botany, the same with *Menyanthes*, a distinct genus of plants. See the article MENYANTHES, *Suppl.*

MENISPERMUM, in botany, the name of a distinct genus of plants, the characters of which are these: The cup is a deciduous perianthium, composed of six ovato-oblong leaves, erecto-patent, and of the length of the corolla; which consists of six ovato-oblong, obtuse, hollow petals, erecto-patent, like the leaves of the cup; the stamina are six very short filaments; the antheræ are simple, and shorter than the corolla; the germina are three, suboval, and terminate in as many patenti-reflex styles, of the length of the corolla; the stigmata are obtuse and emarginated. The fruit is composed of three oval berries, each containing a single cell, and in it a large, single, lunulated, compressed seed. *Linnæi* Gen. Plant. p. 155.

Plukenet calls this genus the one-leaved Virginian *hedera*, with the leaves of convolvulus.

MERCURY (*Suppl.*) — *Virgin*-MERCURY, called *Jungfraw* by the German miners, is used for that which discovers itself without the assistance of fire. This is sometimes seen in drops, globules, or larger masses in the ore, or falls in drops from the crevices in the roof or walls of the mine, or finally is found in large quantities in the hollows of the rocks. These large collections of pure virgin quicksilver often discover themselves by bursting out in small streams in the mines of Friuli. They sometimes are surprised with a stream of it like a thread, which gradually increasing to the thickness of a packthread, continues to run three or four days, and discharges in that time a vast quantity of the quicksilver; if the miners can follow this spring to the head, they generally obtain a large quantity more; and often this sort of springing up of it leads them to very rich veins of the mine which they did not before know of. They give the same name of *Jungfraw* or virgin-quicksilver also to that *Mercury* which has no need of fire for the separation, but is wash'd out of its ores by a sieve and large quantities of water, continually and forcibly running on it.

The ores of quick-silver often contain a large quantity of that mineral embedded in them in this form, and often so mix'd in other parts with sulphurs, as to be disguised into cinnabar; in this case a great deal is separated by this washing, which at the same time frees the ore from dirt, and renders it fitter for the operation of the fire, by which a great deal more is then extracted.

The union of *Mercury* with antimony is very difficult, but has been effected by Monf. Malouin. See Hist. Ac. Scienc. 1740.

The same gentleman succeeded also in uniting *Mercury* with tin and lead, so as to improve these metals in some respects, rendering them harder, whiter, and more sonorous. Hist. Ac. ibid.

English MERCURY, the name of a distinct genus of plants, called by botanists *Chenopodium*. See the article CHENOPODIUM, *Suppl.*

MERLIN, in ornithology, the English name of the yellow-legged *Falco*, with a variegated back, and a brown and white belly. See the article FALCO, *Suppl.*

This bird is also called *Oesalon*. See the article ŒSALON, *Suppl.*

MESHES *of nets*, the openings and vacancies in net-works. Rust. Dict. in voc.

MESSES *of soldiers*, in what respect useful. See the article DIET, *Append.*

METALS are expanded by *Heat*, but in different degrees. See the articles HEAT and PENDULUM, *Append.*

By what may be learned from the analyses of metals, so far as that subject has yet been prosecuted, it seems that they all contain a running *Mercury* fixed in them, as water is fixed in dry, animal, and vegetable substances; and joined with a sulphur or an inflammable part, and an earth, with a little salt in some of them. *Shaw's* Lectures, p. 162.

METHONICA, in botany, the name given by Tournefort to a distinct genus of plants, called by Linnæus *Gloriosa*. See the article GLORIOSA, *Append.*

METOPE (*Cycl.*) — Le Clerc observes, that the beauty of *Metopes* consists in their regularity, on appearing to be perfect squares; and yet when they are equally square, they appear to be less in height than in breadth, on account of the projecture of the little bandelet; for which reason they should be made a minute or two more in height than in breadth, in order to make their appearance uniform.

He also observes, that when the triglyphs and *Metopes* follow each other regularly, the columns must only stand one by one; excepting those of the inner angles, which ought always to be accompanied by two others, one on each side; and here it is worth remarking, that these two columns which accompany that of the angle, are not less necessary on account of the solidity of the building, than of the regularity of of the intercolumniations.

MEU, MEW, or SPIGNEL, a name sometimes given to the *Meum* of botanists. See the article MEUM, *Suppl.*

MEWING, a disorder incident to all kind of birds, being the casting of their feathers. Rust. Dict. in voc.

MIDAS's *Ear-shell*, a name used by some for a species of *buccinum*, or trumpet-shell. See the article TRUMPET-*shell*, *Suppl.*

MILFOIL, a name sometimes given to the *Millefolium*, or yarrow, of other writers. See the article MILLEFOLIUM, *Suppl.*

MILK-*vetch*, the name of a genus of plants, called by botanists *Astragalus*. See the article ASTRAGALUS, *Suppl.*

Bastard MILK-*vetch*, a name sometimes given to the *Phaca*, or *Astragaloides*, of botanists. See the article ASTRAGALOIDES, *Suppl.*

MILK-*wort*, the name of a distinct genus of plants, called by authors *Polygala*. See the article POLYGALA, *Suppl.*

MILK-*wort*, or WART-*wort*, is also a name sometimes given to the *Euphorbia*. See the article EUPHORBIA, *Suppl.*

MILLET, the English name of a distinct genus of plants, called by authors *Milium*. See the article MILIUM, *Suppl.*

MILLET-*grass*, in botany. See the article GRASS, *Append.*

MILT-*waste*, the English name of a distinct genus of plants, known among authors by that of *Asplenium*. See the article ASPLENIUM, *Suppl.*

MINERAL *Juices*. See the article JUICES *mineral*, *Suppl.*

MINERAL *Kermes*. See the article KERMES *mineral*, *Suppl.*

MINERALOGY, the study which teaches the previous part of metallurgy, the way of finding, judging of, and digging mines; with the uses of salts and earths for the making of fluxes in order to the assaying, and making of ores to separate their metals. This art requires a considerable compass of knowledge, before it can be practis'd to advantage; for as it includes the discovery, sinking, and working of mines, it requires a competent knowledge of the nature of effluvia, and the effects of all mineral matters, salts, sulphurs, &c. as well as the knowledge of all valuable mineral substances, as earths, bitumens, stones, ores, gems, and metals. It likewise requires a knowledge in the internal structure of the earth, and its various strata, with a competent skill in mensuration, hydraulics, measuring, and mechanics; for without these we can never judge what mountain, plain, or valley is proper to be dug, or in what manner to dig it, how to discharge the water that may flow into the works, how the beds of ore and stone will dip and run, how the various kinds of earth, marble, and other mineral or metalic matter, are to be cut through or broken, or how the general process of mining should be conducted, in order to procure, with the least expence, the matter of the ore. *Shaw's* Lectures, p. 240.

MINT (*Suppl.*) —*Corymbiferous* MINT, in botany, a name given by some to a species of Tanzy. See the article TANACETUM, *Suppl.*

Spear-MINT, the name commonly given to the narrow leaved spiked *Mint*. See the articles MENTHA and MINT, *Suppl.*

Cat's-MINT, the English name of a genus of plants, called by botanical writers *Cataria*. See the article CATARIA, *Suppl.*

MIRE-*Drum*, and MIRE-*Snipe*, names used in different parts of the kingdom for the *ardea stellaris*, or bittern. See the articles BITTERN and HERON, *Suppl.*

MISCARRIAGE, the popular term for *Abortion*. See the articles ABORTION, *Cycl.* and PREGNANCY, *Suppl.*

MISLETOE, the English name of a distinct genus of plants, called by botanists *Viscum*. See the article VISCUM, *Suppl.*

MITCHELS, among builders, are purbeck stones, from fifteen inches square to two feet, squared and hewed ready for paving. Rust. Dict. in voc.

MITHRIDATE-*mustard*, in botany, the name by which some call the *Thlaspi*, or treacle mustard. See the article THLASPI, *Suppl.*

Bastard-MITHRIDATE-*mustard*, a name sometimes given to the *Thlaspidium* of botanists. See the article THLASPIDIUM, *Suppl.*

MITRE-*shell*, the English name of the smooth and slender buccinum, with a split rostrum. See the article TRUMPET-*shell*, *Suppl.*

MOCK-*orange*, a name by which the *syringa*, or pipe-tree, is sometimes called. See the article SYRINGA, *Suppl.*

MOCK-*privet*, a name sometimes given to the *Phyllerea* of botanists. See the article PHYLLEREA, *Suppl.*

MODILLION (*Cycl.*) — In the Corinthian order it is usual to have a leaf which takes up the whole breadth, and almost the whole length, of the modillions; but Le Clerc is of opinion, that they would be more graceful if this leaf were less, both in length and breadth. The leaf ought likewise to be of the same kind with those which make the ornament of the capital. Build. Dict. in voc.

MOISTURE. The bad effects of too much *moisture*, in regard to health, has been considered under the article MARSHY *Countries*, *Append.*

MOMORDICA (*Suppl.*) — *Stinking* MOMORDICA, a name used by some for the large fruited white *bryony* of Ceylon. See the article *Bryonia alba*, *Suppl.*

MONBIN, in botany, the name given by Plumier to a genus of plants, called by other botanists *Spondias*. See the article SPONDIAS, *Suppl.*

MONEDULA, in ornithology, a name used by some writers for the *Jackdaw*, a species of *Corvus*. See the articles CORVUS, and JACKDAW, *Suppl.*

MONEY-*wort*, the English name of a distinct genus of plants, known among botanists by that of *Nummularia*. See the article NUMMULARIA, *Suppl.*

MONK's-*rhubarb*, the English name of the broad-leaved garden *Lapathum*, or dock. See the article LAPATHUM, *Suppl.*

MONKEY, in zoology, a name given by way of distinction to those apes which have tails; the others, or those without tails, being more properly called *apes*.

The same distinction holds in latin, the tailed ones being called *Cercopitheci*, and those without tails *Simiæ*. See the articles CERCOPITHECUS and SIMIA, *Suppl.*

MONKEY, in the sea-language, a block made of iron, with a catch, used in gins for driving piles. *Blanckley's* Naval Expositor, p. 107.

MONOCEROS *piscis*. Besides the two kinds of unicorn-fish described in the Supplement under the article MONOCEROS, there is another very large one of the same genus. See the article UNICORN, *Suppl.*

MONOCULUS, in zoology, the name of a genus of insects, of the Podaria kind. See the article PODARIA, *Append.*

Its body is short, of a roundish figure, and covered with a firm crustaceous skin; the fore legs are ramose, and serve for leaping and swimming. It has but one eye, which is large, and composed of three smaller ones.

Of this genus, many of which have been reckoned among the microscopic animals, authors enumerate a great number of species; for which see *Hill*, Hist. Anim. p. 22.

MONORCHIS. Beside the common signification of this word as the name of a plant, physicians have also us'd it to express a man who has but one testicle.

MONOTRIGLYPH, in architecture, denotes the space of one *Triglyph*, between two pillasters or two columns. Build. Dict. in voc. See the article TRIGLYPH, *Cycl.*

MOON (*Cycl.*) — The path of the *moon* is concave towards the sun throughout.

In other secondary planets, as the satellites of the superior planets, that part of the path of these satellites which is nearest the sun, is convex towards the sun, and the rest is concave. And we often find in elementary treatises of astronomy, the *Moon*'s path represented in the same manner; that is, as partly convex and partly concave towards the sun; but this is a mistake. For it is to be observed, in general, that the force which bends the course of the satellite into a curve, when the motion is referred to an immoveable plane, is, at the conjunction, the difference of its gravity towards the sun, and of its gravity towards the primary. When the former prevails over the latter, the force that bends the course of the satellite tends towards the sun; and consequently the concavity of the path is towards the sun; and this is the case of the *Moon*. When the gravity towards the primary exceeds the gravity towards the sun, at the conjunction, then the force that bends the course of the satellite tends towards the primary, and therefore towards the opposition of the sun; consequently the path is there convex towards the sun; and this is the case of the satellites of Jupiter. When these two forces are equal, the path has, at the conjunction, what mathematicians call a point of rectitude; in which case, however, the path is concave towards the sun throughout.

The gravity of the *Moon* towards the sun having been found to be greater, at her conjunction, than her gravity towards the earth, so that the point of equal attraction, where those two powers would sustain each other, falls then between the *Moon* and earth, some [a] have apprehended that either the parallax of the sun is very different from that which is assign'd by astronomers, or that the *Moon* ought necessarily to abandon the earth. This apprehension may be removed easily, by attending to what has been shewn by Sir Isaac Newton, and is illustrated by vulgar experiments concerning the motions of bodies about one another, that are all acted upon by a third force in the same direction. Their relative motions not being in the least disturbed by this third force, if it act equally upon them in parallel lines; as the relative motion of the ships in a fleet, carried away by a current, are no way affected by it, if it act equally upon them; or as the rotation of a bullet or bomb, about its axis, while it is projected in the air; or the figure of a drop of falling rain, are not at all affected by the gravity of the particles of which they are made up, towards the earth. It is to the inequality of the action of the sun upon the earth and *Moon*; and the want of parallelism in the directions of these actions, only, that we are to ascribe the irregularities in the motion of the *Moon*.

[[a] The ingenious Mr. *Baxter*, author of *Matho*, or cosmotheoria puerilis.]

But it may contribute towards removing this difficulty to observe, that if the absolute velocity of the *Moon*, at the conjunction, was less than that which is requisite to carry a body in a circle there around the sun, supposing this body to be acted on by the same force which acts there on the *Moon* (i. e. by the excess of her gravity towards the sun, above her gravity towards the earth) then the *Moon* would, indeed, abandon the earth. For, in that case, the *Moon* having less velocity than would be necessary to prevent her from descending within that circle, she would approach to the sun, and recede from the earth. But tho' the absolute velocity of the *Moon*, at the conjunction, be less than the velocity of the earth in the annual orbit, yet her gravity towards the sun is so much diminished by her gravity towards the earth, that her absolute velocity is still much superior to that which is requisite to carry a body in a circle, there, about the sun, that is acted on by the remaining force only. Therefore, from the moment of the conjunction, the *Moon* is carried without such a circle, receding continually from the sun to greater and greater distances, till she arrives at the opposition; where being acted on by the sum of those two gravities, and her velocity being now less than what is requisite to carry a body in a circle, there, about the sun, that is acted on by a force equal to that sum, the *Moon* thence begins to approach to the sun again. Thus, she recedes from the sun, and approaches to it by turns, and in every month her path hath two apsides, a perihelium at the conjunction, and an aphelium at the opposition; between which she is always carried in a manner similar to that in which the primary planets revolve between their apsides. The planet recedes from the sun at the perihelium, because its velocity, there, is greater than that with which a circle could be described about the sun at the same distance by the same centripetal force; and approaches towards the sun from the aphelium, because its velocity, there, is less than is requisite to carry it in a circle, at that distance about the sun. See *Mac Laurin*'s Account of Sir Isaac Newton's Phil. Disc. Book 4. c. 5.

MOON-*wort*, the English name of a distinct genus of plants, called by botanists *Lunaria*. See the article LUNARIA, *Suppl.*

MOON-*trefoil*, a name by which the *Medicago* of botanists is sometimes called. See the article MEDICAGO, *Suppl.*

MOON-*seed*, in botany, the English name of a genus of plants, called by botanists *Menispermum*. See the article MENISPERMUM, *Append.*

MOOR-*buzzard*. See the article BUZZARD, *Suppl.*

MOOTER, in the dock-yards, the person who forms and smooths the tree-nails for use. *Blanckley's* Nav. Expositor, p. 108.

MORBUS *Hungaricus*. See the article HUNGARICUS *morbus*, *Append.*

MORDELLA, a name given by some writers to the *Ear-wig*. See the article EAR-*wig*, *Append.*

MORDELLA, in zoology, the name of a genus of four-winged flies, distinguished by having the last joint of the antennæ globose; most of the species have also legs for leaping. See the article FLY, *Suppl.*

Of this genus there are a great many species, for which see *Hill*, Hist. Anim. p. 49.

MORILLES, a kind of mushroom, about the bigness of a wallnut, pierced with holes like a honey-comb, and said to be good for creating an appetite. They are also accounted restorative, and frequently used in sauces and ragouts.

MORMYLUS, in ichthyology, the name of a species of *Sparus*, with the upper jaw longest, and with twelve parallel, transverse black lines on each side. See the article SPARUS, *Suppl.*

MORTAR (*Cycl.*) — It is said, that the spherical figure is best for the chamber of a *mortar*. Hist. Acad. Scienc. 1740.

But this proposition seems doubtful. By some experiments made before the Royal Society in 1742, it appeared, that the longest cylindrical chambers of the same capacity threw the ball farthest; which may give ground to suspect that a long cylinder might be a better figure for the chamber of a *Mortar* than a sphere of equal capacity. See the article GUNNERY, *Append.*

Coehorn MORTAR, a small kind of *Mortar*, invented by the famous engineer baron Coehorn, to throw small shells or granades. These *Mortars* are commonly fixed, to the number of a dozen, to a block of oak, at an elevation of 45°.

MORTIFICATION, in medicine. See the article SPHACELUS, *Cycl.* and *Suppl.*

MOSCHUS, the *musk animal*. See the articles MOSCHIFERUM *animal*, and MUSK, *Suppl.*

MOTH, in zoology, the English name of a large class of butterflies, comprehending all the nocturnal ones, or those which fly by night, and called *Phalenæ* by authors. See the article PHALENÆ, *Suppl.*

MOTH-*mullein*, in botany, the English name of a distinct genus of plants, known among botanical writers by that of *Blattaria*. See the article BLATTARIA, *Suppl.*

MOTHER-*wort*, the name for two diftinct genufes of plants, the *cardiaca* and *matricaria*, of botanical writers. See the articles CARDIACA and MATRICARIA, *Suppl.*

MOTHER *of thyme*, the Englifh name of a diftinct genus of plants, called by botanifts *ferpyllum*. See the article SERPYLLUM, *Suppl.*

MOUNTAIN, or HILL. It has been found by experiment, that *hills*, though they meafure twice as much as the plain ground they ftand on, yet the produce of one can be no more than that of the other; and therefore in purchafing lands, the hills ought to be eftimated, not according to their fuperficies, but according to the bafe on which they ftand. So that in fome cafes; that is, if the foil be equally rich, two acres on the fide of a hill ought to pafs for no more than one upon the plain of equally rich land.

The reafon of this is evident; for as long as all plants preferve their upright method of growing, *hilly* ground can bear no more plants in number than the plain at the bafe. Again, as to building on a *hill*, the two fides can bear only the fame number of houfes as the bafe on which it ftands. The fame holds in regard to park-pailing over an *hill*; for tho' the meafure over it be fometimes near double the line at the bottom, yet both may be inclofed by the fame number of pales of the fame breadth. *Miller*'s Gard. Dict. in voc. *Hills*.

The method often ufed for meafuring the heights of *Mountains*, by the finking of the mercury in the barometer, is very far from being accurate in practice. That the mercury generally falls, when the barometer is carried up to a higher ground, is true, and has been known ever fince the time of Pafcal. The only queftion is, in what proportion? and this queftion is not yet determined with fufficient accuracy. The rule followed by the generality of authors, is, that the heights of *Mountains*, or other rifing grounds, are as the logarithms correfponding to the heights of the mercury in the barometer. And the foundation of this rule is, that the denfity of the air is every where proportional to the weight of the fuperincumbent air. But the application of this principle is improper in the prefent cafe, becaufe it can hold true only when the air is of the fame degree of heat, which it feldom is, on the different parts of high *Mountains*, in the valleys, and at the furface of the fea. In afcending the Cordelleras of Peru, for inftance, the air is found to be of all temperatures, from the hotteft fummer, to the coldeft winter. And experiments are directly contrary to the rule. For by Father Feuillée's obfervations on the Pic of Tenerif, the mercury in the barometer ftood at 17 inches five lines Paris meafure, at the height of 13158 Paris feet above the furface of the fea, when the barometer at that furface ftood at 27 inches 10 lines. But, according to the rule abovementioned, the barometer on the Pic ought to have been above two inches and two lines lower than what it was found to be by the experiment.

A difference may alfo be perceived between the computed and obferved heights of the barometer, at much fmaller elevations; fuch as 1542 feet; where the obferved height of the mercury exceeded that found by computation above a line and an half; which would make a very confiderable error in the height of the place.

From whence it follows, that the elafticity or fpring of the air at different heights, is not proportional to its denfity, or which amounts to the fame thing, that the mean degree of heat is different at different heights from the furface of the earth; for it is well known, that a difference of heat will make a difference of elafticity in the air, its denfity remaining the fame. See *Daniel Bernoulli* Hydrodynamic. p. 213. feq.

This learned author obferves, that father Feuillée's experiment on the Pic of Tenerif, overturns all the rules and hypothefes hitherto contrived for difcovering the heights of places, from the fall of mercury in the barometer. Mr. Bernoulli has given a new hypothefis of his own, and has founded fome computations on it, which agree pretty well with the experiments he mentions; but it were to be wifhed that this fubject were re-examined with more care by a greater variety of experiments than has been done hitherto.

Monf. Caffini de Thuri has given us [c] a detail of feveral obfervations made with care on two high *Mountains* of Auvergne, and upon the *Mountain* Canigou, one of the higheft of the Pyrenees. From thefe obfervations it appears, that the variations of the heights of the mercury in the barometer, correfponding to the elevation of places above the level of the fea, follow no regular progreffion; there having been found fometimes an inch of difference between the height of the mercury found by obfervation on the *Mountain* Canigou, from the height that refulted from the progreffion eftablifhed in the Memoirs of the Royal Academy in 1703. This progreffion being deduced from obfervations made at fmall elevations, proved erroneous; nor have any of the hypothefes made fince been fufficient to reconcile the irregularities in obfervations, the exactitude of which admits of no doubt. [[c] Mem. Acad. Scienc. 1740. p. 94.]

MOUNTAIN-*heath*, the name by which fome call the *Saxifrage* of botanical writers. See the article SAXIFRAGE, *Suppl.*

MOURAILLE, or BARNACLES, among farriers, is an inftrument compofed of two branches joined at one end with a hinge. It is commonly made of iron, and ferves to take hold of a horfe's nofe, and keep it tight by bringing to, or almoft clofing the other end of the branches, and fo tying them with a ftrap.

MOUSE (*Suppl.*) — MOUSE, in the fea language, is a large knot artificially made by the riggers on the fhip's ftays. *Blanckley*'s Nav. Expof. p. 108.

MOUSE-*ear*, a name fometimes given to the *Hierachium*, or hawkweed of botanifts. See the article HIERACHIUM, *Suppl.*

MOUSE-*tail*, the Englifh name of a diftinct genus of plants, known among botanifts by that of *Myofurus*. See the article MYOSURUS, *Append.*

Dor-MOUSE, the Englifh name of a genus of animals, called by authors *Sorex*. See the article SOREX, *Suppl.*

Sea-MOUSE, the Englifh name of a genus of infects, called by Dr. Hill *Aphrodita*. See the article APHRODITA, *Append.*

MULBERRY-*blite*, a name ufed by fome for a fpecies of blite. See the article BLITUM, *Suppl.*

MULCH, a term ufed by gardeners for rotten dung, or the like, thrown upon beds of young plants, to preferve them from the bad effects of cold or drought.

MULES, among farriers, a diforder incident to horfes, otherwife called *Scratches*. See the article SCRATCHES, *Cycl.*

MULLEIN, the Englifh name of a diftinct genus of plants, called by botanifts *Verbafcum*. See the article VERBASCUM, *Suppl.*

MULLET (*Suppl.*) is alfo ufed as the name of feveral fpecies of *Trigla*. See the article TRIGLA, *Suppl.*

MUNDICK (*Cycl.*) — This mineral fubftance is of an arfenical nature. See *Geoffroi*, in Mem. Acad. Scienc. 1738. p. 107. edit. Paris.

MUS-*marinus*, a name ufed by fome for the *Aphrodita*, a genus of fea infects. See the article APHRODITA, *Append.*

MUSCA, *Crabroniformis* and *Rapax*, names fometimes ufed for the Fly. See the article ASILUS, *fupra.*

MUSCA *Vefpiformis*, the Wafp-fly. See the article ASILUS, *fupra.*

MUSCLE (*Suppl.*) — *Acceleratory* MUSCLES. See the article ACCELERATOR, *Cycl.*

MUSCUS, *Mofs*, in botany, a very comprehenfive clafs of plants, containing a great many diftinct genera. See the article MOSS, *Suppl.*

MUSICAL *Accent*, among Hebrew grammarians. See the article ACCENT, *Cycl.*

MUSICAL *Numbers* (*Suppl.*) — A table of *mufical* numbers within any propofed limit may be thus expeditioufly formed. Place the terms of the progreffion 1, 5, 25, 125, &c. in a column under each other; and multiply every term of this progreffion by 3, continually, till you forefee that the products will exceed the propofed limit. Then if all the numbers thus found be doubled continually, till it be forefeen that the doubled numbers would exceed the propofed limit; all thefe products together, with the powers of 2, will give the *mufical* numbers required.

Thus if it were required to find all the *mufical* numbers within the compafs of eleven octaves; that is, between 1 and 2048; form the column 1, 5, 25, &c. and multiply every term by 3, continually, as in the annexed example;

1. 3. 9. 27. 81. 343. 729, &c.
5. 15. 45. 135. 405. 1215, &c.
25. 75. 225. 675. 2025, &c.
125. 375. 1125, &c.
625, 1875, &c.
&c.

The numbers of which being doubled as often as poffible within the limit 2048, and collected and ranged in order with the powers of 2, will give the following numbers, 1. 2. 3. 4. 5. 6. 8. 9. 10. 12. 15. 16. 18. 20. 24. 25. 27. 30. &c. as in the following table;

Table of *musical* numbers; contained in eleven octaves.

Num.	Chord Asc.	Chord Desc.	Num.	Chord Asc.	Chord Desc.	Num.	Chord Asc.	Chord Desc.
1	F	B	144	G	A	750	B♯	F♭
2	F^{1}	B^{1}	150	G♯	A♭	768	C	E
3	C	E	160	A	G	800	C♯	E♭
4	F^{2}	B^{2}	162	Ȧ	G̣	810	Ċ♯	Ẹ♭
5	A	G	180	B	F	864	D	*D*
6	C	E	192	C	E	900	D♯	*D*♭
8	F^{3}	B^{3}	200	C♯	E♭	960	E	C
9	G	A	216	D	*D*	972	Ė	C̣
10	A	G	225	D♯	*D*♭	1000	E♯	C♭
12	C	E	240	E	C	1024	F^{10}	B^{10}
15	E	C	243	Ė	C̣	1080	Ḟ♯	Ḅ♭
16	F^{4}	B^{4}	250	E♯	C♭	1125	Ḟ♯♯	Ḅ♭♭
18	G	A	256	F^{8}	B^{8}	1152	G	A
20	A	G	270	Ḟ♯	Ḅ♭	1200	G♯	A♭
24	C	E	288	G	A	1215	Ġ♯	Ạ♭
25	C♯	E♭	300	G♯	A♭	1250	G♯♯	A♭♭
27	D	*D*	320	A	G	1280	A	G
30	E	C	324	Ȧ	G̣	1296	Ȧ	G̣
32	F^{5}	B^{5}	360	B	F	1350	Ȧ♯	G̣♭
36	G	A	375	B♯	F♭	1440	B	F
40	A	G	384	C	E	1458	Ḃ	F
45	B	F	400	C♯	E♭	1500	B♯	F♭
48	C	E	405	Ċ♯	Ẹ♭	1536	C	E
50	C♯	E♭	432	D	*D*	1600	C♯	E♭
54	D	*D*	450	D♯	*D*♭	1620	Ċ♯	Ẹ♭
60	E	C	480	E	C	1728	D	*D*
64	F^{6}	B^{6}	486	Ė	C̣	1800	Ḋ♯	*D*♭
72	G	A	500	E♯	C♭	1875	D♯♯	*D*♭♭
75	G♯	A♭	512	F^{9}	B^{9}	1920	E	C
80	A	G	540	Ḟ♯	Ḅ♭	1944	Ė	C̣
81	Ȧ	G̣	576	G	A	2000	E♯	C♭
90	B	F	600	G♯	A♭	2025	Ė♯	C̣♭
96	C	E	625	G♯♯	A♭♭	2048	F^{11}	B^{11}
100	C♯	E♭	640	A	G			
108	D	*D*	648	Ȧ	G̣			
120	E	C	675	Ȧ♯	G̣♭			
125	E♯	C♭	720	B	F			
128	F^{7}	B^{7}	729	Ḃ	F̣			
135	Ḟ♯	Ḅ♭						

To understand this table it is to be observed, that by dividing a given stretched string or chord, by means of a moveable bridge, the sounds produced by its parts will be higher in pitch than those produced by the given chord. And, on the contrary, if we multiply a chord, that is, by a moveable bridge lengthen the sounding part of a chord, we shall have sounds lower in pitch than the given chord. Hence we have the foundation of an ascending, and of a descending scale of musical sounds. The first column of each division of the table, marked *Num.* expresses the musical numbers; the second column marked *Asc.* the names of the notes in the ascending scale; and the third column marked *Desc.* the names of the notes of the descending scale. Thus if the given chord be unity, and called F, then will 15 be E in the the fourth octave ascending of F; 45 will be B in the sixth octave of F, &c. In the descending scale unity will be B; 15 will be C in the fourth octave descending from B; and 45 will be F of the sixth octave, &c.

The reason why unity is marked F in the ascending scale, and B in the descending scale, is, because according to the received notation of what is called the natural scale among musicians; F has no fourth in ascending, nor B a fourth in descending. Now it is plain that no aliquot division of a string can give a fourth, or any of its octaves ascending; nor can any multiple of a string, give the fourth, or any of its octaves, in descending. For the fourth being expressed by $\frac{4}{3}$ in ascending; and by $\frac{3}{4}$ in descending, its octaves will be $\frac{8}{3}$, $\frac{16}{3}$, $\frac{32}{3}$, &c. in the first case, and $\frac{3}{8}$, $\frac{3}{16}$, $\frac{3}{32}$, &c. in the second case, none of which numbers can be multiples, or submultiples of a given string.

F and B being the given sounds, their octaves will be expressed by F^{1}, F^{2}, F^{3}, &c. and B^{1}, B^{2}, B^{3}, &c. which are, respectively, the first, second, and third octaves above the F and below B.

A dot marked over a letter shews that it signifies a sound higher by a comma than the sound expressed by the letter itself. And a dot placed below, denotes the sound to be lowered by a comma. Thus, in the table I find 81 to be Ȧ | G̣, which denotes that A, or the sharp in the seventh octave of F, ascending, is raised a comma; and that G or the sharp third from B, descending, is lowered by the same interval.

If B in the descending scale be supposed to be a tritonus, that is, two tones major, and one tone minor above F of the ascending scale, then will A in one of these scales correspond or be denoted by the same numbers with G in the other scale; and C will correspond to E, but D in the ascending scale will not be expressed by the same numbers as in the descending scale: For in the former D will be a tone major above C, whereas in the latter D must by analogy be a tone major below E, and therefore only a tone minor above C, which is the reason why *D* is in Italicks in the descending scale.

Mr. Hensling has mentioned the distinction between an ascending and a descending scale in the Miscel. Berolinens. He places unity in the ascending scale in F, as it ought; but in the descending scale he places unity in E, which disturbs the analogy of the two scales.

The trumpet and french horn, not having (commonly) a compass beyond four octaves; and their sounds being formed in a manner analogous to those produced by the division of a string, it follows that all the true notes of these instruments will be represented by the musical numbers, 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, 16, &c. This is a fact well known [a], and a confirmation of the truth of that theory which derives all musical proportions from the elements 2, 3, and 5[b]. — [[a] See the article TRUMPET, *Append.* and Philos. Trans. N° 195. [b] See Phil. Trans. loc. cit.]

MUSK *Hyacinth*, a name sometimes given to a distinct genus of plants, called by botanists *Muscari*. See the article MUSCARI, *Suppl.*

MUSK-*seed*, a name used by some writers for the *Ketmia*. See the article KETMIA, *Suppl.*

MUST (*Suppl.*) — A *must* for artificial wine may be thus made: Take twenty pounds of fine sugar; five gallons of water; four ounces of white tartar finely pulverized, or cream of tartar, and boil them in a large vessel over a gentle fire.

MUSTARD (*Suppl.*)—*Mithridate*-MUSTARD, the name of a genus of plants, called by botanists *Thlaspi*. See the article THLASPI, *Suppl.*

Bastard-Mithridate-MUSTARD, the same with the *Thlaspidium* of botanical writers. See the article THLASPIDIUM, *Suppl.*

Rough-Podded MUSTARD, the name by which a species of *Sysimbrium* is sometimes called. See the article SYSIMBRIUM, *Suppl.*

Tower-MUSTARD, the English name of a distinct genus of plants, called by botanists *Turritis*. See the article TURRITIS, *Suppl.*

Treacle-MUSTARD, a name promiscuously used for two distinct genuses of plants, the *Thlaspi* and *Jonthlaspi*. See the articles THLASPI and JONTHLASPI, *Suppl.*

MUTULE (*Cycl.*) — Le Clerc makes *Mutules* in the entablement of the Doric order, not only to distinguish it the more from other entablements, but also because they agree very well with the nobleness of this order, and add something of a masculine beauty to it.

Mutules are commonly made of the same breadth with the triglyphs; but the same author thinks it would be much better if they were made of the same breadth with the capitals of the triglyphs. Nor does he run his *Mutules* so near the extremity of the larmier or drip, as is usually done; leaving a space of three or four minutes between the two, that the profile may appear the more distinctly.

MYOCTONUM. See the article ACONITE, *Cycl.*

MYOSURUS, *Mouse-tail*, in botany, the name of a distinct genus of plants, the characters of which are these: the cup is a deciduous perianthium, composed of five semi-lanceolate, obtuse, reflex, coloured leaves, joined on above the base. The corolla, which is considerably smaller than the cup, consists of five extremely minute petals, and is tubulated at the base, and opens obliquely inwards. The stamina are five filaments, of the length of the cup; the antheræ are erect, and oblong: the germina are very numerous, and are placed on the receptacle in form of a conic, oblong cluster; there are no styles; the stigmata are simple; there is no pericarpium; the receptacle is extremely long, styliform, and covered with numerous, oblong, and acuminated seeds, laid in an imbricated manner. *Linnæi* Gen. Plant. p. 134.

This genus has a great affinity with the ranunculus, and is common in our corn fields. Dodonæus calls it *Cauda Murina*.

MYRICA, *Sweet William*, in the Linnæan system of botany, the name of a genus of plants, the characters of which are these: The male flowers are arranged in an oblong amentum; the cup is a squama of a lunulated figure; there is no corolla, nor proper perianthium; the stamina are four, rarely six, thread-like filaments, longer than the cup; the antheræ are two in number, and didymous. The female flowers are the same as the male ones; the germen of the pistil is of an oval shape; the styles are two; and the stigmata simple; the fruit is an unilocular berry, containing only one seed. *Linnæi* Gen. Plant. p. 474.

This genus comprehends the *Gale* of Tournefort and others; and is nearly allied to the *Pistachia-nut* tree, a species of *Terebinthus*. See the article TEREBINTHUS, *Suppl.*

MYRTLE, the English name of a genus of trees, called by botanists *Myrtus*. See the article MYRTUS, *Suppl.*

Dutch-MYRTLE, or *Candleberry*-MYRTLE, names sometimes given to the *Myrica*, or *Gale* of botanists. See the article MYRICA, *Append.*

MYRTLE-*Sumach*. See the article SUMACH, *infra*.

N.

N.

NAIA, in zoology, the name of a ſpecies of *Coluber*, the ſcuta of whoſe abdomen are one hundred and ninety in number, and the ſquamæ of the tail ſixty. See the article COLUBER, *Append.*

NAMES. *Specific* NAMES. See the article SPECIFIC, *Suppl.*

NAPELLUS. See the article ACONITE, *Cycl.*

NAPHA, a name given by many of the writers in pharmacy to orange-flower water.

NASEBERRY *tree*, the Engliſh name of a diſtinct genus of plants, called by botaniſts Cainito, or *Chryſophyllum*. See the article CHRYSOPHYLLUM, *Append.*

NASTURTIUM *aquaticum*, the name by which C. Bauhine calls the *Syſimbrium*. See the article SYSIMBRIUM, *Suppl.*

NASTURTIUM-*Indicum*, in botany, a name uſed by ſome for a genus of plants, called by others *Cardamindum*, and *Tropæolum*. See the articles CARDAMINDUM, *Suppl.* and TRAPÆOLUM, *Append.*

NAVEL (*Suppl.*) — NAVEL-*hoods*, in ſhip-building, large pieces of ſtuff fitted into the hawſe-holes, to keep the cables from wearing them. *Blanckley's* Nav. Expoſ. p. 110.

NAVEL-*line*, on ſhip-board, a rope reeved through a block made faſt to the middle rib, and another block made faſt to the maſt-head.

NAVEL-*wort* (*Suppl.*)— *Baſtard* NAVEL-*wort*, a name ſometimes given to the *Craſſula* of botanical writers. See the article CRASSULA, *Append.*

Venus's NAVEL-*wort*, the name of a genus of plants, called by authors *Omphalodes*. See the article OMPHALODES, *Suppl.*

Water NAVEL-*wort*, a name ſometimes given to the *Hydrocotyle* of botaniſts. See the article HYDROCOTYLE, *Suppl.*

NECKIB-*el-eſheraf*, in Egypt, the head of the ſherif, or relations of Mahomet, who has the great cognizance of their actions, and the power of inflicting puniſhments upon them. *Pocock's* Egypt, p. 171.

NECKLACE-*ſnake*. See the article SNAKE, infra.

NECTYDALIS, in zoology, the name of a genus of four-winged inſects, diſtinguiſhed by having the antennæ ſetaceous, the exterior pair of wings dimidiated, and the interior pair membranaceous. *Hill*, Hiſt. Anim, p. 55.

Some have called it a *cimex*, and others a *forficula*, or ear-wig, but both erroneouſly. Id. p. 56.

NEEDLE-*fiſh*, the Engliſh name of the *Syngnathus*, with the middle of the body hexangular, and the tail pinnated. See the article SYNGNATHUS, *Suppl.*

It is the ſame fiſh with the *Acus Ariſtotelis ſpecies altera major*. See the article ACUS, *Suppl.*

NEEDLE-*ſhell*, the Engliſh name of a ſpecies of *Centronia*, or *Echinoderma*. See the articles ECHINODERMA, *Suppl.* and CENTRONIA, *Append.*

NEEDLE-*ſhell* is alſo the Engliſh name of a ſpecies of *Turbo*, which is ſlender, and has ventricoſe ſpires, and a ſmall mouth. See the article TURBO, *Suppl.*

Touch-NEEDLES. See the article TOUCH-*needles*, *Suppl.*

Shepherd's-NEEDLE, the name by which ſome writers call the *Scandix*, or *Venus's-comb*. See the article SCANDIX, *Suppl.*

NEGRO-*oil*, a name by which the *palma* of botaniſts is ſometimes called. See the article PALMA, *Append.*

NEP, *Nepeta*, a name ſometimes uſed for the Cat-mint, or *Cataria* of botaniſts. See the article CATARIA, *Suppl.*

NEPA, the name by which ſome call a genus of inſects, otherwiſe known by that of *Scorpio paluſtris*, the water-ſcorpion. See the article SCORPIO, *Suppl.*

NEREIS, in zoology, a genus of inſects of the gymnarthria kind, the body of which is of a cylindric figure; the tentacula are four in number, but two of them are uſually very ſhort. *Hill*. Hiſt. Anim. p. 92.

Authors have deſcribed this genus under the name of *Scolopendra marina*. See the article SCOLOPENDRA *marina*, *Suppl.*

NERIUM, or NERION, in botany, the name of a genus of plants, called in Engliſh *Oleander*. See the article NERION, *Suppl.*

NETTLE (*Suppl.*) — *Sea*-NETTLE, the Engliſh name of a genus of inſects, called by Dr. Hill *Meduſa*. See the article MEDUSA, *Append.*

Hedge-NETTLE, a name by which ſome call the *Galeopſis* of botanical writers. See the article GALEOPSIS, *Suppl.*

Shrubby Hedge NETTLE, the name given by ſome writers to the *Praſſium*, a diſtinct genus of plants. See the article PRASIUM, *Suppl.*

NEUROPTERA, in zoology, the name by which Dr. Hill calls a claſs of four-winged flies, from their wings being membranaceous with nerves, and being diſpoſed in a reticulated form. Vid. *Hill*, Hiſt. Anim. p. 69.

NIGHT (*Cycl.*) — For the diviſions of the *Night* among the antients, ſee the articles DAY, HOUR, &c. *Cycl.*

NIGHTSHADE, *Climbing* NIGHTSHADE, a name ſometimes uſed for the *Baſella* or *Cuſcuta* of botaniſts. See the article CUSCUTA, *Suppl.*

Deadly NIGHTSHADE, a name by which ſome call the *Belladonna*, a diſtinct genus of plants. See the article BELLADONNA, *Suppl.*

Inchanter's NIGHTSHADE, the Engliſh name of a genus of plants, called by botaniſts *Circæa*. See the article CIRCÆA, *Suppl.*

American NIGHTSHADE, a name given to the *Solanoides*, or *Rivinia*, of botaniſts. See the article RIVINIA, *Suppl.*

Virginian NIGHTSHADE, the name by which ſome call a ſpecies of *Phytolacca*. See the article PHYTOLACCA, *Suppl.*

NINDSI, or NINZI, the name of a diſtinct genus of plants, called by botaniſts *Sium*. See the article SIUM, *Suppl.*

NINSI, in botany, a name uſed by ſome for the *Panax*, or All-heal of Linnæus. See the article PANAX, *Append.*

NINTH, in muſic, one of the diſſonant intervals in muſic. It is properly the ſecond doubled; but is differently uſed. When an upper part ſyncopates, the ſecond is accented and treated as a *Ninth*; i. e. it is reſolved by an eighth, and accompanied by a third or fifth, and often a ſyncopated ſeventh. But when the lower part ſyncopates, the ſecond is not thus uſed, but is accompanied by the fourth and ſixth. In thorough baſs, as the *Ninth* has always, or at leaſt commonly, an eight placed after it thus, 9 8; to ſhew that that is reſolved by deſcending to the Octave. Vid. *Broſſ*. Dict. Muſ. in voc.

NOLI *me tangere*, the name uſed by ſome for a ſpecies of *Balſamine*. See the article BALSAMINA, *Suppl.*

NONE-*ſo-pretty*, a popular name for the *Geum* of botanical authors. See the article GEUM, *Suppl.*

NONE-*ſuch*, a name ſometimes given to the *Lychnis* of botaniſts. See the article LYCHNIS, *Suppl.*

NOSE-*bleed*, in botany, a popular name for the *Millefolium* of botanical writers. See the article MILLEFOLIUM, *Suppl.*

NOTOPEDA, in zoology, a name ſometimes given to the *Elater*, a genus of four-winged flies. See the article ELATER, *Append.*

NUMB-*fiſh*, or *Cramp-fiſh*, names given to the *Torpedo*, which is a ſpecies of *raja*, See the articles RAJA, *Suppl.* and TORPEDO, *Cycl.*

NUMBER (*Cycl.*) — *Figurate* NUMBERS. Thoſe of the firſt order are 1, 1, 1, 1, &c. Thoſe of the ſecond order the ſucceſſive ſums of thoſe of the firſt order, viz. 1, 2, 3, 4, 5, &c. and form an arithmetical progreſſion. Thoſe of the third order are the ſucceſſive ſums of thoſe of the ſecond, viz. 1, 3, 6, 10, 15, and are the triangular numbers. Thoſe of the fourth order are the ſucceſſive ſums of the third, viz. 1, 4, 10, 20, 35, and are the pyramidal numbers, and ſo on.

The figurate *Numbers* of any order may be found without computing thoſe of the preceding orders, by taking the ſucceſſive products of as many of the *Numbers* 1, 2, 3, 4, 5, &c. in their natural order, as there are units in the *Number*, which denominates the order of figurates required, and dividing thoſe products always by the firſt product. Thus the triangular *Numbers* are found by dividing the products 1×2, 2×3, 3×4, 4×5, 5×6, &c. each by the firſt product 1×2. The pyramids alſo are found by dividing the products $1 \times 2 \times 3$, $2 \times 3 \times 4$, $3 \times 4 \times 5$, $4 \times 5 \times 6$, &c. each by $1 \times 2 \times 3$. In general, the figurate *Numbers* of any order denoted by M, are found by ſubſtituting ſucceſſively 1, 2, 3, 4, 5, &c. in the place of x in the general expreſſion $\frac{x.\ x+1.\ x+2.\ x+3.\ \&c.}{1.\ 2.\ 3.\ 4.\ \&c.}$ where the factors in the numerator and denominator are ſuppoſed to be multiplied by each other, and to be continued, till the number in each be equal to that which expreſſes the order of the figurates required, diminiſhed by unity. And when a figurate *Number* of any order is divided by the correſponding figurate of any higher order, the numerator of the quotient is invariable, and x. is in its denominator of as many dimenſions as there are units in the difference of the *Numbers* that denote thoſe orders. See *Mac Laurin's* fluxions Art. 351 in the notes.

Figural NUMBERS. See the article FIGURAL, *Append.*

Muſical NUMBERS. See the article MUSICAL, *Append.*

NUMBERING *Rods*. See the article NEPER's *Bones*, *Cycl.*

NUMMULARIA, *Money-wort*, the name by which ſome call the *Lyſimachia* of botaniſts. See the article LYSIMACHIA, *Suppl.*

NUT *(Suppl.)*—*Bladder*-NUT, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Staphylæa*, and *Staphylodendron*. See the article STAPHYLODENDRON, *Suppl.*

Cocoa-NUT, the name of a genus of plants, called by botaniſts *Cacao*. See the article CACAO, *Suppl.*

Earth-NUT, in botany, a name given to two diſtinct genuſes of plants, called by botaniſts *Bulbocaſtanum* and *Arachis*. See the articles BULBOCASTANUM, *Suppl.* and ARACHIS, *Append.*

Hazle-NUT, in botany. See the article HAZLE, *Suppl.*

Malabar-NUT, the name of a genus of plants, known among botaniſts by that of *Adhatoda*. See the article ADHATODA, *Suppl.*

Peas-NUT, the name by which ſome call the *Lathyrus* of botanical writers. See the article LATHYRUS, *Suppl.*

Phyſic NUT, a name ſometimes given to the *Ricinoides* of Tournefort. See the article RICINOIDES, *Suppl.*

Pig-NUT, a name by which the *Bulbocaſtanum*, or earth-*nut*, is ſometimes called. See the article BULBOCASTANUM, *Suppl.*

Spaniſh-NUT, a name by which ſome call the *Siſyrinchium* of botanical writers. See the article SISYRINCHIUM, *Suppl.*

Wall-NUT, the name of a well known genus of trees, called by Linnæus *Juglans*, and by Tournefort ſimply *Nux*. See the article NUX. *Suppl.*

NYCTANTHES, in the Linnean ſyſtem of botany, the name of a genus of plants, the characters of which are theſe; the cup is a one-leaved perianthium, very ſmall, of a cylindric figure, lightly divided into eight ſegments, or denticulæ, of a ſubulated figure, and permanent. The flower conſiſts of a ſingle petal, and is of a hypocrateriform kind; the tube is cylindric, and longer than the cup; the limb is plain, divided into eight ſegments of an oblong figure, and patent; the ſtamina are two extremely ſmall filaments, affixed to the receptacle, and of a ſubulated figure; the antheræ are erect, and ſomewhat acute; the germen of the piſtil is roundiſh and depreſſed; the ſtyle is ſimple, and of the length of the tube; the ſtigmata are two, and are erect; the fruit is a didymous berry, of a roundiſh figure, and contains two cells; the ſeeds are roundiſh and large, and one only is contained in each cell. *Linnæi* Gen. Plant. p. 6.

O.

OAK (*Cycl.*) — OAK-*of-Jerusalem*, the English name of a genus of plants, called by botanists *Chenopodium*, See the article CHENOPODIUM, *Suppl.*

Poison-OAK, a name sometimes given to the *Toxicodendron* of botanists. See the article TOXICODENDRON, *Suppl.*

OAT-*grass*, in botany. See the article GRASS, *Append.*

OBELIAS, among the antients, a kind of small cakes, which were toasted on little spits, and served to table as a desert to be eaten dipped in sweet wine, called *Passum*. *Pitisc.* in voc.

OBELLISCOTHECA, the name given by Vaillant to a genus of plants, called by Linnæus *Rudbeckia*. See the article RUDBECKIA, *Append.*

OBTUSE (*Cycl.*) — OBTUSE-*angular Section of a Cone*, a name given to the hyperbola by antient geometricians, because they considered it only in such a cone, whose section by the axis is a triangle, *obtuse*-angled at the vertex.

OCKHAM, or OCHAM, See the article OAKHAM, *Cycl.*

OCTAETIS, in natural history, a name given by Linnæus, and many other authors, to a kind of star-fish of the astrophyte class, the rays of which are eight in number, where they first part from the body, but soon divide into many more.

OIL-*beetle*, the English name of a genus of insects, called by Dr. Hill *Meloe*. See the article MELOE, *Append.*

OILY-*grain*, the name by which some call the *Sessamum*, of botanical authors. See the article SESSAMUM, *Append.*

OLD-*wife-fish*, the name by which a species of *Ballistes* is called in several of our plantations. See the article BALLISTES, *Suppl.*

OLD-*wife* is also a name given to the *wrasse*, a species of *Labrus*. See the article LABRUS, *Suppl.*

OLIVE (*Suppl.*) — *Spurge*-OLIVE, a name sometimes given to the *Thymelæa* of botanists. See the article THYMELÆA, *Suppl.*

Wild-OLIVE, the English name of a distinct genus of plants, called by Linnæus *Elæagnus*. See the article ELÆAGNUS, *Suppl.*

Wild-OLIVE *of Barbadoes*, a name by which some call the *Bontia*, a distinct genus of plants. See the article BONTIA, *Suppl.*

ONE-*berry*, a name by which the *herba Paris* is sometimes called. See the article HERBA *Paris*, *Suppl.*

ONE-*blade*, or ONE-*leaf*, names sometimes given to the *Smilax* of botanical writers. See the article SMILAX, *Suppl.*

ONION(*Suppl.*)— *Sea*-ONION, a name by which the *Scilla* of botanists is sometimes called. See the article SCILLA, *Append.*

OPERCULUM, in the history of shell-fish, denotes the cartilaginous cover, with which nature has furnished the mouths of the univalve water-shells; for as to the land ones, they have only a viscid liquor to supply the place of an *Operculum*.

ORACH, a name by which the *Chenopodium* of botanical authors is sometimes called. See the article CHENOPODIUM, *Suppl.*

ORANGE-*Mint*, the name of a species of *Mint*. See the articles MENTHA and MINT, *Suppl.*

Mock-ORANGE, a name sometimes given to the *Syringa*, or pipe-tree. See the article SYRINGA, *Suppl.*

ORELLANA, in botany, a name given to a species of *Mitella*. See the article MITELLA, *Suppl.*

ORPHEUS. This fish has been called *Orphos*, *Orphus*, and *Cernua*, by different writers. It is a species of *Sparus*, with the tail not forked, and with a black spot near it. See the articles SPARUS and ORPHEUS, *Suppl.*

ORPINE, in botany, the English name of a genus of plants, known among botanical writers by that of *Telephium*. See the article TELEPHIUM, *Suppl.*

Bastard-ORPINE, a name given to two distinct genuses of plants, called by botanists *Anacampseros* and *Andrachne*. See the articles ANACAMPSEROS, and ANDRACHNE, *Suppl.*

ORRERY, an astronomical instrument, or rather machine, for representing the motions and various appearances of the planets; and hence, with greater propriety, called *Planetarium*. See the article PLANETARIUM, *Append.*

The reason of its being called an *Orrery*, was this: Mr. Rowley, a mathematical instrument-maker, having got one from Mr. George Graham, the original inventor, to be sent abroad with some of his own instruments, he copied it, and made the first for the Earl of *Orrery*. Sir Richard Steel, who knew nothing of Mr. Graham's machine, thinking to do justice to the first encourager, as well as to the inventor, of such a curious instrument, called it an *Orrery*, and gave Mr. Rowley the praise due to Mr. Graham. *Desaguliers*, Experiment. Phil. vol. 1. p. 430.

Since that time *Orreries* have been much in vogue, and executed in the most ornamental manner.

ORTHOCEROS, the same as *Orthocerites*. See the article ORTHOCERITES, *Suppl.*

ORYZA, *Rice*, in botany, the name of a genus of plants, of which we know only one species: The characters are these: The cup is a glume, composed of two valves, with a single flower; it is very small, and the valves are acuminated, and nearly equal in size; the flower is also composed of two obtuse and permanent valves; the nectarium consists of two very small deciduous leaves; the stamina are six capillary filaments of the length of the flower; the antheræ are bifid at the base; the germen of the pistil is of a turbinated figure; the styles are two, capillary, and reflex; the stigmata are plumose; there is no pericarpium; the seed is single, large, oblong, obtuse, and compressed. *Linnæi* Gen. Plant. p. 152.

OSCULATION in geometry, is used for the contact between any given curve and its osculatory circle; that is, the circle of the same curvature with the given curve. See the article CURVATURE, *Append.*

OSCULATORY-*circle*, in geometry, is used chiefly by foreign mathematicians, for the circle of curvature; that is, the circle having the same curvature with any curve at any given point. See the article CURVATURE, *Append.*

OSCULATORY-*Parabola*. See the article PARABOLA, *Append.*

OSCULATORY-*point*, the point of contact between a curve and its *osculatory* circle. See the article CURVATURE, *Append.*

OSIER, the English name for the willow with very long and narrow leaves. See the article SALIX, *Suppl.*

OTARDES, in ornithology. See the article OTIS, *Suppl.*

OUZEL, or *Ring*-OUZEL, the English name of the black *Turdus*, with a white ring round its neck. See the article TURDUS, *Suppl.*

OWL, in ornithology, a large genus of birds, for the characters of which see the article STRIX, *Suppl.*

Grey-OWL. See the article ULULA, *Suppl.*

Great-white OWL, a very large species, nearly equal to a goose in bigness; of a beautiful bright white all over, only sprinkled, as it were, with little spots of a blackish colour.

The other species are: 1. The black and white horned *Owl*. 2. The lesser horned *Owl*. 3. The yellow *Owl*. 4. The hazel-eyed *Owl*. 5. The yellow-eyed *Owl*. 6. The *Owl*, with a variegated tail. 7. The little *Owl*. 8. The common brown *Owl*, or Jay-*Owl*. 9. The *Scops*. 10. The German horned *Owl*. 11. The church *Owl*, or lesser barn *Owl*. 12. The white-beaked *Owl*. 13. The yellow-beaked American *Owl*. 14. The *Jacurutu*. *Hill*, Hist. Anim. p. 119. seq.

OX-*eye*, in botany, the English name of a genus of plants, called by botanists *Buphthalmum*. See the article BUPHTHALMUM, *Suppl.*

OX-*eye-daisy*, a name sometimes given to the *Leucanthemum* of botannical writers. See the article LEUCANTHEMUM, *Suppl.*

OX-*lip*, a name by which the *Primula veris*, primrose, or prime rose, is sometimes called. See the article PRIMULA, *Suppl.*

P.

P.

PADDLE, or PADDLE-*ftaff*, a fmall ftaff, fhod with iron, for cleanfing the plough from ftubble, clods, earth, &c. Dict. Ruft. in voc.

It is alfo much ufed by mole-catchers.

PADUS, in the Linnæan fyftem of botany, the name of a genus of plants, the characters of which are thefe : The cup is a permanent perianthium, formed of a fingle leaf, of a campanulated figure, villofe at the bafe, divided into five fegments, patent, and fcarce at all reflex ; the flower confifts of five large, roundifh, patent petals, inferted by their ungues into the edge of the calyx ; the ftamina are twenty or thirty filaments, of a fubulated figure, nearly of the length of the flower, and inferted into the calyx ; the antheræ are roundifh ; the germen is roundifh ; the ftyle is filiform, and of the length of the ftamina ; the ftigma is obtufe and entire ; the fruit is a roundifh drupe ; the feed is an oval, acuminated nut, with a furrow ; the receptacle of the flower, which invefts the inner furface of the cup, is hairy in this genus ; which comprehends the *Laurocerafus*, and *Cerafus avium* of authors. Vid. *Linnæi* Gen. Plant. p. 215.

PAIGLES, a name fometimes ufed for the *Primula*, or *Cowflip*. See the article PRIMULA, *Suppl.*

PAINS, or *After*-PAINS in Midwifry. See the articles DELIVERY and LYING-*in-women*.

PALM-*tree*, *Palma*, in botany, the name of a diftinct genus of plants, called by Linnæus *Phœnix*. See the article PHOENIX, *Suppl.*

PALMA *Chrifti*, a name frequently given to the common *Ricinus*. See the article RICINUS, *Suppl.*

PALMETTO, the name by which fome call a fpecies of the palm or date-tree, defcribed by Linnæus under that of *Phœnix*. See the article PHOENIX, *Suppl.*

PANAX, in the Linnæan fyftem of botany, the name of a diftinct genus of plants, the characters of which are thefe : The umbel of the calyx is fimple, equal and thick ; the involucrum is very fmall, and formed of a number of leaves, fubulated and permanent ; the perianthium of each flower is very fmall, divided into five fegments, and permanent ; the general corolla is uniform, and the peculiar ones confift of five oblong, crooked, equal petals. The ftamina are five very fhort filaments ; the antheræ are fimple ; the germen of the piftil is roundifh, and placed below the perianthium ; the ftyles are two, and fmall ; and the ftigmata are fimple ; the fruit is a roundifh berry, having one cell, and is coronated with the cup ; the feeds are two, and of a kidney-like fhape.

This genus comprehends the famous *Ginfeng*, *Araliaftrum*, *Ninfi*, and *Aureliana* of other writers.

PANCRATIUM, the *fea-daffodil*, in botany, the name of a genus of plants, the characters of which are thefe : The cup is an oblong, obtufe, compreffed fpatha, opening in the plane fide, and deciduous ; the nectarium of the flower is formed of a fingle leaf, of a cylindraceo-infundibuliform fhape, coloured at top, and with an open mouth, divided into ten fegments ; the petals are fix, lanceolated and plane, and are inferted externally into the tube of the nectarium, above the bafe ; the ftamina are fix fubulated filaments, affixed to the apex of the nectarium ; the antheræ are oblong, and incumbent ; the germen of the piftil is trigonal, and placed under the receptacle ; the ftyle is filiform, and fomewhat longer than the ftamina ; the ftigma is obtufe ; the fruit is a roundifh, triquetrous capfule, formed of three valves, and containing three cells ; the feeds are numerous and globofe ; and the receptacle is columnar. Vid. *Linnæi* Gen. Plant. p. 138.

PANIC, *Panicum*, in botany, the name of a diftinct genus of plants. See the article PANICUM, *Suppl.*

PANICLE, *Panicula*, among botanifts. See the article PANICULA, *Cycl.* and *Append.*

PANICULA (*Cycl.*) — According to Mr. Miller, the *Panicula*, or panicle, is a ftalk diffufed into feveral pedicles, or footftalks, fuftaining the flowers or fruits, as in oats, &c. *Miller*, Gard. Dict.

PANORPA, the *fcorpion-fly*, in zoology, a genus of four-winged infects of the *Neuropetra* kind, the diftinguifhing characters of which are thefe : Its roftrum or trunk is of a cylindric figure, and horny ftructure ; and its tail is furnifhed with a weapon of the cheliform kind. See the article SCORPION-*fly*, *Suppl.*

PANSEY, or PANSY, a fpecies of violet, otherwife called the *Heart's-eafe*. See the articles VIOLA, *Suppl.* and HEART'S EASE, *Append.*

PAPAW, the name by which fome call the *Papaya*, a diftinct genus of plants. See the article PAPAYA, *Suppl.*

PAPPOSE-*plants*, among botanifts, fuch whofe feeds are covered with a *Pappus*, or down. See the article PAPPUS, *Cycl.*

PARABOLA (*Cycl.*)— *Ofculatory*-PARABOLA, in geometry, is ufed particularly for that *Parabola* which not only ofculates or meafures the curvature of any curve at a given point, but alfo meafures the variation of the curvature at that point. See *Mac Laurin's* Appendix to his Algebra, p. 17. *Cramer*, Analyf. des Lignes Courbes, p. 559. See the article CURVATURE, *Append.*

A curve, ftrictly fpeaking, may have an indefinite number of *Ofculatory Parabolas* at any of its points ; but the appellation may be reftrained to that particular *Parabola* which meets the curve fo clofely, that no other parabolic arc can be drawn between them ; and this *Parabola* will meafure the variation of the curvature of the curve at that point. See the article VARIATION of *curvature*, *Suppl.*

PARABOLIFORM *Curves*, a name fometimes given to the parabolas of the higher kind.

PARADISE (*Cycl.*) *Bird of* PARADISE. See the articles PARADISÆA and MANUCODIATA, *Suppl.*

PARALLELOGRAM (*Cycl.* and *Suppl.*) — *Newtonian*, or *Analytic*. PARALLELOGRAM, in algebra, an appellation ufed for an invention of Sir Ifaac Newton's, to find the firft term of an infinite converging feries.

This is fometimes called the method of the *Parallelogram* and *Ruler* ; becaufe a ruler or right line is alfo ufed in it.

This *analytic Prallelogram* is formed by dividing any *Parallelogram* into equal fquares or *Parallelograms*, by lines drawn horizontally and perpendicularly through the equal divifions of the fides of the *Parallelogram*. The cells thus formed are filled with the dimenfions of the fpecies x and y, and their products. The powers, $y^0 = 1$, y, y^2, y^3, y^4; &c. of y, for inftance, being placed in the loweft horizontal range of cells, and the powers of x, or $x^0 = 1$, x, x^2, x^3, &c. in the vertical column to the left, or vice verfa ; fo that thefe powers and their products will ftand thus :

A						
	x^4	$x^4 y$	$x^4 y^2$	$x^4 y^3$	$x^4 y^4$	
	x^3	$x^3 y$	$x^3 y^2$	$x^3 y^3$	$x^3 y^4$	
	x^2	$x^2 y$	$x^2 y^2$	$x^2 y^3$	$x^2 y^4$	
	x	$x y$	$x y^2$	$x y^3$	$x y^4$	
B	1	y	y^2	y^3	y^4	C

Then, when any literal equation is propofed, mark fuch of the the *Parallelograms* or cells, as correfpond to all its terms ; and let a ruler be applied to two, or perhaps more, of the *Parallelograms* fo marked, of which let one be the loweft in the left-hand column at A B, the other touching the ruler towards the right-hand ; and let all the reft not touching the ruler lie above it. Then felect thefe terms of the equation which are reprefented by the *Parallelograms* that touch the ruler, and from them find the quantity to be put in the quote.

This is Sir Ifaac Newton's famous rule, of the application of which he has left us fome examples in his method of fluxions and infinite feries, p. 9 and 10. but without demonftration ; which has been fince fupplied by others. See Mr. *Colfon's* Comment on that treatife, p. 192, feq. *Mac Laurin's* Algebra, p. 251, feq. and particularly Monf. *Cramer's* Analyf. des Lignes Courbes, chap. 7. p. 148, feq.

This learned author obferves [a], that this invention, which is the true foundation of the method of feries, was but imperfectly underftood, and not valued as it deferved for a long time. He thinks it more convenient in practice to ufe the *Analytic Triangle* [b] of the Abbé de Gua, which takes in no more than the diagonal cells lying between A and C, and thofe which lie between them and B. [[a] In his preface, p. 11. [b] Lib. cit. p. 156.]

PARALLELOPLEURON, a term ufed by fome writers for an imperfect parallelogram, or a kind of trapezium, having unequal angles and fides, but which obferve a certain regularity and proportion.

PARAMECIUM, in zoology, the name given by Dr. Hill to a genus of animalcules of the *Gymnia* kind, and of an irregular oblong figure. See the articles ANIMALCULE *Cycl.* *Suppl.* and *Append.* and GYMNIA, *Append.*

Of this genus authors defcribe feveral fpecies ; for which fee *Hill*, Hift. Anim. p. 4. feq.

PARASITICAL *Plants*. See the article PARASITE, *Cycl.*

PARK *Leaves*, a name by which the *Androfæmum*, or *Tutfan*, is fometimes called. See the article ANDROSÆMUM, *Suppl.*

PARENCHYMA (*Cycl.*)—Befides the veffels and canals of the human body, the antients fuppofed a fimple homogeneous and firm matter, peculiar to each part, and thereby diftinguifhing the

the habit of one part from that of another. But fome moderns have denied the exiftence of a *Parenchyma*, or pulpy matter, and have afferted, that the whole body is compofed of veffels and canals. The chief promoter of this opinion was Ruyfch, who having laid the injected parts of the body in rectified fpirit of wine, and then dried them in the air; whatever was not injected, was thereby diffipated, and the remainder confifted merely of veffels; from whence he concluded, that the whole was compofed of veffels. But it feems certain, that a frefh mufcle can never be fo injected, as to appear wholly compofed of canals. If indeed, after injection, it be fuffered to dry, the parts not injected will exhale, and the more the mufcle is dried, the more it will appear compofed of veffels. What is here faid of a mufcle, holds true of all other parts of the body. Thus many veffels run through the fubftance of a bone; but no one has yet been able to demonftrate, that the whole bone is compofed of veffels. There always remains a fubftance peculiar to bones, which has never yet been fhewn to be vafcular. In the brain alfo there always remains fomething which cannot be demonftrated vafcular.

The *Parenchyma* is fenfibly full of juices, fo that very little of truly folid matter remains, when thefe juices are exhaled.

PARIS-*herb*, in botany, the name of a diftinct genus of plants. See the article HERBA *Paris*, *Suppl.*

PAROTID-*glands*. In a fuppuration of thefe, one caution only is needful; namely, to open the abfcefs, as foon as it can be fuppofed to have formed matter; without waiting for a fluctuation, or even foftnefs of the tumour, that may never happen; the pores being here fo very vifcid, that after it is ripe, the part will feel as hard as if the fuppuration had not begun. *Pringle*, Obferv. on the Difeafes of the Army, p. 277.

PARROQUET, in ornithology, the name by which we call the fmaller fpecies of Parrots. See the article PSITTACUS, *Suppl.*

There are a great number of diftinct fpecies of *Parroquets*, as well as of Parrots, which having got peculiar names, are defcribed under their refpective articles.

PARSLEY (*Suppl.*) — *Baftard*-PARSLEY, the name of a genus of plants, known among botanifts by that of *Caucalis*. See the article CAUCALIS, *Suppl.*

Corn-PARSLEY, *Field*-PARSLEY, and *Macedonian*-PARSLEY, names ufed by fome for a fpecies of *Sium*. See the article SIUM, *Suppl.*

Fool's-PARSLEY, the name given by fome writers to a fpecies of *Cicuta*, or hemlock. See the article CICUTA, *Suppl.*

Macedonian-PARSLEY, the name by which the *Myrrhis* of botanifts is fometimes called. See the article MYRRHIS, *Suppl.*

Mountain-PARSLEY, the Englifh name of a genus of plants, called by botanifts *Oreofelinum*. See the article OREOSELINUM, *Suppl.*

PARSLING, on fhip-board, fmall pieces of old canvas, cut four inches broad, and wrapped about fhrouds, ftays, ftraps for blocks, &c. before ferved with fpun yarn. *Blanckley's* Nav. Expof. p. 115.

PARSNEP (*Suppl.*) — *Cows*-PARSNEP, the Englifh name of a diftinct genus of plants, called by botanifts *Sphondylium*. See the article SPHONDYLIUM, *Suppl.*

Sea or *Prickly-headed* PARSNEP, names given to the *Echinophora* of botanifts. See the article ECHINOPHORA, *Suppl.*

Water-PARSNEP, the name ufed by fome for a fpecies of *Sium*, See the article SIUM, *Suppl.*

PASSION-*flower*, the Englifh name of a genus of plants, called by botanifts *Granadilla*. See the article GRANADILLA, *Suppl.*

PASTE (*Suppl.*) — *Chryfolite* PASTE. See the article CHRYSOLITE, *Append.*

PASTINACHA (*Suppl.*) — is alfo ufed for the carrot, or *Daucus* of botanifts. See the article DAUCUS, *Suppl.*

PEA (*Suppl.*) — *Everlafting*-PEA, or *Earth-nut* PEA, names fometimes given to the *Lathyrus*. See the article LATHYRUS, *Suppl.*

Heart-PEA, or *Bladder*-PEA, names by which the *Corindum* of botanifts is fometimes called. See the article CORINDUM, *Suppl.*

Indian-PEA, the name by which a fpecies of *Orobus* is fometimes called. See the article OROBUS, *Suppl.*

Pigeon-PEA, a name fometimes given to the *Cytifus*, or fhrubtrefoil. See the article CYTISUS, *Suppl.*

Scarlet-PEA, in botany, the Englifh name of a genus of plants, called by Linnæus *Glycine*. See the article GLYCINE, *Suppl.*

Winged-PEA, a name by which fome call the *Lotus*. See the article LOTUS, *Suppl.*

PEACOCK, in ornithology, the Englifh name of a genus of birds, called by zoologifts *Pavo*. See the article PAVO, *Suppl.*

PEACOCK-*fifh*, the Englifh name of a fifh of the *Turdus*, or wraffe-kind. See the article PAVO, *Suppl.*

PEAR (*Suppl.*) — *Prickly*-PEAR, a name fometimes ufed for the *Opuntia Cereus*, *Melocactus*, &c. all comprehended by Linnæus under that of *Cactus*. See the article CACTUS, *Suppl.* and *Append.*

PEDALES. See the article ABBOT, *Cycl.*

PEEVIT, the Englifh name of a bird of the *Larus*, or gullkind, with a black head, and grey coloured body. See the article LARUS, *Suppl.*

PELLITORY *of Spain*, the Englifh name of a genus of plants called by different authors *Chamæmelum* and *Buphthalmum*. Linnæus defcribes it under this laft. See the article BUPHTHALMUM, *Suppl.*

The root of this plant is known in the fhops by the name of *Pyrethrum*. See the article PYRETHRUM, *Suppl.*

Double PELLITORY, a name fometimes given to the *Ptarmica*, or fneezewort, of botanical writers. See the article PTARMICA, *Suppl.*

PENDULUM (*Cycl.* and *Suppl.*) — Huygens having difcovered that the vibrations of a *Pendulum* movingin a cycloid, would be performed in equal times, even tho' the vibrations were unequal, this principle was applied to the conftruction of *Pendulum*-clocks; but great inequalities were ftill obferved in their motions; and many years paffed before any fuccefsful attempts were made to remedy thefe irregularities. The late excellent artift Mr. George Graham apprehending, that the irregularities in the motions of clocks arofe from a change of length in the *Pendulum*, by the influences of heat and cold, made feveral trials in order to difcover whether there was any confiderable difference of expanfion between brafs, fteel, iron, filver, &c. when expofed to the fame degrees of heat; conceiving that it would not be very difficult, by making ufe of two forts of metals differing confiderably in their degrees of expanfion and contraction, to remedy, in a great meafure, the irregularities to which common *Pendulums* are fubject. But no hopes of fuccefs arifing from the experiments he then made, he turned his thoughts to the application of the obfervations he had made about the extraordinary expanfion of quickfilver by heat, and he found out a proper method of applying a column of that fluid to the *Pendulum* of a clock, in order to prevent the irregularities arifing from its different lengths by the effects of heat and cold, which fucceeded extremely well, and is what is now called Mr. Graham's *Quickfilver Pendulum*.

After this, Mr. John Harrifon, of Barrow, in Lincolnfhire, one of the moft ingenious artifts of the age, and famous for his invention of the clock for finding the difference of longitude at fea, without having the leaft knowledge of what Mr. Graham had done before him, made feveral experiments upon wires of different metals, in order to find their different degrees of expanfion and contraction. He thought that by a proper combination of wires of two different metals, differing confiderably in their expanfion and contraction, he might be enabled to keep the center of ofcillation of a *Pendulum* always at the fame diftance, from the point of fufpenfion. In confequence of thefe experiments, he made a *Pendulum* confifting of one fteel wire, at the end of which is the bob or weight; and on each fide of this wire, four wires alternately brafs and fteel, fo difpofed and contrived, as to raife the *Pendulum* by the fame quantity that it is lengthened by heat, and to let down the *Pendulum* in the fame proportion as it is raifed by cold.

Mr. Harrifon, in his firft machine for meafuring time at fea, likewife applied this combination of wires of brafs and fteel, to prevent any alterations by heat and cold. And in the two machines or clocks he has fince made for the fame purpofe, a like method of guarding againft the irregularities arifing from this caufe is ufed.

Mr. Graham alfo made a *Pendulum* confifting of three bars, one of fteel between two of brafs, and the fteel bar acted upon a lever, fo as to raife the *Pendulum*, when lengthened by heat, and to let it down, when fhortened by cold; but he found this clock liable to fudden ftarts and jerks in its motion. See Mr. Short, in the Phil. Tranf. vol. 47. p. 517. feq. who there alfo mentions a *Pendulum* of this kind made by Mr. Fotheringham, a quaker in Lincolnfhire.

The ingenious Mr. Ellicot [a] has given a defcription of two methods ufed by himfelf, by which the irregularity of the motion of a clock, arifing from the influence of heat and cold, upon the rod of the *Pendulum*, may be prevented. Mr. Ellicot tells us, that having by many experiments with his pyrometer [b] found a great difference between the expanfion of brafs and iron, he made a *Pendulum* compofed of thofe two metals, and applied it fo fuccefsfully to regulate the motion of a clock, that he avoided all the jerks to which it was fufpected the motion of the machine would be liable. [[a] Phil. Tranf. vol. 47. p. 479. feq. [b] See the article PYROMETER, *Append.*]

Befides the irregularities arifing from heat and cold, *Pendulum*-clocks are liable to others from friction, and from foulnefs, owing to the oil ufed. But Mr. Harrifon has feveral excellent contrivances by which his clocks are almoft entirely free from friction; and therefore he ufes no oil, fo that there is no neceffity of ever cleaning. See Mr. *Short*, ubi fupra. See alfo Monf. Caffini, in Mem. Acad. Scienc. 1741.

PENGUIN, or PINGUIN, in botany, the name by which Dillenius calls the *Ananas* of Tournefort. See the article ANANAS, *Suppl.*

PENNY-*wort*, a name sometimes given to the *Cotyledon*, or navel-wort of botanical writers. See the article NAVELWORT, *Suppl.*

Marsh-PENNY-*wort*, the English name of a genus of plants, called by botanists *Hydrocotyle*. See the article HYDROCOTYLE, *Suppl.*

PENTELASMIS, in the history of shell-fish, the name by which Dr. Hill calls the *conchæ anatiferæ* of other writers. See the article ANATIFERA *concha*, *Suppl.*

The *Pentelasmis*, according to him, is a genus of animals, composed of a shelly body, affixed to a fleshy and soft pedicle; the body is composed of five valves, and the pedicle is sometimes short, and sometimes long. The animal itself belongs to the *Tritons*. See the article TRITON, *Append.*

PEONY, or PIONY, in botany, the English name of a distinct genus of plants, called by botanists *Pæonia*. See the article PÆONIA, *Suppl.*

PEPPER (*Suppl.*) — *Indian* PEPPER, or *Guinea* PEPPER, names by which some call the *Capsicum* of botanists. See the article CAPSICUM, *Suppl.*

Poor-man's-PEPPER, a name sometimes given to the *Lepidium*. See the article LEPIDIUM, *Suppl.*

Water-PEPPER, a name sometimes given to a species of *Sedum*, or House-leek. See the article SEDUM, *Suppl.*

PEPPER-*mint*, the name of a species of mint. See the articles MENTHA and MINT, *Suppl.*

PEPPER-*wort*, a name by which some call the *Lepidium*, or dittander. See the article LEPIDIUM, *Suppl.*

PEPPER-*bird*, the English name of the *Rhamphastos*, with a yellow rump, otherwise called *Toucan*. See the article TOUCAN, *Suppl.*

PERESKIA, in botany, a name given by Plumier to a genus of plants, comprehended under the *Cactus* of Linnæus. See the articles CACTUS, *Append.* and MELOCACTUS, *Suppl.*

PERSEA, in botany, the name given by Plumier to a species of the Laurel of Linnæus. See the article LAURUS, *Append.*

PERSIMON, in botany, a name sometimes given to the *Lachryma Jobi*, or Job's tears. See the article LACHRYMA, *Append.*

PESTILENCE-*wort*, a name sometimes given to the *Petasites*, or butter-burr. See the article PETASITES, *Suppl.*

PETAL (*Suppl.*) — The *Petal* of a plant is that part which, for want of a more distinct expression, we call in English the leaves of the flower. See the article FLOWER, *Suppl.*

That great botanist, the late Mr. Pitton Tournefort, fixed upon the most striking and shewy parts of vegetables, as the foundation of his method and generical divisions of the vegetable world; which he has accordingly rang'd into twenty-two classes.

The first is of the plants with a *monopetalous* or one-leaved flower, form'd like a bell; and the flowers of this class he afterwards subdivides into four kinds; first, the *bell-fashioned* flowers properly so called, as being very nearly of the regular shape of a bell: Secondly, the *tubulate bell-fashioned* flowers, which are narrow and oblong: Thirdly, the *expanded*, which open in form of a wide bason: And, fourthly, the *globose*; the mouth of which is narrower than the body. In this class he comprehends the *Mandrake*, *Lilly of the valley*, &c.

The second class is of the plants with *monopetalous funnel-fashioned*, and *rotated*, or wheel-like flowers. The flowers of this class he divides into two kinds only; the one representing at its mouth, the bottom of an inverted cone, the other a salver or sawcer; and these he distinguishes by the names of *funnel-fashioned* and *salver-like* flowers: Of this class are the *Tobacco*, *Henbane*, &c.

The third class is of what he calls the plants with *anomalous*, *monopetalous* flowers; of these he makes the variously-shaped *monopetalous* flowers of *Birthwort*, *Foxglove*, *Figwort*, and some others; some of which represent a face, and others the snout of an animal: To distinguish the plants of this class the author however is oblig'd fairly to confess the imperfection of the method of classing by the *Petals* alone, and call in the assistance of the different structure of the seed vessels. In this class he comprehends the *Toadflax*, *Butterwort*, &c.

The fourth class is of the plants, which have a *monopetalous*, *labiated*, or lipp'd flower; which he defines to be such an one as is narrow, like a pipe within, and expanded; and in form of lips at the mouth. In this class are comprehended the *Sage*, *Clary*, *Deadnettle*, *Mint*, *Baum*, &c.

The fifth class is of the plants with a *polypetalous*, *cruciform* flower; that is, such an one as is composed of a number of leaves, disposed in form of a cross; and these he afterwards more nicely defines to be such as are always composed of four *Petala*, or leaves only, and those ever disposed in form of a cross. Of this class are the *Cresses*, *Mustard*, *Scurvy-grass*, &c.

The sixth class is of the plants which have a *rosaceous*, or rose-like flower. This he defines to be such an one as is composed of many leaves or *Petals*, disposed like those of the rose into a round figure: The number of *Petals*, he adds, is uncertain and indeterminate in this class; and that they are frequently five, and more rarely four than two. Of this class are the *Chickweed*, *Orpine*, *Saxifrage*, *Rue*, &c.

The seventh class is of the plants with *umbelliferous* flowers. These he defines to be *polypetalous*, *rosaceous* flowers, whose cup goes off into a fruit composed of two seeds, cohering firmly together while green, but naturally separating, when ripe; and observes, that in this class the flowers are generally disposed in great numbers together, and in the form of what the ladies call an *umbrella*, us'd to be carry'd over them to keep off the sun; but he does not make this a necessary character of the class. The plants comprehended under this are *Carrots*, *Parsneps*, *Earth-nuts*, *Chervel*, *Fennel*, &c.

The eighth class is of the plants with a *caryophyllous* or pink-like flower, which he defines to be such an one as is composed of many *Petals*, disposed in an orbicular form, and arising each from the bottom of the cup, as from a tube, in the same manner as they do in the common pink. Of this class are the *Catchfly*, *Sea-lavender*, *Flax*, &c.

The ninth class is of the plants which have a *liliaceous*, or lilly-like flower, which he defines to be such an one as is composed of six *Petals*, sometimes indeed but three, but always divided however into six at the end. Here the author also again acknowledges the imperfection of classing by the *Petals*, since here he takes in the assistance of the figure and division of the seed vessel, which he says must always in this class be tricapsular, or divided into three cells; and plants which have this seed vessel, tho' their flowers are not strictly of the lilly shape, are allowed to be truly of the class. Of this are the *Asphodel*, *Saffron*, *Flower-de-luce*, *Tulip*, *Crown-Imperial*, &c.

The tenth class is of the plants with a *polypetalous*, *papilionaceous* flower, or one that is composed of many *Petals*, and in form resembles a butterfly. These flowers the author defines to be composed of four dissimilar *Petals*, which issue from a one-leaved cup, which is hollow, and like the conic paper-cases people twist up to put spices, &c. in; and divided into many segments at the rim; and from this cup arises also the *Pistil* of the flower. The upper leaf in these flowers which in some sort represents the colours carried by soldiers in battle, he calls the *Vexillum* or *Ensign*; the lower, which is hollow'd, and in form of a boat, the *Hulk*; and the two side ones the *wings*. The plants comprehended under this class are the *Liquorice*, *Peas*, *Fenugreek*, &c.

The eleventh class is of plants with an *anomalous* or irregular *polypetalous* flower. Among these he comprehends such of the *polypetalous* flowers as are of various shape, and composed of dissimilar or irregular *Petals*, and could not well be comprehended under any one expressive or determinate character. Of this class are the *Violet*, *Fumitory*, *Dier's-weed*, *Woolfsbane*, &c.

The twelfth class is of the plants with a *flosculous* flower. This he defines to be one composed of a number of small flowers, crowded close together, and comprehended in the same general *Calyx*, or cup; these flowers, which together compose this complex one, he observes are generally composed of only one *Petal*, which is wider at the mouth, than at the other end, and generally notched or divided there into many segments. He also has recourse to the other parts of the flower for farther descriptions; and comprehends under it the *Thistles*, *Knapweed*, *Bluebottle*, &c.

The thirteenth class is of the plants with a *semiflosculous* flower. These he defines to be composed of a multitude of half flowers, each composed of one *Petal*, hollow in its lower part, but in its middle and upper part flat and plain; and disposed into a single or manifold circle. He here also describes the fructification of the plants of this class, and comprehends in it the *Lettuce*, *Dandelion*, *Hawkweed*, &c.

The fourteenth class is of the plants with a *radiated* flower. These flowers the author describes to have two parts, a middle or *disk*, composed of small *fistular* flowers, and a *rim*, or *edge*, called the *corona*, which is made up of half flowers; and sometimes, though seldom, of plain flat *Petals*. Under this class are comprehended the *Starwort*, *Ragwort*, *Golden-rod*, *Sunflower*, &c.

The fifteenth class is of the plants which have flowers composed of *stamina* or *threads*, sustaining the *apices* or *capsules* of the fecundating farina. The author distinguishes these also by their *Pistil* changing into a single seed envelop'd in a husk, and of this class makes the *Sorrel*, *Arsmart*, *Orrach*, the *Grasses*, *Horsetails*, &c.

The sixteenth class is of those plants which the author supposes to have no flower at all; and yet to produce seeds. Of this class he determines the *Ferns*, *Liverwort*, and *Adder's-tongue*, to be.

The seventeenth class is of those plants whose flowers and fruit he says are both ordinarily wanting. These he afterwards divides into the earth and water plants; among the first he reckons the *Mosses*, *Mushrooms*, &c. And among the others the *Fucuses*, *Algas*, *Corallines*, &c. the flowers and seeds of which he observes we are as yet at least ignorant of.

The eighteenth class is of the trees and shrubs, which have *apetalous* flowers, or flowers without *Petals* or leaves at all. Of this class are the *Ash*, *Box*, &c.

The nineteenth claſs is of the trees and ſhrubs which have *Catkins* or *Iuli* for their flowers. Theſe the author ſays conſiſt either of *ſtamina* and *apices* alone, that is, of the threads or capſules of the farina; or they are compoſed of theſe with ſome little leaves affixed to a long ſlender axis: Theſe *Catkins* he obſerves are always in a different place from the fruit; and that, ſometimes on the ſame, ſometimes on different trees. Of this claſs are the *Walnut*, *Oak*, *Beech*, &c.

The twentieth claſs is of trees and ſhrubs, which have a *monopetalous* flower; and of this are the *Elm*, *Lilac*, *Storax*, *Olive*, &c.

The twenty firſt claſs is of the trees and ſhrubs which have a *roſaceous* flower; and among theſe are comprehended the *Lime*, *Sumach*, *Ivy*, *Vine*, &c.

And the twenty ſecond, or laſt claſs, is of the trees and ſhrubs with a *papilionaceous* flower; among which are reckoned the *Broom*, *Bean*, *Trefoil*, *Judas-tree*, &c.

It is very eaſily ſeen, that this is far from a ſtrictly accurate method; the author has indeed aſſiſted it with figures, which are very uſeful and inſtructive; and, as the judicious Linnæus obſerves, more is in reality to be learned from them, than from all the author has ſaid. *Linnæus* has well obſerved, that this method is neither perfect nor ſufficiently diſtinctive; the glory of inſtructing the botaniſt with truth and certainty was indeed reſerved for that author alone, who when he had ſhewn the imperfection and uncertainty of all the before eſtabliſhed methods, plan'd out an abſolutely new one, founded on the unalterable parts of plants, their organs of fructification. See the article FRUCTIFICATION, *Append.*

PETER'S *wort*, or ST. PETER'S-*wort*, the Engliſh name of a genus of plants, called by botaniſts *Hypericoides* and *Aſcyrum*. See the article ASCYRUM, *Append.*

PETOLA, in zoology, the name of a ſpecies of *coluber*, the ſcuta of whoſe abdomen are two hundred and nine, and the ſquamæ of the tail ninety. See the article COLUBER, *Suppl.*

PETREL, the name of a very remarkable bird, called *Procellaria*, by authors. See the article STORM-*finch*, *Suppl.*

The feet are large, the toes are ſlender, and connected by a fine, thin, black membrane; there is no hinder toe, but the claw in that part is ſmall, and connected immediately to the back of the foot. The middle toe is ſhorteſt, and has only two joints; the outer is longer, and has four; and the interior has three, and is longer than either. *Hill*, Hiſt. Anim. p. 514.

PETRIDIA, in Natural Hiſtory, the name of a genus of foſſils of the *Scrupi*-kind, of a plain uniform ſtructure, of no great variety of colours, and emulating the external form of pebbles. See the article SCRUPI, *Append.*

Of this genus the following are all the known ſpecies: 1. The various ſized, pellucid, colourleſs, cryſtalline *Petridium*, commonly called *Pebble-cryſtal*. 2. The purple, femipellucid, cryſtalline *Petridium*. 3. The ſnow-white, opake, cryſtalline *Petridium*. 4. The opake, whitiſh, reddiſh, or yellowiſh, cryſtalline *Petridium*, commonly called red, white, or yellow ſparry pebbles. 5. The yellowiſh-white pumicoſe, or ſpungy *Petridium*. 6. The hard, porous, whitiſh, cryſtalline *Petridium*. 7. The greyiſh-white, opake, ſtony *Petridium*. 8. The friable, ſhining, white, arenaceous *Petridium*. 9. The white, cryſtalline *Petridium*, ſpotted with ſmall yellow dots. 10. The whitiſh-brown, dull *Petridium*. 11. The bluiſh-white, hard, cryſtalline *Petridium*. 12. The browniſh white, hard, ſhining *Petridium*. Vid. *Hill*, Hiſt. Foſs. p. 563—572.

PETTY-*Whin*, a name by which ſome call the *Ulex*, or *Geniſta Spartium*. See the article GENISTA SPARTIUM, *Suppl.*

PHACA, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, called by Tournefort *Aſtragaloides*. See the article ASTRAGALOIDES, *Suppl.*

PHALÆNÆ, in the hiſtory of inſects, the name by which zoologiſts call the night-butterflies, or moths, as they are vulgarly called. See the article PHALENÆ, *Suppl.*

PHASIANUS, the *Pheaſant*, in ornithology, the name of a genus of birds of the gallinaceous kind. See the articles GALLINÆ, and PHEASANT, *Suppl.*

The diſtinguiſhing characteriſtic of this genus of birds, is, that the area or ſpace about the eyes is naked, and that they have no wattles.

The ſpecies are theſe: 1. The common *Pheaſant*, with a blackiſh purple-colour'd breaſt. 2. The red, or ſcarlet-breaſted *Pheaſant*: This is nearly of the ſize of the common *Pheaſant*, and its breaſt is of a high ſcarlet, and the belly red, but not ſo bright. 3. The Eaſt-India *Pheaſant*: This is an extremely beautiful bird, the whole body of which is variegated with a profuſion of the brighteſt colours, yellow, red, bluiſh-green, and almoſt every other tinge. *Hill*, Hiſt. Anim. p. 486.

PHEASANT'S-*eye*, in botany, a name ſometimes given to the *Adonis*. See the article ADONIS-*flos*, *Suppl.*

PHEASANT'S-*eye Pink*, the name of a ſpecies of *Caryophyllus*. See the article PINK, *Suppl.*

PHOCA (*Suppl.*) — Dr. Parſons has lately given us a diſſertation upon the claſs of the *Phocæ marinæ*. See Phil. Tranſ. vol. 47. pag. 109.

Phoca is the generic name, and all the ſpecies have a great likeneſs to each other, and may all alike have the names *phoca*, *vitulus marinus*, *ſea-cow*, *ſea-lion*, &c. The *manati*, the *ſoil* or *ſeal*, the *walrus* or *mors*, are ſo many ſpecies of this genus. Phil. Tranſ. ib.

PHYSIC *nut*, the Engliſh name of a diſtinct genus of plants, called by botaniſts *Ricinoides*. See the article RICINOIDES, *Suppl.*

PHRYGANIUM, in the hiſtory of inſects, a genus of four-winged flies, of the *Neuroptera* claſs. See the article NEUROPTERA, *Append.*

The wings of the *Phrygania*, of which there are a great many ſpecies, are incumbent; they have four tentacula, two on each ſide.

PICKTOOTH (*Suppl.*)— *Spaniſh* PICKTOOTH, a name by which ſome call the *Viſnaga* of Ray, a ſpecies of *Daucus*. See the article DAUCUS, *Suppl.*

PIECES. Plants may be propagated from their cuttings, ſlips, or *Pieces*; and it has been found that ſome kinds of animals have the like property, which may be called a reproduction of the animal or plant from a part of it. See the articles REPRODUCTION and PLANT, *Append.* and POLYPE, *Suppl.*

PIGEON-*Pea*, a name ſometimes uſed for the *Cytiſus*, or ſhrub-trefoil. See the article CYTISUS, *Suppl.*

PILE (*Suppl.*) — To eſtimate the force of the rammer made uſe of to drive *Piles*, its weight ought to be multiplied into the velocity it acquires in falling. Thus, if a rammer which weighs 500 *lb.* be let fall from four feet, it will fall that height in half a ſecond, and have at the time of percuſſion a velocity capable to carry it eight feet in half a ſecond, without any farther help from gravity; ſo that we muſt multiply 500 by 16, or its weight by the number of feet it would fall in a ſecond, and the product 8000 gives the momentum of the ſtroke. If a capſtan, pullies, or windlas be made to raiſe the rammer to a conſiderable height, and then by an eaſy contrivance looſen it at once from its hook, the momentum of the ſtroke will always be as the ſquare root of the height from which the rammer fell. *Deſaguliers*, Experim. Phil. p. 336, ſeq.

But it is to be obſerved, that the effect of the blow of the rammer will be as the ſquare of its velocity; that is, as the height from whence it falls, and not as the ſquare root of that height. Thus if the blow of the rammer drive the *Pile* 6 foot deep; a blow given with twice the velocity, will, cæteris paribus, drive it four feet deep. This follows from the nature of the force of bodies in motion. See the article FORCE, *Append.*

We have the figure and deſcription of a new machine for driving *Piles*, invented by Mr. Vauloue, in Deſaguliers, Experim. Philoſoph. p. 417, ſeq.

PILE-*wort*, a name by which ſome call the *Ranunculus*, or Crowsfoot. See the article RANUNCULUS, *Suppl.*

PIMPILLO, a name ſometimes given to the *Opuntia* of botanical writers. See the article OPUNTIA, *Suppl.*

PIMPINEL (*Suppl.*) is alſo a name by which the *Sanguiſorba*, or burnet, of botaniſts is ſometimes called. See the article SANGUISORBA, *Suppl.*

PINASTELLA, in botany, the name by which Dillenius calls the *Hippuris* of Linnæus. See the article HIPPURIS, *Suppl.*

PINASTER, the name of ſeveral ſpecies of pine. See the article PINE, *Suppl.*

Ground-PINE, or *Dwarf*-PINE, names by which the *Chamæpitys* of botanical writers is ſometimes called. See the article CHAMÆPITYS, *Suppl.*

Wild-PINE, a name ſometimes given to the *Karatas*, or *Ananas*, of botanical writers. See the article ANANAS, *Suppl.*

PINQUIN, or PENQUIN, the names by which the *Ananas* of Tournefort is ſometimes called. See the article ANANAS, *Suppl.*

PINK (*Suppl.*) — *Sea*-PINK, a name by which ſome call the *Statice*. See the article STATICE, *Suppl.*

PINTLE (*Suppl.*)—*Prieſt's* PINTLE, a name ſometimes given to the *Arum*, or wake-robin. See the article ARUM, *Suppl.*

PIPE (*Cycl.*) — *Air*-PIPE, an invention of the late ingenious Mr. Sutton to clear ſhips of foul air. This he does by a *Pipe*, the branches of which are laid in the hold, and the extremity of which is fixed into the aſh-hole of the furnace. Mr. Watſon has ſhewn how theſe *Pipes* may be laid, ſo as to be no way inconvenient, and relates the ſucceſs of a trial of them, made on a hulk. See Phil. Tranſ. N° 462. p. 12.

We have now three different contrivances publiſhed for cleaning ſhips, and other cloſe places, of foul air.

One by Dr. Deſaguliers, which will change the air in the chamber of ſick people, in a little time; either by drawing out the foul air, or driving in freſh; or doing both ſucceſſively, without opening doors or windows. See Phil. Tranſ. N° 437.

The other by Mr. Sutton before mentioned; and the third by means of Dr. Hale's ventilators, which ſeems to be the moſt expeditious and ſimple method. See the article VENTILATORS, *Append.*

PIPE-*tree*, the Engliſh name of a genus of plants, called by botaniſts *Lilac* and *Syringia*. See the articles LILAC and SYRINGIA, *Suppl.*

Pudding-PIPE-*tree*, a name by which the *Caffia* of botanifts is fometimes called. See the article CASSIA, *Suppl.*

PIPER, in ichthyology, the Englifh name of a fpecies of *Trigla*, with a bifid roftrum, and tubulofe noftrils. It is called by the generality of authors LYRA. See the articles TRIGLA and LYRA, *Suppl.*

PIPERIDGE-*tree*, a name fometimes given to the *Berberis*, or barberry-bufh. See the article BERBERIS, *Suppl.*

PIQUET, a well-known game at cards, and which has in fome cafes been the object of mathematical computations.

Thus Mr. de Moivre has propofed and folved the following problems:

1° To find at *Piquet* the probability which the dealer has for taking one ace or more in three cards, he having none in his hands. He concludes from his computation, that it is 29 to 28 that the dealer takes one ace or more.

2° To find at *Piquet* the probability which the eldeft has of taking an ace or more in five cards, he having no ace in his hands. Anfwer; 232 to 91, or 5 to 2, nearly.

3°. To find at *Piquet* the probability which the eldeft has of taking both an ace and a king in five cards, he having none in his hand. Anfwer; the odds againft the eldeft hand taking an ace and a king are 331 to 315, or 21 to 20 nearly.

4°. To find at *Piquet* the probability of having twelve cards dealt to, without king, queen, or knave; which cafe is commonly called *cartes blanches*. Anfwer; the odds againft *chartes blanches* are 323 to 578956, or 1791 to 1 nearly.

5°. To find how many different fets effentially different from one another, one may have at *Piquet* before taking in. Anfwer; 28,967,278. This number falls fhort of the fum of all the diftinct combinations, whereby twelve cards may be taken out of 32, this number being 225,792,840; but it ought to be confidered, that in that number feveral fets of the fame import, but differing in fuit, might be taken, which would not introduce an effential difference among the fets.

Mr. de Moivre alfo gives fome obfervations on this game, which he had from an experienced player. See Doctrine of Chances, pag. 151 to 159.

Monf. de Monmort has alfo treated of *Piquet* in his Analyfe des jeux de Hazard, pag. 162.

PISHAMIN, or PERSIMON, names by which fome call the *Lacryma Jobi*, a diftinct genus of plants. See the article LACRYMA, *Append.*

PISTACHIA, in the Linnæan fyftem of botany, the name of a genus of trees, called by Tournefort *Terebinthus*. See the article TEREBINTHUS, *Suppl.*

Wild-PISTACHIA, a name given to the *Staphylodendron*, or bladder-nut-tree. See the article STAPHYLODENDRON, *Suppl.*

PISTON (*Cycl.*) — There are two forts of *Piftons* ufed in pumps; the one with a valve, which is called a *Bucket*; and the other without a valve, which is called a *forcer*. See the articles FORCER and PUMP, *Append.*

PITCH-*tree*, in botany, a name fometimes given to the *Fir-tree*. See the article FIR, *Suppl.*

PITCHING, a word fometimes ufed for paving. See the article PAVEMENT, *Cycl.*

PITH (*Suppl.*) — Dr. Hales fhews that the *Pith* ferves to fupply the dilating moifture for the tender fhoots of plants, and that the figure of thefe may be oblong, and not round, like the fruit, there are tough diaphragms, or partitions in the *Pith* at fmall diftances from each other, which check the lateral expanfion; as alfo horizontal fibres, which ferve for the fame purpofe.

Of the fame fort is the *Pith* in the large growing feathers of birds; being compofed of veficles that can be diftended lengthwife, but have fphincters at the ends, to prevent too large a lateral dilation. Vid. *Hales*'s Veget. Statics, vol 1. p. 337.

PLAGIURI. Under this clafs of fifhes are comprehended the following genera: The Phyfeter, Delphinus, Balæna, Monodon, Catodon, and Thrichechus; which fee under their refpective articles PHYSETER, &c.

PLANE-*tree* (*Suppl.*)— *Baftard* or *Palfe* PLANE-*tree*, a name by which fome call the *Acer*, or Maple-tree. See the article MAPLE, *Suppl.*

PLANETARIUM, an aftronomical machine, made to reprefent the motions of the planets, as they really are in nature, or at leaft agreeably to the Copernican fyftem, and commonly called an *Orrery*. See the article ORRERY, *Suppl.*

The moft remarkable of thefe machines was that invented by Huygens, and defcribed by himfelf. See Defcript. Automati planetarii, ap. *Huygen.* Opufcul. pofthum. Tom. 2. p. 157. edit. Amft. 1728.

In this *Planetarium*, the five primary planets perform their revolutions about the fun; and the moon performs her revolution about the earth, in the fame time that thefe revolutions are really performed in the heavens. The orbits alfo of the moon and planets are reprefented with their true proportions, excentricity, pofition, and declination, from the ecliptic or orbit of the earth: So that by this *Planetarium* the fituation of the planets, their conjunctions, oppofitions, &c. may not only be known for the prefent time, but for any time paft, or future, as in a perpetual ephemeris.

This machine is now preferved among the curiofities of the univerfity of Leyden.

But the *Planetariums* or Orreries now moft commonly ufed, do not reprefent the true times of the celeftial motions; but only their proportions; and are of ufe to beginners, to give them an idea of the planetary fyftems, as alfo, if conftructed with fufficient accuracy, to folve feveral queftions relating to the motions of the planets, and of the earth and moon, &c.

Thefe machines are made of various fizes, fome reprefenting more planets than others. However, thefe complex ones are far from being improvements upon the original *Planetarium*, or Orrery, which fhewed only the motion of the moon round the earth, and of the earth and moon round the fun. They give but very confufed, and even falfe ideas of the diftances and bignefs of the planets; which muft always be fo whilft the orbits of the moon, and other fecondary planets, are fixed to the fame machine, which contains the primary ones. In the original one, every thing was well and properly executed; as the phænomena of day and night, and their gradual increafe and decreafe, according to the feafons; the places of the earth where the fun is fucceffively vertical, and feems to defcribe its parallels; the real annual motion of the earth, which gives the fun an apparent annual motion; the rotation of the fun about its axis; the periodical and fynodical month; the folar and fydereal days; the fucceffive illumination of all the parts of the moon, &c.

It is therefore proper to have a machine for reprefenting the general folar fyftem by itfelf; the fun moon, and earth ought alfo to be fhewn feparately; and the fyftem of any other primary planet; as Jupiter, for inftance, with all its fatellites, fhould have a feparate machine fo contrived, as to reprefent in true proportion their magnitudes, diftances, and other phænomena.

As to the magnitudes of the primary and fecondary planets, if the fun's diameter be fuppofed 100, that of Saturn will be $7\frac{5}{10}$, of Jupiter 10, of Mars $\frac{53}{100}$, of the Earth 1, of Venus 1, of Mercury $\frac{54}{100}$, and of the Moon $\frac{285}{1000}$. As to the fatellites of Jupiter and Saturn, they are fuppofed to be about the bignefs of our Earth.

Again, if the diftance of the Earth from the Sun be divided into 10 parts, Mercury will be diftant from the Sun four of thefe parts, Venus feven, Mars fifteen, Jupiter fifty-two, and Saturn ninety-five.

Dr. Defaguliers defcribes a *Planetarium* of his own contrivance, the frame of which, containing the clock-work, is made of ebony; its outfide is adorned with twelve pilafters, between which are painted, on as many vertical planes, the twelve figns of the zodiac. The upper furface is flat, and made of polifhed brafs; on the outward circumference of which are fcrewed fix brafs pillars, fupporting a large flat filvered ring. On this ring, which reprefents the ecliptic, are drawn feveral circles; the three innermoft being divided into twelve parts for the figns of the zodiac, and each of thefe into 30 degrees; and among thofe degrees are graved in their proper places, the nodes, aphelia, and greateft north and fouth latitudes of the planets. The next three circles have the months and days of the months, exactly correfponding to the Sun's place at noon each day throughout the year; and upon the brafs furface of the machine graduated are filver circles, which carry the planets, reprefented by filver balls, and raifed upon arbors or ftems to the height of the ecliptic.

Above the ecliptic ftand fome of the principal circles of the fphere, according to their refpective fituation in the heavens, viz. the two colures, one half of the equinoctial circle, the tropic of cancer, the arctic circle, &c. The whole machine is alfo fo contrived, as to be fet to any latitude, without injuring any of the infide motions.

Within the ecliptic ftand the Sun and other planets; the Sun being in the center of the whole fyftem, and the reft reprefented agreeably to the above-mentioned magnitudes and diftances. When things are thus difpofed, by turning about the handle, or winch of the *Planetarium*, all the planets perform their revolutions round the Sun, according to their periodical times; and being furnifhed with indices of blued-fteel, thefe fhew the longitudes of the planets, by pointing to the divifions on the graduated filver circles, as they move round.

As the diftances of the planets are in their true proportions to each other, fo likewife are their magnitudes; but it cannot be expected, that the diameters of the planets fhould be in proportion to the diameters of their orbits; for to effect this, the machine muft either be made 3000 times bigger than ufual, or the balls reprefenting the planets 3000 times lefs than ufual; whereby they would all be rendered invifible, excepting the Sun, and even it would be lefs than $\frac{1}{100}$ part of an inch in diameter. For the fame reafon it is found impracticable to reprefent the fun by a ball, proportionally bigger than thofe reprefenting the other planets.

Now as the orbit of the Moon, as well as of the fatellites of Jupiter and Saturn, bear no manner of proportion to the orbit of the primary planets, the difproportion between thefe and their fatellites muft be ftill greater. Hence appears the abfurdity of crowding them all into one machine, as is the cafe in the common *Orreries*.

To give a right notion of the diftances and magnitudes of the fatellites with refpect to their primary planets, it will be neceffary to have a feparate machine for each fyftem; or, the

fame machine may be fo contrived, as to reprefent one fyftem after another, by fhifting and adjufting the magnitudes and diftances of the balls. In this manner, the general folar fyftem may be firft exhibited; then that of the Moon and Earth round the Sun; afterwards that of Jupiter and its fatellites: and, laftly, that of Saturn and its fatellites.

We have already taken notice of fome of the phænomena explained by the general *Planetarium*, as well as of that contrived to exhibit the revolution of the Earth and Moon round the Sun. By thefe is likewife plainly fhewn the caufes of eclipfes, as well as of the apparent ftationary and retrograde motions of the planets.

By the *Planetarium* adapted to the fyftem of Jupiter, and its fatellites, are exhibited the immerfion or entrance of a fatellite into the fhadow of Jupiter; its emerfion out of the fhadow; when thefe are vifible; when a fatellite is hidden by the body of Jupiter, before it comes into, or after it is gone out of the fhadow; when a fatellite may be feen to crofs the body of Jupiter; when a fatellite makes a folar eclipfe in Jupiter; and when fatellites eclipfe one another.

PLANT *(Suppl.)—Propagation of* PLANTS. Tho' the moft natural, as well as moft univerfal method of propagating *Plants*, is that of fowing the feeds of each kind in a proper foil; yet fuch is the prolific power of nature, that in fome inftances, like the polype-animal, they may be propagated by fets, pieces, flips, or cuttings taken from the parent tree, or *Plant*, and fet in fuch a foil as they are known to delight in. The whole family of willows are propagated in this manner with the greateft eafe. Thofe forts which grow to be large trees, and are cultivated for timber, are generally planted from fets of about feven or eight feet long, fharpened at their larger ends, which is thruft into the ground by the fides of ditches and banks where the ground is moift; in which places they make a confiderable progrefs, and are a great improvement to fuch eftates; becaufe their tops will be fit to lop every fourth or fifth year. The fallows are planted of leffer fets, only three feet long, thruft two feet into the ground, and one foot above it. The rows fhould be three feet afunder, and the fets in each row eighteen inches; obferving always to place the rows floping, in the fame manner as the ground. The beft feafon for planting thefe cuttings is in February; and if the foil be good, they will produce a great crop of fhoots every year, which will produce, at a moderate computation ten pounds per acre. See *Miller*'s Gard. Dict. in voc. *Salix*.

Befides the willow-kind, the plane-tree, mint, &c. may be propagated in this manner; only it ought to be remarked, that in providing the flips, fprigs, or cuttings, fuch branches as have knots or joints, fhould be cut off two or three inches beneath them; and that fmall top fprigs of two or three years growth, are the beft for this operation. Ruft. Dict. in voc. *Cuttings*.

Another way of propagating *Plants*, is by parting or dividing their roots, each part of which will, by proper management, thrive and fend out frefh roots, which may be feparated in the fame manner. See the article ROOT, *Cycl.* and *Suppl.*

The manner of propagating *Plants*, by laying the tops of branches in the ground, is defcribed under the head LAYER, *Cycl.* and *Suppl.* And the common way by fowing of the feeds, is fufficiently explained under the articles NURSERY, SOWING, SEED, &c. *Cycl.* or *Suppl.*

Syftems of PLANTS. Ray's Syftem of *Plants* is delivered in the Cyclopædia under this head PLANT. The fyftem of Linnæus is to be found in the Appendix, under the head FRUCTIFICATION; and the Syftem of Tournefort in the Appendix under the head PETAL.

Vegetation and œconomy of PLANTS. The theory of the growth and œconomy of *Plants* has received great improvmenets from the experiments of the ingenious Dr. Hales, in his vegetable ftatics.

It appears from a great number of experiments made by that gentleman, that *Plants* imbibe and perfpire moifture very copioufly.

As to the quantity of moifture perfpired by *Plants* and trees, there appears to be a very confiderable difference in different vegetables. The lemon-tree, which is an ever-green, perfpires much lefs than the fun-flower, or than the vine, or the apple-tree, whofe leaves fall off in winter. Thus, from equal areas, the lemon-tree was found to perfpire only $\frac{1}{248}$ of an inch in height, during twelve hours of the day in the month of July; the apple-tree $\frac{1}{102}$; a cabbage $\frac{1}{80}$; a vine $\frac{1}{191}$; and a fun-flower $\frac{1}{165}$ in a day and night. *Hale*'s Veget. Stat. Vol. 1. p. 20, feq.

In order to try what moifture *Plants* would imbibe, the Dr. cut off feveral branches of apple-trees, pear, cherry, and apricot-trees; and having immerfed them into a known quantity of water, he found fome of them imbibed 15 ounces, fome 20 ounces, and others 25 or 30 ounces in 12 hours day more or lefs, according to the quantity of leaves they had; and and yet when he weighed them at night, they were lighter than in the morning, which undoubtedly was owing to their perfpiration. The quantity imbibed decreafed very much every day, the fap veffels being probably fhrunk at the tranfverfe cut, and too much faturated with water, to let any more pafs; fo that ufually in four or five days the leaves faded and withered much. Id. ibid. p. 29.

The Doctor made the fame experiments with elm-branches, oak, ofier, willow, fallow, afpen, curran, goofberry, and philbert branches; but none of thefe imbibed fo much as the foregoing, and feveral forts of ever-greens very much lefs. Id. ibid.

He alfo made feveral experiments to afcertain the force with which *Plants* imbibe moifture. This he did by putting the ftump of a branch into one end of a glafs tube, cementing it faft; and then immerfing the other end of the tube, after being firft filled with water, into a ciftern of mercury; on which removing his finger that ftopped up the lower end of the tube, the ftump imbibed the water with fo much vigour, that in fix minutes time the mercury was raifed eight inches in the tube. It is obfervable, that in all the experiments of this fort, the mercury rofe higheft, when the fun was very clear and warm; and that it fubfided in the nighttime, and rofe again the next day, as the fun fhone upon the branch; only it was neceffary to fill the tube with water; otherwife it would not rife at all. It is alfo remarkable, that the top or fmall end of a branch imbibed the water as well as the ftump end. Id. ibid. p. 85, feq.

The imbibing force of a great variety of trees being tried in the fame manner, by immerfing branches of them in aqueo-mercurial gages, it was found that the pear, quince, cherry, walnut, peach, apricot, plum, black-thorn, white-thorn, goofeberry, water-elder, and fycamore, raifed the mercury from three to fix inches high. The elm, oak, horfe-chefnut, filbert, fig, mulberry, willow, fallow, ofier, afh, lynden, and curran raifed the mercury only one or two inches. But the ever-greens, and the following trees and plants, viz. laurel, rofemary, lauruftine, phyllerea, fuz, rue, barberry, jeffamine, cucumber-branch, pumkin, Jerufalem artichoak, &c. did not raife it at all. Id. ibid. p. 101.

In order to difcover with what force the fap of the vine is pufhed forth in the bleeding feafon, the following experiments were made. Dr. Hales cut off a vine on a weftern afpect, within feven inches of the ground; the remaining ftump having no lateral branches, and being four or five years old, and $\frac{3}{4}$ inch diameter. To the top of this ftump he fixed a glafs tube, twenty five feet high; fecuring the joint with ftiff cement made of bees-wax and turpentine, befides feveral folds of wet bladder faftened over it with Packthread. As the ftem did not at firft bleed into the tube, he filled the tube two feet high with water, which the fame afternoon was imbibed by the ftem within three inches of the bottom. Next day the ftem began to bleed, fo that the fap in the tube continued rifing daily, till it was above twenty-one feet high, and would very probably have rifen higher, if the joint had not feveral times leaked. In the chief bleeding feafon, it would continue rifing night and day; but much more in the day than night; and moft of all in the greateft heat of the day. When the fun fhone hot upon the vine, there was always a continued feries of air bubbles afcending from the ftem through the fap in the tube, in fo great plenty, as to make a large froth on the upper part of the fap, which fhews the great quantity of air drawn in through the roots and ftem. Id. ibid. p. 108.

This force of the rifing fap is five times greater than the force of the blood in the great crural artery of a horfe; feven times greater than the force of the blood in the like artery of a dog; and eight times greater than the blood's force in the fame artery of a fallow doe. Id. ibid. p. 114.

The free communication of the fap veffels of *Plants* appears from hence; that tho' deep gaps or notches be cut in a branch, it will neverthelefs imbibe water in the manner already mentioned. In order to try whether it would not be the fame in branches, as they grow on trees, the Dr. cut two fuch oppofite gaps in a duck-cherry-branch, three inches diftant from each other, notwithftanding which, the leaves of this branch continued green, within eight or ten days as long as the leaves on the other branches of the fame tree. Id. ibid. p. 129.

However, it is the opinion of this excellent author, that there is no uniform circulation of the fap in trees, like that of the blood in animals; for this reafon, that if there were fuch a circulation, the leaves of the ilex grafted upon the Englifh oak would fall in winter equally with thofe of the oak itfelf, which is not found to be the cafe. Id. ibid. p. 149.

And, that the fap does not defcend between the bark and the wood, as the favourers of a circulation fuppofe, feems evident from hence, viz. that if the bark be taken off for three or four inches breadth quite round, the bleeding of the tree above that bared place will much abate, which ought to have the contrary effect, by interrupting the courfe of the refluent fap, if the fap defcended by the bark. But the reafon of the abatement of the bleeding in this cafe may be accounted for, from hence, that the fap is ftrongly attracted upwards by the vigorous operation of the perfpiring leaves. Id. ibid. p. 150.

We have a great many other curious experiments and obfervations, in the fame book, relative to the vegetation and analyfis of *Plants*; which are compofed of the following principles, viz. fulphur, volatile falt, water, earth, and air. See the article AIR, *Suppl.*

The leaves of *Plants* ferve not only as excretory ducts to feparate and carry off the redundant watery fluid, which by being

being long detained in the *Plants*, would turn rancid and prejudicial to them; but likewise to imbibe the dew and rain, which contain salt, sulphur, &c. and to be of the same use to *Plants*, that the lungs are to animals. However, the Dr. remarks, that as *Plants* have not a dilating and contracting thorax, their inspirations and expirations will not be so frequent as those of animals, but depend wholly on the alternate changes from hot to cold for inspiration, and *vice versa* for expiration. Id. ibid. p 326.

But it is from the roots, that by far the greater part of the nourishment of *Plants* is derived. These, therefore, are always found to bear a considerable proportion to the body of the *Plant* above ground; the superficies of the former being about four tenths of that of the latter. Hence, appears the necessity of cutting off many branches from a transplanted tree; because in digging it up, a great part of the roots are cut off. See *Hales*'s Veget. Statics, vol. I. p. 6, 16.

Parasitical PLANTS, among botanists. See the article PARASITE, *Cycl.*

Sensitive PLANT, the English name of a distinct genus of *Plants*, called by botanists *Mimosa*. See the article MIMOSA, *Suppl.*

PLANTAIN-*tree*, the English name of a genus of trees, called by botanists *Plantago*. See the article PLANTAGO, *Suppl.*

PLANTAIN-*tree* is also a name given to the *Musa* of Linnæus. See the article MUSA, *Append.*

Buckshorn PLANTAIN, the name given by some to a species of *Coronopus*. See the article CORONOPUS, *Suppl.*

PLANTAIN-*shot*, a name by which some call the *Canna* and *Cannacorus* of botanists. See the articles CANNA and CANNACORUS, *Suppl.*

Water-PLANTAIN, a name given to several species of *Ranunculus*. See the article RANUNCULUS, *Suppl.*

PLANTATION (*Cycl.*) — As *Plantations* of trees are not only profitable to the owner, as well as ornamental to the country around them, but a national advantage, it may not be improper to give some directions concerning them.

First, then, care must be taken to prepare the ground before trees are taken out of the earth; because they should never be suffered to remain long out of the ground. Care likewise is to be taken not to tear or bruise the roots of the trees, in raising them in order to be transplanted. When taken up, the next thing to be done is to prepare them for planting; which is done by cutting off all the small fibres of the roots, and such roots as are any wise injured in pulling up, or which cross one another. The downright roots of fruit trees are likewise to be pruned off, as should all their irregular branches; that when agitated by the wind, they may not rub against or bruise each other. However, the main shoots ought by no means to be cut off, as is but too often injudiciously practised.

Having thus prepared the trees for *planting*, they are next to be fixed in the ground; in doing which, care must be taken to place them deeper or shallower, according to the nature of the soil; but the best method of all is to raise a hill of earth, wherein to *plant* them. They should be placed as erect as may be, and the earth gently pressed down about their roots; for it is a fault to make it too hard. Pales or stakes should be fixed round them, in order to prevent their being displaced or blown down by the wind.

When the trees are thus *planted* and secured, a little mulch should be laid upon the surface of the ground, to prevent its drying; and as to watering them, it ought to be done with great moderation, nothing being more hurtful to them, than over-watering.

The seasons for *planting* are various, according to the different sorts of trees, or the soil in which they are to be *planted*. For such trees whose leaves fall off in winter, the best time is the beginning of October, provided the soil be dry; but for a wet soil, it is better to defer it to the latter end of February, or the beginning of March; and for many kinds of evergreens, the beginning of April is by far the best season; tho' they may be safely removed at Midsummer, provided they are not to be carried far. They should always be removed in a cloudy moist season, by which means they will take root in a few days.

As the method of cultivating most trees, especially garden ones, is explained under their respective articles, there is the less reason to be particular on that head in this place. However one thing more deserves to be well attended to, as regarding *Plantations* in general. It is this; that *Plantations* should be raised always from trees transplanted from nurseries, and never from hedge-rows, or trees of a large size, because these last seldom come to good account, often dying after continuing alive for many years.

Another general rule in regard to *Plantations*, is, to keep the ground clear of weeds, at least for the space of seven years; for which purpose it should be annually dug, or plowed, where that can be done. This will encourage the roots of the trees to extend themselves, whereby they will draw a larger proportion of nourishment. *Miller*'s Gard. Dict.

PLANTING *Reverse*. It has been already observed, that the branches of trees may be made to serve instead of roots; the putting of which in practice is called *Planting Reverse*. See the article BRANCH, *Suppl.*

Mr. Fairchild of Hoxton gives the following directions on this head. When you have made choice of a young tree of one shoot, whether alder, elm, willow, &c. that will easily take root by layers, the top of the shoot is to be bent gently down into the earth, there to remain till it has taken root; the tree all the while resembling a bow or arch above ground. When the top end is judged to have struck sufficiently strong roots, the old root is to be gently raised out of the ground, and kept in an upright position; after which all the injured parts of the raised roots are to be pruned off, as well as the buds or shoots on the stem of the tree; taking care to rub over these pruned parts with a composition made of four ounces of tallow, as many of bees-wax, two ounces of rosin, and as many of turpentine, melted together in a pipkin; this to be used moderately warm. Vid. *Miller*'s Gardeners Dict.

PLATANOCEPHALUS, in botany, a name used by some botanical writers for the *Cephalanthus*. See the article CEPHALANTHUS, *Suppl.*

PLATANUS, the *Plane-tree* in botany. See the article PLANE-*tree*, *Suppl.*

PLAY (*Cycl.*) — See the article GAMING, *Cycl.*

Duration of PLAY, in the Doctrine of Chances is used for the probability of the play's ending in a given number of games.

In the Cyclopædia, under the article GAMING, the two last problems relate to the duration of *Play*; but this difficult subject has been further pursued by Mr. De Moivre in the second edition of his Doctrine of Chances, p. 162—211.

PLOVER (*Suppl.*)— *Bastard*-PLOVER, a name used in some parts of the kingdom for the *Capella*, or lapwing. See the article CAPELLA, *Suppl.*

PLOUGHMAN, in husbandry, the person who guides the plough in the operation of tilling, or tillage. See the articles PLOUGH and TILLAGE, *Cycl.* and *Suppl.*

PLOUGHMAN's *Spikenard*, the English name of a genus of plants, called by botanists *Conyza*; it is likewise called by us *Flea-bane*. See the article FLEA-*bane*, *Suppl.*

PLUM (*Suppl.*) — *American* PLUM, *Maiden* PLUM, or *Black* PLUM, names given to a distinct genus of plants, called by botanists *Chrysobalanus*. See the article CHRYSOBALANUS, *Suppl.*

Hog-PLUM, the English name of a distinct genus of plants, called by botanists *Spondias*. See the article SPONDIAS, *Suppl.*

Indian date PLUM, a name sometimes given to the *Diospyros* of Linnæus, and *Guajacana* of Tournefort. See the article GUAJACANA, *Suppl.*

PLUNGER, in Mechanics, a solid brass cylinder used as a forcer in forcing pumps. See the articles FORCER and *Forcing* PUMP, *Append.*

POCCOON, a name by which some call the *Sanguinaria*. See the article SANGUINARIA, *Suppl.*

POCK-*wood*, a name sometimes given to *Guaiacum*. See the article GUAIAC, *Cycl.*

PODARIA, in the history of insects, a classical name comprehending all such insects as have limbs, but no wings. See the article APTERIA, *Append.*

Of this class there are two subdivisions. I. Such *Apteria Podaria* as have oblong bodies with numerous legs, or more than six pair: These are the *Iulus*, or gally-worm; the *Scolopendra*, or *Centipes*; and the *Oniscus*, or wood-louse. 2. The *Apteria Podaria* with shorter bodies, and less numerous legs, or fewer than six pair; This subdivision contains numerous genera, as the Pulex, the Podura or Puceron, the Pediculi of various kinds, the Monoculi, the Acari, the Aranei, the Scorpio, and a great many others. See the articles GALLY-*worm*, SCOLOPENDRA, &c. *Suppl.*

PODOPHYLLUM, in the Linnæan system of botany, the name of a genus of plants, called by Tournefort *Anapodophyllum*. See the article ANAPODOPHYLLUM, *Suppl.*

PODURA, in the history of insects, the name by which Dr. Hill calls the *Pucerons*. See the article PUCERON, *Suppl.*

The body of these animals is short and roundish; the tail is crooked and forked, and assists them in leaping. They have three pair of legs, which serve only for walking. The eyes are only two, but each composed of eight others. *Hill*, Hist. Anim. p. 20.

They belong to the class of insects which have limbs, but no wings, and are called by the same author *Podaria*.

POET's *Rosemary*. See the article ROSEMARY, infra.

POINT (*Cycl.* and *Suppl.*)—In the Cyclopædia, a *Point* is defined to be a quantity, which has no parts, or which is indivisible; and Euclid's authority is quoted for this. But it ought to be observed, that the calling a *Point* a quantity; or speaking of indivisible quantities, are absurdities, of which Euclid was never guilty. As to the demonstrations of the proportions of mathematical *Points* to each other, mentioned in the Cyclopædia; they are mere paralogisms. Thus in Mr. Robartes's reasoning [a], supposing with him that the chord of a greater circle, touching a smaller circle at the extremity of its diameter, is $= z$, and the chord of the smaller circle cor-

responding to the common versed sine $= x$, the diameter of the greater circle $= R$, and the diameter of the lesser circle $= S$, it is certain, that $zz = 4R\,x, - 4\,xx$ and that $yy = 4\,S\,x - 4\,xx$, as Mr. Robartes says. But what follows from thence? No more than this, that the ratio of zz to yy is the same with the ratio of $4\,R\,x - 4\,xx$ to $4\,S\,x - 4\,xx$, or dividing both these terms by $4\,x$, as $R - x$ is to $S - x$; and that the ultimate or limiting ratio of zz to yy, is the same with the ultimate or limiting ratio of $R - x$ to $S - x$. But the ultimate ratio of $R - x$ to $S - x$ is the ratio of R to S, and consequently, the ratio of R to S is the ultimate ratio of zz to yy; or, the ratio of $\sqrt{R}$ to $\sqrt{S}$ is the ultimate ratio of z to y. But what then? Does it follow that the terms of this ultimate ratio must be conceived as *Points*? Nothing less. The ultimate ratio of z to y does not imply that the quantities z and y ever exist under this ultimate ratio of $\sqrt{R}$ to $\sqrt{S}$, but only that they may approach to this ratio, so as to differ from it by less than any assigned ratio. Mr. Robartes was misled by the too prevailing language of infinitesimals. See the article FLUXION and LIMITS, *Suppl.*—[a Phil. Transf. N°. 334.]

Singular POINT in geometry, is used for any *Point* of a curve, which has something peculiar to distinguish it from the other *Points* of the curve. *Cramer*, Analyf. des lign. courbes, p. 148.

Of these *Points* there are various kinds, such as *double*, *triple*, &c. or in general, *multiple Points*; *Points of Inflexion* or contrary flexure, &c.

Every *Point* of a curve is *simple*, or *multiple*.

A *simple* POINT, is that which belongs only to one branch of a curve.

A *multiple* POINT is that which is common to several branches of a curve, in particular:

Double POINT is that which is common to two branches of a curve. The conic sections or lines of the second order have no double *Points*; but we find them in the lines of the third order.

Triple POINT is that which is common to three several branches of a curve.

Hence the terms *quadruple*, *quintuple*, &c. *Point* are easily understood.

If a *Point* be supposed to describe a curve, it will pass twice thro' a *double Point*; thrice thro' a *triple Point*, &c.

A *simple* POINT is sometimes *singular*, as when it becomes a *Point* of contrary flexure, of double inflexion, and in many other cases; for a detail of which we refer to *Cramer*, Analyf. de lignes courbes, chap. x. p. 400. seq. and chap. xiii. p. 568. seq.

In the case mentioned in the Supplement, under the head POINT *of contrary Flexure*, where a double infinitely small flexure or inflexion is said to be formed in a *Point*, this *Point* is called by some a *Point of double inflexion*, and by Monsieur de Maupertuis[a], and Mr. Cramer[b], *Point de Serpentement*, and by others, *Point of rectitude*. — [a Mem. Acad. Scien. 1729. p. 277. Ed. Paris. b Analyf. des lignes courbes.]

POINT *of Rectitude*, is defined by Sir *Isaac Newton*, to be that in which the radius of flexure becomes infinite, or its center at an infinite distance: such it is at the vertex of the parabola $a^3x = y^4$.

The *Point of Rectitude* is commonly the limit of contrary flexure: but there are also *Points of Rectitude*, which do not come between the parts of contrary flexure. For the method of investigating these *Points*, see *Newton*'s Meth. of Flux. and Inf. Series. pag. 72.

These *Points of rectitude* are not found in lines of a lower order than the fourth. In lines of this, and of higher orders, a tangent at a *Point* of inflexion may also meet the curve in another *Point*, and if the distance between this *Point* and the *Point* of inflexion be supposed to be infinitely diminished, the secant will become a tangent, and the contact in this case will be equivalent to four intersections, in the same manner that the contact at a *Point* of contrary flexure is equivalent to three intersections. See *Cramer*, lib. cit. p. 403. and *Newton*, Method of Fluxions p. 72.

These *Points of double Inflexion*, are also called *Points of invisible Inflexion*; because in effect they are not sensible, but only known by their analytical properties. Analysts have considered several degrees of these *Points*. *Cramer*, loc. cit.

POINTERS, in ship-building, are pillars in an oblique position, from the floor-rider heads on each side, pointing or meeting each other at the middle of the gun-deck beams. *Blanckley*'s, Naval Expositor, p. 121.

POISON (*Suppl.*)—In the Philosophical Transactions vol. 47. pag. 75. seq. we have an account of several experiments made by Monsieur Herissan, on living animals, with the Indian *Poison* brought over by Monsieur de la Condamine; and mentioned in the Supplement under this head.

This *Poison* which seems to be of a very subtile and dangerous nature is extracted by fire from divers plants, especially from those which the French call Lianes. The Indians in various places of South America prepare this *Poison*, and make use of it for the killing of wild beasts, in this manner:

Those savages are very dextrous at making long trunks, which are the most common weapon used by them in hunting. To these trunks or tubes they fit little arrows made of palm-tree, on which they put a little roll of cotton exactly fitting the bore of the tube. They shoot these with their breath, and seldom miss the mark. They dip the points of these little arrows, as well as of those of their bows, in this *Poison*; which is so active, that in less than a minute, especially when fresh, it kills certain animals, from which the arrow has drawn blood.

Tho' a very small drop of this *Poison*, conveyed into the blood by puncture is sometimes sufficient to kill a man, or at least to cause great disturbance in the animal œconomy, it is quite otherwise when taken in at the mouth; for then it does no sort of mischief. See Phil. Transf. loc. cit.

POISON-*Bush*, a name by which some call the *Tithymalus*. See the article TITHYMALUS, *Suppl.*

POKE or PORK *Physic*, the name by which the *Phytolacca* of botanists is sometimes called. See the article PHYTOLACCA, *Suppl.*

POLE-*cat*, in zoology, the English name of a creature of the weasel-kind, called by authors *Putorius*. See the article PUTORIUS, *Suppl.*

POLEY-*Mountain*, in botany, the English name of a distinct genus of plants, called by botanists *Polium*. See the article POLIUM, *Suppl.*

POLYANTHES, in the Linnæan system of botany, the name of a distinct genus of plants, called by some *Tuberosa*, and *Tuberose Hyacinth*.

The characters are these: There is no cup; the flower consists of one leaf, of an infundibuliform shape; the tube is oblong and crooked; the limb is divided into six segments; the stamina are six subulated filaments, connivent, and of the length of the limb; the antheræ are linear; the germen is roundish, and stands in the bottom of the corolla; the style is filiform, and shorter than the corolla; the stigma is trifid, thick, and covered with a honey-like juice; the fruit is a capsule, of a roundish, but obtusely trigonal form, composed of three valves, containing three cells, and wrapped up in the base of the corolla; the seeds are numerous, semiorbicular, plane, and placed in a double series. *Linnæi* Gen. Plant. p. 140.

POLYANTHUS, the name by which the *primula veris* of botanists is sometimes called. See the article PRIMULA, *Suppl.*

POLYCNEMUM, in the Linnæan system of botany, the name of a distinct genus of plants, called by Tournefort *Camphorata*. See the article CAMPHORATA, *Suppl.*

The characters of it are these: The cup is a subulated, acute, and permanent perianthium, consisting of three leaves; the flower consists of five petals, extremely like those of the cup, only shorter; the stamina are three capillary filaments, shorter than the flower; the antheræ are obtuse; the germen of the pistil is roundish; the style is bifid, and of the length of the stamina; the stigmata are obtuse; the seed, which follows every flower, is single, and has scarce any covering, at most, only a very thin membrane. *Linnæi* Gen. Plant. p. 21.

POLYTRICHUM, πολύτριχον. See the article ADIANTUM, *Suppl.*

POND-*weed* (*Suppl.*)— *Water* POND-*weed*, a name sometimes given to a species of *Persicaria*. See the article PERSICARIA, *Suppl.*

POOR-*man's Pepper*, a name sometimes given to the *Lepidium* of botanical writers. See the article LEPIDIUM, *Suppl.*

POPPY (*Suppl.*)— *Prickly* POPPY, a name by which some call the *Argemone*, a distinct genus of plants. See the article ARGEMONE, *Suppl.*

Spatling POPPY, a name by which the *Lychnis* is sometimes called. See the article LYCHNIS, *Suppl.*

POPULUS, the *Poplar* in botany, the name of a genus of trees. See the article POPLAR, *Suppl.*

PORCUPINE-*fish*, in ichthyology, the English name of several species of *Ostracion*. See the article OSTRACION, *Suppl.*

POROPHYLLUM, a name given by Vaillant to a genus of plants, called by Linnæus *Kleinia*. See the article KLEINIA, *Append.*

POSSET (*Suppl.*) — *Beer*-POSSET. See the article ZYTHOGALA, *Suppl.*

POSTULATE, or POSTULATUM (*Cycl.*) — Authors are not agreed as to the signification of the term *postulatum*. Many, with whom the Cyclopædia agrees, make the difference between axioms and *postulata*, to be the same as that between theorems and problems; axioms, according to those authors, being indemonstrable theoretical truths, and *postulata* indemonstrable practical truths.

But others will have it, that axioms, or common notions are primitive, and common to all things partaking of the nature of quantity, and which therefore may become the objects of mathematical science, such as number, time, extension, weight, motion, &c. and that *postulata* relate particularly to magnitudes strictly so called, or to things having local extension,

fion, fuch as lines, furfaces and folids; fo that in this fenfe of the word *poftulatum*, Euclid, befides axioms, or thofe principles which are common to all kinds of quantity, has affumed certain *poftulata* to be granted him, peculiar to extenfive magnitude. Hence feveral of the principles affumed in his elements, and ranked among the axioms by the moderns, are by Proclus ranked among the *poftulata*; which has induced Dr. Wallis to judge, that the laft of the two fenfes given to the term *poftulatum* is moft agreeable to the meaning of the antient geometers. And thofe who contend for this fenfe of the word, add, that Euclid, in *poftulating* to draw a right line from one point to another, does not mean that any man can actually do this, but only that it may be conceived as poffible. So that *poftulata* are axioms no lefs than the other principles affumed in the elements of geometry, but axioms relating to a particular fubject, and not common to all. *Wallis's* Oper. Vol. 1. p. 667, 668. See the article PRINCIPLE, *Append.*

POTATOES, the Englifh name of the tuberofe-rooted, efculent *Lycoperficon* or *Solanum* of botanical writers. See the article SOLANUM, *Suppl.*

The Englifh name feems evidently formed from *Batatas*, the Indian name of the fame plant. See the article POTATOES, *Suppl.*

Spanifh POTATOE, the name by which fome call feveral fpecies of *Convolvulus*, or bindweed. See the article CONVOLVULUS, *Suppl.*

POTENTILLA, a name ufed by fome for feveral fpecies of *Cinquefoil*. See the article CINQUEFOIL, *Suppl.*

POUCH (*Suppl.*) — *Shepherd's*-POUCH, a name fometimes given to the *Alyffon*, or mad-wort. See the article ALYSSON, *Suppl.*

POWER (*Cycl.* and *Suppl.*) — *Arithmetical* POWER is ufed by Mr. Machin, for compofite numbers or quantities whofe factors are in arithmetical progreffion. See Phil. Tranf. N° 447, and Dr. Martyn's Abridg. Vol. 8. p. 78.

Mr. Machin ufes a particular notation for quantities of this kind. The quantity expreffed by this notation has a double index; that at the head of the root at the right hand, but feparated by a hook to diftinguifh it from the common index, denotes the number of factors; and that above, within the hook on the left hand, denotes the common difference of the factors proceeding in a decreafing or increafing arithmetical progreffion.

Thus the quantity $\overline{n+a}^{\,\overset{a}{\smile}(}$ denotes by its index ^{m} on the right hand, that it is a compofite quantity, confifting of fo many factors as there are units in the number ^{m}; and the index a above on the left, denotes the common difference of the factor's decreafing in an arithmetical progreffion, if it be pofitive; or increafing, if it be negative; and fo fignifies, in the common notation, the common number or quantity, $\overline{n+a}\,.\ \overline{n+a-n}\,.\ \overline{n+a-2a}\,.$ &c.

For example, $\overline{n+5}^{\,\overset{2}{\smile}(6}$ is $= \overline{n+5}\,.\,\overline{n+3}\,.\,\overline{n+1}\,.\,\overline{n-1}\,.\,\overline{n-3}\,.\,\overline{n-5}$, confifting of fix factors whofe common difference is 2. After the fame manner, $\overline{n+4}\,(^5 = \overline{n+4}\,.\,\overline{n+2}\,.\,n.\,\overline{n-2}\,.\,\overline{n-4}$, confifting of five factors. According to which method it will eafily appear, that if a be an integer, then $n\,\overline{+2a+1}^{\,\overset{2}{\smile}(2a+2}$ will be $= \overline{nn-1}\,.\,\overline{nn-9}\,.\,\overline{nn-25}$ continued to fuch a number of double factors as are expreffed by $a+1$, or half the index, which in this cafe is an even number. Thus alfo $\overline{n+2a}^{\,\overset{2}{\smile}(2a+1}$ will be equal to $n.\,\overline{nn-4}\,.\,\overline{nn-16}\,.\,\overline{n-36}$, and fo on, where there are to be fo many double factors, as with one fingle one n, will make up the index $2a+1$, which is an odd number.

If the common difference a be an unit, it is omitted: Thus $\breve{n}\,(^6 = n.\,\overline{n-1}\,.\,\overline{n-2}\,.\,\overline{n-3}\,.\,\overline{n-4}\,.\,\overline{n-5}$, containing fix factors. So $\breve{6}\,(^6 = 6.\ 5.\ 4.\ 3.\ 2.\ 1.$ and the like for others.

If the common difference a be nothing, the hook is omitted, and it becomes the fame with the geometrical *power*: Thus

$$\overline{n+a}^{\,\overset{o}{\smile}(m} = \overline{n+a|}^{\,m}$$ according to the common notation.

The learned author above quoted applies this doctrine of arithmetical *powers* to the inveftigation of the principal rule in the method of fluxions, and its inverfe, which is, that if the ordinate $y = m\,z^{m-1}$, then will the area, or rather the form of the quantity for the area, be $= z^m$; or vice verfa, that if the area be z^m, the ordinate will be $m^{z\,m-1}$; on which occafion he obferves, that the fymbol $\dot{z}$, confidered as a component part of the rectangle $\dot{z}$, may bear a plain interpretation, viz. that it is the meafure according to which the quantity z is meafured. See Phil. Tranf. loc. cit. in the poftfcript. See alfo FLUXION, *Suppl.*

2

PRECESSION (*Cycl.*) — The *preceffion* of the equinoctial points varies; nor are aftronomers entirely agreed as to the quantity of the variation, fo as to eftablifh what the mean *preceffion* is. Dr. Bradley affumes the mean *preceffion* to be one degree in feventy one years and an half. See Phil. Tranf. N° 485. p. 22.

According to this eftimate, the platonic or great year would be equal to 25740 folar years.

Sir Ifaac Newton, in determining the quantity of the annual *preceffion* from the theory of gravity, upon fuppofition that the equatorial is to the polar diameter of the earth, as 230 is to 229, finds the fun's action fufficient to produce a *preceffion* of $9''\frac{1}{7}$ only; and collecting from the tides the proportion between the fun's force and the moon's to be as 1 to $4\frac{1}{2}$, he fettles the mean *preceffion* refulting from their joint actions, at 50″. But fince the difference between the polar and equatorial diameter is found, by the late obfervations of the gentlemen of the Royal Academy of Sciences at Paris, to be greater than what Sir Ifaac had computed it to be; the *preceffion* arifing from the fun's action muft likewife be greater than what he has ftated it at, nearly in the fame proportion. From whence it will follow, that the moon's force muft bear a lefs proportion to the fun's, than $4\frac{1}{2}$ to 1. See Dr. *Bradley* in Philofoph. Tranf. N° 485, pag. 37.

PREVENTERS, on board a fhip of war, are ropes of different fizes, cut into fhort lengths, and knotted at each end, to be ready in cafe a fhroud fhould be fhot or broke, that they may be feized to them. *Blanckley's* Naval Expofitor, p. 123.

PRICKET, among fportfmen. See the article SPITTER, *Append.*

PRICK-*Madam*, the name of a fpecies of *Sedum*; the fame with the yellow houfe-leek, with fharp-pointed leaves. See the article SEDUM, *Suppl.*

PRICK-*Timber*, a name fometimes given to the *Euonymus*, or fpindle-tree. See the article EUONYMUS, *Suppl.*

PRIEST'S *Pintle*, in botany, a name by which *Arum*, or wake-robin is fometimes called. See the article ARUM, *Suppl.*

PRIMROSE, the Englifh name of a genus of plants, called by botanifts *Primula veris*. See the article PRIMULA VERIS, *Suppl.*

PRIMROSE-*tree*, or *Night*-PRIMROSE, the Englifh name of a genus of plants, known among authors by that of *Onagra*; See the article ONAGRA, *Suppl.*

PRINCIPLE (*Cycl.*) — Philofophers and mathematicians are generally agreed in admitting that there are axioms, that is, certain indemonftrable truths, which muft be reckoned among the principles of human knowledge in the ftricteft fenfe. Hobbes feems to advance the contrary, when he fays, in his logic, or firft part of his book de Corpore, that definitions, or their parts, are the only primary propofitions (*propofitiones primæ*) that is, *principles* in an abfolute and ftrict fenfe. But this doctrine of Hobbes cannot be admitted. For however true it may be in itfelf, and with refpect to the divine mind, it feems certain, that the human mind has never yet attained, and perhaps never will attain to a perfect analyfis of its own notions in all cafes. And wherever this analyfis ceafes, definitions ceafe with it; and where definitions ceafe, we are forced, if we would demonftrate any thing of the undefined fubject, to have recourfe to axioms, or to indemonftrable truths admitted by all men, tho' never yet demonftrated by any one. This will appear evident to thofe who attentively confider Euclid's Elements. This great geometer, it is known, does not, ftrictly fpeaking, define a right line; becaufe he could not probably, analyfe the notion of rectitude; for that which is commonly called his definition of a right line, in the beginning of his elements, is no definition, nor is it ever applied afterwards, as the definitions of an equilateral triangle, a fquare, and a circle are. But to fupply the place of a definition, he has affumed the axioms, that two right lines cannot comprehend a fpace; and that they cannot have a common fegment; and thefe axioms become of ufe more than once afterwards. No one has as yet been able to fupply with fuccefs what Euclid omitted to do; for tho' fome, both ancients and moderns, have demonftrated feveral very plain axioms, as that the whole is greater than its part, yet none have demonftrated all the principles of extenfive magnitude affumed by Euclid, which Proclus and others chofe to diftinguifh by the name of *Poftulata*. See the article POSTULATE, *Append.*

Hobbes brings this very inftance of the demonftration that a whole is greater than its part, to prove, that the propofitions commonly called axioms, are not, ftrictly fpeaking, primary, but only fecondary propofitions, and really deducible from definitions. Had he attempted the demonftration of all Euclid's axioms and poftulata, he would foon have found that he had made a rafh induction; and what he gives for a demonftration of the properties of parallels, evidently fhews, how little able he was to fupply what Euclid had omitted. What is here faid of Hobbes, may be applied to others who have attempted to refine upon Euclid, and who have been fond of carrying the analyfes of their demonftrations beyond him.

him. They have all shewn their inability of demonstrating, without taking some axioms or postulata for granted; and indeed most of them expresly admit this, only contending that the *principles* they assume are more evident than those of Euclid. But whether they be so, or not, is of no importance to the present question, which is, whether we are not often obliged to have recourse to axioms, that is, to self-evident, or indemonstrable truths, in the strictest sense; and whether these can be supplied by deductions, or syllogistic reasoning, from definitions only. We should not have taken any notice of this question, had not Hobbes and other metaphysicians and logicians of repute run counter to the common opinion.

But tho' we are forced to assume axioms and postulata in geometry, it may be a question, whether any thing of this kind be necessary in arithmetic, or the science of numbers; and whether the analyses of our notions may not here be carried up to the notions of unity, and of the act of addition, *tamquam possibilia prima*; and whether it was not some consideration of this kind that led Aristotle to say, that arithmetic was more accurate (ακριβέστερον) than geometry. It is certain at least, that the analysis may be, though it seldom is, carried farther in the former than in the latter of these sciences. Because the axioms commonly assumed, and peculiar to arithmetic, such as the addition and multiplication tables, are no more than the aggregates of the simple signs, or simple notations of numbers; and may easily be demonstrated from the definitions of the simple signs made use of; such as that $1+1=2$; $2+1=3$; $3+1=4$, &c.

Bishop Berkeley [a] observes very justly, that the *principles* of science are neither objects of sense nor imagination, but notions of relation, that is, acts of the mind. Thus, space, time, number [b] are not objects of sense or imagination, altho' the things coextended with space or time, or things numbered, be objects of sense. This is most evident in number, which is plainly different from the perception of the things numbered. Nor can the act by which we number be taught or exemplified. For instance, that act of the mind by which we conceive $1+1=2$, cannot be explained or analysed into others; and supposing it could, we must still stop somewhere, and wherever that be, there is something a disciple must have *a se, non a præceptore*, as Aristotle says. So that, strictly speaking, *principles* are not taught. And those who maintain them innate, are perhaps not so absurd as Locke pretends. [[a] Reflections on Tar-water, Art. 264. [b] Ibid. Art. 288.]

Leibnitz maintained, that the *principles* of contradiction, and of a sufficient reason, were the foundations of all science; that the first was sufficient for the demonstration of all necessary, and the other of all contingent, truths. But though it be true, that the *principle* of contradiction, that is, the *reductio ad absurdum*, often occurs expresly, and is oftner implied in geometry; yet by what has been said it appears, that this *principle* alone is not sufficient to demonstrate all the other universally received *principles* of that science. Far less is it true, that we are enabled by the *principle* of a sufficient reason, which amounts to the exclusion of pure chance out of the universe, to demonstrate all physics and morals; but additional *principles* derived from experience, must be assumed.

PRIVIES *of a Camp*. See the article CAMP, *Append.*

PRIVET (*Suppl.*) — *Mock* PRIVET, a name sometimes given to the *Phillyrea* of botanists. See the article PHILLYREA, *Suppl.*

PROCELLARIA, in ornithology, the name used in the Stockholm Transactions, and elsewhere, for the *storm-fink*, or *storm-bird*. See STORM, *Suppl.* and PETREL, *Append.*

PROBABILITY (*Cycl.*) — In the doctrine of *Probability*, one important observation may be made, *viz.* that if one premiss only of an argument be probable, the conclusion is necessarily probable. But if two or more premisses be *probable* the conclusion will not be necessarily *probable*. Thus for instance, supposing the *Probability* of each premiss expressed by $\frac{7}{10}$; the *Probability* of the conclusion will be but $\frac{49}{100}$, which shews it to be improbable. For we may call any thing *improbable*, if the measure of the chance for its happening is less than $\frac{1}{2}$. If there had been three premisses, and the *Probability* of each equal to $\frac{7}{10}$, the *Probability* of the conclusion would be $\frac{343}{1000}$, which is considerably improbable. Again, supposing the *Probability* of the truth of each premiss to be 2 to 1 or expressed by $\frac{2}{3}$, the probability of the conclusion in the case of the two premisses would be $\frac{4}{9}$. Where three premisses are assumed to infer a conclusion, this would be $\frac{8}{27}$; and in case of four premisses, the *Probability* of the conclusion would be but $\frac{16}{81}$, which is less than $\frac{1}{4}$, so that one might with advantage lay 4 to 1 against the truth of a conclusion founded on four probable premisses, for the truth of which separately taken 2 to 1 might be laid. It is to be observed in all these cases, that the premisses are supposed independent, that is, not necessarily connected with each other.

Hence it is easy to account, how it happens, that the most plausible political and physical reasonings, lead so often to conclusions false in fact.

Mr. de Moivre has solved two problems, tending to establish the degree of assent that ought to be given to experience. He determines from his solutions, that if after taking a great number of experiments, it should have been observed, that the happenings or failings of an event have been very near in a ratio of equality, it may safely be concluded, that the *Probabilities* of its happening or failing, at any one time assigned, are very near equal.

And if after taking a great number of experiments, it should be perceived, that the happenings and failings have been nearly in a certain proportion, such as 2 to 1, it may safely be concluded, that the *Probabilities* of happening or failing at any one time assigned, will be very near in that proportion; and that the greater the number of experiments has been, so much the nearer the truth will the conjectures be, that are derived from them.

Chance very little disturbs the events which, in their natural institution, were designed to happen or fail according to some determined law. For if in order to help our conception we image a round piece of metal, with two polished opposite faces, differing in nothing but their colour, whereof one may be supposed to be white and the other black, it is plain that this piece may with equal facility exhibit a white or black face; and we may even suppose that it was framed with that particular view of shewing sometimes the one face, sometimes the other; and that consequently, if it be tossed up, chance will decide the appearance. But altho' chance may produce an inequality of appearance, and that a greater inequality, according to the length of time in which it may exert itself, still the appearance, either one way or the other, will perpetually tend to a proportion of equality. This is, in like manner applicable to a ratio of inequality; and thus in all cases it will be found, that although chance produces irregularities, still the odds will be infinitely great, that in process of time, those irregularities will bear no proportion to the recurrency of that order which naturally results from original design. See *De Moivre*'s Doctrine of Chances, p. 231.—243.

PROBLEM (*Cycl.*) — *Kepler*'s PROBLEM (*Cycl.*) — As to the solution of this *problem*, the late excellent mathematician Mr. Machin observes, that many attempts have been made, at different times, but never yet with tolerable success, towards the solution of the *problem* proposed by Kepler: To divide the area of a semicircle into given parts, by a line from a given point of the diameter, in order to find an universal rule for the motion of a body in an elliptic orbit. For among the several methods offered, some are only true in speculation, but are really of no service. Others are not different from his own, which he judged improper. And as to the rest, they are all some way or other so limited and confined to particular conditions and circumstances, as still to leave the *problem* in general untouch'd. To be more particular, it is evident, that all constructions by mechanical curves are seeming solutions only, but in reality unapplicable; that the roots of infinite series are, upon account of their known limitations in all respects, so far from affording an appearance of being sufficient rules, that they cannot well be supposed as offered for any thing more than exercises in a method of calculation. And then, as to the universal method, which proceeds by a continued correction of the errors of a false position, it is, when duly considered, no method of solution at all in itself; because unless there be some antecedent rule or hypothesis to begin the operation (as suppose that of an uniform motion about the upper focus, for the orbit of a planet; or that of a motion in a parabola for the perihelion part of the orbit of a comet; or some other such) it would be impossible to proceed one step in it. But as no general rule has ever yet been laid down to assist this method, so as to make it always operate, it is the same in effect as if there were no method at all. And accordingly in experience it is found, that there is no rule now subsisting but what is absolutely useless in the elliptic orbits of comets; for in such cases there is no other way to proceed but that which was used by Kepler. To compute a table for some part of the orbit, and therein examine if the time to which the place is required, will fall out any where in that part. So that, upon the whole, it appears evident, that this *problem* (contrary to the received opinion) has never yet been advanced one step towards its true solution. Vid. *Machin*, in Phil. Transf. N° 447. and Martyn's Abridg. Vol. 8. p. 73.

Mr. Machin afterwards proceeds to give his own solution of this *problem*, which is particularly necessary in orbits of a great excentricity; and he illustrates his method by examples, for the orbits of Mercury, of Venus, of the Comet of the year 1682, and of the great Comet of the year 1680, all which shew the universality of that method. See Phil. Transf. loc. cit.

PROPERTY (*Cycl.*) — In the law of England, strictly speaking, that which is called an *estate* in lands and tenements, is termed a *property* in personal chattels, the law considering the first as permanent, the other as temporary and precarious. Peer Williams's Reports, p. 3.

PROSCARABÆUS, in zoology, the name by which some call the *Meloe*, a genus of four-winged flies. See the article MELOE, *Append.*

PSEUDO-*Fumaria*, in botany, a name used by some for a species of *Fumitory*. See the article FUMARIA, *Suppl.*

PSEUDO-*Lotus*, in botany, a name by which some call the *Guaiacana* of Tournefort. See the article GUAIACANA, *Suppl.*

PSEUDO-*Viburnum*, in botany, the name given by Rivinus to a species of *Lantana*. See the article LANTANA, *Suppl.*

PUDDING-*grass*, a name by which the *pulegium*, or pennyroyal, a species of mint, is called. See the articles MENTHA and MINT, *Suppl.*

PUDDING-*pipe-tree*, the English name of a genus of plants, called by botanical writers *Cassia*. See the article CASSIA, *Suppl.*

PUDENDUM-*regale*, a name used by Columna for the *Aphrodita*, a genus of sea-insects. See the article APHRODITA, *Append.*

PULEX-*Aquaticus*, the *water-flea*, a name sometimes used for the water beetles. See the article DYTISCUS, supra.

PULMONES-*marini*, in zoology, a name used by several authors for the *Urticæ marinæ*. See the article URTICA *marina*, *Suppl.*

PUMP (*Cycl.*) — The description of the *Forcing-pump*, given in the Cyclopædia, is erroneous. This kind of *Pump* consists of a barrel, in which there is a forcer, that is, a piston, or embolus without a valve, which moves up and down in the barrel. This communicates with two pipes, the one called a *sucking pipe*, which goes down into the well, and the other called a *forcing pipe*, which goes upwards. There are two valves; the one at any place of the sucking pipe, the other in the forcing pipe, both of which let the water go up, and hinder it from going down. Then when the forcer is moved upwards, as it rarifies the air in the sucking pipe (for the valve in the forcing pipe hinders the outward air, which presses upon it, from going through) the water rises in it, till after several strokes it comes to the forcer; then at every time the forcer goes down, the water that is pressed downwards, being hindered from going through the valves of the sucking pipe, opens and goes through the valves in the forcing pipe. When the forcer goes up again, then the water in the forcing pipe shuts the valves there by its pressure, and consequently the water in the well will rise up in the part of the forcing pipe, between that valve and the sucking pipe; and the same happens at every motion of the forcer.

It is to be observed in the *Forcing-pump*, that the nearer the forcer comes to the well, the better it is. See *Desagulier's* Course of Experim. Philosf. p. 160, 161.

As to the various kinds of *Forcers*, see the article FORCER *Append.*

The *Pump* described in the Cyclopædia, under the name *Forcing-pump*, is properly a *lifting-pump*; and the common *Pump*, which works by the pressure of the air, is called a *Sucking-pump*. Dr. Desaguliers, in his course of Experimental Philosophy, [a] has given a full account of the construction of all these kinds of *Pumps*, and of some others more complex; as also of their buckets, valves, and other parts belonging to them. [[a] Vol. 2. p. 152, to 166.]

Air-PUMP. See the article AIR-*pump*, *Cycl.*

There are several inconveniencies attending AIR-*pumps* of the common form, tho' much improved from what they used to be formerly. These inconveniencies are enumerated, and a method shewn to remedy them, by Mr. *Smeaton*, in the Phil. Transf. Vol. 47. p. 415, seq.

This ingenious artist has succeeded so well in his construction of the *Air-pump*, as to be able to rarify air a thousand times; whereas the best of the common *Air-pumps*, esteemed good in their kind, and in complete order, never rarified it above one hundred and forty times.

Mr. Smeaton's *Air-pump* acts also as a condensing engine, by the very simple apparatus of turning a cock. So that this *Air-pump* is an universal engine, for shewing any effect arising from an alteration in the density or spring of the air, and with a little addition may be made to shew the experiments of the air-fountain, wind-gun, &c. See the Phil. Transf. loc. cit. p. 422, seq.

PUMPELMOES, a name sometimes used for a species of Orange. See the article ORANGE, *Suppl.*

PURGING-*nut*, or *Physic-nut*, the name by which some call the *Ricinoides*, a distinct genus of plants. See the article RICINOIDES, *Suppl.*

PURPLE-*wort*, a name given to several species of trefoil, of a purple colour. See the article TREFOIL, *Suppl.*

PURSLAIN (*Suppl.*)—*Sea*-PURSLAIN, a name by which some call two very different genuses of plants, the *Atriplex* and *Chenopodium*. See the articles ATRIPLEX and CHENOPODIUM, *Suppl.*

PUTREFACTION (*Suppl.*) — It is an observation of Lord Bacon, that an inquiry into the means of preventing or staying *putrefaction*, is of excellent use in physic. Dr. Pringle has made a great many curious experiments and remarks on this subject, which are published by way of Appendix to his Observations on the Diseases of the Army.

Putrefaction is one of the instruments of nature, by which many great changes are brought about. With regard to medicine, we know that neither animal nor vegetable substances can become aliment, without undergoing some degree of *Putrefaction*. Many distempers proceed from a deficiency of this action. The crisis of fevers seems to depend upon it; and even animal heat, according to Dr. Stevenson, does the same. See the article HEAT, *Suppl.*

Now, that the concoction of the humours is nothing else but *Putrefaction*, seems probable from hence, that whenever they are in that state, they are always more fluid, and fitter to pass through the smaller vessels, where they stagnated before. Again, the offensiveness of the sweats, or other excretions consequent on a crisis, is likewise a sure sign of a high degree of corruption. The time of resolution or *Putrefaction* depends on the degree of heat, the habit of the patient, and on the part obstructed. Resolution is the *Putrefaction* of the impacted humour only, but suppuration implies a corruption of the vessels also. This manner of speaking, indeed, has been disused, from the prejudice that nothing was putrid but what was offensively so; whereas, in fact, every fibre becoming more tender, and humour thinner, may be considered as putrid in some degree, whether the change tends to the better health, or to the destruction of the person, or whether it becomes grateful or offensive to the senses. *Pringle*, Observ. on Diseas. of the Army. p. 337.

Mr. Boyle has used the words *fermentation* and *Putrefaction* of the blood promiscuously, in his treatise on the human blood. Stahl and other celebrated chemists likewise use the terms *putrid ferment*. See the article FERMENT, *Suppl.*

Putrefaction is always found to generate air. Hence, though flesh, as well as blood, be specifically heavier than water, yet dead bodies are found to float, after lying some time at the bottom, from air generated in the bowels by *Putrefaction*.

Now, as it has been found by experiments, that the blood and other animal substances begin to emit air, before they are so far corrupted, as the same frequently are in putrid diseases, it is probable that several of the symptoms in deep surfeits may be owing to the action of the confined air.

As all the humours of animal bodies become thinner by *Putrefaction*, so the solid or fibrous parts are thereby relaxed or rendered more tender. And hence the extraordinary bulk of the heart, liver, and spleen, incident to persons labouring under putrid diseases, may be accounted for. It is remarkable, that in dissections of people who die of the plague, the heart is almost always found of an uncommon bigness; and as to the scurvy, the liver and spleen are sometimes inlarged to such a degree, that the tumour may be seen outwardly. Id. ibid. p. 391, seq.

It being a received opinion, that bodies become highly alkaline by *Putrefaction*, the Doctor made the following experiments, in order to discover how far this might be true.

The serum of human blood *putrified*, made, with a solution of sublimate, first a turbid mixture, and afterwards a precipitation; which is indeed one of the tests of an alkali, but not to be admitted here, since the same thing was done with the recent urine of a person in perfect health, which is never accounted alkaline. The same serum did not tinge the syrup of violets green, and made no effervescence when the spirit of vitriol was poured upon it. The experiment was twice made upon portions of different serums, both highly putrid; and once on water, in which corrupted flesh had been sometime infused; and the most that could be found was, that a reddish cast having been previously given to the syrup with an acid, this colour was rendered fainter, but not destroyed by the *putrid* humours. And as to effervescence, the spirit of vitriol being dropped into those liquors unmixed, and also diluted with water, the mixture was quiet, and only a few air-bubbles appeared on shaking the glasses.

Upon the whole, though there were some marks of a latent alkali in the putrid serum, they were so very faint, that a quantity of water equal to that of the putrid liquors, mixed with only one drop of spirit of hartshorn, being put to the same trial, shewed more of an alkaline nature, than any of the other.

It has also been a maxim, that all animal substances, after *Putrefaction*, being distilled, send forth a great quantity of volatile salt in the first water; but Mr. Boyle found, that this held good only in urine; and that in the distillation of the serum of human blood *putrefied*, the liquor which came over first had little strength, either as to its smell or taste, and did not at first effervesce with an acid. And here it may be observed, that the chemists have generally applied those properties which they discovered in urine, to all the humours indifferently; whereas, in fact, there is a great diversity: for some animal substances, such as urine, the bile, and the crassamentum of the blood, soon putrefy; the serum, the saliva, and the white of an egg, slowly. Yet those that soonest corrupt, do not always arrive at the highest degree of *Putrefaction*: thus, the bile is soonest corrupted, but the rankness of it is not to be compared to that of flesh; and the white of an egg is not only much less disposed to putrify than the yolk, but when corrupted, yields a different and less offensive smell.

Doctor Pringle farther observes, that it seems peculiar to stale urine to contain an alkaline salt, which, without distillation, makes

makes a ſtrong effervefcence with acids. Whereas moſt other animal humours putrefied, though of a more intolerable fœtor, yet contain leſs volatile ſalt, leſs extricable, and then not effervefcing with acids. But, what makes the difference between ſtale urine, and other putrid ſubſtances ſtill more ſpecific, is its inoffenſiveneſs with regard to health; whilſt the ſteams of moſt other corrupted bodies are often the cauſe of putrid and malignant diſeaſes. So far then from dreading the volatile alkali as the deleterious part of corrupted bodies, it ſhould rather ſeem to be a corrector of *Putrefaction*. *Pringle* obſerv. on the diſ. of the army.

But ſtill there remains a prejudice, as if theſe ſalts being the produce of corruption, ſhould therefore haſten *Putrefaction*; and that not only in diſtempers where they are unwarily taken, but alſo in experiments out of the body. As to the effects ariſing from the internal uſe of them, little can be ſaid, unleſs the kind of diſeaſe were preciſely ſtated: for ſuppoſing theſe ſalts were by their nature diſpoſed to promote *Putrefaction*; yet if that is already begun, from a languor of circulation, and obſtruction, then may the volatiles, by their ſtimulating and apperient qualities, be the means of ſtopping its progreſs; and, on the other hand, though they were really antiſeptic, yet, if the humours are diſpoſed to corrupt, from exceſs of heat or motion, theſe very ſalts by adding to the cauſe, may augment the diſeaſe. So that upon the whole, it ſeems to be the faireſt criterion of the true nature of theſe volatiles, to enquire whether they accelerate or retard *Putrefaction* out of the body.'

In order to decide this queſtion, repeated experiments were made, by joining both the ſpirit and the ſalt of hartſhorn to various animal ſubſtances; and it was conſtantly found, that ſo far from promoting *Putrefaction*, they evidently hindered it, even more powerfully than common ſea-ſalt. Hence, the Doctor thinks it probable, that the ſame taken by way of medicine, will likewiſe prove antiſeptic; or at leaſt, that we cannot juſtly ſuppoſe them corrupters of the humours, more than fermented ſpirits or ſea-ſalt.

With regard to the *Putrefaction* of dead bodies, it is found that ſome parts corrupt much ſooner than others. Thus, as the abdominal viſcera and muſcles corrupt the ſooneſt, it is a rule with anatomiſts, to begin their diſſections and demonſtrations with thoſe parts, the quick *Putrefaction* of which may be aſcribed to the putrid ſteams of the fæces. Next to the abdominal viſcera and adjacent parts, the lungs are commonly ſooneſt tainted; either from the air ſtagnating in the veſiculæ bronchiales, or from ſome remains of perſpirable matter, that by acting as a ferment, may haſten the *Putrefaction*. Id. ibid. p. 392.

It is obſervable, that the *Putrefaction* of meat, and other ſubſtances, advances quicker in a confined than free air; for, as the moſt putrid parts are alſo the moſt fugitive, they inceſſantly iſſue from a corruptible ſubſtance, and diſperſe with the wind; but, in a ſtagnation of air, they remain about the body; and, in the nature of a ferment, excite its corruption.

Putrefaction is one cauſe of bilious and intermitting fevers, the dyſentery, malignant or peſtilential fevers, the ſcurvy, lepra Arabum, &c. See the articles Bilious, Dysentery, Malignant, &c. *Append.*

Thoſe ſubſtances which reſiſt *Putrefaction*, are called *Antiſeptics*, and the promoters of it *Septics*. See the articles Antiseptics and Septics, *Append.*

Putrefaction of the blood. See the article Blood, *Append.*

PUTRID *ferment.* See the article Ferment, *Suppl.*

Putrid *fever.* See the articles Bilious and Malignant.

PUTREFIERS, among phyſicians, the ſame with *Septics*. See the article Septics, *Append.*

PYE, or Magpye, in ornithology. See the article Pica, *Suppl.*

Sea-Pye, in ichthyology, the Engliſh name of the *Pica marina*. See the article Pica *marina*.

PYROMETER, the name of a machine contrived to meaſure the alteration of the dimenſions of metals, ariſing from heat.

Muſchenbroek, who was the original inventor of this machine, has given a table of the expanſion of the different metals, in the ſame degree of heat. See the article Heat, *Append.*

As to the conſtruction of the *Pyrometer*, the curious may conſult Deſagul. Experim. Philoſoph. p. 421, ſeq.

But it has been obſerved, that Mr. Muſchenbroek's *Pyrometer* was liable to ſome objections, and theſe have been removed, in a good meaſure, by Mr. Ellicott, who has given a deſcription of his improved *Pyrometer* in the Philoſophical Tranſactions, N° 443. This may alſo be ſeen in Dr. Martyn's Abridgment, vol. 8. p. 464.

In this *Pyrometer* the lengthening of a bar of metal by heat $\frac{1}{7\,2\,0}$ of an inch, will carry an index once round a circle divided into 360 degrees, ſo that if the metal lengthens the 7200th part of an inch, the index will move one degree. ibid.

By the help of this inſtrument Mr. Ellicott found, upon a medium, that the expanſions of bars of different metals, as nearly of the ſame dimenſions as poſſible, by the ſame degree of heat, were as follows:

Gold,	Silver,	Braſs,	Copper,	Iron,	Steel,	Lead,
73	103	95	89	60	56	149

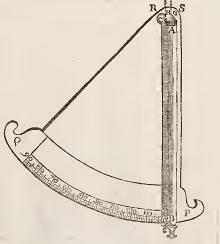
The great difference between the expanſions of iron and braſs, has been applied with good ſucceſs to remedy the irregularities in pendulums ariſing from heat. Phil. Tranſ. Vol. 47. p. 485. See the articles Heat and Pendulum, *Append.*

PYTHAGORIC, or *Abacus* table. See the article Table, *Cycl.*

QUADRANT (*Cycl.*) — *Davis*'s QUADRANT. When the horizon is obſcured by hazy weather, *Davis*'s *Quadrant* is of no uſe; and this often occaſions melancholy conſequences. Means have therefore been ſought after to remedy this defect. Mr. Leigh propoſes a water-level to be fixed to the *Quadrant*; and he likewiſe has given the deſcription and uſe of an apparatus to be added to this inſtrument, conſiſting of a mercurial level, which he prefers, no doubt juſtly, to a water-level. See Phil. Tranſ. N° 431. Sect. 1 and 2.

Hadley's QUADRANT, the common name for the juſtly eſteemed *Quadrant*, invented by the late John Hadley, Eſq; This *Quadrant*, which at firſt had the fate of all other ingenious inventions, to be neglected by ignorant and obſtinate men, even though highly uſeful to them in their profeſſion, ſeems at laſt to have made its way, in ſpite of habit and prejudice.

We cannot here inſert a full deſcription and draught of this inſtrument; but we muſt obſerve, that though the late Mr. Hadley was undoubtedly the inventor of it, yet the principle upon which his invention turns, had not eſcaped the ſagacity of Sir Iſaac Newton, long before, as appears from a paper in his hand-writing found among the papers of the late Dr. Halley. But this was totally unknown to Mr. Hadley, and ſeemed to have been forgot by Dr. Halley himſelf. The account of Sir Iſaac's invention is inſerted in the Philoſophical Tranſactions, N° 465, and in Dr. Martyn's Abridgment, vol. 8. p. 129. and is as follows:



P Q R S denotes a plate of braſs accurately divided in the limb D Q, into $\frac{1}{2}$ degrees, $\frac{1}{2}$ minutes, and $\frac{1}{12}$ minutes, by a diagonal ſcale; and the $\frac{1}{2}$ degrees, $\frac{1}{2}$ minutes, and $\frac{1}{12}$ minutes, counted for degrees, minutes, and $\frac{1}{6}$ minutes. A B is a teleſcope, three or four feet long, fixed on the edge of the braſs plate. G is a ſpeculum, fixed on the ſaid braſs plate perpendicularly, as near as may be to the object glaſs of the teleſcope, ſo as to be inclined 45 degrees to the axis of the teleſcope, and intercept half the light which would otherwiſe come through the teleſcope to the eye. C D is a moveable index, turning about the center C, and, with its fiducial edge, ſhewing the degrees, minutes, and $\frac{1}{6}$ minutes, on the limb of the braſs plate P Q; the center C, muſt be over-againſt the middle of the ſpeculum G. H is another ſpeculum, parallel to the former, when the fiducial edge of the index falls on $00^{d}\ 00'\ 00''$; ſo that the ſame ſtar may then appear through the teleſcope, in one and the ſame place, both by the direct rays and by the reflected ones; but if the index be turned, the ſtar will appear in two places, whoſe diſtance is ſhewed, on the braſs limb, by the index.

By this inſtrument the diſtance of the moon from any fixed ſtar is thus obſerved: view the ſtar through the perſpicil by the direct light, and the moon by the reflected (or, on the contrary) and turn the index till the ſtar touch the limb of the moon, and the index ſhall ſhew upon the braſs limb of the inſtrument, the diſtance of the ſtar from the limb of the moon; and though the inſtrument ſhake, by the motion of your ſhip at ſea, yet the moon and ſtar will move together, as if they did really touch one another in the heavens; ſo that an obſervation may be made as exactly at ſea as at land. And, by the ſame inſtrument may be obſerved, exactly, the altitudes of the moon and ſtars, by bringing them to the horizon; and thereby the latitude, and times of obſervations, may be determined more exactly than by ways formerly practiſed. In the time of obſervation, if the inſtrument move angularly about the axis of the teleſcope, the ſtar will move in a tangent of the moon's limb, or of the horizon; but the obſervation may notwithſtanding be made exactly, by noting when the line, deſcribed by the ſtar, is a tangent to the moon's limb, or to the horizon. To make this inſtrument uſeful, the teleſcope ought to take in a large angle: And to make the obſervation true, let the ſtar touch the moon's limb, not on the outſide of the limb, but on the inſide. Vid. Philoſoph. Tranſact. N° 465. p. 155, 156.

For the common uſes at ſea a teleſcope is not neceſſary; Mr. Hadley's Quadrants are therefore generally made without one, which renders the uſe of them much more ready. He has alſo added ſome contrivances to facilitate their uſe; which are deſcribed in the printed papers uſually ſold with the inſtrument.

Other *Quadrants* have been contrived ſince, by ſome ingenious artiſts, all of which have their merit, but the particulars of their conſtructions are too many for this place; and perhaps on the whole nothing preferable to Mr. Hadley's invention has yet been found.

Mural QUADRANT. Mr. Geiſten has lately given us a deſcription of a new aſtronomical *mural Quadrant*, which he ſays is free from many of the uſual inconveniencies attending the uſe of ſuch inſtruments. See Phil. Tranſ. N° 483. Sect. 18.

QUADRIGA, in ſurgery, otherwiſe called CATAPHRACTA, is a ſtrong bandage made uſe of in fractures of the *Sternum*. It is compoſed of a double headed roller about ſix Paris ells long, and three or four fingers broad. See *Heiſter*'s Surgery, P. III. Ch. 4. §. 14.

QUADRILLE, a well known game at cards; and which has been, in ſeveral caſes, the object of mathematical computations. See Mr. *De Moivre*'s Doctrine of Chances, 2d edit. p. 83 to 90.

QUAKING-*graſs*, in botany. See the article GRASS, *Append.*

QUANTITY (*Cycl.*) — The note in the Cyclopædia, from Mr. Machin's paper in the Phil. Tranſ. N° 447. ſhould have been extended, as it ſerves to render the notions of mathematical *Quantity* more diſtinct and adequate than any thing that is commonly to be met with in authors on this ſubject. Not to give the reader the trouble of turning to the Cyclopædia for the ſake of a few lines, we ſhall inſert the whole. Mr. Machin, in the poſtſcript to the ſolution of Kepler's problem, inſerted in the before cited number of the Phil. Tranſ. ſays,

That he takes a mathematical *Quantity*, and that for which any ſymbol is put, to be nothing elſe but number with regard to ſome meaſure which is conſidered as one. For we cannot know preciſely and determinately, that is, mathematically, how much any thing is but by means of number. The notion of continued *Quantity*, without regard to any meaſure, is indiſtinct and confuſed; and although ſome ſpecies of ſuch *Quantity*, conſidered phyſically, may be deſcribed by motion, as lines by points, and ſurfaces by lines, and ſo on; yet the magnitudes or mathematical *Quantities* are not made by that motion, but by numbering according to a meaſure.

Accordingly, all the ſeveral notations that are found neceſſary to expreſs the formations of *Quantities*, do refer to ſome office or property of number or meaſure; but none can be interpreted to ſignify continued *Quantity* as ſuch.

Thus ſome notations are found requiſite to expreſs number in its ordinal capacity, or the *numerus numerans*, as when one follows or precedes another, in the firſt, ſecond, or third place from that upon which it depends; as the *Quantities* $x^{\backprime}$, $x^{\backprime\backprime}$, x, x', x'', referring to the principal one x.

So, in many caſes, a notation is found neceſſary to be given to a meaſure as a meaſure; as for inſtance, Sir Iſaac Newton's ſymbol for a fluxion $\dot{x}$; for this ſtands for a meaſure of ſome kind, and accordingly he uſually puts an unit for it, if it be the principal one upon which the reſt depend.

So ſome notations are expreſly to ſhew a number in the form of its compoſition, as the index to the geometrical power x^{n}, denoting the number of equal factors which go to the compoſition of it, or what is analogous to ſuch.

But that there is no ſymbol or notation but what refers to diſcreet *Quantity*, is manifeſt from the operations, which are all arithmetical.

And hence it is, there are ſo many ſpecies of mathematical *Quantity* as there are forms of compoſite numbers, or ways in the compoſition of them; among which there are two more eminent for their ſimplicity and univerſality than the reſt; one is the *geometrical power*, formed from a conſtant root; and the other, though well known, yet wanting a name, as well

well as a notation, may be called the *arithmetical power*; or the power of a root uniformly increaſing or diminiſhing. This is the Power whoſe notation is deſigned in the article *Arithmetical* POWER, *Append.*

QUARTER (*Cycl.* and *Suppl.*) — QUARTER-*round*, in architecture, denotes any moulding whoſe contour is either a perfect quadrant, or *Quarter* of a circle, or that approaches near to that figure. Build. Dict. in voc.

QUARTERS, — *Winter*-QUARTERS, in military affairs. *Winter-Quarters*, when cold and moiſt, are productive of inflammatory diſorders, particularly hard coughs, with inflammations of the pleura and lungs. See the article BARRACKS, *Append.*

In very hot countries it has ſometimes been cuſtomary, to put armies into *Summers quarters.*

QUEEN'S *Gilliflower*, the name by which ſome call the *Heſperis* of botanical writers. See the article HESPERIS, *Suppl.*

QUICK, the name by which ſome call a ſpecies of *Meſpilus*, or medlar. See the article MESPILUS, *Suppl.*

QUICK-*beam*, a name ſometimes given to the *Sorbus*, or ſervice-tree. See the article SORBUS, *Suppl.*

QUICK-*graſs*, the Engliſh name of a genus of plants, called by Linnæus *Agroſtis.* See the article AGROSTIS, *Suppl.*

QUICKEN-*tree*, a name alſo given to the *Sorbus.*

QUICKSILVER-*water.* See the article WATER, *Append.*

R.

RADICULA, in botany, the name by which Dillenius calls the *Siſymbrium* of other botaniſts. See the article SISYMBRIUM, *Suppl.*

RADISH (*Suppl.*) *Horſe*-RADISH, a popular name for a ſpecies of *Cochlearia*, or ſcurvy graſs. See the article COCHLEARIA, *Suppl.*

Water-RADISH, the name by which ſeveral ſpecies of *Siſymbrium* are ſometimes called. See the article SISYMBRIUM, *Suppl.*

RADIUS *of Concavity*, in geometry, is ſometimes uſed [a] for the *Radius* or ray of curvature, or the *Radius* of the oſculatory circle. See the article CURVATURE, *Append.* [[a] De Moivre, Miſcel. Analyt. p. 231.]

RADIUS *of Curvature*, in geometry. See the article CURVATURE.

RADIUS *Oſculi* is alſo uſed in the ſame ſenſe.

RADIUS *Vector*, in mechanics, is uſed for a right line drawn from the center of force in any curve in which a body is ſuppoſed to move by a centripetal force, to that point of the curve where the body is ſuppoſed to be. See the article *Central* FORCE, *Append.*

RAGGED *Robin*, a name uſed ſometimes for the *Lychnis.* See the article LYCHNIS, *Suppl.*

RAIN (*Suppl.*) — Beſides the cauſes of rain mentioned in the Cyclopædia, Deſaguliers thinks it owing to the loſs of electricity in the vapours whereof the clouds are formed. See the articles VAPOUR and ELECTRICITY, *Append.*

RAISING *Pieces*, in carpentry, the pieces which lie on the tops of the poſts and punchions, and under the beams; thoſe lying on the brick work being called platbands. Build. Dict. in voc.

RAMMER *for piles.* See the article PILE, *Append.*

RAMPHASTOS, in ornithology, the name by which Dr. Hill calls the *Toucan* of other writers. See the article TOUCAN, *Suppl.*

The *Ramphaſtos* is a diſtinct genus of birds, of the *Pica*, or magpie kind. Its beak is remarkably large, equal, in moſt ſpecies to the whole body in magnitude. There are no viſible noſtrils. The feet have each four toes, two of which ſtand forward, and the other two backward, as in the parrot. *Hill*, Hiſt Anim. p. 381. The ſpecies are theſe: 1. The *Ramphaſtos* with a red rump. 2. The *Ramphaſtos* with a yellow rump. 3. The *Ramphaſtos* with a white rump. 4. The green *Ramphaſtos*, with a party-coloured beak.

Theſe birds have been called by Linnæus, and other writers, *Roſtratæ*, from the largeneſs of their beaks.

RAMPION is alſo a name given to the blue-flowered *Campanula*, or bell-flower, with an eſculent root. See the article CAMPANULA, *Suppl.*

RAMSONS, a name given to the broad-leaved wild *Allium*, or Garlick. See the article GARLICK, *Suppl.*

RANGLE, in falconry, is when gravel is given a hawk to bring her to her ſtomach. Dict. Ruſt. in voc.

RANUNCULUS (*Suppl.*) — *Globe*-RANUNCULUS, a name ſometimes given to a ſpecies of *Hellebore.* See the article HELLEBORUS, *Suppl.*

RAPE, a name ſometimes uſed for the *Napus*, or navew. See the article NAPUS, *Suppl.*

Wild-RAPE, the Engliſh name of a genus of plants, called by botaniſts *Rapiſtrum.* See the articles RAPISTRUM, *Suppl.*

RAPHIDIA, in the hiſtory of inſects, the name by which Dr. Hill calls a genus of four-winged flies, of the neuroptera-kind. See the article NEUROPTERA, *Append.*

The head of the *Raphidia* is of a horny ſubſtance, and is depreſſed. The tail is armed with a weapon of a ſlender form, ſharp, horny, and ſimple, not bifid at the extremity. *Hill*, Hiſt. Anim. p. 70.

RARATAS, in botany, the name by which Plumier calls the *Ananas*, or pine-apple of Tournefort. See the article ANANAS, *Suppl.*

RAT (*Suppl.*) — *Mountain*-RAT, the Engliſh name of a creature, otherwiſe called the *Marmotte.* See the article MARMOTTE, *Suppl.*

RATIO (*Suppl.*) — It is to be obſerved, that in this article of the Supplement the method deſcribed of inſerting ſecondary *Ratios*, gives two ſeries, the one containing the *Ratios* greater than the true, and the other the *Ratios* leſs than the true; and if we conſider each ſeries ſeparately, we ſhall always find, that the *Ratios* expreſſed by larger numbers, approach nearer the truth than thoſe expreſſed by ſmaller numbers. But if we compare the *Ratios* of one ſeries with thoſe of the other, it may often happen, that a *Ratio* expreſſed in ſmaller numbers, ſhall approach nearer the truth, than another expreſſed by greater numbers. For inſtance, let the *Ratio* 519529 to 328612, expreſſing the proportion of the ſemi-tone major to the ſemi-tone minor in muſic, be propoſed. The quotients, according to the method here deſcribed, will be 1. 1. 1. 2. 1, &c. Hence the *Ratios* greater than the true will be 2 : 1, 5 : 3, &c. and the *Ratios* leſs than the true will be 1 : 1, 3 : 2; 11 : 7, &c. Now, I ſay, that the *Ratio* 3 : 2, though expreſſed in ſmaller numbers approaches nearer to the truth than 5 : 3; for the exponent of the propoſed *Ratio* $\frac{519529}{328612} = 1.581$ and $\frac{3}{2} = 1.5$ alſo $\frac{5}{3} = 1.667$. Hence the exponent of the *Ratio* of 5 to 3 will exceed the truth by $0.086 = 1.667 - 1.581$; but the exponent of the *Ratio* 3 to 2 will be deficient by no more than $0.081 = 1.581 - 1.5$. Again, ſuppoſe the *Ratio* of 927707238 to 659826661, expreſſing the chance of the dealer's at whiſt having four trumps [a], were propoſed. Dividing the firſt term by the ſecond, &c. the quotients will be 1. 2. 2. 6. 3. 1. 1. 4, &c. which gives the *Ratios* greater than the true 2 : 1, 3 : 2, 10 : 7, 17 : 12, &c. and leſs than the true 1 : 1, 4 : 3, 7 : 5, 52 : 37, &c. And here the *Ratio* 7 : 5, tho' expreſſed in ſmaller numbers, approaches nearer to the truth, than either 10 : 7, or 17 : 12, as will eaſily appear by reducing their exponents to decimals. But no inconveniencies of this kind can happen, if we content ourſelves with the principal and primary *Ratios*, they being alternately greater and leſs, and continually approaching nearer to the truth. — [[a] See the article WHIST, *Append.*]

RATTLE-*graſs*, a name ſometimes uſed for a ſpecies of *Pedicularis*, or Louſe-wort. See the article PEDICULARIS, *Suppl.*

RATTLE-*net.* See the article WOLF-*net*, *Suppl.*

RATTLE-*ſnake-root*, in botany, a name ſometimes uſed for the *Polygala*, or Milk-wort. See the article POLYGALA, *Suppl.*

RAVEN (*Suppl.*) — *Indian*-RAVEN, the Engliſh name of the *Buceros.* See the articles BUCEROS, *Append.* and CORVUS-*Indicus*, *Suppl.*

RAY, in geometry, is often uſed for *Radius.*

RAY *of Curvature.* See the article CURVATURE.

RAZOR-*fiſh*, is a name frequently given to a ſpecies of *Coryphæna*, otherwiſe called *Novacula piſcis.* See the articles CORYPHÆNA and NOVACULA, *Suppl.*

REBUS (*Suppl.*) — REBUS, in heraldry, a coat of arms which bears an alluſion to the name of the perſon; as three caſtles, for Caſtleton; three cups, for Butler, three conies, for Coniſby; a kind of bearings which are of great antiquity.

RED-*breaſt*, in ornithology, the Engliſh name of a ſpecies of *Motacilla*, called alſo *Rubecula* and *Erithacus.* See the articles MOTACILLA and RUBECULA, *Suppl.*

REED (*Suppl.*) — *Indian flowering* REED, the name by which the *Canna* of botaniſts is ſometimes called. See the article CANNA, *Suppl.*

REEM-

REEMING-*irons*, a kind of chiſſels, broader than ordinary, uſed for opening the ſeams of ſhips, before they are caulked. *Blankley*'s Nav. Expoſ. p. 130.

REFRACTION (*Cycl.*) — The *Refraction* of the air has many times ſo uncertain an influence on the places of celeſtial objects, very remote from the zenith, that wherever *Refraction* is concerned, the concluſions deduced from obſervations that are much affected by it, will always remain doubtful, and too precarious in many caſes to be relied upon. See Dr. *Bradley*, in Phil. Tranſ. N° 485.

REGIMENTAL *Hoſpital*. See the article HOSPITAL, *Append.*

REIN-*deer*, the Engliſh name of the *Rangifer*, a creature of the deer-kind. See the articles DEER and RANGIFER, *Suppl.*

RELL-*mouſe*, the Engliſh name of the white bellied mouſe, with a blackiſh back, and long body. See the article GLIS, *Suppl.*

REPRESENTATIVE (*Cycl.*)—REPRESENTATIVE *Power*, in metaphyſics, a term introduced by Leibnitz, to ſignify that power of the human ſoul, by which it repreſents to itſelf the univerſe, according to the ſituation of the body in the univerſe. See the article IDEA, *Suppl.*

Wolfius calls this power *vis repreſentativa*, to denote its being an active power, or rather a force actually exerting itſelf. For he expreſly ſays, *quod vis conſiſtat in continuo agendi conatu*. And he thinks that from this principle of a *vis repreſentativa*, every phænomenon of the human mind may be accounted for. See his Phyſcholog. Ration. Art. 529.

But it may be preſumed, that many will find this principle too obſcure to be admitted.

When it is ſaid, that our ideas are *repreſentative* of things without us, or of the univerſe; it may be aſked in what ſenſe this is to be underſtood? Do they *repreſent* it 1° as a picture does its original? or 2° as an effect of a cauſe? or 3° as a ſign repreſents the thing ſignified? The firſt opinion is exploded in part by Locke and the Carteſians, and totally by Dr. Berkely, late Biſhop of Cloyne. The ſecond is admitted by Hobbes, but denied by Leibnitz himſelf, and the idealiſts. The third ſhould ſeem to be the opinion of Leibnitz, but he is not ſufficiently explicit.

Dr. Berkeley admits ideas to be ſigns; but according to him they are arbitrary ſigns, depending on the immediate will of the deity: hence the viſual language; and ideas, only ſignify or ſuggeſt each other, and ſpirits; but not bodies, the exiſtence of which is totally unknown.

REMITTENTS, or REMITTING *fevers*, the ſame with the bilious ones. See the article BILIOUS, *Append.*

REMOTION, *Remotio*, in rhetoric. See the article METASTASIS, *Suppl.*

REPETEND, in arithmetic, is uſed for that part of an interminate decimal fraction, which is continually repeated ad infinitum.

Thus in the interminate decimal fraction 317. 45 316 316 316, &c. the figures 316 are called the *Repetend*. *Cunn*, Treat. of Fractions.

Theſe *Repetends* often ariſe in the reduction of vulgar fractions to decimals, thus $\frac{1}{3} = 0.\ 3333$, &c. $\frac{1}{7} = 0.\ 142857\ 142857$, &c. $\frac{1}{11} = 0.\ 090909$, &c.

Single REPETEND, is that where one figure only is repeated, as in 0. 3 3 3, &c.

Compound REPETEND, is that where two or more figures are repeated, as in 0. 09 09, &c. or in 0. 142857 142857, &c.

Decimals with *Repetends* may always be reduced to vulgar fractions. For either the *Repetend* begins with the decimal, or not:

If the *Repetend* begins with the firſt place of decimals, make it the numerator of a vulgar fraction, and make the denominator conſiſt of as many 9's as the *Repetend* has figures, then will this vulgar fraction be equal to the decimal.

Thus, if the *Repetend* be ſingle, as in 0. 3 3 3 3, the vulgar fraction equal to it will be $= \frac{3}{9} = \frac{1}{3}$. So if the *Repetend* be compound, as in 0. 09 09, &c. the equivalent vulgar fraction will $= \frac{09}{99} = \frac{9}{99} = \frac{1}{11}$.

And in like manner 0. 142857 142857, &c. $= \frac{142857}{999999} = \frac{1}{7}$.

The reaſon is obvious from this conſideration, that the decimal 0. 3 3 3, &c. is $= \frac{3}{10} + \frac{3}{100} + \frac{3}{1000}$, &c. the ſum of which by the rule mentioned under FRACTION, *Suppl.* will be equal to $\frac{3}{10}$ divided by $1 - \frac{1}{10} = \frac{3}{9} = \frac{1}{3}$, and ſo of the reſt.

If the *Repetend* does not begin with the firſt place of decimals, but at ſome place farther on towards the right, as in the decimal 0. 8 3 3 3 3, &c. where the *Repetend* does not begin till the ſecond place of decimals, *obſerve*, that 0. 8333 + &c. $= \frac{8}{10} + \frac{3}{100} + \frac{3}{1000} +$ &c. $= \frac{8}{10} + \frac{1}{10} \times \frac{3}{10} + \frac{3}{10^2} +$ &c. But $\frac{3}{10} + \frac{3}{10^2} +$ &c $= \frac{3}{9} = \frac{1}{3}$, as before, therefore the propoſed decimal is $= \frac{8}{10} + \frac{1}{10} \times \frac{1}{3} = \frac{8}{10} + \frac{1}{30} = \frac{24+1}{30} = \frac{25}{30} = \frac{5}{6}$.

Thus alſo if the decimal 0. 2 27 27, &c. were propoſed, we ſhall find it $= \frac{2}{10} + \frac{1}{10} \times \frac{27}{100} + \frac{27}{100^2} +$ &c. And $\frac{27}{100} + \frac{27}{100^2} +$ &c. being $= \frac{27}{99} = \frac{3}{11}$, the decimal will be $= \frac{2}{10} + \frac{1}{10} \times \frac{3}{11} = \frac{2}{10} + \frac{3}{110} = \frac{22+3}{110} = \frac{5}{22}$. The reaſon of which is obvious from what has been ſaid.

It may perhaps be worth while to obſerve, that if the numerator of a vulgar fraction be unity, and the denominator any prime number, except 2 and 5, the decimal equal to the propoſed fraction will always be a *Repetend*, beginning at the firſt place of decimals; and this *Repetend* muſt neceſſarily be a ſubmultiple, or an aliquot part of a number expreſſed by as many 9's as the *Repetend* has figures; that is, if the *Repetend* have 6 figures, it will be a ſubmultiple of 999999; if four figures, it will be a ſubmultiple of 9999, &c. From whence it follows, that if any prime number be called p, the ſeries 9999, &c. produced as far as is neceſſary will always be diviſible by p, and the quotient will be the *Repetend* of the decimal fraction $= \frac{1}{p}$.

REPRODUCTION (*Cycl.*) — It is very well known, that trees and plants are to be raiſed from ſlips and cuttings, and ſome late obſervations have ſhewn, that there are ſome animals which have the ſame property.

The Polype was the firſt inſtance we had of this; but we had ſcarce time to wonder at the diſcovery Mr. Trembley had made, when Mr. Bonett diſcovered the ſame property in a ſpecies of water-worm. See the articles POLYPE and WATER-WORM, *Suppl.*

Amongſt the plants which may be rais'd from cuttings, there are ſome which ſeem to poſſeſs this quality in ſo eminent a degree, that the ſmalleſt portion of them will become a complete tree again. See the article PLANT, *Append.*

It deſerves enquiry, whether or not the great author of nature, when he ordained that certain inſects as theſe polypes and worms ſhould reſemble thoſe plants in that particular, allowed them this power of being *reproduced* in the ſame degree; or, which is the ſame thing, whether this *Reproduction* will or will not take place in whatever part the worm is cut: In order to try this, Mr. Bonett entered on a courſe of many experiments on the water-worms which have this property. Theſe are, at their common growth, from two to three inches long, and of a browniſh colour, with a caſt of reddiſh. From one of theſe worms he cut off the head and tail, taking from each extremity only a ſmall piece of a twelfth of an inch in length, but neither of theſe pieces were able to *reproduce* what was wanting. They both periſhed in about twenty-four hours; the tail firſt, and afterwards the head. As to the body of the worm from which theſe pieces were ſeparated, it lived as well as before, and ſeemed indeed to ſuffer nothing by the loſs, the head-part being immediately uſed as if the head was thereon, boring the creature's way into the mud. There are, beſides this, two other points in which the *Reproduction* will not take place, the one of theſe is about the fifth or ſixth rim from the head, and the other the ſame diſtance from the tail; and in all probability the condition of the great artery in theſe parts is the cauſe of this.

What is ſaid of the want of the *reproductive* power of theſe parts, relates only to the head and tail ends; for as to the body, it feels very little inconvenience from the loſs of what is taken off, and very ſpeedily *reproduces* thoſe parts. Where then does the principle of life reſide in ſuch worms, which after having their heads cut off, will have, not only the ſame motions, but even the inclinations, that they had before; and yet this difficulty is very ſmall, compared to ſeveral others, which at the ſame time offer themſelves to our reaſon? Is this wonderful *Reproduction* of parts only a natural conſequence of the laws of motion, or are there lodged in the body of the creature a chain of minute buds or ſhoots, a ſort of little embryos already formed and placed in ſuch parts where the *Reproductions* are to begin? Are theſe worms only mere machines, or, are they like more perfect animals, a ſort of compound, the ſprings of whoſe motions are actuated or regulated by a ſort of ſoul? And if they have themſelves ſuch a principle, how is it that this principle is multiplied and is found in every ſeparate piece? Is it to be granted, that there are in theſe worms not a ſingle ſoul (if it is to be ſo called) in each, but that each contains as many ſouls as there are pieces capable of *reproducing* perfect animals? Are we to believe with Malpighi, that theſe ſorts of worms are all heart and brain from one end to the other? This may be, but yet if we knew that it was ſo, we ſhould know in reality but very little the more for knowing it; and it ſeems after all, that in caſes of this kind we are only to admire the works of the great Creator, and ſit down in ſilence.

The nice ſenſe of feeling in ſpiders has been much talked of by naturaliſts; but it appears that theſe worms have yet ſomewhat more ſurprizing in them in regard to this particular. If a piece of ſtick, or any other ſubſtance, be brought near them, they do not ſtay for its touching them, but begin to leap and friſk about, as ſoon as it comes towards them. There want however ſome farther experiments to aſcertain whether this be really owing to feeling or to ſight; for tho' we can diſcover no diſtinct organs of ſight in theſe creatures, yet they ſeem affected by the light of the ſun or a candle, and always friſk about it in the ſame manner at the approach of either; nay even the moon-light has ſome effect upon them.

A twig of willow, poplar, or many other trees being planted in the earth, takes root, and becomes a tree, every piece of which will in the fame manner produce other trees. The cafe is the fame with thefe worms; they are cut to pieces, and thefe feveral pieces become perfect animals; and each of thefe may be again cut into a number of pieces, each of which will in the fame manner produce an animal. It had been fuppofed by fome, that thefe worms were oviparous; but Mr. Bonett, on cutting one of them to pieces, having obferved a flender fubftance refembling a fmall filament to move at the end of one of the pieces, feparated it, and on examining it with glaffes, found it to be a perfect worm of the fame form with its parent, which lived and grew larger in a veffel of water into which he put it. Thefe fmall worms are eafily divided, and very readily complete themfelves again, a day ufually ferving for the production of a head to the part that wants one, and in general the fmaller and flenderer the worms are, the fooner they complete themfelves after this operation. When the bodies of the large worms are examined by the microfcope, it is very eafy to fee the appearance of the young worms alive and moving about within them; but it requires great precifion and exactnefs to be certain of this; fince the ramifications of the great artery have very much the appearance of young worms, and they are kept in a fort of continual motion by the fyftoles and diaftoles of the feveral portions of the artery which ferve as fo many hearts. It is very certain, that what we force in regard to thefe animals by our operations, is done alfo naturally every day in the brooks and ditches where they live. A curious obferver will find in thefe places many of them without heads or tails, and fome without either; as alfo other fragments of various kinds, all which are then in the act of completing themfelves; but whether accidents have reduced them to this ftate, or they thus purpofely throw off parts of their own body for the *Reproduction* of more animals, is not eafy to determine. They are plainly liable to many accidents, by which they lofe the feveral parts of their body, and muft perifh very early, if they had not a power of *reproducing* what was loft; they often are broken into two pieces, by the refiftance of fome hard piece of mud, which they enter; and they are fubject to a difeafe, a kind of gangrene rotting off the feveral parts of their bodies, and muft inevitably perifh by it, had they not this furprizing property.

This worm was a fecond inftance after the polype, of the furprizing power in an animal of recovering its moft effential parts, when loft; but nature does not feem to have limited her beneficence in this refpect to thefe two creatures; Mr. Bonett tried the fame experiments on another fpecies of water-worm, differing from the former in being much thicker: This kind of worm, when divided in the fummer feafon, very often fhews the fame property; for if it be cut into three or four pieces, the pieces will lie like dead for a long time, but afterwards will move about again, and will be found in this ftate of reft to have recovered a head, or a tail, or both. After recovering their parts, they move very little, and according to this gentleman's experiments, feldom live more than a month.

It fhould feem that the more difficult fuccefs of this laft kind of worm, after cutting, and the long time it takes to recover the loft parts, if it do recover them at all, is owing to its thicknefs; fince we always find in that fpecies of worms which fucceeds beft of all, that thofe which are thinneft always recover their parts much fooner than the others.

The water infects alfo are not the only creatures which have this power of recovering their loft parts. The earth affords us fome already difcovered to grow in this manner from their cuttings, and thefe not lefs deferving our admiration than thofe of the water; the common earth worms are of this kind. Some of thefe worms have been divided into two, others into three or four pieces, and fome of thefe pieces, after having paffed two or three months without any appearance of life or motion, have then begun to *reproduce* a head or a tail, or both. The *Reproduction* of the anus, after fuch a ftate of reft is no long work; a few days does it, but it is otherwife with the head, that does not feem to perform its functions in the divided pieces, till about feven months after the feparation. It is to be obferved, that in all thefe operations both on earth and water-worms, that the hinder part fuffers greatly more than the fore part in the cutting, for it always twifts itfelf about a long time, as if actuated by ftrong convulfions; whereas the head ufually crawls away without the appearance of any great uneafinefs.

REVERSION *of Series (Cycl.)* — The problems mentioned under this head in the Cyclopædia may indeed be folved by the method of *Reverfion of Series*, but are only particular cafes of it, and not a general account of that method, which is to be underftood thus: The value of any indefinite quantity, y, for inftance, being expreffed by an infinite *Series* of fimple terms, including different powers of another variable quantity, x, the value of x is thence to be found, by a kind of reverfed operation, expreffed in a *Series* of fimple terms, including different powers of the quantity y. Thus, if $y = x - \frac{1}{2}x^2 + \frac{1}{3}x^3 - \frac{1}{4}x^4 + \&c.$ by the *Reverfion of the Series*, we fhall have, $x = y + \frac{1}{2}y^2 + \frac{1}{6}y^3 + \frac{1}{24}y^4 + \frac{1}{120}y^5$. Thus alfo, if $dx + bx^2 + cx^3 + dx^4 + \&c. = gy + hy^2 + iy^3 + ky^4 + \&c.$ x may be found by this method, expreffed by the powers of y.

There are various ways of doing this. One, which is often convenient, is, by affuming a *Series* with indeterminate coefficients of a certain form; examples of which are given under the head FORM *of a Series*, *Append.* See Mac Laurin's Algebra, pag. 263. and Mr. De Moivre, in the Phil. Tranf. N° 240.

Other methods may be feen in Mr. Stuart's explanation of Sir Ifaac Newton's Treatife of Analyfis by equations of an infinite number of terms, p. 455.

RESERVATORY, a term fometimes ufed in a fynonymous fenfe with *Refervoir*, See the article RESERVOIR, *Cycl.*

RETURN, in the military language, denotes the lift of the fick, given in once a week by the furgeon to the commanding officer of a regiment.

Commiffioned officers are not put in the *Returns*, which, on that account, are but an imperfect lift of the fick.

Twelve fick, in a battalion of 780 private men, is the loweft *Return* that can be expected, even in the moft healthy feafon and climate, as well as beft quarters. *Returns* are often much higher, but feldom exceed feventy in a battalion.

It is to be obferved, that *Returns* include all accidents unfitting a foldier for duty. See *Pringle*, Obferv. on the Dif. of the Army, p. 12, 36.

RHAPONTICOIDES, in botany, a diftinct genus of plants, according to Vaillant, but efteemed only a fpecies of *Centauria* by Linnæus. See the article CENTAURIA.

RHAPONTICUM, a diftinct genus of plants, according to Vaillant, but comprehended under the *Centauria* by Linnæus. See the article CENTAURIA, *Append.*

RHETORICAL *Accent*, among Hebrew grammarians. See the article ACCENT, *Cycl.*

RHEUM, in botany, the name given by Linnæus to *Rhubarb.* See the article RHUBARB, infra.

RHEUMATISM *(Cycl.)* — This is a difeafe incident to winter, and owing, chiefly, to a fuppreffion of perfpiration.

In a complete and obftinate *Rheumatifm*, the joints are often confiderably fwelled and inflamed; but in fevers with *rheumatic* pains, this is feldom the cafe. Accordingly, in thefe laft, the cure may be effected in a few days, by twice or thrice bleeding, and promoting a diaphorefis by the cooler medicines, particularly vinegar-whey. But if the *Rheumatifm* be attended with violent pains or fwelling of the joints, fweating is reckoned improper; fo that the cure muft be obtained by repeated and almoft daily bleedings, till the fever is gone, and the pains either entirely removed, or rendered much eafier.

If the pain and fwelling of the joints remain after the fever is abated, three or four leeches may be applied to the part where the inflammation and tumour are greateft; letting the blood ooze, till it ftops of itfelf. As the relief hereby obtained is fometimes confiderable, and the evacuation but fmall, the repetitions need not be limited. But, then, no benefit is to be expected from leeches in any pains of the joints, not attended with both inflammation and fwelling.

In the true acute *Rheumatifm*, internal medicines avail little. The beft perhaps are the neutral falts, with very fmall dofes of camphor, fo as neither to heat or force a fweat. As to diet, it ought to be of the loweft kind. Outward applications are alfo to be omitted, as long as any fever or inflammation remains. The fpirituous and volatile liniments inflame, and the emolient fomentations, though they give eafe for the time, do harm by relaxing, unlefs very fparingly ufed. If there is no inflammation, the aking parts may be rubbed with flannel, and anointed with the linimentum volatile or faponaceum, according as the fkin is too much hardened or relaxed by the ufe of the one or other. After the patient has continued fome time in this courfe, his recovery will be quickened by the ufe of the cold-bath, or the bark; and to thofe who can afford it, riding is fpecific. *Pringle*, Obferv. on the Dif. of the Army, p. 152, feq.

RHUBARB, in botany, the Englifh name of a diftinct genus of plants, of which there is only one known fpecies. See the article RHABARBARUM, *Suppl.*

Monk's-RHUBARB, the name of a fpecies of *Lapathum*, or dock. See the article LAPATHUM, *Suppl.*

RIB-*wort*, a name fometimes given to the *Plantago* of botanifts, See the article PLANTAGO, *Suppl.*

RIBBAND-*Screw-fhell*, the Englifh name of the *Turbo*, with broad fpiral fafciæ, and a fmall mouth. See the article TURBO, *Suppl.*

RIBES, in botany, a general name given by Linnæus to the goofberry and currant bufhes, which he makes one genus of plants, called by others *Groffularia.* See the article GROSSULARIA, *Suppl.*

RICE, the Englifh name of a genus of plants, known among botanifts by that of *Oryza.* See the article ORYZA, *Append.*

RIFTS, a difeafe in horfes arifing from corruption lodged in the palate of the mouth. Ruft. Dict. in voc.

RIG, or Rigling, the fame with *Ridgling*. See the article Ridgling, *Cycl.*

RING-*Ouzel*, the Englifh name of the black *Turdus*, with a white ring round its neck. See the article Turdus, *Suppl.*

RIPENING *of fruit*, in gardening, may be forwarded feveral ways. The method practifed in the Levant, for maturating the domeftic fig-tree, has been already mentioned; alfo the great ufe of hot beds, for bringing to maturity many exotic plants, which could not be otherwife effected in cold climates. See the articles Caprification, *Suppl.* and Hot-*beds*, *Cycl.* and *Suppl.*

Several other methods of haftening the fructifications of trees, and other vegetables, have likewife been taken notice of under the article *Forcing*. See the article Forcing, *Suppl.*

ROBIN (*Suppl.*) — Ragged-Robin, a name fometimes ufed for the *Lychnis*. See the article Lychnis, *Suppl.*

Wake-Robin, the Englifh name of a genus of plants, called by botanifts *Arum*. See the article Arum, *Suppl.*

ROCK-*rofe*, a name fometimes given to the *Ciftus* of botanifts. See the article Cistus, *Suppl.*

ROCKET, in botany, the Englifh name of a genus of plants, called by botanifts *Eruca*. See the article Eruca, *Suppl.*

Corn-Rocket, or *fquare-podded* Rocket, a diftinct genus of plants, called by botanifts *Erucago*. See the article Erucago, *Suppl.*

Garden-Rocket, a name by which the *Hefperis* of botanifts is fometimes called. See the article Hesperis, *Suppl.*

Water-Rocket, or *Winter*-Rocket, the name of a fpecies of *Sifymbrium*. See the article Sisymbrium, *Suppl.*

ROD (*Suppl.*) — *Shepherd's*-Rod, *Dipfacus*, in botany, the Englifh name of a diftinct genus of plants. See the article Dipsacus, *Suppl.*

ROE-*buck*, the Englifh name of the *Cervus* with ramofe, cylindric, and erect horns. It is the fmalleft of the deer-kind, and has been called *Capreolus* and *Caprea*, tho' without the leaft refemblance of the goat-kind. See the article Capreolus, *Suppl.*

ROLLER (*Suppl.*) is alfo the name by which fome call the *Ampelis*, or *Garrulus Bohemicus*. See the article Ampelis, *Suppl.*

ROOT (*Suppl.*) — The *roots* of plants may be reverfed and turned into branches; and *vice verfa*, the branches into roots. This is called *Planting reverfe*. See the articles Plant and Planting *reverfe*, *Append.*

Seminal-Root. See the article Seminal, *Suppl.*

ROPE (*Cycl.* and *Suppl.*) — Though it be difficult to give a certain account of the forces required to bend *ropes* of different diameters, in making them go round bodies of different bigneffes, yet to make no allowance for the lofs of motion fuftained thereby, would be as prejudicial to the practice of mechanics, as it would be to overlook the friction of the parts of engines. The difficulty of afcertaining this force arifes from the different materials of which they are made, their different ftiffnefs, according as they are more or lefs twifted; and fometimes from the temperature of the air, as to moifture and drinefs.

Dr. Defaguliers has computed the forces required to bend *Ropes* of different diameters, ftretched by different weights, round rollers of different bigneffes: The refult of his experiments is expreffed in the following table.

Diameters of the *Ropes* of three ftrands, expreffed in tenth parts of an inch	Weights ftretching the *ropes*, expreffed in *lb.* avoirdupois.	Refiftance about a roller of half an inch diameter, in *oz.* avoirdupois	Refiftance about a roller of one inch diameter in *oz.* avoirdupois	Refiftance about a roller $1\frac{1}{2}$ inches diameter in *oz.* avoirdupois.
0, 5	60 *lb.*	225 *oz.*	$112\frac{1}{2}$ *oz.*	75 *oz.*
0, 2	60	90	45	30
0, 1	60	45	$22\frac{1}{2}$	15
0, 5	40	150	75	50
0, 2	40	60	30	20
0, 1	40	30	15	10
0, 5	20	75	$37\frac{1}{2}$	25
0, 2	20	30	15	10
0, 1	20	15	$7\frac{1}{2}$	*

On the whole, it has been found by experiments, that the difficulty of bending a *rope* round a roller decreafes directly as the diameter of the roller increafes; or is, inverfely, as the diameter of the roller. See *Defaguliers*, Experim. Phil. vol. 1. p. 233, feq.

ROSE (*Suppl.*) — *Bay*-Rose, the name of a genus of plants, called by botanifts *Nerium*, or *Nerion*. See the article Nerion, *Suppl.*

Campion-Rose, a name fometimes given to the *Lychnis*. See the article Lychnis, *Suppl.*

China-Rose, the name by which fome call the *Ketmia* of botanifts. See the article Ketmia, *Suppl.*

Mountain-Bay Rose, a name by which the *Chamærhododendros* of botanifts is fometimes called. See the article Chamærhododendros, *Suppl.*

Gelder-Rose, a name fometimes given to the *Opulus*, or water-elder. See the article Opulus, *Suppl.*

Rose of *Jericho*, a name by which fome call the *Hefperis*. See the article Hesperis, *Suppl.*

South-Sea Rose, a name fometimes given to the *Nerion* of botanifts. See the article Nerion, *Suppl.*

Rock-Rose, the name by which the *Ciftus* of botanifts is fometimes called. See the article Cistus, *Suppl.*

Rose-*Root*, a name by which fome call the *Anacampferos*, or Orpin. See the article Anacampseros, *Suppl.*

ROSEMARY (*Suppl.*) — *Spanifh*-Rosemary, a name fometimes given to the *Thymelæa* of botanifts. See the article Thymelæa, *Suppl.*

Poet's-Rosemary, a name fometimes given to the *Caffia* of botanifts. See the article Cassia, *Suppl.*

ROSTRATA, in zoology, a name ufed by feveral zoologifts for the *Ramphaftos* or Toucan, a genus of birds. See the article Ramphastos, *Append.*

ROTHER, a term ufed by *Blanckley*, in his Naval Expofitor, for *Rudder*. See the article Rudder, *Cycl.* and *Suppl.*

ROUCOU, in botany, a name given to a fpecies of Mitella.

ROVES, in fhip-building, fmall fquare pieces of iron, with a hole punched in the middle through which the nail goes, where it is clenched, and binds together the boards of pinnaces, yawles, &c. *Blanckley's* Naval Expofitor, p. 137.

ROUGHINGS, a word ufed in many parts of the kingdom for the grafs which comes after mowing. Ruft. Dict. in voc.

ROUP, in poultry, is a filthy boil or fwelling upon their rumps, known by the ftaring, or turning back of the feathers.

The *Roup*, if not foon remedied, will corrupt the whole body; to prevent which, the feathers are to be pulled away, the fwelling laid open, and the matter preffed out; after which the part is to be wafhed with falt and water, or brine. Ruft. Dict. in voc.

ROWLUCKS, among fhip-carpenters, fmall fpaces left in the gunwale, where two thoals are let in at fuch a diftance from each other, as to admit the oar, at the end of the loom to lie on to row the boat. *Blanckley's* Naval Expofitor, p. 188.

RUDBECKIA, in the Linnæan fyftem of botany, the name of a genus of plants, called by Vaillant *Obelifcotheca*, and in Englifh the *Dwarf-fun-flower*.

The characters are thefe: The common cup is compofed of a double order of leaves, fix in each order, and covered with plane, broad, but fhort fquamæ; the compofite flower is radiated; the proper one tubulofe, infundibuliform, with its mouth divided into five fegments; the ftamina are five very fhort, capillary filaments; the antheræ cylindric; the germen of the piftil is placed under the receptacle; the ftyle is filiform, and of the length of the flower; the ftigma is divided into two parts, which bend backwards; the receptacle is paleaceous and conic; the feeds are fingle and oblong. Vid. *Linnæi* Gen. Plant. p. 415.

The fpecies of *Rudbeckia* are thefe. 1. The *Rudbeckia*, with the lower leaves divided into three lobes, and the upper ones undivided. 2. The compofite laciniated-leaved *Rudbeckia*. 3. The oblong, hairy-leaved *Rudbeckia*. 4. The great, fcabrous *Rudbeckia*. 5. The broad-leaved, many-flowered *Rudbeckia*. 6. The tall *Rudbeckia*, with red ftalks. 7. The fmall, fhort-leaved *Rudbeckia*. 8. The great-flowered, hairy *Rudbeckia*. Vid. *Hill*, Hift. Plant. p. 584.

Rudbeckia is alfo a name ufed by Houfton for the *Conocarpus* of Linnæus. See the article Conocarpus, *Append.*

RUE (*Suppl.*) — *Dog's*-Rue, a name fometimes given to the *Scrophularia*, or fig-wort. See the article Scrophularia, *Suppl.*

Meadow-Rue, the Englifh name of a genus of plants, called by botanifts *Thalictrum*. See the article Thalictrum, *Suppl.*

Wall-Rue, the Englifh name of a diftinct genus of plants, called by botanifts *Ruta muraria*. See the article Ruta *muraria*, *Suppl.*

RULE (*Cycl.*) — Rule *of five*, or, *Compound* Rule *of Three*. What is faid in the Cyclopædia of this *rule's* being more eafily performed by two fimple *rules of three*, is fometimes true, but not always. In fome cafes, not only five, but feven, or nine terms may be given, from whence it is neceffary to determine an eighth, or a tenth, which indeed might be performed by repeated applications of the fimple *rule of three*, but not fo expeditioufly. Mr. Jones has therefore given a general *rule* by which all cafes of the *rule of Three* or of proportion may be folved.

The *rule* is, 1°. Set down the terms expreffing the condition of the queftion, in one line. 2°. Under each conditional term fet its correfponding one in another line. 3°. Multiply the *producing terms* of one line, and the produced term of the

the other line continually, and take the refult for a dividend. 4°. Multiply the remaining terms continually, and let the product of them be a divifor. 5°. The quotient of this divifion will be the term required.

By *producing terms* here, are meant, whatever neceffarily and jointly produce any effect; as the Caufe and the Time; length, breadth, and depth; buyer and his money; feller and his goods; all neceffarily infeparable in producing their feveral effects.

In a queftion where a term is underftood, and not expreffed that term may be expreffed by unity.

Example. If 250 *l.* ferve fix perfons for nine months; how long will 1000 *l.* ferve four perfons at the fame rate?

Here the terms which exprefs the condition are.

	£.	P.	M.
	250 :	6 :	9
correfponding terms	1000 :	4 :	Q

Where Q is put to reprefent the term required.

Among the conditional terms, fix perfons and nine months are producing, and 250 *l.* is produced: among their correfponding terms four perfons and Q are producing, and 1000 *l.* are produced.

But it being impoffible to multiply the producing terms in the fecond line, and the produced in the firft, becaufe Q is unknown; therefore multiply the producing terms of the firft line, by the produced in the fecond, and divide by the product of the reft.

Then will $Q = \frac{6 \times 9 \times 1000}{4 \times 250} = 6 \times 9 = 54.$

See Mr. *Dodfon*'s Anti logarithmic Canon, pag. 38. feq.

But if the notion of producing and produced terms fhould feem obfcure, thofe who have a knowlege of the doctrine of compound ratios, will eafily perceive that in the foregoing queftion, Q is to 9 months in the compound ratio of 4 perfons to 6 perfons inverfely, and of 1000 *l.* to 250 *l.* directly, that is, $\frac{Q}{9} = \frac{6}{4} \times \frac{1000}{250}$, therefore $Q = \frac{6 \times 9 \times 1000}{4 \times 250} = 54$ as before. And in like manner may other queftions, relating to the compound rule of proportion, be ftated and folved, however complex.

RUNT (*Suppl.*) — RUNT is alfo a name given to Scotifh or Welch neat, or cows of a fmall fize. Dict. Ruft. in voc.

RUPTURE, (*Cycl.*) in furgery. See the article HERNIA, *Cycl.* and *Suppl.*

RUPTURE-*Wort*, the Englifh name of a genus of plants, called by botanifts *Herniaria*. See the article HERNIARIA, *Suppl.*

RUSH (*Suppl.*) — *Flowering*-RUSH, the Englifh name of a genus of plants, called by botanifts *Butomus*. See the article BUTOMUS, *Suppl.*

RUSSET, a country word for a dark brown colour. Ruft. Dict. in voc.

RUT (*Suppl.*) — RUT is alfo the term ufed for the track or mark of a wheel in the road. Ruft. Dict. in voc.

RYE-*Grafs*, in botany, the fame with what is otherwife called *Rey-grafs*. See the article REY-*Grafs*, *Suppl.*

S.

S.

SAFFRON (*Suppl.*)—*Indian* SAFFRON, a name sometimes given to turmeric. See TURMERIC, *Cycl.*
Bastard-SAFFRON, the English name of a genus of plants, called by botanists *Carthamus*. See the article CARTHAMUS, *Suppl.*

SAGE (*Suppl.*)—SAGE *of Jerusalem*, a name sometimes given to a species of *pulmonaria*. See PULMONARIA, *Suppl.*

SAGE *of Jerusalem*, or SAGE-*tree*, names by which the *phlomis* of botanists is sometimes called. See the article PHLOMIS, *Suppl.*

Wild SAGE, a name sometimes given to the *lantana* of botanists. See the article LANTANA, *Suppl.*

Wood-SAGE, the name by which some call the *scordium* or *teucrium* of botanists. See the article TEUCRIUM, *Suppl.*

SAGITTA, in architecture, a name sometimes used for the key-piece of an arch. See KEY and ARCH, *Cycl.*

SAGREE, a name sometimes given to the *galeus spinax*, or prickly hound-fish. See the article GALEUS, *Suppl.*
It is a species of *squalus*. See the article SQUALUS, *Suppl.*

SAINT-*foin*, in botany, the English name of a genus of plants, called by botanists *onobrychis*. See the articles ONOBRYCHIS and SAINT-FOIN, *Suppl.*
This plant is propagated as clover for the food of cattle. It will hold well in the ground, and continue to grow and be of use for twenty years; but then the main crop is always to be mowed, and not to be eaten upon the ground.

SAKER (*Suppl.*) — SAKER, in ornithology, the same with *sacre*. See the article SACRE, *Suppl.*

SALACIA, in zoology, the name of a genus of insects of the *gymnarthria* kind; the body of which is ovato-oblong, and the tentacula are numerous, and disposed in little clusters. See GYMNARTHRIA, *Append.*
It is called by different authors *priapus marinus*, and *mentula marina*. See the article PRIAPE *de mer*, *Suppl.*

SALICORNIA, in botany, the name of a genus of plants, the characters of which, according to *Linnæus*, are these: the cup is of a tetragonal form, truncated, bellied out, and permanent. There is no corolla. The stamen is a single, simple, capillary filament. The anthera is roundish. The germen of the pistil is of an oblong ovated figure: the style is simple and placed under the stamen, and the stigma is bifid. There is no pericarpium, but the cup becomes more ventricose, and contains a single seed. Vid. *Linnæi* Gen. Plant. p. 4.
There are only two species of this genus, which are, 1. The short-jointed *salicornia*, and 2. The longer-jointed *salicornia*. *Hill*, Hist. Plant. p. 154.

SALIVA (*Cycl*)—Dr. *Pringle*, in the appendix to his observations on the diseases of the army, has given the result of several experiments made to ascertain the effects of the *saliva* in digestion.
By adding a small portion of it to some raw beef, he remarked, that this mixture putrefied slower than another which had no *saliva* in it; from whence he infers its antiseptic nature.
Another experiment, made to ascertain the fermentative power of *saliva*, was this: he took two drachms of fresh meat, the same quantity of bread, and to these added as much *saliva* as he supposed necessary to digestion. This mixture being beat in a mortar, was put into a close phial, and set in the furnace, where it remained about two days, with scarce any visible fermentation; but, on the third day, this action became manifest. The bread and flesh were then found risen in the water, a sediment forming, and bubbles of air continually mounting. In short, the fermentation was complete, being distinguished by a vinous smell, as in ordinary working liquors. The action continued about twice as long as when no *saliva* was used; it was likewise much more moderate, and generated air with little tumult. When the fermentation intirely ceased, the mixture had a pure acid taste; and what was equally remarkable, had no putrid smell during the whole process.
From these experiments the doctor concludes, that if the *saliva* is well prepared, is in a sufficient quantity, and well mixed with the aliment, it is qualified for resisting putrefaction, preventing immoderate fermentation, flatulence, and acidity in the primæ viæ. But if the *saliva* is deficient, unsound, or not well mixed with what is swallowed, that the aliment may first putrefy, then grow acid, and in that action ferment strongly, and generate much air in the stomach and bowels. *Pringle*, Observ. p. 355.
Accordingly, in surfeits, or upon swallowing without due mastication; when meats are eat tough and fat, or with farinaceous substances unfermented; or, when by any accident the *saliva* is vitiated, too scanty, or not intimately mixed with the food, the fermentation becomes tumultuous, the stomach swells with air; and this extraordinary commotion being attended with an unusual heat, brings on that uneasiness called the *heart-burn*, and occasions that excessive sourness of the stomach, whereby the teeth are not only set on edge, but the throat excoriated. This last, however, only happens when the stomach is relaxed, or any wise disabled from conveying the whole aliment into the intestines; for, what is left having time to undergo a complete fermentation, is thereby changed into a harsh sort of vinegar. Id. ibid. p. 368.
Since one great use of *saliva* is to moderate fermentation, it is probable, that such substances as resemble it most in this quality, will prove the best stomachics whenever that humour fails. Of this class are acids, wines, spirits, and bitters; but as all these retard as well as moderate fermentation, they may be frequently less proper than some of the antiscorbutics, as horse-radish, mustard, and garden scurvy-grass, which, at the same time that they moderate, retard fermentation but little. As to aromatics, however assisting they may be in digestion by their heat and stimulus, they promise less of a carminative quality than either the bitters or antiscorbutics; in as much as they are more disposed to increase than to moderate fermentation, and consequently to produce air instead of suppressing it. Id. ibid. p. 376.

SALLOW, a name by which several species of the *salix*, or willow, are frequently called. See the article SALIX, *Suppl.*

SALMON (*Suppl.*)—SALMON-*peel*, the name of a fish found in great plenty in the rivers of Wales, agreeing in the colour of its flesh, and perhaps in kind with the common salmon. Rust. Dict. in voc.

SALMON-*sewse*, a name sometimes used for the young fry of salmon.

SALOMON'S *seal*, in botany, the same with *solomon's seal*. See SOLOMON'S *seal*, infra.

SALT (*Suppl.*)—*Ætna* SALT. See the article ÆTNA, *Suppl.*

SALT-*wort*, a name sometimes given to the *salicaria* or willow-herb, of other writers. See the article SALICARIA, *Suppl.*

SAMPHIRE, the English name of a genus of plants, called by botanists *crithmum*. See the article CRITHMUM, *Suppl.*

Prickly SAMPHIRE, the name given by some writers to a species of *echinophora*. See the article ECHINOPHORA, *Suppl.*

SAND (*Suppl.*)—SAND-*eel*, in ichthyology, the English name of the *ammodytes*. See the article AMMODYTES, *Suppl.*

SAND-*snake*, a species of serpent. See the article AMMODYTES, *Suppl.*

SANICLE, the English name of a genus of plants, called *sanicula* by botanists. See the article SANICULA, *Suppl.*

Water-SANICLE, a name sometimes given to a genus of plants, called by botanists *geum*. See the article GEUM, *Suppl.*

Bear's ear SANICLE, the name by which some call the *cortusa* of botanists, a distinct genus of plants. See the article CORTUSA, *Suppl.*

SAPLING, among gardeners, a name by which they call any young tree that is full of sap. Rust. Dict. in voc.

SAPONARIA, *soap-wort*, in botany, the name of a genus of plants, the characters of which are these. The cup is a permanent perianthium, formed of a single leaf, oblong and divided into five segments at the edge. The flower consists of five petals: the ungues are narrow, angulated, and of the length of the cup: the limb is plane, the bracteæ broadest towards the extremity, and obtuse. The stamina are ten subulated filaments, of the length of the tube of the flower, alternately inserted into the ungues of the flower: the antheræ are oblong and incumbent. The germen of the pistil is cylindric; the styles are two, strait, parallel, and of the length of the stamina: the stigmata are acute. The fruit is a covered capsule, nearly of the length of the cup, and containing only one cell; in which are included numerous small seeds. The receptacle is free. The germen and capsule are, in some species, more short and rounded, and the segments of the cup are deeper in some than in others; in some they are almost five leaved. Vid. *Linnæi* Gen. Plant. p. 191.
Dillenius and others make this genus only a species of *spergula*. See the article SPERGULA, *Append.*

SAPPADILLA, a name used by some for the *cainito*, or *chrysophyllum*, of botanists. See the article CHRYSOPHYLLUM, *Append.*

SARACEN'S *consound*, a name sometimes given to the *solidago* or *virga aurea* of botanists. See the article VIRGA *aurea*, *Suppl.*

SARFE, the Engliſh name of a ſpecies of *cyprinus*, with the iris of the eye, and all the fins and tail red. See CYPRINUS, *Suppl.*

It is otherwiſe called *erythrophthalmus*, or the *red-eye*. See the article ERYTHROPHTHALMUS, *Suppl.*

SASSAFRAS-*tree*, in botany, the names of a ſpecies of *laurus*, according to Linnæus, with undivided and trilobate leaves. See LAURUS, *Append.*

It is a native of America, and called by C. Bauhine, *ſaſſafras arbor ficulneo folio.*

The bark of this tree is an excellent diaphoretic and attenuant, the wood is alſo in much eſteem. See SASSAFRAS, *Cycl.* and *Suppl.*

SATTIN (*Cycl.*)—*White* SATTIN, in botany, a name given by ſome to the *lunaria*. See the article LUNARIA, *Suppl.*

SATYRIUM, in the linnæan ſyſtem of botany, the name of a genus of plants, the characters of which are theſe: the cup is formed of vague ſpathæ. There is no perianthium. The flower conſiſts of five ovato-oblong petals. The nectarium is monophyllous. The ſtamina are very ſhort and ſlender filaments; the antheræ are ovated; the germen of the piſtil is contorted; the ſtyle is very ſhort; and the ſtigma compreſſed and obtuſe. The fruit is an oblong capſule, containing one cell; in which are numerous, very ſmall ſeeds, like ſawduſt. *Linnæi* Gen. Plant. p. 432.

This genus is called *orchis* or *trago-orchis* by other botaniſts. See the article ORCHIS, *Suppl.*

SAUCE-*alone*, a name ſometimes uſed for the *heſperis* of botaniſts. See the article HESPERIS, *Suppl.*

SAVIN (*Suppl.*)—*Indian* SAVIN, the name of a genus of plants, deſcribed by Linnæus under that of *bauhinia*. See the article BAUHINIA, *Suppl.*

SAW-*wort*, in botany, the Engliſh name of a genus of plants, known among botaniſts by that of *ſerratula*. See the article SERRATULA, *Suppl.*

SAXIFRAGE (*Suppl.*)—*Pimpernel*-SAXIFRAGE, or *burnet*-SAXIFRAGE, names uſed for the *tragoſelinum* of botanical writers. See the article TRAGOSELINUM, *Suppl.*

SCALD, a burn cauſed by ſome boiling liquor. See the article BURN, *Suppl.*

SCALE—*differential* SCALE, is uſed for the ſcale of relation ſubtracted from unity. See SERIES, *Append.*

SCALE *of relation*, in algebra, an expreſſion denoting the relation of the terms of recurring ſeries to each other. See the article SERIES, *Append.*

SCALLOP, in conchyliology, the Engliſh name of the *pecten*. See the article PECTEN, *Suppl.*

SCAMMONY (*Cycl.*)—SCAMMONIA, in botany, the name uſed in the ſhops and among medicinal writers for a ſpecies of bind-weed. See the article CONVOLVULUS, *Suppl.*

SCARE-*crow*, the Engliſh name of a bird of the *larus*, or gull kind, with grey wings, red legs, and the reſt of the body black. See the article LARUS, *Suppl.*

SCARLET *lychnis*, in botany, the name of a ſpecies of *lychnis*. See the article LYCHNIS, *Suppl.*

SCARLET *cardinals flower*, the name of a ſpecies of *rapuntium*. See the article RAPUNTIUM, *Suppl.*

SCARLET *oak*, the Engliſh name of a ſpecies of *ilex*, called by antient writers *ſmilax*. See the article ILEX, *Suppl.*

SCAVEL *ſpitter*, denotes a ſmall ſpade, ſhod only half way, and uſed in digging clay. *Blanckley*, Naval Expoſitor, p. 142.

SCELASIUS, in zoology, the name by which Dr. Hill has called a genus of animalcules with viſible legs.

It is common in ditch-water, and is leſs quick in its motions than moſt other animalcules. *Hill*, Hiſt. Anim. p. 10.

SCIATICA (*Cycl.*) See the article GOUT, *Cycl.* and *Suppl.*

SCIATICA-*creſs*, a name by which ſome call the *cardamine*, or ladies ſmock. See the article CARDAMINE, *Suppl.*

SCIATICA-*creſs* is alſo a name ſometimes given to a ſpecies of *lepidium*, or dittander. See the article LEPIDIUM, *Suppl.*

SCILLA, *ſquill*, in the linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe; there is no cup; the flower conſiſts of ſix oval, deciduous, and very patent petals: the ſtamina are ſix ſubulated filaments, of half the length of the flower; the antheræ are oblong, and incumbent; the germen of the piſtil is roundiſh; the ſtyle is ſimple, of the length of the ſtamina, and deciduous; the ſtigma is ſimple: the fruit is a ſmooth capſule, of a ſuboval figure, marked with three furrows, formed of three valves, and containing three cells: the ſeeds are numerous and roundiſh.

This genus comprehends the *liliohyacinthus*, and the *hyacinthus ſtellaris* of other botanical writers; and is reckoned only a ſpecies of *ornithogalum* by Tournefort, Vid. *Linnæi* Gen. Plant. p. 145.

SCORCHING *fennel*. See FENNEL, ſupra.

SCORDIUM, in botany, the name by which ſome call the *teucrium* of other botanical writers. See the article TEUCRIUM, *Suppl.*

SCORPION-*inſect*, the Engliſh name of a ſpecies of *acarus*, called by ſome *Araneus coccineus*. See ACARUS, *Append.*

SCORPION-*ſhell*, the Engliſh name of a ſpecies of murex, otherwiſe called the *ſpider-ſhell*. See the article MUREX, *Suppl.*

Water-SCORPION, the Engliſh name of a genus of four winged flies, called by authors *nepa*. See the article NEPA, *Append.*

SCORPION-*graſs*, the Engliſh name of a genus of plants, called by botaniſts *ſcorpioides*. See the article SCORPIOIDES, *Suppl.*

SCORPION-*ſena*. See the article SENA, infra.

SCORPIURUS, in the linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *ſcorpioides*, and in Engliſh *ſcorpion-graſs*. See the article SCORPIOIDES, *Suppl.*

SCOURINGS, among farriers, ſuch gentle purges as preſerve horſes from noxious humours. Vid. Ruſt. Dict. in voc.

SCREEN, an inſtrument for keeping off the wind, or the heat of the fire.

SCREEN is alſo uſed for a frame of laths to ſift earth, ſand, gravel, &c.

SCREEN likewiſe denotes a wire frame for ſeparating of corn from duſt, ſand, cockle, &c. Dict. Ruſt. in voc.

SCRUPI, in natural hiſtory, the name of a claſs of foſſils, formed in detached maſſes, without any cruſts; of no determinate figure, or regular ſtructure; and compoſed of a cryſtalline or ſparry matter, debaſed by an admixture of earth, in various proportions.

Under this claſs are comprehended, 1. The *telaugia*. 2. The *petridia*. 3. The *Lithozugia*. 4. The *Jaſpides*, or *Jaſpers*. See the articles TELAUGIA, PETRIDIA, &c. *Append.*

All theſe genera ſtrike fire with ſteel, only ſome more readily than others. Vid. *Hill*, Hiſt. Foſſ. p. 546, ſeq.

SCRY, in falconry, denotes a great flock of fowl. Ruſt. Dict. in voc.

SCULL-*cap*, a name ſometimes given to a genus of plants, called *ſcutellaria* or *caſſida* by botaniſts. See the article CASSIDA, *Suppl.*

SCUT, among ſportſmen, a term uſed for the tail of a hare or rabbit. Dict. Ruſt. in voc.

SEA-*apple*, or SEA-*egg*, the Engliſh name of the roundiſh *Centronia*, with crooked and faſciculated ſpines. See the article CENTRONIA, *Append.*

SEA-*dragon*, the Engliſh name of the *cottus*, with the ſecond back-fin white. See the article COTTUS, *Suppl.*

SEA-*eagle*, *aquila marina*, the Engliſh name of the *raja*, with a long ſerrated ſpine on a finny tail. See the articles RAJA, and AQUILA *marina*, *Suppl.*

SEA-*hare*, in the hiſtory of inſects, the Engliſh name of the *lernea*. See the article LERNEA, *Append.*

SEA-*horſe*, a name ſometimes, though improperly, given to the *Hippopotamus*, or river-horſe. See the article HIPPOPOTAMUS, *Suppl.*

SEA-*lungs*, in the hiſtory of inſects, the Engliſh name of a ſpecies of *meduſa*. See the article MEDUSA, *Append.*

SEA-*mouſe*, in the hiſtory of inſects, the Engliſh name of the *aphrodita*. See the article APHRODITA, *Append.*

SEA-*nettle*, in zoology, a name improperly given to the *meduſa*, a genus of naked-bodied inſects. See the article MEDUSA, *Append.*

SEA-*pearch*, *perca marina*, in ichthyology. See the article PERCA *marina*, *Suppl.*

SEA-*ſerpent*, *ſerpens marinus*, the Engliſh name of the cylindric *murœna*, with the tail naked and acute. See the articles SERPENT and MURÆNA, *Suppl.*

SEA-*water*. See the article WATER, *Append.*

SEA-*worms*, See the article WORMS *of the ſea*, *Append.*

SEAL (*Suppl.*)—*Ladies* SEAL, in botany, the name by which ſome call the *tamnus*, a diſtinct genus of plants. See TAMNUS, *Suppl.*

Solomon's SEAL, the Engliſh name of a diſtinct genus of plants, called by authors *polygonatum*. See the article POLYGONATUM, *Suppl.*

SEAMS, or SEYMS, in horſes, certain clefts in their quarters, occaſioned by the drineſs of the foot, or by riding upon hard ground. Ruſt. Dict. in voc.

SEAN, a kind of long and large net. Ruſt. Dict. in voc.

SECRETION (*Suppl.*)—It is the opinion of ſeveral authors that all *ſecretion* is performed by glands, but this ſeems very doubtful, not to ſay falſe.

SEELING (*Suppl.*)—SEELING, in falconry, is the running a thread through the eye-lids of a hawk, when firſt taken, to make her endure the head the better. Ruſt. Dict. in voc.

SELANDERS, in horſes, the ſame with the *malanders*. See the article MALANDERS, *Cycl.*

SELF-*heal*, a name by which the *prunella* or *brunella* of botaniſts is ſometimes called. See the article PRUNELLA, *Suppl.*

SELF-*heal* is alſo a name given to ſanicle, on account of its great efficacy in healing freſh wounds, ſtopping fluxes and the gonorrhœa. Ruſt. Dict. in voc. SANICLE.

SELINUM, a name given by ſome to a ſpecies of *ſium*. See the article SIUM, *Suppl.*

SEMENDA, in ornithology, a ſpecies of birds found in the inland parts of the Eaſt-Indies. Scaliger makes no doubt but it is the ſame with the *phœnix*. *Hofm.* Lex. in voc. See the article PHOENIX, *Cycl.*

SENA (*Suppl.*)—This genus of plants is comprehended by Linnæus under the *caſſia*. See CASSIA, *Suppl.* and *Append.*

Baſtard

Bastard SENA, in botany, a name by which authors call *cassia*. See the article CASSIA, *Suppl.*

Bladder-SENA, the English name of a genus of plants, called by botanists *colutea*. See the article COLUTEA, *Suppl.*

Podded-SENA, the name by which the *coronilla* of botanical writers is sometimes called. See the article CORONILLA, *Suppl.*

Scorpion-SENA, the name of a genus of plants, called by authors *emerus*. See the article EMERUS, *Suppl.*

SENGREEN, a name sometimes given to *sedum*, or houseleek. See the article SEDUM, *Suppl.*

SENNA, in botany, &c. See SENA, *Cycl.* and *Suppl.*

SENSITIVE *plant*, *mimosa*, in botany, the English name of a distinct genus of plants. See the article MIMOSA, *Suppl.*

SEPELAER. See PLATEA, *Suppl.*

SEPIA, in zoology, the name of a genus of sea-insects of the gymnarthria kind, called by us the *cuttle-fish*, and *ink-fish*. See INK-*fish*, *Append.*

The body of the *sepia* is of an oblong figure, and depressed; it is furnished with ten tentacula, two of which are longer than the others, and are pedunculated. It is often six inches in length, and three and a half in diameter.

It is supported by an oblong, light and spungy substance, of a friable texture, and lined with a light fungous pith. This is used by the silver-smiths, and as a dentifrice under the name of *os sepium*, *os sepiæ*, or cuttle-fish-bone. *Hill's* Hist. of Anim. p. 97.

SEPTICS, among physicians, an appellation given to all such substances as promote putrefaction. See PUTREFACTION, *Append.*

From the many curious experiments, made by Dr. Pringle to ascertain the *septic* and *antiseptic* virtues of natural bodies, it appears that there are very few substances of a truly *septic* nature. Those commonly reputed such by authors, as the alcaline and volatile salts, he found to be no wise *septic*. However, he discovered some, where it seemed least likely to find any such quality: these were chalk, common salt, and the testaceous powders. He mixed twenty grains of crabs eyes, prepared with six drachms of ox's gall, and an equal quantity of water. Into another phial he put an equal quantity of gall and water but no crabs-eyes. Both these mixtures being placed in the furnace, the putrefaction began much sooner, where the powder was, than in the other phial. On making a like experiment with chalk, its *septic* virtue was found to be much greater than that of the crabs-eyes: nay, what the doctor had never met with before, in a mixture of two drachms of flesh, with two ounces of water and thirty grains of prepared chalk, the flesh was resolved into a perfect mucus in a few days.

To try whether the testaceous powders would also dissolve vegetable substances, the doctor mixed them with barley and water, and compared this mixture with another of barley and water alone. After a long maceration by a fire the plain water was found to swell the barley, and turn mucilaginous and sour; but that with the powder kept the grain to its natural size, and though it softened it, yet made no mucilage and remained sweet.

Nothing could be more unexpected, than to find sea-salt a hastener of putrefaction; but the fact is thus. One drachm of salt preserves two drachms of fresh beef in two ounces of water, above thirty hours, uncorrupted, in a heat equal to that of the human body; or, which is the same thing, this quantity of salt keeps flesh sweet twenty hours longer than pure water. But then half a drachm of salt does not preserve it above two hours longer. Twenty five grains have little or no antiseptic virtue, and ten, fifteen, or even twenty grains manifestly both hasten and heighten the corruption. The quantity, which had the most putrefying quality, was found to be about ten grains to the above proportion of flesh and water.

Many inferences might be drawn from this experiment. One is, that since salt is never taken in aliment beyond the proportion of the corrupting quantities, it would appear that it is subservient to digestion, chiefly by it's *septic* virtue, that is, by softening and resolving meats: an action very different from what is commonly believed.

It is to be observed that the above experiments were made with the salt kept for domestic uses. See *Pringle*, Observ. on the diseases of the army, p. 848, seq.

SERAPH (*Cycl.*)—SERAPH is also the name of a Turkish gold-coin, worth about five shillings sterling. Dict. Rust. in voc.

SERCIL *feathers of a hawk*, the same with those called pinions in other fowl. Dict. Rust. in voc.

SERE, in falconry, the yellow between the beak and eyes of a hawk. Dict. Rust. in voc.

SERJEANT of the acatery, See ACATERY, *Cycl.*

SERIES, in algebra (*Cycl.*)—The notion of a *series* given in the Cyclopædia is too limited, when confined to ranks or progressions of quantities increasing or decreasing in some constant ratio: for the term *series* is indifferently used whether the terms of any number of quantities following each other have a constant ratio, or even relation or not. And, strictly speaking, a *series* of quantities increasing or decreasing in a constant ratio is no more than what is commonly called a geometric progression.

The doctrine of *series* is of extensive use in mathematics, and has been carried far; though not so far as could be wished. It would far exceed the limits of our design to enter into a detail of the discoveries relating to this subject. Something, however, should be added to what has been said in the Cyclopædia, to give a notion of the principal kinds of *series*, and the method of notation used in treating of them.

A *series* being proposed, one of the principal questions concerning it, is, to find the law of its continuation. For this no universal rule can be given; but it often happens, that the terms of the *series* taken two and two, three and three, or in greater numbers have an obvious and simple relation, by which the *series* may be determined and produced indefinitely. Thus if unity be divided by $1-x$, the quotient will be a geometric progression, any term of which will be to the next antecedent term as x to 1. And by this property the *series* $1+x+x^2+x^3+$ &c. may be distinguished and produced *ad infinitum*. In like manner in other cases of division, other *series's* will arise, the terms of which will have a constant relation to each other, and this relation recurring always throughout the *series*, they have been called recurring *series* by Mr. de Moivre, who first considered them, and applied them to the solution of several intricate problems. See *Recurring* SERIES, *infra*.

In many cases, the relation of the terms of a *series* is not constant, as it is in those arising from division. Yet this relation often varies according to a certain law obvious upon inspection. Thus in the *series* $1+\frac{2}{3}x+\frac{8}{15}x^2+\frac{16}{35}x^3+\frac{128}{315}x^4+$ &c. The terms may be continued indefinitely by the continued multiplication of these fractions $\frac{2}{3}$, $\frac{4}{5}$, $\frac{6}{7}$, $\frac{8}{9}$, &c. And the following *series*. $1+\frac{1}{6}x+\frac{3}{40}x^2+\frac{5}{112}x^3+\frac{35}{1152}x^4+$ &c. may be continued by the multiplication of the fractions $\frac{1\times 1}{2\times 3}$, $\frac{3\times 3}{4\times 5}$, $\frac{5\times 5}{6\times 7}$, $\frac{7\times 7}{8\times 9}$, &c.

Series's of this kind may be defined by *differential equations*. The equation defining a *series* is that which assigns the relation of the terms generally by their distances from the beginning. To do this Mr. Stirling conceives the terms of the *series* to be placed as so many ordinates on a right line given by position, and he, for the sake of simplicity, takes unity as the common interval of these ordinates. The initial terms of the *series* he denotes by the initial letters of the alphabet, A, B, C, D, &c. A being the first, B the second, C the third &c. And he denotes any term in general by the letter T, and the rest following it in order, T', T'', T''', T'''', &c. He denotes the distance of the term T from any given term, or from any given intermediate point between two terms, by the indeterminate quantity z: so that the distances of the terms T', T'', T''', &c. from the said term or point, will be, $z+1$, $z+2$, $z+3$ &c. for the increment of the abscis is the common interval of the ordinates, or terms of the *series* applied to the abscis.

These things being premised let this *series* be proposed, 1, $\frac{1}{2}x$, $\frac{3}{8}x^2$, $\frac{5}{16}x^3$, $\frac{35}{128}x^4$, $\frac{63}{256}x^5$ &c. in which the relations of the terms are $B=\frac{1}{2}Ax$, $C=\frac{3}{4}Bx$, $D=\frac{5}{6}Cx$, $E=\frac{7}{8}Dx$ &c. The relation in general will be defined by the equation, $T'=\frac{z+\frac{1}{2}}{z+1}Tx$, where z denotes the distance of T from the first term of the *series*. For by substituting 0, 1, 2, 3, 4, &c. successively in the place of z, the relations of the terms of the proposed *series* will arise. In like manner, if z be the distance of T from the second term of the *series*, the equation will be $T'=\frac{z+\frac{3}{2}}{z+2}Tx$, as will appear by substituting the numbers -1, 0, 1, 2, 3, 4, &c. successively for z. Or if the indeterminate z denotes the place of the term T in the *series*, its successive values will be 1, 2, 3, 4, &c. and the equation will be $T'=\frac{z-\frac{1}{2}}{z}Tx$.

It appears therefore that innumerable differential equations may define one and the same *series*, according to the different points from whence the origin of the abscissa z is taken. And on the contrary the same equation defines innumerable different *series's* by taking different successive values of z. For in the equation $T'=\frac{z-\frac{1}{2}}{z}Tx$, which defines the *series* above mentioned, when 1, 2, 3, 4, &c. are the successive values of the abscissæ; if $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{2}$, &c. be successively substituted for z, the relations of the terms arising will be $B=\frac{2}{3}Ax$, $C=\frac{4}{5}Bx$, $D=\frac{6}{7}Cx$, &c. from whence the *series* A, $\frac{2}{3}Ax$, $\frac{8}{15}Ax^2$, $\frac{16}{35}Ax^3$, $\frac{128}{315}Bx^4$, &c. will arise, which is different from the former. But the equation will always determine the *series* from the given values of the abscissa and of the first term, when the equation includes but two terms of the *series*; as in the last example, where the first term being given, all will be given. But when the equation includes three terms, two must be given; and three must be given, when it includes four, and so forth.

If the *series* x, $\frac{1}{6}x^3$, $\frac{1}{40}x^5$, $\frac{5}{112}x^7$, $\frac{35}{1152}x^9$ &c. be proposed, where the relations of the terms are, $B=\frac{1\times 1}{2\times 3}Ax^2$, $C=\frac{3\times 3}{4\times 5}Bx^2$, $D=\frac{5\times 5}{6\times 7}Cx^2$, &c. the equation defining

this

this *series* will be $T' = \frac{\overline{2z-1} \times \overline{2z-1}}{2z \times \overline{2z+1}} T x^2$, or $T' = \frac{4zz - 4z + 1}{4zz + 2z} T x^2$, where the successive values of z are 1, 2, 3, 4, &c. See Mr. *Stirling*'s *methodus differentialis*, in the introduction.

This may suffice to convey a notion of these differential equations, defining the nature of *series's*. But as to the application of these equations in finding the sums of *series's*, it would require a treatise to explain it. We must therefore refer the curious to that excellent one just quoted, as also to Mr. de Moivre's *Miscellanea Analytica*; and several curious papers by Mr. Euler in the acta Petropolitana.

A *series* often converges so slowly as to be of no use in practice. Thus if it were required to find the sum of the *series* $\frac{1}{1.2} + \frac{1}{3.4} + \frac{1}{5.6} + \frac{1}{7.8} + \frac{1}{9.10} +$ &c. which lord Brounker found for the quadrature of the hyperbola true to 9 figures, by the mere addition of the terms of the *series*, Mr. Stirling computes that it would be necessary to add a thousand millions of terms for that purpose; for which the life of man would be too short. But by that gentleman's method the sum of the *series* may be found by a very moderate computation. See Meth. Diff. p. 26, seq.

Recurring SERIES, is used for a *series* which is so constituted, that having taken at pleasure any number of its terms, each following term shall be related to the same number of preceding terms according to a constant law of relation. Thus in the following *series*,

$$\begin{array}{cccccc} A & B & C & D & E & F \\ 1 + & 2x + & 3xx + & 10x^3 + & 34x^4 + & 97x^5 + \&c. \end{array}$$

in which the terms being respectively represented by the capitals A, B, C, D, &c. we shall have

$$D = 3Cx - 2Bxx + 5Ax^3$$
$$E = 3Dx - 2Cxx + 5Bx^3$$
$$F = 3Ex - 2Dxx + 5Cx^3 \text{ \&c.}$$

Where it is evident, that the law of relation between D and E is the same as between E and F, each being formed in the same manner from the three terms which precede it in the *series*.

The quantities $3x - 2xx + 5x^3$ taken together and connected with their proper signs is what Mr. de Moivre calls the *Index* or the *scale of relation*. Sometimes the bare coefficients $3 - 2 + 5$ are called the scale of relation. And this scale of relation subtracted from unity is called the *differential scale*. Thus in the foregoing *series* the scale of relation being $3x - 2xx + 5x^3$, the differential scale will be $1 - 3x + 2xx - 5x^3$.

On the subject of recurring *series* see Mr. de Moivre's Miscellan. Analytic. p. 27. seq. and p. 72. seq. as also his doctrine of chances 2d Edit. p. 193. seq. and Mr. Euler's analys. infinit. Tom. I. p. 175. seq.

A recurring *series*, with its scale of relation being given, the sum of that *series* continued *in infinitum* will also be given. For instance, suppose a *series* $a + bx + cxx + dx^3 + ex^4 +$ &c. where the relation of the coefficient of any term to the coefficients of any two preceding terms may be expressed by $f - g$; that is, $e = fd - ge$; and $d = fc - gb$ &c. Then will the sum of the *series* continued *in infinitum* be,

$$\frac{\begin{array}{c} a + bx \\ -fax \end{array}}{1 - fx + gxx}$$

To facilitate the intelligence of this rule by a particular example, assume any *series* whereof the two first coefficients are given, such as 2 and 5, and suppose f and g to be respectively 2 and 1; then we shall have the following *series*, $2 + 5x + 8xx + 11x^3 + 14x^4 + 18x^5 +$ &c.

And the sum $= \frac{2 + 5x - 4x}{1 - 2x + xx} = \frac{2 + x}{\overline{1-x}^2}$

For the proof divide 1 by $\overline{1-x}^2$

$$\begin{array}{ll} 1 - 2x + xx)\ 1\ (& 1 + 2x + 3xx + 4x^3 + \text{\&c. which} \\ \text{multiplied by} & \underline{2 + x} \\ & 2 + 4x + 6xx + 8x^3 + \text{\&c.} \\ \text{gives} & \underline{+ x + 2xx + 3x^3 + \text{\&c.}} \\ \text{the product} = & 2 + 5x + 8xx + 11x^3 + \text{\&c.} = \text{the given } series. \end{array}$$

Analogous rules might be derived for more complex cases; and Mr. de Moivre's general rule is,

1° Take as many Terms of the *series* as there are parts in the scale of relation. 2°. Subtract the scale of relation from unity, the remainder is the differential scale. 3°. Multiply the terms taken in the *series* by the differential scale, beginning at unity, and so proceeding orderly, remembring to leave out what would naturally be extended beyond the last of the terms taken. Then will the product be the numerator, and the differential scale will be the denominator of a fraction expressing the sum required.

But we must here observe that when the sum of a recurring *series* extended *ad infinitum* is found by Mr. de Moivre's rule, it ought to be supposed, that the *series* converges indefinitely, that is, that the terms may become less than any assigned quantity. For, if the *series* diverges, that is, if its terms continually increase, it is not true, that the rule gives the sum. For the sum in such cases is infinite, or greater than any given quantity, whereas the sum exhibited by the rule will often be finite. The rule therefore in this case only gives a fraction, the reduction of which into a *series* gives the proposed *series*. Thus $\frac{1}{\overline{1-x}^2}$ reduced to an infinite *series* gives the recurring *series* $1 + 2x + 3xx +$ &c. whose scale of relation is $2 - 1$, and its sum by the rule will be $\frac{a + bx - fax}{1 - fx + gxx} = \frac{1 + 2x - 2x}{1 - 2x + xx} = \frac{1}{\overline{1-x}^2} =$ the quantity from which the *series* arose. But this quantity cannot in all cases be deemed equal to the infinite *series* $1 + 2x + 3xx$ &c. For stop where you will, there will always be a supplement required to make the product of the quotient by the divisor equal to the dividend. When the *series*, indeed, converges infinitely, the supplement diminishing continually, it becomes less than any assigned quantity, and is therefore, without error, reputed nothing; but in diverging *series*, this supplement becomes indefinitely great, and the *series* deviates indefinitely from the truth. See Mr. *Colson*'s comment on Sir *Is. Newton*'s method of fluxions and infinite *series* p. 152. Mr. *Stirling*'s method. Differentialis p. 36. *Bernoulli*, de Serieb. infinit. p. 249. *Cramer*, Analyse des lignes Courbes, p. 174.

A *recurring series* being given, the sum of any number of the terms of that *series* may be found. This is prob. III. p. 73. Miscel. Analys. and prop. V. p. 196. of the Doctrine of chances. One solution of the simplest case will be sufficient to give an idea of the method there used.

Let there be a geometric progression $a + ax + ax^2 + ax^3 +$ &c: it is required to find the sum of a number n of its terms. Then will the last term be ax^{n-1}. Suppose the progression continued *ad infinitum*, and we shall have two infinite progressions, the first beginning with a and the second with ax^n. Now the difference of the sum of these two must be the sum of the number n of terms. By the rule the sum of the first infinite progression will be $\frac{a}{1-x}$; and the sum of the second will be $\frac{ax^n}{1-x}$. But $\frac{a}{1-x} - \frac{ax^n}{1-x} = \frac{a - ax^n}{1-x}$, which will therefore be the sum of a number n, of terms.

This quantity $\frac{a - ax^n}{1-x}$ is equal to $\frac{ax^n - a}{x - 1}$, which last expression, calling $ax^{n-1} = l$, will be equivalent to this, $\frac{lx - a}{x - 1}$, which is the common rule for finding the sum of any geometric progression of which a, the first term; x, the ratio; and l the last term are given.

The *series* resulting from the division of unity by $\overline{1-x}^p$ or $\frac{1}{\overline{1-x}^p} = \overline{1-x}^{-p}$ is $1 + px + p \times \frac{p+1}{2} xx + p \times \frac{p+1}{2} \times \frac{p+2}{3} x^3 +$ &c. And the sum of any number of terms expressed by n of this *series* will be $\frac{\overline{1-x}^n}{\overline{1-x}^p} - \frac{nx^n}{\overline{1-x}^{p-1}} - \frac{\frac{n}{1} \times \frac{n+1}{2}}{\overline{1-x}^{p-2}} x^n - \frac{\frac{n}{1} \times \frac{n+1}{2} \times \frac{n+2}{3}}{\overline{1-x}^{p-3}} x^n -$ &c. which is to be continued till the number of terms $= p$. See Miscel. Analys. pag. 167. Doctrine of chances. p. 196. This theorem is of use in finding the sums of progressions of figurate numbers, and others.

Suppose, for instance, it were required to find the sum of any number n of terms of the geometric progression $1 + x + xx + x^3 +$ &c. generated by $\frac{1}{1-x}$. Here $p = 1$. And the sum will consequently be $= \frac{1 - x^n}{\overline{1-x}^p} = \frac{1 - x^n}{1 - x}$.

Again, if the sum of a number n of terms of the *series* $1 + 2x + 3xx + 4x^3 +$ &c. were required. The *series* is generated from $\frac{1}{\overline{1-x}^2}$ Then $p = 2$. And the sum $= \frac{1 - x^n}{\overline{1-x}^2} - \frac{nx^n}{1-x}$. Suppose $x = 1$ then will the sum be $\frac{nn + n}{2} = n \times \frac{n+1}{2}$ which is the sum of the arithmetical progression $1 + 2 + 3 + 4 +$ &c. continued to the number n of terms. But it is to be observed that it requires a particular artifice to derive this sum from the general rule: for at first sight the sum appears under this form $\frac{1 - 1}{\overline{1-1}^2} - \frac{n}{1 - 1}$.

$\frac{n}{1-1}$ which determines nothing. See Miſc. Analyſ. loc. cit.

In like manner, the ſum of a number n of terms of the *ſeries* of triangular numbers will be found to be $n \times \frac{n+1}{2} \times \frac{n+2}{3}$, as in Miſcel. Analyſ. p. 168.

By the like methods the ſum of any number of ſquares, cubes, &c. of the natural *ſeries* of numbers may be found. Which may alſo be done by Sir Iſaac Newton's differential method. See DIFFERENTIAL *method*, *Append.*

3° In a recurring *ſeries* any term may be obtained whoſe place is aſſigned. For after having taken ſo many terms of the *ſeries* as there are terms in the ſcale of relation, the *ſeries* may be protracted till it reach the place aſſigned. But if that place be very diſtant from the beginning of the *ſeries*, the continuation of the terms will prove laborious: other methods have therefore been contrived. See Miſcel. Analyſ. p. 33, ſeq. and Doct. of chances, p. 197, ſeq.

Theſe queſtions have been reſolved in many caſes, beſides thoſe of *recurring ſeries*. But as there is no univerſal method for the quadrature of curves, neither is there one for the ſummation of *ſeries*; there being a great analogy between theſe things, and ſimilar difficulties ariſing in both. See the authors before cited.

The inveſtigation of Mr. Daniel Bernoulli's method for finding the roots of algebraic equations, which is inſerted in the article EQUATION, *Suppl.* depends upon the doctrine of *recurring ſeries*. See *Euler*, Analyſis infinitorum, Tom. I. pag. 276, ſeq.

In general algebraic quantities may be expreſſed by a *ſeries*, either by diviſion or by the extraction of roots, in a method analogous to that uſed in arithmetic for expreſſing vulgar fractions and roots by decimals. And the conſideration of this analogy ſeems to have given riſe to Sir Iſaac Newton's doctrine of infinite *ſeries*. See his method of fluxions and infinite *ſeries* in the beginning.

But the ſame great author had alſo another method of throwing quantities into an infinite *ſeries*, by means of a general form aſſumed for that purpoſe. See FORM.

Interpolation of a SERIES, ſee INTERPOLATION.

Interſcendent SERIES. See INTERSCENDENT *ſeries*.

Tranſcendental SERIES. See TRANSCENDENTAL *ſeries*.

Hyperbolic SERIES is uſed for a *ſeries* whoſe ſum depends upon the quadrature of the hyperbola. Such is the *ſeries* $\frac{1}{1}+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+$ &c. *De Moivre*, Miſc. Analyſ. p. 111.

Circular SERIES, is uſed for a *ſeries* whoſe ſum depends on the quadrature of the circle. Such is the *ſeries* $1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-$ &c. *De Moivre*, Miſc. Analyſ. p. 111. or the ſum of the *ſeries* $1+\frac{1}{4}+\frac{1}{9}+\frac{1}{16}+\frac{1}{25}+$ &c. continued *ad infinitum*, according to Mr. Euler's diſcovery.

Mixt SERIES, that *ſeries* whoſe ſum depends partly on the quadrature of the circle and partly on that of the hyperbola. *De Moivre*, Miſc. Analyſ. p. 111.

Determinate SERIES, a *ſeries* the terms of which proceed by the powers of a determinate quantity. If that determinate quantity be unity, the *ſeries* is ſaid to be *determined by unity*. *De Moivre*, Miſcel. Analyſ. p. 111.

Reverſion of SERIES. See REVERSION *of ſeries*.

Summable SERIES, is uſed when the ſum of the terms of a *ſeries* may be found. Such is the *ſeries* $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+$, &c. the ſum of which is ſaid to be equal to unity, or, to ſpeak more accurately, the limit of whoſe ſum is unity. See the article PROGRESSION, *Suppl.*

An indefinite number of ſummable infinite *ſeries's* may be found: ſuch are, for inſtance, all infinite recurring *ſeries*, when converging, and many others, for which Meſſieurs De Moivre [a], Bernoulli [b], Stirling [c], Euler [d], and Mac Laurin [e], may be conſulted.—[[a] Miſcel. Analyſ. p. 110, ſeq. [b] De Serieb. infinit. paſſim. [c] Method. Different. p. 34, ſeq. [d] Acta Petropolit. paſſim. [e] Fluxions, Art. 350, ſeq. See alſo PROGRESSION, *Suppl.*]

SERMOUNTAIN, a name ſometimes given to the plant called *ſeſili*, or *ſiler* by authors. See the articles SESILI and SILER, *Suppl.*

SERPENT'S *tongue*, or ADDER'S *tongue*, names by which the *ophiogloſſum* of botaniſts is frequently called. See the article OPHIOGLOSSUM, *Suppl.*

SERPYLLUM (*Suppl.*) is alſo uſed by ſome as the name of a ſpecies of *thymbra*. See the article THYMBRA, *Suppl.*

SERVICE-*tree*, in botany, the Engliſh name of a genus of trees, called by botanical writers *ſorbus*. See the article SORBUS, *Suppl.*

Wild SERVICE, a name by which ſome call the *cratægus* of botanical writers. See the article CRATÆGUS, *Suppl.*

SESAMUM, *oily grain plant*, in botany, the name of a genus of plants, the characters of which are theſe. The cup is a one-leaved perianthium, divided into five ſegments; the uppermoſt of which is ſhorteſt. The flower conſiſts likewiſe of one petal of a campanulated form, and divided into five ſegments; of which the loweſt is by far the longeſt. The ſtamina are four filaments, ſhorter than the flower; the antheræ are oblong, acute, and erect. The germen of the piſtil is oval and rough; the ſtyle is filiform; the ſtigma is lanceolated, and divided into two parts. The fruit is an oblong capſule, containing four cells, in which are numerous ſeeds of an oval figure. *Linnæi* Gen. Plant. p. 293.

SESSION (*Suppl.*)—The court of *ſeſſion*, otherwiſe called the *college of juſtice*, is the ſupreme court in Scotland for all civil cauſes. It conſiſts of one conſtant preſident and fourteen other judges, who are lords by their office, which they hold by patent *quamdiu ſe bene geſſerint*. The Lord High Chancellor preſides here when preſent. The king names ſeveral other extraordinary lords, who ſit, but are not obliged to attendance, becauſe they have no ſalaries; but they may vote among the reſt.

The court ſits from the firſt of November, old ſtyle, to the laſt of February, and from the firſt of June to the laſt of July, all incluſive; which holds of all the inferior courts or judicatories in Scotland. In time of *ſeſſion*, or term, they ſit from nine o'clock to twelve in the forenoon, every day in the week but Sunday and Monday: ſometimes they ſit in the afternoon, to end concluded cauſes, or to hear ſuch long debates as the forenoon was too ſhort to hear, which gives a great diſpatch to cauſes that come before them. The lords, both ordinary and extraordinary, when in the inner houſe, ſit on a ſemicircular bench in their robes; where the advocates debate their clients cauſes before them. There are ſix principal clerks belonging to this court. Nine of the lords make a quorum in the inner houſe, otherwiſe they cannot vote in any caſe, except ſuch as are referred to one or more of the whole lords; and one of the ordinary lords (the preſident being always excepted) is weekly appointed judge in the outer houſe, for diſcuſſing of ordinary actions, and has ſix under clerks to attend him. He meddles with no extraordinary caſes, except where it is remitted to him by all the lords to be diſcuſſed in the outer houſe for diſpatch.

That the lords may have time to read informations, petitions, &c. and the ſuitors be eaſed of the trouble of going with them to their houſes, every lord has a box ſtanding upon a table in the waiting room in the inner houſe from two to four o'clock in the afternoon every day; wherein all who have papers to offer, may put them by a ſlit in the cover. Each of the principal clerks have alſo a box, and parties muſt put their bills, anſwers, or informations of cauſes to be reported, into the clerk of the proceſs's box.

The rolls of the court bring in all cauſes in their due order. Cauſes of the greateſt conſequence are at firſt adviſed by the whole lords in the inner houſe. Other cauſes are called of courſe before an ordinary in the outer houſe, who decides the controverſy, if clear, without farther trouble or expence; and, in caſe of difficulty, takes ſome little time to adviſe it himſelf, or to adviſe with the whole lords upon it. And if any of the parties think themſelves wronged by the ſentence of the ordinary, they may complain to the lords, and get their anſwer upon a bill. See *Chamb.* Preſ. State of Gr. Brit. p. 381, ſeq.

An appeal lies from this court to the Houſe of Lords.

SETTER-*wort*, a name by which hellebore is ſometimes called. See the article HELLEBORUS, *Suppl.*

SETTING, (*Suppl.*) among cock-maſters, is the placing a cock, that has fought ſo that he cannot ſtand, beak to beak againſt the other cock, and if he does not ſtrike the battle is won. Dict. Ruſt. in voc.

SETTING *down*, in falconry, is when a hawk is put into the mew. Id. ibid.

SETTING-*dog*, one trained up to find out and diſcover to the ſportſman whereabouts fowl are.

SETTS *for ſaws*, inſtruments for ſetting their teeth when out of order. *Blanckley*, Nav. Expoſ. p. 145.

SETWELL, in botany, a name ſometimes uſed for a ſpecies of *valerian*. See the article VALERIAN, *Suppl.*

SEWEL, among ſportſmen, denotes any thing that is ſet or hung up, to keep a deer out of any place. Ruſt. Dict. in voc.

SEYMS, among farriers. See SEAMS.

SHADDOCK, in botany, the name by which ſome call a ſpecies of orange. See the article ORANGE, *Suppl.*

SHAKLES, aboard a ſhip. See SHACKLES, *Suppl.*

SHAKY, or SHAKEN, among builders, an appellation given to timber which is cracked either with the heat of the ſun, or the drought of the wind. Build. Dict. in voc.

SHAVE-*graſs*, a name ſometimes uſed for the *equiſetum*, or horſe-tail. See the article EQUISETUM, *Suppl.*

SHAVING-*irons*, among gardeners, tools to keep a garden free from weeds, otherwiſe called *edging-irons*. Ruſt. Dict. in voc.

SHAW (*Suppl.*)—SHAW-*fowl*, an artificial bird, made for fowlers to ſhoot at. Ruſt. Dict. in voc.

SHEAT, or SHUT, a name by which ſome call a young hog. Ruſt. Dict. in voc.

SHELDAPLE, a name uſed in ſeveral parts of the kingdom for the chaffinch. Ruſt. Dict. in voc.

SHELL (*Suppl.*)—*Caterpillar*-SHELL, the Engliſh name of a ſpecies of *turbo*. See the article TURBO, *Suppl.*

Crown imperial Shell, the Engliſh name of a ſpecies of *voluta*. See the article Voluta, *Suppl.*

Chalice-Shell, or *cup*-Shell, the Engliſh name of a ſpecies of *balanus*. See the article Balanus, *Suppl.*

Dog-tooth Shell, the Engliſh name of a ſpecies of *dentale*. See the article Dentale, *Suppl.*

Needle-Shell, the Engliſh name of a ſpecies of *centronia*. See the article Centronia, *Append.*

Needle-Shell. See the article Needle, ſupra.

Scorpion-Shell, or *Spider*-Shell, names uſed for a ſpecies of *murex*. See the article Murex, *Suppl.*

Tiger-Shell, the Engliſh name of the red *voluta* with large white ſpots. See the article Voluta, *Suppl.*

Toe-Shell, the Engliſh name of a genus of *ſhells*, otherwiſe called *pollicipes*. See the article Pollicipes, *Suppl.*

Turtle-Shell, the Engliſh name of two ſpecies of different kinds of *ſhells*, the *murex* and *voluta*. See the articles Murex and Voluta, *Suppl.*

Shell-*drake*, in zoology, a common Engliſh name for the *tadorna*. See the article Tadorna.

SHEPHERD, in country affairs, a perſon who keeps or looks after ſheep. Dict. Ruſt. in voc.

Shepherd's *needle*, a name by which the *ſcandex* of botaniſts is ſometimes called. See the article Scandex, *Suppl.*

Shepherd's *pouch*, *alyſſon*, in botany, the name of a diſtinct genus of plants, otherwiſe called *madwort*. See the article Alysson, *Suppl.*

Shepherd's *ſtaff*, or Shepherd's *rod*, in botany, names given to the *dipſacus* of botanical writers. See the article Dipsacus, *Suppl.*

SHERBET, or Sherbit, a compound drink, firſt brought into England from Turkey and Perſia, conſiſting of fair water, lemon juice, ſugar, amber, and other ingredients.

Another kind of it is made of violets, honey, juice of raiſins, &c.

The word *ſherbet*, in the Perſian language, ſignifies *pleaſant liquor*. Dict. Ruſt. in voc.

SHRIMP, the Engliſh name of the common *ſquilla* with a long tail, and the ſnout ſerrated above, and tridentated below. See the article Squilla, *Append.*

SHROVE, in zoology, the ſame with *ſhrew*. See the article Shrew, *Suppl.*

SHUT, among farmers. See Sheat, *Append.*

SICYANIA, the *gourd-worm*, the name of a genus of worms; the body of which is of an oblong form, flat on the belly, and rounded on the back; its ſkin is ſoft, and its mouth large, horizontal, and emarginated, or dented in the middle. It reſembles the common gourd in figure, and from thence has got this name of *vermis cucurbitinus*, or the *gourd-worm*. It is frequently found in the inteſtines of animals. *Hill*, Hiſt. Anim. p. 16.

SIDE-*ſaddle-flower*, a name ſometimes given to the *ſarracena* of botanical writers. See the article Sarracena, *Suppl.*

SIDEROCHITA, in natural hiſtory, a claſs of cruſtated ferrugineous bodies, of a moderately firm and compact texture, compoſed of ferrugineous mixed with earthy matter, and formed of repeated incruſtations, making ſo many coats or cruſts round a ſofter or harder nucleus, or round looſe earths, or an aqueous fluid. Vid. *Hill*, Hiſt. Foſſ. p. 531.

Under this claſs are comprehended the *empherepyra*, *heteropyra*, *geodes*, and *enhydri*. See the article Empherepyra, &c. *Append.*

SIDEROXYLUM, in the Linnæan ſyſtem of botany, the name of a diſtinct genus of plants, the characters of which are theſe: the cup is a ſmall erect perianthium, compoſed of a ſingle leaf, divided into five ſegments, and permanent. The flower conſiſts of a ſingle petal, divided into five roundiſh, erect, concave ſegments; and, at the baſe of every one of theſe, there is placed a cuſpidated, ſerrated denticle, bending inwards. The ſtamina are five ſubulated filaments, of the length of the flower: the antheræ are ſimple: the germen of the piſtil is roundiſh; the ſtyle is ſubulated, and of the length of the ſtamina; the ſtigma is ſimple. The fruit is a roundiſh berry, containing only one cell. The ſeeds are four in number. *Linnæi* Gen. Plant. p. 81.

SILK-*graſs*, a name uſed for two very different genuſes of plants, the *aloe* and *dog's bane*. See the articles Aloe and Dog's Bane, *Suppl.*

Silk-*machine*. See the article Machine, *Append.*

SILVER-*bruſh*, a name ſometimes given to the *barba jovis* of botaniſts. See the article Barba-*jovis*, *Suppl.*

Silver-*weed*, *potentilla*, or *argentina*, in botany, the name of a diſtinct genus of plants. See the articles Argentina and Pentaphylloides, *Suppl.*

SILVERING (*Cycl.*)—This is a ſpecies of gilding, and may be done thus: take as much aqua fortis as you think there is occaſion for, put it into a glaſs, which ſet in warm aſhes; then put in your quantity of ſilver, after having beaten it very thin, and cut it into little ſhreads. When the ſilver is diſſolved, take it off the aſhes; and, mixing that liquid with as much white tartar as will make it like paſte; rub with this mixture the metal you want to ſilver. Copper, braſs, or any other metal may be thus made to appear like ſilver itſelf.

Copper, braſs, ſteel, or iron may be *ſilvered*, ſo as not to come off, unleſs made red-hot, in the following manner. Take urine which is made in the morning, cover it, and let it ſtand a whole month, and it will ferment; put it afterwards into an earthen pot, and let it boil; ſkim it, and when the third part is evaporated, take to two pints of urine one ounce of tartar, and one ounce of galiz-ſtone; mix them all together, and let them boil once up. When you would *ſilver* any metal, rub it well with brick-duſt on a wet woollen rag, till it is clean and fine, then put it twenty-four hours in the prepared urine; afterwards dry it, and where you deſign to *ſilver*, rub it over with quick-ſilver, which muſt be laid on thin with an iron ſpatula that has alſo lain two hours in urine. The quick-ſilver thus laid on, muſt be then rubbed on with a ſoft woollen rag, and it will make a fine *ſilvering*.

Braſs may be *ſilvered*, by boiling it with filings of good pewter and white tartar, in equal quantities. There are ſeveral other methods of *ſilvering*, for which ſee *Smith's* Laboratory, p. 37. ſeq.

SINGLE (*Suppl.*)—Single, among ſportſmen, the tail of a buck, or any of the deer kind. Ruſt. Dict. in voc.

SISON, the officinal name of a ſpecies of *ſium*. See the article Sium, *Suppl.*

SKEETS, in the ſea language, narrow oblong ladles, for wetting the ſails or ſides of a ſhip. *Blanckley's* Nav. Expoſ. p. 152.

SKEPE, or Skuttle, in country affairs, a ſort of flat, broad baſket for winnowing of corn. Dict. Ruſt. in voc.

SKIDS, wooden fenders laid on the outſide of a ſhip for the conveniency of hoiſting things into the ſhip. *Blanckley's* Nav. Expoſ. p. 152.

SKREEN. See Screen, *Append.*

SLEEPER, in zoology, a name peculiarly given to the dormouſe, or *mus avellanorum* of authors. See the article Mus, *Suppl.*

Sleeper, in building, a name uſed for the oblique rafter that lies in a gutter. Build. Dict. in voc.

SLIPPER (*Suppl.*)—*Lady's* Slipper, the Engliſh name of a genus of plants, called by botaniſts *helleborine*. See the article Helleborine, *Suppl.*

Slipper is alſo a name ſometimes uſed for a *plinth*. See the article Plinth, *Cycl.*

SLOTH, in zoology. See Sloath, *Suppl.*

SNAIL, in the hiſtory of inſects, the Engliſh name for the *limax*. See the articles Snail, *Suppl.* and Limax, *Append.*

Snail is alſo the name of the animal inhabiting many kinds of ſhells, as the patella, cochlea, nerite, buccinum, turbo, trochus, voluta, murex, purpura, lyra, and concha veneris. *Hill*, Hiſt. Anim. p. 114. See the articles Patella, Cochlea, &c.

Snail *trefoil*. See the article Trefoil, infra.

SNAKE (*Suppl.*)—*Coach-whip*-Snake, the name by which ſome call a ſpecies of *coluber*. See the article Coluber, *Append.*

Corn-Snake, the name of another ſpecies of *coluber*.

Necklace-Snake, the Engliſh name of the *natrix torquata* of zoologiſts. See the article Natrix, *Suppl.*

Sand-Snake, the Engliſh name of a kind of ſerpent found in Lybia, and ſome parts of Italy. See the article Ammodytes, *Suppl.*

Snake-*root*, *ariſtolochia*, in botany, the name of a genus of plants, otherwiſe called *birthwort*. See the article Aristolochia, *Suppl.*

Rattle-Snake-*root*, a name ſometimes given to *polygala*, a diſtinct genus of plants. See the article Polygala, *Suppl.*

SNAP-*tree*, *adhatoda*, in botany, the name of a diſtinct genus of trees. See the article Adhatoda, *Suppl.*

SNEAD, or Sneath, in country affairs, the handle of a ſcythe, or the like tool. Ruſt. Dict. in voc.

SNEEZE-*wort*, *ptarmica*, in botany, the Engliſh name of a diſtinct genus of plants. See the article Ptarmica, *Suppl.*

SNET, among ſportſmen, denotes the fat of all kinds of deer. Ruſt. Dict. in voc.

SNIPE (*Suppl.*)—*Mire*-Snipe, the name uſed in ſome parts of the kingdom for the *ardea ſtellaria*, or bittern. See the article Bittern, *Suppl.*

Snipe-*bills*, in the ſea language, a kind of hooks uſed for faſtening the axel-trees of the chain-pumps to the bitts. *Blanckley's* Nav. Expoſ.

SNOW-*drop*, the Engliſh name of a diſtinct genus of plants, according to Linnæus, who calls it *galanthus*, but is made only a ſpecies of *narciſſo-leucoium* by *Tournefort*. See the article Narcisso-Leucoium, *Suppl.*

Snow-*drop-tree*, the Engliſh name of a genus of trees, called by botaniſts *chionanthus*. See the article Chionanthus, *Append.*

SOAP-*berry-tree*, *ſapindus*, in botany, the name of a genus of trees. See the article Sapindus. *Suppl.*

Soap-*wort*, the Engliſh name of the *ſaponaria* of botaniſts. See Saponaria, *Append.*

SOAR (*Suppl.*)—Soar-*age*, in falconry, denotes the firſt year of a hawk's age. Ruſt. Dict. in voc.

SOLANDERS, in farriery. See MALANDERS, *Cycl.*

SOLANOIDES, in botany, the name of a genus of plants, called by Linnæus *rivinia*. See the article RIVINIA. *Suppl.*

SOLDIER (*Suppl.*)—Not only humanity but intereft require that great care fhould be taken of the health of *foldiers*. Much inftruction may be drawn for this purpofe from Dr. Pringle's excellent treatife, called obfervations on the difeafes of the army. He there remarks, that the circumftances of *foldiers* in time of war, differ from thofe of other people, in that they are more expofed to the injuries of the weather, and always crouded together, whether in camp, barracks, or hofpitals: wherefore the moft general divifion of thefe diftempers, may be into fuch as arife from the intemperature of the weather, and thofe from infection.

Military difeafes depending on the weather, are reducible to two forts, *viz.* to thofe of fummer, and to thofe of winter. However, as expofitions to cold are unavoidable upon the firft encampment, as alfo for fome time before the army ufually goes into winter-quarters, the winter diforders beginning about the end of autumn, will not entirely ceafe before the fummer is well advanced; and, on the other hand, as the heats of fummer and damps of autumn difpofe the body to ficknefs, the camp-diftempers are never quite over with the campaign, but continue fome time after the troops retire into winter-quarters.

The fummer difeafes are all of a bilious or putrid nature, as thofe of winter are inflammatory. See BILIOUS and INFLAMMATORY, *Append.*

Difeafes of SOLDIERS, arifing from heat and cold. See the articles HEAT and COLD, *Append.*

Diet of SOLDIERS. See DIET, *Append.*

Exercife of SOLDIERS. See EXERCISE. See alfo the articles CAMP, HOSPITAL, FEVER, &c.

Frefh-water SOLDIER, a name given in feveral parts of England to the *ftratiotes*, a diftinct genus of plants, called by Boerhaave *aloides*. See the article STRATIOTES, *Append.*

SOLEMN *acceptance*. See ACCEPTANCE, *Cycl.*

SOLIDAGO, in the Linnæan fyftem of botany, the name of a very comprehenfive genus of plants, taking in the *virga aurea* of Tournefort, with feveral fpecies of the *jacobæa* of the fame author. *Linnæi* Gen. Plant. p. 403. See the article VIRGA *aurea*, *Suppl.*

The great characteriftic of this genus, is, that the receptacle is naked, the down fimple, the fquamæ of the cup imbricated, and the radii of the corollulæ about five.

SOLINE, among carpenters, a joift, rafter, or piece of wood, either flit or fawed, wherewith the builders lay their ceilings. Build. Dict. in voc.

The word is French.

SOLOMON's *feal*, the Englifh name of a diftinct genus of plants, called by botanifts *polygonatum*. See the article POLYGONATUM, *Suppl.*

SOPES. See the article SOAP, *Cycl.* and *Suppl.*

SOPHIA *chirurgorum*, a name fometimes given to a fpecies of *fifymbrium*. See the article SISYMBRIUM, *Suppl.*

SORREL (*Suppl.*)—*Wood* SORREL, the Englifh name of a genus of plants, called by botanifts *lujula*, or *oxys*. See the article OXYS, *Suppl.*

Indian SORREL, a name fometimes given to *ketmia*. See the article KETMIA, *Suppl.*

SOURE-*fop*, or SOWRE *fop*, in botany, a diftinct genus of plants, called by botanifts *guanabanus* and *anona*. See the article ANONA, *Suppl.*

SPACE (*Cycl.*)—Some authors have afferted that *fpace* is a fubftance. The Cartefians, who do not allow of any diftinction between *fpace* and matter, were naturally enough led to the opinion, that *fpace* or extenfion was a fubftance. Others who admit a vacuum, and confequently an effential difference between *fpace* and matter, affert alfo that *fpace* is a fubftance. Among thefe we find *s'Gravefande*, Introd. ad Philof. fect. 19.

Others put *fpace* into the fame clafs of beings as time and number; that is, they make it to be no more than a notion of the mind. Hence, according to thefe authors, abfolute *fpace*, of which the Newtonians fpeak, is a mere chimera. See the writings of the late bifhop of Cloyne, *paffim.*

SPADE (*Suppl.*)—SPADE alfo denotes any gelded beaft, or a deer three years old. Ruft. Dict. in voc.

SPAID, or SPAYD, a term ufed by fportfmen for a red male deer that is three years old. Ruft. Dict. in voc.

SPANISH-*broom*, *fpartium*, in botany. See the article SPARTIUM, *Suppl.*

SPANSHAKLE, aboard a fhip, a large clafp of iron, which goes round the end of the davit upon the forecaftle. *Blanckley*, Naval Expofitor, p. 155.

SPARING, among cock-fighters. See the article SPARRING, *Suppl.*

SPARROW (*Suppl.*)—*Reed*-SPARROW, the Englifh name of a bird of the *picus*, or wood-pecker kind. See the article REED-*fparrow*, *Suppl.*

SPARROW-*hawk*, the Englifh name of the yellow-legged *falco*, with a white undulated breaft, and a fafciated brown tail. See the article FALCO, *Suppl.*

SPAT, a term ufed by the fifhermen for the fpawn of oyfters, which is caft in the month of May. Dict. Ruft. in voc.

SPEAR-*mint*, in botany, the Englifh name of the narrow-leaved, aromatic-fcented mint. See the articles MINT and MENTHA, *Suppl.*

SPERGULA, *fpurry*, in the Linnæan fyftem of botany, makes a diftinct genus of plants, but is comprehended by Tournefort among the *alfines*. See the article ALSINE, *Suppl.*

SPHERES, polifhed fpherical maffes of a mixt metalline compofition, ufed in optics. The manner of making them is as follows. Take of pure tin three pounds, copper one pound; melt thefe two metals together, and when in fufion caft upon the mafs fix ounces of burnt tartar, and an ounce and half of falt petre; and laftly, a quarter of an ounce of alum, and two ounces of arfenic: let all thefe matters evaporate and burn away, and then caft the pure metal into the figure of a *fphere*, and it will be capable of a high and elegant polifh. *Neri's* Art of Glafs, p. 166.

SPIDER-*fhell*, the Englifh name of feveral fpecies of *murex*. See the article MUREX, *Suppl.*

SPIDER-*wort*, (*Suppl.*) is alfo the name by which many call the *ephemerum* of botanical writers. See the article EPHEMERUM, *Suppl.*

SPIKES (*Suppl.*)—The word *fpikes*, among botanifts, denotes flowers fet thick above each other. Dict. Ruft. in voc.

SPIKE-*lavender*. See the article LAVENDULA, *Suppl.*

SPIKENARD, (*Cycl.*) *nardus*, in botany. See the article NARDUS, *Suppl.*

Ploughman's SPIKENARD, the Englifh name of a genus of plants, otherwife called *conyza*, and *flea-bane*. See the article FLEA-*bane*, *Suppl.*

SPILES, in a fhip, are fmall wooden pins, which are driven into the nail-holes, when a fhip's fheathing is taken off. *Blanckley*, Naval Expofitor, p. 156.

SPINACH (*Suppl.*)—*Strawberry*-SPINACH, a name fometimes given to *blite*. See the article BLITUM, *Suppl.*

SPINDLE (*Suppl.*)—The ftaff which fupports the vane at the maft-head, is likewife called a *fpindle*. *Blanckley*, Naval Expofitor, p. 156.

SPINDLE-*fhell*, the Englifh name of a fpecies of buccinum. See the article TRUMPET-*fhell*, *Suppl.*

SPINDLE-*tree*, the Englifh name of a genus of trees, called by botanifts *euonymus*. See the article EUONYMUS, *Suppl.*

African SPINDLE-*tree*, the Englifh name of a genus of plants, called *euonymoides* and *celaftrus* by authors. See the article CELASTRUS, *Append.*

SPINDLING, a term ufed by gardeners for the firft appearance or putting forth of flowers, ftems; or their running up in length. Ruft. Dict. in voc.

SPIRKETTING, among fhip-carpenters, denotes ftrakes of thick plank wrought from the lower edge of each port to each deck refpectively within fide of the fhip. *Blanckley*, Naval Expofitor, p. 156.

SPIT-*deep*, a term ufed among farmers for a foil as deep as can be dug up at once with a *fpit* or fpade. Dict. Ruft. in voc.

SPITTER, among fportfmen, a red male deer near two years old, whofe horns begin to grow up fharp and fpitwife. It is otherwife called a *brocket* and *pricket*. Ruft. Dict. in voc.

SPLEEN-*wort*, a name fometimes ufed for a genus of plants, called by botanifts *afplenium*, and in Englifh more commonly *milt-wafte*. See the article ASPLENIUM, *Suppl.*

SPOON-*bill*, in ornithology, the Englifh name of the *platea*. See the article PLATEA, *Suppl.*

SPOON-*wort*, a name by which fome call the *cochlearia*, or fcurvy-grafs. See the article COCHLEARIA, *Suppl.*

SPRAINTS, among fportfmen, a term ufed for the dung of the otter. Ruft. Dict. in voc.

SPRAT, the Englifh name of the little *clupea*, with the lower jaw longeft, and the belly very acute. See the article CLUPEA, *Suppl.*

SPROUTS, a word ufed by country people for fmall fhoots of old cabbage. Ruft. Dict. in voc.

SPUNK, a term ufed indifferently for half-rotten wood, match for guns, and a fubftance growing on the fides of trees. Dict. Ruft. in voc.

SPUR-*fhell*, a name fometimes given to the little elevated *cochlea*, with the edge of the volutions ferrated. See the article COCHLEA, *Suppl.*

SPURGE-*olive*, the Englifh name of a genus of plants, called by botanifts *chamelæa*. See the article CHAMELÆA, *Suppl.*

Sun-SPURGE, a name by which fome call feveral fpecies of *tithymalus*. See the article TITHYMALUS, *Suppl.*

SQUASH, the Englifh name of a genus of plants, called by authors *melopepo*. See the article MELOPEPO, *Suppl.*

SQUILL, *fquilla*, in zoology, a large genus of animals, comprehending the fhrimp or *fquilla*, properly fo called, the crayfifh, the crab, and lobfter: all which, according to Dr. Hill, make one genus of infects, of the podaria kind. See the articles INSECT, *Suppl.* and *Append.* and PODARIA, *Append.*

The characteriftics of this genus are, that they have ten legs, the foremoft pair cheliform, or made for pinching and holding

holding things; that they have only two eyes, and that the tail is foliated.

The *squillæ* may be conveniently arranged under three subdivisions. 1. The smaller long-tailed *squillæ*, commonly called *shrimps*. 2. The larger long-tailed *squillæ*, or the *lobster* and *cray-fish* kind. 3. The short-tailed kind, called also *canceres*, and in English *crabs*.

Of those denominated *shrimps* we have the following species. 1. The long-tailed *squilla*, with the snout serrated above, and tridentated below. This is the common *shrimp*. 2. The long-tailed *squilla*, with a smooth snout, called the smooth-nosed *shrimp*. 3. The long-tailed *squilla*, with a soft tail, and the right claw largest. This is called the *hermit*. 4. The larger, long-snouted sea-*squilla*. 5. The smaller, narrow-snouted sea-*squilla*. 6. The fresh-water small *squilla*.

Of the second order of *squillæ*, commonly called *lobsters*, or *cray-fish*, we have the following species. 1. The common *lobster*. 2. The thick-horned, slender-bodied *lobster*. 3. The short and broad-bodied *lobster*. 4. The very long-bodied *lobster*. 5. The small-bodied *lobster*. 6. The great sea *cray-fish*. 7. The *cray-fish* with the snout serrated above, and with a single denticulation at the base. This last species, though only three inches and an half in length, greatly approaches to the figure of the common *lobster*.

Of those *squillæ*, called *crabs*, *canceres*, there are the following species. 1. The common large *crab*. 2. The *wart-crab*, *cancer verrucosus*. 3. The *spider-crab*, or long-legged, short-tailed *squilla*. 4. The *king-crab*, or *molucca-crab*, called the *squilla clypeata*. 5. The rough-bodied, smooth-clawed *squilla*, called *cancer mœas*. 6. The smooth and long-clawed *crab*, called by Johnston the female of the common kind. 7. The little squall *crab*. 8. The little woolly *crab*. 9. The thick-bodied duck *crab*. 10. The round-bodied duck *crab*. 11. The common, or oval-bodied duck *crab*. 12. The very long-armed duck *crab*. 13. The very small-bodied, rough, long-armed *crab*. 14. The lunar *crab*. 15. The florid *crab*. 16. The frog *crab*. 17. The prickly and hairy, long-armed *crab*. 18. The great prickly, long-armed *crab*. 19. The short-bodied, reticulated *crab*. 20. The elliptic-bodied *crab*. 21. The smooth, long-legged *crab*. Vid. *Hill*, Hist. Anim. p. 28, seq. and Table of Crustaceous Animals, N° 18, 19, &c.

SQUILL, *scilla*, in botany, the English name of a distinct genus of plants. See the article SCILLA, *Append.*

SQUILL, *scilla*, in botany, the English name of a distinct genus of plants, according to Linnæus; but comprehended under the *ornithogala* by Tournefort. See the article ORNITHOGALUM, *Suppl.*

STAFF (*Suppl.*)—*Shepherd's* STAFF, or *shepherd's rod*, in botany, the name of a genus of plants, called by botanists *dipsacus*. See the article DIPSACUS, *Suppl.*

STAG-*beetle*, in the history of insects, the English name of a species of *scarabæus*, with ramose horns. See the article SCARABÆUS, *Suppl.*

STAG'S *horn-tree*, a name sometimes given to the *rhus*, or sumach, a distinct genus of plants. See the article RHUS, *Suppl.*

STAGGARD, among sportsmen, a young male deer only four years old. Rust. Dict. in voc.

STAINING (*Suppl.*)—STAINING *of horn*. See the article HORN, *Append.*

STAINING *of ivory*. See IVORY, *Append.*

STANDARD (*Suppl.*)—STANDARDS, in ship-building, a sort of knees fayed from the deck to the sides of the ship within board, to strengthen her. *Blanckley*, Naval Expositor, in voc.

STAPHYLÆA, in the Linnæan system of botany, the name of a genus of plants, called by Tournefort *staphylodendron*. See the article STAPHYLODENDRON, *Suppl.*

STAPHYLINUS, in zoology, the name of a genus of four-winged flies, the antennæ of which are slender and filiform. There are two vesicles situated above the tail. The exterior wings are dimidiated and short.

Of this genus there are a great many species, distinguished from each other by the colour of the several parts of their bodies. Vid. *Hill*, Hist. Anim. p. 57.

STAR (*Suppl.*)—Our excellent astronomer, Dr. Bradley, had no sooner discovered the cause, and settled the laws of the aberration of the fixed *stars* [b], than his attention was again excited by another new phænomenon, *viz.* an annual change of declination in some of the fixed *stars*, which appeared to be sensibly greater than a procession of the equinoctial points of 50″ in a year, the mean quantity now usually allowed by astronomers, would have occasioned.—[[b] See the article LIGHT, *Append.*]

This apparent change of declination was observed in the *stars* near the equinoctial colure; and there appearing at the same time an effect of a quite contrary nature, in some *stars* near the solstitial colure, which seemed to alter their declination less than a procession of 50″ required, Dr. Bradley was thereby convinced, that all the phænomena in the different *stars* could not be accounted for merely by supposing that he had assumed a wrong quantity for the procession of the equinoctial points. He had also, after many trials, sufficient reason to conclude, that these second unexpected deviations of the *stars* were not owing to any imperfection of his instruments. At length, from repeated observations, he began to guess at the real cause of these phænomena.

It appeared from the Doctor's observations, during his residence at Wansted, that some of the *stars* near the solstitial colure had changed their declinations 9″ or 10″ less than a procession of 50″ would have produced; and, at the same time, that others near the equinoctial colure had altered theirs about the same quantity more, than a like precession would have occasioned: the north pole of the equator seeming to have approached the *stars*, which come to the meridian with the sun, about the vernal equinox and the winter solstice; and to have receded from those, which come to the meridian with the sun, about the autumnal equinox and the summer solstice.

From the consideration of these circumstances, and the situation of the ascending node of the moon's orbit when he first began to make his observations, he suspected that the moon's action upon the equatorial parts of the earth might produce these effects. For, if the precession of the equinox be, according to Sir Isaac Newton's principles, caused by the actions of the sun and moon upon those parts; the plane of the moon's orbit being, at one time, above ten degrees more inclined to the plane of the equator, than at another; it was reasonable to conclude, that the part of the whole annual precession, which arises from her action, would in different years be varied in its quantity; whereas the plane of the ecliptic, wherein the sun appears, keeping always nearly the same inclination to the equator, that part of the precession, which is owing to the sun's action, may be the same every year; and from hence it would follow, that although the mean annual precession, proceeding from the joint actions of the sun and moon, were 50″; yet the apparent annual precession might sometimes exceed, and sometimes fall short of that mean quantity, according to the various situations of the nodes of the moon's orbit.

In the year 1727, the moon's ascending node was near the beginning of Aries, and consequently her orbit was as much inclined to the equator, as it can at any time be; and then the apparent annual precession was found, by the Doctor's first year's observations, to be greater than the mean; which proved, that the *stars* near the equinoctial colure, whose declinations are most of all affected by the precession, had changed theirs, above a tenth part more than a precession of 50″ would have caused. The succeeding year's observations proved the same thing; and in three or four years time the difference became so considerable, as to leave no room to suspect that it was owing to any imperfection either of the instrument, or observations.

But some of the *stars*, that were near the solstitial colure, having appeared to move, during the same time, in a manner contrary to what they ought to have done, by an increase of the precessions; and the deviations in them being as remarkable as in the others, it was evident that something more than a mere change in the quantity of the precession would be requisite to solve this part of the phænomenon.

Upon comparing the observations of *stars* near the solstitial colure, that were almost opposite to each other in right ascension, they were found to be equally affected by this cause. For whilst γ Draconis appeared to have moved northward, the small *star*, which is the 35th Camelopardali Hevelii, in the British catalogue, seemed to have gone as much towards the south; which shewed, that this apparent motion in both those *stars* might proceed from a nutation in the earth's axis; whereas the comparison of the Doctor's observations of the same *stars*, formerly enabled him to draw a different conclusion, with respect to the cause of the annual aberrations arising from the motion of light. For the apparent alteration in γ Draconis, from that cause, being as great again as in the other small *star*, proved, that that did not proceed from a nutation of the earth's axis; as, on the contrary, this may. Upon making the like comparison between the observations of other *stars*, that lie nearly opposite in right ascension, whatever their situations were with respect to the cardinal points of the equator, it appeared, that their change of declination was nearly equal, but contrary; and such as a nutation or motion of the earth's axis would effect.

The moon's ascending node being got back towards the beginning of Capricorn in the year 1732, the *stars* near the equinoctial colure appeared about that time to change their declinations no more than a precession of 50″ required; whilst some of those near the solstitial colure altered theirs above 2″ in a year less than they ought. Soon after the annual change of declination of the former was perceived to be diminished, so as to become less than what 50″ of precession would cause; and it continued to diminish till the year 1736, when the moon's ascending node was about the beginning of Libra, and her orbit had the least inclination to the equator. But by this time, some of the *stars* near the solstitial colure had altered their declinations 18″ less, since the year 1727, than they ought to have done from a precession of 50″. For γ Draconis, which in those nine years should have gone about 8″ more southerly, was observed

in 1736, to appear 10″ more northerly than it did in the year 1727.

As this appearance in γ Draconis indicated a diminution of the inclination of the earth's axis to the plane of the ecliptic, and as several astronomers have supposed that inclination to diminish regularly; if this phænomenon depended upon such a cause, and amounted to 18″ in nine years, the obliquity of the ecliptic would, at that rate, alter a whole minute in thirty years; which is much faster than any observations before made, would allow. The Doctor had therefore reason to think that some part of this motion at least, if not the whole, was owing to the moon's action upon the equatorial parts of the earth; which he conceived might cause a libratory motion of the earth's axis. But as he was unable to judge, from only nine years observations, whether the axis would entirely recover the same position that it had in the year 1727, he found it necessary to continue his observations through a whole period of the moon's nodes; at the end of which he had the satisfaction to see, that the *stars* returned into the same positions again, as if there had been no alteration at all in the inclination of the earth's axis: which fully convinced him that he had guessed rightly as to the cause of the phænomenon. This circumstance proves likewise, that if there be a gradual diminution of the obliquity of the ecliptic, it does not arise only from an alteration in the position of the earth's axis, but rather from some change in the plane of the ecliptic itself: because the *stars*, at the end of the period of the moon's nodes, appeared in the same places, with respect to the equator, as they ought to have done, if the earth's axis had retained the same inclination to an invariable plane.

The Doctor having communicated these observations, and his suspicion of their cause, to the late Mr. Machin, that excellent geometer soon after sent him a table, containing the quantity of the annual precession in the various positions of the moon's nodes, as also the corresponding nutations of the earth's axis; which was computed upon the supposition that the mean annual precession is 50″, and that the whole is governed by the pole of the moon's orbit only: and therefore Mr. Machin imagined that the numbers in the table would be too large; as, in fact, they were found to be. But it appeared that the changes which Dr. Bradley had observed, both in the annual precession and nutation, kept the same law, as to increasing and decreasing, with the numbers of Mr. Machin's table. Those were calculated upon the supposition, that the pole of the equator, during a period of the moon's nodes, moved round in the periphery of a little circle, whose center was 23° 29′ distant from the pole of the ecliptic: having itself also an angular motion of 50″ in a year, about the same pole. The north pole of the equator was conceived to be in that part of the small circle, which is farthest from the north pole of the ecliptic, at the time when the moon's ascending node is in the beginning of Aries: and in the opposite point of it, when the same node is in Libra.

If the diameter of the little circle, in which the pole of the equator moves, be supposed equal to 18″; which is the whole quantity of the nutation, as collected from Dr. Bradley's observations of the *star* γ Draconis; then all the phænomena in the several *stars* which be observed will be very nearly solved by his hypothesis. But for the particulars of his solution, and the application of his theory to the practice of astronomy, we must refer to the excellent author himself [b]; our intention being only to give the history of the invention.—[[b] See Phil. Transf. N° 485.]

The corrections arising from the aberration of light, and from the nutation of the earth's axis, must not be neglected in astronomical observations; since such neglects might produce errors of near a minute in the polar distances of some *stars*. See Phil. Transf. loc. cit. p 26.

As to the allowance to be made for the aberration of light, Dr. Bradley assures us, that having again examined those of his own observations, which were most proper to determine the transverse axis of the ellipsis, which each *star* seems to describe, he found it to be nearest to 40″; and this is the number he makes use of in his computations relating to the nutation. Ibid. p. 23.

Monsieur d'Alembert has published a treatise, intitled, *Recherches sur la precession des equinoxes et sur la nutation de la terre dans le systeme Newtonien*, 4to. Paris, 1749. The calculations of this learned gentleman agree, in general, with Dr. Bradley's observations. But Monsieur d'Alembert finds, that the pole of the equator describes an ellipsis in the heavens, the ratio of whose axes is as 4 to 3 [c]; whereas, according to Dr. Bradley, the curve described is either a circle, or an ellipsis, the ratio of whose axes is as 18 to 16 [d].
—[[c] Journal. Britan. par Monsieur *Maty*, Jan. 1750, p. 93.
[d] Phil. Transf. ibid. p. 35.]

Dr. Bradley [e] says, in general, that experience has taught him that the observations of such *stars* as lie nearest the zenith, generally agree best with one another, and are therefore the fittest to prove the truth of any hypothesis.—[[e] Phil. Transf. loc. cit. p. 29.]

From the result of the comparison of our best modern observations, with such as were formerly made with any tolerable degree of exactness, there appears to have been a real change in the position of some of the fixed *stars*, with respect to each other; and such as seems independent of any motion in our system, and can only be referred to some motion in the *stars* themselves. Arcturus affords a strong proof of this: for if its present declination be compared with its place, as determined either by Tycho or Flamsteed, the difference will be found to be much greater, than what can be suspected to arise from the uncertainty of their observations.

It is reasonable to expect, that other instances of the like kind must also occur among the great number of visible *stars*; because their relative positions may be altered by various means. For if our own solar system be conceived to change its place with respect to absolute space, this might, in process of time, occasion an apparent change in the angular distances of the fixed *stars*: and in such a case, the places of the nearest *stars* being more affected than of those that are very remote, their relative position might seem to alter, though the *stars* themselves were really immoveable. And, on the other hand, if our system be at rest, and any of the *stars* really in motion, this might likewise vary their apparent positions; and the more so, the nearer they are to us, or the swifter their motions are, or the more proper the direction of the motion is to be rendred perceptible by us. Since then the relative places of the *stars* may be changed from such a variety of causes, considering the amazing distance at which it is certain some of them are placed, it may require the observations of many ages, to determine the laws of the apparent changes, even of a single *star*: much more difficult, therefore, must it be to settle the laws relating to all the most remarkable *stars*.

When the causes which affect the places of all the *stars* in general are known; such as the precession, aberration, and nutation; it may be of singular use, to examine nicely the relative situations of particular *stars*; and especially of those of the greatest lustre, which, it may be presumed, lie nearest to us, and may therefore be subject to more sensible changes, either from their own motion, or from that of our system. And if, at the same time that the brighter *stars* are compared with each other, we likewise determine the relative positions of some of the smallest that appear near them, whose places can be ascertained with sufficient exactness; we may perhaps be able to judge to what cause the change, if any be observable, is owing. The uncertainty that we are at present under, with respect to the degree of accuracy wherewith former astronomers could observe, makes us unable to determine several things relating to this subject: but the improvements, which have of late years been made in the methods of taking the places of the heavenly bodies, are so great, that a few years may hereafter be sufficient to settle some points, which cannot now be settled, by comparing even the earliest observations with those of the present age. See Dr. *Bradley*, in Phil. Transf. N° 485.

STAR-*apple*, the English name of a genus of plants, called by botanists *cainito* and *chrysophyllum*. See the article CHRYSOPHYLLUM, *Suppl.*

STAR-*thistle*, the English name of a species of centaury, called by some *calcitrapa*. See the article CENTAUREA, *Append.*

STARCH (*Cycl.*)—In the history of the royal Academy of Sciences 1739, p. 24, Edit. Paris, a kind of *starch* is mentioned, made of potatoes and red truffles. By the short account there given, this *starch* seems not to be so good as the common, but might be of use in case of a scarcity of wheat.

STARLING, the English name of a genus of birds, called by authors *sturnus*. Some, erroneously, account it a species of *turdus*, or thrush.

Of this genus there is only one species, which is the *starling*, the beak of which is of a subulated figure, depressed in an angulated manner, and obtuse at the extremity; and it's tongue is marginated and acute. It is of the size of the common black-bird. The beak is near half an inch long, and is yellow in the male, and brown in the female. The general colour is black, but variegated with spots of grey; and the tips of the feathers of the neck and back are yellowish. It has also various other tinges, according to the light it is seen in. The wing and tail-feathers are brown, with some yellow at their edges. *Hill*, Hist. of Animals, p. 496.

STEEL (*Suppl.*)—The manner of hardening *steel* for magnetical bars, which Mr. Canton [a] says proved better than any other he could meet with, is as follows: Cut a sufficient quantity of the leather of old shoes into very small pieces; provide an iron pan, a little exceeding the length of a bar, and wide enough to lay two side by side without touching each other or the pan, and at least an inch deep. This pan is to be nearly half filled with the bits of leather, upon which the two bars are to be laid, a small wire being fastened to the end of each to take them out by. Then fill the pan quite with the leather, and place it on a gentle flat fire, covering and surrounding it with charcoal. The pan being brought to somewhat more than a red heat, and kept so for about

about half an hour, the bars are to be suddenly quenched in a large quantity of cold water.—[a See Method of making artificial magnets, Lond. 1751.]

For the expanſion of *ſteel* by heat, ſee the article HEAT, *Append.*

STELLULARIA, in the Linnæan ſyſtem of botany, the name of a genus of plants, called by Tournefort *alſine*. See the article ALSINE, *Suppl.*

STICK-*a-door*, a name ſometimes uſed for the *ſtoechas*. See the article STOECHAS, *Suppl.*

STILLATORY, a name ſometimes uſed for a ſtill-houſe. See the article STILL-*houſe*, *Suppl.*

STILOBATUM, in architecture, denotes the body of the pedeſtal of any column. See PEDESTAL, *Cycl.*

STIRK, or STURK, a word uſed among country people for a young ox or heifer. Ruſt. Dict. in voc.

STITCH-*wort*, a name ſometimes given to the *alſine*, or *ſtellularia* of botaniſts, otherwiſe called *chickweed*. See the article ALSINE, *Suppl.*

STITHY, or STUTHY, is uſed either for a ſmith's anvil, or a diſeaſe in oxen, cauſing the ſkin to ſtick ſo cloſe to the ribs that they cannot ſtir. Ruſt. Dict. in voc.

STIVER, a Dutch coin, twenty of which make a guilder. See the article COIN, *Cycl.*

STOCK-*July-flower* (*Suppl.*)—*Dwarf* STOCK-*July-flower*, a name given by ſome to the *heſperis*. See the article HESPERIS, *Suppl.*

STOECHAS, in botany, the name of a genus of plants, printed *ſtaechas* in the Supplement by an error of the preſs. See STÆCHAS, *Suppl.*

STOMATIA, in zoology, the name of a genus of ſhell-fiſh, frequently confounded with the *ear-ſhell*. See the article EAR-*ſhell*, *Suppl.*

The ſhell of the *ſtomatia* is formed of one piece, has no perforations in any part of its ſurface, and is of a depreſſed, flat figure; and its mouth is the moſt patent of all the univalve ſhells, the limpet only excepted. It has a ſhort ſpiral turn running into the mouth at the head.

There are ſeveral ſpecies of this genus. See *Hill*, Hiſt. Anim. p. 119, ſeq.

STONE (*Cycl.*)—We have not only accounts of *ſtones* of various degrees of hardneſs taken out of the bladders of perſons affected with this terrible malady, but even of extraneous matter lodged within, and ſerving for the nucleus of thoſe *ſtones*. Thus, in the Philoſophical Tranſactions, there is an account of a boy who for a long time voided hair by urine, and afterwards being troubled with the *ſtone*, on being cut for it, the *ſtone* taken away was very hard and heavy, and of the bigneſs of a gooſe's egg: it was covered with a cruſt, looking like the mortar of an old wall, and this was full of cracks and chinks, out of every one of which there was found to grow hair.

The hairs, which he had been uſed to void by urine, certainly grew alſo out of the clefts of this *ſtone*, for they would often hang out at the end of the penis; and on pulling them away, ſeemed to grow faſt to ſomething, and to be pulled out by the roots.

In another boy of about five or ſix years of age, who was cut for the *ſtone*, the *ſtone* taken out being broken by accident, there was diſcovered within it a piece of flint, of the ſhape and figure, as well as bigneſs, of a common piſtol flint. This ſerved as the nucleus to the other *ſtony* matter which encruſted it over. It is utterly impoſſible that a flint, of this ſhape, ſhould have been formed in the bladder, nor is it eaſy to account for its coming there; the boy muſt have ſwallowed it at ſome time, but then its making its way into the bladder, is a very hard matter to account for. A perſon, who uſed himſelf to ſwallow piſtol bullets, is recorded in the ſame place to have voided them by urine, cruſted over with *ſtony* matter; but all this is equally hard to account for. Philoſ. Tranſ. N° 266. p. 688.

Dr. Cheyne ſays, that ſoap lees, ſoftened with a little oil of ſweet almonds, drunk about a quarter of an ounce twice a day, on a faſting ſtomach; or ſoap and egg-ſhell pills, with a total milk and ſeed diet, and Briſtol-water; will either diſſolve the *ſtone* in the kidneys or bladder, or make it eaſy. See Nat. Meth. of Curing, p. 266.

We often meet with hiſtories, in medical writers, of the *ſtone*, or human calculus, making its way through unuſual places, as the perineum, ſcrotum, *&c.* See Philoſ. Tranſ. N° 456.

Mr. le Dran aſſures us, when a ſmall *ſtone* is lodged in the neck of the bladder, the patient only is pained in piſſing till the firſt drops of the urine come away; when the *ſtone* is large, his greateſt pain is while the laſt drops are evacuated; but when the difficulty of urining depends on the diſeaſes of the coats of the bladder, the pain continues all the time of the evacuation. By obſerving theſe ſymptoms, he has declared people to have no *ſtone* in the bladder, after ſeveral others had aſſured them there was a *ſtone*; and his opinion was confirmed by probing with the catheter. He names one inſtance of this, in a perſon who had laboured under what he calls a contracted hardened bladder, whom he cured after ſeveral bleedings and purges, by injecting into the bladder a decoction of marſh-mallow roots and linſeed, which he changed afterwards for barley-water, with ſome honey of roſes. By theſe he removed the pain, and brought the bladder, which at firſt could ſcarce contain two ſpoonfuls of liquor, to the ordinary capacity.

We have an account, in the Philoſophical Tranſactions, of a *ſtone* weighing above ten ounces, taken out of the bladder of a large maſtif: on cutting the *ſtone* aſunder, a piece of dog-graſs was found in its center. Vid. Philoſ. Tranſact. N° 482. ſect. 1.

We read of a *ſtone* in the bladder formed on a needle. See Med. Eſſ. Edinb. Vol. IV. art. 16.

Mr. Hales is of opinion that all paſſable *ſtones*, which have lately fallen from the kidneys into the bladder, and which have broken off from larger ones, might readily and eaſily be brought out thence, by conveying into the empty bladder, by a catheter, ſome very mucilaginous ſubſtance, ſuch as ſyrup of marſh-mallows, or a ſolution of gum arabic, or barley-water: ſuch ſubſtances would bring away the *ſtones* ſoon, and with great eaſe to the patient; and thereby not only prevent much pain by the fruitleſs endeavours to bring them away with the weak force of the urine, but alſo effectually ſecure the patient from the danger of their growing too big to come away, by long continuing in the bladder. Phil. Tranſ. N° 477.

Pitcarn recommends the uſe of milk for common drink, in the *ſtone*, with barley-water and a little ſugar. He adds, that he cannot give any better reaſon why milk is ſerviceable to nephritics, than becauſe the ſame is always found ſerviceable to gouty perſons. The ſymptoms of both diſeaſes are the ſame, excepting what relates to the parts affected.

Dr. Mead ſeems to think, that the proximate cauſe of this diſeaſe is a tartarous ſalt conveyed out of the blood into the ſmall ducts of the kidneys: for it is the nature of theſe ſalts to contain a conſiderable quantity of that ſubtile matter which Newton [a] has ſhewn to be the cauſe of the coheſion of bodies. Thus, the calculus is a ſubſtance compoſed of earth and a very large ſhare of air concreted in the renal ducts; and either remains therein, or drops down into the urinary bladder.

As to the method of cure the Doctor obſerves, to prevent thoſe ſalts from ſhooting into cryſtals, lixivial ſalts ſeem to be very proper. Next to keep the cryſtals from coaleſcing into a calculous ſubſtance, oily medicines are very efficacious; and this rule ought to take place with regard to diet as well as medicines.

But when calculous concretions are actually formed in the kidneys, and are to be brought away by the ureters, the caſe requires very prudent management. It is a very common error in practice to give ſtrong forcing diuretics with an imaginary view of driving out the gravel with the urine: whereas this intention is anſwered with greater ſafety in moſt caſes by relaxing and lubricating medicines; eſpecially, if in caſe of violent pain, bleeding be premiſed, and anodynes interſperſed. For a *ſtone* is never forced out while the patient is in great torture; though when the pain ceaſes it ſometimes comes away unexpectedly, and almoſt of its own accord, with the urine; and the reaſon of this is, that pain conſtringes the fibres of the parts, which reſume their natural ſtate, and perform their functions properly when the troubleſome ſenſation is over. Wherefore three or four grains of opium, diſſolved in five or ſix ounces of the common decoction, may be given by way of clyſter; which will greatly relieve the pain, and ſometimes procure greater advantages. However, there are conjunctures, after the pain is abated, when powerful diuretics may be adminiſtred; but with this precaution, that as ſoon as they have had their effect, they are no longer to be continued.—[a See Life of Mr. Boyle prefixed to his works.]

All this while the body ſhould conſtantly be kept open: wherefore, in caſe of coſtiveneſs, it will be expedient to give clyſters, and ſometimes to purge gently with infuſion of ſena and manna: but ſtrong cathartics are to be avoided.

Of the lubricating medicines abovementioned, the chief are oil of ſweet almonds, ſyrup of marſh-mallows, emulſions made with almonds, and the like; to which may be added, the uſe of the warm bath. But among the powerful diuretics, turpentine and ſoap are the beſt.

Such is the courſe to be purſued in the paroxyſm of the diſeaſe. But out of it the patient ſhould uſe bodily exerciſe, eſpecially riding every day, but ſo as not to fatigue: his food ſhould be mild, and of eaſy digeſtion; and his drink either ſmall wine and water, or new ſoft ale; which will be rendered better and wholſomer, if ground-ivy leaves be infuſed in it, while it is working. Mead is likewiſe a proper drink; for honey is an excellent diuretic. A ſpoonful alſo of honey in a glaſs or two of the infuſion of marſh-mallows roots, is an admirable cleanſer of the kidneys, if uſed for a conſtancy. The wines ought to be the ſofteſt and ſmootheſt that can be had; and the lighteſt, cleareſt river, or running water, is preferable to all other. For, as Pliny [b] ſays, thoſe ſprings are particularly condemned, the waters

of

of which line the vessels, in which they are boiled, with thick crusts.—[b *Plin.* Nat. Hist. lib. 31. cap. 3.] See the articles LITHONTRIPTIC and LITHOTOMY, *Append.*

But particular care should be taken, not to put the patient into a course of powerful diuretics, with a view of preventing the gravel from concreting in the kidneys: because, whatever great things may be said of this sort of medicines by ignorant pretenders, they certainly injure the parts by their heat and acrimony. *Mead*, Monit. & Pract. Med. p. 191, seq.

The Leipsic Acts give a very remarkable instance of *stones* in the blood vessels, discovered by accident on opening a vein in the arm: the surgeon finding it necessary to make a large orifice, several small but very hard *stones* were discharged at it with the blood. The patient was a man of seventy two years of age.

STONES *in animals*. We meet with great variety of forms and appearances in the *stones* produced by different animals, and in their different parts. Wedelius describes a vast number of various kinds taken from dogs, hogs, cows, and other animals which he had opened: but the most singular instance is of one which was taken from a cow, and was of the colour of burnished gold. Dr. Lister confirms this singular observation with another of a like kind, that came within his own knowledge: this was of two hundred small globular *stones*, the largest not exceeding the size of a small tare, and the smaller not bigger than pins heads. They were covered with a frothy substance in the bladder, and adhered to one side of it; but when cleaned and dried, they resembled seed pearl in shape, and were of a fine gold colour. They were finely polished, even when viewed by the microscope; and when broken, and examined in the same manner, it was found to be only a thin skin of gold colour that covered them in this manner, their inner substance being coarse and opake, somewhat resembling sugar-candy, but not so fine. *Wedel.* Observ. N° 106. Philos. Transf. N° 206.

Corner STONES. See the article CORNER, *Append.*

STONE-*break*, a name by which some writers call the *alchimilla*, or ladies mantle. See the article ALCHIMILLA, *Suppl.*

STONE-*crop*, a name sometimes given to the *sedum*, or houseleek. See the article SEDUM, *Suppl.*

STONE-*crop-tree*, in botany, the name by which some call the *blitum*, or blite, of other authors. See the article BLITUM, *Suppl.*

STOOK, a term used in many parts of the kingdom for a shock of corn, containing twelve sheaves. Rust. Dict. in voc.

STOOL, (*Suppl.*) in ship-building, the name of the supporters of the poop and top lanterns. *Blanckley*, Naval Expositor, in voc.

STORAX-*tree*, in botany, the English name of the *styrax*. See the article STYRAX, *Suppl.*

STORK, the name of a bird of the *ardea*, or heron kind. See the article HERON, *Suppl.*

The *stork* has been described under the name *ciconia* by several authors. See the article CICONIA, *Suppl.*

STOVE (*Suppl.*)—STOVES, at sea, are square boxes made of planks, and lined with brick, for burning charcoal in to dress the admiral's victuals. *Blanckley*, Nav. Expos.

STOVER, a word used by country people for straw or fodder for cattle. Rust. Dict. in voc.

STRATIOTES, in the Linnæan system of botany, the name of a distinct genus of plants, the characters of which are these. The cup is a two-leaved spatha, compressed, obtuse, connivent, and carinated on each side. Beside this, there is also a perianthium, which is formed of a single leaf, divided into three segments, and is erect and deciduous. The flower consists of three obversely cordated, erect and patent petals, of double the size of the cup. The stamina are twenty filaments, of the length of the perianthium, and inserted into the receptacle. The antheræ are simple. The germen of the pistil stands under the receptacle of the perianthium. There are six styles, divided each into two parts, and of the length of the stamina. The stigmata are simple. The fruit is an oval berry, attenuated at each end, somewhat hexaedral, and contains six cells. The seeds are numerous, oblong, crooked, and as it were alated.

There is only one known species of this genus. Vid. *Linnæi* Gen. Plant. p. 253.

STRATIOTES, in botany, is also a name by which some call the *hottonia* of Linnæus. See the article HOTTONIA, *Suppl.*

STRAWBERRY-*cinquefoil*, the name by which some call the *pentaphylloides* of botanists. See the article PENTAPHYLLOIDES, *Suppl.*

STRAWBERRY-*blite*. See the article BLITUM, *Suppl.*

STRAWBERRY-*spinach*. See SPINACH, supra.

STRICKLE, or STRICKLESS, an instrument for striking off the over-measure of corn, &c. Rust. Dict. in voc.

STUBBING, among farmers, is the pulling up of shrubs, broom, hops, or the like, out of lands. Rust. Dict. in voc.

STUBBLE, that part of the stalks of corn which remains on the land, after the corn is reaped.

STUFF, among joiners, &c. a term used for the wood they work on. Build. Dict. in voc.

STURGEON, the English name of the *sturio* of ichthyologists. See the article STURIO, *Suppl.*

STURK, the same with *stirk*. See the article STIRK, *Append.*

STURLING, the English name of a bird called by zoologists *sturnus*. See the article STURNUS, *Suppl.*

STUTHY, the same with *stithy*. See the article STITHY, *Append.*

STYE, in the management of swine, a place for keeping or fattening them. Rust. Dict. in voc.

STYLOBATUM, in architecture, the same with pedestals. See the article PEDESTAL, *Cycl.*

SUBSTANCE, (*Cycl.*) is usually distinguished into thinking and unthinking *substances*. Of the former class is the human soul; and of the latter, philosophers commonly consider matter only. But some b reckon space among *substances*. The Cartesians consider space and matter as the same. The Leibnitians put space in the same class of being with number and time, and make them all alike notional. Leibnitz said, *agere est character substantiarum.*—[b s'*Gravesande*, Introd. ad Philos. sect. 19.]

The idealists deny matter to be a *substance*, making it a mere phænomenon. See bishop *Berkley*'s Dialogues.

The materialists, on the other hand, deny spirit to be a *substance*. But as they cannot deny the existence of thought, as the idealists deny the existence of matter, the materialists are forced either to allow all matter to have perception, essentially; or to say, that it is superadded to matter, or a modification thereof. All which lead to inextricable difficulties.

SUCCORY (*Suppl.*)—*Gum*-SUCCORY, the name by which some call the *chondrilla* of botanists. See the article CHONDRILLA, *Suppl.*

SUCCULENT *plants*, among botanists, those which are plump and full of juice. Rust. Dict. in voc.

SUCKER, or SUCK-*fish*, in ichthyology. See the article REMORA, *Suppl.*

Stone-SUCKER, the English name of a genus of fishes. See the article PETROMYZON, *Suppl.*

Great SUCKER, the English name of a species of *hirundo*, or swallow, with an undivided tail, and bristles at the mouth. See HIRUNDO, *Suppl.*

The generality of authors have erroneously made this bird a species of owl; it much resembles the cuckow in shape, and has been called the *churn-owl*, and *caprimulgus*. See the article CAPRIMULGUS, *Suppl.*

SUDORIFICS (*Cycl.* and *Suppl.*)—*Sudorifics*, if taken in time, are the best medicines for preventing inflammatory and feverish disorders of all kinds. See the articles FEVER and INFLAMMATORY, *Append.*

Dr. Pringle condemns the use of treacle, given with this intention, on account of its heating quality. However, he observes, that it is rendered more *sudorific*, and less narcotic, by adding ten grains of salt of hartshorn to a common dose, and promoting the sweat by a large draught of vinegar-whey. Instead of this composition, two scruples of salt of hartshorn, saturated with about three spoonfuls of common vinegar, may be given at bed-time. *Pringle*, Observ. on the Diseases of the Army, p. 131.

SUGAR-*cane*, *saccharum*, in botany, the name of a distinct genus of plants, according to Linnæus. See the article SACCHARUM, *Suppl.*

SULL, a word used in the western parts of England for a plough. Rust. Dict. in voc.

SULPHUR-*wort*, the name by which *peucedanum*, or hog's fennel is sometimes called. See the article PEUCEDANUM, *Suppl.*

SULTAN-*flower*, a name sometimes used for the *cyanus*, or blue bottle. See the article CYANUS, *Suppl.*

SUMACH, the English name of a genus of plants, called by botanists *rhus*. See the article RHUS, *Suppl.*

Coriars SUMACH, or *myrtle* SUMACH, the name by which *coriaria*, a distinct genus of plants is sometimes called. See the article CORIARIA, *Append.*

Venetian SUMACH, a name by which some call the *coccygria*, or *cotinus* of botanists. See the article COTINUS, *Suppl.*

SUMMITS *of flowers*, the same with the antheræ, or tops of the stamina. See the article FLOWER, *Suppl.*

SUN-*flower* (*Suppl.*)—*Dwarf* SUN-*flower*, the English name of a genus of plants, called by botanists *rudbeckia*. See the article RUDBECKIA, *Append.*

SUN-*spurge*, in botany. See the article SPURGE, *supra.*

SUPERCILIUM *terræ*. See ADIANTUM.

SUPPLICATION, *supplicatio*, in antiquity, a religious solemnity observed on account of some remarkable success against an enemy; and especially when the army had conferred the title of *imperator* on their general, in whose name the senate ordered the temples to be opened for the reception of the people, and thanks to be rendered to the Gods.

On

On ſuch an occaſion the imperator ſent meſſengers crowned with laurel with letters to the ſenate, which were likewiſe adorned with laurel, to demand of them the title of *imperator*, and the honour of a *ſupplication*. This ſolemnity conſiſted in ſacrificing and feaſting in the temples, with giving thanks to the gods for the ſucceſs obtained, and praying for the continuance of their aſſiſtance. At firſt there were only a few days taken up in ſuch feſtivals; but afterwards they were increaſed gradually, till they came to no leſs than fifty. On ſubduing the Sabines, in the year of the city 304, a *ſupplication* of one day only was ordained; on the taking of Veii, Camillus had a *ſupplication* of four days decreed him; Pompey had twelve on putting an end to the Mithridatic war; Cæſar had fifteen, and afterwards twenty for reducing Gaul; Octavianus and Panſa had fifty days of *ſupplication* for delivering the colony of Mutina.

SWALLOW (*Suppl.*)—*Sea*-SWALLOW, the Engliſh name of a genus of birds, called by authors *ſterna*. See the article STERNA, *Suppl.*

SWARTH, among country people, the ſame with *ſwath*. See the next article.

SWATH, (*Cycl.*) a word uſed by country people for a row of graſs or corn, as laid by the mower. Ruſt. Dict. in voc.

SWEALING *a hog*, a word uſed in ſome parts of the kingdom for ſinging him. Ruſt. Dict. in voc.

SWEATH, the ſame with *ſwath*. See the article SWATH, ſupra.

SWEET-*apple*. See the article APPLE, ſupra.

SWEET-*Johns*. See the article JOHNS, ſupra.

SWEET-*William of Barbadoes*, the Engliſh name of a genus of plants, called by botaniſts *quamoclit*. See the article QUAMOCLIT, *Suppl.*

SWEET-*willow*. See the article WILLOW, infra.

SWINE's *creſs*, a name given to a ſpecies of *naſturtium*. See the article NASTURTIUM, *Suppl.*

SWIVELS, a kind of rings made to turn round in a ſtaple, or other ring. Theſe are uſed when a ſhip lies at her moorings; alſo in tedders for cattle, that they may turn round without unwarping the tedder.

SWORD-*fiſh*, the Engliſh name of the *xiphias*, a genus of fiſhes. See the article XIPHIAS, *Suppl.*

SWORD-*graſs*. See ACORUS, *Cycl.*

SYMPHORICARPOS, in botany, the name of a genus of plants, according to Dillenius, but made a ſpecies of *lonicera* by Linnæus. See the article LONICERA, *Append.*

T.

TADORNA, the name of a fpecies of duck, printed *tadoma* in the Supplement, by an error of the prefs. See the article TADOMA, *Suppl.*

TANNER, a perfon who dreffes hides by tanning. See the article TANNING, *Cycl.* and *Suppl.*

TANSEY, or TANZY, the Englifh name of a genus of plants. See the article TANACETUM, *Suppl.*

Wild TANSEY, a name by which fome call the *potentilla*. See the article POTENTILLA, *Suppl.*

TARE, *vicia*, in botany, the name of a genus of plants, otherwife called vetch. See the article VICIA, *Suppl.*

TARRAGON, a name fometimes given to *abrotanum*, or fouthernwood. See the article SOUTHERNWOOD, *Suppl.*

TEA, *thea*, in botany, is made a diftinct genus of plants. See the article THEA, *Append.*

TEDDER, or TETHER, a rope tied to a horfe's foot, that he may grafe within a certain compafs. Ruft. Dict. in voc.

TEG (*Suppl.*)—TEG, among fportfmen, denotes a doe of the fecond year. Ruft. Dict. in voc.

TELAUGIA, in natural hiftory, the name of a genus of *fcrupi*, of a glittering appearance, ufually containing flakes of talc, and emulating the ftructure of the granites. *Hill*, Hift. Foff. p. 547. See SCRUPI, *Append.*

Of this genus we have the following fpecies. 1. The hard, fhining, black and white *telaugium*. 2. The hard, fhining, red and white *telaugium*. 3. The red *telaugium*, variegated with white and black. 4. The hard, heavy *telaugium*, of a greyifh black, variegated with white. 5. The brownifh red *telaugium*, variegated with white and yellowifh. 6. The reddifh white *telaugium*, variegated with black and gold colour. 7. The hard, white *telaugium*, variegated with brown. 8. The bluifh white, brittle *telaugium*. 9. The brown, friable *telaugium*, variegated with yellow. 10. The hard, purplifh brown *telaugium*, variegated with white and yellow. 11. The heavy, red *telaugium*, variegated with black and white. 12. The hard, bluifh green *telaugium*, variegated with white. Id. ibid. p. 547—556.

TELEPHIASTRUM, *baftard orpine*, in botany, the name of a genus of plants, called by Linnæus *anacampferos*. See the article ANACAMPSEROS, *Suppl.*

TELESCOPE (*Cycl.*)—Mr. James Gregory was undoubtedly the firft inventor of reflecting *telefcopes*. The conftruction of his *telefcope* is different from that of Sir Ifaac Newton, and in fome refpects not fo advantageous, as is fhewn in Phil. Tranf. N° 83.

Mr. Gregory defcribes this *telefcope* at the end of his *Optica Promota*, publifhed in 1663; being led into the invention of it, not by the confideration of the different refrangibility of the rays of light, which was not then known, but by an inconvenience he forefaw would follow from an hyperbolic object-glafs. For he obferves, that if it be fufficiently broad to receive light enough into a *telefcope* that fhall magnify very much, it muft of confequence be very thick; in which cafe, the cleareft glafs would hinder too much of the light from being tranfmitted. He might alfo have added another inconvenience, that though it will collect a pencil of rays coming parallel to its axis into a fingle point, yet it cannot collect the rays of an oblique pencil fo accurately as a glafs confifting of fpherical furfaces will do, as has been found by experience; and therefore fpherical lenfes, upon this and fome other accounts, are fitter for optical ufes than thofe of any other figure.

Thefe reflecting *telefcopes* were not brought into practice till 1719, by Mr. John Hadley; Sir Ifaac Newton's firft, and that of Mr. Gregory foon after. This laft, in fmall lengths, has an excellent effect, and is exceeding commodious. We have a defcription of it by Dr. Smith [a], which differs from that of its inventor chiefly in this, that he directs his larger reflecting concave lens to be made of a parabolic figure, and his leffer of an elliptical one, inftead of the fpherical ones now ufed, as being the only figures that can be polifhed without infuperable difficulties.—[[a] Optics, in the remarks, fect. 137, feq.]

Reflecting *telefcopes* have been greatly improved by Mr. Short; but the particulars of his method are not publifhed. For the theory of thefe and other *telefcopes*, fee Dr. Smith's Optics.

TELESCOPE-*fhell*, the Englifh name of a fpecies of *turbo*, of a conic figure, with plane, ftriated, and very numerous fpires. See the article TURBO, *Suppl.*

TEMPERAMENT (*Suppl.*)—As Huygens has not given the names of all the intervals that occur in his *temperate* fcale, we fhall here infert them in the octave, from C to *c*, with their refpective meafures in commas, and tenths of a comma.

Intervals.		Names.	Meafures.
From C to D^{bb}.	1.	Diminifhed fecond, extreme flat fecond, or enharmonic diefis,	1.8.
C ♯.	2.	Semitone minor, or chromatic diefis,	3.6.
D^{b}.	3.	Flat fecond, or femitone major,	5.4.
C ♯♯.	4.	Double femitone minor,	7.2.
D.	5.	Second, or tone,	9.0.
E^{bb},	6.	Diminifhed third, or extreme flat third,	10.8.
D ♯.	7.	Superfluous fecond,	12.6.
E^{b}.	8.	Third minor, or flat third,	14.4.
D ♯♯.	9.	Extreme fuperfluous fecond,	16.2.
E.	10.	Third major, or fharp third,	18.0.
F^{b}.	11.	Diminifhed fourth,	19.8.
E ♯.	12.	Superfluous third,	21.6.
F.	13.	Fourth,	23.4.
G^{bb}.	14.	Extreme diminifhed fifth,	25.2.
F ♯.	15.	Falfe fourth, or tritonus,	27.0.
G^{b}.	16.	Falfe fifth, or femidiapente,	28.8.
F ♯♯.	17.	Extreme fuperfluous fourth,	30.6.
G.	18.	Fifth,	32.4.
A^{bb}.	19.	Diminifhed fixth, or extreme flat fixth,	34.2.
G ♯.	20.	Superfluous fifth,	36.0.
A^{b}.	21.	Flat fixth, or fixth minor,	37.8.
G ♯♯.	22.	Extreme fuperfluous fifth,	39.6.
A.	23.	Sharp fixth, or fixth major,	41.4.
B^{bb}.	24.	Diminifhed feventh, or extreme flat feventh,	43.2.
A ♯.	25.	Superfluous fixth,	45.0.
B^{b}.	26.	Flat feventh, or feventh minor,	46.8.
A ♯♯.	27.	Extreme fuperfluous fixth,	48.6.
B.	28.	Sharp feventh, or feventh major,	50.4.
c^{b}.	29.	Diminifhed octave,	52.2.
B ♯.	30.	Superfluous feventh,	54.0.
c.	31.	Octave,	55.8.

The *temperate* diefis enharmonica of Huygens being 1.8 comma, nearly, which is eafily remembred, the meafure of any interval in the octave may be found by multiplying it by the number denoting the place of that interval. Thus the fixth minor, being the twenty-firft interval, will be $= 1.8 \times 21 = 37.8$. The octave being the thirty-firft, will be $= 31 \times 1.8 = 55.8$, which does not differ from the truth by more than 0.00237, that is, not by $\frac{1}{400}$ of a comma, and therefore perfectly infenfible. See INTERVAL, *Suppl.*

All the intervals in the foregoing table, either have received names, or at leaft might receive them, from a perfect analogy to the names in ufe among practical muficians; but many of thefe intervals are as yet unheard of among practitioners. Perhaps, if all the genera of antient mufic were reftored, every interval here mentioned might be of ufe, either in melody or harmony, and thereby greatly add to the variety of compofition.

TENDERLINGS, a name given to the foft tops of deer's horns, when they begin to fhoot forth. Ruft. Dict. in voc.

TENDREL, a term peculiarly applied to the young fhoot, or fprig of a vine.

TENEBRIO, the *ftinking beetle*, the name of a genus of beetles, the antennæ of which are oblong, flender, and filiform.

It has no interior wings, in which fingular deficiency it differs widely from all other beetles; but the form and ftructure of all its other parts refer it to this clafs. See the article SCARABÆUS, *Suppl.*

Mouffet has called it the *blatta fœtida*. There are feveral fpecies of it.

TERRA *alana*, a name fometimes given to the yellowifh white *tripoli*. See the article TRIPOLI, *Cycl.* and *Supplement.*

TETHYS, in zoology, the name of a genus of naked fea-infects, the bodies of which are formed, as it were, of two lips, with an oblong cartilaginous body between them. They have four tentacula, fhaped like ears, and there are two perforations in moft fpecies near the tentacula.

There are feveral fpecies of this genus. Vid. *Hill*, Hift. Anim. p. 92.

THATCH, a common covering for houfes in moft parts of the country.

The beft kind of *thatch* is that called *helm*, or ftiff unbruifed wheat-ftraw, with the ears cut off, and bound up in bundles. This being difpofed in an uniform and longitudinal

order on the roof, is fixed on with laths, withies, or ropes. Ruſt. Dict. in voc.

THEA, the *tea-tree*, in botany, the name of a genus of plants, the characters of which are theſe. The cup is a very ſmall, plane, permanent perianthium, divided into ſix roundiſh, obtuſe leaves. The flower conſiſts of ſix large roundiſh, concave, and equal petals. The ſtamina are numerous filaments, about two hundred, and are very ſlender, capillary, and ſhorter than the flower. The antheræ are ſimple. The germen of the piſtil is globoſe and trigonal. The ſtyle is ſubulated, and of the length of the ſtamina. The ſtigma is ſimple. The fruit is a capſule, formed of three globular bodies, growing together: it contains three cells, and opens into three parts at the top. The ſeeds are ſingle, globoſe, and internally angulated. *Linnæi* Gen. Plant. p. 233.

Of this genus there is only one known ſpecies, which is the tree whereon our common *tea* is produced. See the article Tea, *Cycl.*

THEAVE, among country people, denotes an ewe lamb of the firſt year. Ruſt. Dict. in voc.

THERMOMETER (*Cycl.*)—In the Philoſophical Tranſactions [b] we have the deſcription of a *thermometer*, made with a rod of metal, either braſs or iron.—[[b] N° 485. p. 128—130.]

This inſtrument is compoſed of an upright ſtaff or bar of the beſt iron, four feet long, and an inch and a quarter broad, having a poliſhed braſs bar of the ſame length and width ſcrewed to it before it, with four ſteel ſcrews, and being alſo capped with ſteel, and thereon a lever moving upon a ſtud of ſteel, which communicates with another leſs lever, which is alſo upon a ſtud, having a chain at the end of it, which laps round an axis, whereto the index is fixed, which ſhews the degrees marked on a ſemicircular arch. Under the ſteel ſcrew heads there are ſmall ſlits in the braſs bar, except the lowermoſt which is fixed, which admit of its expanding, whereby it protrudes and operates on the firſt mentioned lever, which being raiſed moves the leſs lever, and thereby draws the chain which turns the axis affixed to the index, which ſhews the degree of warmth of the weather marked on the ſemicircular arch. There is a ſcrew through two ſtuds to draw the great lever backwards and forwards, as occaſion may be; and there is alſo a counterbalance to the ſmall lever, to draw the hand back when the braſs bar ſhrinks.

Dr. Mortimer laid claim to a like invention, and gave the deſcription of his *thermometer* in the Phil. Tranſ. N° 484, in the Appendix, p. 672.

The late Dr. George Martine, in his Book of Eſſays printed at London 1740, has treated the ſubject of *thermometers* very fully. Among other curious things, he has given a plate of ſeveral *thermometers*, which he compares, in order to ſhew the correſponding degrees in each.

As a fixed and unalterable point of heat is not yet found, the conſtruction of *thermometers* ſtill remains imperfect. For the heat of boiling water is not always preciſely the ſame, neither can we depend abſolutely on the point of freezing. Fahrenheit has placed the freezing point at 32, and that of boiling water at 212; ſo that he divides the diſtance between the freezing point and that of boiling water into 180 degrees.

Sir Iſaac Newton [c], in his ſcale of the degrees of heat, marks the freezing point 0, and that of boiling water 34. Hence one of his degrees correſponds to $5\frac{5}{17}$ degrees of Fahrenheit's *thermometer*.—[[c] See Phil. Tranſ. N° 270.]

It is to be obſerved, that if two *thermometers* be filled with different ſpirits, they cannot be adjuſted to correſpond by comparing together their ſcales: for example, if the firſt *thermometer* riſes 4 diviſions, when the ſecond riſes but 3, it is not to be expected that the ſecond ſhall juſt riſe 6, 9 or 12 diviſions, when the firſt riſes 8, 12 or 16; becauſe the ſpirit will not dilate in one in the ſame proportion that it does in the other; ſo that unleſs the liquor be made to go its whole range in each of them, and the one be new marked for every degree of the other, they will not be brought to correſpond. Mr. de Reaumur being aware of this, attempted in a very ingenious way to eſtabliſh a general conſtruction of ſuch *thermometers*, which might be copied at all times, and in all countries; and ſo to ſettle a general correſpondence of obſervations to be made by ſuch inſtruments. He took a large ball and tube, and knowing well the contents of the ball and that of the tube in every part, he graduated the tube, ſo that the ſpace from one diviſion to another might contain $\frac{1}{1000}$ part of the liquor, which contained 1000 parts when it ſtood at the freezing point. Then putting the ball of his *thermometer* and part of the tube into boiling water, he obſerved whether it roſe 80 diviſions, which if it exceeded, he changed his liquor, and adding water to it lowered it ſo, that on the next trial from the freezing point to the point of boiling water it ſhould only riſe 80 diviſions: but if the liquor being too low, fell ſhort of 80 diviſions, he raiſed it by adding rectified ſpirit to it. The liquor thus prepared fitted his purpoſe, and would ſerve for making a *thermometer* of any ſize, whoſe ſcale would agree with his ſtandard. Such liquor or ſpirits being nearly of the ſtrength of brandy may be eaſily had, and may be made of a proper degree of denſity by raiſing or lowering it.

Dr. Martine finds ſome faults in this *thermometer*; one of which is, that the ball or bulk of the *thermometer* being large, is not heated or cooled ſoon enough to ſhew the quick variation of the weather. And, indeed, this is a fault common to all *thermometers*, which have bulbs to hold their liquor; a cylinder being much better, whatever liquor is uſed, except where great degrees of heat are to be meaſured, as in Sir Iſaac Newton's linſeed-oil *thermometer*. For though moſt ſpirit *thermometers* have the degree of the heat of boiling water marked upon them, as one of their boundaries; yet the heat of boiling water is always greater than that of boiling ſpirits, and therefore they are unfit to meaſure that degree of heat. But linſeed-oil is capable of ſuſtaining much greater degrees of heat; for it will bear a greater degree than what will melt lead, without firing or having the glaſs ball of the *thermometer* melted. Whereas water is only capable of a certain degree of heat, much lower, at which it will evaporate; but this is only when water boils in open veſſels. Of late years quickſilver has been made uſe of for *thermometers*, and theſe are found to be the moſt uſeful of any; becauſe they will bear ſuch degrees of heat or cold as will burſt ſpirit-*thermometers*, or freeze the liquor in them. This laſt inconveniency happened to the French philoſophers, who went to the north polar circle to examine into the figure of the earth; for the ſpirit in their *thermometers* froze, but their mercurial ones were as uſeful as any where elſe. Fahrenheit of Amſterdam may be looked upon as the inventor of this *thermometer*; and though Prins, and ſome others in England, Holland, France, and other countries, have made this inſtrument as well as Fahrenheit, yet ſtill they may be called Fahrenheit's, as being graduated according to his ſcale.

For the different kinds of theſe *thermometers*, ſee *Deſaguliers*, Exper. Phil. Vol. II. p. 295. See alſo Dr. *Martine's* Eſſays before mentioned.

Sir Iſaac Newton filled his *thermometer* with linſeed-oil, which will bear a very great heat. He aſſumes the rarefaction of the oil to be proportional to its heat [d]; and this aſſumption ſeems juſt from his experiments. However, it were to be wiſhed that this ſubject were farther examined. —[[d] See the Phil. Tranſ. loc. cit.]

Dr. Hales places the freezing point at 0, and the heat of water on which floating wax begins to melt at 100. In his *thermometer* the heat of boiling water anſwers to $146\frac{1}{3}$.

We ſhall here inſert a table of ſome obſervations made, with the *thermometers* of Fahrenheit, Reaumur, Sir Iſaac Newton, and Dr. Hales, communicated by Mr. Labelye.

1. *Obſervations by Fahrenheit*'s thermometer.

Deg.	
at 212	Boiling water.
190	Brandy boils.
174	Alcohol boils.
156	Serum of blood, and white of eggs hardens.
146	Killing heat for animals, in a few minutes.
108	A hen hatching eggs, but ſeldom ſo hot.
from 107 to 103	Heat of ſkin in ducks, geeſe, hens, pigeons, partridges and ſwallows.
at 106	Heat of ſkin in a common ague and fever.
from 103 to 100	Heat of ſkin in dogs, cats, ſheep, oxen, ſwine and other quadrupeds.
from 99 to 92	Heat of the human ſkin, in health.
at 97	Heat of a ſwarm of bees.
96	A perch died in three minutes, in water ſo heated.
80	Heat of the air in the ſhade, in very hot weather.
74	Butter begins to melt,
64	Heat of the air in the ſhade, in warm weather.
48	Temperate air, in England and Holland.
43	Oil of olive begins to ſtiffen and grow opaque.
32	Water juſt freezing, or ſnow and ice juſt thawing.
30	Milk freezes.
28	Urine and common vinegar freezes.
25	Blood out of the body freezes.
20	Good Burgundy, ſtrong claret and Madera freezes.
7	One part of ſpirits of wine mixt with three parts water freezes.
5	Greateſt cold in Penſilvania in 1731-2, 40° lat.
4	Greateſt cold at Utrecht in 1728-9.
0	A mixture of ſnow and ſalt, which is able to freeze oil of tartar *per deliquium*, but not brandy.

We muſt here obſerve, that the heat of a hen hatching chickens is placed, by this table, at 108 of Fahrenheit's *thermometer*; but it appears from Mr. Reaumur's experiments, that eggs will hatch in a heat no greater than that of the human ſkin. See Hatching, *Append.*

2. *Obſervations by Reaumur*'s thermometer.

$97\frac{1}{2}$	Anſwers to the heat of boiling water.
80	Spirit of wine in Reaumur's *thermometer* boils.

Deg.	
at $29\frac{2}{3}$	Greateſt heat of the air in the ſhade; obſerved at Paris in 1706, 1707, 1724.
$10\frac{1}{4}$	Conſtant heat of the caves of the obſervatory at Paris.
0	Artificial congelation of water.
$14\frac{1}{4}$	Lower than (0) greateſt cold at Paris, in 1709.

3. *Obſervations by Sir Iſaac Newton*'s thermometer.

34	Water boils vehemently.
$28\frac{6}{11}$	Heat between water boiling and wax melting.
24	Heat of water on which floating wax melts.
$20\frac{2}{11}$	Heat of water on which floating melted wax begins, by cooling, to loſe its fluidity and tranſparency.
17	Heat of a bath ſupportable to the hand at reſt.
$14\frac{3}{11}$	Heat of a bath ſupportable to the hand in motion. The heat of blood juſt let out, is almoſt the ſame.
12	Heat of *thermometer*, in contact with a human body. The heat of a bird hatching her eggs much the ſame.
6, 5, 4	Heats of the air in the ſummer.
4, 3, 2	Heats of the air in ſpring and autumn.
2, 1, 0	Heat of the air in the winter.
0	Water begins to freeze.

4. *Obſervations by Dr. Hales*'s thermometer.

$146\frac{1}{3}$	Anſwers to the heat of boiling water.
100	Heat of water on which floating wax begins to melt.
59	Leaſt proper heat for the melon-thiſtle.
56	——————— ananas, or pine-apple.
53	——————— pimiento.
51	——————— euphorbium.
48	——————— cereus.
45	——————— aloes.
43	——————— Indian fig.
40	——————— ficoides.
38	——————— orange.
36	——————— mirtle.
0	Freſh water juſt freezing.

THICKET, a thick huſh, or place full of buſhes and brambles. Ruſt. Dict. in voc.

THILL, the beam, or draught-tree of a cart or waggon, upon which the yoke hangs. Ruſt. Dict. in voc.

THILLER, or THILL-*horſe*, the horſe that is put under, or immediately yoked to the *thill*. Ruſt. Dict. in voc.

THIMBLE, a cover for the finger, made of braſs, ſteel or ſilver, and uſed by all people who ſow, as taylors, milliners, &c.

THIMBLE, in the ſea language, a ſort of ring, the outſide of which is conſiderably hollowed to receive ropes. *Thimbles* are fixed as loops, to prevent the tackle-hook from galling the rope. *Blanckley*, Naval Expoſ. p. 169.

THIRDENDALE, a liquid meaſure in uſe at Saliſbury, containing three pints. Ruſt. Dict. in voc.

THIRST (*Suppl.*)—We find warm druggs, as liquorice, ſometimes effectual in allaying *thirſt*: nay pepper will, in ſome caſes, have a like effect, by cauſing a more plentiful flow of the ſaliva.

In feveriſh diſorders, the patient is frequently tormented with a violent *thirſt*, which is moderated by acidulating the barley-water, or ſage-tea, with ſpirit of vitriol, or with lemon-juice; but by nothing ſo much, as allowing the patient ſome ſlices of an orange. *Pringle*, Obſerv. on Diſeaſ. of Army, p. 135.

THISTLE (*Suppl.*)—*Bleſſed* THISTLE, a name by which ſome call the *cnicus*, or ſaffron-flower. See the article CNICUS, *Suppl.*

Carline-THISTLE, *carlina*, in botany, the name of a genus of plants. See the article CARLINA, *Suppl.*

Diſtaff-THISTLE, in botany, the name of a genus of plants, called by botaniſts *atractylis*. See ATRACTYLIS, *Append.*

Fiſh-THISTLE, a name ſometimes uſed for the *cinara*, or artichoak. See the article CINARA, *Suppl.*

Fuller's THISTLE, the name by which ſome call the *dipſacus*, or teaſel. See the article DIPSACUS, *Suppl.*

Melon-THISTLE, or *Torch*-THISTLE, the Engliſh name of a genus of plants, called by botaniſts *cactus*. See the article CACTUS, *Suppl.* and *Append.*

Melancholy-THISTLE, the ſame with the *gentle thiſtle*, or *cirſium*. See the article *gentle*-THISTLE, *Suppl.*

Sow-THISTLE, the Engliſh name of a genus of plants, called *ſonchus* by botaniſts. See the article SONCHUS, *Suppl.*

Star-THISTLE, the name by which ſome call the *calcitrapa*, a ſpecies of *centauria*. See the article CENTAURIA, *Appendix.*

THORN, a name denoting, or characterizing ſeveral different genera of prickly plants. Thus:

THORN-*apple* is the Engliſh name of the *ſtramonium* of botaniſts. See the article STRAMONIUM, *Suppl.*

Black-THORN, the name by which ſome call the *prunus ſylveſtris*, or wild plum, more uſually called *ſloe*. See the article PRUNUS, *Suppl.*

Box-THORN, or *Avignon*-THORN, names given to the *lycium* of botanical writers. See the article LYCIUM, *Append.*

Buck-THORN, the name of a genus of plants. See the article RHAMNUS.

Chriſt's THORN, the Engliſh name of a genus of plants, called *paliurus* by botanical writers. See PALIURUS, *Suppl.*

Egyptian-THORN, a name ſometimes given to *acacia*. See the article ACACIA, *Suppl.*

Goat's THORN, the Engliſh name of a genus of plants, called by botaniſts *tragacanth*. See the article TRAGACANTH, *Suppl.*

Haw-THORN, *White*-THORN, *Ever-green*-THORN, &c. names given to the *meſpilus*. See the article MESPILUS, *Suppl.*

Purging-THORN, a name ſometimes given to the *rhamnus*. See the article RHAMNUS, *Suppl.*

THORNBACK, the Engliſh name of a ſpecies of ray-fiſh, prickly on the back, and with tuberculoſe teeth, and a tranſverſe cartilage in the belly. See the article RAIA, *Suppl.*

THOROUGH-*wax*, in botany, a name by which ſome writers call the *bupleurum*, or hare's ears. See the article HARE's *ears*, *Suppl.*

THREE-*leaved graſs*. See the articles TREFOIL and TRIFOLIUM, *Suppl.*

THRICHECUS, in zoology, the name uſed by Dr. Hill for the *manati*, or ſea-cow. See the article MANATI, *Suppl.*

THROAT-*wort*, a name given to ſeveral ſpecies of *campanula*. See the article CAMPANULA, *Suppl.*

THROPPLE, among country people, denotes the windpipe of a horſe. Ruſt. Dict. in voc.

THROSTLING, a diſeaſe of black cattle, proceeding from humours gathering under their throats; by which means their throats are ſo dangerouſly ſwelled, that they will be choaked unleſs ſeaſonably relieved by bleeding. Ruſt. Dict. in voc.

THRUSH, in ornithology, the Engliſh name of a large genus of birds, called by authors *turdus*. See the article TURDUS, *Suppl.*

THYME (*Suppl.*)—*Wild* THYME, *Lemon*-THYME, or *Mother-of*-THYME, names uſed for a diſtinct genus of plants, called by botanical writers *ſerpyllum*. See the article SERPYLLUM, *Suppl.*

Maſtich-THYME, a name uſed for the *marum*, *maſtichina*, or *thymbra*. See the article THYMBRA, *Suppl.*

THUYA (*Suppl.*)—The leaves of this tree ſmell like ointment, and in fact prove an excellent one for freſh wounds, cloſing them ſpeedily. Ruſt. Dict. in voc. *lignum*.

TICK, in the hiſtory of inſects, the name of the ſheep-louſe, called by authors *acarus*. See the article ACARUS, *Suppl.*

TIER, in the ſea language, the name of the ſeveral ranks of guns; which, according as they are placed on the lower, middle, or upper decks, are called the lower, middle, or upper *tier*. *Blanckley*, Nav. Expoſ. p. 169.

TIERCEL, in falconry, a name given to a male hawk, as being a third part leſs in ſize than the female. Ruſt. Dict. in voc.

TIGER (*Suppl.*)—The ſkull of this creature, both as to the teeth and other particulars, very much reſembles that of the cat, except that, in the room of the tranſverſe futures of the cat's, there is in the *tiger*'s one in the figure of a great Y, ſo cloſe and firm, that the bones ſeem contiguous.

Its tuſks are a little crooked, like thoſe of the dog and cat; their exerted part very white, and the bow of ſome of them very long, not leſs than five inches. Its claws are whitiſh, and ſemitranſparent, very flat, ſharp and pointed, and extremely hooked; every way in colour and ſhape like the claw of a cat. Uſually, on the fore paws of the larger *tigers*, theſe are at the baſis an inch broad, and are two inches and a half long. The bone on which the claw is ſet receives it into a little groove, and is by a double epiphyſis itſelf inſerted into the claw; by which means the claw is firmly held in its place. *Grew*'s Muſ. p. 13.

TIGER-*ſhell*, the Engliſh name of the red *voluta*, with large white ſpots. See the article VOLUTA, *Suppl.*

TIKE (*Suppl.*)—TIKE is alſo uſed for a ſmall bullock or heifer, and for a ſort of worm. Ruſt. Dict. in voc.

TILLER, (*Cycl.*) a term uſed by farmers to ſignify, that the produce of the grain branches out into ſeveral ſtalks. In which ſenſe, it denotes the ſame thing with the Latin word *fruticare*. Vid. *Tull*'s Horſe-hoeing Huſbandry, p. 105.

TILTH, a country term for tillage, manuring, or improving of ground. Ruſt. Dict. in voc.

TIMBER (*Suppl.*)—*Prick*-TIMBER, a name by which ſome call the *euonymus*, or ſpindle-tree. See the article EUONYMUS, *Suppl.*

TIN, how expanded by heat. See the article HEAT, *Append.*

TIPULA (*Suppl.*)—*Waſp*-TIPULA, in natural hiſtory, the name of an inſect, the deſcription of which ſee under the article WASP-*tipula*, *Suppl.*

TIRING, in falconry, is the giving a hawk a leg or pinion of a pullet to pluck at. Dict. Ruft. in voc.

TIT-*lark*. See ALAUDA, *Suppl.*

TOBACCO, *nicotiana*, the Englifh name of a diftinct genus of plants. See the article NICOTIANA, *Suppl.*

TOE-*fhell*, the Englifh name of a genus of fhells, called by authors *pollicipes*. See the article POLLICIPES, *Suppl.*

TOFT (*Cycl.*)—TOFT alfo fignifies a grove of trees. Dict. Ruft. in voc.

TOLK, in ornithology, a name fometimes given to the black, brown, and white, mottled *tringa*. See the article TRINGA, *Suppl.*

TONGUE (*Suppl.*)—To the inftances briefly mentioned under this head in the Supplement, we may add the following account of a man at Montagu, in the Bas Poictou, who being feized with the fmall-pox in his fifth or fixth year, loft his whole *tongue* by gangrene, or putrefaction; yet, notwithftanding, performed in perfection the five actions belonging to the *tongue*, viz. fpeaking, tafting, fpitting, chewing, and fwallowing [a]; nature having, with infinite artifice, given a new conformation to the mouth, proper to fupply the want of the laft organ.—[[a] *Jac. Rolandi Aglosftomographia, five defcriptio oris fine lingua quod perfecté loquitur et reliquas fuas functiones naturaliter exercet*; firft publifhed in French, at Saumur, in 1630; tranflated into Latin by Car. Ruygerns, and publifhed in the Ephem. German. D. an. 3. p. 481—513.]

For fpeech, inftead of the ordinary provifion, the little flefhy part of the *tongue* remaining was inflected in the middle towards the palate, the teeth inverted, and long inwards, the mufculi buccinatores eafily contracting between the dentes molares. In fine, there was a difpofition in all the organs to produce fpeech without a *tongue*: for the breath iffuing at the oval aperture of the larynx, was further broken, and rendered vocal by the inflation of the flefhy body, the motion of the lips, the retraction of the buccinatores, the tremulous agitation of the uvula, and the commotion of the lower jaw. Laftly, by the inverfion of the teeth, the depreffion of the palate, the abundance of faliva, and the capacity of the mouth, the found was ftill further modified and determined, fo as to render it articulate. Habit too, and the repeated attempts to fpeak at an age when the parts were eafily flexible, had contributed greatly to the diftinctnefs of it. For tafting, it is evident from this, as well as other confiderations, that the *tongue* is not the only organ of it, but that the palate is alfo a feat of this fenfe. For chewing, the office of turning the meat in the mouth was here performed by the lips and cheeks, the mufcles whereof repelled towards the maxillares; fuch parts, as in maftication might fall from one fide to the other. For the firft morfel he took, he could only chew on that fide into which he put it with his hand; the fecond he put in like manner on the other fide; and thus varied and fupplied each alternately. For fwallowing, the gravity of the food contributed fomething to this; which he further promoted by ftretching out his neck, inclining his head, and drawing back the buccinatores within his teeth; all which were feconded by the mouth and fauces, being well moiftened with plenty of faliva. In effect, divers animals, as the tortoife and the crocodile, ftork, &c. fwallow without any *tongue*; and fifhes, though their *tongue* is fixed immoveable to their palate. For fpitting, it was performed by the lips, aided by the internal contraction of the mouth, and the retraction of the buccinatores over the grinders.

Roland's inftance was fingular at that time, but a parallel one has been fince obferved in a girl at Lifbon fifteen years old; of which an account was given in 1718 to the Royal Academy of Sciences, by M. de Juffieu [b]. Upon infpecting the mouth of this girl, there appeared nothing in all that part ordinarily poffeffed by the *tongue*, but a little eminence in form of a papilla, between three and four lines high, in the middle of her mouth, fcarce perceivable by the eye. Upon preffing this with the finger, a kind of motion of contraction and dilatation was perceived in it; which fhewed, that though the *tongue* was wanting, the mufcles of which it was formed, and which are deftined to give it motion, were neverthelefs there. With the help of thefe fhe fpoke as diftinctly and eafily, as if nothing had been wanting: fhe diftinguifhed taftes like other people. For maftication, it was chiefly effected by the motion of the lower jaw, which fhe drew nearer to, or further from the grinders of the upper, under which the food to be chewed was. In this action fhe fometimes alfo made ufe of her fingers, but much more in the action of fwallowing, in order to protrude the mafticated food towards the orifice of the œfophagus. For drinking, fhe performed it like other people, excepting the attention fhe employed to prevent the liquor going down too faft; in order to which, fhe kept her head a little inclined forwards. Laftly, the action of fpitting was fupplied by the mufcles of the papilla, which filled the lower part of her mouth: thefe rifing almoft to a level with the teeth of the lower jaw, and the buccinatores approaching towards both jaws, expreffed the faliva, and conducted it to the fphincter of the lips, from whence the air, driven with violence from the larynx, ferved as a vehicle to expel it out of the mouth [c].—[[b] Mem. de l'Acad. Scienc. an. 1718. p. 6—16. [c] *Juffieu*, loc. cit. p. 7, feq.]

Serpent's TONGUE, or *Adder's* TONGUE, names given to the *ophioglosfum*, a diftinct genus of plants. See the article OPHIOGLOSSUM, *Suppl.*

TONIC *accent*. See the article ACCENT, *Cycl.*

TOOTH-*pick*, a name by which fome call the *vifnaga*, a fpecies of *daucus*, according to Linnæus. See the article DAUCUS, *Suppl.*

TOOTH-*wort*, the Englifh name of a genus of plants, called by botanical writers *dentaria*. See the article DENTARIA, *Suppl.*

TORROCK, a bird of the larus or gull kind, with a white head, and a fpot of black on each fide. See the article LARUS, *Suppl.*

TOUCH-*me-not*, the name of a fpecies of *balfamine*. See the article BALSAMINA, *Suppl.*

TOURNEFORTIA, in botany, a name given by Pontedera to a genus of plants, called by Linnæus *anthofpermum*. See the article ANTHOSPERMUM, *Append.*

TOWER-*muftard*, the Englifh name of a genus of plants, called *turritis* by botanifts. See the article TURRITIS, *Suppl.*

TRACES (*Suppl.*)—*Ladies* TRACES, in botany, the name of a diftinct genus of plants, called by botanifts *orchis*. See the article ORCHIS, *Suppl.*

TRACHELIUM (*Suppl.*) is alfo a name ufed by many for feveral fpecies of *campanula*. See the article CAMPANULA, *Suppl.*

TRADESCANTIA, in the Linnæan fyftem of botany, the name given to the *ephemerum* of Tournefort. See the article EPHEMERUM, *Suppl.*

TRAGO-*orchis*, in botany, a name ufed by fome authors for the *fatyrium* of Linnæus. See the article SATYRIUM, *Append.*

TRAJECTORY (*Cycl.*)—This term is often ufed, in general, for the path of any body moving either in a void, or in a medium that refifts its motion; or even for any curve paffing through a given number of points. Thus Newton, Princip. lib. 1. prop. 22. propofes to defcribe a *trajectory* that fhall pafs through five given points.

TRAVE, among farriers, the fame with *travice*. See the article TRAVICE, *Suppl.*

TRAVELLER's *joy*, a name by which the *clematitis*, or virgin's bower, is fometimes called. See the article VIRGIN's *bower*, *Suppl.*

TREACLE-*muftard*. See the article MUSTARD, fupra.

TREE (*Suppl.*)—*Cork*-TREE, the Englifh name of a genus of plants, called by botanifts *fuber*. See the article SUBER, *Suppl.*

Chafte TREE. See the article VITEX, *Suppl.*

Germander TREE. See the article TEUCRIUM, *Suppl.*

White-leaf, or *mealy* TREE, a name by which fome call the *viburnum*. See the article VIBURNUM, *Suppl.*

TREE *of life*, the Englifh name of a genus of *trees*, called *thuya* by botanifts. See the article THUYA, *Suppl.*

TREE-*loufe*. See the article LOUSE, fupra.

TREFOIL (*Suppl.*)—*Bean* TREFOIL, a name fometimes given to the *cytifus*. See the article CYTISUS, *Suppl.*

Bird's foot TREFOIL, a name given by fome writers to the *lotus*. See the article LOTUS, *Suppl.*

Marfh-TREFOIL, the name of a genus of plants, called by botanifts *menyanthes*. See MENYANTHES, *Suppl.*

Moon-TREFOIL, the name by which many call the *medicago* of botanical writers. See the article MEDICAGO, *Suppl.*

Shrub-TREFOIL, a name given to very different plants; as the *ptelea* of Linnæus, the *cytifus*, and *dorycnium*, or the filvery *convolvulus*. See the articles PTELEA, CYTISUS, &c. *Suppl.*

Snail TREFOIL, *medica*, in botany, the name of a diftinct genus of plants. See the article MEDICA, *Suppl.*

TRELLIS, an affemblage of wooden bars, croffing one another, either in a ftrait line, or flopewife, defigned to fupport wall-trees.

There is another kind of *trellis*, made of iron-wire. See Build. Dict. in voc.

TRILATERAL, in geometry, an appellation given to all three-fided figures. See TRIANGLE, *Cycl.*

TRILOCULAR, in botany, is applied to a capfule having three cells. See CAPSULE, *Append.*

TRIM, in carpentry, is to fit one piece of timber into another. Build. Dict. in voc.

TRIOSTEOSPERMUM, in botany, the name by which Dillenius calls a fpecies of *lonicera*. See the article LONICERA, *Append.*

TRIPETALOUS *plants*, fuch whofe flower confifts of three petals or leaves. Ruft. Dict. in voc.

TRITON, in zoology, the name by which Dr. Hill calls a genus of infects of the *gymnarthria*, or naked kind.

The body of the *triton* is oblong; the roftrum at the mouth is of a fpiral form; the tentacula are fourteen in number, and twelve of them cheliferous. Vid. *Hill*, Hift. Anim. p. 89, feq.

TROAT, among sportsmen, the cry of a buck in rutting time. Dict. Rust. in voc.

TROCHING, the small branches on the top of a deer's head. Rust. Dict. in voc.

TROPÆOLUM, in the Linnæan system of botany, the name of a genus of plants, called by Tournefort *cardamindum*, and by C. Bauhine *nasturtium indicum*.

The characters are these: The cup is a deciduous perianthium, composed of a single leaf, divided into five segments, erecto-patulous, acute, coloured, and the two lower ones narrower than the rest. The flower consists of five roundish petals, inserted into the divisions of the cup; the two upper petals are sessile; the three others have very long and barbated ungues. The stamina are eight short, subulated, declinated, unequal filaments. The antheræ are erect, oblong, quadrilocular, and assurgent. The germen is roundish, striated, and formed of three lobes. The style is simple, erect, and of the length of the stamina. The stigma is trifid and acute. The fruit consists of three capsules, convex, fulcated, and striated on one side, and angular on the other. The seeds are three in number, gibbous on one side, and angulated on the other; but, upon the whole, somewhat roundish, and striated deeply. Vid. *Linnæi* Gen. Plant. p. 158. See the article CARDAMINDUM, *Suppl.*

TROPHY (*Cycl.*)—TROPHY, in architecture, an ornament representing the trunk of a tree, charged or encompassed all round with arms, or military weapons, both offensive and defensive. Build. Dict. in voc.

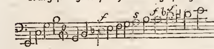
TROUGH, (*Cycl.*) a hollow wooden vessel for kneading bread in, or to beat apples in for cyder; also a piece of the trunk of a tree made hollow, to feed swine in, or an open pipe or channel, made of boards, for the conveyance of water. Dict. Rust. in voc.

TRUE-*love*, or *Herb* TRUE-*love*, the name of a genus of plants, called *herba Paris* by botanists. See the article HERBA *Paris*, *Suppl.*

TRUG (*Cycl.*)—TRUG is also a country word for a milk-tray, or a hod to carry mortar in.

TRUMPET (*Cycl.*)—The usual sounds of the *trumpet* are represented by the following musical notes.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.



Here the lowest sound being denoted by 1, the pitch of the rest, or the number of their respective vibrations, during the time that C vibrates once, will be expressed by the numbers denoting the order of the sounds, 2, 3, 4, 5, &c. The sounds expressed by the musical numbers, that is, by 2, 3, 5 [a], and their composites, which are 4, 6, 8, 9, 10, 12, 15, 16, are all perfectly in tune; but the sounds expressed by numbers not musical, as 7, 11, 13, 14, are false. Three of these, *viz.* B♭, its octave, and A, distinguished by *f* placed over them, are too flat; and the remaining note F, marked with an S, is too sharp.—[[a] See MUSICAL *numbers*, *Suppl.* and *Append.*]

The reason of which is, that B♭ ought to be a tone major below C; that is, its pitch to that of C will be as 8 to 9; but the proportion given by the *trumpet* is as 7 to 8; which being a less proportion than that of 8 to 9, it follows, that B♭ will be too flat. The same holds true of its octave. And A being a tone minor above G, it ought to be to G as 10 to 9: but in the *trumpet*, it is to G as 13 to 12; which being less than the proportion of 10 to 9, it follows, that A will be too flat. On the other hand, F ought to be a semitone major above E; that is, F ought to be to E, as 16 to 15; but, in the *trumpet*, F is to E, as 11 to 10; which being a greater proportion than that of 16 to 15, it follows that F is too high or too sharp.

This system of *trumpet* notes is an effectual confutation of those who are for introducing 7, 11, 13, and other primes into music.

TRUMPET-*honeysuckle*. See the article HONEYSUCKLE, supra.

TRUNK (*Suppl.*)—TRUNK is also used for a strong chest, or box, of a roundish form, at least on the upper side. Rust. Dict. in voc.

TUBEROSA, a name given by Heister to a genus of plants, called by Linnæus *polyanthes*. See POLYANTHES, *Append.*

TUE-*iron*, in smithery, the iron through which a smith's bellows blow. *Blanckley*, Naval Expos. p. 178.

TUEL, among sportsmen, denotes the fundament of a horse, or wild beast. Dict. Rust. in voc.

TULIP (*Suppl.*)—*African* TULIP, or *Cape* TULIP, names used by some for the *hæmanthus*, a distinct genus of plants. See the article HÆMANTHUS, *Suppl.*

TULIP-*tree*, the English name of a genus of trees, called by botanists *tulipifera*, and *liriodendrum*. See the article LIRIODENDRUM, *Suppl.*

Laurel-leaved TULIP-*tree*, a name sometimes given to the *magnolia* of botanical writers. See the article MAGNOLIA, *Suppl.*

TUMPING, the making a kind of fence in the fields, by setting trees almost on the surface of the ground, and covering their roots with mould. Rust. Dict. in voc.

TUN-*hoof*, a name sometimes used for ground-ivy. See the article IVY, *Suppl.* and *Append.*

TURBITH, in botany, a name used by many for the *thapsia*, or deadly carrot. See the article THAPSIA, *Suppl.*

Mineral TURBITH (*Cycl.*)—We read of this preparation's being given to the quantity of ten grains, with the same quantity of camphor, and fifteen grains of the pilul. ex duob. to remove the swelling of the testicles. This medicine, which in the beginning vomited and purged, at last operated chiefly as an alterative. It is said to be successful in obstinate venereal and scrophulous disorders. See Medic. Ess. Edinb. Vol. IV. art. 4.

TURCOIS (*Cycl.*)—This gem has many virtues attributed to it; but all that we know of it at present is, that, like other bodies which contain copper, it is a violent emetic, and not at all fit to be received into practice.

TURCOIS *colour*, the pale blue of the natural *turcois* gem. This is a very favourite colour in the glass trade, and is given to glass in the following manner. First calcine common sea-salt, and beat it to a fine powder; then make a pot of the sea-green glass, of a fair and full colour: to this, when in fusion, throw in at times the powder of salt, till the mass has lost all its transparence, and is become paler and opake; then add, by very small quantities at a time, more and more salt, till the colour is exactly that of the *torcois* gem; and when it is so work it immediately, for the salt is soon burnt off, and the glass becomes transparent, and of its green colour. If it become transparent while working, more salt must be thrown in, and that will reduce it to the same opacity again. *Neri's* Art of Glass, p. 57.

TURCOIS *enamel*, an enamel exactly of the colour of the *torcois* gem, and very much resembling it in many respects. It is made in the following manner: Take of the common matter of enamels six pounds, melt it, refine it, and cast it into the furnace again; when it is melted and refined put in, of thrice-calcined brass three ounces, zaffer prepared ninety-six grains, wherewith mix well forty-eight grains of manganese; mix these well, and put them into the matter at four times; let the whole incorporate, and afterwards take a proof to see if it be right, or if it require more of any of the powders. *Neri's* Art of Glass, p. 149.

TURK's *cap*, a name used by some for a species of lilly. See the article LILIUM, *Suppl.*

TURK's *head*, a name sometimes used for the *cactus*, a distinct genus of plants. See the article CACTUS, *Append.*

TURKY-*baum*. See the article BAUM, supra.

TURKY-*wheat*, a name sometimes given to *maiz*, or *yucca*. See the articles YUCCA and MAIZ, *Suppl.*

TURNEP (*Suppl.*)—*French* TURNEP, the name by which some call the *napus* of botanical writers. See the article NAPUS, *Suppl.*

TURNEP-*cabbage*, in botany. See the articles BRASSICA and CABBAGE, *Suppl.*

TURTLE-*shell*, (*Suppl.*) is also the name of several species of the *testudo*, or tortoise. See the article TESTUDO, *Supplement.*

TUSK (*Cycl.*)—TUSK, in carpentry, a bevel shoulder, made to strengthen the iron of the joist, which is let into the girder. Build. Dict. in voc.

TWITCH-*grass*, the same with *quick-grass*, a weed very hurtful to the farmers. Rust. Dict. in voc.

TWYBLADE, a name used by some for the *ophris* of botanical writers. See the article OPHRIS, *Suppl.*

TYPH-*wheat*, a kind of corn very like rhye. Rust. Dict. in voc.

U.

VACCA *marina*, in zoology, a name fometimes ufed for the *manati*, or fea cow. See the article MANATI, *Suppl.*

VALERIAN (*Suppl.*)—*Greek* VALERIAN, a name frequently ufed for the *polemonium* of botanifts. See the article POLEMONIUM, *Suppl.*

VALERIANOIDES, in botany, a name given by Petiver to the *cephalanthus* of Linnæus. See the article CEPHALANTHUS, *Append.*

VALLEY (*Cycl.*)—VALLEYS, in building, denote the gutters over the fleepers in the roof of a building. Build. Dict. in voc.

VALLOR, VALLOW, or VATE, among country people, a hollow mould, in which a new-made cheefe is preffed. Ruft. Dict. in voc.

VARVELS, in falconry, fmall filver rings about a hawk's leg, with the owner's name on them. Ruft. Dict. in voc.

VATE, in the making of cheefe. See VALLOR, fupra.

VAULT (*Suppl.*)—*Going to the* VAULT, a term ufed by fportfmen for a hare's taking the ground like a coney, which fhe fometimes does. Ruft. Dict. in voc.

VEGETABLE (*Suppl.*)—*Perfpiration of* VEGETABLES. See PERSPIRATION, *Append.*

VELLICULA, a name fometimes ufed for the *forficula*, an infect called in Englifh the *ear-wig*. See the article EAR-WIG, *Append.*

VELLING, a term ufed by hufbandmen in the weft of England for plowing up by the turf. Ruft. Dict. in voc.

VENTILATOR, a machine by which the noxious air of any clofe place, as an hofpital, gaol, fhip, chamber, &c. may be changed for frefh.

The noxious qualities of bad air have been long known, tho' not fufficiently attended to in practice; but it is to be hoped, that the indefatigable pains taken by Dr. Hales to fet the mifchiefs arifing from foul air in a juft light, and the eafy remedy he has propofed by the ufe of his *ventilators*, will at length prevail over that unaccountable floth, or obftinacy, which, where particular interefts are not immediately concerned, feems to poffefs the generality of mankind, and which rarely allows them to give due attention to any new difcovery.

The *ventilators* invented by that ingenious author confifts of a fquare box of any fize; in the middle of one fide of this box a broad partition, or midriff is fixed by hinges, and it moves up and down by means of an iron rod, fixed at a proper diftance from the other end of the midriff, and paffing through a fmall hole in the cover of the box. Two boxes of this kind may be employed at once, and the two iron rods may be fixed to a lever moving on a fixed center; fo that by the alternate raifing and preffing down of the lever, the midriffs are alfo alternately raifed and depreffed, whereby thefe double bellows are at the fame time both drawing in air, and pouring it out through apertures with valves made on the fame fide with, and placed both above and below the hinges of the midriffs. For a farther account of this machine we refer to the author himfelf, who gives a full detail of it, and of its manner of working. See Defcription of *Ventilators*, by Stephen Hales, D. D. Lond. 1743, 8vo.

The Doctor has fhewn the ufe of his *ventilators* very fully. As to fhips, in particular he obferves that the wind-fail, made ufe of at fea to introduce frefh air between decks, is far from being fufficient for that purpofe; nor can it be ufed with equal fafety to the fick, and thofe who are fleeping, by means of the ftrength of the wind which conveys the air with too much violence. But when the foul air is carried off by means of *ventilators*, notwithftanding the great velocity with which they throw out the air, which they may do at the rate of fixty tuns in a minute, yet the motion of it downwards into the hold, to fupply what is carried off, is fo very gentle, that it cannot be perceived; becaufe the fum of all the open paffages for it through the deck exceeds the opening of the trunk of the *ventilator*, in fo great a proportion as 100 to 1, or more. Befides, in a calm the wind-fail can do little or no good; nor when the fhip is under fail, at which time the wind-fail is not ufed. And it is to be obferved, that it is not the *ventilating* of a fhip now and then with a wind-fail, when wind and weather ferve, that will fuffice; it ought to be done daily, if due regard be had to the health of the fhip's crew. The great quantity of rancid noxious vapours, which are inceffantly exhaling from a number of live human bodies, the ftench that inceffantly arifes from the bilge water, and from the hot, ftagnant, putrid air in the hold, makes it very advifeable to refrefh fo bad an air continually, either with the wind-fail, when that can be properly ufed, or elfe with *ventilators*, which are intended to fupply the defects of the wind-fail.

Ventilators muft alfo be of particular fervice in new fhips, which are obferved to be more unhealthy, on account of a greater quantity of fappy wreak which arifes from new timber, and makes the confined air the more unwholefome.

They will alfo be an effectual prefervative of horfes in tranfports, where they are fometimes fuffocated, when in a ftorm there is a neceffity to fhut the hatches down.

Thefe *ventilators* will alfo drive out of the hold of a fhip that dangerous vapour which arifes from corn, which is fo noxious, that fometimes they dare not venture into the hold, till after the hatches have been opened for fome time.

Ventilation will not only be of fervice to preferve feveral kinds of goods, but alfo the timbers and planks of the hold itfelf, when laid up in ordinary, as well as when in ufe, and will make the air in the hold lefs noxious, though it will ftill be offenfive to the fmell, by reafon of the bilge water. But this may be made lefs offenfive, by often letting in fweet water from the fea, and then pumping it out; which good practice ought to be continued, notwithftanding the ufe of the *ventilators*.

What is here faid of the foul air of fhips may be applied to that of mines, gaols, work-houfes, barracks and hofpitals. In mines, *ventilators* may guard againft the fuffocations, and other terrible accidents arifing from damps. The air of gaols has been often known to be infectious; and we had a fatal proof of this, by the accident that happened a few years ago at the feffions at the Old-Bailey. To guard againft the like for the future, as well as to preferve the health of the prifoners, a worthy magiftrate, in 1752, had *ventilators* placed in Newgate, which are wrought by a wind-mill: and in the beginning of the prefent year, 1753, Dr. Hales gave an account of the good fuccefs attending the ufe of thefe machines, by a remarkable decreafe in the ufual mortality and ficknefs of that place.

The Doctor is alfo of opinion, that a *ventilation* of warm dry air from the adjoining ftove, with a cautious hand, might be of fervice to trees and plants in green-houfes; where it is well known that an air full of the rancid vapours, which perfpire from the plants, is very unkindly to them, as well as the vapours from human bodies are to men. For frefh air is as neceffary to the healthy ftate of vegetables, as of animals.

The larger kinds of *ventilators*, ufed by the Doctor, are ten feet long, five feet broad, and two feet high, in the clear within. Thofe he ufed by way of experiment on board the Captain, a feventy gun fhip, were ten feet long, four feet three inches wide, in the clear within, and thirteen inches deep; one inch of which being occupied by the midriff, there remained a foot depth for it to rife and fall in. A *ventilator* of thefe dimenfions will, through a trunk of a foot fquare, drive the air at the rate of twenty-five miles in an hour, which is double of what Mariotte affigns for the velocity of a pretty ftrong wind.

But befides thefe large *ventilators*, the Doctor made a fmaller fort, four feet in length, fixteen inches in breadth, and thirteen inches, all in the clear within. This fmaller *ventilator* may be very ufeful in preferving the bread, in the bread-room of a fhip, fweet and dry. Peafe alfo, and oatmeal, which are apt to heat and fpoil in cafks, may be preferved, by putting them into a large bin, with a falfe bottom of hair cloth laid on bars, whereby frefh air may be blown upwards through them with thefe fmall *ventilators*.

Ventilators are alfo of excellent ufe for the drying of corn, hops, and malt. *Hales*, lib. cit. p. 100, 108, 129, 151. Gunpowder may be thoroughly dried, by blowing air up through it by means of *ventilators*. *Hales*, ib. p. 119, feq. What advantage dry gunpowder has over that which is damp, may be feen by the experiment mentioned in the article GUNPOWDER, *Append.*

VENUS (*Cycl.*)—Signior Bianchini has given the defcription of a globe for *Venus*, the principal properties of which are, that the plane of the ecliptic makes an angle of 15° with the axis, the tropics are 75° from the equator, and the polar circles only 15° from it. For a farther account of it, fee *Defaguliers*, Experim. Philofoph. Vol. II. p. 552, feq.

Venus's *comb*, the Engliſh name of a genus of plants, called by botanical writers *ſcandix*. See the article Scandix, *Suppl.*

Venus's *looking-glaſs*, a name ſometimes uſed for the *campanula*, or bell-flower. See the article Campanula, *Suppl.*

Venus's *navel-wort*, the name by which ſome call the *omphalodes*, a diſtinct genus of plants. See the article Omphalodes, *Suppl.*

VERGE, among gardeners, generally denotes the edge or outſide of a border; but more particularly, is uſed for a ſlip of graſs adjoining to gravel-walks, and dividing them from the borders in the parterre-garden. *Miller*, Gard. Dict.

VERMIS *aureus*, the name by which Bartholine, and others, call the *aphrodita*, a genus of ſea-inſects. See the article Aphrodita, *Append.*

VERVAIN *mallow*, the Engliſh name of a diſtinct genus of plants, called by botanical writers *alcea*. See the article Alcea, *Suppl.*

VESSEL (*Cycl.*)—*Chemical* Vessels. The article of *chemical* Apparatus, *Suppl.* having been accidentally forgot, we are forced to inſert it under this title Vessel, though ſomewhat improperly, the word Apparatus being of much more extenſive ſignification.

Dr. Shaw, in his Eſſay on the uſe of a portable laboratory, has given a liſt of all the apparatus neceſſary for it, which will ſerve alſo, in general, for a complete chemical apparatus for all ordinary caſes, and common courſes of chemical experiments: for extraordinary purpoſes it may be enlarged at diſcretion, according to the views of the operator.

The chemical apparatus may be divided into two kinds, the remote and immediate; or, in other words, ſuch as are preparatory to the operations, and ſuch as are actually employed in them. The remote apparatus conſiſts of ſeveral particulars. Among theſe are firſt ſuch as are neceſſary to the exactitude of the proceſs, for every chemical operation is to be performed in an exact manner. Good ſcales and weights are neceſſary for the exactly determining the quantity of the ſubject to be employed, weight being the true index of the quantity of matter in bodies; but in common caſes, or where water, or other liquors of nearly the ſame ſpecific gravity with water are uſed, the work is conſiderably ſhortened by the uſe of a meaſure, which in water very nearly correſponds to weight in the common acceptation, a pint of it very nearly anſwering to a pound in weight. Hence the next thing to a ſet of ſcales and weights, in the chemical apparatus, is a ſet of nice meaſures; but they muſt be uſed with great diſcretion, and though ever ſo exact as to their contents, they muſt not be truſted to in the nicer operations. A pint of ſpirit of wine falls conſiderably ſhort of a pound, and a pint of quickſilver weighs fourteen pounds; between the ſeveral weights of theſe there is a great variety.

Many ſolid ſubſtances require to be reduced into ſmall parts, before they can be made the ſubjects of chemical operations; and for this reaſon there will be a neceſſity for mortars, ſieves, raſps, files, hammers, ſlicers, and forceps. Next to theſe come the inſtruments uſed in the management of the fire; theſe are ſhovels, hooks, tongs, and blow-pipes: and for charging the veſſels with the ſubject matters to be worked upon in the operations, there are required hollow ſhells, horns, tin plates, bruſhes, hares feet, ſpoons, and ſpatulas. Rounds are alſo required to ſet certain glaſſes on; and for emptying their contents, and thoſe of other veſſels, hooked tongs, cones, ingots, baſons, funnels, and ſtore-glaſſes, furniſhed, according to the nature of the things to be kept in them, with common cocks, wax ſtopples, and glaſs ſtopples; and for the tying down of theſe, bladders, leather, and the like. In the laſt place come the inſtruments for making certain utenſils, as moulds for muffles, teſts, crucibles and melting-pots, and iron rings for cutting glaſſes and the necks of retorts.

The more immediate apparatus, or that employed in the operations themſelves, are veſſels containing the ſubjects to be wrought upon; particularly glaſs eggs, and bodies for digeſtion; retorts and receivers for diſtillation; blind heads for bodies in ſublimation; ſtone pans and cut glaſſes for evaporation; peculiar ſpout-receivers, and glaſſes for ſeparation; ſtrainers for percolation; paper for filtration; muffles and teſts for cupellation; crucibles for melting; pots for cementing; and lutings to cloſe the junctures of the veſſels whenever neceſſary. *Shaw*'s Chemiſtry, p. 384.

See Tab. of Chemical Furnaces, Veſſels, and Utenſils.

VESTIBLE (*Cycl.*)—Vestible is alſo uſed for a kind of little antichamber before the entrance of an ordinary apartment.

VETCH (*Suppl.*)—*Ax*-Vetch, in botany, the Engliſh name of a genus of plants, called by authors *ſecuridaca*. See the article Securidaca, *Suppl.*

Bitter-Vetch, the Engliſh name of a genus of plants, known among botanical writers by that of *orobus*. See the article Orobus, *Suppl.*

Bindweed-leaved-Vetch, a name ſometimes given to the *vetchling*. See the article Vetchling, infra.

Chickling-Vetch, the Engliſh name of the *lathyrus*, a diſtinct genus of plants. See the article Lathyrus, *Suppl.*

Crimſon-graſs-Vetch, a name ſometimes uſed for the *niſſolia*; a diſtinct genus of plants. See the article Nissolia, *Suppl.*

Hatchet-Vetch, the name by which ſome call the *ſecuridaca* of botanical writers. See the article Securidaca, *Suppl.*

Kidney-Vetch, the name by which ſome call a ſpecies of *vulneraria*. See the article Vulneraria, *Suppl.*

Liquorice-Vetch, the Engliſh name of a genus of plants, known among botaniſts by that of *glycine*. See the article Glycine, *Suppl.*

Medic-Vetch, the name by which many call the *onobrychis*, a diſtinct genus of plants. See the article Onobrychis, *Suppl.*

Milk-Vetch, the Engliſh name of a genus of plants, called by botanical writers *aſtragalus*. See the article Astragalus, *Suppl.*

Vetch-*graſs*, in botany. See the article Grass, *Append.*

VETCHLING, the Engliſh name of a diſtinct genus of plants, known among botaniſts by that of *aphaca*. See the article Aphaca, *Suppl.*

VIGILIA, *watch*, in antient chronology. See the article Watch, *Append.*

VINE (*Suppl.*)—*Black*-Vine, a name by which the *tamnus*, or black briony is ſometimes called. See the article Tamnus, *Suppl.*

Spaniſh-arbor-Vine, a name by which ſeveral ſpecies of *convolvulus* are ſometimes called. See the article Convolvulus, *Suppl.*

White-Vine, or *Wild*-Vine, a name ſometimes given to the *bryonia alba*. See the article Bryonia *alba*, *Suppl.*

VINEGAR (*Suppl.*) is ſaid to be a good remedy for the ſting of waſps. Perhaps it might alſo be ſucceſsfully applied to the ſting of bees, gnats, &c. A late author pretends, that taken internally, eſpecially if mixed with the powder of cantharides, *vinegar* is a remedy againſt the hydrophobia. *Vinegar* and honey, or oxymel, of the conſiſtence of a ſyrup, ſwallowed warm, is very good in many caſes of ſore throats ariſing from colds.

VIOLET (*Suppl.*)—*Dame*'s, or *Queen*'s Violet, the Engliſh name of a diſtinct genus of plants, called by botaniſts *heſperis*. See the article Hesperis, *Suppl.*

Bulbous-Violet, a name ſometimes given to the ſnow-drop, a plant which Linnæus makes a diſtinct genus under the name *galanthus*; but which Tournefort comprehends among the *narciſſo-leucoiums*. See the article Narcisso-*leucoium*, *Suppl.*

Corn-Violet, a name ſometimes given to the *campanula*, or bell-flower. See the article Campanula, *Suppl.*

Dog's tooth Violet, the name by which ſome call the *dens canis* of botanical writers. See the article Dens *canis*, *Suppl.*

VIPER's *bugloſs*. See the article Bugloss, ſupra.

Viper's *graſs*, the Engliſh name of a diſtinct genus of plants, called by botanical writers *ſcorzonera*. See the article Scorzonera, *Suppl.*

VIS *viva*, in mechanics, a term uſed by Leibnitz and his diſciples for *force*, which they diſtinguiſh into two kinds, *vis mortua*, and *vis viva*; underſtanding by the former any kind of preſſure, and by the latter that force or power of acting, which reſides in a body in motion. See Force.

VISNAGA, in botany, a genus of plants, according to Ray, but comprehended by Linnæus under the article *daucus*. See the article Daucus, *Suppl.*

Visnaga is alſo uſed by J. Bauhine as the name of a ſpecies of *fœniculum*. See the article Foeniculum, *Append.*

VITRUM *Archimedeum*, *Archimedes's glaſs*, a name given by Swedenborg to an inſtrument which he invented for the examination of mixt metals, and by means of which he could diſcover the quantities, without the trouble of the apparatus, and calculation commonly uſed for this purpoſe.

VIXEN, or Fixen, among ſportſmen, denotes a fox's cub. Ruſt. Dict. in voc.

UMBER (*Cycl.* and *Suppl.*)—This earth when burnt makes a good ſhade for gold. It need only be put into the naked fire in large lumps, which ſhould not be taken out till they be thoroughly red hot. Build. Dict. in voc.

UNACCENTED *part of a bar*. See Accent, *Cycl.*

UNILOCULAR, in botany, is applied to a capſule having but one cell. See Capsule, *Cycl.*

UNRECLAIMED *hawk*, in falconry, one that is wild and untamed. Ruſt. Dict. in voc.

UNSUMMED, a term uſed by falconers for a hawk's feathers before they have arrived at their full length. Ruſt. Dict. in voc.

VOLUBILIS, in botany, the name of a genus of plants, according to Dillenius; but comprehended by others under *convolvulus*, or bind-weed. See the article Convolvulus, *Suppl.*

VOMIT (*Suppl.*)—*Black*-Vomit, a diſtemper frequent in the Weſt-Indies, particularly at Carthagena. The following account of this diſtemper has been communicated to us by a friend.

The city of Carthagena is ſituate 10 degrees 25 minutes $48\frac{1}{2}$ ſeconds of north latitude. The weather there is always ſultry hot. A thermometer conſtructed by Monſieur de Reaumur gave on the 19th of November, 1735, one of their winter months, the degree of the warmth of the air 1025 diviſion

divifions and a half; and this with little variation both night and day. The greateft height to which the fpirit afcended at Paris the fame year by a thermometer, graduated in the fame manner, was $1025\frac{1}{2}$ divifions; fo that the heat of the cool nights at Carthagena was nearly equal to that of the hotteft days at Paris.

As the heats in this climate are fo great without receiving any mitigation from the night, it is no wonder that the perfpiration of the inhabitants is very great. From this it comes about, that all thofe who make their abode there any time appear pale and weakly, as though newly recovering from a fit of illnefs. You remark in all their actions, even fo far as in their fpeaking, a certain idlenefs, and, as our author expreffes himfelf, a disjointednefs: notwithftanding this they are in good health, though their afpect indicates the contrary. The people who arrive there from Europe, hold their appearance of ftrength and colour in their countenances during three or four months; but after that time they lofe both one and the other from the quantity of fweat, until they become like the former inhabitants. Thefe effects are moft obfervable in younger people: on the contrary, thofe who are further advanced in life when they go thither, preferve their former appearance better, and enjoy fo good a ftate of health, that they live commonly to more than eighty years of age.

As the temperament of this country is particular, fo are fome of its diftempers. Thefe may be confidered of two kinds, *viz.* thofe diftempers to which the Europeans newly arrived there are liable, and they only; and thofe which are common to all perfons there, as well Criollos as Chapetones.

The diftempers of the firft clafs are many, as the refort of the Europeans there is very great. They are very dangerous, and often mortal. They frequently deftroy a great part of the people, both failors and others, who arrive there from Europe. The continuance of thefe diftempers is very fhort: they laft but three or four days, in which time the fick either die, or are out of danger. The particular diftemper, to which they are moft liable, is very little known, though it takes its rife in fome from taking cold, in others from indigeftion; but from whichfoever of thefe, or what other caufe it takes its rife, it becomes in the fhort time before mentioned the *vomito prieto*, or *black vomit*, which is what kills them; it being very rare that thofe who have it efcape. It is obferved in fome that their delirium is fo violent, that they are obliged to be tied down in their beds, that they may not tear themfelves to pieces, and they often die raving with the greateft degree of agony.

It is to be remarked, that thofe only are fubject to this diftemper who are lately arrived from Europe, the inhabitants of the country, as well as thofe who have lived there any time, are by no means liable to it, and enjoy perfect health during its greateft violence. As the crews of fhips are very liable to this diftemper, and more fo than the officers and paffengers, who have greater variety of food and liquor; it has been conceived that the great exercife and labour of thefe people, and their feeding upon falt provifions, prepares their conftitutions to be liable in this climate to corruption of the blood and humours, from whence is fuppofed to proceed the *vomito prieto*. What muft be obferved, is, that although the crews of fhips fuffer the greateft mortality, neverthelefs paffengers and others, who go the voyage under the greateft advantages with regard to the conveniences of life, are not free from being expofed to it. It muft be remarked alfo, that thofe perfons, who after having been ufed to this climate, go from thence, and are abfent even three or four years, are not liable to it at their return, but retain their health like the other inhabitants, although in their way of living they have not obferved the moft exact regimen.

The defire of knowing the caufe of this terrible calamity has occupied from time to time the minds of the furgeons who make this voyage in the galleons, as well as thofe of the phyficians of the country; and their opinion has been, that it chiefly takes its rife from the labour, to which the fhips crews are conftantly expofed, and their manner of living. There is no doubt but thefe may greatly contribute thereto; but then it will be difficult to conceive why perfons, who are better circumftanced, are likewife liable to it: and it is fomewhat extraordinary, that notwithftanding many endeavours have been made towards finding out remedies equal to this difeafe, none have been difcovered either as fpecifics or prefervatives; for the inconftancy of the fymptoms is fo great, that they are not in the beginning to be diftinguifhed from thofe, which are in common to this with flighter diftempers; but the principal complaints at firft are a wearinefs and great diforder in the head.

This diftemper does not always attack the fhips of Europe at their arrival in the bay of Carthagena, nor is it very antient in that country; for what they heretofore called *chapetonada*, fo denominated, as thofe from Europe were only liable to it, were indigeftions; and though they were in that climate always attended with danger, the women of the country, as they do now, cured them with eafe, efpecially when they were taken in time. The fhips afterwards going from Carthagena to Porto Bello, it was there fucceeded the great mortality, which was always attributed to the unfeafonablenefs of the climate, and to the fatigue of the fhip's crew in unloading their fhips, and in the bufinefs of the fair there.

The *black vomit* was not known at Carthagena, nor in its neighbourhood, until the years 1729 and 30; when firft it carried off a great part of the crews of the fhips of war, which Don Domingo Juftiniani then commanded, and were then there as guarda coftas. Thefe fhips were firft attacked at Santa Martha, where the feverity of this diftemper, and its great flaughter, had caft a great terror upon their crews. The fecond attack of this diftemper was on board the galleons commanded by Don Manuel Lopez Pintado, when its mortality was highly formidable; and death followed the attack fo quick, that perfons who were one day feen walking at large, were next day met carrying to their graves.

Our author is of opinion that this, as well as fome other diftempers, to which Europeans are liable to at, or foon after their arrival at Carthagena, and other places under the fame circumftances, fhould be confidered as arifing from the great alteration that happens in their conftitutions there: and this change, which from the climate is foon brought about, makes them fuffer this and other diftempers, which either deftroy them, or generate in them a difpofition to bear the heats; after which, being as it were naturalifed, they enjoy the fame fhare of health with the natives.

Our author remarks, that at Carthagena, when the fhips from Spain fail in their arrival, the European productions, which at all times are dear and much valued there, are fometimes quite expended. Thefe more particularly are wine, oil and raifins. When this is the cafe with regard to wine, the people there fuffer much in their health; as every body, except the negroes and thofe who ufe brandy, accuftom themfelves to drink it with their food. From the want of this their ftomachs fail, they grow fick, and this ficknefs becomes general. This want of wine happened when our author arrived at Carthagena, and the ficknefs in confequence was fo general in that city, that mafs was celebrated only in one of their churches.

URSUS, the *bear*, in zoology. See the article BEAR, *Suppl.*

URUBU, in ornithology, the name by which Marcgrave calls a fpecies of *vultur*. See the article VULTUR, infra.

VULTUR, in ornithology, the name of a genus of birds of the falcon, or hawk-kind. See the article FALCO, *Suppl.*

The neck of the *vultur* is long, and almoft bare of feathers; the legs are covered with feathers down to the feet, or nearly fo; under the throat there is a fpace covered with hair, inftead of feathers; the head alfo, in many fpecies, is naked, or has, at the utmoft, only a downy matter on it.

Of this genus of birds we have the following fpecies. 1. The greyifh black *vultur*, with a fhort tail. This is of the fize of a full grown turkey. 2. The chefnut-coloured *vultur*, called alfo the *Bætic vultur*, with a fhort tail. This is equal in fize to a full grown hen. 3. The yellow-legged, crefted *vultur*, called *leporarius*, or the hare-catcher. This is of the bignefs of a goofe. 4. The golden-breafted, blue-legged *vultur*, with a blackifh back. Its fize is equal to that of a turkey-cock. 5. The tawney brown *vultur*, with yellow legs. This is of the bignefs of a large capon. 6. The Brafilian, white-legged *vultur*, called by fome authors *urubu* and *aura*. In fize it is equal to the common kite.

W.

WAAL, in the sea language, the same with *wale*. See the article WALE, *Suppl.*

WAG-*tail*, in ornithology, the English name of the *motacilla* with a black breast. See the article MOTACILLA, *Suppl.*

WAIL, in the sea language, the same with *wale*. See the article WALE, *Suppl.*

WALL-*wort*, a name sometimes given to the *sambucus*, or dwarf-elder. See the article SAMBUCUS, *Suppl.*

WARDS *of hospitals*. See HOSPITAL, *Append.*

WARREN (*Suppl.*)—WARREN is also used for a contrivance to preserve fish in the midst of a river, to be taken at pleasure. Rust. Dict. in voc.

WART-*wort*, the name sometimes given to two very different genuses of plants, the *tithymalus* and *lampsana*. See the articles TITHYMALUS and LAMPSANA, *Suppl.*

WASHING (*Cycl.* and *Suppl.*)—The *washing* or cleansing of some colours may be thus performed: take the colours to be *washed*, and put them into a vessel of fair water; stir it about till the water be all coloured therewith, and if any filth swim on the top of the water, scum it clean off; and when you think the grossest part of the colour is settled at the bottom, then pour off that water into another earthen vessel, that is able to contain the first vessel full of water four or five times; then pour more water into the first vessel, and stir the remaining colour till the water be thick; and after it is a little settled, pour that water also into the second vessel. Let this be repeated till all the finest of the colour is drawn off, and nothing but course gritty stuff remains behind. Then letting the water in the second vessel stand to settle, till it is perfectly clear, pour it off, and reserve the *washed* colour in the bottom of the vessel for use.

The colours to be thus *washed* are red lead, blue and green bice, verditer, blue and green smalt, Spanish brown, yellow ochre, *&c.* Build. Dict. in voc.

WASP. The application of vinegar is said to be good against the sting of these creatures.

WATCH (*Cycl.*)—WATCH, *vigilia*, in Roman antiquities, a division of their night; being the fourth part of the space of time between sun-set and sun-rising, and consequently varying according to the season of the year. See the articles DAY, HOUR, *&c. Cycl.*

Death-WATCH. See the article DEATH, supra.

WATER (*Cycl.*)—It has been proved by many instances, that *water* alone is capable of sustaining human life a long time. Physical writers give us many accounts of people's living four or five days on it, but the Philosophical Transactions furnish us with a much more memorable instance.

Some people at work in a deep coal-pit near Liege, had the misfortune to pierce into a subterranean current of *water*, of such force that it instantly filled a great part of the works. The person who struck the blow into it was drowned, and some that were near the mouth of the pit escaped very narrowly by being drawn up; but twenty-four days after, when the mine was cleared of the *water*, and people came down to work in it again, four of the persons, who had been supposed drowned, were found alive: they had saved themselves by climbing into a place above the reach of the *water*; they had not the least morsel of bread with them, but had lived all this time on the *water* of a little spring which broke out by them. This *water* was examined, and found to have no peculiar matter contained in it, but only the common sparry substance found in all *water*, and that not in any abundance. Phil. Transf. N° 159.

We have also an account in the Philosophical Transactions of a man who lived for eighteen years on no other aliment than *water*, and now and then, though seldom, clarified whey. The man was pretty healthy. See N° 466. sect. 7.

The Italian physicians have talked much of cures performed by means of cold *water*, which they esteem almost an universal remedy; giving in a day fifteen, twenty, or twenty-five pounds of *water*, made cold by ice, and applying at the same time cold *water*, or snow, to several parts of the body. By this method they treat fevers, small-pox, dropsy, *&c.* See Commerc. Norimb. 1736. hebd. 8. sect. 2.

Water, when applied to animal bodies, and when nearly of the same heat with these, relaxes their solids, and dilutes their fluids.

Water putrifying by stagnation is extremely dangerous to health. Thus in the holds of ships, the bilge *water*, if the ship is tight, and the *water* not pumped out often, soon becomes so extremely poisonous, as frequently to suffocate those seamen, who, as the pumps are subject to be clogged with filth, venture down to cleanse them; and also to affect persons at a distance with violent head-achs, cold sweats, and frequent vomitings, which continue more or less, in proportion to the distance from the well of the ship when the injury was received, and the degree of putrefaction in the *water* and air. Phil. Transf. N° 463. p. 63.

To prevent the above mentioned inconveniences many schemes have been thought of, particularly the machines of Dr. Hales [a], and Dr. Desaguliers [b]; the first by an instrument, which he calls the ventilator, and may not improperly be called the ship's lungs; see VENTILATOR; and the latter by a machine, which is an improvement of the Hessian bellows.—[[a] In his Treat. of Ventilators. [b] Phil. Transf. N° 437.]

Putrified *water* being thus noxious, a method of preventing its putrefaction would be very desirable, and this seems now to be found in the use of lime. See LIME-*water*, *Append.*

Rough *waters*, that will not bear soap, may often be corrected by letting them stand a few days. See *Boyle*'s Works abr. Vol. I. p. 141.

It has been said that Thames *water* has a peculiar property of recovering after putrefaction; but others have the same. See *Boyle*'s Works abr. Vol. I. p. 141.

Mr. Boyle tells us, he prepared a salt of the same nature with Glauber's sal mirabile, which seemed to have a power of coagulating common *water*; for being dissolved in a proper quantity of it, the whole mixture shot together into fine crystals, apparently of an uniform substance, and so brittle, as to be reducible into powder. See *Boyle*'s Works abr. Vol. I. p. 332.

Water may be used with good success in taking the height of any accessible object, as it naturally becomes parallel to the horizon. The manner of performing this operation is exactly the same as with a mirror. Tr. Pract. Geom. p. 19. See the article MIRROR, *Cycl.*

Water by its fall may be made to afford wind enough to blow a fire. This is practised in the brass works of Tivoli near Rome. See Phil. Transf. N° 2.

Chalybeate, or *Steel*-WATERS. The learned Mr. Monro of Edinburgh has an inquiry into *steel*, or *chalybeate waters*, where he considers them with regard to their medical use, in order to discover what their real or comparative strength is, how they bear carriage, and how long they retain their virtues; that physicians may judge which of them is most proper in the various diseases and circumstances of patients, which must be drank at the fountain-head, and which might be conveniently drank at a distance from it. See Medical Essays, Vol. III. art. 7. Abr. Vol. I. p. 126.

Chalybeate waters strike a red, purple, violet, or black colour with galls; and it is said by several writers, that this change of colour is a certain mark of a *chalybeate water*, and that the deepest colour shews the greatest proportion of steel. Mr. Monro, to satisfy himself of the truth of this, made a weak solution of sal martis in *water*, and found that, with a tincture of galls, he could form all the different colours, the larger quantity of the solution always requiring the greater number of drops of the tincture to bring it to all the colour it would take; and that it was deeper, in proportion to the quantity and strength of the solution and tincture employed. If words could express the various shades of colours betwixt the pale red and the black, the simple experiment of bringing *steel-waters* to the deepest colour they could strike with galls, might determine the proportions of steel in each. But as this is impracticable, and as it is necessary to know the quantity of steel contained in any given quantity of *water*, some general standard must be appointed, to which all may be brought. To obtain this, he made several experiments to find out the quantity of steel in its artificial salt, and found it to be a little more than a third part. He dissolved some of the salt in *water*. Twenty ounces of the solution contained an ounce, except a scruple, which was precipitated; one hundred and forty-two drops of this solution weighed two drachms; every drop therefore contained one twenty-fifth of a grain of salt, or one seventy-fifth of a grain of steel. To compare a *chalybeate water* with this solution, into a known quantity of such *water* drop a strong clear tincture of galls, allowing a sufficient time between each drop for its full effect, till the addition of more tincture makes no change. This experiment should be repeated, to come at the exact number of drops requisite. Then mix the same number of drops of tincture with as much common *water*,

water, as there was mineral *water*, in a glafs, exactly like that made ufe of in the preceding trial. Drop in the folution of fteel cautioufly, till the colour is the fame with that of the mineral water. By this means, the due proportion of the folution to imitate any *fteel-water* may be known. He has thus made fpring *water* fo like to feveral *chalybeate waters*, that none could diftinguifh them. Med. Eff. Edin. Vol. I. p. 126.

Galls in tincture are more convenient than in fubftance for making thefe experiments, for it acts much fooner, and more equally, and can be added in lefs quantities, which deferves to be regarded; for too large a proportion of galls poured at once into *fteel-waters*, will be fo far from ftriking the colour ftronger or fooner, that no change will happen for feveral hours after, and at laft the *water* gradually becomes of a deep fea-green colour, inftead of a purple or violet. Good *chalybeate waters* may have been condemned as containing no iron, or as being impregnated with copper, from an addition of too much galls. Frefh tincture of galls is preferable to that which has been long kept; but even fuch as was grown mouldy, and had a thick fediment, anfwered the common trials. Frequent trials fhould be made, at different times, with *water* bottled at different feafons, in order to afcertain the proper feafons for bottling mineral *waters*, and to find out the time each will keep. It is alfo requifite to obferve what time it is before the galls ftrike the full colour, and how long it remains in an open glafs; for Mr. Geoffroy's fuppofition appears reafonable, that both thefe effects will be moft flowly produced, when the fteel is moft intimately blended with the other principles of the *water*. Med. Eff. Edinb. Vol. I. p. 127.

There is a ftrong refemblance between our *fteel-waters* and common *water*, in which fal martis is diffolved, but the natural fpaw expofed to the air foon lofes its chalybeate tafte, and will not ftrike a purple colour with galls; expofed to heat its virtues are fooner loft, and it becomes vapid in no long time in the clofeft veffels; but a folution of fal martis bears heat, and being expofed to the air, without alteration; it may be fufpected that this difference depends upon the fmall proportion of the vitriolic principles, and fome change they may thereby undergo in the *water*; and therefore Mr. Monro having added as much fal martis to fome bottles of *water*, as had been found to make it of the fame tafte, and to ftrike the fame colour with *chalybeate waters*, he corked fome carefully, others lefs carefully, and a third fort he left open. The *water* in thefe laft loft its tafte and virtues in a fortnight, became muddy, and had a faffron-coloured powder at the bottom. The fecond kind kept longer, but had a ftinking fmell before it became vapid. The *water* which was carefully corked and rofined kept well, but acquired a ftrong fmell of rotten eggs, like to what feveral fpaws have when kept; when the bottle was left open, the ftinking fmell went off; foon after, the chalybeate virtues were not to be obferved, and the bottom of the bottle was covered with the faffron-coloured powder, which is generally to be feen in bottles where *chalybeate waters* have been kept. The difference therefore between the natural and artificial *fteel-waters* confifts in the greater volatility of the former. Med. Eff. Edinb. Vol. I. p. 128.

Spaw and Pyrmont, and fome of our own *chalybeate waters*, feem an exception to the refemblance between the diluted folution of falt of fteel and the natural *fteel-waters*; for the colours they ftrike with the galls is faint, while their tafte and other effects are ftrong. This produced another experiment to imitate them, by mixing filings of iron, oil of vitriol, and *water*, in a Florence flafk, which being laid on its fide, and another, in which was fome fountain *water*, immediately fitted to it. The fumes which arofe upon the effervefcence of the oil of vitriol with the fteel, came over into this. After the effervefcence was over, on taking away the glafs with the *water*, it was found limpid, but with a ftrong empyreumatic fmell; its tafte at firft was pungent, and then the acidulous tafte prevailed. When tincture of galls was mixed with it, it became of a purple, but faint colour, which held many days without precipitation. Next morning the empyreuma was gone, and the *water* had an agreeable fpaw tafte. In lefs than a day this went off, a fmall quantity of faffron-coloured powder fell to the bottom, and the galls had no effect on the *water*. Med. Eff. Edinb. Vol. I. p. 129.

This *water* gives no fign of acidity, as might be fufpected, when mixed with fyrup of violets and clove-july-flowers, in the colour of which it makes no alteration; neither do the more fpirituous fpaws; whereas the folution of falt of fteel, and fome fpaws, appear alkaline, from changing the colour of both the fyrups green.

The fuccefs of this experiment produced fome others, to difcover what it was that evaporated, and what precipitated in thefe *waters*. Oil of vitriol poured on the faffron-coloured refiduum made no effervefcence; upon the addition of a little *water*, fome of the powder feemed to be diffolved. Tincture of galls did not change the colour, but upon adding fpirit of hartfhorn, a great effervefcence arofe, and a deep purple coagulum was made. The fame experiments fucceed with ruft of iron, which refembles this powder. Neither ruft, nor the powder, when fufpended in *water*, ftrike any colour with galls, although crocus martis does. What evaporates is the menftruum, which carries away fome of the principles of the iron with it. From feeing the effects of acid, and of the air upon iron, and finding vitriol naturally formed, it may reafonably be fuppofed, that the menftruum of the irony particles in thefe *waters* is an acid. From confidering how much fulphur is in iron, what a ftinking fmell mineral *waters* have before they turn vapid, and how much the fulphur of iron is deftroyed before the iron turns into ruft, which again refembles the powder precipitated in thefe *waters*, we may fairly fuppofe that the menftruum carries the fulphur along with it, and leaves only the earthy parts with a fmall proportion of fulphur. Med. Eff. Edinb. Vol. I. p. 130.

It may hence be fufpected, that *fteel-waters* are impregnated with common grofs vitriol, or with the more fubtile fumes of iron diffolved in the natural menftruum; or with both in different proportions. The quicker precipitation, and lefs volatility of *chalybeate waters*, feems to fhew that the fulphur is not fo much freed from the earthy particles, as in others which precipitate more flowly, and are more volatile. The common obfervation of air generated in all effervefcences, fermentations, putrefactions, and wherever a confiderable change is produced in the compofition of bodies, feems to account for the quantity of elaftic air, obferved in *chalybeate waters*, in the more fpirituous when recent, and in others, when the putrid fmell fhews the fulphur to be more difengaged.

It feems alfo, that the different kinds of *fteel-waters* fhould be prefcribed, according as there is occafion for a fubtile, penetrating fulphureous fpirit, to pervade the fmalleft veffels, or according to the quantity of an abforbent aftringent earth, which is required to be joined with this fpirit.

Where different fpaws are not to be had, the fame *water* perhaps may be made to anfwer each of thefe intentions, according to its being more or lefs kept, or expofed to the air or heat. Med. Eff. Abr. Vol. I. p. 131.

The ingenious author, from whom thefe obfervations and conjectures have been taken, feems to think that the menftruum really flies off from mineral *waters*; but this, as is obferved in a note added by his learned abridger [a], has not yet been made appear by any fatisfactory experiments. It is certain, that fome mineral *waters*, when carefully bottled at the well-head, and oiled at top, after the manner of Florence wine, and then well corked and cemented, have been found to continue many months poffeffed of their properties of ftriking black or purple with galls; and hence it appears that the irony particles, or mineral fpirit of the *water*, cannot eafily efcape through the pores of glafs; at leaft not while the *water* remains in a found ftate. When the *water* begins to corrupt, as in time it will, though thus fecured, it tinges lefs and lefs with galls, and at length affords no red, purple, or dufky colour therewith. Whence we are led to conclude, that the irony particles make their efcape through the pores of the glafs, or of the oil, the cork and cement; or elfe are fo changed, as no longer to retain their irony nature, and ftrike with galls. But that the latter feems rather to be the truth of the cafe, is fupported by this, that during the diminution of the tinging faculty, there appears to be a manifeft change in the natural texture of the *water*; for a vifible feparation of parts enfues, the whole grows fetid, a grofs matter falls to the bottom, the oil that was liquid before, now becomes almoft as hard as tallow, and appears tinged black to a confiderable height: but what is remarkable, the *water* now affords manifeft figns of its containing actual brimftone, not the leaft indication whereof appeared before. It feems therefore that the *water*, as taken from the well, is a compound liquor, gradually tending to an alteration in its parts, as if there was a flow fermentation among them, whereby the natural texture of the whole is broke in time, even though the external air be kept from communicating therewith; but if external air be admitted, remarkable changes muft fooner begin, and finifh their period [b].—[[a] Ibid. p. 130. [b] *Shaw's* Enq. into Scarb. *Wat.* p. 160, feq.]

There is commonly fuppofed to be fomething fo very volatile in many *fteel-waters*, as well as of thofe of Liege and Pyrmont, that it difappears upon the leaft accefs of air, after they are taken up from the well, efpecially in hot weather; yet it does not feem clear from experiments, that the alterations which fpaw *waters* undergo, by being expofed to the air, is owing to the diffipation of any volatile part. Ibid. p. 109, and note *.

Though *chalybeate waters* are commonly fuppofed to contain vitriol, and to be of a ferruginous nature, and have from thence obtained their name, yet it is not eafy to determine what falts they contain, or whether they be all impregnated with the fame kind of falts. Mr. Du Clos could neither find alum nor vitriol in any of the French wells, only in one he found fome refemblance of the latter. All the other wells gave a falt, anfwering to a compofition of nitre and fea falt mixed in various proportions, which probably is the natural falt of the earth difcovered by Tournefort [c], refem-

 bling,

bling, in moft trials, the nitrum of the Levant, which is neither acid nor alcali, but approaching moft to the latter [d]. —[[c] Pref. to Hift. of Plants near Paris. [d] Medic. Eff. Abr. Vol. I. p. 108.]

Chalybeate waters often break the bottles into which they are put, and many of them foon lofe their chalybeate properties when bottled. To prevent the former inconvenience, Dr. Hales put a fmall glafs tube through the cork of the bottles, filling them fo, as to leave no air bubbles between the cork and the *water*. In other bottles he put very foft compreffible corks. By both thefe means the *water* was allowed to rarify, without burfting the bottles. By mixing very few drops of an acid, fuch as oil of fulphur, with the *fteel-waters*, they long retain their chalybeat properties. See *Hales*, Philofoph. Experiments.

Mineral-Waters. The method of analyfing *mineral-waters*, according to Dr. Shaw, fhould be this. Firft, let it be tried what changes they will fuffer by mere ftanding; let fome of the *water* be put into open glaffes, and fome into fuch as are ftopt, and after fome hours keeping, examine by the tafte whether it be any way different from that frefh drawn from the fpring; after this let it ftand fome days or weeks, and finally compare it with frefh *water* of the fame fpring, and obferve whether it have any fcum at top, or fediment at bottom, or fides of the glaffes.

2. Let fome of the *water* be kept in open cylindrical glaffes in a warm place till it is wholly evaporated, the dry fubftance left behind muft be carefully preferved, to be compared with the refiduum to be afterwards made by fire.

3. Put a quantity of the *water* at the fpring-head into a glafs retort, and a receiver being luted on, let the whole be carefully diftilled over, and both the *water* and the dry refiduum weighed, and carefully preferved. If during this operation a vapour is feen to force its way out at the joints, it fhews there is a fpirit, or light fubtile matter. In the *water* too fine to be feparated this way, the *water* feparated by diftillation is to be tried feveral ways, to fee whether it differs from common diftilled *water* or not, and whether it have the fame mineral particles that the *water* itfelf had before diftillation. If it contains any fea falt, it will turn white with a folution of filver; if any vitriol of iron, it will turn black with powdered galls; and if any fulphur united with an alkaline falt, it will turn black in time with any of the metallic folutions. The dry matter left in the retort is to be boiled in fix times its own weight of pure diftilled *water*, this being afterwards filtered and fet to cryftallize, will give, after a proper evaporation, its own peculiar falt in cryftals; and if more forts of falt than one fhould be contained in the *water*, they will be all thus feparated by repeated evaporations and cryftallizations.

Whether thefe falts be acids or alkalis, is eafily found by the common experiments, the acid turning fyrup of violets red, and the alkali turning a folution of corrofive fublimate yellow. The neutral falts, wafhed out of the earth by *waters*, are chiefly fea falt, and fuch as confift of a vitriolic falt, and a falt or earth of an alkaline nature. Sea falt is difcovered by its tafte, by the white fume it yields on being mixed with oil of vitriol, and by its figure in cryftallization: and the other neutral falts are difcovered by their property of producing, or regenerating fulphur, upon being mixed and melted with falt of tartar and powdered charcoal. Thus, if two ounces of fuch falt be mixed with one ounce of falt of tartar, and an ounce of powdered charcoal, and the whole put into a crucible, there will be produced a reddifh-coloured mafs of a fulphureous alkaline tafte, and giving a high yellow colour to fpirit of wine, which will turn filver black; and being precipitated by an acid affords a true lac fulphuris, which may be fublimed, and melted into brimftone like the common.

What remains of the refiduum, after *water* has feparated the falt, is properly earth: this is often of more kinds than one, and may be feparated by repeated wafhings into bole, ochre, fand, and whatever elfe it confifts of; and thefe may afterwards be tried, as to their nature, by fire in the common ways, the firft and readieft of which is the feeing whether they will calcine or vitrify; and the next, with proper additions, to try whether they contain any metalline or mineral particles, which may be feparable by the feveral fluxes: and if the quantity of metalline matter be too fmall to be collected into a regulus, or fhew itfelf in the common way, it may be melted with chryftalline glafs, and from the colour it gives that glafs, the metal it contains may be known.

It is generally fuppofed, that the *mineral-waters* receive their virtue from the falts they contain. Dr. Lifter is of opinion that thefe are principally two, the one common fea falt, and the other the nitrum calcarium; and found, on experiment, that from thofe very *waters*, which others had boldly affirmed contained nitre of the common kind, vitriol, alum, and the reft, he only could feparate thefe two falts.

Thefe falts mixed with ochres make the various kinds of our *mineral-waters*, as they happen to be mixed in various proportions.

Monfieur Du Clos obferves of the examining the virtues of *mineral-water*, that moft of them are liable to great errors. The French Academy, after long deliberation, propofed to themfelves a method of examining the *waters* of their own country, by which they arrived at a more thorough knowledge of their virtues than was had before, and which may ferve as a leffon to all other experimenters in the fame way. They have found by all their enquiries, that the principal things giving virtues to *waters* are falts and earths, and thefe give very different qualities to them, as they differ in quantity or in quality in the feveral fprings. The falts, which they procured by a flow evaporation or diftillation, proved to be of two kinds: the one the nitre of the antients, a fulphureous mineral falt, much refembling the alkali of plants; the other the common culinary falt. This confifts of two parts, an alkaline bafis and an acid. Thefe two principles are fometimes combined in the *waters*, and then it is abfolute falt that they contain, and eafily feparated and known: but it fometimes alfo happens, that thefe principles are feparated, and only the one or the other contained in a *water*; thefe therefore, when procured in the analyfis, are not eafily known, and when they are, as it very often happens, blended with the difunited principles of other falts, they form together a fort of concretes, yet more hard to be known than the other. It is generally fuppofed, that in almoft all medicinal *waters* there is either alum or vitriol; but this is an opinion taken up too much at random, and it appeared, on the examination of all the mineral fprings of France, that no one of them contained either the one or the other of thefe falts, except that of Vahls in Dauphiné, which contained a falt fomewhat refembling white vitriol. The tafte and the mixture with acids, alkalis, and tinctures of vegetables, are the great means of knowing thefe falts; for as to their figures they vary greatly, even in the fame portion of falt, according to the different degree of the evaporation of the *water* they were diffolved in. *Du Clos*, Exam. des Eaux Min.

Earths are found in different quantities in the different *waters*, and fo confufed by being blended with one another, and with other foffils, that it is much more difficult to afcertain their fpecies, than thofe of earths in any other form, or than thofe of the falts in the fame *waters*. The colours of the earths are very various, but this is the leaft variety; for fome of them form themfelves into fhapes and appearances fo different from the others, that it is hard to fay what they are like, or to what fuch fingularities in their concretions fhould be attributed. Some float about in the almoft evaporated *water* in form of films and clouds; fome like flocks, fome appear in the form of mucilages, others like little flaccid clods of clay, and others like grains of fand; fome are foluble in acids, fome only in part foluble, and fome not at all fo; fome will give a tincture to diftilled vinegar, others not; and in the fire fome run to glafs, and others calcine to lime.

The great quantity of the *mineral-waters*, which phyficians ufually prefcribe to be taken by thofe they recommend them to, feems to prove that they expect the principal benefit from them by their cleanfing the vifcera by this internal ablution; and this effect is indeed no trifling one, fince moft of thofe ftubborn difeafes, which they recommend thefe *waters* in, are owing to obftructions of the vifcera, which the large quantities of thefe *waters* may eafily remove: but it were well, if the phyficians would be more accurate in diftinguifhing the different properties of them, and not give them at random, as is too often done, to the no fmall detriment of the patient.

The vinous fharp tafte of fome of thefe *waters* which evaporate with the leaft heat, or on being expofed to the air, feems to be owing to that matter which is the firft ftate or being of fulphur, and of all the concretions thence refulting; fuch as the various vitriols, and the like. There are found earths impregnated with this acid volatile fulphureous matter, of the concretions of which are fometimes made fulphureous and vitriolic minerals. This vaporous and indigefted matter may very well be the bafis of vitriol; but in this its firft ftate it cannot be a vitriolic concretion, if it be found in earths where there is yet no vitriol. It is more eafy to obferve it in its products, when it has received fome mineral concretion, than in its natural ftate; though in this latter ftate it is as likely to impregnate *waters* as in any other. The moft probable opinion, as to the heat of thefe *waters*, is, that there are in certain deep receffes of the earth hot vapours, which continue at all times fo, becaufe there is no accefs of the external air to cool them; and where thofe rarified matters have not room to become more rarified, and fo to become lefs hot, or more diffipated; and that fuch collections of hot vapours are what give heat to the warm baths, and hot *medicinal-waters*. *Du Clos*, Exam. de les Eaux Min.

Many *mineral-waters* evidently contain a large quantity of fpar, which though fufpended in them in an abfolutely pellucid ftate, may yet be regularly feparated from them by evaporation in its own figure. The *waters* of the fountain de Salut, and thofe of the fpring du Pied, and feveral other in Gafcony, have been tried, and are found, if gradually evaporated to a certain degree, to yield a fcum, which, when examined

examined by the microfcope, is found to confift of oblique parallellopiped parts; and if they are evaporated wholly to drynefs, there is found at the bottom a fhining duft, which, when examined in the fame manner, is found to contain many particles of the fame kind, all bright as fragments of the pureft fpars.

As to the ufe of *mineral-waters* the learned Heifter [a] obferves, that in general they are found to agree much better with perfons in the middle ftages of life, than with the very old or very young. If any general rule can be given in this cafe, it is, that people fhould not take them when younger than eighteen, or when older than fixty. Young people, efpecially fuch as are under ten years old, fhould by no means be allowed to drink the chalybeate *waters*, becaufe of the tender ftate of their vifcera; and older people than thofe of fixty are never found to receive any benefit from them, unlefs they are of very robuft conftitutions, or have been long accuftomed to the drinking them: in fome cafes however, particularly in hectics, young people may be allowed to drink the milder kinds mixed with an equal quantity of milk, and often find great benefit from them.—[[a] Compend. Medic. Pract. cap. 20.]

In confirmed confumptions and ulcers of the lungs, the ftronger chalybeate *waters* are found to do no fort of fervice, but rather hurt; but in cafes where the ulcers are but beginning, the drinking the weaker ones with milk has been known to do great good. In fpittings of blood arifing from ulcerations of the lungs, the ftronger cold chalybeate *waters* do nothing but harm; but in the fame cafes, where the milder kinds are taken warm, and mixed with an equal quantity of milk, they are found to be very beneficial. They muft never be taken in cafes of dyfenteries in confirmed dropfies, nor where there is a ftone in the bladder or kidneys; but in œdematous fwellings of the legs and feet, they are often found highly ufeful. In venereal cafes, whether recent, or of long ftanding, they do not cure, but they difpofe the body the more readily to be cured: but in a fimple gonorrhœa, where there is no venereal taint, they have been often known to cure, when all other methods have failed.

Method of taking them. All people who are of a plethoric habit ought to be blooded before they begin to take them, for by this means there is a freer accefs given them into the veffels, and they become much more able to correct the whole mafs. Perfons who are not of a plethoric habit have no occafion to bleed before they take them, but all ought to take a gentle purge to clear the primæ viæ; and to this purpofe nothing is more proper than the common purging falts of Epfom, or Glauber's: but all the draftic purges are carefully to be avoided on this occafion, fuch as fcammony, refin of jalap, and the like. If there be indications for vomiting in the patient, fuch as pains, and a fenfation of weight at the ftomach, with bitternefs in the mouth, naufeas, and reachings to vomit, then it is extremely proper to give, a day or two before the beginning the courfes of the *waters*, a gentle dofe of ipecacoanha.

Time moft proper. The beft hour of drinking them is early in the morning; fix or feven o'clock is very proper, becaufe they then have time to finifh their operation before dinner, but earlier than this is not fo proper; and thofe who go to the wells or fprings at three or four in a morning, are expofed to all the injuries of a cold and damp air, which prevents perfpiration, and often brings on coughs and other diforders of the breaft and head. It was formerly a cuftom to drink them in an afternoon, but this is at prefent left off, as found to produce many diforders of the ftomach; and fuch as are defirous of having the utmoft effects of the *waters*, content themfelves at this time of the day with drinking them at home in fmall quantities, and mixed with wine.

Seafon moft proper. The fummer is the feafon in which the *mineral-waters* are to be drank with the greateft advantage. The months of June, July and Auguft, are more proper for the taking them than any other time of the year; but upon urgent occafions, the courfe of them may be begun in May, and continued till September; and in fome extraordinary cafes, the ufe of them may be allowed even in winter.

Method of drinking them. It is always proper to begin the ufe of them by fmall quantities, and gradually increafe them to larger. Thus the firft day it may be proper to drink about a pint and half at four draughts, the fecond day a quart may be drank, and on the third or fourth three pints: after this the quantity may be increafed to two quarts a day, and more than this it is not proper to take, unlefs the perfon be of a very robuft habit; for many people have injured themfelves by taking too large quantities. The quantity that is taken as the moft the ftrength will bear, whether it be two, three or four pints, is to be continued every day for a fortnight or three weeks, or longer, if the nature of the difeafe requires it; and when the courfe is to be finifhed, it muft be done in the fame manner in which it was begun, by taking lefs and lefs every day, till the ufe is gradually worn off, and no purge or other medicine is neceffary afterwards.

The *mineral-waters* in general operate in fome conftitutions by ftool, and in others by urine fingly; but in moft they operate both ways together. Thefe are both very proper ways of excretion, and whichever nature choofes the *waters* fhould pafs off by, it is to be judged proper and falutary, and by no means to be checked. If the difcharge by urine be plentiful, and the bowels are moved but once a day, it is very well in many conftitutions; but where, as in fome conftitutions, it happens that the *waters* actually act as aftringents in the bowels, this is to be prevented, and a fmall dofe of the common purging falts is to be taken in the firft draught of the *waters* every morning.

In the taking them it is to be obferved, that they are not to be poured down as it were all at once, for the ftomach is often loaded and injured by this, but the firft glafs fhould be fuffered to pafs off, and then, after walking about for ten minutes or longer, a fecond is to be taken, and fo on; and no draught fhould exceed half a pint in quantity; fo that the taking the whole quantity in this manner fhould be the bufinefs of an hour and half, or two hours. After this it is proper to ufe moderate exercife by walking, or otherwife, till dinner time; and in the mean time, if the *waters* would pafs off by urine or ftool, this muft be by no means repreffed. People who have very weak and tender ftomachs, or who have diforders of the breaft, and drink the *waters* in a rainy feafon, fhould have them gently warmed before they take them: this is beft done by fetting a glafs of them in a veffel of hot *water*, and they are only to be fuffered to ftand thus till moderately hot, and then immediately drank off; for if heated to too high a degree, they eafily lofe their virtues by evaporation.

All perfons are to regulate the quantity of the *waters* they drink to the ftrength of their own conftitution; however fmall a quantity they perceive to be enough, and to operate in the manner they expect, they are to be contented with that, and never to teize nature to make her bear more.

It is a certain rule, in regard to all *mineral-waters*, that they are much the beft when drank at the place, though fome of them bear carriage much better than others. It is a neceffary caution, that the motion of the body be never violent in the time of taking the *waters*, for if it produce fweat it always obftructs, in fome degree, their operation by urine or ftool; and if flatulences are troublefome at the time, it will be proper to take candied orange-peel, or fome other carminative at the time. In order to have all the good effects of the *waters*, a regulation of diet is extremely neceffary; it is proper to dine and fup early, and the dinner fhould not be too heavy. It is a good rule indeed, under fuch a courfe as this, never to eat or drink fo much as one can, but always to rife with an appetite. The foods principally to be avoided, during fuch a courfe, are fuch as are dried in the fmoak, or have been long kept in falt, and the flefh of young animals is in general to be greatly preferred to that of old ones; and in general, a too great quantity of vegetables, efpecially of the flatulent ones, is to be avoided. Lamb, chickens, veal, and the like, are moft proper for the diet at this time; and to thefe are to be added the tender river fifh, as trout and pike: broths alfo of all kinds are good; and peas, kidney-beans, fpinach, and afparagus, are all very proper. The bread that is eaten under the courfe fhould never be ftale; the moft proper drink at the time is good wine, and if the perfon is not over thirfty, it is beft to drink this pure, not mixed with *water*: but in this cafe it is only to be allowed within the bounds of moderation; half a pint, at the utmoft, at a meal to thofe who have not been habituated to it; and to thofe who have, fomewhat lefs than their cuftomary quantity. The liquor next proper after wine, is found and well-bodied ale; but fuch as is either new and fermenting, or fo old as to be ftale, is by no means to be ufed.

Violent exercife is wrong, but different conftitutions will bear different degrees of it, and thofe of cold and pituitous habits fhould ufe confiderably more than others. The feafon of the year is alfo to be regarded, for the fame degree of exercife that is good in a cooler, is too much in a hotter air. The greateft caution, in the courfe of the taking thefe *waters*, is to avoid too much fitting ftill, either after the taking them, or after meals; for the *waters* remaining in the body, or the food remaining undigefted, from thefe caufes the confequence is, that the patient is fubject to flatulencies, colics, diarrhœas, and pains of the ftomach. Sleeping immediately after meals is alfo improper, as it occafions at this time diforders of the head, and many other complaints.

There are fome cafes, however, in which the *mineral-waters* may be drank with great advantages by perfons confined to their bed: thus gouty, paralytic, and other extremely emaciated, or weak perfons, have often found great benefit by this method. Slare even goes fo far, as to advife this as the beft method of taking them in all cafes; but the more judicious writers all judge him in an error in this, becaufe there are very many reafons why motion and bodily exercife, after the drinking them, muft be beneficial. It is proper to abftain, as much as poffible, from all forts of paffi-

paſſions, during the courſe of taking theſe *waters*. Violent anger, grief, or terrors and frights, have been known to occaſion more miſchief at ſuch a time than they would otherwiſe have done; and all people are to abſtain as much as may be from venery during the time, leſt it too much debilitate the body, already weakened by the diſcharges occaſioned by the *waters* by ſtool and urine. Suppers ſhould be moderate during the courſe, and the wine drank at that meal ſhould be diluted with *water*: it is always very adviſeable in this caſe alſo to walk for ſome time after ſupper, that the ſleep may be more quiet, ſound, and refreſhing. And the cold air of the night, eſpecially if it be a damp ſeaſon, is cautiouſly to be avoided, leſt it occaſion catarrhs and other diſorders; for this reaſon, it is proper to ſup early all the while.

Symptoms attending the taking theſe waters. Theſe are of many kinds, and differ greatly from the ſame *waters* drank at the ſame ſeaſon, in perſons of different habits and conſtitutions. One of the moſt common, is a binding of the bowels; and from this there often ariſe pains in the bowels, colics and vomitings, with other the like diſorders. People of melancholy, hypocondriac, and hyſteric habits, are more ſubject than any others to this complaint from them: this is a ſymptom eaſily removed by any of the mild cathartics, and nothing in particular is more proper for that purpoſe than a decoction of ſena, tamarinds, and rhubarb, to be taken a few ſpoonfuls at a time, as occaſion ſhall require. A ſmall doſe of the cooling ſalts may alſo be taken, but all the hot and reſinous purges are apt to occaſion hypercatharſes. On the other hand, ſome are thrown into a diarrhœa by them, and this is often a ſalutary ſymptom; and while the patient's ſtrength is unhurt, and he is not found to ſuffer any great inconvenience from it, this is by no means to be checked, for very often the patient is greatly relieved by a copious diſcharge of the noxious humors this way, and by a continuance in the ſame courſe, becomes abſolutely cured by this means: but when the perſon is perceived to be greatly weakened by this ſymptom, and it is attended with nauſeas, vomitings, and pains in the bowels, it muſt be carefully checked or reſtrained. This is often done by drinking the ſame *waters* in a ſmaller quantity, and warm inſtead of cold; but if this do not prove ſufficient, ſmall draughts of cinnamon-*water* are to be allowed, and, if neceſſary, ſmall doſes of diaſcordium every night. In caſes where the *waters* take this turn violently, it is proper to abſtain from them for ſome days, and then to take to them again with great caution, and in ſmall quantities.

Some perſons, at their firſt entering on a courſe of the *mineral-waters*, are thrown into vomitings by them; and theſe are ſometimes ſalutary, ſometimes merely ſymptomatic. If it be ſalutary, the perſon is always the better for it, and the noxious humors are very happily attenuated and diſcharged this way by the *waters*: in this caſe, all the cautions neceſſary is not to drink too much of them at a time, and ſometimes, between whiles, to take a little of ſome bitter tincture. But if, on the contrary, the patient is greatly weakened by this vomiting, the method is to drink ſmaller quantities, and to eat and drink more ſparingly at meals. Sometimes this ſymptom ariſes from a redundance of bile, or of pituitous humors from the ſtomach and bowels, not having been emptied by a purge before the entering on the courſe: in this caſe a gentle purge is to be given, and after that the common ſtrengthening and bitter ſtomachics, and the *waters* are afterwards to be cautiouſly taken in ſmall quantities.

When the patient is attacked with violent colic pains, and the common method of eating candied orange-peel, and the carminative ſeeds, does not take effect, a gentle purge is to be given to evacuate the humors which occaſion them, and after this, tincture of cardamum ſeeds, or ſome other ſuch carminative, uſually takes effect. In caſes where the pains are more violent and obſtinate, a glyſter of camomile flowers boiled in milk, with a little ſugar, may be given at times, and the *waters* afterwards muſt be drank in ſmall quantities, and always warmed.

If an immoderate flux of the menſes or hæmorrhoids ſhould happen during the time of taking the *waters*, it will be proper to abſtain from the uſe of them on that occaſion for a few days; but if theſe evacuations are in a moderate degree, the *waters* may be continued, only taking them in ſmaller quantity, and not quite cold. Sometimes intermittent fevers come on while perſons are drinking the *waters*; but theſe are not to be regarded as any very bad caſe; for if the uſe of the *waters* be continued, and the carminatives and bitters of the common kind taken at times with them, they are uſually ſoon cured. Pains of the gout, rheumatiſm, ſciatica, and teeth, alſo ſometimes return upon people accuſtomed to them, while they are in a courſe of the *waters*; but theſe are not to be greatly regarded, for they uſually go off again very eaſily, only by continuing the uſe of the *waters*, and require no peculiar cure: only, during the time the pains laſt, ſome comforting cordial may be taken at times; and if they are violent, a few drops of laudanum may be taken every night going to reſt, or a few grains of the ſtorax pill. See *Heiſter*, loc. cit.

Bath and *Briſtol*-WATER. Dr. Guidot pretends that the *Bath* and *Briſtol-waters* are of the ſame virtues, but in a different degree; that both are impregnated with the ſame principles, but the *Bath-waters* containing a much greater ſhare of them, and therefore capable of doing that in a little time which thoſe of *Briſtol* could only do in a much longer. But this ſeems to be far from a true ſtate of the caſe.

The due ſecretions of the blood, and their proper diſtributions, are as neceſſary to the preſervation of life, as the circulation itſelf; and the greateſt part of diſeaſes take their origin from the glandular ſecretions being either too much increaſed or diminiſhed. The blood is ſometimes too thin, and then a too great quantity of its ſerous part is ſeparated either by the glands of the ſkin, guts, or kidneys, as in colliquative ſweats, fluxes of the belly, and diabetes. Some times the blood is too thick and viſcous, and by this means occaſions obſtructions, not only in its own canals, but in the glands; and then the ſecretions are as much leſs than they ſhould be, as in the former inſtance they were greater, and hence ariſe as long a train of diſeaſes. In ſome caſes there is alſo a too great fullneſs of blood, and in others a deficiency, both which hinder the proper ſecretions.

In theſe different caſes the *Bath* and *Briſtol-waters* have their ſeveral uſes: the *Bath-waters* are beneficial when the ſecretions are diminiſhed, the *Briſtol-waters* when they are too much increaſed: the *Bath-waters* powerfully attenuate, the *Briſtol* not leſs powerfully incraſſate: the *Bath-waters* are ſpirituous, and help in deficiences of the blood; the *Briſtol-waters* are cooling, and ſuppreſs plenitude with its ſeveral conſequences, ſuch as inflammations, hæmorrhages, *&c.*

The *Briſtol-waters* are ſuppoſed by many a modern diſcovery, and their uſe but of late date, but this is a very erroneous opinion. Dr. Venner, near eighty years ago, has written profeſſedly of them, and given them their true character, and proper commendations in all the diſeaſes in which they are at this time found effectual, the diabetes ooly excepted, in which their uſe has not been known ſo long. They were not indeed much frequented at that time, nor of ſome years afterwards; but that was merely from the want of the neceſſary accommodations at the place. Dr. Maplet, in the year 1639, writes largely of their virtues, particularly in diſorders of the urinary bladder and kidneys, and adds great praiſes of their external efficacy in curing cancerous ulcers; but with all this praiſe, they never came into an univerſal repute, till their character was eſtabliſhed by Dr. Mead and Dr. Lane.

The diſeaſes in which the *Briſtol-waters* are found moſt ſucceſsful, are internal hæmorrhages and inflammations, ſpitting of blood, dyſenteries, and immoderate fluxes of the menſes, and purulent ulcers of the viſcera. Hence they are given in conſumptions, ſcurvies, rheumatiſms, diabetes, ſlow fevers, atrophy, gleets, and even in ſcrophulous caſes, with very happy effects: and in all theſe caſes the *Bath-waters* are not only improper, but hurtful; for they rouſe and quicken the circulation, whereas theſe allay the heat, and reſtrain the too rapid motion of the blood. *Bath-waters* ſeem to be adapted to the diſorders of the ſtomach, guts, and nerves; *Briſtol* to thoſe of the lungs, kidneys, and bladder. *Bath-waters* are at variance with a milk courſe, and the *Briſtol-waters* can never be judiciouſly directed, but where milk may be joined with ſucceſs. This is ſo great a truth, that it holds good even in caſes of the diabetes, in which milk is of great ſervice, and has been preſcribed almoſt from the earlieſt times.

The *Briſtol* and *Bath-waters* are both preſcribed by different phyſicians in dropſies. No one can doubt, but that diuretic and drying medicines are of ſervice in this diſeaſe, and as the *Briſtol-waters* poſſeſs theſe virtues in a much larger degree than the *Bath*, they are certainly the moſt adviſeable, unleſs in caſes where a jaundice is joined with the dropſy; in which caſe the *Bath-waters* claim the preference, from their great efficacy in opening obſtructions of the viſcera, where there is no formidable inflammation.

The efficacy of the *Briſtol-water* in the diabetes, has procured it the name of a ſpecific in that diſeaſe; and it certainly much better deſerves that title than moſt of the medicines which have, at one time or other, been honoured with it, for it cures this terrible diſeaſe almoſt infallibly, and that in a very ſhort time, and without any ſenſible evacuation. The patient in this caſe may drink it in as large quantities as he pleaſes. The time for drinking the *Briſtol-waters* medicinally, is from April to September. The *Bath-waters* may be drank the whole year, but the colder months are much the beſt for them, or at leaſt the very heat of ſummer is leſs eligible than any other ſeaſon; and perhaps the beſt months for them are April, May, September, and October.

Buxton-WATERS, the *waters* of medicinal ſprings near Buxton in the Peak of Derbyſhire.

Theſe *waters* are the hotteſt of any in England, except thoſe of

of Bath. The *Buxton-waters* break out in several places thereabouts; what is called Buxton-bath takes in several warm springs. Thirty-two yards north east of this is St. Anne's well, which is chiefly supplied from a spring on its north side. Twenty yards south east of St. Anne's, in another close, is a place where a hot spring and a cold one rise in the same receptacle. About sixty-three yards south east of this is that called Bingham's well, called also Leigh's *water*, from the great benefit a neighbouring gentleman of that name received from it. A little way east of this is another; and in the streams of the level that carries the *water* from the bath, there rises another very plentiful one; and about four yards farther east there arise three or four other small ones. From this account, it may easily be conceived that there can be no great difference between the *waters* of these several springs, though on trials they seem to yield different portions of salts and sediments; at the utmost, their difference can be only in degree.

The distempers they are recommended in, are the rheumatism, gout, scurvy, wandering pains, cramps, convulsions, dry asthmas, want of apetite, indigestions, contractions, stiffness and lameness of the limbs, suppression of the menses, and all stoppages and beginning obstructions.

As to the difference of age and sex in patients, there is little caution required in the drinking them, except that they should be taken more sparingly by young people, between the ages of twenty-three and thirty, if very full of blood and juices, and by women with child in their first and last months.

As to the method of using them, except the body be costive, and the first passages furred up with gross humors, it is not only unnecessary, but hurtful, to prepare the body for them, as it is called, by purging; or at least by any stronger purges than manna, cream of tartar, and the like.

The heat of *Buxton-waters*, in frosty weather, is equal to that of common river *water* with which two fifths of boiling *water* has been immediately mixed. See *Short*'s Hist. of Min. *Wat.*

Sea-Water. Authors, who write with accuracy of *sea-water*, distinguish it as to its degrees of saltness and virtues, according to the nature of the seas where it is taken, and the depths from which it is drawn up. Count Marsigli always divides the *waters* of a deep sea into three portions, the upper, the middle, and the deep: each of these, according to him, reach to one third of the depth of the bed of *water* from the superficies to the bottom. The upper *water* he finds greatly to differ from the lower or deep *water* in its qualities and strength, but the middle portion to be always more nearly allied to one of the others; he therefore never takes any notice of the middle portion, but makes all his observations of the differences of *sea-water* from the upper and lower portions.

The *sea-water* is brighter and clearer than that of any river or pond, but this is not seen, as the whole body of it is viewed together, because then many various colours are reflected from its surface; but on taking up a large glass of it, and setting it in a still place, it is seen to have none of all the whole series of its colours when viewed at sea, being intirely owing to its motion, and the different reflections its waves have in different angles and directions.

The *sea-water* appears indeed coloured in its superficial part in some places, particularly about the mouths of large rivers; but this is not of its own nature, but is merely owing to the foul *water* of these rivers mixing itself with it, they being frequently yellowish or bluish, sometimes blackish, from the quantity of dirt they contain, or the various earthy particles which they wash off from their banks and bottoms in their passage.

As these fresh *waters* principally mix themselves with the superficial part of the *sea-water*, they extend themselves a great way, and give a foulness to the upper part of a vast quantity of *sea-water*, whose bottom part is all the while perfectly clear. These foul *waters* of rivers extend themselves also farther, or a less way into the sea, according to the way the wind sits; for if the wind blows directly into the mouth of the river, the surface is disturbed in such a direction, that the fresh *water* is beaten under, and blends itself below as well as above, and therefore tinges the surface for a much less extent: but if, on the contrary, the wind sits directly from the river, all its *waters* are blown on, without sinking so deep as they otherwise would, and the foulness is extended over a large surface, though it is not so considerable in degree.

The *water* of the sea taken up at great depths, is generally clear and bright, as has been observed; but this is not always the case, for in some places a quantity of it taken up in very deep *water*, and that near the bottom, is found fouled in the same manner as the superficial part is near the mouths of large rivers; and this, when strictly inquired into, is found to proceed from the same cause, the mixing of a foul river *water* loaded with particles of earth, which it has washed off from the substances it passed through, and containing large quantities of blue, black, or yellow earth, all which it would suffer to subside, if set by for a time in a still place. Count Marsigli has proved, that as rivers burst up in many places out of the surface of the dry ground, so they do also in several parts of the bottom of the sea: in these places they pour in their whole body of fresh *water*, which is fouler than that of our common rivers, because, in its subterranean passage, it has been surrounded on all parts with earth, and confined to a much fouler channel. The foul *waters* these mouths of rivers discharge from the bottom upwards into the *sea-water*, cannot but act upon that clear liquor, in the same manner as the superficial *waters* do on the surface, and both must be fouled alike. This author has particularly described one of these subterranean rivers opening into the sea from his own observations. This foulness in shallow *water* is sometimes seen through the clearer superficial part by the naked eye, and often, beside this, an observer thinks he sees many other colours in mid-*water*; but these are, for the most part, not inherent in the *water*, but are formed by the reflections of the clouds, *&c.* The *sea-water* being naturally clear, in deep places where it is not disturbed it appears blue, but in shallower *water* it often has different colours, which are owing to the reflections of the coloured matter at the bottom, which will give a tinge to the *water* in places, where not so near the eye as to be distinctly seen themselves. The clouds also give a sort of coloured appearance to the surface of the *sea-water*, in regard to our eye, though the *water* itself be really colourless as that of the purest spring. We have a familiar instance of this in the white look of the *sea-water* in the south seas at certain times: and, on the cuntrary, when any thing fouls the *sea-water*, and gives it a dusky colour, the clouds above add greatly to that appearance. This we see in the Euxine, which being very deep would naturally appear blue if the *water* were clear, but as it is often fouled with dusky matter, and clouds are frequent over it, it appears for a great part of the year absolutely black, and has thence obtained the name of the Black sea.

Count Marsigli commemorates also another singular instance of this effect of the clouds on the colour of the *sea-water*, which fell within his own observation. Being at the port of Cassis on the seventeenth of December, in the year 1706, at about an hour before sun-set, there arose a large cloud of a blood-red colour, of the nature of those usual in some evenings about sun-set, but accidentally very large, and strongly coloured: as this extended itself above, the *sea-water* under it appeared of the same colour, and looked as red as blood for a great extent, still spreading the same blood colour farther as the cloud extended. This remarkable phænomenon lasted till the darkness hid it; and the people of the place, who saw the sea blood coloured, paid no attention to the cloud above that caused this colour, but looked on it as a miraculous presage of war and bloodshed.

As the clouds in many cases thus evidently give colour to the *sea-water*, in regard to our eye, so the sun does the same thing in many others: but in all these cases it is to be observed, that the colours are so far from being real, that the *water* is all the time clear, pellucid, and colourless; only its different reflections, from these different occasions, present our eyes with colours, as the colourless glass prism, or the cut side or edge of a common looking-glass does.

The sun, as it shines with different force at different times, gives different tinges to the *water*, by shewing more or less plainly the substances which are at its bottom. This is evident from a familiar experiment of this author's, who fishing on the coasts with a live bait, which was a small red fish, and with a red line, observed, that when he let down his bait into the *water*, in places where the rocks kept off the sun's rays, he could only see his fish at the depth of seven yards; but that even there the fish and the line both appeared white, having lost to the eye their natural red colour: and that, on the contrary, when he let down the bait on the other side of the rock where the sun shone, he could see it perfectly plain at the depth of eleven yards; and at that greater depth, both the fish and the line appeared of their natural red colour. It is evident from this, in how great a degree the sun's rays affect the *water* in the shewing its contents; and it is very evident also, that upon this principle alone the same sea, with a coloured bottom, at some moderate depth, must appear coloured by that bottom in sunshiny weather, and not at all so in cloudy.

Beside the clouds, the sun, the foulness of rivers, and the different bottoms, it is certain that the winds also contribute greatly to give the colours we observe in *sea-water*. A tempest in the winter season, an hour or two before sunset, will shew all the colours that *sea-water* is capable of giving, and that without any other accident whatever to assist in it. The waves in this case striking violently against one another, beat off from each other a great number of globules of *water*, and these are thrown up to different heights and distances; then as the sun, now low and near the horizon, darts its rays obliquely upon them, they form several little rainbows, which are of greater and less extent, and of more or less duration, according to the circumstances of their ascent. The fresh *water* of some large rivers is also found to have, in particular places, the same effect where the

the ſtones lie high, and the waves break upon them; the globules of *water* are in the ſame manner raiſed from their ſurface, and little rainbows of ſhort duration are formed. Near the ſhores the *ſea-water*, inſtead of appearing of all this variety of colours, generally looks white: this is owing to the violent motion of the waves, in which they beat one againſt another, as alſo againſt the rocks and ſands, and by the mere agitation of their parts put on this colour. The *water* at theſe times ſeems, in theſe places, really of a milky nature, but as ſoon as it ſettles again into a calm, the clearneſs of the *water* returns, and no ſettlement happens in the whole body of it; which ſhews that it was not made white by the addition of any other matter to it, but only by the diſturbing of its own particles.

Theſe are all the various colours and appearances that the *ſea-water* puts on in different places, and on various occaſions; and we ſee, in the whole, that theſe differences are in general owing not to the alteration in its nature, but only in its change of parts in their directions to the eye, and in their breaking one againſt another, or receiving more or leſs light, or that from a clear or from a cloudy ſky. *Marſigli*, Hiſt. Phyſ. de la Mer.

Count Marſigli has gone through a long courſe of experiments upon *ſea-water*, and after a thouſand tedious proceſſes has obſerved, that three liquors alone are of power to ſhew the different nature of the *ſea-water* in various places, and that very readily: theſe only need, therefore, be carried abroad by thoſe who intend to make experiments of this kind. Theſe are an infuſion of mallow-flowers in *water*, made ſo ſtrong, as to be of a violet colour, ſpirit of ſal armoniac, and oil of tartar. The two laſt of theſe will always keep as long as there is occaſion; the other may be preſerved from decay by ſugar diſſolved in it in different quantities, according to the time it is to be kept, and the climate it is to be carried to; for this ingredient, if added in ſo large a quantity as twice the weight of the liquor, ſo as to make it a true ſyrup, does not prevent it from performing its office in theſe experiments; and in this ſtate it will keep every where, and ever ſo long. When intended for leſs ſevere trials, it may have a ſmaller proportion of the ſugar, and its effects will be then more ſudden and more manifeſt. This infuſion of mallow-flowers mixed with *ſea-water*, turns it to a greeniſh yellow colour, like that of the chryſolite. The ſpirit of ſal armoniac mixed with *ſea-water*, renders it turbid and muddy, and after a time a white ſediment is formed, and ſubſides by ſmall pieces at a time to the bottom of the glaſs. Oil of tartar occaſions the ſame change, but it does it with much more violence.

By mixing theſe liquors with *ſea-water*, taken up in different places, and at various depths, we ſee the different quantity of ſalt it contains manifeſted, by the more or leſs ſudden productions of theſe changes, and by the deepneſs or paleneſs of the colour, and the quantity of matter precipitated. The common attempts of ſweetning *ſea-water* are alſo eaſily proved by this means, for the more ſalt it contains, after theſe pretended ſweetnings, the more colour or precipitation it will occaſion in theſe mixtures; and the mixing them with it, if perfectly freed from its ſalt, will produce no change at all, as is evident by mixing them ſeverally with *ſea-water* carefully diſtilled; for as this proceſs intirely robs it of its ſalt, there is no ſort of alteration made in it by the mixing theſe liquids. Id. ibid.

The ſudden and ſurpriſing clearneſs of *ſea-water*, on certain occaſions, is a thing not yet accounted for: we have many inſtances given of the fact by the writers of voyages and travels, but one of the moſt remarkable is recorded in the Philoſophical Tranſactions, as having happened on the ſhores of Iceland. On the 13th of May, in the year 1642, all the ſea that beats upon the promontories of that coaſt, and which is uſually very thick and turbid, was for two days together ſo perfectly pellucid and ſhining, that the ſmalleſt ſtones and plants, and the ſea ſhells, where the *water* was forty fathom deep, were ſeen in ſo diſtinct a manner, that they appeared not more than four feet from the ſurface. The fiſhermen who were out in their boats, were ſo terrified at the unuſual appearance, that they left their buſineſs, and the whole country looked on it as a prodigy. Philoſ. Tranſ. N° 110.

In the making of common ſalt from *ſea-water*, it appears that there are other ſubſtances beſide ſalt contained in it, as there is a ſtony cruſt formed on the ſides of the pans, and a powder precipitated to the bottom at the corners; beſide theſe, there are ſome ſubſtances ſeparated from the *water* before it is let into the pan, during its ſubſidence in the ciſtern, and there alſo remain ſome afterwards mixed in the bittern, after all the ſalt is extracted from it. Vid. *Brownrig* of Salt, p. 74.

The *ſea-water* in its motion gathers up mud, ſand, and many other impurities, which ſoon ſubſide in the ciſtern; others, ſomewhat more intimately mixed, are ſeparated with the ſcum raiſed by the whites of eggs in clarifying the brine. But beſide theſe groſs ſubſtances, *ſea-water* contains a glutinous matter of a much finer texture, which is more intimately mixed in it: this Count Marſigli ſays is ſo light, as to riſe with the *water* when diſtilled in a ſand-heat, and therefore may eaſily be raiſed in vapour by the ſun, and falling may fecundate the fields, and promote the growth and nouriſhment of plants. This viſcous matter ſeems earthy, ſaline, and oleaginous; and this is the ſubſtance which, in ſtormy weather, forms a thick ſcum upon the ſurface of the waves; and to this viſcous part is chiefly owing the putrefaction of *ſea-water*, when ſuffered to ſtagnate: for it is evident that the whole ſea in any place will become fetid, when it has been calm for ſome time together, ſo that in ſhips becalmed people have often been threatened with ſickneſſes from the ſtench. Mr. Boyle records two inſtances of this, one in the African ſeas, the other near the Azores iſlands. In the putrefaction of *ſea-water* this ſlimy matter is attenuated, and its texture deſtroyed, and part of it flies off in fetid exhalations, while part ſubſides to the bottom. *Marſigli*, Hiſt. Phyſ. de la Mer. *Boyle* on the Saltneſs of the Sea.

Beſide this viſcous matter, *ſea-water* probably alſo holds an earthy ſubſtance, ſo very bright and ſubtile, that it is elevated in the foregoing proceſs along with the *watery* vapours, as well as the ſlimy matter. The walls of the houſes where ſalt is boiled are covered with this earth, and it ſeems of the nature of that earth contained in clear lime-*water*, which is known to ſubſide from it by proper methods, even after it has been raiſed in diſtillation.

Beſide this light earth, *ſea-water* contains another very coarſe one; this the ſalt-workers call *ſcratch*, and find it on the ſides and at the bottom of the corners of their pans. And it is very probable that this would be ſeparated from *ſea-water* by congelation, for if Briſtol-*water* be frozen, and thawed again, there is always an earth of this kind ſeparated from it; and the petrifying *water* at Knareſborough being frozen in the ſame manner, depoſits its ſtony or calcarious ſediment. Theſe earthy particles are not ſeparated from the *water* in the ſame ſtate in which they were ſuſpended in it, for when the *watery* particles are evaporated, then ſtony ones get together, and concrete in cluſters; and in this ſtate they can no more be diſſolved in *water*, unleſs they are again ſeparated into the ſame minute maſſes which they were in before. It is evident that this powder can riſe in vapour from the experiments of diſtillation, and accident has proved this yet clearer; for in the boiler of a fire-engine, if *water* be uſed which is highly impregnated with this ſtony matter, as is uſually the caſe with that which ariſes from among ſtrata of freeſtone, and the like, the cylinder into which the vapours riſe will be ſo filled with ſtony matter, that the piſton cannot riſe in it.

This powder is properly a ſparry matter, and is in general the ſame ſubſtance which forms incruſtations on the vegetables, &c. in ſprings. It has been found, and deſcribed by all authors who have analyſed *waters* of any kind. Dr. Collins, in his Diſcourſe on Salt and Fiſheries, calls it ſtone-powder; Dr. Liſter calls it *arena alba*, and *lapis albus* [a], white ſand and white ſtone; and Dr. Hoffman *pulvis candidus*, and in ſome other parts of his works *ſuccus maris ſalino-terreus calciformis* [b]. [a] *Liſter*, de Font. Med. Angl. [b] *Hoffman*, Oper. Tom. III.

Theſe particles are extremely ſmall and minute while ſuſtained in the *water*, as appears by their paſſing through paper with it in filtration, as has been proved by Dr. Plot in his experiments on it; and hence it is able to enter the veſſels of plants and animals, particularly the teſtaceous fiſhes, the ſhells of which it has great affinity to. It alſo forms the ſtalactitæ in caverns, and many other of the cruſtaceous foſſils. *Plot*, Hiſt. Staffordſhire, cap. 2. p. 109.

This earth is capable of being diſſolved in *water* in very conſiderable quantities, ſome of our ſalt ſprings affording a *water* which contains it in the proportion of one thirty-ſixth part of its own weight, which is nearly the ſame proportion in which common ſalt is found diſſolved in *ſea-water* in general. *Liſter*, de Font. Med. Angl. lib. 1. cap. 6. The great ſolubility of this earth in *water*, ſhews that it very nearly approaches to the nature of ſalts; and it is even found to enter into the compoſition of perfect ſalts, for being long expoſed to the open air, it imbibes the aerial vitriolic acid, and with it is converted into a neutral ſalt, which Liſter ranks among his calcarious nitres. This ſalt nearly reſembles the bitter purging ſalt of the Epſom-*waters*. It is of a highly alkaline quality, and turns a mixture of ſyrup of violets and *water* green.

The next ingredient of *ſea-water*, that offers itſelf in an analyſis of it, is ſalt: this is the moſt obvious of all others, and is contained in it in very different quantities at different times, and in different places. The Baltic ſea is very weakly impregnated with ſalt; the Engliſh and German ſeas are much more ſtrongly ſo, and the Mediterranean much more ſo than any other; and finally, the *water* on the coaſt of Moſambique is ſuppoſed much ſalter even than this. Mem. Acad. Par. 1711.

Father Feuillee, in paſſing through the Straits of Gibraltar towards America, obſerved the *ſea-water* to diminiſh in gravity as he approached the line. Dr. Hales found the *water* of the ſea, taken up near the buoy of the Nore, to contain $\frac{1}{29.5}$ of its whole weight in ſalt, and that of the Mediterranean contained $\frac{1}{27.5}$; and Count Marſigli found the

the *water*, taken from the ſurface of the Gulf at Lyons, to contain only $\frac{1}{32}$ of ſalt, while that of the ſame place, taken at a greater depth, contained $\frac{1}{29}$. From this that author argues for the ſeas being ſalter at greater depths than near the ſurface, but this might be owing to the falling in of the freſh-*water* rivers near that place; for Mr. Boyle found the *ſea-water* of our own ſeas to be of the ſame ſaltneſs at all depths: and indeed there is great reaſon for ſuppoſing, that in many places, where there falls in little freſh *water*, and where the ſun daily raiſes a great deal of *water* in vapour, it may remain much more ſalt near the ſurface than at great depths, juſt contrary to the foregoing ſuppoſition. *Hales*, Exper. on diſtilled *Sea-water*.

From late experiments it appears, that *ſea-water* is heavieſt and ſalteſt at great depths, and that it is of a temperate heat there; that is, 53 degrees of Fahrenheit's thermometer. See Phil. Tranſ. Vol. 47. p. 213, 214.

It is to be obſerved, that all the authors who have made experiments of this kind have evaporated *ſea-water*, and given the weight of the dry remainder as the quantity of ſalt contained in it; but this is not the true ſtate of the caſe, for this dry reſiduum always contains a quantity of the calcarious earth, or ſcratch, and of the ſalts of the bittern: beſide this, a certain quantity, more or leſs, of aqueous moiſture will remain in the ſalt, and this will alter its weight, as it will be in a greater or leſs proportion, according to the degree of fire uſed; and Mr. Boyle found that his reſiduum of the *water* of the Nore, which, when in the form of what he called a dry ſalt, was $\frac{1}{30}$ part of the *water*, when it had been well dried in a crucible, was but $\frac{1}{37}$ of the *water* uſed. *Boyle* of the Saltneſs of the Sea.

Beſide common ſalt, the *ſea-water* contains other ſalts, which are found in the bittern, or bitter brine remaining after the ſea ſalt is extracted. Firſt it contains a bitter purging ſalt, known in the ſhops under the name of *Epſom-ſalt*. This was firſt extracted from the Epſom, Dullwich, and other purging *waters*, but is now made only from the bittern at Newcaſtle, and other places; and it is chiefly to this bitter ſalt that the *ſea-water* owes its bitter taſte, though that has been ſuppoſed to proceed from bituminous matter contained in it, and often found on its ſurface, or lodged upon the rocks by its motion. Philoſ. Tranſ. N° 377, 378.

Another ſalt is alſo found in bittern, which is called a muriatic calcarious ſalt, its acid principle being ſpirit of ſea ſalt, and its baſis an earth nearly allied to quickſilver. This ſalt remains in the bittern after the purging ſalt has been extracted from it, and though it is a neutral ſalt, it cannot be made to ſhoot in cryſtals, but may be procured in a dry form by fire; but it is very difficultly kept in this form, being, of all other ſalts, the moſt ready to imbibe the *watery* particles of the air, and run *per deliquium*. *Hoffman*, Obſ. Chym. de Lixiv. a Sale relict.

Beſide theſe ſalts, the bittern contains a conſiderable portion of a fixed mineral alkali. Theſe principles are all found in boiling the *ſea-water* into ſalt. But beſide theſe there muſt be many other ſubſtances, which eſcape our ſearch in this manner, ſuch as the ſeeds and excrements of innumerable plants and animals, and the tinctures which thoſe plants and animals impart to it in their decay. Theſe, together with divers ſaline and ſulphureous particles, will naturally fall under the obſervation of thoſe who ſhall attempt a perfect analyſis of *ſea-water* by the nicer methods of chemiſtry; a thing yet much wanted in the learned world. *Brownrig* of Salt, p. 92.

Many ways have been attempted to arrive at the art of making *ſea-water* freſh and potable; the advantages of ſuch a thing are evident enough, but the difficulties very great. Liſter propoſes the doing it by means of ſea plants; theſe vegetables, like other plants, continually exhaling a large quantity of *water* in form of vapour, and that being all freſh, he propoſes on this baſis a diſtillation, without fire, in this manner. The body of a large ſtill, or alembic, is to be filled three parts with *ſea-water*, ſeveral freſh and growing ſea plants are to be put into this in their growing poſture, and the head being then fitted on, and a receiver adapted to the noſe, there will be a continual aſcent of vapours from the plant, which will condenſe into *water* in the head, and this will be thence conveyed into the receiver ſweet, clear, and every way fit for drinking. The quantity thus procured, however, though conſiderable in regard to the manner of its being obtained, can be but ſmall in proportion to the wants of a ſhip's company.

Mr. Kanton therefore attempted a more general method of doing it in quantities; to this purpoſe a large quantity of *ſea-water* is to be taken up in a proper veſſel, and as much oil of tartar *per deliquium* is to be added to this, as will render it turbid, and cauſe a large precipitation. After this the *water* is to be diſtilled, the furnace of the ſtill being ſo contrived as to take up very little room, and conſume but a ſmall quantity of fuel; the ſea itſelf may ſerve for a worm-tub, the worm paſſing out of the ſhip, and in again at another place. When the *water* is thus diſtilled, it is to be mixed with an alkaline earth, and after ſtirring thoroughly about, the earth is to be ſuffered to ſubſide to the bottom, and the *water* poured off clear; it is then ſaid by the inventor of this ſcheme to be perfectly ſweet, and no way diſtinguiſhable from the very pureſt river *water*. Phil. Tranſ. N° 67.

Another method of ſeparating ſalt from *ſea-water* without fire is propoſed in the Philoſophical Tranſactions: take a veſſel of wax, hollow within and every where tight, plunge it into the ſea, or other ſalt *water*, and there will be made ſuch a ſeparation, that the veſſel ſhall be full of ſweet *water*, the ſalt ſtaying behind. But though this *water* have no ſaltiſh taſte, yet a ſalt will be found in the eſſay. Philoſ. Tranſ. N° 7. p. 128.

To obtain freſh wholeſome *water* from *ſea-water*, Dr. Hales's method is to keep the *ſea-water* cloſe ſhut up till it has putrefied, and has again become ſweet, then to diſtill, three fourths of the *ſea-water* will be free both of the bittern and acid. Mr. Hales enters into a particular detail of the circumſtances which may make the practice of this ſupply of freſh *water* eaſy. Philoſ. Experim.

Drinking *ſea-water* with ſome wine, is ſaid to prevent people from being ſick at ſea. Act. Phyſ. Medic. Acad. Nat. Curioſ. Vol. V. Obſ. 84.

Sea-water, drank to the quantity of a pint, is a moderate purgative to moſt people. It has been of late much in faſhion, and is ſaid to be very beneficial in many caſes, particularly in glandular diſorders.

Simple-WATERS. In the diſtillation of *ſimple-waters*, a good general rule is this: take as much of the dried herb, as when cut ſmall will fill two thirds of the ſtill to be uſed; pour upon this as much rain *water* as will make the plant float commodiouſly, leaving however a fourth of the ſtill empty; digeſt this a while in a gentle heat, and then give fire enough to work the ſtill, and draw off ſo long as the *water* appears thick or milky, and taſtes of the herb. *Shaw's* Lect. p. 198.

It is a principal caution in this operation to remove the receiver before the more pellucid, acid, faint, and dead *water* comes over, as it will at length do, and by mixing with the reſt will ſpoil the whole, by giving it a vapid or faint taſte, and ſometimes a degree of acidity or vitriolic ſtypticity, or emetic quality; for part of the eſſential ſalt of the plant now riſing, corrodes the head of the ſtill, and carries over with it ſome particles of the metal: for which reaſon, ſuch *waters* ſhould be either diſtilled with a glaſs head, or a pewter one, or elſe the laſt running carefully watched, and not ſuffered to come over and mix with the firſt; for want of this caution, children, and perſons of tender habits, have been often vomited, purged, &c. contrary to the intention of the preſcriber, by a *ſimple-water*.

The *ſimple-waters* diſtilled by this method may often be too ſtrong to give alone, but then it is eaſy to let them down to a proper ſtrength with common *water*; which is beyond all compariſon better than to mix them with their own faints, or the liquor of their ſecond running.

There are yet however two methods of improving the common *ſimple-waters*, which might eaſily be put in practice: the firſt is the cohobating, and carefully digeſting the plant; the ſecond the fermenting it. With regard to the firſt, if the liquor remaining in the ſtill be expreſſed from the herb, and returned, along with all the *water* that came over, upon a freſh quantity of the ſame ſubject, and they be digeſted together in a gentle heat for two days, and then diſtilled as before, the *water* thus obtained will be much richer, and more efficacious than before; and if the ſame operation be repeated two or three times, thoſe who have not tried it cannot eaſily conceive how very rich a *ſimple-water* may by that means be made: and this is moſt neceſſary in diſtilling the *ſimple-waters* of roſes, elder-flowers, balm, and the like ſubjects, which afford but little oil, and otherwiſe make but weak *waters*.

The other method recommended, *viz.* by fermentation, is performed by adding to the plant and *water*, put together as for diſtillation, a tenth or twelfth part of ſugar or honey, or elſe a fortieth part of yeaſt; then ſetting the whole in a warm place to ferment for three or four days only, ſo that the herb may not fall to the bottom, nor the fermentation be above half finiſhed; then the whole being committed to the ſtill, a *water* may be procured at one operation, extremely rich, or impregnated with the whole virtue of the plant; and thus may *ſimple-waters* be made fit for long keeping without ſpoiling, the ſmall quantity of inflammable ſpirit generated in the fermentation ſerving excellently to preſerve them. *Shaw's* Lectures, p. 199.

Diſtilled-WATERS. To procure the *diſtilled-waters* of vegetables, or other ſubjects, pure and free from all mixture of the other principles of the body it was extracted from, let the *water*, as diſtilled, be put into a funnel lined with paper to be filtred, and the funnel being kept continually filled up, that the lighter oil may not come in contact with the paper, the *water* will be tranſmitted through, in a great meaſure, without the oil; but there ſtill remains ſome proportion of oily, and commonly of ſaline matter alſo in it. If the ſaline matter be acid, the way to deſtroy it is by mixing chalk, or any alkaline ſalt with the *water*, which being afterwards diſtilled again, will then riſe pure. If the plant were alkaline, and an alkaline ſalt be ſuſpended in the *water*, let it

be

be made a neutral one, by mixing fome acid, and then the *water* filtred and diftilled again. By thefe methods the *water* of vegetables is procured pure; and this is the way of proving, that the chemical principle *water* is lodged in, and may be feparated from all fuch fubftances. *Shaw's* Lectures, p. 150.

Cordial-WATERS. In the making of all compound fpirituous liquors, or, as they are called by the apothecaries, *cordial-waters*, the great care is to ufe a pure and well-rectified fpirit, as nearly infipid as poffible, that the flavour of it may not mix among the flavours of the other ingredients. It is the general cuftom to ufe the proof-fpirit, but it would be infinitely better to ufe the alcohol, or totally inflammable; partly, as the ftrength of the *water* would be much better afcertained that way, the proof ftrength determined by the crown of bubbles being very vague and uncertain, and that of the alcohol or totally inflammable fpirit perfectly fixed and certain; and becaufe this fpirit is always more free from the oil of the ingredient it is made from, and on that account not only approaches more to that fo much defired thing, a pure and taftelefs fpirit, but being free from oil of its own is the more hungry, the more ready to imbibe that of the ingredients added to it, and has no overpowering tafte to give of its own.

If the method of ufing alcohol be not chofen, let a fine, clear, and pure melaffes fpirit of the proof ftrength be ufed, without any farther addition of *water* in the ftill, an additional quantity of *water* only taking up room to very bad purpofe, and prolonging and prejudicing the operation; and when alcohol is employed, it fhould only be mixed with an equal quantity of pure *water*, to reduce it to the proof ftrength. When the choice of a fpirit is thus fettled, the next thing to be had regard to is the matter of digeftion, for without this many ingredients will not part with their flavour and virtues at all, and many others but very imperfectly. Cinnamon in particular, if not macerated in the fpirit a long while before diftillation, will not part with its heavy oil, which will therefore be left in the ftill, and thrown away, while the flightly impregnated fpirit is faved.

When the ingredients have ftood a due time in digeftion, according to their feveral natures, the fpirit is to be drawn from them in the manner that beft tends to bring over their virtues, whereon the character and expectation of the *water* is founded; fo if the ingredients naturally abound in a heavy vifcous oil, the operation fhould be performed with a brifker fire, than when the oil is thin, light, and etherial. Thus ftrong cinnamon-*water*, after a fufficient digeftion to loofen the oil, may be drawn over fmarter, or with a brifker fire, than citron-*water*, the fpirit of mint, or the like, in which the oil of the ingredient is thin, and will eafier afcend with the fpirit.

The capital thing in this compound diftilling refts here, that a fufficient quantity of the fine effential oil of the ingredients be received into, and mixed with the fpirit, while the groffer, lefs fubtile, and lefs agreeable oil is thrown out. To effect this to any degree of perfection, requires that the operation be well conducted from the beginning, that the receiver be changed in due time, and that the fpirit be prudently made up.

When no regard is had to thefe three particulars, as is ufually the cafe among the apothecaries, the confequence is, that the *cordial-water* becomes a thick, turbid, and milky liquor, and taftes more like what the diftillers call faints, than like a *cordial-water*, and is fitted to give ficknefs rather than to cure it. At leaft, before it can be ufed, it muft either ftand a long time to fine itfelf, if ever it will fine, or have its grofs and terreftrial parts precipitated by art. On the contrary, when thefe rules are prudently obferved, the *water* proves, without farther trouble, clean tafted, clear, brifk, pleafant, and refrefhing.

The diftillers in general make their compound *waters* in a much neater manner than the apothecaries; and what has led them into the way of doing fo, is their ftrict obfervance of the bubble proof, a thing which the apothecaries feem either not to underftand, or to pay very little regard to.

The diftillers, in the making of their compound *waters*, find, that if they let the faints run in among the clear fpirit, it kills the proof, as they call it, before the time; hence they are inftructed to leave the faints out, and to make up the fpirit with pure *water*, referving the faints to other ufes, to which they are better adapted, as containing a copious oil; or they let the ftill work longer than the procefs for making the *water* would require, and by this means obtain a larger quantity of oil than is commonly imagined: this they preferve feparate, if the oil of only fome one ingredient; and they fell large quantities of the oils of juniper, anife and caraway, and the like, to the druggifts, chemifts, and apothecaries. But this is a very fcandalous cheat on the buyer, for there is a very great difference between a pure and clear effential oil, that is perfect and intire, and fuch a one as has, in this manner, been robbed of its lighter and finer parts by diftillation with a fpirituous menftruum.

It is a general rule in this bufinefs to change the receiver as foon as the fpirit runs proof, and make up the quantity with *water*: in this cafe, the whole is certain to be clean and fine; but there are fome cafes, as in particular in the diftilling of cinnamon-*water*, where a fmall quantity of the faints ought to be fuffered to come into the fpirit: but this is to be obferved by way of ftint, that fo much is never to be allowed of the faints as will make the *water* milky; for the *water* fhould always be kept in the ftate of full proof, as it mellows and ripens, as they exprefs it, much fooner in this than in any other ftate. But if the cuftom could be univerfally introduced, it would be better that all the *waters*, kept by the apothecaries, fhould be juft in the ftate in which they came over, that is, three fifths of the quantity of the proof fpirit put into the ftill: if this were generally brought about, it would be eafy for the phyficians to regulate the dofes in their prefcriptions accordingly; every draught and julep that they entered into would be the better for it. *Shaw's* Effay on Diftillery.

Dr. Shaw in another treatife, after obferving that the apothecaries ufually fucceed but ill in diftilling *cordial-waters*, lays down the four following rules, by the obfervance of which the art of making thefe *waters* might be brought to great perfection.

The firft is, to ufe a well-cleanfed fpirit that is freed from its own effential oil, for as the defign of compound diftillation is to impregnate a fpirit with the effential oil of the ingredients, it ought firft to be deprived of its own.

The fecond rule is, to fuit the time of the digeftion of the ingredients to their tenacity, or the ponderofity of their oil: thus rhodium wood and cinnamon require to be longer digefted, before they are diftilled, than calamus aromaticus, or lemon-peel. Sometimes alfo cohobation, or the pouring of the fpirit already diftilled back upon the ingredients, proves neceffary, as particularly in making the ftrong cinnamon-*water*, where the effential oil is extremely ponderous, and difficultly rifes along with the fpirit without this cohobation.

The third rule is, to fuit the degree of fire, or ftrength of the diftillation, to the ponderofity of the oil intended to be raifed with the fpirit: thus ftrong cinnamon-*water* fhould be diftilled off brifker than the fpirit of mint or balm.

The fourth rule is, that a due proportion of only the finer effential oil of the ingredients be thoroughly united, or incorporated with the fpirit, fo as to keep out the groffer and lefs fragrant oil. This may chiefly be effected by leaving out the faints, and making up to ftrong proof with fine foft *water* in their ftead.

The addition of fugar to *cordial waters* is a thing of little moment, and may therefore be omitted. If the four rules before laid down be duly obferved, there is no occafion for diftilling in balneo mariæ, nor for fining down *waters* with alum, whites of eggs, ifinglafs, or the like, for they will be prefently bright, fweet, and pleafant tafted, without any farther trouble. *Shaw's* Lectures, p. 127.

Motion of WATER, in hydraulics. The theory of the motion of running *water* is one of the principal objects of hydraulics, and many eminent mathematicians have applied themfelves to this fubject. But it were to be wifhed that their theories were more confiftent with each other, and with experience. The curious may confult Sir *Ifaac Newton's* Principles, lib. 2. prop. 36. with the comment. *Dan. Bernoulli's* Hydrodynamica. *Jo. Bernoulli*, Hydraulica, Oper. Tom. IV. p. 389, feq. Dr. *Jurin*, in the Philof. Tranfactions, N° 452, and in Dr. *Martyn's* Abridg. Vol. VIII. p. 282, feq. *'sGravefande*, Phyfic. Elem. Mathemat. lib. 3. pars 2. *Polenus*, de Caftellis, and others. Mr. Mac Laurin, in his Fluxions, art. 537, feq. has illuftrated Sir Ifaac Newton's doctrine on this intricate fubject, which ftill, notwithftanding the labours of all thefe eminent authors, remains in a great meafure obfcure and uncertain. Even the fimpleft cafe of the motion of running *water*, which is when it iffues from a hole in the bottom of a veffel kept conftantly full, has never yet been determined, fo as to give univerfal fatisfaction to the learned. We fhall here mention fome of the phænomena of this motion, as ftated by Dr. Jurin from Polenus.

1. The depth of the *water* in the veffel, and the time of flowing out being given, the meafure of the effluent *water* is nearly in proportion to the hole.

2. The depth of the *water*, and the hole being given, the meafure of the effluent *water* is in proportion to the time.

3. The time of flowing out, and the hole being given, the meafure of the effluent *water* is nearly in a fubduplicate proportion to the height of the *water*.

4. The meafure of the effluent *water* is nearly in a ratio compounded of the proportion of the hole, the proportion of the time, and a fubduplicate proportion of the depth of the *water*.

5. The meafure of the *water* flowing out in a given time, is much lefs than that which is commonly affigned by mathematical theorems. For the velocity of effluent *water* is commonly fuppofed to be that which a heavy body would acquire in vacuo in falling from the whole height of the *water* above the hole; and this being fuppofed, if we call the area of the hole F, the height of the *water* above the hole A, the velocity which a heavy body acquires in falling in

in vacuo from that height V, and the time of falling T; and if the *water* flows out with this conſtant velocity V, in the time T, then the length of the column of *water*, which flows out in that time will be 2 A, and the meaſure of it will be 2 AF. But if we calculate from Poleni's [a] accurate experiments, we ſhall find the quantity of *water* which flows out in that time to be no more than about $\frac{571}{1000}$ of this meaſure 2 AF.—[[a] *Polen.* de Caſtellis, art. 35, 38, 39, 42, 43.]

Poleni alſo found, that the quantity of *water* flowing out of a veſſel through a cylindrical tube far exceeded that, which flowed through a circular hole made in a thin lamina, the tube and hole being of equal diameter, and the height of the *water* above both being alſo equal; and he found it to be ſo when the tube was inſerted, not into the bottom, which others had obſerved before, but into the ſide of the veſſel.

6. Since the meaſure of the *water* running out in the time T, is 2 A F $\times \frac{571}{1000}$, the length of the column of *water* which runs out in that time, is 2 A $\times \frac{571}{1000}$. Therefore if each of the particles of *water*, which are in the hole in the ſame ſpace of time, paſſes with equal velocity, it is plain that the common velocity of them all is that with which the ſpace 2 A $\times \frac{571}{1000}$ would be gone over in the time T, or the velocity V $\times \frac{571}{1000}$. But this is the velocity with which *water* could ſpring in vacuo to near $\frac{1}{3}$ of the height of the *water* above the hole.

7. But when the motion of *water* is turned upwards, as in fountains, theſe are ſeen to riſe almoſt to the entire height of the *water* in the ciſtern. Therefore the *water*, or at leaſt ſome portion of the *water*, ſpouts from the hole with almoſt the whole velocity V, and certainly with a much greater velocity than V $\times \frac{571}{1000}$.

8. Hence it is evident, that the particles of *water*, which are in the hole in the ſame point of time, do not all burſt out with the ſame velocity, or have no common velocity; though ſome mathematicians have hitherto taken the contrary to be certain.

9. At a ſmall diſtance from the hole, the diameter of the vein of *water* is much leſs than that of the hole. For inſtance, if the diameter of the hole be 1, the diameter of the vein of *water* will be $\frac{21}{25}$, or 0.84, according to Sir Iſaac Newton's meaſure, who firſt obſerved this phænomenon; and according to Poleni's meaſure $\frac{20}{26}$, or $\frac{20\frac{1}{2}}{26}$, that is, taking the mean diameter 0.78, nearly.

As to the manner of accounting for theſe phænomena we have already obſerved that authors are not agreed; and it would be far beyond our deſign to ſtate their different theories, we muſt therefore refer to the originals above quoted.

Neither are authors agreed as to the force with which a vein of *water*, ſpouting from a round hole in the ſide of a veſſel, preſſes upon a plane directly oppoſed to the motion of the vein. Moſt authors agree that the preſſure of this vein, flowing uniformly, is equal to the weight of a cylinder of *water*, the baſis of which is the hole through which the *water* flows, and the height of which is equal to the height of the *water* in the veſſel above the hole. The experiments made by Mariotte and others ſeems to countenance this opinion. But Mr. Daniel Bernoulli rejects it, and eſtimates this preſſure [b] by the weight of a cylinder, the diameter of which is equal to the contracted vein, (according to Sir Iſaac Newton's obſervation above mentioned) and the height of which is equal to twice the height of the *water* above the hole, or, more accurately, to twice the altitude correſponding to the real velocity of the ſpouting *water:* and this preſſure is alſo equal to the force of repulſion [c], ariſing from the reaction of the ſpouting *water* upon the veſſel. For he ſays that he can demonſtrate, that this force of repulſion is equal to a preſſure exerted by a vein of ſpouting *water* upon a plane directly oppoſed to its motion, if the whole vein of *water* ſtrikes perpendicularly againſt the plane. From whence it would follow, that the preſſure or force of the vein will be greater in proportion, as its contraction is leſs; and this contraction vaniſhing, as it does when the *water* ſpouts thro' a ſhort tube, and the vein being at the ſame time ſuppoſed to have the whole velocity it can acquire by theory, the ſpouting *water* will then exert a preſſure double to what is commonly ſuppoſed. But the actual velocity of the *water* being always ſomething leſs than it ought to be by theory, and the vein of *water* being not uncommonly contracted to almoſt one half, experiments have led authors to think that the preſſure, exerted by ſpouting *water*, was equal to the weight of a cylinder of the ſame diameter with the vein, and of the height of the *water* above the hole. The ingenious author remarks, that he ſpeaks only of ſingle veins of *water*, the whole of which are received by the planes upon which they preſs: for as to the preſſures exerted by fluids ſurrounding the bodies they preſs upon, as the wind, or a river, the caſe is different, though confounded with the former by writers on this ſubject.—[[b] Hydrodynamica, ſect. 13. p. 289. [c] Ib. p. 279.]

Mr. Bernoulli endeavours to confirm his theory by a diſſertation in the eighth volume of the Acta Petropolitana [d]; where he obſerves, that the experiments formerly [e] made before the Academy of Sciences at Paris, to eſtabliſh the quantity of the preſſure exerted by a vein of ſpouting *water*, are very far from proving the truth of the rule they are brought to eſtabliſh. For inſtance, in one of thoſe experiments, the height of the *water* in the veſſel above the hole from whence the vein ſpouted was two feet Paris meaſure, the diameter of the circular hole which was cut in the horizontal bottom of the veſſel was four lines, and the force of the vein of *water* was obſerved to be one ounce and three quarters. But the weight of a cylinder of *water* of the diameter of the hole, and of the height of the *water* in the veſſel, is ſcarce equal to one ounce and three eighths. The difference therefore is at leaſt $\frac{3}{8}$ of an ounce, which is about $\frac{3}{11}$ of the whole weight of the beforementioned cylinder of *water*. So that it is ſurpriſing, that this difference ſhould have been aſcribed to the removal of the plane, receiving the impulſe, to ſome diſtance from the hole; for this cauſe, ſuppoſing the plane removed to the diſtance of two inches, could not produce an increaſe of $\frac{1}{18}$ of an ounce. It appears therefore, that the common opinion is rather overturned, than confirmed by experience.—[[d] P. 114. [e] *Du Hamel*, Hiſt. Acad. Paris, An. 1679. ſect. 3. cap. 5.]

Mr. Bernoulli, on the other hand, thinks his own theory ſufficiently eſtabliſhed by the experiments he relates; for the particulars of which, we refer to the Acta Petropolitana, Vol. cit. p. 122, ſeq.

This ingenious author thinks, that his theory of the quantity of the force of repulſion, exerted by a vein of ſpouting *water*, might be uſefully applied to move ſhips by pumping; and he thinks the motion produced by this repulſive force would fall little, if at all, ſhort of that produced by rowing. He has given his reaſons and computations at length in his Hydrodynamica, p. 293 to 302.

The ſcience of the preſſures exerted by *water*, or other fluids in motion, is what Mr. Bernoulli calls *hydraulico-ſtatica*. This ſcience differs from hydroſtatics, which conſiders only the preſſure of *water* and other fluids at reſt; but hydraulicoſtatics conſiders the preſſure of *water* in motion. Thus the preſſure exerted by *water* moving through pipes, upon the ſides of thoſe pipes is an hydraulico-ſtatical conſideration, and has been erroneouſly determined by many, who have given no other rules in theſe caſes, but ſuch as are applicable only to the preſſure of fluids at reſt. See Hydrodynam. ſect. 12. p. 256, ſeq.

Raiſing of WATER, in hydraulics. The great uſe of raiſing *water* by engines for the various purpoſes of life are well known. Machines have in all ages been contrived with this view, a detail of the beſt of which, with the reaſons of their conſtructions, would be very curious and inſtructive. Monſieur Balidor has executed this in part in his Architecture Hydraulique, and it is to be hoped that he will ſoon finiſh that uſeful undertaking. Dr. Deſaguliers has alſo given us a deſcription of ſeveral engines to raiſe *water*, in his Courſe of Experimental Philoſophy, Vol. II. not to mention the compilers of treatiſes under the title of Theatres of Machines, &c.

Dr. Deſaguliers [f] has ſettled the maximum of engines for raiſing *water* thus: a man with the beſt *water*-engine cannot raiſe above one hogſhead of *water* in a minute, ten feet high, to hold it all day; but he can do almoſt twice as much for a minute or two. [[f] Experim. Philoſ. Vol. II. p. 498.]

Dr. Deſaguliers obſerves [g], that when we come to examine the beſt engines, and thoſe that are moſt cried up, if we look narrowly into them, and meaſure the *water* they deliver, and at what height they deliver it; or bring to calculation the beſt atteſted relations concerning them, we ſhall find that they do not exceed this maximum, though they may far outdo ſome very bad engine that they are compared with. —[[g] Ibid.]

The famous machine at Marli, though it has many ingenious contrivances, muſt yet be reckoned a bad one, if we conſider the vaſt loſs of force in it. This loſs, according to Mr. Daniel Bernoulli's [h] computation, is not leſs than $\frac{55}{56}$ of the abſolute force of the machine.—[[h] Hydrodynam. p. 182.]

Mr. Daniel Bernoulli [i] thinks that a man may, with the moſt perfect machine, raiſe one cubic foot of *water*, in one ſecond of time, to the height of one foot. But by an experiment he made at Geneva with a good pump, he found that a man could not raiſe above four fifths of that quantity. —[[i] Hydrodyn. p. 199.]

Yet the greateſt quantity, mentioned by Mr. Bernoulli, falls ſhort of Dr. Deſaguliers's maximum: for according to the Doctor's rule, one hogſhead being equivalent to eight cubic feet, and the raiſing one hogſhead of *water* to the height of 10 feet being equivalent to the raiſing 10 hogſheads of *water*, or 80 cubic feet, to the height of one foot, it follows, that a man may raiſe 80 cubic feet of *water*, in one minute, to the height of a foot. But by Mr. Bernoulli's rule, he can only raiſe 60 cubic feet of *water* to that height in the ſame time.

Engines for raiſing *water* are either ſuch as throw it up with a great velocity, as in jets; or ſuch as raiſe it from one place to

to another by a gentle motion. For the general theory of theſe engines, ſee *Daniel Bernoulli*'s Hydrodynamica, ſect. 9.

WATERS, among farriers, the name given to a diſtemperature of horſes. The hinder legs of theſe creatures are very ſubject to a defluxion of certain white, ſharp and corrupt humours, or *waters*, as they call them, which happen very rarely to the fore legs.

This diſeaſe is diſcovered by ſearching the paſterns, where, if a moiſtneſs is felt beneath the hair, and is extremely ſtinking, there is danger of its growing to the utmoſt height of this diſeaſe, in which it will grow all round the paſtern and paſtern joint, and ſometimes almoſt up to the very ham. Theſe *waters* frequently cauſe the paſterns to ſwell, keeping the legs ſtiff, and making the horſe lean; finally, they often ſeparate the fleſh from the coronet near the heel. This diſeaſe is very obſtinate and ſtubborn when once rooted in the horſe. It may eaſily be ſtopt in the beginning, but when of any continuance, it is an error to attempt to ſtop it, for if dried up ever ſo often, it will always return again. It is in vain to attempt a cure of this diſeaſe in the winter, unleſs it be but juſt begun; but in the ſummer ſeaſon all attempts ſucceed better, and what the farriers call the white honey charge has ſurpriſing effects, often performing a cure alone.

Some farriers diſtinguiſh between the *waters* and what they call *watery ſores*, though others call them only degrees of the ſame diſtemper. Thoſe who diſtinguiſh them, deſcribe the *watery* ſore as a white, corroſive, and malignant matter, iſſuing out of the pores of a horſe's leg, uſually on the lower part only, but ſometimes all over it; and beginning from a ſtinking matter, deadening the ſkin of the paſtern and fetlock, and by degrees looſening the hoof from the coronet at the heel. The breaking out of this matter is always uſhered by a ſwelling of the lower part of the leg, and attended with pain; and the humour at length acquiring a ſharp and venomous quality, it is attended with warts, clefts, and nodes, which in proceſs of time over-run the whole part, and render the cure very difficult.

This diſeaſe generally appears firſt on the outſide of the paſtern, and by degrees riſes up to the middle of the leg, peeling off ſome part of the hair all the way. The method of cure ſhould be this: as ſoon as a horſe is ſiezed with the diſtemper, he ſhould be blooded ſparingly, at the utmoſt not exceeding two pounds; after this he ſhould take large doſes of a decoction of guaiacum, or of box-wood, twice every day for eight days; after this he is to take three or four briſk purges, and then to have recourſe to the decoction again. In the interim, the hair muſt be all clean ſhaved off from the diſtempered part of the leg, and it muſt be rubbed with a wiſp of hay very often, and the *watery* ſores in it anointed with the following ointment. Take a pound of black ſoap, three ounces of ſpirit of wine, two ounces of common ſalt, and three ounces of burnt alum; there is to be as much meal or flower added to theſe, as will make the whole into a proper conſiſtence: this is to be laid on all the ſores without any covering or bandage, and the next morning it is to be waſhed off with a lee of aſhes freſh made. This anointing and waſhing is to be repeated every day, and between the effect of this, and of the internal remedies, the diſeaſe ſeldom fails of a cure, if it be not very obſtinate, or of very long ſtanding.

Bird-lime-WATER. See LIME-*twigs*, *Suppl.*

Citron-WATER. See the article CITRON-*water*, *Append.*

Diſtilled-WATERS. See the article DISTILLED, *Suppl.*

Diſtilled-WATERS of laurel-leaves poiſonous. See the article LAUROCERASUS.

Egra-WATER. See the article EGRANA *aqua*, *Suppl.*

Hay-WATER. See the article HAY, *Suppl.*

Montroſe-WATERS. See the article MONTROSE, *Suppl.*

Pepper-WATER. See the article PEPPER, *Suppl.*

Pyrmont-WATER. See the article PYRMONT, *Suppl.*

Quickſilver-WATER is made with four ounces of quickſilver to two quarts of ſpring *water* boiled to one quart.

This is reckoned an efficacious medicine in ſeveral caſes, as the worms and the itch in children, by Dr. Cheyne and others.

Rain-WATER. See the article RAIN, *Suppl.*

Sorrance-WATERS. See the article SORRANCE, *Suppl.*

Spa-WATER. See the article SPA-*water*, *Suppl.*

Tar-WATER. See the article TAR, *Suppl.*

Tiberiades-WATER. See the article TIBERIADES, *Suppl.*

Vitriolic-WATER. See the article VITRIOLIC, *Suppl.*

Ziment-WATER. See the article ZIMENT, *Suppl.*

WATER-*bellows*. See the article BELLOWS, *Suppl.*

WATER-*calaminth*, the name uſed by ſome for a ſpecies of *mint*. See the articles MINT and MENTHA, *Suppl.*

WATER-*creſs*, the name by which ſome call the *ſiſymbrium*, a diſtinct genus of plants. See the article SISYMBRIUM, *Suppl.*

WATER-*drop-wort*. See the article DROP-*wort*, ſupra.

WATER-*engine*, in mechanics. This term is ambiguous; for it may either ſignify an engine to raiſe *water*, or any engine that moves by the force of *water*.

WATER-*germander*. See the article GERMANDER, ſupra.

WATER-*hemp-agrimony*. See the article *Water*-HEMP, ſupra.

WATER-*lilly*. See the article LILLY, ſupra.

WATER-*parſnep*. See the article PARSNEP, ſupra.

WATER-*pepper*. See the article PEPPER, ſupra.

WAX (*Suppl.*)—*Thorough*-WAX, in botany, the name by which ſome call the *bupleurum*, or hare's ears. See the article HARE's *ears*, *Suppl.*

WAY, (*Suppl.*) the ſame with *weigh*. See WEIGH, *Cycl.*

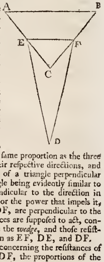
WAYFARING-*tree*, a name ſometimes given to the *viburnum*. See the article VIBURNUM, *Suppl.*

WEATHER (*Cycl.* and *Suppl.*)—WEATHER-*boarding*, among carpenters, &c. denotes the nailing up of boards againſt a wall, and ſometimes the boards themſelves when thus nailed up. Build. Dict. in voc.

WEATHER-*tiling*, among workmen, the covering the upright ſides of houſes with tiles. Id. ibid.

WEB-*caſe*, in natural hiſtory, the Engliſh name for what zoologiſts more uſually call *aurelia*, or *chryſalis*. See the article CHRYSALIS, *Append.*

WEDGE (*Cycl.*)—The effect of the *wedge* may be thus explained: Let ABC repreſent a *wedge* driven into the cleft EDF, of which DE and DF are the ſides; and if we ſuppoſe thoſe ſides DE and DF to react upon the *wedge* with directions perpendicular to DE and DF, let the horizontal line EF meet DF in F: then when the force impelling the *wedge*, ſuppoſed perpendicular to the horizon, is in equilibrio with the reſiſtances of the ſides of the cleft DE and DF, theſe three powers are in the ſame proportion as the three right lines EF, DE, and DF. But it follows from the compoſition of motion, that when three powers are in equilibrio with each other, they are in the ſame proportion as the three ſides of a triangle parallel to their reſpective directions, and conſequently, as the three ſides of a triangle perpendicular to their directions; ſuch a triangle being evidently ſimilar to the former. But EF is perpendicular to the direction in which the weight of the *wedge*, or the power that impels it, is ſuppoſed to act; and DE, DF, are perpendicular to the directions in which their reſiſtances are ſuppoſed to act, conſequently the power that impels the *wedge*, and thoſe reſiſtances, are in the ſame proportion as EF, DE, and DF.



If other ſuppoſitions are made, concerning the reſiſtances of the ſides of the cleft DE and DF, the proportions of the powers may be determined from the ſame principles. See *Mac Laurin*'s Account of Sir Iſaac Newton's Philoſophical Diſcoveries, p. 168, ſeq.

Mechanical writers have differed very much in determining the properties of the *wedge*, or the proportion between the moving force, and the reſiſtance the *wedge* meets with. In ſplitting of timber, the proportion here mentioned ſeems to take place, and that mentioned in the Cyclopædia wrong. In other caſes, different proportions might obtain; for a detail of which *Varignon*'s Nouvelle Mechanique, ſection 8. Vol. II. p. 149, ſeq. may be conſulted. See alſo 's*Graveſande*, Phyſ. Elem. Mathem. lib. I. cap. 14. ſchol. I.

WEED (*Suppl.*)—*Dyer*'s WEED, the Engliſh name of a genus of plants, known among botaniſts by that of *luteola*. See the article LUTEOLA, *Suppl.*

Silver-WEED, *pentaphylloides*, in botany, a diſtinct genus of plants. See the article PENTAPHYLLOIDES, *Suppl.*

WELL (*Suppl.*)—WELL, in ſhip-building, a ſquare place parted off and planked round the main-maſt, from the gun-deck down to the foot-waaling, to keep the ballaſt, &c. from the pumps placed therein. *Blanckley*'s Naval Expoſitor, in voc.

WHEAT, in botany, the Engliſh name of a diſtinct genus of plants, called by authors *triticum*. See the article TRITICUM, *Suppl.*

Cow-WHEAT, the Engliſh name of a diſtinct genus of plants, called *melampyrum* by botanical writers. See the article MELAMPYRUM, *Suppl.*

French-WHEAT, or *Buck*-WHEAT, in botany, a genus of plants, called by botaniſts *fagopyrum*. See the article FAGOPYRUM, *Suppl.*

Indian-WHEAT, a name ſometimes given to the *maiz* or *yucca*. See the articles MAIZ and YUCCA, *Suppl.*

WHEE, or WHEY, a word uſed in the northern parts of the kingdom for a heifer, or young cow. Ruſt. Dict. in voc.

WHEELS (*Cycl.*)—The *wheels* of all carriages ought to be exactly round, and the fellies ſhould be at right angles to the naves, according to the inclination of the ſpokes; that is, the plane of the curvature of the *wheel* ſhould cut the nave at right angles, though it need not paſs through the place where the ſpokes are inſerted into the nave.

The reaſon why the ſpokes ought to be inclined to the nave, ſo as the *wheels* may be diſhing, or concave, is this: in paſſing over unequal ground, that *wheel* which is in the rut bears

bears a greater part of the weight than the other, as being lower; now, in ſuch a caſe, the ſpokes of a diſhing *wheel* become perpendicular, and therefore have the greateſt ſtrength; whilſt the oppoſite *wheel*, being upon higher ground, bears a leſs part of the weight, and conſequently the ſpokes need not be at their full ſtrength. Indeed, if *wheels* always turned upon ſmooth and level ground, the ſpokes ought to be ſtrait upon the naves, or at right angles to their axes.

As to the axel-trees of *wheels*, they ought to be ſtrait in all reſpects, and at right angles to the ſhafts, or to the pole. It would alſo be much more advantageous to make the four *wheels* of a coach or waggon large, and nearly of a height, than to make the fore-*wheels* of only half the diameter of the hind-*wheels*, as is uſual in many places. Carriages too with four *wheels* have greatly the advantage of thoſe with two: for in applying horſes to a cart, or chaiſe with two *wheels*, it is plain that the tiller carries part of the weight, in what manner ſoever it be kept in equilibrio upon the axel-tree. In going down a hill, the weight bears upon the horſe; and in going up hill, the weight falls the other way and lifts the horſe, by which means part of his force is loſt. Beſides, as the *wheels* ſink into the holes in the road, ſometimes on one ſide, ſometimes on the other, the ſhafts ſtrike againſt the tiller's flanks, which is the deſtruction of many horſes. Add to this, that when one of the *wheels* ſinks into a hole or rut, half the weight will fall that way, whereby the cart will be in danger of being overturned.

We have a great many more obſervations concerning *wheel*-carriages in *Deſaguliers*'s Experim. Philoſoph. p. 201, ſeq.

Blowing-WHEEL, (*Suppl.*) a machine contrived by Dr. Deſaguliers for drawing out the foul air of any place, or for forcing in freſh, or doing both ſucceſſively without opening doors or windows. See Phil. Tranſ. N° 437.

The intention of this machine is the ſame as that of Dr. Hales's ventilator, but not ſo effectual, nor ſo convenient. See *Deſagul.* Courſe of Exper. Philoſ. Vol. II. p. 563—568. This *wheel* is alſo called a *centrifugal-wheel*, becauſe it drives the air with a centrifugal force.

Water-WHEEL *of a mill*, that which receives the impulſe of the ſtream by means of ladle-boards or float-boards. See the article FLOAT-*boards*, *Append.*

Mr. Parent, of the Academy of Sciences, has determined the greateſt effect of an under-ſhot *wheel* to be, when its velocity is equal to the third part of the velocity of the water that drives it. See MACHINE, *Append.*

In fixing an under-ſhot *wheel*, the workmen ought to conſider whether the water can run clear off, ſo as to occaſion no back-water to ſtop its motion. For a farther account of *water-wheels*, ſee *Deſaguliers*, Experim. Philoſ. Vol. II. p. 422, ſeq.

WHICKEN, a name ſometimes uſed for the *ſorbus*, or quick-beam. See the article SORBUS, *Suppl.*

WHIN, or GORSE, a name uſed in ſeveral parts of the kingdom for the *ulex* or *geniſta ſpartium* of botaniſts. See the article GENISTA *ſpartium*, *Suppl.*

WHIST, or WHISK, a well known game at cards. Several caſes of this game have been the objects of mathematical computations. Thus Mr. de Moivre has ſolved this problem: To find the odds that any two of the partners, that are pitched upon, have not the four honours? Mr. de Moivre concludes from his ſolution,

1°. That it is 27 to 2, nearly, that the dealers have not the four honours.

2°. That it is 23 to 1, nearly, that the eldeſt have not the four honours.

3°. That it is 8 to 1, nearly, that neither one ſide nor the other have the four honours.

4°. That it is 13 to 7, nearly, that the two dealers do not reckon honours.

5°. That it is 25 to 16, nearly, that either one ſide or the other do reckon honours, or that the honours are not equally divided.

The ſame learned author alſo determines, that the odds for the partners who are eight of the game, if dealers, againſt thoſe who are nine, is nearly as 17 to 11. But if thoſe who have eight of the game are eldeſt, the odds will be 34 to 29. And that without conſidering whether thoſe who are eight are dealers, or eldeſt, there is one time with another 7 to 5, nearly. But thoſe who have furniſhed the author with the data for the ſolution, not having ſtated them ſufficiently, the concluſion is deemed erroneous; but we know no body that has endeavoured to rectify it.

We ſhall here inſert another problem.

To find the chance of the dealer's having four trumps. One trump being certain, the problem is reduced to this, to find what probability there is that in taking at random 12 cards out of 51, whereof 12 are trumps, and 39 not trumps, 3 of the 12 ſhall be trumps.

By Mr. de Moivre's rules it will be found, that the total of the chances for the dealer = 92770723800; and that the total of the chances for taking any 12 cards out of 51 = 158753389900. The difference of theſe two numbers = 65982666100. The odds therefore will be 9277 &c. to 6598 &c.

Or we may compute the chance of three players having 10, 11, or 12 trumps among 39 cards. Then we ſhall find that the total of chances for taking 10, 11, or 12 trumps among 39 cards = 65982666100; and that all the chances out of 51 = 158753389900. The difference = 92770723800 = all the chances for the dealer, and the odds will be 9277 &c. to 6598 &c. as before.

The approximating ratios to the ratio of 9277 &c. to 6598 &c by Mr. Cotes's method, (ſee RATIO, *Suppl.*) are,

Ratios greater than true 2:1, 3:2, 10:7, 17:12, 24:17, &c.

leſs than true 1:1, 4:3, 7:5, 52:37, 97:69, &c.

But it is to be obſerved that the ratio 24 : 17, though expreſſed in much greater terms than 7 to 5, is extremely little nearer the truth; and the ratio 17 to 12 is not ſo near as 7 to 5; which ſhews that in practice we ſhould only retain the primary approximations of Cotes's method, for the ſecondary may lead us into error.

The bets for the dealer in this caſe, among the members of a great club, were formerly laid equal. But the vaſt odds of above 40 *per cent.* may ſhew how cautious gentlemen ought to be in laying bets without previous computation.

The odds in money in this caſe, is,

	l.	*s.*	*d.*	
more than	140	11	11½	to 100*l.*
leſs than	140	11	11¾	

WHORTLE, or WHORTLE-*berry*, the Engliſh name of a genus of plants, called by botaniſts *vaccinium*, or *vitis idæa*. See the article VITIS *idæa*, *Suppl.*

WIDGEON, in ornithology, the Engliſh name of a bird of the duck kind, with a brown head, a white front, and a tail black underneath. See the article DUCK, *Suppl.*

WIDOW-*wail*, a name by which ſome call the *cneorum* of botanical writers. See the article CNEORUM, *Suppl.*

WILLIAM, or *Sweet*-WILLIAM. See SWEET-*William*, ſupra.

Sweet-WILLIAM *of Barbadoes*. See SWEET, ſupra.

WILLOW (*Suppl.*)—*Dutch* or *Sweet*-WILLOW, the name by which the *myrica* of botaniſts is ſometimes called. See the article MYRICA, *Suppl.* and *Append.*

French-WILLOW, or *Podded* WILLOW-*herb*, names given to the *epilobium* or *chamænerium* of botanical writers. See the article CHAMÆNERIUM, *Suppl.*

WILLOW-*herb*, the Engliſh name of a genus of plants, called by botaniſts *ſalicaria*. See the article SALICARIA, *Suppl.*

WINCH, a popular term for a windlaſs. See the article WINDLASS, *Cycl.*

WINCH alſo denotes the crooked handle for turning round wheels, grind-ſtones, &c. *Blanckley*'s Naval Expoſitor.

WINCHING, in the manege, is ſaid of a horſe when he kicks, ſpurns, or throws out his hind feet. Ruſt. Dict. in voc.

WIND-*flower*, the Engliſh name of a genus of plants, called by writers on botany *anemone*. See the article ANEMONE, *Suppl.*

WIND-*ſeed*, the name by which ſome call the *arctotis* of botanical authors. See the article ARCTOTIS, *Suppl.*

WINDING *of ſilk*. We have an excellent machine for this purpoſe at Derby, contrived by Meſſieurs Thomas and John Lombe; but as the proprietors are not willing that a deſcription of it ſhould be made public, the following general account of it muſt ſuffice.

It conſiſts of no leſs than 26586 wheels, and 97746 movements. One water-wheel communicates motion to all the reſt of the wheels and movements, of which any one may be ſtopped ſeparately and independently of the reſt. One fire-engine conveys air to every part of the machine; and one regulator governs the whole work. 73728 yards of ſilk are *wound* every time the water-wheel goes round, which is three times every minute; ſo that 318,504,960 yards of ſilk may be *wound* every day and night, and conſequently 99,373,547,550 yards of ſilk in one year. See *Deſaguliers*, Experim. Philoſoph. Vol. I. p. 70.

WINTER-*cherry*. See the article CHERRY, ſupra.

WINTER-*creſs*. See the article CRESS, ſupra.

WINTER-*green*. See the article GREEN, ſupra.

WITCH-*hazel*. See the article HAZEL, ſupra.

WITHERING *of a cow*, is when, after calving, ſhe does not caſt her cleanſing, which if not timely remedied will kill her. Ruſt. Dict. in voc.

WITHY, a large ſpecies of willow, fit to be planted upon high banks and the ſides of ditches, within reach of the water, or on the weeping ſides of hills. Ruſt. Dict. in voc.

WOLF (*Suppl.*)—WOLF-*fiſh*, the Engliſh name of the *lupus marinus* of authors. See the article LUPUS *marinus*, *Suppl.*

WOOD (*Suppl.*)—*Almiggim*-WOOD. See the article ALMIGGIM, *Suppl.*

WOOD-*bine*, or WOOD-*bind*, the Engliſh name of a genus of plants, called by Tournefort *periclymenum*, but comprehended by Linnæus among the *loniceras*. See the articles PERICLYMENUM, *Suppl.* and LONICERA, *Append.*

WOOD-*men*, certain foreſt-officers appointed to take care of the king's *woods*. Ruſt. Dict. in voc.

WOOD-*roof*, or WOOD-*ruffe*, the Engliſh name of a genus of plants, called by botaniſts *aſperula*. See the article ASPERULA, *Suppl.*

WOOD-*ſage*. See the article SAGE, ſupra.
WOOD-*ſorrel*. See the article SORREL, ſupra.
WOODMEIL, a coarſe, hairy kind of ſtuff, made of Iceland-wool, with which the ſhip-carpenters, in ſome of his majeſty's yards, line the ports of ſhips of war. *Blanckley's* Naval Expoſitor, in voc.
WOODY-*nightſhade*. See the article NIGHTSHADE, ſupra.
WOOLDING, in the ſea language, denotes the winding of ropes, at certain diſtances, about a maſt, in order to ſtrengthen it. *Blanckley's* Naval Expoſitor, in voc.
WORM (*Suppl.*)—*Earth*-WORM. See the articles LUMBRICUS, *Append.* and WORMS, *Suppl.*
Golden-WORM, *vermis aureus*, a name ſometimes given to the *aphrodita*, a genus of ſea inſects. See the article APHRODITA, *Append.*
Guinea-WORM, or *Hair*-WORM, names uſed for the *chætia* of naturaliſts. See the article CHÆTIA, *Append.*
Sea-WORM. See the article LUMBRICUS, *Append.*
Tape-WORM. See the article TAPE-*worm*, *Suppl.*
WORMING *of a dog*, is the cutting out a nerve from under his tongue; by which means, it is ſaid, that if ever he runs mad, he will be rendered incapable of biting. Query the fact.
WOULD, a name uſed ſometimes by the farmers for the *luteola*, or dyer's weed. See the article LUTEOLA, *Suppl.*
WOUND-*wort*, the name of a genus of plants, called by botaniſts *vulneraria*. See the article VULNERARIA, *Suppl.*
WOUND-*wort* is alſo the name of the *ſolidago*, another genus of plants, called by Tournefort *virga aurea*, or golden rod. See the article VIRGA, *Suppl.*
WOUND-*wort of Achilles*, a name ſometimes given to the *millefolium*, or yarrow. See the article MILLEFOLIUM, *Suppl.*
WREN. See JENNY-*wren*, *Suppl.*
WYTHERS, the ſame with *withers*. See WITHERS, *Cycl.*

X.

XIPHOS, Ξιφος, among the Athenians, a capital puniſhment by beheading with the ſword. *Potter*, Archæol. Græc. Tom. I. p. 133. See the article PUNISHMENT, *Cycl.*

XYLOSTEUM, in botany, the name of a genus of plants, according to Rivinus, but comprehended under the *lonicera* by Linnæus. See the article LONICERA, *Append.*

Y.

YAMS, in botany, a name ſometimes uſed for the *rhizophora* of Linnæus. See the article RHIZOPHORA, *Append.*

YARD (*Suppl.*)—The *yards* of ſhips are uſually faſhioned into eight ſides in the middle, and from thence taper to the ends in ſixteen.

The top and top-gallant *yards* are generally made out of Gottenburg, or Norway maſts: all which are made of ſuitable dimenſions, both in diameter and length. *Blanckley's* Naval Expoſitor, in voc.

YARN (*Suppl.*)—*Marking*-YARN, in ſhips of war. See the article MARKING, *Append.*
YARROW, the Engliſh name of a genus of plants, called by botaniſts *millefolium*. See the article MILLEFOLIUM, *Suppl.*
Water-YARROW, the Engliſh name of the *hottonia*, a diſtinct genus of plants. See the article HOTTONIA, *Suppl.*
YEANING, a term uſed for an ewe's lambing, or bringing forth a lamb. Ruſt. Dict. in voc.
YEARNING, the ſame with *earning*. See EARNING, *Append.*
YEOMAN *of the ſalt ſtores*. See ACATARY, *Cycl.*

ARTICLES omitted.

ELECTRICITY (*Cycl.*)—A body in which *electricity* may be excited by some action upon that body, as rubbing, patting, or warming it, and sometimes only exposing it to cold and dry air, after it has been covered, is called an *electric per se*: such are glass, crystals, and pretious stones; resins, gums, sulphur, sealing wax, and most dry parts of animals, as silk, hair, and the like.

Electrics per se are also called original *electrics*.

A *non-electric per se* or simply a *non-electric*, is a body in which *electricity* cannot be excited by any action upon the body itself; or at least one in which that property, if at all, is very slightly perceptible. Of this kind are wood, animals, living or dead, vegetable substances, water and metals.

But *non-electrics* receive *electricity*, when brought near to *electrics per se*, in which *electricity* has been excited.

In order to know that *non-electrics* have received the communicated *electricity*, they must be insulated; that is, they must not be suspended from, or supported by any bodies, but what are *electrics per se*: for if one *non-electric* be touched by another, and this by a third, &c. all the *electricity* received by the first will go to the second, and from this to the third &c. till at last it be lost upon the ground. But if several *non-electrics* touching one another, are at last terminated by *electric* bodies, in that respect they make but one body, and receive and retain *electricity* for some time. However it must be observed, that bodies slightly *non-electric*, such as dry wood, may serve for supporters to those bodies which are very highly *non-electric*, as metals.

Electricity may be communicated to *non-electrics* by applying a glass tube or globe, excited by friction, to one end of those bodies; and there are several ways of finding when the *non-electrics* have received the *electricity*. Thus, if an iron bar be suspended horizontally by two silken strings that are very dry, and the rubbed tube be applied, or brought near to one of the ends of the bar, and then some leaf-gold, or leaf-brass, or any other light bodies, placed upon a small stand, or a plate, be brought near the other end, they will be alternately attracted and repelled by the bar. Likewise, if the finger be brought near the end, or other part, of the bar, the *electrical* effluvia will give a very sensible and sometimes painful stroke, with a snapping noise, and produce a flash of light. If the communicated *electricity* should prove too faint to be tried this way, a small flaxen thread, suspended by a stick, may be brought near the body that has been *electrified*; and if the *electricity* has been communicated, even in a small degree, the thread will be attracted without destroying the *electricity* received by the body till after some time. This thread Doctor Desaguliers calls the *thread of trial*.

It is to be observed, that an *electric per se* does not receive this virtue from another *electric per se*, though excited, till it is become a *non-electric*; which happens when it is made wet or moist; and then it will be made *electric* only by communication. *Electric* bodies, in which it is difficult to excite *electricity*, may be looked upon as *non-electrics*, when their *electricity* is not excited; and then they will be in the same condition as *non-electrics per se*, and be liable to receive *electricity* by communication in the same manner.

From what has been said, it appears that *non-electrics* are conductors of *electricity*. Water conducts it very well, but metals are the most convenient conductors.

These things being premised, we shall here add some of the principal phænomena of *electricity*; that is, such as seem to give some light towards a theory of this wonderful property of bodies.

1. When the *electricity* of a glass tube has been excited by rubbing, if you move your fingers long-wise from one end of the tube to the other, but without touching it, you will hear a continued snapping, like a distant noise of thorns burning; and if the room be darkened, you will see sparks of light wherever the tube snaps; and likewise a light following the hand that rubs the tube.

2. A down feather being tied to the top of a wooden broach or skewer, of about six or seven inches in height, and fixed upright upon a foot, if you bring the excited tube near it, all the fibres of the feather stretch out towards the tube; but as soon as you remove the tube, the fibres of the feather turn back, and stick strongly to the skewer. If you bring your finger near to the feather, while its fibres are tending towards the tube, the finger will repel them; but as soon as you remove the tube, they are attracted by the finger. If you cover the feather with a very dry glass recipient, such as is used on the air-pump, the tube will attract the feather in the same manner through the glass: and this happens, even when the recipient has been exhausted of its air by the pump. When the tube is rubbed near the recipient, whether it be full of air or empty, the fibres of the feather follow the motion of the hand along the tube, arising upon the broach or skewer.

3. Without making use of the tube, if you rub the recipient that covers the feather with both hands, the fibres of the feather will stretch themselves out towards the glass, like the rays of a sphere. If you rub but with one hand, the fibres will stretch themselves towards that part of the glass which is rubbed; and when you blow against the glass, those fibres will be repelled, notwithstanding the interposition of the glass: which happens also, when you strike the air with the hand towards the feather, without touching the recipient.

4. After the tube has been rubbed, if any assistant lets go a down feather in the air, at the distance of a foot or two from the tube, the feather will jump towards the tube with an accelerated motion, and adhere to it for some time; and then of a sudden it will be repelled from the tube, and will fly about the air in such manner, that the nearer you bring the tube to it, the more it will be repelled, till it has touched some other body; and then it will be drawn again by the tube; which after some time will drive it away again. Sometimes, when the finger is held at eight or ten inches from the tube, the feather will jump from the tube to the finger, and from the finger to the tube, thirty or forty times together.

5. If a string of any kind be stretched horizontally, and from the string you hang a thread of silk about three foot long, and very dry, and to the lower end of that thread you fasten a down feather; then, at the distance of about two or three feet, you hang up another feather, but by a flaxen thread; the rubbed tube being brought near will attract the first feather, which, when it has adhered to it a little while, will fly from the tube, and then be repelled by it every time the tube is brought near, till it has touched some other body, as in the preceding experiment, and then it will be attracted anew. But the feather, which is suspended by the flaxen thread, will always be attracted at the approach of the tube, and never repelled. And if you wet the silken thread, the feather hanging at it will be repelled no more, but always attracted by the tube.

6. If you make use of a tube which is hermetically sealed at one end, and has at the other end a brass ferril with a screw, by which means the air may be pumped out of it; if you rub the tube, after the air is exhausted, it does not attract any more, as has already been taken notice of in the Cyclopædia, N° 7; nor does the tube give the light before mentioned, N° 2, but it gives much more light within. Then if, by opening the cock a little way which is fastened to the tube, the air be let in slowly, while the tube is rubbed, the light diminishes; and being interrupted by the air, as it comes in, looks like lightning at a distance, till all the air is come in, and then there is no more light within; but the light goes all to the outside, and the attraction returns.

7. If two small boards, or two small octavo books, be set edge wise, parallel to each other, and about the distance of ten inches asunder, upon a stand of seven or eight inches diameter; little pieces of leaf gold, or brass, laid upon the stand between those boards, will not be attracted by the rubbed tube held near them, till it be brought quite between the said boards, as near to the stand as half the distance of the boards from each other: that is, when the tube is so held, that a circle described round the axis of the tube, with the distance that is between that axis and the stand, passes between the boards or books without touching them. But when the rubbed tube being held horizontally, at the distance of a foot from the stand, seems to have no virtue, because the leaf-gold has no motion, if an assistant snatches away the boards, all on a sudden the pieces of gold will be attracted and repelled several times, without giving any new friction to the tube.

8. When the air is very dry, and the rubbed tube can attract the leaf-gold laid on a small stand, to the distance of three foot or beyond; if the same leaf-gold be laid upon a table, or any large surface, the excited tube must be brought very near before it can produce its effect.

9. When the air is moist, the experiment, N° 4, does not succeed well: for after the feather in the air has been some time driven about by the tube, it comes back of itself to the tube, without having touched any other body; and sometimes after having adhered to the tube, towards the middle of it, it flies off from it, and comes again immediately to the tube, sticking to that part of it which is farthest from the hand. It happens also, when the air is very dry, and the tube repels the feather, after having attracted it, to the distance of two or three feet, that if you wet the top of the tube at the end, for the length of six or seven inches, the feather will come and stick to that end of the tube, without having touched any other body.

10. Having

10. Having filled with water a ſmall drinking glaſs, of about an inch diameter, when you bring the rubbed tube near it, the water riſes in a little hill, accumulated at the edge of the glaſs; ſometimes jumping towards the tube in a little jet, ſo ſmall that you can hardly ſee it, though you may find the tube wholly wet with it. One may alſo obſerve, that this accumulated water riſes in the ſhape of a ſmall cone, whoſe axis is ſometimes ſtretched out horizontally towards the tube, then ſnaps and falls down again flat upon the reſt of the water. If this experiment be made in the dark, a flaſh of light accompanies the ſnapping.

11. If by means of an artificial fountain, in which air is condenſed upon the water to make it ſpout, you play a ſmall jet, of about the fortieth part of an inch diameter, upwards or downwards; the rubbed tube being brought near, the jet will bend towards the tube at the diſtance of a foot; and if the tube be brought nearer, the jet being wholly drawn away by the tube, is changed into a dew upon the tube, ſo that it adheres to the tube in little drops, provided the jet be not made to ſpout with too much force.

12. If a packthread or hempen ſtring be ſtretched horizontally to the length of about twelve hundred feet, at the end of which is ſuſpended an ivory ball of about an inch and an half in diameter; this ball will draw and repel leaf-braſs, or leaf-gold, when the rubbed tube is brought near the other end of the ſtring, and the thread of trial being brought near to the ball, is attracted by it.

In this experiment the ſupporters of the ſtring muſt be *electrics per ſe*, whether they be hair-ropes, fiddle-ſtrings, or cat-guts, ribbons, ſtrings of ſilk, glaſs tubes, long bodies of ſulphur or of reſin, *&c.* and all theſe bodies muſt be very dry. If the ſtring be wet, the experiment will ſucceed the better.

This experiment was, we believe, firſt made by the late Mr. Stephen Gray; and it might be improved, by employing an iron wire inſtead of a packthread or hempen ſtring. When an iron wire is uſed, its ſupporters might be wooden ſticks, being *non-electrics* in a ſlighter degree, as before obſerved; but *electrics* are beſt.

The conductor of *electricity*, in theſe and the like caſes, need not be ſtretched at length, but may be carried backwards and forwards in parallel or other lines, provided they be not placed too near to each other, but at a proper diſtance, as, for inſtance, three feet.

13. If two or three iron bars be ſuſpended in the ſame horizontal line, at the diſtance of ſix inches from one another, the *electricity* communicated by the rubbed tube to the end of one of the bars will go on from the one to the other quite to the end of the laſt bar, where a pricking will be felt, a noiſe heard, and a flaſh of fire ſeen. If the air is dry, the *electricity* will jump from one bar to another at a greater diſtance; but in moiſt weather, the bars muſt not hang at above an inch diſtance from each other.

Theſe experiments may be made with a glaſs tube, about three foot and an half long, an inch and an half in diameter, and about $\frac{1}{12}$ of an inch thick, open at both ends, but ſometimes hermetically ſealed at the end fartheſt from the hand. Theſe proportions are not neceſſary, but only convenient for the hand; and the glaſs of the tube ought not to be leſs than $\frac{1}{12}$ of an inch in thickneſs; for when thinner, the *electricity* is indeed ſooner excited by friction, but it does not laſt ſo long as when the tube is thicker. See *Deſaguliers's* Diſſertation concerning *Electricity*, in his Experim. Philoſ. Vol. II. p. 316. ſeq.

The Doctor obſerves with Monſieur du Fay, that there are two ſorts of *electricity*, a reſinous, and a vitreous kind. One of the experiments, upon which this difference is eſtabliſhed, is as follows.

14. If a down feather be ſuſpended by a ſilken thread, as in the experiment N° 5, ſealing-wax, well rubbed, will produce the ſame effect as the tube, but more weakly, drawing the feather; and when once it is ſeparated from the wax, the wax repels it continually, till the feather has touched ſome other body. But the difference here is, that when the feather is in a ſtate of repulſion, in reſpect of the wax, the rubbed tube attracts it; and when the tube has given the feather its repulſive ſtate, then the rubbed wax attracts it: which ſhews, according to theſe gentlemen, that the *electricity* of glaſs is different from the *electricity* of ſealing-wax; and the like may be obſerved of other reſinous ſubſtances.

But, perhaps, this phænomenon may be accounted for, by ſuppoſing, as the truth is, that the *electrical* power of excited glaſs is ſtronger than that of ſealing-wax, and then from Mr. Ellicott's hypotheſis, hereafter mentioned, the phænomenon follows.

Doctor Deſaguliers has deduced from his experiments, that bodies which are *electric per ſe*, being excited to *electricity*, repel all other bodies that have *electricity*, but attract them as ſoon as they have loſt their *electricity*; and ſo *vice verſa*. Theſe deductions agree very well with Mr. Ellicott's mentioned below.

The Doctor conjectures alſo, that the particles of pure air are *electric* bodies, always in a ſtate of *electricity*, and that vitreous *electricity*, and from this *electricity* of the air, he conjectures, ingeniouſly, that the riſe of vapours may depend upon *electricity*. See the Diſſertation before cited.

To theſe experiments related, among others, by Dr. Deſaguliers, we muſt add from Mr. Ellicott [a], that when the tube, N° 1, is ſtrongly excited, ſparks will not only iſſue from it in ſtreams while it is rubbing, but will continue to dart out from it for a conſiderable time after the rubbing has ceaſed, and a very ſtrong offenſive ſmell will be perceived.—[a Several Eſſays towards diſcovering the Laws of *Electricity*, Lond. 1748.]

15. The ſame gentleman obſerves, that if a ball (of cork ſuppoſe, for lightneſs) be hung by a ſilk line, and the excited tube is applied to it, it will not only be attracted, but will have an attractive quality communicated to it from the tube; and if any light bodies are brought near the ball, they will be attracted by it.

16. As the tube, when ſtrongly excited, will not only attract, but afterwards repel any light bodies brought near it, in like manner the cork-ball will be endued with the ſame property; ſo that a ſmaller ball will firſt be attracted towards it, and then repelled from it, in the ſame manner as the leaf-gold in the beforementioned experiments; and on touching any other body, it will be again attracted; and this may be repeated ſeveral times, provided the ſmaller ball is much leſs than the larger one. But the effect will conſtantly grow weaker and weaker; becauſe every time the leſſer ball is attracted, it carries off with it ſome of the *electric* virtue, and is likewiſe endued with the ſame properties as the larger ball.

Mr. Gray, Monſieur du Fay, and others have obſerved, that this *electrical* quality is not only to be excited in glaſs, but in moſt ſolid bodies capable of friction, metals excepted; though in ſome it will ſcarce be ſenſible. And this *electrical* power is found to be ſtrongeſt in wax, reſins, gums and glaſs. And as glaſs is the eaſieſt procured of a proper form, it has generally been uſed in making theſe experiments. It has been further obſerved, that thoſe bodies, in which the *electrical* quality is capable of being excited the ſtrongeſt by friction, will receive the leaſt quantity of it from any other excited body, and therefore are properly made uſe of, to ſupport any body deſigned to receive the *electrical* virtue. The truth of this will ſufficiently appear from the following experiments.

17. Two lines, one of ſilk, and the other of thread, being hung up, (as in the experiment, N° 5.) that of thread will be attracted by the tube at a much greater diſtance than the ſilk. If a feather, or other light body, be faſtened to each ſtring, and if the tube be brought to the feather faſtened to the ſilk, it will not only be firſt attracted and then repelled, as has been ſaid N° 5, but by the virtue communicated to the feather from the tube, the ſeveral fibres of the feather will ſtrongly repel each other. On the contrary, the feather faſtened to the thread will be ſtrongly attracted by the excited tube, and not repelled, the virtue paſſing off by the thread it is hung to. If a glaſs ball is hung to the ſilk line, it will be but weakly attracted by the tube; but one of cork or metal will be ſo much more ſtrongly.

18. Let a rod of iron be ſuſtained by ſilk lines, and by means of a glaſs ſphere (which can be more regularly and conſtantly excited than a tube) be made *electrical*, it will be found to have all the properties of the excited tube firſt mentioned. A ſtream of light will come from the end of it, if it is pointed. It will attract, repel, and communicate this virtue to any other *non-electric* body. On the approach of a *non-electric*, a ſpark of fire, with a ſnap attending it, will come from it; which ſpark will be greater or leſs, as the bodies approaching it have more or leſs of the *electrical* quality reſiding in them; and there will likewiſe be the ſame offenſive ſmell as was obſerved of the glaſs tube.

19. Let a rod of iron, pointed at one end, be ſuſpended on ſilk lines, as in the laſt experiment, and by the ſphere be made *electrical*. When the rod is ſtrongly *electrified*, a ſtream of light in diverging rays will be ſeen to iſſue from its point; and if any *non-electric* body is held a few inches from the point, the light will become viſible to a greater diſtance; and if the *non-electric* body is likewiſe pointed, a light will ſeem to iſſue from that in diverging rays, in the ſame manner as from the *electrified* rod. But if the *non-electrical* body is flat, and held at the ſame diſtance from the rod as the pointed one was, no light will be ſeen to come from it. It is alſo to be obſerved, that the effluvia from the end of the *electrified* rod ſtrike againſt the hand or face, brought near to that end, like a blaſt of wind.

20. If the *non-electric* body, whether flat or pointed, be brought nearer to the end of the rod than in the laſt experiment, there will be a ſmall ſtream of light produced, reaching quite from the *electric* to the *non-electric* body; and if brought ſtill nearer, there will iſſue a ſpark, attended with a ſmall ſnapping noiſe, which will be ſucceeded by others at equal intervals; and if the *non-electric* is held at ſome diſtance from the ſide of the rod, the point of it will frequently appear luminous, but no part of the *electrified* rod will be ſo. If it is brought nearer, there will likewiſe be ſparks

ſparks produced, at nearly equal intervals from each other, which will ſometimes appear as iſſuing from the ſide of the *electrified* rod, at others, as coming from the *non-electric*.

21. Take two plates of metal, very clean and dry, whoſe ſurfaces are nearly equal; hang one of them horizontally to the *electrified* rod, and bring under it, upon the other, any thin, light body, as leaf-ſilver, *&c.* when the upper plate is made *electrical*, the ſilver will be attracted by it; and if the under plate is held at a proper diſtance, will be perfectly ſuſpended at right angles to the plates, without touching either of them; but if they are either brought nearer together, or carried farther aſunder, the leaf-ſilver will ceaſe to be ſuſpended, and will jump up and down between them. The ſame effect will be produced, if you reverſe the experiment, by *electrifying* the bottom plate, and ſuſpending the other over it. See Mr. *Ellicott*'s Eſſays before mentioned.

22. By the experiments made in Germany, and repeated in England by Mr. Watſon, it appears, that ſpirit of wine may be ſet on fire by the power of *electricity*. This will ſucceed not only with the etherial liquor, or phlogiſton of Frobenius, and rectified ſpirit of wine, but even with common proof ſpirit. But all theſe muſt be warmed a little, ſo as to emit an inflammable vapour.

And the experiment ſucceeds equally well, whether an *electrified* perſon, or other *electrified* body, be brought near the not *electrified* ſpirit; or whether the *electrified* ſpirit be brought near a *non-electric* body.

This laſt method of firing the ſpirit is ſaid, by Mr. Watſon, to be done by the repulſive power of *electricity*. And the former, where the not *electrified* ſpirit is fired by its being brought near to a man ſtanding upon a cake of wax, or to a ſword, or bar of metal, ſuſpended by ſilk lines, is ſaid to be performed by the attractive power of *electricity*. Of theſe two kinds, the repulſive power has generally been found the ſtrongeſt.

23. Not only ſpirits of wine, but alſo ſal volatile oleoſum, dulcified ſpirit of nitre, Peony water, Daffy's elixir, Helvetius's ſtyptic, and ſome other mixtures, where the ſpirit has been very conſiderably diluted, may be fired by the power of *electricity*; and ſo may diſtilled vegetable oils, as that of turpentine, lemon, orange peels, juniper, and even thoſe which are ſpecifically heavier than water, as oil of ſaſſafras; alſo reſinous ſubſtances, ſuch as balſam capivi and turpentine; all which ſend forth, when warmed, an inflammable vapour. The inflammable vapour, produced by putting an ounce of filings of iron, an ounce of oil of vitriol, and four ounces of water into a Florence flaſk, may be fired by the ſame means; as may alſo gunpowder, if ground with a little camphor, or with a few drops of ſome inflammable chemical oil. To increaſe the ſurpriſe, theſe ſubſtances may be fired by ice, or by a drop of water, only thickened a little with the ſeeds of fleawort.

All theſe experiments have ſucceeded, though not always in damp weather, with a glaſs tube rubbed by the hand merely; but if a greater *electrical* force be excited, by means of a globe, theſe experiments will ſucceed in any weather, though not with equal eaſe.

24. If ſome oil of turpentine is ſet on fire in any veſſel, held in the hand of an *electrified* man, the thick ſmoke that ariſes therefrom, received againſt any *non-electric* of a large ſurface, held in the hand of a ſecond man ſtanding upon an *electrical* cake; this ſmoke will, at a foot diſtance from the flame, carry with it a ſufficient quantity of *electricity*, for the ſecond man to fire any inflammable vapour. The *electrical* ſtrokes have been likewiſe perceptible upon the touching the ſecond man, when the *non-electric* held in his hand has been in the ſmoke of the oil of turpentine between ſeven and eight feet above the flame. Here we find the ſmoke of an original *electric*, a conductor of *electricity*.

25. Likewiſe, if burning ſpirit of wine be ſubſtituted in the place of the oil of turpentine, and if the end of an iron rod, in the hand of the ſecond man, be held at the top of the flame, this ſecond man will kindle other warm ſpirits held near his finger. Here we find, that flame conducts the *electricity*, and does not perceptibly diminiſh its force. The like is to be obſerved of red-hot iron; and of the coldeſt mixtures that art can produce.

26. Of all the ſurpriſing phænomena of *electricity*, none ſeems to be more ſo, than the extraordinary accumulation of the *electrical* power in a phial of water, firſt diſcovered by Profeſſor Muſchenbroek of Leyden. The experiment is this: a phial of water is ſuſpended to a gun-barrel by a wire let down a few inches into the water through the cork; and this gun-barrel, ſuſpended in ſilk lines, is applied ſo near an excited glaſs globe, that ſome metallic fringes, inſerted into the gun-barrel, touch the globe in motion. Under theſe circumſtances a man graſps the phial with one hand, and touches the gun-barrel with a finger of the other; upon which he receives a violent ſhock through both his arms, eſpecially at his elbows and wriſts, and acroſs his breaſt. The experiment ſucceeds beſt *cæteris paribus*, 1°. when the air is dry. 2°. When the phial, containing the water, is of the thinneſt glaſs. 3°. When the outſide of the phial is perfectly dry. 4°. In proportion to the number of points of *non-electric* contact. Thus if you hold the phial only with your thumb and finger, the ſnap is ſmall; larger when you apply another finger, and increaſes in proportion to the graſp of your whole hand. 5°. When the water in the phial is heated, which being then warmer than the circumambient air, prevents the condenſation of the floating vapours therein upon the ſurface of the glaſs.

A gun-barrel is not neceſſary in theſe experiments; a ſword, or any other ſolid piece, or tube of metal, is equally uſeful. Mr. Watſon has given us many curious obſerva ions relating to this experiment, and has varied it a great many ways. Among other things he obſerves, that the phial may be *electrified* by applying the wire therein to the globe in motion; after which, if it is graſped in one hand, and the wire touched with a finger of the other, the ſtroke is as great as from the gun-barrel. And if you graſp the phial with your hand, and do not at the ſame time touch the wire, the acquired *electricity* of the water is not diminiſhed. So that, unleſs by accident or otherwiſe the wire is touched, the *electrified* water will retain its force many hours, may be conveyed ſeveral miles, and afterwards exert its force upon touching the wire.

To prove Mr. Watſon's aſſertion that the ſtroke is *cæteris paribus*, as the points of contact of *non-electrics* to the glaſs, Dr. Bevis wrapped up two large round bellied phials in very thin lead ſo cloſe as to touch the glaſſes every where, except their necks. Theſe were filled with water, and corked, with a ſtaple of ſmall wire running through each cork into the water. A piece of ſtrong wire about five inches long, with an eye at each end, was provided, and at each end of this, hung one of the phials of water by the ſmall ſtaple running through the cork. A ſmall wire loop was then faſtened into the lead at the bottom of each phial, and into theſe loops was inſerted a piece of ſtrong wire like the former. If then theſe phials were hung acroſs the gun-barrel and *electrified*, and a perſon ſtanding upon the floor touched the bottom wire with one hand, and the gun-barrel with the other, he received a moſt violent ſhock through both his arms and acroſs his breaſt. The *electrical* exploſion has been ſince vaſtly increaſed. But Mr. Watſon is of opinion, that the violence of the exploſion of the *electric* force accumulated in the glaſs, is not ſo much owing to the quantity of *non-electrical* matters contained in the glaſs, as to the number of points of *non-electrical* contact within the glaſs, and the denſity of the matter conſtituting thoſe points, provided this matter be in its own nature a ready conductor of *electricity*. For a cylindrical glaſs jar blown very thin, of ſixteen inches in height, and eighteen inches in circumference, having been covered both within and without with leaf-ſilver to within an inch of its top, the exploſion from this jar was equal to that from three glaſſes, each about ſeventeen inches in height, and four in diameter, and filled with fifty pounds of leaden ſhot each. The exploſion in theſe caſes is ſo violent as to become dangerous; and has been found mortal not only to ſmall birds, but even to a rat; and Mr. Franklin killed a well-grown turkey with it.

27. A very conſiderable *electrical* exploſion may be made from a plate of glaſs thus: Let a thin plate of glaſs of about a foot ſquare, be covered on both ſides with leaf-ſilver; and make this adhere to the glaſs by a very thin paſte. A margin of an inch muſt be left on both ſides; otherwiſe, upon *electrifying* this plate, the *electricity* would be prevented from being accumulated upon one of its ſurfaces, by being propagated from the ſilver on one ſide to that of the other. When the glaſs plate is thus prepared, if it be placed upon a table in ſuch a manner, that when fully *electrified* by a wire or ſuch like from the prime conductor, a perſon touches the under ſurface with a finger of one of his hands, and brings one of the fingers of the other near the upper ſurface, or near the prime conductor, he will be ſhocked in both his arms and croſs his breaſt. The ſame effect happens, if when this plate is *electrified* as before, a perſon holds it in his hand by the margin, and without touching the ſilver, preſents it, even ſome time after it has been taken from the prime conductor, to another perſon, who touches the under ſurface with his finger, and holds it there till he touches the upper ſurface with a finger of his other hand. This is an experiment contrived by Dr. Bevis, who obſerves, that though the exploſion from the glaſs plate ſilvered was occaſioned by about ſix grains of ſilver, upon which the *electricity* was accumulated, yet the exploſion was equal if not ſuperior to that from half a pint of water contained in a thin glaſs as uſual.

28. The commotion ariſing from the diſcharge of the accumulated *electricity* in the phial, may be felt by a great number of men at once. Monſieur le Monnier, at Paris, is ſaid to have communicated this ſhock through a line of men, and other *non-electrics*, meaſuring nine hundred toiſes, which is more than an Engliſh mile; and the Abbé Nollet [a] made the experiment upon 200 perſons, ranged in two parallel lines.—[[a] Lettres ſur l'*Electricité*, p. 207.]

29. This *electrical* commotion has been made very ſenſible quite acroſs the river Thames, by the communication of no other medium than the water of that river; and ſpirit of wine has been fired at that diſtance.

30. The commotion has alſo been perceptible to two or more

more obfervers at confiderable diftances from each other, even as far as two miles.

In thefe laft experiments, and in many others of the like nature, Mr. Watfon obferves, that the *electrical* power, accumulated in any *non-electric* matter contained in a glafs phial, defcribes upon its explofion a circuit through any line of fubftances *non-electrical* in a confiderable degree; if one end thereof is in contact with the external furface of this phial, and the other end upon the explofion touches either the *electrified* gun-barrel, to which the phial in charging is ufually connected, or the iron hook always fitted therein. Thus if a perfon ftands upon a dry wooden floor with a coated phial ever fo highly charged in one of his hands, and if another perfon, without touching the firft, ftands but fix inches from him, and touches the iron hook of the phial, neither of them are fhocked; becaufe the floor between them, though the diftance is fo fhort, will not conduct the *electricity* fufficiently quick. But if thefe two perfons tread upon a piece of wire laid between them, they each of them feel the *electrical* commotion in that arm which touches the phial and hook, and in that foot which treads upon the wire; the wire here conducting the *electricity* quick enough, which the dry floor would not. The circuit is here formed by the coated phial, its hook, fo much of the bodies of thefe two perfons as form a curve line between the wire, the phial, and hook, and the wire between thefe perfons. If thefe perfons ftand upon, or touch with any part of their bodies any *non-electrics*, which readily conduct *electricity*, the circuit is completed, and the effect is the fame. Hence Mr. Watfon infers, that when the obfervers have been fhocked at the end of two miles of wire, the *electrical* circuit is four miles; *viz.* two miles of wire, and the fpace of two miles of the *non-electric* matter between the obfervers, whether it be water, earth, or both. So in the experiments made near Weftminfter bridge, where the river is above 400 yards over, the circuit muft have been above 800 yards, *viz.* above 400 yards of conducting wire laid upon the Portland ftones of the bridge, and fomething more than 400 yards of water. That the water made part of the circuit, and that the fhock was not communicated from the Surry fhore to the other fide merely by the conducting wire, is evident from this, that if the obferver on the Weftminfter fhore did not communicate with the river, either by dipping his hand, or an iron rod held therein into the river, the fhock arifing from the difcharge of the phial was not at all felt by him, although the obferver on the Surry fide felt it as before. This circuit of the *electrical* matter has been farther confirmed by feveral other ingenious experiments by the fame gentleman.

It is to be obferved, that the commotion is equally ftrong, whether the *electricity* is conducted by water, or dry ground. And that if the wires, between the *electrifying* machine and the obfervers, are conducted upon dry fticks, or other fubftances *non-electric*, in a flight degree only, the effects of the *electrical* power are much greater, than when the wires in their progrefs touch the ground, moift vegetables, or other fubftances in a great degree *non-electric*.

31. It is remarkable, that if the *electrical* machine, and the man who turns the wheel thereof, be mounted upon *electrical* cakes, the *electrical* power is fo far from being increafed hereby, as fome might expect, that it is, on the contrary, much diminifhed, and fometimes is not at all perceptible.

It was this experiment which induced Mr. Watfon to conceive, that the *electrical* power was not inherent in the glafs, but came from the floor of the room. And, he fays, he was confirmed in this opinion when he found, that if he touched the frame of the machine with one hand, while he ftood upon the floor, and with a finger of the other hand touched the gun-barrel, the fire would iffue, and the fnapping would continue as long as he held his hand upon the machine, but would ceafe upon his taking it off. In like manner, if the man, who turned the wheel, put one of his feet upon the floor, the other remaining upon the wax, the *electricity* at the gun-barrel would fnap, and ceafe upon his replacing his foot. But of this hypothefis more hereafter.

32. The accumulation of *electricity* may be meafured to great exactnefs by the following method, difcovered by Mr. Canton. When the phial is fufficiently *electrified*, by applying the wire thereof to the glafs globe, which is known by the appearance of a brufh of flame at the end of the wire, hang a flender piece of wire to the fufpended gun-barrel, detached for this purpofe from the globes. Upon your applying the wire of the *electrified* phial to that hanging to the gun-barrel, you perceive a fmall fnap; this you difcharge by touching the gun-barrel with your finger, which likewife fnaps: and thus alternately *electrifying* and difcharging, you proceed until the whole *electricity* of the water is diffipated, which is, fometimes, not done under an hundred difcharges. If you do not difcharge the *electricity* every time, the fnaps from the wire of the *electrified* phial to the gun-barrel, are fcarcely perceptible. The acquired *electricity* of the water is eftimated in proportion to the number of ftrokes.

This accumulation of *electricity* may perhaps be thought to deferve a farther explanation, and may be thus illuftrated. As we take it for granted, that there is always a determinate quantity of atmofphere furrounding the terraqueous globe, we conceive, when we fee the mercury in the barometer very low, that there then is a lefs accumulated column of this atmofphere impending over us, than when we fee the mercury high. In like manner, when we obferve that the *electrified* gun-barrel attracts or repels only very light fubftances, at a very fmall diftance, or that the fnap and fire therefrom are fcarce perceptible, we conceive then a much lefs quantity of *electrical* atmofphere furrounding the gun-barrel. This power being more or lefs, is called the greater or lefs degree of the accumulation of *electricity*. And this is only attainable to a certain point, if you *electrify* ever fo long; after which, unlefs otherwife directed, the diffipation thereof is general. In the phial filled with water, in Mufchenbroek's experiment, or filled with any other *non-electric*, as filings of iron, if the wire be held to the globe in motion, when the accumulation is complete, the furcharge runs off from the point of the wire, as a brufh of blue flame. That by ftopping the current of *electricity*, *non-electrics* might be excited; and that by accumulating their power, they might be made to exert more force than *electrics per fe* would at any point of time, is that capital difcovery of the late Mr. Gray; which is to be regarded as the bafis upon which all the prefent improvements of our knowledge in *electricity* are founded.

33. By comparing the refpective velocities of *electricity* and found, that of *electricity*, in any diftance yet experienced, appears inftantaneous.

For the detail of thefe curious experiments, and of feveral others, we muft refer to Mr. Watfon's experiments and obfervations, tending to illuftrate the nature and properties of *electricity*, Lond. 1745; and the fequel to the experiments, &c. Lond. 1746; as alfo to his account of the experiments made by fome gentlemen of the Royal Society, Lond. 1748.

34. Mr. Franklin of Philadelphia, in his experiments and obfervations on *electricity*, has obferved, that granulated lead is better than water for filling the phial or glafs jar to be *electrified*; and he has been able to excite the *electrical* force to fuch a degree, as not only to fire gunpowder [a], and to kill a turkey of ten pound weight [b], but to produce a fufion of metals [c].—[[a] Phil. Tranf. Vol. XLVII. p. 291. [b] Ibid. p. 209. [c] Ibid. p. 290.]

This ingenious author's method of firing gunpowder by the *electric* flame has fomething particular, as it does not require any inflammable vapour to be previoufly raifed. The powder may be fired thus: a fmall cartridge is filled with dry powder, hard rammed, fo as to bruife fome of the grains. Two pointed wires are then thruft in, one at each end, the points approaching each other in the middle of the cartridge, till within the diftance of half an inch: then the cartridge being placed in the circle, when four *electrified* glafs jars are difcharged, the *electric* flame leaping from the point of one wire to the point of the other, within the cartridge among the powder, fires it, and the explofion of the powder is at the fame inftant with the crack of the *electrical* difcharge.

35. As to metals, this gentleman obferves, that he has been able by *electricity* frequently to give polarity to needles, and to reverfe it. A fhock from four large glafs jars fent thro' a fine fewing needle, gives it polarity; and it will traverfe, when laid on water. The polarity is given ftrongeft, when the needle is ftruck lying north and fouth; and weakeft, when lying eaft and weft. In this cafe, the end entred by the *electric* blaft points north: but when the needle lies north and fouth, the end that lies towards the north will continue to point north, whether the fire entred at that end, or the contrary end.

36. In thefe experiments, the ends of the needles are fometimes finely blued, like a watch-fpring, by the *electric* flame. This colour, given by the flafh from two glafs jars only, will wipe off; but four will fix it, and frequently melt the needles. Sometimes the furface on the body of the needles is alfo run, and appears bliftered, when examined by a magnifying glafs. The jars Mr. Franklin made ufe of hold feven or eight gallons, and are coated and lined with tinfoil. Each of them takes a thoufand turns of a globe of nine inches diameter to charge it. Tin-foil has been melted between glafs by the force of two jars only. Phil. Tranf. loc. cit.

37. The effects of lightning and thofe of *electricity* appear very fimilar. Lightning has been known to ftrike people blind, the *electrical* fhock has had the fame effect on animals. Animals have been killed by both. The mariners compafs has fometimes loft its virtue by lightning; and by Mr. Franklin's experiments it appears, that polarity may be given and reverfed by *electricity*. The late Mr. Stephen Gray obferved feveral years ago [d], that the *electric* fire feemed to be of the fame nature with that of thunder and lightning. Others have fince fallen into the fame opinion. Indeed many experiments fhew, that the flame of *electricity* has been juftly called by Mr. Franklin a mimic lightning [e], fince it blinds and kills animals, and melts metals, &c. like

like natural lightning.—[d Phil. Transf. Vol. cit. p. 536. e Ibid. p. 290.]

38. This analogy is now farther confirmed by the difcovery made in France, in confequence of Mr. Franklin's hypothefis, of being able, by a proper apparatus, to collect the *electricity* from the atmofphere during a thunder ftorm. For a pointed bar of iron, 40 feet high, having been placed upon an *electrical* body, and a ftormy cloud having paffed over the place where the bar ftood, thofe that were appointed to obferve it drew near, and attracted from it fparks of fire, perceiving the fame kind of commotions as in the common *electrical* experiments. The like effect followed, when a bar of iron 99 feet high was placed upon a cake of refin, two feet fquare and two inches thick. For a ftormy cloud having paffed over the bar, where it remained half an hour, fparks were drawn from the bar. Thefe were the firft experiments made in France, and they have been fufficiently varied and verified fince; fo that it feems now certain, 1°. that a bar of iron, pointed or not, is *electrifed* during a ftorm. 2°. That a vertical or horizontal fituation is equally fitting for thefe experiments. 3°. That even wood is *electrifed*. 4°. That by thefe means a man may be fufficiently *electrifed* to fet fire to fpirit of wine with his finger, and repeat almoft all the ufual experiments of artificial *electricity*; for fuch may that which is excited by friction be denominated.

It is, however, to be remarked, that thefe phænomena are attended with irregularities, and do not always fucceed perfectly. Sometimes fimple clouds, without thunder or lightning, produce more *electricity*, than when there is loud thunder. Sometimes the *electricity* does not fhew itfelf but where there is lightning: in other cafes, the *electricity* which feemed diffipated during the rain, began again as foon as the rain ceafed, altho' the thunder was very diftant. See the Phil. Tranf. Vol. XLVII. p. 534, feq.

39. Mr. Franklin has contrived a very ingenious and eafy way of trying experiments of this kind by means of an *electrical* kite, made of a large thin filk handkerchief, extended and faftened at the four corners to two flight ftrips of cedar, of fufficient length for this purpofe. This kite being accommodated with a tail, loop, and ftring, will rife in the air like thofe of paper. To the top of the upright ftick of the crofs is to be fixed a very fharp-pointed wire, rifing a foot or more above the wood. To the end of the twine, next the hand, is to be tied a filk ribband; and where the twine and filk join, a key may be faftened. The kite is to be raifed when a thunder guft appears to be coming on, and as foon as the thunder-clouds come over the kite, the pointed wire will draw the *electric* fire from them, and the kite with all the twine will be *electrified*; and the loofe filaments of the twine will ftand out every way, and be attracted by an approaching finger. When the rain has wet the kite and twine, fo that it can conduct the *electric* fire freely, it will ftream out plentifully from the key, on the approach of a man's knuckle. At this key the phial may be charged; and from *electric* fire thus obtained fpirits may be kindled, and all the other *electrical* experiments be performed, which are ufually done by the help of a rubbed glafs globe or tube, and the famenefs of the *electric* matter with that of lightning may thereby be completely demonftrated. Phil. Tranf. Vol. cit. p. 565, feq.

From this identity, fome have conceived hopes of depriving the clouds of all their thunder, and thereby rendering thunder ftorms harmlefs. See Philof. Tranf. Vol. cit. p. 289, 535.

40. It has been pretended, that odours would pervade *electrified* globes and tubes of glafs, and that the medicinal effects of drugs might likewife be tranfmitted this way; as alfo, that if perfons were to hold in their hands, or place under their naked feet, odoriferous, or purging fubftances, and were then to be *electrifed*, they would be fenfible of the effects of thefe fubftances. But it feems now certain, that all thefe pretences have been impofitions on the credulity of the world, and that when proper experiments have been tried, no fuch effects have been perceived, nor have the moft poifonous fubftances manifefted any influence in this way. See Dr. Bianchini's experiment, mentioned in the Philof. Tranf. Vol. XLVII. p. 399, feq.

41. However, though thefe pretended wonders, tranfmitted to the reft of Europe from Italy and Leipfic [f], have no foundation in fact, yet it does not follow, that medicinal advantages are not to be gained from *electricity* itfelf. So fubtle and fo elaftic a fluid admitted in a large quantity into our bodies, as, from undoubted experience, it greatly heats the flefh, and quickens the pulfe, may, more efpecially when affifted with the expectation of fuccefs in the patient, in particular cafes be attended with very great advantages [g]. —[f Phil. Tranf. Vol. cit. p. 231, feq. g Mr. Watfon in Phil. Tranf. Vol. cit. p. 406.]

In effect, we meet with fome cures performed in paralytic cafes by the force of *electricity*. See Hiftoire generale et particuliere de l'*Electrité*, Paris, 1752, part. 3. p. 36, feq. And we meet with accounts of feveral other diforders cured by the fame means, in that treatife; but we fear not all equally well attefted.

42. The *electrical* virtue having, in fome cafes, accelerated and facilitated the motion of liquids through capillary tubes, the Abbé Nollet was led to fuppofe, that the *electrical* effluvia might alfo contribute to accelerate the growth of vegetables, and to increafe the perfpiration of animals, and the experiments made by that gentleman feem to fupport his opinion; though objections have arifen, as to what he has advanced with refpect to the acceleration of the motion of fluids through capillary tubes or fyphons: for Mr. Ellicott feems to have proved, that this acceleration is not barely owing to the fluids being *electrified*, but that other circumftances are neceffary, in order to produce this effect. Mr. Ellicott obferves, that if a veffel of water is hung to the prime conductor, having a fyphon in it of fo fmall a bore that the water will be difcharged from it only in drops, on the water's becoming *electrical* by means of the machine, it will immediately run in a ftream, and continue to do fo, till the water is all difcharged, provided the fphere is continued in motion. And the true reafon of the water's running in a ftream in this cafe feems to be, that fo long as the machine is in motion, there is a conftant fucceffion of the *electric* effluvia excited, which vifibly run off from the end of the prime conductor in a ftream; and as they are in like manner carried off from all bodies hung to it, thofe effluvia which run off from the end of the fyphon, being ftrongly attracted by the water, carry fo much of it along with them, as to make it run in a conftant ftream. See Mr. *Ellicott's* Effays before mentioned, p. 11, 12, &c.

The fame author obferves farther, that if the veffel of water, with the fyphon in it, is fufpended by any *non-electric* body over another ftrongly *electrified*, the water will immediately run from the fyphon in a ftream; but if fupported by a piece of filk, or any other *electrical* body, the water will immediately ceafe running, and only be difcharged in drops. And he accounts for this phænomenon from the principles of attraction between *non-electrics* and *electrical* effluvia, and of non-attraction between the fame effluvia and original *electrics*. See page 15 of the Effays before cited.

43. Mr. Watfon has given us a particular account of feveral curious phænomena of *electricity* in vacuo in the Philofophical Tranfactions, Vol. XLVII. p. 362, feq. The *electrical* effluvia, in their paffage through an exhaufted glafs tube, of almoft three inches in diameter, afford a moft agreeable fpectacle in a darkened room. We may obferve, not as in the open air, brufhes or pencils of rays an inch or two in length, but corufcations extending the whole length of the tube, that is, in his experiment, thirty-two inches, and of a bright filver hue. Thefe did not immediately diverge, as in the open air, but frequently, from a bafe apparently flat, divided themfelves into lefs and lefs ramifications, and refembled very much the moft lively corrufcations of the aurora borealis. At other times, when the tube has been exhaufted in the moft perfect manner, the *electricity* has been feen to pafs between two brafs plates, contrived fo, that they might be placed at different diftances from each other, in one continued ftream, of the fame dimenfions throughout its whole length.

If the exhaufted tube be made part of the circuit before mentioned in Mufchenbroek's experiment, at the inftant of explofion, a mafs of very bright embodied fire may be feen jumping from one of the brafs plates in the tube to the other. But this is obferved not to take place, when one of the plates is farther diftant from the other than ten inches. If the diftance be greater, the fire begins to diverge, and lofe part of its force; and this force diminifhes in proportion to its divergency, which is nearly as the diftance of the two plates.

But though the vacuum here employed greatly exceeded that which is ufually made by common air-pumps, yet it was far from being perfect. Thefe experiments were therefore tried with a torricellian vacuum, very ingenioufly contrived by Lord Charles Cavendifh. The apparatus confifted of a cylindrical glafs tube of about three-tenths of an inch in diameter, and of feven feet and an half in length, bent in fuch a manner, that thirty inches of each of its extremities were nearly ftraight, and parallel to each other, from which an arch fprung, which was likewife of thirty inches. This tube was carefully filled with mercury; and each of its extremities being put into its bafon of mercury, fo much of the mercury ran out, until, as in the common barometrical tubes, it was in equilibrio with the atmofphere. Each of the bafons containing the mercury was of wood, and was fupported by a cylindrical glafs of about four inches in diameter, and fix inches in length; and thefe glaffes were faftened to the bottom of a fquare wooden frame, fo contrived, as that to its top was fufpended, by filk lines, the tube filled with mercury before mentioned; fo that the whole of this apparatus, without inconvenience, might be moved together. The torricellian vacuum then occupied a fpace of about thirty inches. In making the experiment, when the room was darkened, a wire from the prime conductor of the common *electrical* machine, communicated with one of the bafons of mercury, and any *non-electric* touching the other bafon, while the machine was in motion,

 the

the *electricity* pervaded the vacuum in a continued arch of lambent flame, and as far as the eye could follow it, without the leaft divergency.

It is to be obferved, that upon admitting a very fmall quantity of air into the exhaufted tube, the phænomena difappear; not fo much from the fmall quantity of air admitted, as from the vapours which infinuated themfelves therewith. For thefe phænomena have been vifible, though in a lefs perfect degree, when a much larger quantity of air was left in the receiver, by omitting to exhauft it as much as poffible.

If the *electrifying* machine, and the man who turns the wheel thereof, are fupported by *electrics per fe*; and if a piece of wire be connected with the brafs cap covering the upper extremity of the exhaufted tube, or to the end of the long brafs rod, by the fliding of which through a box of oiled leather, the upper brafs plate may be moved in the tube; and if the other end of the wire be faftened to any part of the frame of the *electrifying* machine, when this is put in motion, the *electrical* corufcations may be feen to pafs, as before, from one of the brafs plates contained in the tube to the other, and to continue, unlefs the air infinuates itfelf, as long as the machine is in motion. If, under thefe circumftances, the hand of a perfon ftanding on the floor is brought near the fides of the glafs, the corufcations will direct themfelves that way in a great variety of curious forms.

This experiment, in which the *electricity* is feen pufhing itfelf on through the vacuum by its own elafticity, is confidered by Mr. Watfon as an *experimentum crucis* of the truth of his doctrine hereafter mentioned.

It may be obferved in all thefe experiments, that a vacuum does not conduct *electricity* fo perfectly as metals or water. For, in the laft experiment, a perfon ftanding upon the floor, and applying his finger to the upper brafs cap of the tube, receives a fmart ftroke; and in the former, fnaps of fire may be drawn from the prime conductor. Thefe are arguments of fome degree of accumulation, while the *electricity* is paffing through the vacuum; fince nothing of this kind happens when metals, ftanding upon the ground, touch the prime conductor.

Such are the principal phænomena of *electricity* hitherto difcovered; but the chief queftion remains: What are the general laws of thefe phænomena, and what are their caufes?

Mr. Ellicott thinks that the following conclufions, or general laws, may be juftly deduced from the phænomena.

1°. That thefe remarkable phænomena are produced by means of effluvia; which, in exciting the *electrical* body, are put into motion, and feparated from it.

2°. That the particles compofing thefe effluvia ftrongly repel each other.

3°. That there is a mutual attraction between thefe particles and all other bodies whatfoever.

That there are effluvia emitted from the tube when rubbed, and which furround it as an atmofphere, is evident from that offenfive fmell arifing from them, from that fenfation on the hands or face, when the tube is brought near either of them, and from thofe fparks of light, on a ftill nearer approach of the finger to it.

That the particles of thefe effluvia repel each other, is proved by the cork balls, and the fibres of the feather repelling each other, when impregnated with them; and by the leaf-gold being repelled by the tube, and not returning to it again, until by coming near, or touching fome *non-electric* body, the effluvia are drawn off from it. From this property it is, that thefe effluvia expand themfelves with fo great a velocity whenever they are feparated from the *electric* body; and as they are likewife capable of being greatly condenfed, may we not from hence juftly conclude they are *elaftic*?

That there is a mutual attraction between thefe effluvia and moft other bodies, appears from their collecting from the tube fuch quantities thereof, as to endue them with the fame properties with the tube itfelf, as is proved from feveral of the experiments above mentioned.

Thefe principles being admitted, it will follow, that the greater difference there is in the quantity of *electrical* effluvia in any two bodies, the ftronger will be their attraction. For, if the effluvia in each are equal, inftead of attracting, they will repel each other; and in proportion as the quantity of *electric* matter is drawn from one of the bodies, will the attraction between them increafe, and confequently be ftrongeft, when any one of them has all the *electrical* matter drawn from it.

The particles of thefe effluvia are fo exceeding fmall, as eafily to pervade the pores of glafs, as is evident, in that a feather, or any light bodies inclofed in a glafs ball hermetically fealed, will be put in motion on the excited tube being brought near the outfide of it: and it has been generally thought that they pafs thro' the pores of the denfeft bodies, and feveral experiments render this fuppofition not improbable, tho' none of them are quite conclufive.

Mr. Ellicott then proceeds to fhew, in a very ingenious manner, how, from thefe principles, the phænomena of fome of the more remarkable experiments of *electricity* may be accounted for. But as what he fays cannot, with juftice to his reafonings, be abridged, we muft refer the curious to his effays before quoted; only adding, that we have feen a manufcript of his, where he endeavours to account for the experiment of Mufchenbroek on thefe principles, in a manner that makes us wifh to fee the reft of his experiments, obfervations, and reafonings on this fubject publifhed.

Mr. Watfon has endeavoured to prove, that *electricity* is not furnifhed from the glaffes employed in the experiments, nor from the circumambient air. He thinks that *electricity* is the effect of a very fubtile and elaftic fluid, occupying all bodies in contact with the terraqueous globe, and that every where in its natural ftate it is of the fame degree of denfity; and that glafs, and other bodies, which are called *electrics per fe*, have the power of taking this fluid from one body, and conveying it to another, in a quantity fufficient to be obvious to all our fenfes; and that under certain circumftances, it is poffible to render the *electricity* in fome bodies more rare than it naturally is, and, by communicating this to other bodies, to give them an additional quantity, and make their *electricity* more denfe; and that thefe bodies will thus continue until their natural quantity is reftored to each; that is, by thofe which have loft part of theirs, acquiring what they have loft, and by thofe, to which more has been communicated, parting with their additional quantity. Both one and the other of thefe is, from the elafticity of the *electric* matter, attempted to be done from the neareft *non-electric*; and when the air is moift, this is foon accomplifhed by the circumambient vapours, which here may be confidered as preventing, in a very great degree, our attempts to infulate *non-electric* bodies.

This fhort fketch of Mr. Watfon's fyftem is taken from his own words in the Philofophical Tranfactions, Vol. XLVII. p. 371, 372. For the detail of his illuftrations and proofs, his treatife before quoted, or the Phil. Tranfact. Vol. XLIV and XLV, muft be confulted, and particularly Vol. XLVII, p. 372, & feq. where, after giving the *experimentum crucis* before mentioned, he endeavours to fhew that it amounts to a full proof of the truth of his doctrine, that *electricity* is furnifhed by thofe bodies, hitherto called *non-electrics*, and not by the *electrics per fe*; and that we are able to add to, or take from, that quantity of *electricity* naturally adherent to bodies.

Mr. Watfon's fyftem naturally leads him to afk, by what denomination fhall we call this extraordinary power? From its effects in thefe operations fhall we call it *electricity*? From its being a principle neither generated nor deftroyed; from its being every where and always prefent, and in readinefs to fhew itfelf in its effects, tho' latent and unobferved, till by fome procefs it is produced into action, and rendered vifible; from its penetrating the denfeft and hardeft bodies, and its uniting itfelf to them; and from its immenfe velocity; fhall we, with Theophraftus, Boerhaave, Niewentiit, 'sGravefande, and other philofophers, call it elementary fire? Or fhall we, from its containing the fubftance of light and fire, and from the extreme fmallnefs of its parts, as paffing thro' moft bodies we are acquainted with, denominate it, with Homberg and the chemifts, the chemical fulphureous principle, which, according to the doctrines of thefe gentlemen, is univerfally diffeminated? Whatever we call it, it feems certain, that this power has many furprifing properties, and cannot but be of great moment in the fyftem of the univerfe.

To conclude, we muft obferve that the ingenious Mr. Wilfon has, in a treatife exprefs, endeavoured to account for the phænomena of *electricity*, from Sir Ifaac Newton's æther.

As to other hypothefes, we refer to the *Hiftoire generale et particuliere de l'Electricité* before mentioned.

SOUND (*Suppl.*)—The fpace through which *found* is propagated in a given time, has been very differently eftimated by authors who have written concerning this fubject. Roberval gives it at the rate of 560 feet in a fecond; Gaffendus, at 1473; Merfenne, at 1474; Du Hamel, in the Hiftory of the Academy of Sciences at Paris, at 1172; the Academy del Cimento, at 1185; Boyle, at 1200; Roberts, at 1300; Walker, at 1338; Sir Ifaac Newton, at 968; Dr. Derham, in whofe meafure Mr. Flamfteed and Dr. Halley acquiefced, at 1142. But by the accounts fince publifhed by M. Caffini de Thury, in the Memoirs of the Royal Academy of Sciences at Paris for the year 1738, where cannon were fired at various, as well as great diftances, under great variety of weather, wind, and other circumftances, and where the meafures of the different places had been fettled with the utmoft exactnefs, *found* was propagated at a medium at the rate only of 1038 French feet in a fecond. The French foot exceeds the Englifh by nearly feven lines and a half, or is as 107 to 114: And confequently, 1038 French feet are equal to 1106 Englifh feet. The difference therefore of

of the meaſures of Mr. Derham and M. Caſſini is 34 French, or 36 Engliſh feet in a ſecond. According to this laſt meaſure, the velocity of *ſound*, when the wind is ſtill, is ſettled at the rate of a mile, or 5280 Engliſh feet, in $4\frac{77}{100}''$.

UNDULATION, or BEAT, in muſic, is uſed for that rattling, or jarring of ſounds, which is obſerved, chiefly, when diſcordant notes are ſounded together.

The phænomenon is more fully deſcribed thus, by Dr. Smith [a]: In tuning muſical inſtruments, eſpecially organs, it is a known thing, that while a conſonance is imperfect, it is not ſmooth and uniform, as when perfect, but interrupted with very ſenſible *undulations* or *beats*; which, while the two ſounds continue at the ſame pitch, ſucceed one another in equal times, and in longer and longer times, while either of the ſounds approaches gradually to a perfect conſonance with the other, till at laſt the *undulations* vaniſh, and leave a ſmooth, uniform conſonance.—[[a] Harmonics, p. 107.]

This learned author obſerves farther, that quicker *undulations* are *beats*, and are remarkably diſagreeable in a concert of ſtrong, treble voices, when ſome of them are out of tune; or in a ring of bells ill tuned, the hearer being near the ſteeple; or in a full organ badly tuned. Nor can the beſt tuning wholly prevent that diſagreeable battering of the ears with a conſtant rattling noiſe of *beats*, quite different from all muſical ſounds, and deſtructive of them, and chiefly cauſed by the compound ſtops called the cornet and ſeſquialter, and by all other loud ſtops of a high pitch, when mixed with the reſt. But if we be content with compoſitions of uniſons and octaves to the diapaſon, whatever be the quality of their ſounds, the beſt manner of tuning will render the noiſe of their *beats* inoffenſive, if not imperceptible.

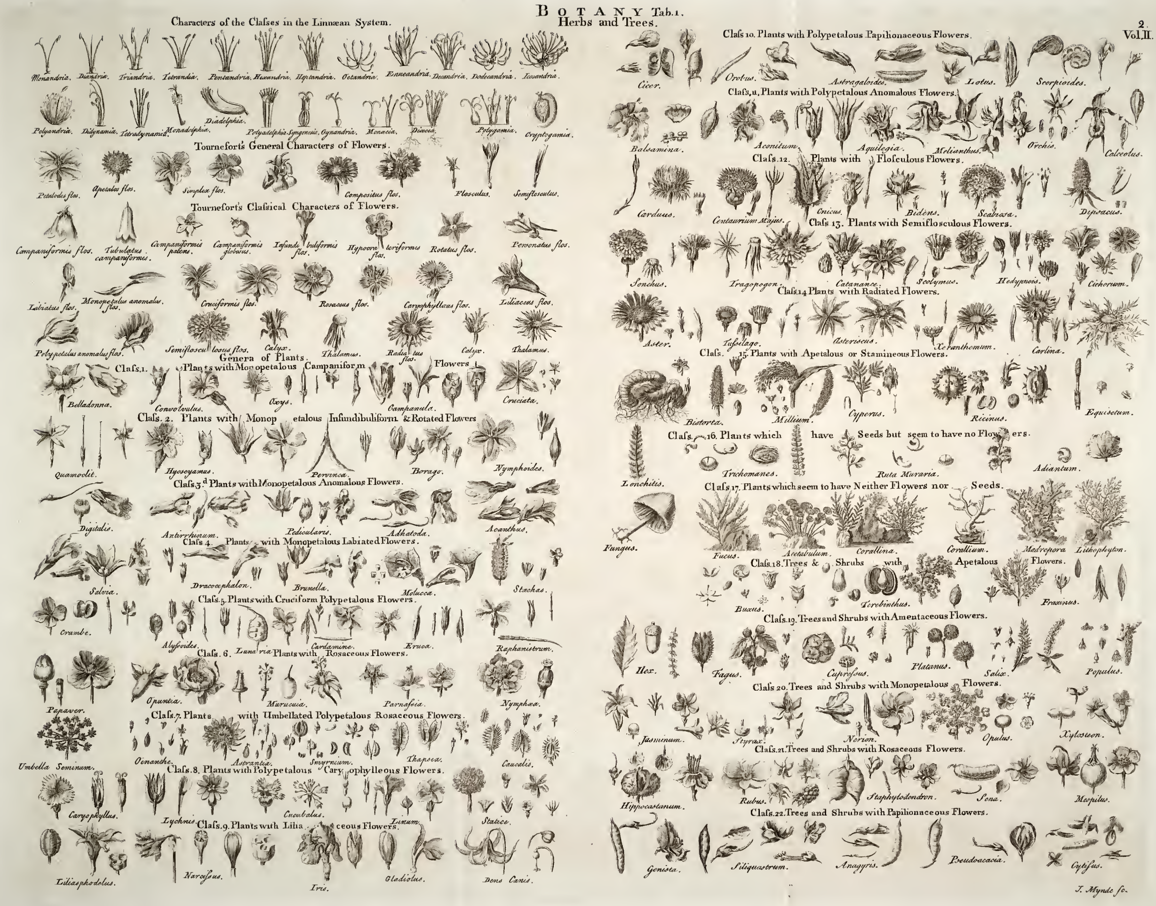
The Doctor has with great ingenuity deduced the theory of theſe *undulations* from his principles, and has applied his doctrine to the tuning of inſtruments; by which he has ſhewn, that a perſon of no ear at all for muſic may ſoon learn to tune an organ, according to any propoſed temperament of the ſcale, and to any deſired degree of exactneſs, far beyond what the fineſt ear, unaſſiſted by theory, can poſſibly attain to. This may be done by counting the number of *undulations* in a certain time, ſuch as 15 ſeconds. See the treatiſe before cited, Prop. xx. p. 215. and the table, p. 244. Plate 20.

From this ingenious theory the learned author has demonſtrated ſeveral errors in what Monſieur Sauveur has delivered concerning theſe *undulations* or *beats*. See Harmonics, Scholium 2. p. 115.

In the ſame treatiſe we find ſome curious obſervations relating to the analogy of audible and viſible *undulations*. See p. 128, 273.

F I N I S.

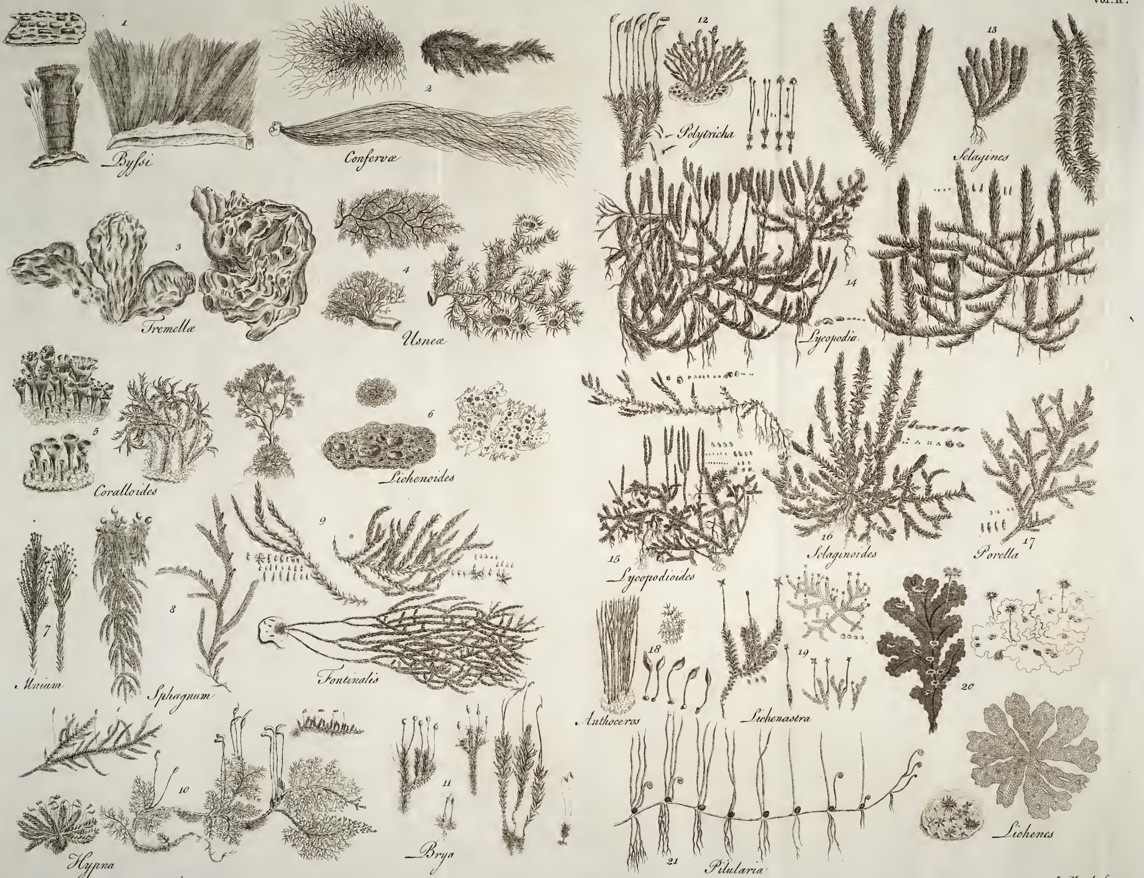
A General Table of Fossils.


BOTANY Tab.1.
Herbs and Trees.
2.
Vol.II.
Characters of the Clases in the Linnæan System.
Monandria. Diandria. Triandria. Tetrandia. Pentandria. Hexandria. Heptandria. Octandria. Enneandria. Decandria. Dodecandria. Icosandria.
Polyandria. Didynamia. Tetradynamia. Monadelphia. Diadelphia. Polyadelphia. Syngenesia. Gynandria. Monæcia. Diœcia. Polygamia. Cryptogamia.
Tournefort's General Characters of Flowers.
Petalodes flos. Apetalos flos. Simplex flos. Compositus flos. Flosculus. Semiflosculus.
Tournefort's Clasical Characters of Flowers.
Campaniformis flos. Tubulatus campaniformis. Campaniformis patens. Campaniformis globosus. Infundibuliformis flos. Hypoocrateriformes flos. Rotatus flos. Personatus flos.
Labiatus flos. Monopetalus anomalus flos. Cruciformis flos. Rosaceus flos. Caryophylleus flos. Liliaceus flos.
Polypetalus anomalus flos. Semiflosculosus flos. Calyx. Thalamus. Radiatus flos. Calyx. Thalamus.
Genera of Plants.
Clas.1. Plants with Monopetalous Campaniform Flowers
Belladonna. Convolvulus. Oxys. Campanula. Cruciata.
Clas. 2. Plants with Monopetalous Infundibuliform &Rotated Flowers
Quamoclit. Hyoscyamus. Pervinca. Borago. Nymphoides.
Clas.3.d Plants with Monopetalous Anomalous Flowers.
Digitalis. Antirrhinum. Pedicularis. Adhatoda. Acanthus.
Clas 4. Plants with Monopetalous Labiated Flowers.
Salvia. Dracocephalon. Brunella. Molucca. Stæchas.
Clas.5. Plants with Cruciform Polypetalous Flowers.
Crambe. Alysoides. Lunaria. Cardamine. Eruca. Raphanistrum.
Clas. 6. Plants with Rosaceous Flowers.
Papaver. Opuntia. Murucuia. Parnassia. Nymphæa.
Clas.7. Plants with Umbellated Polypetalous Rosaceous Flowers.
Umbella Seminum. Oenanthe. Astrantia. Smyrnium. Thapsia. Caucalis.
Clas.8. Plants with Polypetalous Caryophylleous Flowers.
Caryophyllus. Lychnis. Cucubalus. Linum. Statice.
Clas.9. Plants with Liliaceous Flowers.
Liliasphodelus. Narcissus. Iris. Gladiolus. Dens Canis.
Clas 10. Plants with Polypetalous Papilionaceous Flowers.
Cicer. Orobus. Astragaloides. Lotus. Scorpioides.
Clas.11. Plants with Polypetalous Anomalous Flowers.
Balsamina. Aconitum. Aquilegia. Melianthus. Orchis. Calceolus.
Clas.12. Plants with Flosculous Flowers.
Carduus. Centaurium Majus. Cnicus. Bidens. Scabiosa. Dipsacus.
Clas 13. Plants with Semiflosculous Flowers.
Sonchus. Tragopogon. Catanance. Scolymus. Hedypnois. Cichorium.
Clas.14 Plants with Radiated Flowers.
Aster. Tussilago. Asteriscus. Xeranthemum. Carlina.
Clas. 15. Plants with Apetalous or Stamineous Flowers.
Bistorta. Millium. Cyperus. Ricinus. Equisetum.
Clas. 16. Plants which have Seeds but seem to have no Flowers.
Lonchitis. Trichomanes. Ruta Muraria. Adiantum.
Clas 17. Plants which seem to have Neither Flowers nor Seeds.
Fungus. Fucus. Acetabulum. Corallina. Corallium. Madrepora. Lithophyton.
Clas.18. Trees & Shrubs with Apetalous Flowers.
Buxus. Terebinthus. Fraxinus.
Clas.19. Trees and Shrubs with Amentaceous Flowers.
Ilex. Fagus. Cupressus. Platanus. Salix. Populus.
Clas 20. Trees and Shrubs with Monopetalous Flowers.
Jasminum. Styrax. Nerion. Opulus. Xylosteon.
Clas.21. Trees and Shrubs with Rosaceous Flowers.
Hippocastanum. Rubus. Staphylodendron. Sena. Mespilus.
Clas.22. Trees and Shrubs with Papilionaceous Flowers.
Genista. Siliquastrum. Anagyris. Pseudoacacia. Cytisus.
J. Mynde sc.

BOTANY Tab. 2.

DISTINCTIONS OF THE LEAVES, FLOWERS, AND CUPS OF PLANTS.

BOTANY Tab. 3.
THE GENERA OF MOSSES



J. Mynde sc.

QUADRUPEDS and SERPENTS

THE MORE SCARCE AND CURIOUS BIRDS.

J. Mynde fc.

THE MOST SCARCE and REMARKABLE FISHES.

INSECTS.

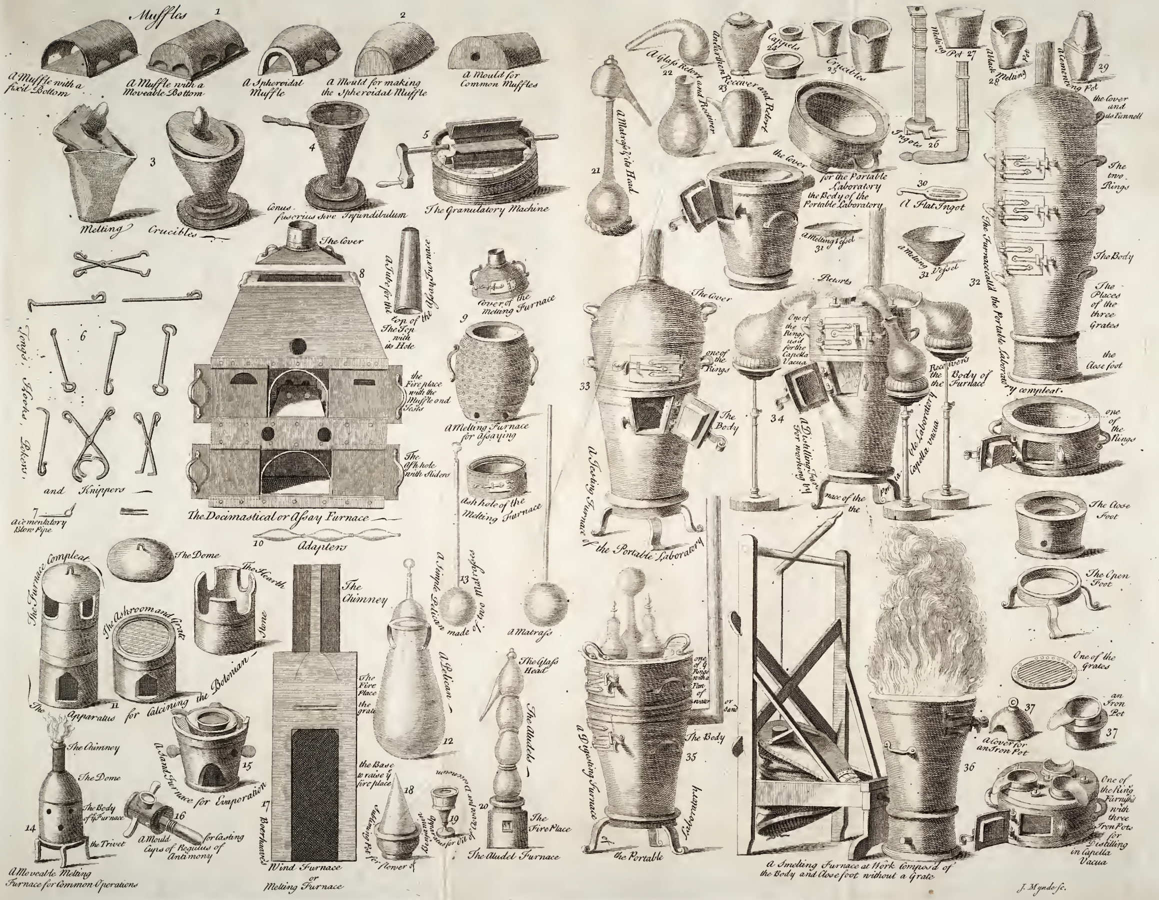

Larger Insects.
1 Libella, The Dragon-fly
2 The Lanthorn-Fly
3 The Common Locust
4 Mantis, The Praying Locust
5 Cicada
6 The Stag-horn'd Beetle
7 Gryllotalpa
8 Scorpion
9 Caterpillars
Butter-flies and their Chrysalises
10
11 Chrysalises
Smaller Insects
Mineurs de Feuilles; or Leaf Insects in their Cells and Separate.
12
Trefoil Leaf
Sowthistle Leaf & the Fly
Ranunculus Leaf
Honeysuckle Leaf
Oak Leaf
all with the Path of the Insects
Tæniæ of various kinds.
13
Tæniæ of Cloaths, the Cases, Worms, and Flies
Tæniæ of Leaves their Cases Worms and Flies
Elm Leaf
14
Tænia of the Oak Leaf
Tænia of the Hornbeam Leaf
15
16
Tæniæ Aquaticæ, or Cadworms in their various Cases and naked
17
Papilionaceous Flies of the Tæniæ Aquaticæ
18
Tænia of the Lilly Leaf with the Beetle produced from it
19
Tænia of y Artichoak with its Chrysalis
Pucerons of various kinds.
20
Tæniæ of Honey-Combs, with their long Pipes or Cases
21
The winged Rose Puceron magnified
The naked Rose Pucerons magnified
Pucerons of the Elder
Pucerons on Branches of Trees in the natural Size & magnified
Pucerons on vitiated Branches of the Lime Tree
Pucerons in the Suberdes of the Gooseberry Tree
Pucerons of the Peach Tree magnified
22
Cottony Pucerons of the Beech-Tree
Bastard-Pucerons of various Speices with the Flies they are chang'd to
23
Bastard-Pucerons of the Fig Tree & Box
Puceron-eaters, or Worms that destroy the Pucerons
24
The Fly of y Puceron-Eater
A Puceron-Eater on a Branch loaded with Pucerons
Crysalis of the Puceron-Eater on a Stick
Leaf-Galls & Insects which occasion them
25
Flies of the Oak-leaf Galls
Oak leaf Galls
26
The Punaise of y Chamadrys Galls
Chamadrys flower Galls
27
Leaf Galls of the Lime
The Worm & Fly of y Galls of y Carduus
28
Hemorhoidalis natural and magnified
Gallinsects of various Species
29
Gallinsects of the Peach Tree
30
Kermes Gallinsect
31
The Boat Gallinsects
32
Gallinsects of the Vine
33
Nymph & Case of the Boat-Gallinsect
34
Flies of the Gallinsects
35
The Shell Gallinsect of y Elm
Gallinsects in Copulation
The Case of y Gallinsects Fly with the Nymph all Magnified
Progallinsects of various Species
36
Progallinsects of the Elm natural size & magnified
with the Cotton and without the Cotton
37
The Cochineal Progallinsect magnified
38
Young Progallinsects of the Elme magnified
39
The Swallows nest Fly in its natural Size
The Swallows nest Fly Magnified
Worms of the Water &c with their Flies
40
The Pencill-tail'd water Worm
41
The red-Water Worm
The Shining Canada Worm
44
42
The Formica-leo
The Hexapode Worm of the Libella
45
46
The Hexapode Water Worm with Oars
43
The Fly of the brown jointed waterworm coming out of its Case in its natural size & Magnified
Tipulæ & their Worms.
47
Tipulæ in Copulation
48
The Worm and Nymph of the Tipulæ
49
The Rat-tail'd Water Worms and their Flies
Flies of the Rat tail'd Water Worms
50
51
Bastard-Caterpillar of the Bramble with its Chrysalis and Flies.
52
The Stalk of the Rose Tree wounded for receiving the Eggs
The Bastard-Caterpillar of the Rose with its Flies
Prickly-Caterpillars
53
Of the Oak
54
Of the Plumb-Tree
J. Mynde sc.


ECHINODERMATA or SEA-URCHINS
Cidares
Cidares
miliares 1
Cidares variolatæ 2
Cidares Mammillatæ 3
Cidares assulatæ 4
Clypeus 5
Scutum humile 6
Scu=
=ta
Scutum Altum 7
Arachnoides 8
Placentæ
Mellita 9
Rotulæ 10
Corda marina
Ovum Marinum
Spatangi 11 11
12
Rotulæ 10
Aciculæ Cidaris Variolatæ testæ Affixæ
13
Spatagoides 14
Echinometra Pomum Marinum dicta 15
Echinometra setacea 16
Echinometra digitata 17
SQUILLÆ et CANCERES
Locusta marina Indica 18
Squilla lata 19
Squilla Arenaria 20
Cancer volans 21
Cancer Lanosus 22
Cancellus anatum longimanus 23
Cancer spinosus longimanus minor 24
Squilla lutaria 25
Pagurus 26
Cancer raniformis 27
Cancer lunaris 28
Cancer floridus 29
Cancer Spinosus 30
Cancer Spinosus longimanus major 31
Cancer Spinosus, The Rots Crab. 32
Pediculus Marinus, The Sea Louse. 33
Cancer Arachnoides, The Spider-Crab. 34
Cancellus anatum vulgaris 35
Cancellus Anatum rotundus 36
Cancellus Anatum crassus 37
Cancer Calappoides 38
Cancer Moluccensis, the King-Crab. 39
J. Mynde sc.

A General Table of Shells

J. Mynde sc.

MICROSCOPICAL OBJECTS and DISCOVERIES


Muffles
A Muffle with a fixed Bottom
A Muffle with a Moveable Bottom
A Spheroidal Muffle
A Mould for making the Spheroidal Muffle
A Mould for Common Muffles
Melting Crucibles
Conus fusorius sive Infundibulum
The Granulatory Machine
The Cover
The Docimastical or Assay Furnace
A Tube for the top of the Assay Furnace
The Top with its Hole
the Fire place with the Muffle and Tests
The Ash hole with Sliders
Cover of the Melting Furnace
A Melting Furnace for assaying
Ash hole of the Melting Furnace
Tongs, Hooks, Pokers, and Knippers
A Cementatory Blow Pipe
Adapters
The Furnace Compleat
The Dome
The Hearth
The Ashroom and Grate
The Apparatus for calcining the Bolonian Stone
The Chimney
The Fire Place
the grate
the Base to raise ye fire place
Boerhaave's Wind Furnace or Melting Furnace
A Simple Pelican made of two Matrasses
A Matrass
A Pelican
A Sand Furnace for Evaporation
The Chimney
The Dome
The Body of ye Furnace
the Trivet
A Moveable Melting Furnace for Common Operations
A Mould for casting Cups of Regulus of Antimony
Subliming Pot for Flower of
The Glass Head
The Aludels
The Fire Place
The Aludel Furnace
A Glass Retort
An earthen Receiver and Retort
Cappels
Crucibles
Melting Pot
A black Melting Pot
A Cementing Pot
Ingots
A Flat Ingot
A Matrass with its Head
the Cover for the Portable Laboratory
the Body of the Portable Laboratory
A Melting Vessel
A Melting Vessel
Retorts
The Cover
one of the Rings
The Body
A Testing Furnace of the Portable Laboratory
One of the Rings used for the Capella Vacua
Receivers
the Body of the Furnace
A Distilling Furnace for working by
The Furnace call'd the Portable Laboratory compleat
the Cover and its Funnell
The two Rings
The Body
The Places of the three Grates
the Close foot
one of the Rings
The Close Foot
The Open Foot
One of the Grates
an Iron Pot
A Cover for an Iron Pot
One of the Rings Furnish'd with three Iron Pots for Distilling in Capella Vacua
A Digesting Furnace of the Portable Laboratory
The Body
A Smelting Furnace at Work compos'd of the Body and Close foot without a Grate
J. Mynde sc.